

About us

ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 110,000* talented employees in over 100 countries.

ABB has been present in India for over a century. ABB in India is a stock exchange listed company serving utility, industry, transport and infrastructure customers with power and automation technologies. The company has a deep manufacturing footprint in the country, developed over several decades with multiple world-class manufacturing locations, global feeder factories and development & engineering centers.



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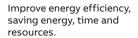
Data Centers

The future data center will have an intelligent grid connection, buying and selling energy, discriminating between grid and renewable power sources and contributing to the stability of power supply for its neighbors.

Having a highly efficient data center is a very demanding task. Two of the main challenges are: building a highly efficient data center, and having the right degree of information coming from measurements to take the correct action.

Main benefits







Monitor energy loss and reduce it up to 5%



Eliminate the risks of outages and guarantee service continuity 24/7.



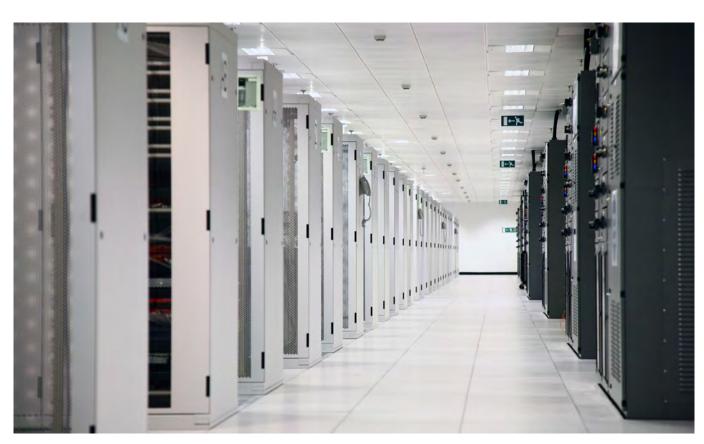
Save up to 40% of the space needed for the equipment for electrical energy distribution.



Minimize the design time of the electrical distribution.

Our application packages were designed by domain experts to focus on your specific challenges.

- +Intelligent distribution for electric power in Data Center
- +Continuous power in Data Center



Building Solutions

Our vison is a building space that is modular, efficient and flexible over time. Energy distribution and automation suiting well-being and productivity with transparency of costs and our mission is to offer an experience of excellence for different spaces, with ultimate technology components that are adaptable and able to support customer specific businesses.

Segmentation



Residential

Single family

- Houses
- Private dwellings
- · Single apartments

Multiple family

- Multi family dwelling
- · Apartment's complex



Commercial

Hospitality

- Hotels, Resorts, Motels
- Dormitories, Lodgings, Rooming
- Cruiser ships

Office

- · Low/Mid/High-rise
- Multi-purpose
- Laboratories
- Call centres
- Single/Time-share property

Retail & Mall

- Stores, Hypermarkets
- Retail chains, malls
- Restaurants, Food chains
- Showrooms

Leisure Facilities

· Casinos, Theme parks

Institutional

Healthcare

- Hospitals
- Nursing, Retirement homes
- Elderly care, Day care
- Multi-centres

Educational

- Schools, Universities, Colleges
- Research facilities
- Archives, Libraries

Public

- State/city buildings, Halls
- · Post-offices
- Temples, Historic
- Police, Military, Prisons



Infrastructure

Transportation

- · Airports, Ports, Stations
- Bus/Truck/Train terminals
- · Parking facilities
- Tunnels

Storage

- Warehouses
- · Cold storage plants

Others Infrastructure

 Water/Sewage treatment



Industrial

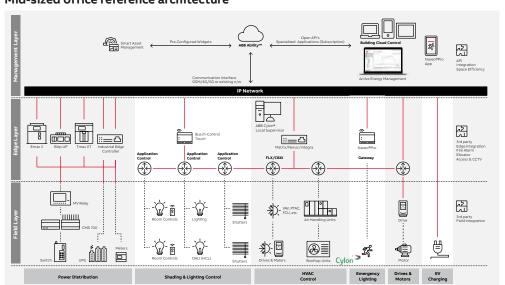
Manufacturing

- Facility
- Manufacturing
- Transformation
- Packaging

Others Industries

- Chemical,
 Pharmaceutical
- Processing
- Telecom
- Power plants
- Agricultural

Mid-sized office reference architecture



Transportation rail & infrastructure

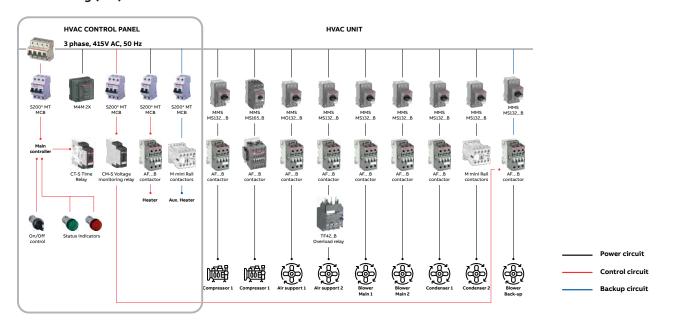
When it comes to rail infrastructure electrification, the key focus areas are DC voltage, AC voltage and custom solutions. We provide complete solutions for a reliable network. Our innovative products are designed for heavy-duty industrial applications and are extensively tested to withstand the requirements of a transportation system, helping to ensure maximum reliability for our customers.



Keep your rolling stock vehicles always up and running and play your role in the energy transition, thanks to our Switching & Protection solutions in compliance with rail standards.

Our Motor Starting and Protection solutions ensure that combinations of core power devices work in co-ordination with each other, while providing continuous operation and guaranteeing ease of installation. In addition, our solutions guarantee additional protection by providing control and monitoring functions for the whole system.

ABB offering (IEC)



Food & beverage

Food and beverage industry is highly demanding in terms of requirements for safety, productivity, efficiency and quality and Electrification Business has a complete set of solutions that are responding to this segment needs.



Depending on the nature of their business, F&B industrial buildings include a mix of different processes and equipment with greatly varying power protection requirements. We have categorized the major applications as below.

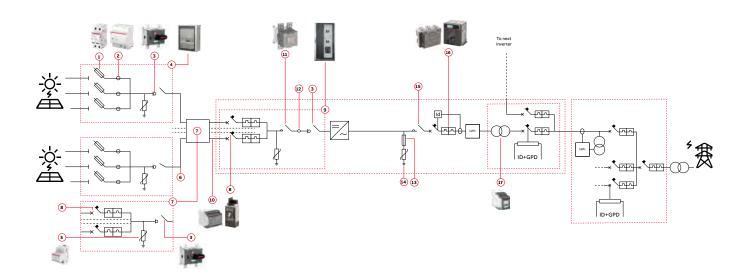
- Power quality in Food & Beverage
- Continuous power in Food & Beverage
 Intelligent Distribution for Food & Beverage
- Transfer switching for Food & Beverage
 Motor Starting & Protection in Livestock & Poultry

Solar

Solar is a leading sustainable energy source for utility-scale and distributed power generation and self-consumption to drive growth in mature and developing economies



ABB offers full range of solutions that meet the 1500V DC requirements, allow monitoring and communication functions at any level of a PV plant and offer advanced energy storage solutions to ensure continuous operations in any kind of application.



Low-voltage products:

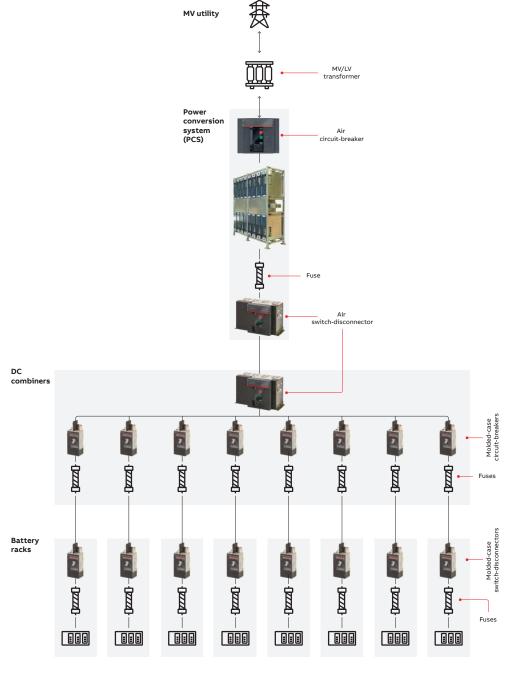
- 1. Fuse disconnectors: E 90 PV; Fuses: E 9F PV
- 2. Current measurement system: CMS
- 3. Switch-disconnectors: OTDC
- 4. String combiners: 1000V DC/1500V DC
- 5. Surge Protection Devices: OVR PV
- 6. String Monitoring Controller
- 7. Recombiner
- 8. Moulded Case Circuit-Breakers: Tmax PV
- 9. Switchboards: ArTuK

- 10. Insulation monitoring devices: CM-IWx
- 11. Contactors: GF and GAF series
- 12. GFDI application: S804U-PVS5
- 13. Fuse disconnectors: E 90
- 14. Surge protection devices: OVR T1 / T1-T2 / T2 QS
- 15. Contactors: AF Series
- 16. Moulded Case Circuit-Breakers: Tmax XT, Tmax T Air Circuit-Breakers: Emax 2
- 17. Temperature monitoring relay: CM-TCN.012

Battery Energy Storage System (BESS)

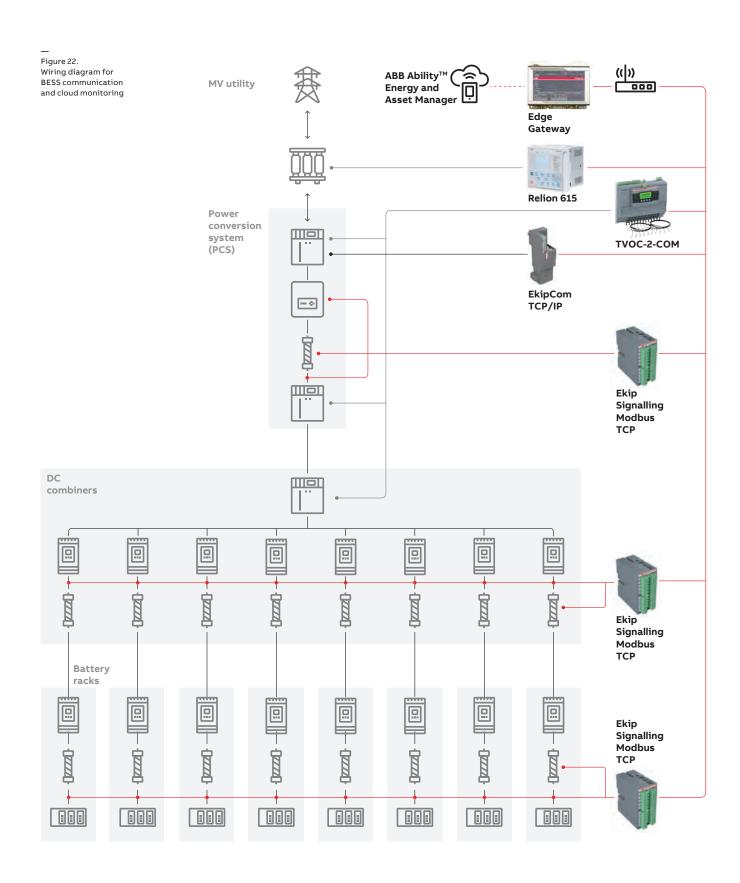
In a world becoming more digital and electric every day, we need Energy Storage Systems to help the world produce and consume energy more efficiently and sustainably.

Our Switching and Protection solutions help our customers to handle higher fault current events, manage direct currents, and protect battery storages against ground faults.



 $^{^6}$ To provide the complete 4 MW BESS architecture, two of these modules in parallel are needed, as shown in Fig. 3 on page 7

BESS communication architecture for remote monitoring



Wind

ABB supplies products, systems, solutions and services to the wind industry, starting from components needed inside the wind turbines to transmission, distribution and monitoring systems for the power generated by the plant



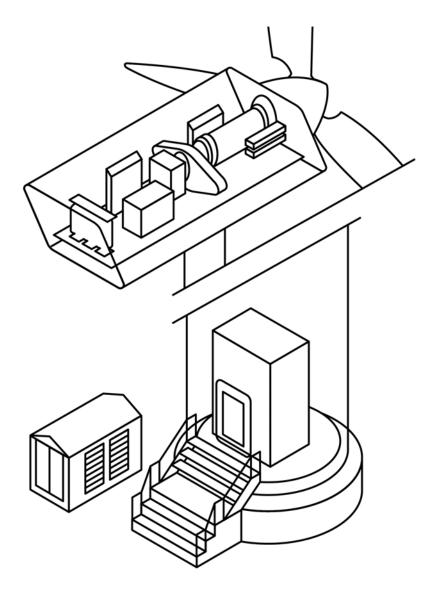
Wind energy is one of the fastest growing industries. Global wind capacity reached 486 GW in 2016 according to WWEA, having grown by 54 GW in that year and with an average growth of 14.5% since 2012. ABB is a leader in the wind industry, providing components to turbine manufacturers as well as everything needed to connect wind farms to the grid. ABB generators, electrical panels and low-voltage products are present inside more than 40,000 wind turbines worldwide. ABB has also delivered

tens of thousands of transformers and hundreds of wind farm substations. Furthermore, our customers can count on ABB Service solutions for an optimized wind economy. With our local presence, global footprint, fast delivery and responsiveness, our service offering includes efficiency improvement and production increase, while improving reliability and reducing Levelized Cost Of Energy (LCOE) over the entire lifetime of a turbine or a wind farm.

ABB in wind industry

Low voltage product portfolio

ABB is driven by a continuous search for innovation. That is why, many of our ideas have revolutionized the electrical industry.



Often recognized as a provider of single, high-quality products, the extent of ABB's solution offering is often forgotten. ABB pioneered the wind and solar industry and has worked closely with the largest Original Equipment Manufacturers (OEMs) for a long time. We are known for our individual products, but our solutions are what really stand apart.

















Application Finder

By simply selecting a market segment, the standard you need and the end-use you are looking for, you will get the full list of applications available and the related bill of materials and schematics, to build a complete application and speed up the project of your customer.



https://new.abb.com/low-voltage/low-voltage-products/applications

Segment

















Battery Energy Storage System

Food & Beverage

&

Solar

Data Centers

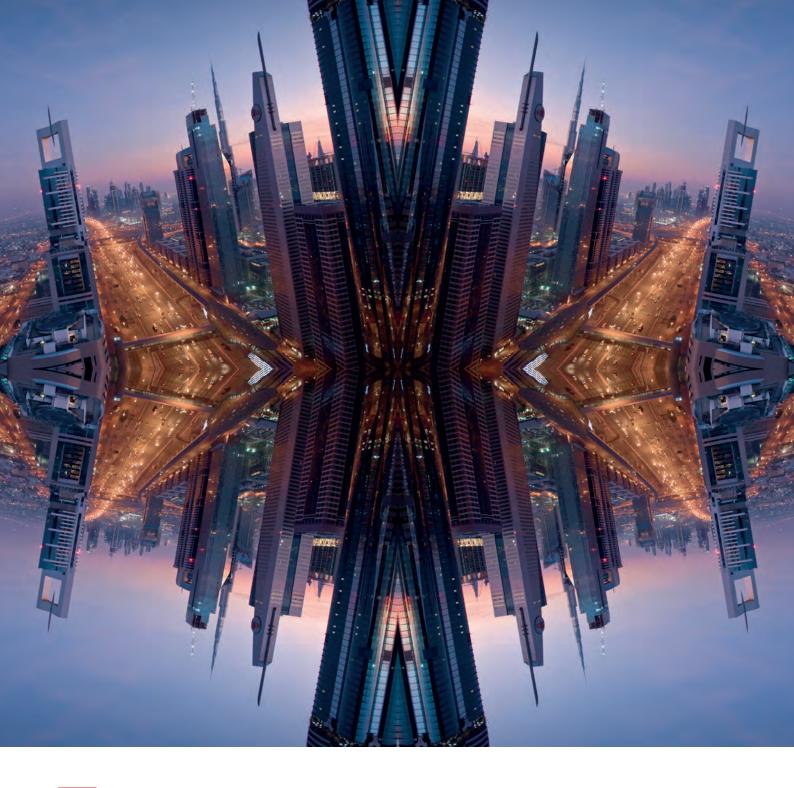
Ra

HVAC & Refrigeration

Machinery

Horticulture

Standard	End use	Description	Schematics	App note	вом
IEC	Electric distribution	Continuous Power solutions for Containerized power distribution in 1750kW N+1 IT Loads in Data Centers	[DWG]	Ę	Ø\/\
IEC	Electric distribution	Continuous Power for Main Distribution Boards of Data center		Ę	8%
IEC	Electric distribution	Continuous Power for Main Distribution Boards of Data center		Ę	%
IEC	Electric distribution	Continuous Power for Main Distribution Boards of Data center		Ę	%
IEC	Electric distribution	Continuous Power for Main Distribution Boards of Data center		Ę	8%
IEC	Electric distribution	Continuous Power in Data Centers Selectivity in UPS networks		Ę	
IEC	Electric distribution	Intelligent Distribution in Data Centers Essential Level offering 0.5 MW IT Load	owo owo	R	



Get the Infinite PerspectiveABB SACE Infinitus

Build your sustainable electrical distribution system of the future, with ABB SACE Infinitus. This solid-state circuit breaker is 100X faster than traditional breakers, with near zero breaking time. But Infinitus goes way beyond asset protection – it opens up infinite possibilities for resilient DC distribution systems. Like ensuring maximum availability with faulty zone isolation. Or optimizing efficiency with 100x more endurance and the lowest power losses in category. The result? A seismic shift in how you think about electrical distribution. **stories.abb.com/sace-infinitus**



ABB Ability™ Energy and Asset Manager

Understanding power and assets

ABB AbilityTM Energy and Asset Manager is a state-of-the-art cloud solution

that integrates energy and asset management in a single intuitive dashboard. Providing full remote visibility of asset and electrical-system behavior, ABB Ability™ Energy and Asset Manager provides insights that help you minimize cost and risk and maximize performance and safety across your operations. Want to get started now? Testing and purchasing Energy and Asset Manager is easy on the ABB Ability Marketplace™.



Energy and Asset Management made easy

The Energy and Asset Management modules can be purchased separately or together, depending on your needs. Monitoring can also be segmented down to individual pieces of equipment and/or sub-systems-such as an elevator, a single HVAC system, or a production line.



ABB Ability™ Energy Manager

Energy efficiency has become essential to running cost-efficient operations. ABB Ability $^{\text{TM}}$ Energy Manager provides real-time understanding of your energy consumption and identifies areas of improvement.

And it's scalable, from a single site to a multi-facility system with hundreds of users.



Monito

Discover site performance, supervise the electrical system and allocate costs.



Analyze

Schedule automatic data exports, improve the use of assets and take the right business decision.



Act

Set up alerts and notify to key personnel and remotely implement an effective efficiency strategy to achieve energy savings in a simple way.

ABB Ability™

Asset Manager

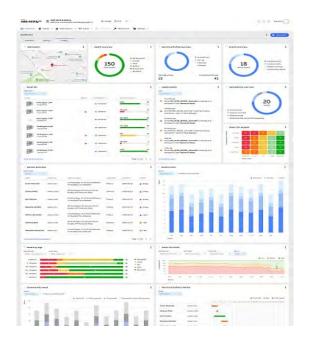


ABB Ability™ Asset Manager sets a new benchmark for simplicity and flexibility in asset-performance management. It gives you the power of seeing and optimizing your site equipment behavior anytime, anywhere via an intuitive graphic interface, resulting in greater reliability and availability and minimized unplanned maintenance.



Condition monitoring

ABB Ability[™] Asset Manager provides granular visibility of your asset behavior in real time for both LV and MV environments



Predictive analytics

Detect potential faults through condition assessment, performance trends and pre-alarm notifications.



Maintenance planning

Root-cause analysis of asset condition enables predictive maintenance that significantly reduces unplanned downtime and operational costs.

Architecture

Truly plug & play

Embedded solution with Ekip Com Hub

Emax 2, Ekip UP and TruONE equipped with the new Ekip Com Hub establishes the cloud connection for the whole switchboard.

External solution with

ABB Ability™ Edge Industrial gateway

The ABB Ability $^{\text{\tiny{TM}}}$ Edge Industrial gateway module can

be mounted on DIN-rail to collect data throughout the system. You can also connect sensors to measure environmental parameters (temperature, water, gas) via both analog and digital 1/0. ABB Ability™ Edge Industrial gateway has enhanced connectivity functionalities, providing Wi-Fi or 3G/4G connectivity.

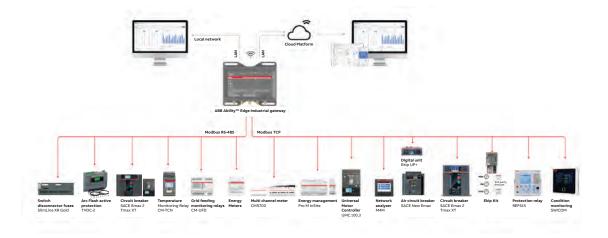
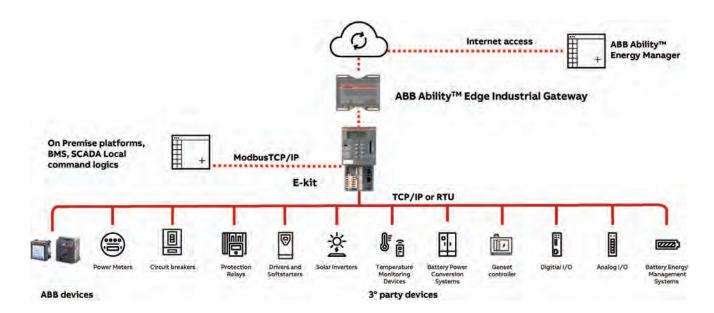


ABB E-kit

The new connectivity interpreter for the energy management



The new connectivity interpreter for the energy management E-kit gives the highest flexibility to integrate different product families, ABB or third party, in on-premise or cloud energy supervision platforms.

Lite panel

One digital panel fits all



Lite Panel is the new switchboard HMI able to monitor and control until 28 electrical assets at the same time, directly connected in the on-premise communication network, showing their data as digital twins through pre-defined templates.

Value proposition



Safety

Monitor and control the electrical assets, also with fault detections and diagnostics data check, far from the switchboard power sections reduce the risk of serious incidents.



Energy efficiency

Supervision of assets status, energy and power quality from a unique panel improves the data collection efficiency with less 70% of time spent nearby electrical rooms and enables analytics to plan saving actions.



Easy to install

The plug & play panel architecture saves more than 4 times the components and wirings compared to traditional market benchmarks.



Optimum interface

Until 28 digital-twin devices are available from a single interface within the local secure network, so leveraging on the already present communication tag points.

Ekip UP+

The low voltage digital unit for next generation of plants





UP-date basic switchgear

Ekip UP+ updates switchboards with new monitoring, protection and power control solutions.

- Compatible with all switching devices, ABB or not.
- 100% applicable for every low-voltage scenario.



UP-load your electrical system

Ekip UP+ uploads your system data to the cloud-connected ABB Ability™ platform.

- Enabling full microgrid control.
- In less than 10 minutes without any external gateway.



UP-grade your facilities

Ekip UP+ is the unit that upgrades the electronics of old facilities to make them digital.

- 40% operational cost saving via the energy management system and predictive maintenance.
- Cost-effective solution compared with traditional retrofitting.



Maximize UP-time

Ekip UP+ maximizes uptime for system integration as a plug and play unit with easy installation.

- 50% time saving when retrofitting, with reduced impact on switchboard design.
- Almost zero downtime during commissioning.
- No need for disassembly, just a clamp on a Rogowski coil.
- Easy configuration as a result of one ecosystem with ABB air and molded-case circuit breakers.
- Initial configuration at your fingertips.

For new installations

- A multi-functional digital unit allowing protection, metering, and asset management
- Save 20% of operational costs on electrical distribution through power management functionalities.
- One single architecture and user experience throughout all ABB low-voltage air and molded-case circuit breakers.
- Perfect integration into all automation and energy management systems through a variety of available communication protocols.
- A cost-effective solution for entry-level logics, e.g., load shedding, thanks to its multiple IOs and programmable status.
- Advanced metering accuracy throughout the whole chain (main unit and its sensors).

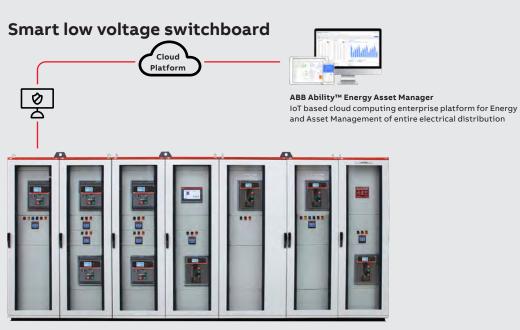
For upgrading existing installations

- Extend the lifetime of your existing lowvoltage circuit breakers with a cost-effective solution in which your investments are made scalable and flexible.
- Enjoy the latest state-of-the-art metering, protection and control functionalities.
- Benefit from a plug-and-play solution, offering easy and fast installation and commissioning to upgrade your plant's installed base to the next-generation technology.
- Connect your existing circuit breakers to the cloud and explore our ABB Ability EAM platform.

ArTuK

Fully checked and certified (IEC 60439-1 and IEC 61439-1 and 2 Standard) by an external independent organisation (Acea Lovag, DEKRA, CPRI & ERDA), the ArTu switchgear is a synonym of safety and quality. The certification is the fruit of severe tests carried out on the whole configuration, consisting of metalwork structures, circuit-breakers and busbar system.

The ArTu K series switchgear is ideal for primary distribution board, motor control center, power control center etc. upto 6300A with air and molded-case circuit-breakers and any internal segregations up to Form 4, and for floor-mounted distribution switchgear with molded-case and modular circuit-breakers. The switchgear has been tested for Internal Arc (as per IEC 61641) and Seismic (as per IEC 60068).



ArTu K Switchboards are safe and reliable

The ArTu switchgear is noted for the following features:

- Integrated range of modular metalwork structures up to 6300 A with common accessories.
- Possibility of fulfilling all application requirements in terms of installation (floorstanding, modular and corner versions) and degree of protection (IP31, IP41, IP 42, IP52, IP54 & IP65).
- Maximum integration with modular apparatus and the molded-case and air circuit-breakers, so that additional drilling or adaptations are not required.
- Minimum switchgear assembly time, thanks to the simplicity of the kits, standardization of the small assembly items, self-supporting elements and the presence of clear reference points for assembly of the plates and panels –
 Segregations in kits up to Form 4.

The use and installation of the kits according to the instructions provided means that assembly and cabling times can be reduced to a minimum, for example, thanks to the reference points for positioning the panels and plates, and that respect of the insulation distances and the rated characteristics of the circuit-breakers are guaranteed.

Smart switchgear

Let's go digital



Electrical distribution digitalization is aimed to answer rising demand for energy efficiency and continuity of service for electrical installation. The key aspect in realizing an intelligent distribution system is to have smart switchgears that can be easily monitored and managed from remote, in order to answer market demand for reliability and efficiency.

ABB intelligent distribution solutions are aimed to answer requirements from any segment and application.

Choose the smart switchgear design package that best fits your needs and helps you in designing, building, installing and operating the electrical installation.



Flexibility
Simple to realize offering up to
66% less cables and up to 10% less
connectivity components



Energy efficiency Sustainable, offering from 7% up to 20% energy efficiency improvements



Service continuity Reliable and simple to service, offering up to 36% less maintenance cost



Future proof Offering upgrade and update solutions with zero downtime

Electrical characteristics

ArTu distribution switchgear

Conformity with the IEC 61439-1-2 Standard

The ArTu switchboards have undergone the type tests foreseen by the new IEC 61439-1-2 Standard at the certified test laboratories. The results of these tests guarantee the performances of the ArTu switchboards and allow the assembler of the switchboard using ABB metal structures, ACBs, MCCBs, MCBs and other low voltage switchgear, not to carry out further type tests, respecting the selection criteria and the assembly instructions of the various components. These results, given below, can be referred to for drawing up the declaration of conformity of the electric switchboard.

Over temperature

(Ref. par. 8.2.1. of the Standard)

The thermal dissipation values are indicated in detail catalogue, referring to all the dimensions of the ArTu switchboards and to the type of installation, deriving from the type tests carried out. The dissipated power data (in Watts) are according to the admissible over temperature inside the switchboard in the upper part, and must be compared with the sum of the powers dissipated by all the components installed inside the switchboard (taking appropriately into account the factor of contemporaneity).

Technical characteristics	
Compliance with Standards	IEC 61439-1-2
Test of vibration for structure ArTu K	according to IEC 60068-2-57 Standard
Test of anti-seismic	according to IEE Std 693 Standard
Busbar	Copper / Aluminium
Rated service voltage Ue	up to 1000 V
Rated insulation voltage Ui	up to 1000 V
Rated frequency	50-60 Hz
Rated impulse withstand voltage Uimp	8 / 12 kV*
Rated current In	up to 6300 A
Rated short-time short-circuit withstand current Icw	50kA, 65kA, 100kA
Rated peak short-circuit current lpk	105 kA, 137 kA, 220 kA
Degree of protection IP	
Without Glass door	IP31/IP41
With Glass door/without Glass door and ventilated side panels	IP42/IP52/IP54
With Glass door	IP65

^{*} Main busbar and ACB feeder

Mechanical characteristics

ArTu distribution switchgear

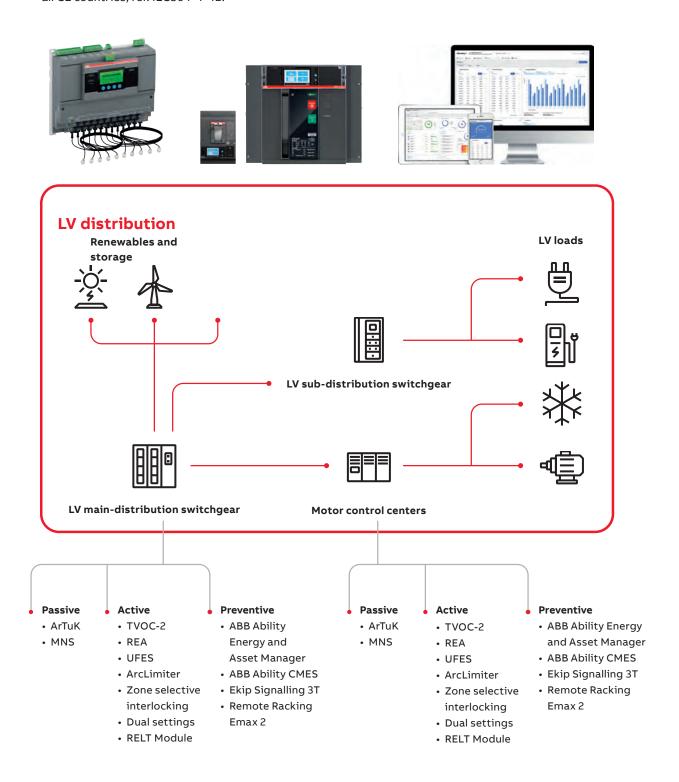
Material			
ArTu K structure	Galvanized steel sheet with	Galvanized steel sheet with 9-fold structure	
Panels	1.5/2.0 mm thick steel shee	1.5/2.0 mm thick steel sheet	
Doors	1.5/2.0 mm thick steel shee	1.5/2.0 mm thick steel sheet / 4mm thick tempered glass	
Mounting plates	2.0/2.5mm thick hot galvar	nized steel sheet	
IK Degree of resistance to impacts			
With glass door	IK 09		
With blind door	IK 10	IK 10	
Painting			
Standard colour	Light Grey RAL 7035		
Painting standard	Powder coated	Powder coated	
Ambient characteristics			
Type of installation	Indoors		
Installation conditions	Floor-mounted	Floor-mounted	
Complete discrete (48 / mls 0/)	Constant	23°C/83% - 40°C/93%	
Service climate (t° / r.h. %)	Variable	23°C/98% - 40°C/98%	
A soloi ant to some south we limite	Operating	-5°C +50°C	
Ambient temperature limits	Storage	-25°C +55°C	



Arc flash protection and mitigation solutions

Passive, active and preventive

Most short-circuit faults in LV and MV switchgears are accompanied by an electric arc. An arc fault always leads to considerable damage to equipment and personnel unless it is distinguished very fast. The fault should be disconnected as fast as possible and in less than 0.1 s to avoid serious damages and give involved person a fair chance to survive the accident without severe damages. This is a demand found in the electrical safety rules in all CE countries, ref. IEC364-4-42.



Active arc flash mitigation solutions

Improve safety, reduce damage













	Arc Guard System TVOC-2	Emax 2 and Tmax XT
Technology type	Optical-based internal arc detection and mitigation, which trips LV or MV circuit breaker	Zone-selective interlocking
Dedicated product or optional function	Dedicated product for arc flash mitigation	Optional function of Emax 2 and Tmax XT circuit breakers
Application	Low-voltage, medium-voltage	Low-voltage
Operating time	1-2 ms	40 ms with S protection (ANSI 50TD, 51)
Total arc clearing time	With LV ABB circuit breaker: 45 50 ms With MV ABB circuit breaker: 50 100 ms	Depends on circuit breaker frame and fault current
Certifications	DNV, ABS, BV, TÜV (SIL 2)	
Enables personnel safety during maintenance	Yes	Yes
Enables arc mitigation 24x7	Yes	Yes
Benefits and features	Increased personnel safety. Significant reduction of overpressure, toxic gases.	Increased personnel safety with hardwired or digital zone selectivity between circuit breakers.
	 Outstanding reaction time < 1 ms (< 2 ms with CSU-2) All-in-one unit with up to 30 single point sensors in three separate zones for selectivity 	Can be used for zone selectivity interlocking i.e. selective short circuit, ground fault, instantaneous and directional protections.
	 Suitable for MV and LV applications with light only detection or both light and current detection Open loop Rogowski coils simplify installation and retro fit Simple commissioning of TVOC-2 and CSU-2 through HMI, Modbus RTU or Ekip Connect Factory calibrated sensors – no need for on-site adjustment Modbus RTU and ABB Ability™ Energy and Asset Manager connectivity 	Digital zone selectivity can be provided with Ekip Link or Ekip Com IEC61850 to integrate the ABB circuit breakers in a substation automation system.



Click here for more information



Click here for more information









•		
	Alternative settings group (dual settings)	Energy-reducing maintenance switch with RELT module
	Optional function of Emax 2 and Tmax XT circuit breakers	Optional function of Emax 2 and Tmax XT circuit breakers
	Low voltage	Low voltage
	Low-voltage	Low-voltage
	5-7 ms to change alternate settings	2.5 ms
	Depends on circuit breaker frame and fault current	Emax 2: 28 42 ms at 60 Hz
	Yes	Yes
	No	No
	Increased personnel safety. Add an extra level of protection with	Increased personnel safety. Dramatically reducing the impact
	two user selectable sets of settings for circuit breakers.	of an arc flash event.
	All protection settings can be changed between SET A and SET B	The 2I is a temporary protection that is faster than the normal

to reduce trip protection thresholds and time delays.

Can be easily activated by Ekip Connect.

Different input can be set for the parameter change, e.g. selector $% \left(1\right) =\left(1\right) \left(1\right)$ switch, open door microswitch.

instantaneous protections.

Depending on the fault current, this function can provide a total clearing time as low as 1.5 cycles at 60 Hz.

- Cannot be deactivated remotely.

 Positive feedback provides a clear indication that the safety function is working properly.
- Easy-to-use wizard is automatically engaged during initial installation.
- $\,$ $\,$ Commissioning can be executed through the circuit breaker touch screen.



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Preventive arc flash protection solutions

Safer operations at a distance





	ABB Ability™ Energy and Asset Manager	ABB Ability™ Condition Monitoring for electrical systems	Ekip Signalling 3T module and PT1000 probes- Emax 2 and Tmax XT
Fechnology type	Energy and Asset Management cloud-computing platform and predictive maintenance indication	Condition monitoring and energy management on-premise based platform	Condition monitoring
Dedicated product or optional function	Dedicated product	Dedicated product	Optional module for Emax 2 and Tmax XT
Application	Low-voltage, medium-voltage	Low-voltage, medium-voltage	Low-voltage
Application Benefits and features	ABB Ability™ Energy and Asset Manager, the innovative cloud- computing solution designed to monitor, optimize, predict and control the electrical system. ABB Ability™ Energy and Asset Manager assists anytime and anywhere via smartphone, tablet or personal computer. The user can: Monitor Oversee site performance, supervise the electrical system and allocate costs. Explore Visualize the system structure, verify asset health and get	On-premise solution for plant-wide condition and energy monitoring. Data storage and analytics to prevent failures, predict asset maintenance and optimize production. Simple web browser access to intuitive user dashboard with health index, single line and panel views, trends. Integrated nowledge Base provides root cause and suggested action on any event. Integrated data analysis to provide detailed insights on asset health and prediction of upcoming maintenance needs. Monitoring temperature of critical	ABB PT1000 sensor can be installed directly on the busbar, Ekip Connect software allows easy programming for plug-and-play installations. Emax 2, Tmax XT or Ekip UP can replace the external unit for temperature monitoring. Ekip Signalling 3T can monitor three PT1000 sensors and one 4-20 mA input. Ekip Signalling 3T acquires signals from three PT1000 temperature sensors directly connected to the module. Additional channel 4-20 mA collects information from external sensors or equipment.
	actionable insights following predictions and prescriptions. Analyze Schedule and analyze automatic data exports, improve the use of assets and make the right business decision. Act Set up alerts to notify key personnel while remotely implementing an effective efficiency strategy, managing maintenance activities and scheduling next actions.	connection with detailed analysis of switchgear thermal situation and early warning about developing issues. Report function of switchgear condition and statistics as well as energy report, which indicates trends up to each individual load in low-voltage switchgear and MCC. Integration capability of ABB and 3rd-party products based on Modbus communication protocol.	Emax 2, Tmax XT or Ekip UP can house two modules: Ekip Signalling 3T-1 and Ekip Signalling 3T-2. Pressure, relative humidity, vibration and further data monitoring is also possible using the additional 4-20 mA input.

Product web page



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Arc flash mitigation solutions

TVOC-2

TVOC-2, ABB's Arc Guard System™, builds on the well known TVOC design. Its functions and features improve an already great product, putting even more focus on reliability, flexibility and simplicity.

Arc Guard System™ increases the protection of people and equipment, and minimizes unnecessary production stops. TVOC-2 is ABB's state-of-the-art solution for arc fault protection in all applications.

With over 40 years of experience, Arc Guard System™ has become an industry standard in several key markets, helping to protect personnel and businesses around the world.

Typical applications include all low- and medium-voltage switchgear where a high level of protection is needed.

Reliability

- Certified according to functional safety (SIL-2) standard
- Over 40 years' experience in Arc Guard Systems™
- Pre-calibrated optical detectors
- Testing the full length of the supervised detectors, the module confirms the entire system is ready and functioning
- Factory tested current sensors with Rogowski technology for both LV and MV applications

Flexibility

- With IP54 high protection degree, HMI (Human Machine Interface) can be mounted on the panel door
- HMI-COM (HMI with communication module) adds ability to communicate with a remote station using Modbus RTU.
 Also the current sensing unit is able to communicate through Modbus RTU.
- Expandable with up to 30 standard detectors or 20 supervised detectors
- Configure the system to isolate separate breaker zones of the switchgear
- The Current Sensing Unit (CSU-2) is an accessory needed in those applications where strong light is expected on a regular basis.

Simplicity

- User-friendly start-up menu
- DIN-rail or wall-mounted
- Easy to expand as the switchgear functions are added

The diagram below shows how the exponential increase in energy over time affects different switchgear materials.



0.2 sec Steel fire

0.15 sec Copper fire

0.1 sec Cable fire

Total clearing time

0 30-50 100 150 200 ... 700 800 900 1 sec

Total clearing time = ABB Arc Guard System™ + breaker

Arc Guard TVOC-2 and TVOC-2-E6 Extension module



SACE Emax 2

The all-in-one innovation



The world of electrical power distribution changes fast and major new trends such as renewables, energy storage and microgrids are now crowding onto the stage. These trends lead to new customer and application demands.

To meet these demands, ABB has now unveiled the innovative Emax 2 all-in-one, the evolution of the Emax 2 into a multi-functional platform that is able to manage the next generation of electrical distribution systems such as microgrids.

Emax 2 all-in-one is the first circuit breaker that meets new grid requirements.

It enables a direct communication to the new energy management cloudcomputing platform ABB Ability™ Electrical Distribution Control System.

Smart plug and play architecture makes Emax 2 all-in-one easy-to-use. Leveraging also unmatched electrical performances, Emax 2 sets a new circuit breaker benchmark for the needs of today and tomorrow.

SACE Emax 2, the all-in-one solution to manage "low-voltage distribution systems".

Efficiency and control

The power needed, when needed

Efficiency

Achieving maximum efficiency of an electrical installation requires intelligent management of power supplies and energy use. For this reason, the new technologies used in the SACE Emax 2 circuit breakers allow the productivity and reliability of installations to be optimized, and at the same time, power consumption to be reduced while fully respecting the environment.

New advanced functionalities, together with protection trip units, communication and system devices contribute to make SACE Emax 2 the circuit breaker that maximizes efficiency in all low-voltage electrical installation.

Control

SACE Emax 2 circuit breaker is the first single device ready to manage all the dynamics of a low-voltage electrical installation.

Managing loads in any condition is now possible thanks to Advanced Functionalities such as:

· Adaptive load shedding

Fast load shedding to guarantee continuity for critical loads during black-outs. Typical scenario is when LV distribution is disconnected from the grid (MV).

Predictive load shedding

Slow load shedding to avoid overloads, giving the possibility to modulate loads consumption.

Power controller

Patented algorithm to reduce the peak of power consumed, allowing savings on electricity bills. Managing different power sources and connecting them to main grid is also crucial, so that service continuity is maximized.

• Embedded ATS functions.

An automatic transfer switch system used in all application where continuity is essential and where there are multi source supplies.

Synchro-reclosing

Synchronization and automatic reconnection of the Microgrid to the main grid when the power is back. Emax 2 is able to act as a controller of main grid condition, disconnecting a plant when necessary and also, to adapt protection to on-grid or off-grid conditions.

Interface protection system and Interface device

Check of grid-connected operation that shall be immediately and automatically interrupted in case of outage of the distribution grid or when the voltage and frequency values of the grid itself are out of the range of values defined by the Distribution System Operator (DSO).

Adaptive protection

Network changes recognition and automatic set of thresholds to guarantee protection and co-ordination in on-grid and off-grid conditions.

SACE Emax 2 automatic circuit breakers

Common data		
Rated service voltage Ue	[V]	690
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50 - 60
Number of poles		3-4
Version		Fixed - Withdrawable
Suitable for isolation according to		IEC 60947-2



SACE Emax 2			E1.2		
Performance levels			В	С	N
Rated uninterrupted current Iu	@ 40°C	[A]	630	630	250
		[A]	800	800	630
		[A]	1000	1000	800
		[A]	1250	1250	1000
		[A]	1600	1600	1250
		[A]			1600
		[A]			
Neutral pole current-carrying ca	apacity for 4-pole CBs	[%lu]	100	100	100
Rated ultimate short-circuit	400-415 V	[kA]	42	50	66
breaking capacity Icu	440 V	[kA]	42	50	66
	500-525 V	[kA]	42	42	50
	690 V	[kA]	42	42	50
Rated service short-circuit brea	[%Icu]	100	100	100 1)	
Rated short-time withstand current Icw	(1s)	[kA]	42	42	50
	(3s)	[kA]	24	24	30
Neutral pole current-carrying carred ultimate short-circuit preaking capacity Icu Rated service short-circuit brea Rated short-time withstand current Icw Rated short-circuit making capacity (peak value) Icm Jtilization category (according Breaking 4) Dimensions Weights (CB with trip unit and	400-415 V	[kA]	88	105	145
	440 V	[kA]	88	105	145
	500-525 V	[kA]	88	88	105
	690 V	[kA]	88	88	105
Utilization category (according	to IEC 60947-2)		В	В	В
Breaking 4)	Maximum breaking time for I <icw< td=""><td>[ms]</td><td>40</td><td>40</td><td>40</td></icw<>	[ms]	40	40	40
	Maximum breaking time for I>Icw	[ms]	25	25	25
Dimensions	H - Fixed/Withdrawable	[mm]	296/363.5	296/363.5	296/363.5
	D - Fixed/Withdrawable	[mm]	183/271	183/271	183/271
	W - Fixed 3p/4p/4p FS	[mm]	210/280		
	W - Withdrawable 3p/4p/4p FS	[mm]	278/348		
Weights (CB with trip unit and	Fixed 3p/4p/4p FS	kg	14/16		
current sensor)	Withdrawable 3p/4p/4p FS including fixed part	kg	38/43		

1) Ics: 50kA for 400V...440V voltage; 2) Ics: 125kA for 400V...440V voltage; 3) E4.2H 3200A: 66 Icw (3s); 4) Total clearing time is the sum of breaking time and trip time

SACE Emax 2			E1.2	<u> </u>		
Mechanical life with regular ordina	intenance prescribed by the manufacturer Frequency		≤ 1000	1250	1600	
maintenance prescribed by the ma	anufacturer	[No. cycles x 1000]	20	20	1600 20 60 8 6,5	
	Frequency	[Oper./Hour]	60	60	60	
Electrical life with regular	440 V	[No. cycles x 1000]	8	8	8	
ordinary maintenance prescribed	Frequency ical life with regular 440 V	[No. cycles x 1000]	8	6,5	6,5	
by the manufacturer		[Oper./Hour]	30	30	30	







E2.2					E4.2					E6.2		
В	С	N	S	Н	С	N	S	Н	V	н	V	х
1600	1600	800	250	800	3200	3200	3200	3200	2000	4000	4000	4000
2000	2000	1000	800	1000	4000	4000	4000	4000	2500	5000	5000	5000
	2500	1250	1000	1250					3200	6300	6300	6300
		1600	1250	1600					4000			
		2000	1600	2000								
		2500	2000	2500								
			2500									
100	100	100	100	100	100	100	100	100	100	50-100	50-100	50-100
42	66	66	85	100	66	66	85	100	150	100	150	150
42	66	66	85	100	66	66	85	100	150	100	150	150
42	50	66	66	85	50	66	66	85	100	100	130	130
42	50	66	66	85	50	66	66	85	100	100	100	100
100	100	100	100	100	100	100	100	100	100 ²⁾	100	100	100
42	50	66	66	85	55	66	66	85	100	100	100	120
42	42	50	50	66	50	50	66	75 ³⁾	75	100	100	100
88	145	145	187	220	145	145	187	220	330	220	330	440
88	145	145	187	220	145	145	187	220	330	220	330	440
88	105	145	145	187	105	145	145	187	220	220	286	286
88	105	145	145	187	105	145	145	187	220	220	220	264
В	В	В	В	В	В	В	В	В	В	В	В	В
40	40	40	40	40	40	40	40	40	40	40	40	40
25	25	25	25	25	25	25	25	25	25	25	25	25
371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/425	371/42
270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/383	270/38
276/366		,			384/510	384/510	,			762/888/1014	,	
317/407					425/551	425/551				803/929/1069		
41/53					56/70	56/70				109/125/140		
84/99					110/136	110/136				207/234/260		

E2.2				E4.2				E6.2		
< 1600	1600	2000	2500	< 2500	2500	3200	4000	4000	5000	6300
25	25	25	20	20	20	20	15	12	12	12
60	60	60	60	60	60	60	60	60	60	60
15	12	10	8	10	8	7	5	4	3	2
15	10	8	7	10	8	7	4	4	2	2
30	30	30	30	20	20	20	20	10	10	10

SACE Emax 2 switch disconnectors

Switch disconnectors, identified with the abbreviation "/MS", are devices that satisfy the isolating specifications provided by the IEC 60947-3 Standard. The switch disconnectors are derived from the corresponding automatic circuit breakers, and they have the same dimensions and accessory options.

This version differs from the automatic circuitbreakers only because of the absence of protection trip units. The device, when in the open position, guarantees an isolating distance between the main contacts of the circuit breaker that is sufficient to ensure that the installation downstream is not live. Furthermore the switch disconnectors, if used with an external protection relay with maximum delay of 500ms, enable a breaking capacity at a maximum rated operating voltage (Ue) equal to the value of rated short-time withstand current (Icw) for one second.

Common data		
Rated service voltage Ue	[V]	690
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50 - 60
Number of poles		3-4
Version		Fixed - Withdrawable
Suitable for isolation according to		IEC 60947-3



SACE Emax 2	_		E1.2	_	
Performance levels			B/MS	N/MS	
Rated uninterrupted current	Iu @ 40°C	[A]	630	250	
		[A]	800	630	
		[A]	1000	800	
		[A]	1250	1000	
		[A]	1600	1250	
		[A]		1600	
Neutral pole current-carrying	capacity for 4-pole CBs	[%lu]	100	100	
Rated short-time withstand	(1s)	[kA]	42	50	
current Icw	(3s)	[kA]	24	30	
Rated short-circuit making	400-415 V	[kA]	88	105	
capacity (peak value) Icm	440 V	[kA]	88	105	
	500-525 V	[kA]	88	105	
	690 V	[kA]	88	105	
Utilization category (according	g to IEC 60947-3)	-	AC-23A	AC-23A	
Dimensions	H - Fixed / Withdrawable	[mm]	296 / 363.5	296 / 363.5	
	D - Fixed / Withdrawable	[mm]	183 / 271	183 / 271	
ated short-time withstand urrent lcw ated short-circuit making apacity (peak value) lcm	W - Fixed 3p/4p/4p FS	[mm]	210 / 280		
	W - Withdrawable 3p/4p/4p FS	[mm]	278 / 348		

1) E4.2H/MS 3200A: 66KA Icw (3s)

SACE Emax 2			E1.2			
Mechanical life with regular ordinary		[lu]	< 1000	1000	1600	
maintenance prescribed by the i	manufacturer	[No. cycles x 1000]	20	20	20	
	Frequency	[Oper./Hour]	60	60	60	
Electrical life with regular	440 V	[No. cycles x 1000]	8	8	8	
ordinary maintenance prescribed by the manufacturer	690 V [No. cycles x 1000		8	6.5	6.5	
prescribed by the mandracturer	Frequency	[Oper./Hour]	30	30	30	







E2.2			E4.2			E6.2	
B/MS	N/MS	H/MS	N/MS	H/MS	V/MS	H/MS	X/MS
1600	800	800	3200	3200	2000	4000	4000
2000	1000	1000	4000	4000	2500	5000	5000
	1250	1250			3200	6300	6300
	1600	1600			4000		_
	2000	2000					
	2500	2500					
100	100	100	100	100	100	50-100	50-100
42	66	85	66	85	100	100	120
42	50	66	50	75 ¹⁾	75	100	100
88	145	187	145	187	220	220	264
88	145	187	145	187	220	220	264
88	145	187	145	187	220	220	264
88	145	187	145	187	220	220	264
AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A	AC-23A
371 / 425	371 / 425	371 / 425	371 / 425	371 / 425	371 / 425	371 / 425	371 / 425
270 / 383	270 / 383	270 / 383	270 / 383	270 / 383	270 / 383	270 / 383	270 / 383
276 / 366			384 / 510			762 / 888 / 1014	
 317 / 407			425 / 551			803 / 929 / 1069	

E2.	.2				E4.2				E6.2		
< 1	1600	1600	2000	2500	< 2500	2500	3200	4000	4000	5000	6300
25	;	25	25	20	20	20	20	15	12	12	12
60)	60	60	60	60	60	60	60	60	60	60
15		12	10	8	10	8	7	5	4	3	2
15		10	8	7	10	8	7	4	4	2	2
30)	30	30	30	20	20	20	20	10	10	10

SACE Emax 2/E9, Emax 2/E10 circuit breakers up to 1000V

ABB SACE Emax 2/E9 circuit breakers can effectively and simply control all wind and solar applications - with the highest availability and continuity of service.

The world of renewable energy is evolving rapidly causing major changes in electrical power distribution trends. This causes an increased focus on:

- Power continuity for critical loads and the best performance, even at high altitudes
- · Optimized, fast maintenance
- · Minimized device footprint

These trends lead to new customer and application demands. To meet these demands, ABB has now unveiled the innovative Emax 2/E9 all-in-one, the evolution of the Emax 2 into a multifunctional platform that is able to manage the next

generation of electrical plants such as microgrids. Emax 2/E9 all-in-one is the first smart circuit breaker that enables direct communication with the new energy management cloud-computing platform ABB Ability™ Energy and Asset Manager. Smart and plug-and-play architecture makes Emax 2/E9 all-in-one easy to use. With the best performance up to 900 V of any device on the market, Emax 2/E9 is ready to control and protect all applications with voltages over 690 V.

Emax 2/E9 sets a new circuit-breaker benchmark for the electrical power distribution systems of today and tomorrow.

Common data		
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50 - 60
Number of poles		3-4
Version		Fixed - Withdrawable
Suitable for isolation according to		IEC 60947-2,3



SACE Emax 2/E9			E1.2	E2.2			E4.2		E6.2	
Performance levels			N/E9	S/E9	H/E9	H/E10	S/E9	H/E9	H/E9	X/E9
Rated uninterrupted current Iu @ 40°C		[A]	1250	1250	1250	2500	3200	3200	5000	5000
		[A]		2000	2000		4000	4000	6300	6300
		[A]		2500	2500					
Neutral pole current-carrying capacity for 4-pole CBs		[%lu]	100	100	100		100	100	50-100	50-100
Rated service voltage Ue		[V]	800	900	900	1000	900	900	900	900
Rated ultimate short-circuit breaking capacity Icu	800V	[kA]	35	50	65		65	90	90	100
	900V	[kA]		50	65		65	75	75	90
	1000V	[kA]				50				
Rated service short-circuit breaking capacity Ics		[%Icu]	100	100	100	100	100	100	100	100
Rated short-time withstand current lcw	(1s) 800V	[kA]	35	50	65		65	75	75	90
	(3s) 800V	[kA]	30	50	65		65	75 (1)	75	90
	(1s) 900V	[kA]		50	65		65	75	75	90
	(3s) 900V	[kA]		50	65		65	75 (1)	75	90
	(1s) 1000V	[kA]				50				
	(3s) 1000V	[kA]				50				
Rated short-circuit making capacity (peak value) Icm	800V	[kA]	73.5	105	143		143	200	200	220
	900V	[kA]		105	143		143	165	165	198
	1000V	[kA]				105				
Utilization category (according to IEC 60947-2)			В	В	В	В	В	В	В	В

1) E4.2H/MS 3200A: 66kA Icw (3s)

SACE Emax 2/E9 MS Switch disconnectors up to 900V

Switch disconnectors at 900V are identified with the abbreviation "/E9 MS", and satisfy the isolating specifications according the IEC 60947-3 Standard.

The switch disconnectors are derived from the corresponding automatic circuit breakers, and they have the same dimensions and accessory options.

This version differs from the automatic circuit breakers because of the absence of protection trip units.

The device, when in the open position, guarantees an isolating distance between the main contacts of the circuit breaker that is sufficient to ensure that the installation downstream is not live.

Furthermore the switch disconnectors, if used with an external protection relay with maximum delay of 500ms, enable a breaking capacity at a maximum rated operating voltage (Ue) equal to the value of rated short-time withstand current (Icw) for one second.

Common data		
Rated service voltage Ue	[V]	900
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50-60
Number of poles		3
Version		Fixed-Withdrawable
Suitable for isolation according to		IEC 60947-3



SACE Emax 2/E9				E4.2		
Performance levels				H/E9 MS		
Rated uninterrupted	current lu @ 40°C		[A]	2500		
			[A]	3200		
			[A]	4000		
Rated short-time with	nstand current Icw	(1s)	[kA]	75		
		(3s)	[kA]	75 ⁽¹⁾		
Rated short-circuit m	aking capacity (peak value) Icm	900V	[kA]	165		
Jtilization category (according to IEC 60947-3)				AC-23A		
Dimensions		H - Fixed/Withdrawable		371/425		
		W - Fixed/Withdrawable		270/383		
		D - Fixed	d/Withdrawable	384/425		
1) 66kA lcw (3s) up to 320	00A		'	'		
SACE Emax 2/E9				E4.2		
		[lu]		≤ 3200	4000	
Mechanical life (1)		[No. cy	cles x 1000]	20	15	
	Frequency	[Oper./	Hour]	60	60	
Electrical life	900 V	[No. cy	cles x 1000]	1	1	
	Frequency	[Oper./	Hour]	10	10	

¹⁾ with regular ordinary maintenance prescribed by the manufacturer.

SACE Emax 2 MS/DC-E

Air switch disconnectors at 1500 V DC



The SACE Emax 2 MS/DC-E air switch-disconnectors further expand SACE's broad offering of low voltage devices providing a solution to all our customer's applications. Meeting both IEC and UL standards, this new range was designed with internationalization in mind. It offers to design engineers, panel builders and OEM manufacturers the chance to rely on a single provider and meet the specific requirements of a wide range of DC applications installed in any part of the world. A range that keeps pace with the times.



Global availability

Ensuring performances at 1500V DC under IEC and UL standards, SACE Emax 2 MS/DC-E range provide a unique solution for any projects around the world. Any version up to 3200A can also be ordered with IEC & UL & CCC approvals. This means that engineers, panel builders, inverter manufacturers and OEMs can find the right solution for any plant installed anywhere in the world.



Flexible installation

The SACE Emax 2 MS/DC-E range of air switch-disconnectors guarantee great flexibility for any installation. It is possible to insulate one polarity or both, and manage current flow in both directions. In addition, it is available in fixed and drawable version, and terminals can be setup vertically or horizontally.



Energy efficiency

The SACE Emax 2 MS/DC-E range is here to support the energy efficiency trend in Energy Storage and Photovoltaic systems. Achieving 1500V DC helps to cut power losses and make our planet a better place.

IEC Range

The SACE Emax 2 MS/DC-E IEC range has been developed for installations up to 1500V DC and 4000 A, with short-time withstand current up to 100 kA.

The SACE Emax 2 MS/DC-E is compliant with DC-PV2, the most demanding Utilization Category according to IEC 60947-3 Annex D, since it requires the ability to connect and disconnect PV circuits where significant overcurrents may occur and where current flow can be in either direction; these are common characteristics of centralized PV systems.

Because of dedicated shorting busbar (jumper) kits, all four poles can be connected in series to isolate a single polarity source, or alternatively for a dual polarity source 2 poles can be configured in series for the positive supply and the other 2 poles in series for the negative supply.

SACE Emax 2 MS/DC-E can be fitted with a vast assortment of electrical and mechanical accessories already available for the standard SACE Emax 2 range. The IEC version has also achieved China CCC certification.

Common data		
Rated service voltage Ue	[V]	1500
Rated insulation voltage Ui	[V]	1500
Rated impulse withstand voltage Uimp	[kV]	12
Number of poles		4
Version		Fixed - Withdrawable
Suitable for isolation according to		IEC 60947-3
Utilization category		DC22A, DC-PV2 (Annex D)



SACE Emax2 MS/DC-E for IEC	·		E4.2	·	·
Performance levels			S	Н	V
Rated uninterrupted current lu @ 40°	,C	[A]	1600	1600	1600
		[A]	2000	2000	2000
		[A]	2500	2500	2500
		[A]	3200	3200	3200
		[A]	4000	4000	4000
Rated short-time withstand current Icw	(1s)	[kA]	65	85	100
Rated short-circuit making capacity (peak value) Icm	1500 V	[kA]	65	85	100
Dimensions	H - Fixed	[mm]	371		
	D - Fixed		270		
	W - Fixed 4p		510		
	H – Draw out	[mm]	425		
	D – Draw out	[mm]	393		
	W – Draw out 4p	[mm]	551		

Emax 2 trip units overview

SACE Emax 2 trip units offer a complete range of solutions for any installation requirements, for both distribution and generator protection. New features are now available with a renewed black look and feel.

Ekip Dip: The standard trip unit



Ekip Touch: The smart trip unit



Ekip Hi-Touch: The ultimate trip unit



Ekip G: The generator trip unit



Ekip Dip LI Ekip Dip LSIG

- Overcurrent protection for distribution systems
- Phase and neutral current protections
- LED permanent trip cause signalization
- · Thermal memory as standard feature
- Neutral setting up to 200%
- Trip history with real-time and date stamping using USB port

Ekip Touch LI Ekip Touch LSIG

- Advanced set of protections and measurements, always upgradable and customizable
- · Embedded Bluetooth low energy technology
- · Intuitive touchscreen interface
- High measurement accuracy of electrical parameters

Ekip Hi-Touch LSIG

- Complete set of advanced protections and measurements
- Dual settings of protection
- Network analyzer function
- · Suitable for microgrid applications

Ekip G Touch LSIG Ekip G Hi-Touch LSIG

- Designed for installations with generators such as genset, co-generation and marine applications
- Dedicated set of generator protections

New digital experience

Solutions

Three solutions are available to fully exploit the potential of the Ekip architecture: Embedded ATS, adaptive load shedding and power controller.



Embedded ATS

This function enables the activation of auxiliary generation sources (e.g. generators) and transfers the feed of the loads from the distribution network to such auxiliary sources, thus ensuring a secure transfer to maintain service continuity and reliability of the system. How to order: via ABB Ability Marketplace™. The hardware accessories must be ordered via traditional ordering channels.



Adaptive load shedding

Thanks to this solution, the circuit-breaker enables islanding transition to avoid blackouts. It actively controls the power consumption based on the priorities set by the user.

How to order: via ABB Ability Marketplace $^{\text{\tiny TM}}$ or traditional ordering channels. The hardware accessories must be ordered via traditional ordering channels.



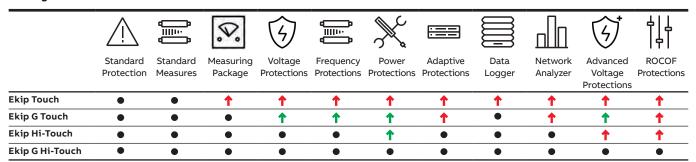
Power controller

This function is the ideal solution for load management and represents an optimum compromise between reliability, simplicity and cost-effectiveness. Based on a patented calculation algorithm, Ekip Power Controller allows a list of loads to be controlled from remote according to the priorities defined by the user. How to order: via ABB Ability Marketplace™ or traditional ordering channels. The hardware accessories must be ordered via traditional ordering channels.

When a solution is purchased via ABB Ability Marketplace $^{\text{TM}}$, it must be activated through Ekip Connect 3 installed on a PC using Ekip T&P to scan the trip unit.

These solutions require the installation of hardware components that have to be ordered through the traditional ordering channels. For further information, please refer to the specific documentation available on ABB Library (www.abb.com/abblibrary/DownloadCenter/).

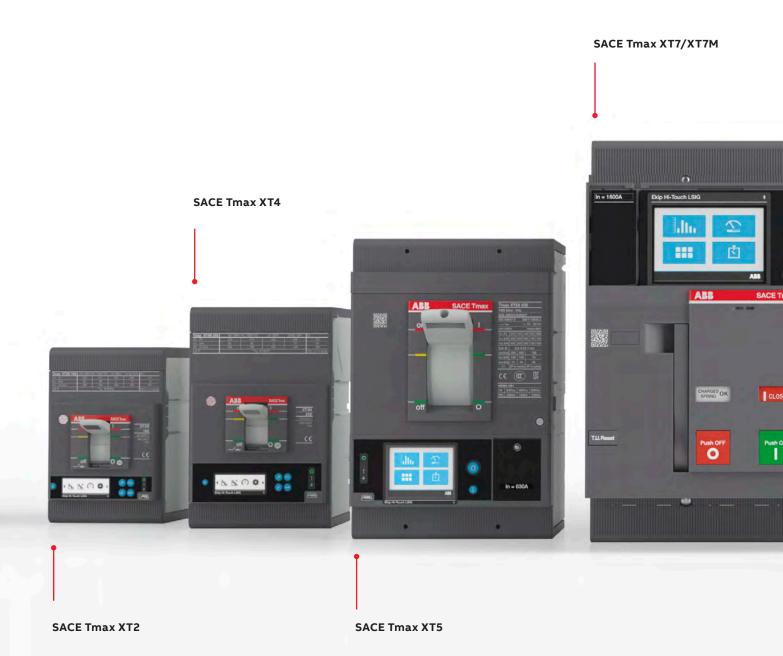
Packages



- Available by default
- 🕈 Upgradable
- 🕈 Some elements of the package are already provided by default. It is possible to upgrade the trip unit to achieve the complete package.

SACE Tmax XT

The right choice: a complete circuit-breaker range for any solution





SACE Tmax XT6 SACE Tmax XT1

Added value each step of the way

There is more than just a circuit-breaker in the SACE Tmax XT range

A new generation of molded case circuit-breakers delivering great added value.

There is a lot more to the range of SACE Tmax XT than what meets the eye, and the benefits for your business are noticeable. To start with, the whole selection and ordering process has been overhauled to make it far easier to get your hands on the parts you need, speeding things up by about 30%. Installation has been simplified to increase user-friendliness, frames have been streamlined to save space, and improved connectivity - such as Bluetooth and

Ekip mobile - will save you considerable time. Another additional benefit is the reliable cloud connectivity and overall increase in information available, meaning diagnostics and maintenance are vastly improved, resulting in less downtime. Finally, thanks to the smart power controller concept, overall energy consumption can be reduced by up to 20%.

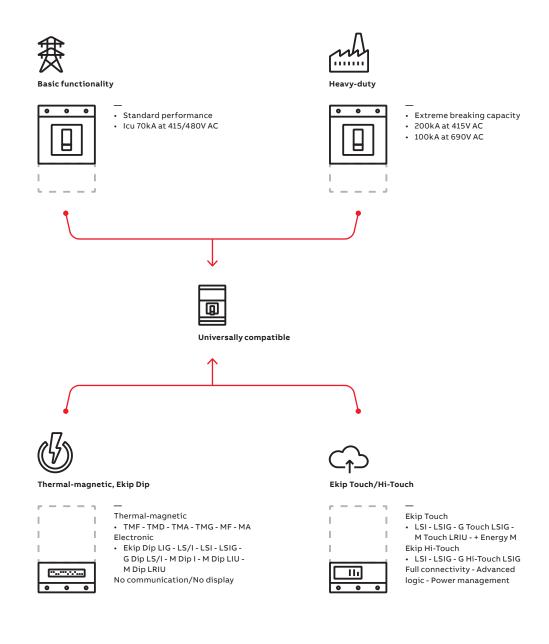


Choosing the right circuit-breaker has never been so easy

You consider what you need. We'll show you what is possible.

The world of circuit-breakers is a complex one, yet choosing the right device for your individual needs has never been simpler thanks to SACE Tmax XT range. Maybe you are looking for a basic protection device for a standard distribution plant. Or perhaps you need something more complex, such as a device that integrates

protection, automation, measuring and communication into a cloud-based supervision system. Whatever you are looking for, with a wealth of customization possibilities and a range of possible solutions depending on the breaking part and trip unit you choose, the power of circuit-breaking is firmly in your hands.





Basic functionality

Whether you are a hotel owner or planning a production line, where you need to consider the overall power voltage over a period of time, the whole SACE Tmax XT range offers all the circuit breaking power you need to keep your business running long into the future.



Heavy duty

When it comes to heavy duty usage – whether it is ships, chemical parks, mining, or heavy duty machinery – the SACE Tmax XT2, XT4, XT5 and XT7 frames are designed to work well beyond the normal constraints when you will be pushing the limits of your installation to the maximum.



Thermal-magnetic, Ekip Dip - manual operation

This either consists of the standard thermal-magnetic trip unit intended for basic protection or the Ekip Dip trip unit, the first level of electronic trip unit that can provide increased accuracy, a wider regulation range, delayed s hort-circuit protection and individual trip information.

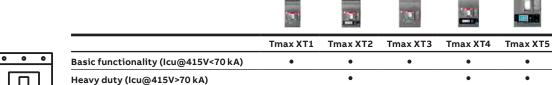


Ekip Touch/Hi-Touch - cloud functionality

Once you are working with the XT2, XT4 XT5 or XT7 frames, all activity can be remotely monitored via the cloud thanks to the Ekip Touch/Hi-Touch trip units which send all data to the ABB Ability™ EDCS and can be monitored through smartphone or tablet whenever and wherever you like.

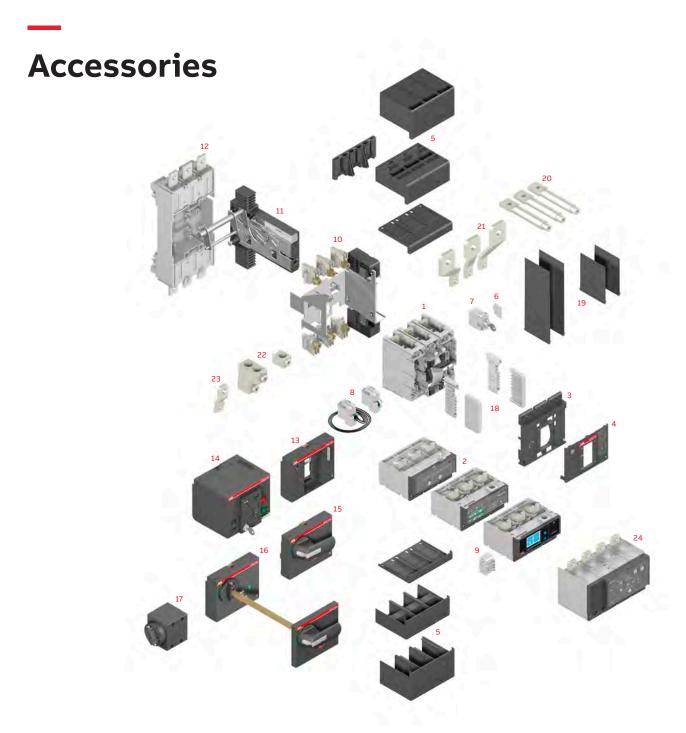
Tmax XT6

Possible combinations within the range





Thermal-magnetic trip units	•	•	•	•	•	•	
Ekip Dip (standard electronic)		•		•	•	•	•
Ekip Touch/Hi-Touch (smart electronic)		•		•	•		•



Various accessories are also available:

- 1. Breaking unit
- 2. Trip units
- 3. Front
- 4. Polish plate
- 5. Terminal covers
- 6. Auxiliary contacts
- 7. Key lock
- 8. Service releases
- 9. Communication module
- 10. Conversion kit for plug-in/ withdrawable versions
- 11. Guide of fixed part in the withdrawable version

- 12. Fixed part FP
- 13. Front for lever operating mechanism FLD
- 14. Stored energy motor operator MOE
- 15. Direct rotary handle RHD
- 16. Transmitted rotary handle RHE
- 17. Conversion kit RHE > RHS
- 18. Cable rack
- 19. Phase separators
- 20. Rear orientated terminals R
- 21. Front extended spread terminals ES
- 22. Front terminals for copper-aluminium FC CuAl
- 23. Front extended terminals EF
- 24. Residual current release

SACE Tmax XT automatic circuit-breakers for alternating current (AC) distribution



Size				XT1			
Rated uninterrupted current	[A]			160			
Poles	[No.]			3, 4			
Rated service voltage, Ue (AC) 50-60Hz	[V]			690			
Rated insulation voltage, Ui	[V]			800			
Rated impulse withstand voltage, Uimp	[kV]			8			
Versions				Fixed, Plug-in	1)		
Max supply voltage on bottom side (F, P, W)	[V]			690			
Breaking capacities according to IEC 60947-2		В	С	N	S	н	
Rated ultimate short-circuit breaking capacity, Icu							
Icu @ 220-230-240V 50-60Hz (AC)	[kA]	25	40	65	85	100	
Icu @ 380V 50-60Hz (AC)	[kA]	18	25	36	50	70	
Icu @ 415V 50-60Hz (AC)	[kA]	18	25	36	50	70	
Icu @ 440V 50-60Hz (AC)	[kA]	15	25	36	50	65	
Icu @ 500V 50-60Hz (AC)	[kA]	8	18	30	36	50	
Icu @ 525V 50-60Hz (AC)	[kA]	6	8	22	35	35	
Icu @ 690V 50-60Hz (AC)	[kA]	3	4	6	8	10	
Rated service short-circuit breaking capacity, Ics							
Ics @ 220-230-240V 50-60Hz (AC)	[kA]	100%	100%	75% (50)	75%	75%	
Ics @ 380V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	75%	
Ics @ 415V 50-60Hz (AC)	[kA]	100%	100%	100%	75%	50% (37.5)	
Ics @ 440V 50-60Hz (AC)	[kA]	75%	50%	50%	50%	50%	
Ics @ 500V 50-60Hz (AC)	[kA]	100%	50%	50%	50%	50%	
Ics @ 525V 50-60Hz (AC)	[kA]	100%	100%	50%	50%	50%	
Ics @ 690V 50-60Hz (AC)	[kA]	100%	100%	75% (5)	50% (5)	50%	
Rated short-circuit making capacity, Icm							
Icm @ 220-230-240V 50-60Hz (AC)	[kA]	52.5	84	143	187	220	
Icm @ 380V 50-60Hz (AC)	[kA]	36	52.5	75.6	110	154	
Icm @ 415V 50-60Hz (AC)	[kA]	36	52.5	75.6	110	154	
Icm @ 440V 50-60Hz (AC)	[kA]	30	52.5	75.6	110	143	
Icm @ 500V 50-60Hz (AC)	[kA]	13.6	36	63	75.6	110	
Icm @ 525V 50-60Hz (AC)	[kA]	9	13.6	46.2	73.5	73.5	
Icm @ 690V 50-60Hz (AC)	[kA]	4.26	5.88	9	13.6	17	
Breaking capacities according to NEMA-AB1							
@ 240V 50-60Hz (AC)	[kA]	25	40	65	85	100	
@ 480V 50-60Hz (AC)	[kA]	8	18	30	36	65	
Utilization Category (IEC 60947-2)				Α			
Icw	[kA]			-			
Reference Standard				IEC 60947-2			
Insulation behaviour				V			
Mounted on DIN rail				DIN EN 50022	2		
Machanicallifa	[No. Operations]			25,000			
Mechanical life –	[No. Hourly operations]			240			
Electrical life @ 41E V (AC)	[No. Operations]			8,000			
Electrical life @ 415 V (AC)	[No. Hourly operations]			120			
					_		

⁽¹⁾ XT1 plug-in In max=125A (2) In<32A Icu=25kA/Ics=20kA, with magnetic trip unit only and In≤52A/Icu=Ics=5kA

⁽³⁾ Ics=100% Icu up to 250 A with EF, ES, Rear and external FC CuAl (2x...) terminal. When any other terminals are used and load >200A Icu=25%



XT2



хтз



XT4

						13			^	14		
		160			2	50			160	/ 250		
		3, 4			3	, 4			3	, 4		
		690			6	90			6	90		
		1000			8	00			1000			
'		8			8				8			
	Fixed, W	ithdrawabl	e, Plug-in		Fixed, Plug-in				ed, Withdra	awable, Plug	 g-in	1
		≤ 480				90		≤ 600				
N	S	н	L	٧	N	S	N	s	н	L	V	х
'												
65	85	100	150	200	50	85	65	85	100	150	200	200
36	50	70	120	150	36	50	36	50	70	120	150	200
36	50	70	120	150	36	50	36	50	70	120	150	200
36	50	65	100	150	25	40	36	50	65	100	150	200
30	36	50	60	70	20	30	30	36	50	60	85	100
20	25	30	36	50	13	20	20	25	45	50	70	100
10	12	15	18	20	5	6	10	12	15	20	50(2)	100
100%	100%	100%	100%	100%	75%	50%	100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	75%	50% (27)	100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	75%	50% (27)	100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	75%	50%	100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	75%	50%	100%	100%	100%	100%	100%	100%
100%	100%	100%	100%	100%	75%	50%	100%	100%	100%	100%	100%	100%
100%	100%	100%	75% (15)	75%	50% (3)	50%	100%	100%	100%	100%	100%(3)	100%(3)
'												
143	187	220	330	440	110	187	143	187	220	330	440	440
75.6	110	154	264	330	75.6	110	75.6	110	154	264	330	440
75.6	110	154	264	330	75.6	110	75.6	110	154	264	330	440
75.6	110	143	220	330	52.5	84	75.6	110	143	220	330	440
63	75.6	110	132	154	40	63	63	75.6	110	132	187	220
40	52.5	63	75.6	110	26	40	40	52.5	94.5	110	154	220
17	24	30	36	40	7.5	9	17	24	30	40	110	220
1								'	1			
65	85	100	150	200	50	85	65	85	100	150	200	200
30	36	65	100	150	25	35	30	36	65	100	150	100
		A				Α				Α		
		-				-				-	-	
		IEC 60947-	2		IEC 6	0947-2			IEC 60	0947-2		
V										/		
DIN EN 50022					DIN EN	N 50022			DIN EN	1 50022		
		25,000				,000				000		
		240				40				40		
		8,000				000		8,0			10,	000
		120			<u>'</u>	20				20		

_ _

SACE Tmax XT automatic circuit-breakers for alternating current (AC) distribution



				-				
Size				X.	Г5			
Rated uninterrupted current	[A]			400 ,	/ 630			
Poles	[No.]		,	3.	4			
Rated service voltage. Ue (AC) 50-60Hz	[V]			69	90			
Rated insulation voltage. Ui	[V]			10	00			
Rated impulse withstand voltage. Uimp	[kV]	8						
Versions		Fixed. Withdrawable. Plug-in (5)						
Max supply voltage on bottom side (F. P. W)	[V]			69	90			
Breaking capacities according to IEC 60947-2		N	S	Н	L	٧	Х	
Rated ultimate short-circuit breaking capacity. Icu								
Icu @ 220-230-240V 50-60Hz (AC)	[kA]	70	85	100	150	200	200	
Icu @ 380V 50-60Hz (AC)	[kA]	36	50	70	120	200	200	
Icu @ 415V 50-60Hz (AC)	[kA]	36	50	70	120	200	200	
Icu @ 440V 50-60Hz (AC)	[kA]	36	50	65	100	180	200	
Icu @ 500V 50-60Hz (AC)	[kA]	25	30	50	85	150	150	
Icu @ 525V 50-60Hz (AC)	[kA]	25	30	50	85	100	120	
Icu @ 690V 50-60Hz (AC)	[kA]	20	25	40	70	80	100	
Rated service short-circuit breaking capacity. Ics								
Ics @ 220-230-240V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 380V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 415V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 440V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 500V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 525V 50-60Hz (AC)	[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 690V 50-60Hz (AC)	[kA]	100%	100%	100%(2)	100%(3)	100%(3)	100%(3)	
Rated short-circuit making capacity. Icm								
Icm @ 220-230-240V 50-60Hz (AC)	[kA]	154	187	220	330	440	440	
Icm @ 380V 50-60Hz (AC)	[kA]	75.6	110	154	264	440	440	
Icm @ 415V 50-60Hz (AC)	[kA]	75.6	110	154	264	440	440	
Icm @ 440V 50-60Hz (AC)	[kA]	75.6	110	143	220	396	440	
Icm @ 500V 50-60Hz (AC)	[kA]	52.5	63	110	187	330	330	
Icm @ 525V 50-60Hz (AC)	[kA]	52.5	63	110	187	220	264	
Icm @ 690V 50-60Hz (AC)	[kA]	40	52.5	84	154	176	220	
Breaking capacities according to NEMA-AB1			'					
@ 240V 50-60Hz (AC)	[kA]		'					
@ 480V 50-60Hz (AC)	[kA]		,					
Utilization Category (IEC 60947-2)			A (u	p to 630A). I	3 (up to 500)A) ⁽⁴⁾		
Icw (1 sec)	[kA]		,	(5			
Reference Standard				IEC 60	947-2			
Insulation behaviour					/			
Mounted on DIN rail					-			
Machanicallifo	[No. operations]			20,0	000			
Mechanical life —	[No. hourly operations]			12	20			
Electrical life @ 41E V (AC)	[No. operations]		7,0	000 (400A) ·	- 5,000 (630)A)		
Electrical life @ 415 V (AC) —	[No. hourly operations]			6	0			

(1) Not suitable for IT distribution systems > 440Vac (2) lcs = 75% ln > 500A (3) lcs = 50% ln > 500A (4) Category B: only when equipped with an electronic trip unit







XT6 ⁽¹⁾				XT7				XT7 M			
8	300 / 1000 (5)	800 / 1	000 / 1250 /	1600		800 /	1000 / 1250	7 / 1600		
	3. 4			3. 4			3. 4				
	690		,	690			690				
	1000		,	1000				1000			
	8			8				8			
Fixe	d. Withdraw	able	Fixed	d. Withdrawa	able		Fix	ed. Withdra	wable		
	690			690				690			
N	S	Н	S	Н	L		S	Н	L		
70	85	100	85	100	200		85	100	200		
36	50	70	50	70	120		50	70	120		
36	50	70	50	70	120		50	70	120		
30	45	50	50	65	100		50	65	100		
25	35	50	45	50	85		45	50	85		
25	35	50	45	50	65		45	50	65		
20	22	25	30	42	50		30	42	50		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
100%	100%	100%	100%	100%	100%		100%	100%	100%		
154	187	220	187	220	440		187	220	440		
75.6	110	154	110	154	264		110	154	264		
75.6	110	154	110	154	264		110	154	264		
63	94.5	110	110	143	220		110	143	220		
52.5	73.5	110	94.5	110	187		94.5	110	187		
52.5	73.5	110	94.5	110	143		94.5	110	143		
40	46.2	52.5	63	88.2	110		63	88.2	110		
A (up to	1000A) - B ((800A) ⁽⁴⁾		В				В			
	10			20				20			
	IEC 60947-2	<u> </u>	<u> </u>	EC 60947-2				IEC 60947-	2		
	~			· ·				~			
	-			-				-			
	20,000			10,000				20,000			
	120			60				60			
	5,000			3,000				3,000			
	60			60				60			

⁽⁵⁾ Plug-in/Withdrawable: max In 40°C=600A (6) 1000A only for fixed execution with EF. ES. R and FCCuAl terminals. EF terminals are supplied as standard if no other terminals are ordered

SACE Tmax XT automatic circuit-breakers for direct current (DC) distribution



Size					XT1				
Rated uninterrupted current		[A]			160	'			
Poles		[No.]	[No.] 3, 4						
Rated service voltage, Ue	(DC)	[V]	500						
Rated insulation voltage, Ui	(DC)	[V]							
Rated impulse withstand voltag	ge, Uimp	[kV]			8				
Versions					Fixed, Plug-in ⁽	(2)			
Breaking capacities according	to IEC 60947-2		В	С	N	S	н		
Rated ultimate short-circuit br	eaking capacity, Icu								
Icu @ 250V (DC) 2-pole in series	5	[kA]	18	25	36	50	70		
Icu @ 500V (DC) 2-pole in series	5	[kA]	-	_	_	_	_		
Icu @ 500V (DC) 3-pole in series	S ⁽¹⁾	[kA]	18	25	36	50	70		
Icu @ 750V (DC) 3-pole in series	5	[kA]	-	_	_	_	_		
Rated service short-circuit bre	aking capacity, Ics								
Ics @ 250V (DC) 2-pole in series	5	[kA]	100%	100%	100%	100%	75%		
Ics @ 500V (DC) 2-pole in series	5	[kA]	-	_	_	_	_		
Ics @ 500V (DC) 3-pole in series	S ⁽¹⁾	[kA]	100%	100%	100%	100%	75%		
Ics @ 750V (DC) 3-pole in series	5	[kA]	-	_	-	_	_		
Utilization Category (IEC 60947	'-2)			1	Α				
Reference Standard				IEC 60947-2					
Insulation behaviour				<i>V</i>					
Mounted on DIN rail					DIN EN 50022	2	-		
Mechanical life		[No. Operations]		1	25,000				
		[No. Hourly operations]			240				
Dimensions									
Fixed	3 poles	[mm]			76.2 x 70 x 130				
(Width x Depth x Height)	4 poles	[mm]			01.6 x 70 x 13	10			
Trip units for power distribution	on								
TMD/TMA									
TMD/TMF						,			
MF/MA									
Trip units with low magnetic (1	rmg)			1	1				
TMG									
Interchangeable trip units									
Weight									
Fixed	3/4 poles	[kg]			1.1 / 1.4				
Plug in (EF terminals)	3/4 poles	[kg]			2.21 / 2.82				
Withdrawable (EF terminals)	3/4 poles	[kg]							

⁽¹⁾ XT1: a 4 poles in series connection is required to be used in 500 V DC installations.

⁽²⁾ XT1 plug-in In max=125A





	_		XT2			X1	L3
			160			25	
			3, 4			3,	
			500			50	
			1000			80	
			8			8	
		Fix	ed, Withdrawable, Plug	ı-in		Fixed, I	
	N	S	H	<u>L</u>	v	N	S
	36	50	70	85	100	36	50
	_	_	-	_	_	-	_
	36	50	70	85	100	36	50
	_	_	-	-	_	-	_
	-		_		1		
10	00%	100%	100%	100%	100%	100%	75%
	_	-	-	_	_	-	_
10	00%	100%	100%	100%	100%	100%	75%
,	_	_	-	_	_	-	_
			А			A	Ā
			IEC 60947-2			IEC 60	947-2
			V			V	/
			DIN EN 50022			DIN EN	50022
			25,000			25,0	000
			240			24	10
			90 x 82.5 x 130			105 x 7	
			120 x 82.5 x 130			140 x 7	0 x 150
							•
			v			_	,
			12/16			17	/ 2 1
			1.2 / 1.6			1.7 /	
			2.54 / 3.27			3.24	/ 7.1
			3.32 / 4.04				

SACE Tmax XT automatic circuit-breakers for direct current (DC) distribution



Size					X.	T4			
Rated uninterrupted current		[A]			160,	/ 250			
Poles		[No.]			3,	, 4			
Rated service voltage, Ue	(DC)	[V]			75	50			
Rated insulation voltage, Ui	(DC)	[V]		,	10	00		,	
Rated impulse withstand voltage,	, Uimp	[kV]				3			
Versions				Fix	ed, Withdra	wable, Plug	g-in		
Breaking capacities according to	IEC 60947-2		N	S	Н	L	V	Х	
Rated ultimate short-circuit brea	aking capacity, Icu								
Icu @ 250V (DC) 2 poles in series		[kA]	36	50	70	85	100	100	
Icu @ 500V (DC) 2 poles in series		[kA]	36	50	70	85	100	100	
Icu @ 500V (DC) 3 poles in series		[kA]	36	50	70	85	100	100	
Icu @ 750V (DC) 3p in series		[kA]	_	_	-	-	50	70	
Rated service short-circuit break	king capacity, Ics								
Ics @ 250V (DC) 2 poles in series		[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 500V (DC) 2 poles in series		[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 500V (DC) 3 poles in series		[kA]	100%	100%	100%	100%	100%	100%	
Ics @ 750V (DC) 3 poles in series		[kA]	-	-	-	-	100%	100%	
Utilization Category (IEC 60947-2	2)				,	4			
Reference Standard					IEC 60	947-2			
Insulation behaviour					٠	/			
Mounted on DIN rail					DIN EN	50022			
Mechanical life	_	[No. Operations]			25,0	000			
		[No. Hourly operations]			24	40			
Dimensions									
Fixed	3 poles	[mm]				2.5 x 160			
(Width x Depth x Height)	4 poles	[mm]			140 x 82	2.5 x 160			
Trip units						<u>.</u>			
TMD/TMA									
TMD/TMF						<u>-</u>			
MF/MA				-					
Trip units with low magnetic (TM	1G)								
TMG									
Interchangeable trip units									
Weight						-			
Fixed	3/4 poles	[kg]			•	/ 3.5			
Plug in (EF terminals)	3/4 poles	[kg]				/ 5.52			
Withdrawable (EF terminals)	3/4 poles	[kg]			5/	6.76			





				T5				XT6	
			400	/ 630				800	
			3	, 4				3, 4	
			7:	50				750	
			1,0	000				1,000	
				8				8	
			Fixed, Withdra	awable, Plug-in			ı	ixed, Withdrawable	!
	N	S	н	L	V	X	N	S	н
	25	35	50	70	85	100	35	50	70
	25	35	50	70	85	100	20	35	50
	-	-	-	-	-	-	-	-	-
	-	-	-	-	85	100	18	24	36
	100%	100%	100%	100%	100%	100%	100%	50% (35kA)	50%
	100%	100%	100%	100%	100%	100%	100%	50%	50%
	-	-	-	-	-	-	=	-	-
	-	_	-	_	100%	100%	100%	75%	50%
				Α				A	
				0947-2				IEC 60947-2	
				/				V	
				<u> </u>				<u> </u>	
			20.	000				20,000	
				20				120	
			,	,				1	
			140 x 10	03 x 205				210 x 103.5 x 268	
			186 x 10	03 x 205				280 x 103.5 x 268	
				/				· ·	
			3.25	/ 4.15				9.5 / 12	
				/ 6.65				=	
				/ 6.9				12.1 / 15.1	
									

SACE Tmax XT switch-disconnectors

Switch-disconnectors are devices created from the corresponding circuit-breakers and feature the same overall dimensions, versions, and can be fitted with the same accessories.

Applications

These devices are mainly used as:

- general disconnection devices in sub-switchboards;
- switching and insulation devices for lines, bus bars or groups of apparatus;

In the open position, the disconnector guarantees a sufficient insulation distance (between the contacts) to ensure safety and to prevent an electrical arc from striking.

Utilization category

Tmax XT disconnectors comply with utilization categories defined by IEC 60947-3 Standard.

Characteristics

Size			XT1D	XT3D	XT4D	1000
Conventional free air therm	al current, Ith	[A]	160	250	250	
Poles		[No.]	3, 4	3, 4	3, 4	
Versions			Fixed, Plug-in	Fixed, Plug-in	Fixed, Plug-in, Withdrawable	
Rated service voltage, Ue	(AC) 50-60Hz	[V]	690	690	690	
	(DC)	[V]	500	500	500	
Rated insulation voltage, Ui		[V]	800	800	800	
Rated impulse withstand vo	oltage, Uimp	[kV]	8	8	8	
Rated making capacity in	(Min) Disconnector only	[kA]	2.8	5.3	5.3	
shortcircuit, Icm	(Max) With automatic circuit-breaker on supply side	[kA]	154	105	330	
Rated short-time withstand	current for 1s, Icw	[kA]	2	3	3.6	
Rated operating current, le	e (AC) 50-60Hz					
AC-22A	415-440Vac		160	250	250	
AC-23A			125	200	200	
AC-22A	690V AC		160	250	250	
AC-23A			125	200	200	
Rated operating current, le	e DC					
DC-22A	250V DC		160 - 2p in series	250 - 2p in serie	s 250 - 2p in series	
DC-23A			125 - 2p in series	200 - 2p in serie:	s 200 - 2p in series	
DC-22A	500V DC		160 - 4P in series	250 - 3p in serie	s 250 - 2p in series	
DC-23A			125 - 4P in series	200 - 3p in serie	s 200 - 2p in series	
DC-22A	750V DC		-	=	-	
DC-23A			-	-	-	
Electrical life AC22 / AC23 (AC) 440 V In					
Mechanical life						

(1) 1000A only for fixed execution with EF, ES, R and FCCuAl terminals. EF terminals are supplied as standard if no other terminals are ordered

Coordination

Supp	oly side			Х	T1 16	0			Х	T2 16	60		ХТ3	250		Х	T4 25	0			Х	T5 40	0		
	Icu @ 4	15V AC	В	С	N	S	Н	N	S	Н	L	v	В	S	N	S	н	L	٧	N	S	Н	L	v	
			18	25	36	50	70	36	50	70	120	150	36	50	36	50	70	120	150	36	50	70	120	200	
	XT1D	160	18	25	36	50	70	36	50	70	70	70	-	-	-	-	-	-	-	-	-	-	-	-	
	XT3D	250	-	-	-	-	-	-	-	-	-	-	36	50	36	50	50	50	50	-	-	-	-	-	
	XT4D	250	-	-	-	-	-	-	-	-	-	-	36	50	36	50	70	120	150	-	-	-	-	-	
	XT5D	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	50	70	120	200	
side	XT5D	630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
d si	XT6D	630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Loa	XT6D	800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	XT6D	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	XT7D	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	XT7D	1250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	XT7D	1600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	

Protection

Each switch-disconnector must be protected on the supply side by a coordinated device which safeguards it against short-circuits.

The section "Coordination" in the table below shows the correspondence between each switch-disconnector and the relevant circuit-breaker.

Making capacity

The making capacity Icm is highly important since a switch-disconnector must be able to withstand the dynamic, thermal and current stresses which can occur during closing operations without being destroyed, right up to short-circuit closing conditions.

	XT5D	XT6D	XT7D	XT7D M
400	630	630 - 800 - 1000	1000 - 1250 - 1600	1000 - 1250 - 1600
3, 4	3, 4	3, 4	3, 4	3, 4
Fixed,	Plug-in, Withdrawable	Fixed, Withdrawable (1)	Fixed, Withdrawable	Fixed, Withdrawable
690	690	690	690	690
750	750	750	750	750
1000	1000	1000	1000	1000
8	8	8	8	8
7,65	12,3	30	40	40
440	440	220	252	252
5	7,6	10	20	20
'	'			
400	630	630 - 800 - 1000	1000 - 1250 - 1600	1000 - 1250 - 1600
400	630	630 - 800	1000 - 1250 - 1600	1000 - 1250 - 1600
400	630	630 - 800 - 1000	1000 - 1250 - 1600	1000 - 1250 - 1600
400	630	630 - 800	1000 - 1250 - 1600	1000 - 1250 - 1600
400 2p in s	eries 630 2p in series	630 - 800 - 1000 - 2p in series	1000 - 1250 - 1600 - 2p in series	1000 - 1250 - 1600 - 2p in series
400 2p in s	eries 630 2p in series	630 - 800 - 2p in series	1000 - 1250 - 1600 - 2p in series	1000 - 1250 - 1600 - 2p in series
400 2p in s	eries 630 2p in series	630 - 800 - 1000 - 2p in series	1000 - 1250 - 1600 - 3p in series	1000 - 1250 - 1600 - 3p in series
400 2p in s	eries 630 2p in series	630 - 800 - 2p in series	1000 - 1250 - 3p in series	1000 - 1250 - 3p in series
400 3p in s	eries 630 3p in series	630 - 800 - 1000 - 3p in serie	1000 - 1250 - 1600 - 4 p in series	1000 - 1250 - 1600 - 4 p in series
400 3p in s	eries 630 3p in series	630 - 800 - 3p in serie	1000 - 1250 - 4 p in series	1000 - 1250 - 4 p in series
5,000	3,000	3,500	2,500	2,500
20,000	20,000	20,000	10,000	20,000

	Х	T5 63	30		X	T6 80	0	XT	6 100	00	XΊ	7 10	00	XΊ	7 12	50	XΊ	7 16	00	XT	7 M 10	000	XT7	M 1	250	XT7	M 10	600
N	S	Н	L	٧	N	S	Н	N	S	Н	S	Н	L	S	Н	L	S	Н	L	s	Н	L	S	Н	L	S	Н	L
36	50	70	120	200	36	50	70	36	50	70	50	70	120	50	70	120	50	70	120	50	70	120	50	70	120	50	70	120
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	50	70	120	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	50	70	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		-	-	-	-	-	-
-	-	-	-	-	36	50	70	-	-	-	-	-		-	-	-	-	-	-	-	-		-	-	-	-	-	-
-	-	-	-	-	-	-	-	36	50	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	50	70	120	-	-	-	-	-	-	50	70	120	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	70	120	-	-	-	-	-	-	50	70	120	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	70	120	-	-	-	-	-	-	50	70	120

Tmax XT trip unit offering

The Tmax XT trip units represent the ideal solution for any application up to 1600A.

The Tmax XT molded case circuit-breaker family complies with numerous installation requirements. Circuit-breakers are available with trip units dedicated to three different application groups. The table below shows the trip units for each circuit-breaker frame and the related rated interrupted current ranges.

The power distribution and generator protection application trip units are available in both 3 and 4-pole versions. With the XT2, XT4, XT5, XT6, XT7 and XT7 M versions the trip units are interchangeable, in order to make a performance upgrade of the system easier.







Rated uninterrupted current ranges [A]		XT1	XT2	ХТ3	
Power Distribution Prot	ection				
Thermal-magnetic					
	TMD	16160 (1)	1,632	63250	
	ТМА		40160		
Ekip Dip					
	Ekip Dip LS/I		10160		
	Ekip Dip LIG		10160		
	Ekip Dip LSI		10160		
	Ekip Dip LSIG		10160		
Ekip Touch					
	Ekip Touch LSI		40160		
	Ekip Touch LSIG		40160		
	Ekip Touch Measuring LSI		40160		
	Ekip Touch Measuring LSIG		40160		
	Ekip Hi-Touch LSI		40160		
	Ekip Hi-Touch LSIG		40160		
Motor Protection					
Magnetic					
	MF/MA		1160	100200	
Ekip Dip					
	Ekip M Dip I		10160		
	Ekip M Dip LIU		25160		
Ekip Touch					
	Ekip M Touch LRIU		40100		
Generator Protection					
Thermal-magnetic					
	TMG		16160	63250	
Ekip Dip					
	Ekip G Dip LS/I		25160		
Ekip Touch					
	Ekip G Touch LSIG				
	Ekip G Hi-Touch LSIG				
1) 16A and 20A for N. C. H. have	a the TME trip unit				

Maximum flexibility is guaranteed for customers: on the XT5, XT7 and XT7 M, with Ekip Touch trip units, the interchangeable rating plug enables the rated current to be changed according to system requirements.











XT4	XT5	XT6	ХТ7	XT7 M
1632				
40250	320630	630800		
40230	320030	030000		
40250	250630	6301000	6301600	6301600
40250	250630	6301000	6301600	6301600
40250	250630	6301000	6301600	6301600
40250	250630	6301000	6301600	6301600
 100250	250630		6301600	6301600
100250	250630		6301600	6301600
100250	250630		6301600	6301600
100250	250630		6301600	6301600
100250	250630		6301600	6301600
100250	250630		6301600	6301600
10200	320500			
40250	250630	6301000	6301600	6301600
40160	250500	630800		
100200	250500		6301600	6301600
	320630			
40250	250630	6301000	6301600	6301600
	250630		6301600	6301600
	250630		6301600	6301600

SACE Tmax PV

Molded case switch disconnectors

The Tmax PV line of IEC switch-disconnectors has generation's history of offering complete adaptability, versatility and freedom for any type of application.

Under IEC 60947-3, Tmax PV offers switch-disconnectors to meet standard 1100V DC applications. In addition, it offers the versatility of extended capacities to 1500V DC for the increasingly demanding solar applications of today's market.

Tmax automatic circuit-breakers according to IEC up to 1000V DC are available as a special version of the standard Tmax line.

Common data		
Operating temperature	[°C]	-25 °C +70 °C
Storage temperature	[°C]	-40 °C +70 °C
Numbers of poles		4
Version		fixed

Molded case circuit-breakers up to 1500V DC in compliance with IEC 60947-2

Whenever a consistent short-circuit current can be found, 1000V and 1500V DC automatic circuit-breakers are available in the Tmax T and Tmax PV range.

				Foru	se at 1000VDC	For	use at 1000VDC	with jumpers	For use at
			Tmax T4	Tmax T5	Tmax T6	Tmax T4	Tmax T5	Tmax T6	T4N/PV-E
Rated uninterrupted current		[A]	250	400/630	630/800	80250	400/630	630/800	100250
Poles			4	4	4	4	4	4	4
Rated service voltage, Ue		[VDC]	1000	1000	1000	1000	1000	1000	1500
Rated impulse withstand volta	ge, Uimp	[kV]	8	8	8	8	8	8	8
Rated insulation voltage, Ui		[V]	1150	1150	1150	1150	1150	1150	1500
Rated ultimate short-circuit b	reaking capa	city, Icu							
Icu @ 1000V (DC) 2 poles + 2 po series (1)	oles in	[kA]	-	-	-	20	20	20	
Icu @ 1000V (DC) 4 poles in ser	ries (1)	[kA]	40 (2)	40 (2)	50 ⁽²⁾	-	-	-	
Icu @ 1500V (DC) (1)		[kA]	-	-	-	-	-	-	25 (τ = 1 ms) ⁽⁶⁾ 10 (τ = 5 ms) ⁽⁷⁾
Rated service short-circuit bro	eaking capaci	ity in DC, Ics							
Ics @ 1000V (DC) 2 poles + 2 po series (1)	oles in	[kA]	-	-	-	10	10	10	
Ics @ 1000V (DC) 4 poles in ser	ies (1)	[kA]	20 (2)	10 (2)	12,5(2)	-	-	-	
Ics @ 1500V (DC) (1)		[kA]	-	-	-	-	-	-	20 (τ = 1 ms) ⁽⁶⁾
									7.5 (τ = 5 ms) ⁽⁷⁾
Category of use (IEC 60947-2)			А	B (400 A) ⁽³⁾ A (630 A)	B (4)	А	B (400 A) A (630 A)	В	Α
Behaviour on isolation			•	•	•	•	•	•	•
Reference Standards			IEC 60947-2	IEC 60947-2	IEC 60947-2	IEC 60947-2	IEC 60947-2	IEC 60947-2	IEC 60947-2
Thermomagnetic releases	TMD		•	-	-	•	-	-	-
	TMA		•	•	•	•	•	•	-
	TMF		-	-	-	-	-	-	•
Terminals			FC Cu	FC Cu	F - FC CuAl - R	F	F	F	FC Cu - FC CuA
Connection with jumpers			-	-	-	• (8)	• (8)	• (8)	● (8
Version			F	F	F(5)	F	F	F	F
Mechanical life		[No. operations]	20000	20000	20000	7500	7500	7500	7500
Electrical life		[No. operations]	1000 ⁽⁹⁾	1000 (9)	1000 (9)	1000 (9)	1000 (9)	1000 (9)	1000 ⁽⁹⁾
Dimensions	4 poles	W [mm/in]	140/5.52	184/7.24	280/11,02	140/5.52	184/7.24	280/11,02	140/5.52
		D [mm/in]	103.5/4.07	103.5/4.07	103.5/4.07	103.5/4.07	103.5/4.07	103.5/4.07	103.5/4.07
		H [mm/in]	205/8.07	205/8.07	268/10.55	205/8.07	205/8.07	268/10.55	205/8.07
Weight (with standard terminals)	Fixed	[kg/lbs]	3.05/6.72	4.15/9.15	12/26.46	3.05/6.72	4.15/9.15	12/26.46	3.05/6.72

- (1) See the wiring diagrams on page 9/2
- (2) Power supply only from above
- (3) Icw = 5 kA
- (4) Icw = 7,6 kA (630 A) 10 kA (800 A)
- (5) For Tmax T6 in withdrawable version please ask ABB SACE
- (6) According to IEC 60947-2 Edition 5.0 Annex P
- (7) According to IEC 60947-2 Edition 4.2 and GB 14048.2
- (8) Selection of one of the jumper connection options is mandatory. Jumpers KITs to be ordered separately (not supplied with CB).
- (9) Opening with SOR or UVR

Ranges

Molded case switch-disconnectors up to 1100V DC in compliance with IEC 60947-3 $\,$

Electrical charachteristics

Tmax PV switch-disconnectors in compliance with the IEC60947-3		T4D/PV	T5D/PV	T6D/PV	T7D/PV (1)
Rated service current in category DC22 B, Ie	(A)	250	500	800	1250-1600
Number of poles	(No.)	4	4	4	4
Rated service voltage, Ue		1100V DC	1100V DC	1100V DC	1100V DC
Rated impulse withstand voltage, Uimp	(kV)	8	8	8	8
Rated insulation voltage, Ui	(V)	1150V DC	1150V DC	1150V DC	1150V DC
Test voltage at industrial frequency for minute	1 (V)	3500	3500	3500	3500
Rated short-circuit making capacity, switch-disconnector only, Icm	(kA)	3	6	9.6	19.2
Rated short-time withstand current for 1s, Icw	(kA)	3	6	9.6	19.2
Versions		F	F	F	F
Standard terminals		F	F	F	F
Mechanical life	(No. Operations)	7500	7500	7500	20000
Electrical life (operations @ 1100V DC)	(No. Operations)	500 (2)	500 (2)	500 ⁽²⁾	500(2)
Basic dimensions	W (mm/in)	140/5.52	186/7.33	280/11.02	280/11.02
	D (mm/in)	103.5/4.07	103.5/4.07	103.5/4.07	154/6.06 (manual) 178/7.01 (motorized)
	H (mm/in)	205/8.07	205/8.07	268/10.55	268/10.55
Weight (with standard terminals only)	(kg/lbs)	3.05/6.72	4.15/9.15	12/26.46	12.5/27.56 (manual) 14/30.86 (motorized)

⁽¹⁾ installation in vertical position only; (2) openings with SOR or UVR

Molded case switch-disconnectors up to 1500V DC in compliance with IEC 60947-3

Electrical charachteristics

Tmax PV switch-disconnectors in compliance with the IEC60947-3		T4D/PV-E	T5D/PV-E	T7D/PV-E (1)
Rated service current in category DC22 A, le	(A)	250	500	1250-1600
Number of poles	(No.)	4	4	4
Rated service voltage, Ue		1500V DC	1500V DC	1500V DC
Rated impulse withstand voltage, Uimp	(kV)	8	8	8
Rated insulation voltage, Ui	(V)	1500V DC	1500V DC	1500V DC
Rated short-circuit making capacity, switch-disconnector only, Icm	(kA)	3	6	19.2
Rated short-time withstand current for 1s, Icw	(kA)	3	6	19.2
Versions		F	F	F
Standard terminals		F	F	F
Mechanical life	(No. Operations)	7500	7500	20000
Electrical life (operations @ 1500V DC)	(No. Operations)	1000(2)	1000 (2)	500(2)
Basic dimensions	W (mm/in)	140/5.52	186/7.33	280/11.02
	D (mm/in)	103.5/4.07	103.5/4.07	178/7.01
	H (mm/in)	205/8,07	205/8.07	268/10.55
Weight (with standard terminals only)	(kg/lbs)	3.05/6.72	3,15/9.15	14/30.86

⁽¹⁾ installation in vertical position only. Motorized version; (2) openings with SOR or UVR

Ranges

Circuit breakers up to 800V AC - IEC

			T4V-HA	T5V-HA	T5X-HA
Rated service current		[A]	80-250	320-630	320-400
Poles			3/4	3/4	3/4
Standard			IEC 60947-2/GB14048.2	IEC 60947-2/GB14048.2	IEC 60947-2/GB14048.2
Rated service voltage		[VAC]	800	800	800
Rated impuls withstand voltage		[VAC]	8	8	8
Rated insulation voltage		[VAC]	1000	1000	1000
Rated breaking capacity, Icu		[kA]	25	32	35
Rated service breaking capacity, Ics		[kA]	12	16	18
Isolation behaviour		[kA]	Yes	Yes	Yes
Category of use		[kA]	A	А	А
Product certification			IEC - CCC	IEC - CCC	IEC - CCC
Thermomagnetic releases			TMA	TMA (Up to 500A)	-
Electronic trip units			PR222DS-LSIG (250A)	PR221 (630A)	PR222DS-LSIG
Version			F	F	F
Class of pollution			III	III	III
Terminals			F - FcCuAl - FcCu	F - FcCuAl - FcCu	F - FcCuAl - FcCu
Mechanical life		[No. operations]	20000	20000	20000
Electrical life		[No. operations]	2000	1000	1000
Dimensions		W [mm/in]	140/5.52	186/7.33	186/7.33
		D [mm/in]	103.5/4.07	103.5/4.07	103.5/4.07
		H [mm/in]	205/8,07	205/8,07	205/8,07
Weight (with standard terminals)	Fixed	[kg/lbs]	3.05/6.72	3,15/9.15	3,15/9.15

Circuit breakers up to 1150V AC - IEC

		T4V (1)	T5V (1)	
Rated service current	[A]	250	400-630	
Poles		3/4	3/4	
Standard		IEC 60947-2	IEC 60947-2	
Rated service voltage	[VAC]	1150	1150	
Test voltage at power frequency for 1 min.	[VAC]	3500	3500	
Rated impulse withstand voltage	[VAC]	8	8	
Rated insulation voltage	[VAC]	1150	1150	
Rated breaking capacity, Icu	[kA]	12	12	
Rated service breaking capacity, Ics	[kA]	12	10	
Isolation behaviour	[kA]	Yes	Yes	
Category of use	[kA]	Α	400A: B ⁽²⁾ 630A: A	
Product certification		IEC	IEC	
Thermomagnetic releases		TMD TMA	ТМА	
Electronic trip units		PR221DS PR222DS/P PR222DS/PD	PR221DS PR222DS/P PR222DS/PD	
Version		F	F	
Class of pollution		III	III	
Terminals		FC Cu - F* - EF*	FC Cu - F* - EF*	
Mechanical life	[No. operations]	20000	20000	
Electrical life	[No. operations]	1000	1000	
Dimensions	3P W [mm/in]	105/4.13	140/1.57	
	4P W [mm/in]	140/1.57	184/7.24	
	D [mm/in]	103.5/4.07	103.5/4.07	
	H [mm/in]	205/8.07	205/8.07	
Weight (with standard terminals) Fix	ed 3P [kg/lbs]	2.35/5.18	3.25/7.17	
	4P [kg/lbs]	3.05/6.72	4.15/9.15	

⁽¹⁾ Power supply only from the top (2) Icw 5kA * Ordering extracodes

Switch disconnectors up to 1150V AC - IEC

			T4D
Rated service current		[A]	250
Poles			3
Standard			IEC 60947-3
Product certification			IEC
Rated service voltage		[VDC]	1150
Rated insulation voltage		[VDC]	1150
Short-circuit current withstand		[kA]	3,6
Version			F
Standard terminals			F
"Terminals provided with Jumper kit (see ordering codes for details)"			-
Mechanical life		[No. operations]	2000
Electrical life		[No. operations]	1000
Dimensions		W [mm/in]	105/4.13
		D [mm/in]	103.5/4.07
		H [mm/in]	205/8.07
Weight (with standard terminals)	Fixed	3P [kg/lbs]	2.35/5.18

Circuit breakers up to 1000V AC - IEC

			T4L	T4V ⁽¹⁾	T5L	T5V ⁽¹⁾	T6L(1)
Rated service current		[A]	2!	50	400	-630	630-800
Poles			3,	/4	3,	/4	3/4
Standard			IEC 60	947-2	IEC 60	947-2	IEC 60947-2
Rated service voltage		[VAC]	10	00	10	00	1000
Test voltage at power frequency for	1 min.	[VAC]	35	00	35	00	3500
Rated impulse withstand voltage		[VAC]		8	8	3	8
Rated insulation voltage		[VAC]	10	00	10	00	1000
Rated breaking capacity, Icu		[kA]	12	20	12	20	12
Rated service breaking capacity, Ics		[kA]	12	12	10	12	6
Isolation behaviour		[kA]	Y	es	Y	es	Yes
Category of use		[kA]	,	A		A: B ⁽²⁾ A: A	B ⁽³⁾
Product certification			IEC	IEC - CCC	IEC	IEC - CCC	IEC - CCC
Thermomagnetic releases			-	TMD TMA	-	TMA	TMA
Electronic trip units			PR221DS PR222DS/P PR222DS/PD	PR221DS PR222DS/P PR222DS/PD	PR221DS PR222DS/P PR222DS/PD	PR221DS PR222DS/P PR222DS/PD	PR221DS PR222DS/P PR222DS/PD
Electronic trip units for motor protection			Ekip M-LRIU	-	Ekip M-LRIU	-	-
Version			F, P, W	F	F, P, W ⁽⁴⁾	F	F (5)
Class of pollution			I	II	ļ	II	III
Terminals			FC Cu -	F* - EF*	FC Cu -	F* - EF*	F - FC CuAl** - R - EF* - ES*
Mechanical life		[No. operations]	200	000	200	000	20000
Electrical life		[No. operations]	10	00	10	00	1000
Dimensions		3P W [mm/in]	105,	4.13	140,	1.57	210/8.27
		4P W [mm/in]	140,	/1.57	184,	7.24	280/11.02
		D [mm/in]	103.5	5/4.07	103.5	6/4.07	103.5/4.07
		H [mm/in]	205,	/8.07	205,	/8.07	268/10.55
Weight (with standard terminals)	Fixed	3P [kg/lbs]	2.35	/5.18	3.25	/7.17	9.5/20.94
		4P [kg/lbs]	3.05	/6.72	4.15	/9.15	12.0/26.46
	Plug-ir	3P [kg/lbs]	3.60	/7.94	5.15/	11.35	
		4P [kg/lbs]	4.65/	10.25	6.65/	14.66	-
With	ndrawable	3P [kg/lbs]	3.85	/8.49	5.40/	11.91	
		4P [kg/lbs]	4.90/	10.80	6.90/	15.21	-

⁽¹⁾ Power supply only from the top
(2) Icw 5kA
(3) Icw = 7.6 kA (630 A) - 10 kA (800 A)
(4) Tmax T5 630 is only available in the fixed version
(5) For T6 in the withdrawable version, please ask ABB SACE
* Ordering extracodes
**Ordering standard 1SDAO codes

Simplicity and safety, up to 50kA

Formula Air is an ideal solution for main installation requirements, from distribution switchboards to onboard compartments. This comprehensive range offers the most suitable solution for each specific set of requirements. Easy to use Formula Air products are also easy to order. The ACBs are available in 3 sizes up to 4000A with performance level up to 50kA which are equipped with new Ek 1 and Ek 2 trip units.







Current ca	apacity			
F4			2500 -	4000
F2	1600 - 2000)		
FA	630 - 1600			

- **Ek 1.** Enables rapid and accurate setting of the protections with the use of dip switches. This is the most appropriate solution for common applications.
- **Ek 2.** Enables simple and intuitive navigation thanks to the graphical user interface of the LCD screen.

Simplicity and safety, up to 50kA

Common data		
Rated service voltage Ue	[V]	440
Rated insulation voltage Ui	[V]	1000
Rated impulse withstand voltage Uimp	[kV]	12
Frequency	[Hz]	50 - 60
Number of poles		3-4
Version		Fixed - Withdrawable
Operating temperature		-25°C+70°C
Storage temperature		-40°C+70°C







Formula Air automatic circuit-bre	eakers		FA1		FA2	FA4
Performance levels			В	С	С	С
Max rated uninterrupted current a	t 40°C - Iu	[A]	630	630	1600	2500
		[A]	800	800	2000	3200
		[A]	1000	1000		4000
		[A]	1250	1250		
		[A]	1600	1600		
				,		
Neutral pole current-carrying capa	acity for 4 poles breakers	[%lu]	100	100	100	100
Rated ultimate breaking capacity	@400-415V	[kA]	42	50	50	50
under short circuit - Icu	@440V	[kA]	42	50	50	50
Rated service breaking capacity u	nder short-circuit - Ics	[%lcu]	100	100	100	100
Rated short time withstand	(1s) @440V	[kA]	42	50	50	50
current - Icw	(3s)	[kA]	24	24	25	25
Rated making capacity under short-circuit (peak value) - Icm	440 V	[kA]	88	105	105	105
Utilization category (according to	IEC 60947-2)		В	В	В	В
Operating times		[ms]	40	40	40	40
Dimensions	H - Fixed/Withdrawable	[mm]		296/363.5	371/425	371/425
	D - Fixed/Withdrawable	[mm]		183/271	270/383	270/383
	W - Fixed 3p/4p	[mm]		210/280	276/317	384/510
	W - Withdrawable 3p/4p	[mm]		278/348	317/407	425/551
Weights (CB with trip unit and	Fixed 3p/4p			14/16	41/53	56/70
current sensor)	Withdrawable 3p/4p (fixed part i	included)		38/43	54/99	110/136

Formula Air Switch-disconnector		'	FA1	FA2	FA4
Performance levels			N/MS	C/MS	C/MS
Max rated uninterrupted current at 40°C - I	u	[A]	630	1600	2500
		[A]	800	2000	3200
		[A]	1000		4000
		[A]	1250		
		[A]	1600		
Neutral pole current-carrying capacity for 4	poles breakers	[%lu]	100	100	100
Rated making capacity under short-circuit (peak value) - Icm	440 V	[kA]	105	105	105
Rated short time withstand current - Icw	(1s) @440V	[kA]	50	50	50
	(3s)	[kA]	30	25	25
Category			AC23	AC23	AC23

Formula AIR	,		FA1			FA2	FA4	FA4	
Mechanical life with regular		[lu]	≤ 1000	1250	1600	≤ 2000	2500	3200	4000
ordinary maintenance		[No. cycles x 1000]	15	15	15	15	15	15	15
Frequency		[Oper./Hour]	60	60	60	60	60	60	60
Electrical life with regular ordinary maintenance	440 V	[No. cycles x 1000]	6	6	6	6	5	5	4
Frequency		[Cycles/Hour]	30	30	30	30	20	20	20

Trip unit protection functions

ABB Code	ANSI Code	Function	Threshold
L	49	Overload protection	l1 = 0.4 - 0.42 - 0.45 - 0.47 - 0.5 - 0.52 - 0.55 - 0.57 - 0.6 - 0.62 - 0.65 - 0.67 - 0.7 - 0.72 - 0.75 - 0.77 - 0.8 - 0.82 - 0.85 - 0.87 - 0.9 - 0.92 - 0.95 - 0.97 - 1 x ln
		Thermal memory	
		Tolerance	tripping between 1.05 and 1.2 x I1
S	50TD	Short-circuit selective protection	I2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 x In
		Tolerance	± 7% f ≤ 6 x n ± 10% f > 6 x n
	51	Short-circuit selective protection	I2 = 0.6 - 0.8 - 1 - 1.5 - 2 - 2.5 - 3 - 3.5 - 4 - 5 - 6 - 7 - 8 - 9 - 10 x In
		Thermal memory	
		Tolerance	± 7% f ≤ 6 x n ± 10% f > 6 x n
ı	50	Short-circuit instantaneous protection	I3= 1.5 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 x In
		Tolerance	± 10%
G	50N TD	Earth fault protection	I4 = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 x In
		Tolerance	± 7%
	51N	Earth fault protection	I4 = 0.1 - 0.2 - 0.3 - 0.4 - 0.6 - 0.8 - 1 x In
		Tolerance	± 7%

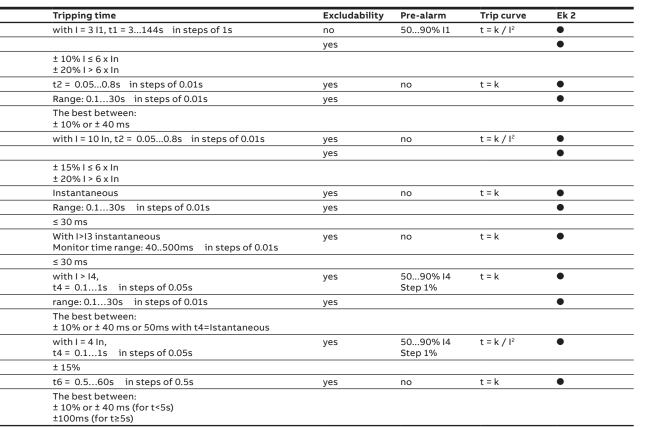
ABB Code	ANSI Code	Function	Threshold
L	49	Overload Protection	I1 = 0.41 x In in steps of 0.001 x In
		Thermal Memory	
		Tolerance	tripping between 1.05 and 1.2 x I1
S	50TD	Time-delayed overcurrent protection	I2 = 0.610 x In in steps of 0.1 x In
		Start up	Activation: 0.610 x In in steps of 0.1 x In
		Tolerance	± 7% ≤ 6 x ln ± 10% > 6 x ln
	51	Time-delayed overcurrent protection	I2 = 0.610 x In in steps of 0.1 x In
		Thermal Memory	
		Tolerance	± 7% ≤ 6 x ln ± 10% > 6 x ln
I	50	Istantaneous overcurrent protection	I3= 1.515 x In in steps of 0.1 x In
		Start up	Activation: 1.515 x In in steps of 0.1 x In
		Tolerance	± 10%
MCR		Closing on short-circuit protection	I3= 1.515 x In in steps of 0.1 x In
		Tolerance	± 10%
G	50N/50N TD	Earth fault protection	I4 ⁽¹⁾ = Inst, 0.11 x In in steps of 0.001 x In
		Start up	Activation: 0.21 x ln in steps of 0.2 x ln
		Tolerance	± 7%
	51N	Earth fault protection	I4 ⁽¹⁾ = 0.11 x In in steps of 0.01 x In
		Tolerance	± 7%
IU	46	Current unbalance protection	I6 = 290% In unbalance in steps of 1% In
		Tolerance	± 10%

ABB Code	Trip threshold	Trip time
L	Trip between 1.05 and 1.2 x I1	± 20%
S	± 10%	± 20%
I	± 15%	≤ 60ms
G	± 15%	± 20%
Other protection*	± 15%	± 20%

^{*} only for Ek 2

Trip time	Excludability	Pre Alarm	Trip curve	Ek 1
with I = 3 I1, t1 = 3 - 12 - 24 - 36 - 48 - 72 - 108 - 144 s	No	50 90 I1 Step 1%	t = k / I ²	•
	Yes			•
± 10% If ≤ 6 x In				
± 20% If > 6 x In				
t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8s	Yes	No	t = k	•
The best between: ± 10% or ± 40 ms				
with I = 10 In, t2 = 0.1 - 0.2 - 0.3 - 0.4 - 0.5 - 0.6 - 0.7 - 0.8s	Yes	No	t = k / I ²	•
	Yes	No		
± 15% If ≤ 6 x In				
± 20% If > 6 x In				
Instantaneous	Yes	No	t = k	•
≤ 30 ms				
t4 = 0.1 - 0.2 - 0.4 - 0.8s	Yes	5090% 14	t = k	•
		Step 1%		
The best between: ± 10% or ± 40 ms				
t4 = 0.1 - 0.2 - 0.4 - 0.8s	Yes	5090% 14	t = k / I ²	•
		Step 1%		
± 15%		<u> </u>		





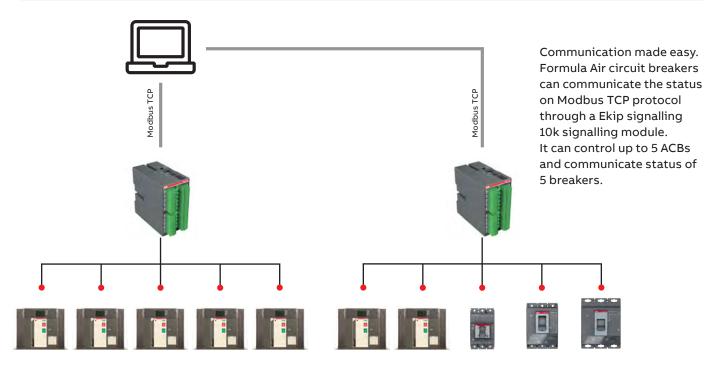


Protection Trip unit





Parameters	EK 1 - LI	EK1- LSIG	EK2-LSIG
Neutral protection	•	•	•
Switchable thermal memory	•	•	•
Graphical display with current metering			•
Closing on short-circuit (MCR)			•
Start-up function			•
Instantaneous earth fault (G-ANSI 50N)			•
Current unbalance protection			•
Watchdog function	•	•	•
Contact wear Indication			•
Display of No. of operations			•
Display of last maintaince date			•
Zone Selectivity for S & G protections			•
Display of 20 trip history & 100 events			•
Test function	•	•	•
Download breaker maintenance data from ACB	•	•	•



SACE Formula DSP

Performance made simple

SACE FORMULA DSP is part of the ABB FORMULA range, a complete product range for standard applications dedicated to residential, commercial and industrial environments. A perfect synthesis of quality at your fingertips, easy to select, install and use.





Easy to install

Click-in fixing for accessories to guarantee time saving and fast installations



Simplified selection

Availability of a short list of codes enables simplified product selection and easy ordering



Wide applications

Capability to cover standard applications dedicated to residential, commercial and industrial environments



Safety and Reliability

Compliance with the main safety standards and directives



Standardization

Same fixing points and dimensions of SACE Tmax XT series guarantee standardization of the solutions with the whole ABB molded-case circuit-breakers range



Exactly what you need

Performances are tailor-made to cover exactly what you need



Quality

ABB long experience in molded-case circuit-breakers design is a guarantee of quality



Sustainability

Compliance with the international regulations of Product Materials and Environmental Health and Safety

SACE Formula DSP

Technical characteristics

Size				P1		P2		Р3		P4 (1)
						11				8
Rated uninterrupted current	[A]			160		250	4	100/630		800
Poles	[No.]			3, 4		3, 4		3, 4		3, 4
Rated service voltage, Ue	AC 50-60Hz [V]			500		500		500		500
	DC [V]			250		250		250		250
Rated insulation voltage, Ui	[V]			750		750		750		750
Rated impulse withstand voltage, Uimp	[kV]			8		8		8		8
Breaking capacities according to IEC 609	47-2	В	С	N	С	N	N	S	N	S
Rated ultimate short-circuit breaking ca	pacity, Icu									
Icu @ 220-230-240V 50-60Hz (AC)	[kA]	25	40	50	40	50	50	80	50	80
Icu @ 380V 50-60Hz (AC)	[kA]	18	25	36	25	36	36	50	36	50
Icu @ 415V 50-60Hz (AC)	[kA]	18	25	36	25	36	36	50	36	50
Icu @ 440V 50-60Hz (AC)	[kA]	15	25	36	25	36	36	50	30	45
Icu @ 500V 50-60Hz (AC)	[kA]	3	4	6	4	5	20	25	20	22
Icu @ 250V (DC) 2-pole in series	[kA]	18	25	36	25	36	25	35	35	50
Rated service short-circuit breaking cap	acity, Ics			'						
Ics @ 220-230-240V 50-60Hz (AC)	[kA]	25	40	50	40	50	50	80	50	80
Ics @ 380V 50-60Hz (AC)	[kA]	18	25	36	25	36	36	50	36	50
Ics @ 415V 50-60Hz (AC)	[kA]	18	25	36	25	36	36	50	36	50
Ics @ 440V 50-60Hz (AC)	[kA]	7.5	12.5	18	12.5	18	36	50	30	45
Ics @ 500V 50-60Hz (AC)	[kA]	3	3	3	3	3	15	18	15	6
Ics @ 250V (DC) 2-pole in series	[kA]	18	25	36	25	36	25	35	35	35
Rated short-circuit making capacity, Icm				'						
Ics @ 220-230-240V 50-60Hz (AC)	[kA]	52.5	84	105	84	105	105	176	105	176
Ics @ 380V 50-60Hz (AC)	[kA]	36	52.5	75.6	52.5	75.6	75.6	105	75.6	105
Ics @ 415V 50-60Hz (AC)	[kA]	36	52.5	75.6	52.5	75.6	75.6	105	75.6	105
Ics @ 440V 50-60Hz (AC)	[kA]	30	52.5	75.6	52.5	75.6	75.6	105	63	94.5
Ics @ 500V 50-60Hz (AC)	[kA]	4.26	5.88	9	5.88	7.5	40	52.5	40	46.2
Utilization Category (IEC 60947-2)				Α		Α		Α		Α
Reference Standard			IEC	60947-2	IEC	60947-2	IEC (60947-2	IEC	60947-2
Insulation behaviour				•		•		•		•
Mechanical life	[No. Operations]			20,000		20,000		15,000		15,000
	[No. Hourly operations]			240		240		240		240
Electrical life @ 415 V (AC)	[No. Operations]			7,000		6,000		5,000		4,000
	[No. Hourly operations]			120		120		120		120
Dimensions										
Fixed (Width x Depth x Height)	3 poles [mm]		76.2 x	70 x 130	105 x 70 x 150		140 x 103 x 205		210 x 103.5 x 268	
	4 poles [mm]		101.6 x	70 x 130	140 x	70 x 150	186 x 10	03 x 205	280 x 103	3.5 x 268
Weight										
Fixed	3 /4 poles [kg]			1.1 / 1.4		1.7 / 2.1	3.2	5 / 4.15		9.5 / 12

⁽¹⁾ Not suitable for IT distribution Systems >440V AC

Power distribution protection

Field of appl	ication		Trip Unit				L – Overloa	d Protection			I – Sł	ort-circuit Pr	otection
					Curren	t Threshold		Trip Time	Cı	rrent Thresh	old	Т	Trip Time
Power Distribution Protection			TMD			Adjustable		Fixed		Fixed Adjustable		Fixed instantaneous	
			TMA		Adjustable		Fixed						
	In [A]	40	63	80	100	125	160	200	250	320	400	630	800
TMD	P1	•	•	•	•	•	•				·		
	P2							•	•				
ТМА	P3									•	•	•	
	P4												

SACE Formula DSA

Simplicity and quality in a single product

01 SACE FORMULA DSA A1
02 SACE FORMULA DSA A2
03 SACE FORMULA DSA A3

The SACE FORMULA DSA circuit-breakers from 15A to 630A consist of the interruption part together with the trip unit and they can be installed:

- directly on the back plate of the cubicles;
- on a DIN rail (A1 and A2);
- back door (A1, A2 and A3, 2-3 4 poles).

They are characterised by:

· fixed version;

3 poles

- polarity: 1 pole (A1), 2 poles (A1 and A2), 3
 poles (A1, A2 and A3), 4 poles (A1, A2 and A3);
- maximum breaking capacity of 36kA for A1 and A2 and of 50kA for A3 at 415V AC;

- fixed thermomagnetic trip unit (TMF) for protection of networks in alternating and direct current (A1, A2, A3);
 - ELT LI electronic trip unit with fixed thresholds for the protection of networks in alternating current (A3):
 - only two depths: 60mm (A1, A2) and 103.5mm (A3);
 - · standard front terminals;
 - the possibility of use at 50°C without derating up to 250A (except for A1 125A);



SACE Formula DSA

Simplicity and quality in a single product

Quality is the rapid installation system. With FORMULA Link, the simplicity of the SACE FORMULA family shows up in all its strength. The connection between the supply side circuit-breaker and FORMULA Link is made using special incoming connections kit, whereas the connection between the load side circuit-breakers and FORMULA Link is made using the outgoing connection kits.

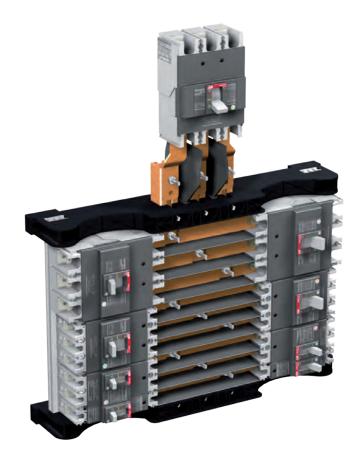
Installation and putting into service are simple and rapid.

Three different frames of FORMULA Link are available:

- 250A FORMULA Link;
- 400A FORMULA Link;
- 630/800A FORMULA Link.

All the versions of the moulded-case circuit-breakers can be installed in the FORMULA Link: SACE FORMULA DSA A1 and A2 in the single-pole, two-pole and three-pole versions, and SACE FORMULA DSA A3 in the three-pole version.

Sace Formula DSA. Small space, great quality.



SACE Formula DSA

Simplicity and quality in a single product

			A1							A2				А3	
Frame size		[A]	125							250				400/	630
Rated current, In		[A]	15:	125						125	.250			320	.630
Poles		[Nr]	1, 2,	3, 4						2, 3,	4			3, 4	
Rated service volta	age, Ue (AC) 50-60 Hz	[V]	550 ((2p-3p	-4p); 4	15 (1p))			550 (2p-3p	-4p)		550	
	(DC)	[V]	250 ((2p-3p	-4p); 1	25 (1p))			250 (2p-3p	-4p)		250	
Rated insulation vo	oltage, Ui	[V]	690							690				690	
Rated impulse wit	hstand voltage, Uimp	[kV]	6							6				6	
Versions			Fixed	d						Fixed	1			Fixed	1
Performance Level	ıl		Α	В	С		N			В	С	N		N	S
Poles		[Nr]	3/4	3/4	1	3/4	1	2	3/4	3/4	3/4	2	3/4	3/4	3/4
Rated ultimate sh	ort-circuit breaking capa	city,	lcu												,
Icu @ 240 V 50-60	Hz (AC)	[kA]	10	25	18	30	25	50	100	25	50	50	85	85	100
Icu @ 380 V 50-60	Hz (AC)	[kA]	10	18	2.5	25	5	36	36(5)	18	25	36	36	36	50
Icu @ 415 V 50-60	Hz (AC)	[kA]	10	18	2.5	25	5	36	36(5)	18	25	36	36	36	50
Icu @ 440 V 50-60	Hz (AC)	[kA]	8	15	-	20	-	25	25	15	20	25	25	36	50
Icu @ 480 V 50-60	Hz (AC)	[kA]	7.5	10	-	15	-	18	18	15	18	18	25	25	35
Icu @ 500 V 50-60	Hz (AC)	[kA]	5	5	-	8	-	10	10	5	8	10	10	20	25
Icu @ 550 V 50-60		[kA]	5	5	-	8	-	10	10	5	8	10	10	15	20
lcu @ 125 V (DC) 1	•	[kA]	-	-	5	-	10	-	-	-	-	-	-	-	-
lcu @ 250 V (DC) 2	•	[kA]		5	-	10	-	10	10	18	25	10	36	36	50
Rated short-circui	it service breaking capac	ity, Ic	s												,
lcs @ 240 V 50-60		[kA]	50%			50%	50%	50%	50%	50%	50%	50%	50%	50%	
lcs @ 380 V 50-60	Hz (AC)	[kA]	50%				50%	50%	50%	50%	50%	50%	50%	50%	
lcs @ 415 V 50-60		[kA]	50%		50%			25%	25%	50%	50%	50%	50%	50%	
lcs @ 440 V 50-60	Hz (AC)	[kA]	50%			25%		25%	25%	50%	50%	50%	50%	50%	
lcs @ 480 V 50-60	Hz (AC)	[kA]	50%			25%(25%	25%(1)	50%	50%	50%	50%	50%	
lcs @ 500 V 50-60	Hz (AC)	[kA]	50%			25%(25%	25%	50%	50%	50%	50%	50%	
lcs @ 550 V 50-60	Hz (AC)	[kA]	50%			25%(25%	25%	50%	50%	50%	50%	50%	50%
lcs @ 250 V (DC) 2	poles in series	[kA]	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Rated short-circui	it making capacity, Icm														
Icm @ 240 V 50-60	0 Hz (AC)	[kA]	52.5	52.5	36	63	52.5	105	220	52.5	105	105	187	187	220
Icm @ 380 V 50-60	0 Hz (AC)	[kA]	17	36	3.8	52.5	7.5	75.6	75.6	36	52.5	75.6	75.6	75.6	105
Icm @ 415 V 50-60	O Hz (AC)	[kA]	17	36	3.8	52.5	7.5	75.6	75.6	36	52.5	75.6	75.6	75.6	105
Icm @ 440 V 50-60	0 Hz (AC)	[kA]	13.6	30	-	40	-	52.5	52.5	30	40	52.5	52.5	75.6	105
Icm @ 480 V 50-60	0 Hz (AC)	[kA]	12.8	17	-	30	-	36	17	30	36	36	52.5	52.5	73.5
Icm @ 500 V 50-60	0 Hz (AC)	[kA]	7.5	7.5	-	13.6	-	17	17	7.5	13.6	17	17	40	52.5
Icm @ 550 V 50-60	0 Hz (AC)	[kA]	7.5	7.5	-	13.6	-	17	17	7.5	13.6	17	17	30	40
Utilization categor	ry (IEC 60947-2)		Α							Α				Α	
Hold 100% In at 50	0°C	[A]	15:	100						125	.250			300-4	100 ⁽⁴⁾
Reference Standar	rd		IEC 6	0947-	2					IEC 6	0947-2	2		IEC 60	0947-2
Isolation behaviou	ır														
Fixing onto DIN rai	il		DIN	EN 500	22					DINE	N 500	22		-	
Mechanical life (G2	2.10) [No. operations	5]	8500)						1000	0			5000	
Electrical life @ 41	15 V (AC) [No. operations	5]	1500)						4000)			2000	
Total opening	Shunt opening release SOR)	[ms]	15							15				15	
	Undervoltage release (UVR)	[ms]	15							15				< 25	
	1 pole			x60x13	30					-				-	
Dimensions	2 poles			x60x13						70x6	0x150				
(Width x Depth x	3 poles			x60x13							60x150				x 103.5 x 205
Height)	4 poles			2x60x1							60x15				103.5 x 205
	1 pole		0.24							-				-	
	2 poles		0.470	_						0.730)			_	
Weiaht ·	3 poles	[kg]	0.700							1.100				3.25	
3	<u> </u>		0.700							1.450				4.15	
	1 noles		U. 76							1.43(,			4.13	
	4 poles	[kg]													
Trip Unit		[kg]											-		
Trip Unit		[kg]	•							•				■ (up	o to 500A)
		[kg]								•					o to 500A)
Trip Unit Thermal-magnetic		[/9]	•												

Switches

ABB has a wide portfolio of low voltage switches. They are suitable for diverse applications, in motor control centers, in switch boards and as main switches in various equipment and machines. From single to 8 poles and combination switches for change-over, automatic transfer, bypass, reversing, etc.

Switch disconnectors 16 - 4000 A

The switch disconnector is largely used as the main switch in low voltage switchgears for distribution of power, starting and stopping motors and isolating loads during maintenance.

The range from 16 to 125 Amps are either base plate or door mounted by snap-on or screw fitting front operated 3, 4, 6 and 8-pole are available as standard.

From 160 to 4000 Amps, the switch disconnectors, also called load break switches, are designed as pole modules and they are available as 1, 2, 3 and 4-pole versions, front or side operated.

Switch disconnectors OTDC and OTDCP 10 - 1000 A

The OTDC range of switch-disconnectors is specially designed for DC applications. Thanks to a compact design, efficiency and reliability, OTDC switches bring photovoltaic installations to the next level.

Switch disconnector fuses 16 - 1250 A

The switch disconnector fuse is used as the main switch in low voltage switchgears in industry for distributing power and protecting motors, cables and other devices against short-circuits and over loads.

The switch disconnector fuses are available for all types of fuse links, DIN, BS, NFC, UL, CSA.

The range includes single pole to four pole versions, front-or side-operated. The pole module design enables location of the operating mechanism in any position together with the direction of the terminals giving flexibility to installation in different types of cubicle designs.

Change-over and transfer switches 16 - 3200 A

ABB's change-over and transfer switches are designed to transfer loads from one power source to another in a wide variety of applications.

The range includes switches from 16 to 3200 Amperes, which can be operated manually, remotely by using a motor or automatically.

ABB's change-over and transfer switches are tested according to IEC 60947-6-1 and IEC 60947-3 standards. The switches have ratings in AC31 and AC33 utilization categories, up to 415 V. In motorized switches, the motor operators have a wide voltage operation range.

Enclosed switches 16 - 1600 A

The ABB enclosed switches are suitable for power distribution in factories and buildings, as local motor isolators and as main switches. Each incoming supply shall be provided with a hand operated main switch-disconnector according to the Machine Directive EN 60204 and isolate reliably the electrical equipment from the supply.

ABB enclosed switches are designed and tested to meet these requirements and complies with IEC 60 947-3.

The enclosed switches are easy to install and safe to use in industrial, public and residential environments. The indication of the handle is always reliable and lockable in the OFF-position with a standard padlock. ABB's long experience in switch disconnects guarantees a long and safe use.

Auto Transfer Switches 40 - 3000 A

Technologies for external environment-complete range 40-4000 A. ABB offers a wide selection of automatic transfer switches (ATS). They have the features and functionality that make them suitable for diverse applications.



HRC Fuse links - DIN & BS

Features

- Total safety for your cables and motors
- Wide and dense current ratings for optimal dimensioning of other circuit components.
- · Low let through energy
- Energy saving through low power losses.
- High breaking capacity
- · Superior current limiting capability
- Emission free operation
- Reliable protection and safe operation

Standards

• IEC 60269

Technical Data

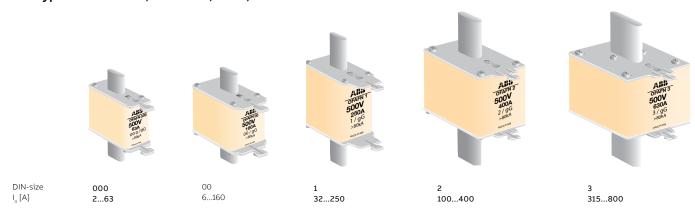
The fuse links are tested to the following short circuit ratings:

	IEC Fuse	
	0003	4
Breaking capacity, AC (DIN) 500 V	80 kA/	1201.4
3 - 1 - 3 - 1	120 kA	120 kA
690 V	80 kA	160 kA
	F1C3	
Breaking capacity, AC (BS) 415 V	80 kA	

Applications

- General Installation
- Industrial Applications

DIN-Type HRC fuse links, 2A...800 A, 500 V, 80 kA



BS-Type HRC fuse links, 2A...800 A, 415 V, 80 kA



Switch fuses OESA32...160

Technical data according to IEC 60947-3		Switch size	
Rated insulation voltage and rated operational voltage AC-20 and DC-20	Pollution degree 3		
Dielectric strength Rated impulse withstand voltage		50 Hz 1 min	
Rated thermal current in ambient 35°C and temporarily in 40°C / max. fuse power dissipation	in open air		
with minimum cable cross section	in enclosure	Cu	
Derating at 60°C	in open air in enclosure		
Rated operational current AC-21A		≤500V 690V	
Rated operational current AC-22A		≤500V 690V	
Rated operational current AC-23A		≤500V 690V	
Rated operational current / pole in series DC-21A, DC-22A and DC - 23A		≤220V 440V	
		230V 400V	
Rated operational power AC-23 ¹⁾		415V 500V 690V	
Rated breaking capacity AC - 23A		≤500V	
Rated conditional short circuit current Ip (r.m.s) and corresponding max allowed cut-off current Ic		80 kA, 415V	
The cut-off current Ic refers to values listed by fuse manufacturers (single phase test acc.to IEC60269)		100kA, 500V	
		50 kA, 415V	
Rated short-time withstand current, 1s	r.m.s - value		
Rated capacitor power when no initial	The capacitor ratings of the switch fuses are limited by the	400V 415V	
charge of the capacitor	fuse links	690V	
Power loss/pole	with rated current, without fuse		
Mechanical endurance	Divided by two for operation cycles		
Fuse types, IEC 60269-2	Sec I, DIN 43620		
	Sec II, BS 88		
Weight without accessories	3/4 pole switch fuses		
Terminal bolt size (included)	Metric thread diameter x length		
Terminal tightening torque	Counter torque reqd.		
Fuse-links bolts tightening torque Operating torque	Typical for 3-pole switch fuses		

 $^{^{9}}$ Some fuselinks limit these figures further, starting current characteristics must be considered separately

²⁾ Utilization category B

 ³ Ambient temperature 60 °C: derating 20%. Mounting on "ceiling": derating 10%. Mounting on wall, horizontal fuses: derating 8%.
 4) Utilization category B
 5) Some fuse links limit these figures further. Starting current characteristics must be considered separately.
 6) OESA Mini, use 4-pole switches with 2 + 2 parallel contacts in series.
 7) Maximum fuse body diameter < 55 mm



А	OESA_32	OESA_63	OESA_100	OESA_125	OESA_160
	V	750	750	750	750
kV	8	8	8	8	8
kV	12	12	12	12	12
A/W	32/3.3	63/5.8	100/7.4	125/10.6	160/10.7
A/W mm2	32/3.3 6	63/5.8 16	100/7.4 50	125/10.6 50	160/10.7 50
%	20/20	20/20	20/20	20/20	20/20
A	32	63	100	125	160
A	-	63 ²⁾	1002)	125²)	1602)
A A	32 -	63 63 ²⁾	100 100 ²⁾	125 1252	160 135 ²⁾
A A	32	63 40 ²⁾	100 50 ²⁾	100 50 ²⁾	100 50 ²⁾
А	32/3	63/3	100/3	125/3	160/3
A kW	32 [/] /4 7.5	63/4	100/4	125/́4²) 30	160/4 ²⁾
kW	11	30	55	55	55
kW kW	15 15	30 30	55 70	55 70	55 70
kW kW	-	30	45	45	45
А	256	504	800	800	2000
kA	10	12	23	23	23
kA	6	9	17	17	17
kA	6	8	14	14	14
kVAr kVAr	15 16	30 32	50 55	50 55	57 62
kVAr	-	50	90	90	100
W	0.7	4	5	5	9
Oper	20,000	20,000	20,000	20,000	20,000
	00/000	00/000	00	00	00
	A2	А3	A4	A4	B2
kg	1.6/1.9	1.6/1.9	1.8/2.3	1.8/2.3	1.8/2.3
	·		-	·	M8x25
mm			M8x25	M8x25	
Nm	5	5	1522	1522	1522
Nm	2.5	2.5	10	10	10
Nm Nm	3.5 3	3.5 3	10 5	10 5	5

Switch fuses OS/OSM200...1250

Technical data according to IEC 60947-	3	Switch size	Α	OS_ 200_
Rated insulation voltage and rated operational voltage AC-20 and DC-20	Pollution degree 3		V	1000
Dielectric strength Rated impulse withstand voltage		50 Hz 1min.	kV kV	10 12
Rated thermal current in				
ambient 35 °C and temporarily in 40 °C /	In open air		A/W	200/17
max. fuse power dissipation	In enclosure		A/W	200/15
with minimum cable cross section		Cu	mm²	95
Rated thermal current of detachable neutral	In open air / Cu cable or bar cross section	In "N3" types	A/mm²	290/120
Derating, mounting on	In open air or ventilated enclosure		%	0
wall horizontal fuses	Totally enclosed		%	5
Derating, mounting on ceiling	•		%	10
Derating at 60 °C	In open air / in enclosure		%	20/20
Rated operational current AC-21A	, , , , , , , , , , , , , , , , , , , ,	≤ 500 V	А	200
		690 V	Α	200
Rated operational current AC-22A		≤ 415 V	A	200
nated operational current rice 227		500 V	A	200
		690 V	A	200
Rated operational current AC-23A		≤ 415 V	A	200
nated operational current AC 25A		500 V	A	200
		690 V	A	200
Rated operational current /		≤ 220 V	A	200/1
poles in series DC-21A, DC-22A and DC-23A		≤ 220 V 440 V	A	200/1
poles III series DC-21A, DC-22A and DC-25A		660 V	A	· ·
				200/3
		750 V	A	180/4
D-t1		880 V	A	180/4
Rated operational power AC-231)		230 V	kW	60
	_	400 V	kW	110
		415 V	kW	110
		500 V	kW	132
		690 V	kW	200
Rated breaking capacity AC-23		≤ 690 V	A	1600
Rated conditional short-	at prospective SC-current	80 kA, 415 V	kA	35
circuit current lp (r.m.s.)	Max. OFA_ fuse size gG/aM		Α	250/200
and corresponding max.	at prospective SC-current	100 kA, 500 V	kA	37.5
allowed cut-off current îc	Max. OFA_ fuse size gG/aM		Α	250/200
	at prospective SC-current	80 kA, 690 V	kA	25
	Max. OFA_ fuse size gG/aM		Α	160/
The cut-off current îc refers	at prospective SC-current	50 kA, 415 V	kA	28
to values listed by fuse	Max. BS fuse size gG/gM		Α	200/200M315
manufacturers (single phase	at prospective SC-current	80 kA, 690 V	kA	28
test acc. to IEC60269)	Max. BS fuse size gG/gM		A	200/200M250
Rated short-time withstand	r.m.svalue		kA	8
current, 1s.	Max. distance from switch frame	mm	150	150
·	to nearest busbar/cable support			
Rated capacitor power	The capacitor ratings of the switch-fuses	400 V	kVAr	90
when no initial charge of the capacitor	are limited by the fuse links	415 V	kVAr	100
		500 V	kVAr	120
		690 V	kVAr	160
Power loss / pole	With rated current, without fuse		W	8
Mechanical endurance	Divide by two for operation cycles		Oper.	20 000
Fuse types, IEC 60269-2	Sec. I, DIN 43620			0
	Sec. IA, NFC 0-3 Ref.A, 4a Ref.B			1
	Sec. II, BS 88			B1-B2
	Size / distance of fuse-link bolts		mm	M6/111
Weight without accessories	3-pole switch fuses		kg	2.6
Terminal bolt size (included)	Metric thread diameter x length		mm	M8X25
Terminal tightening torque	Counter torque required		Nm	15-22
Fuse-links bolts tightening torque			Nm	4
Operating torque	Typical for 3-pole switch fuses		Nm	7
¹⁾ Some fuselinks limit these figures further, starting cu	r- ⁴⁾ Utilization category E	3		

Some fuselinks limit these figures further, starting current characteristics must be considered separately
 Utilization category B
 Ambient temperature 60 °C: derating 20%. Mounting on "ceiling": derating 10%. Mounting on wall, horizontal fuses: derating 8%.

⁴⁾ Utilization category B
5) Some fuse links limit these figures further. Starting current characteristics must be considered separately.
6) OESA Mini, use 4-pole switches with 2 + 2 parallel contacts in series.
7) Maximum fuse body diameter < 55 mm



OS_ 1250_	OS_ 800_	OS_ 630_	OS_ 400_	OS_ 315_	OS_ 250_
1000	1000	1000	1000	1000	1000
10	10	10	10	10	10
12	12	12	12	12	12
1250/110	800/65	630/60	400/45	315/32	250/23
1000/85	720/55	570/50	400/30	315/32	250/20
2 x 400	2 x 240	2 x 158	240	185	120
1250/2 x 400	900/2 X 240	900/2 X 240	450/250	450/240	290/120
4	4	0	4	0	0
8	8	5	8	5	5
10	10	10	10	10	10
20/20	20/20	20/20	20/20	20/20	20/20
1250 ⁴⁾	800	630	400	315	250
12504)	800	630	400	315	250
1250	800	630	400	315	250
1250 ⁴⁾	800	630	400	315	250
12504)	800	630	400	315	250
1000	800	630	400	315	250
10004)	800	630	400	315	250
10004)	800	630	400	315	250
	800/14)	630/14)	400/2	315/2	250/1
	800/24)	630/24)	400/34)	315/34)	250/2
	720/34)	630/34)	400/44)	315/44)	250/3
	720/44)	630/44)	400/44)	315/44)	230/4
	720/44)	630/44)			230/4
315	250	200	132	100	75
560	450	355	220	160	140
560	450	355	230	180	145
710	560	450	280	220	170 250
1000	710	630	400	315	
8000	6400	6400	3200	3200	2000 40.5
89 1250/1250	77 800/880	77 800/880	59 500/500		355/315
105	83	83	63.5		37.5
1250/-	800/880	800/880	500/500		250/250
88	55	55	46		32.5
1000/1000	500/630	500/630	315/400		200/250
90	67	67	44	44	28
30	01	01	400/400M500	400/400M500	250/200M315
109	55	55	48	48	28
1250/-			400/400M450	400/400M450	250/200M250
40	18	18	14	14	8
	150	150	150	150	150
440	310	250	180	145	105
460	340	270	200	160	115
550	375	300	215	175	135
750	550	450	325	250	190
75	75	46	30	19	13
600	10 000	10 000	16 000	16 000	20 000
4.4 a	3 4 a	3	0-2 3	2	0-1
D1	C1-C3	C1-C2	B1-B4 ³⁾	B1-B4 ³⁾	B1-B3 ²⁾
2xM12/149	M 10/133, 184	M 10/133, 184	M8/111	M8/111	M8/111
29	11.5	11.5	5.7	5.7	3.1
M 12x40	M 12x40	M 12x40	M10x30	M10x30	M10x30
50-75	50-75	50-75	30-44	30-44	30-44
M12:40	M10:30 M12:40	M10:30 M12:40	20	20	5
65	38	38	19	19	7
Side operated	이 이 이 이	o o Between	At the end of		

Placing options of the operating mechanism



At the end of the switch fuse OS_03 or 04



Between the poles OS_12 or 22



Side operated types OS_30 or 40 OS_03 or 04

Switch-disconnectors OT16...OT160G



Technical data according to IEC 60947-3			Size	[A] /Switch type
				16 / OT16F
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V	750
Dielectric strength		50 Hz 1min.	kV	6
Rated impulse withstand voltage			kV	8
Rated thermal current and rated operational current AC20/DC20	Ambient 40°C ²⁾	In open air	Α	25
	Ambient 40°C ²⁾	In enclosure	Α	25
	Ambient 60°C	In enclosure	A	20
with minimum conductor cross section		Cu	mm2	4
Rated operational current, AC-21A		up to 415 V	A	16
Rated operational current, AC-22A		440690 V	A	16
Rated operational current, AC-22A		up to 415 V 440500 V	A	16
		690 V	A	16
Rated operational current, AC-23A		up to 415 V	A	16
nated operational current, he 25h		440 V	A	16
		500 V	A	16
		690 V	Α	10
Rated operational current / poles in series, DC-21A		2448 V ¹⁾	Α	16/1
		110 V	Α	16/2
		220 V	A	16/3
		440 V	Α	16/4
		500 V	A	16/4
D. I		750 V	A	16/8
Rated operational current / poles in series, DC-22A		2448 V ¹⁾	A	16/1
		110 V	A	16/2
		220 V 440 V	A	16/3 10/4
		750 V	A	16/8
Rated operational current / poles in series, DC-23A		2448 V ¹⁾	Ä	16/1
Rated operational current / poles in series, be 25A		110 V	A	16/2
		220 V	A	16/4
		440 V	Α	10/4
		750 V	Α	16/8
Rated operational power, AC-23A (These values are given for		220240 V	kW	3
guidance and may vary acc. to the motor manufacturer)		400415 V	kW	7.5
		440 V	kW	7.5
		500 V	kW	7.5
Data di buandina anno situ AC 22A		690 V	kW	7.5
Rated breaking capacity, AC-23A		up to 415 V 440 V	A	128 128
		500 V	A	128
		690 V	Ä	80
Rated breaking capacity/poles in series, DC-23A		2448 V	A	64/1
		220 V	A	64/3
		110 V	Α	64/2
		440 V	Α	40/4
		750 V	Α	64/8
Rated conditional short-circuit current Ip (r.m.s.) and	Ip (r.m.s.)	50 kA	kA	6.5
corresponding				
max. allowed cut-off current îc . The cut-off current îc refers to values	Max. OFA_fuse size gG/aM	≤ 415 V	Α	40/32
listed by fuse manufacturers (single phase test acc. to	lp(r.m.s.)	100 kA	kA	
IEC60269)	Max. OFA fuse size qG/aM	≤ 500 V	Δ	
	Ip (r.m.s.)	≤ 500 V	A kA	
	Max. OFA fuse size gG/aM	≤ 690 V	A	
	lp(r.m.s.)	50 kA	kA	4
	Max. OFA fuse size gG/aM	≤ 690 V	A	25/16
Rated short-time withstand current	r.m.svalue Icw	690 V, 0.25 s	kA	
	r.m.svalue Icw	690 V, 1 s	kA	0.5
Rated short circuit making capacity	Peak value Icm	690 V/500 V	kA	0.705
Rated capacitor power (The capacitor ratings are limited by the fuse link.)		400415 V	kVAr	6.5
Power loss / pole	At rated operational current		W	0.3
Mechanical endurance	Divide by two for operation		Oper.	20 000
	cycles			
Weight without accessories	3-pole		kg	0.11
	4-pole		kg	0.15
Cable size	Cu-wire size suitable for terminal clamps		mm2	0.7510
	terminal ciamps		AWG	18-8
Tarminal tightoning targus	Counter torque required		Nm	0.8
Terminal tightening torque	Counter torque required			

¹⁾ Below 48 V, two poles in parallel up to OT80 are recommended particularly in polluted atmosphere. 2) Acc. to IEC 60947-1, § 6.1.1.



160 / OT160G	125 / OT125F	100 / OT100F	80 / OT80F	63 / OT63F	40 / OT40F	25 / OT25F
1000	750	750	750	750	750	750
10	6	6	6	6	6	6
12	8	8	8	8	8	8
160	125	115	80	63	40	32
160	125	115	80	63	40	32
	100	80	63	50	32	25
70	50	35	25	16	10	6
160	125	100	80	63	40	25
160 160	125 125	100 100	80 80	63 63	40 40	25 25
100	125	100	80	63	40	25
	125	100	80	63	40	25
160	90	80	75	63	23	20
160 160	78 70	65 60	<u>65</u> 58	63 45	23 23	20 20
160	50	40	20	20	12	11
100	125/1	100/1	80/1	63/1	32/1	25/1
	125/2	100/2	80/2	63/2	32/2	25/2
	125/4	100/4	80/4	63/4	32/3	25/3
			16/4 16/4	16/4 16/4	16/4 16/4	16/4 16/4
			10/4	10/4	32/8	25/8
	125/1	100/1	80/1	63/1	32/1	25/1
	125/2	100/2	80/2	63/2	32/2	25/2
	80/4	63/4	45/4 10/4	45/4 10/4	32/4 10/4	25/3 10/4
			10/4	10/4	25/8	25/8
	125/1	100/1	80/1	63/1	32/1	25/1
	125/2	100/2	80/2	63/2	32/2	25/2
	63/4	63/4	45/4 10/4	45/4 10/4	32/4 10/4	25/4 10/4
			10/4	10/4	16/8	16/8
45	22	22	22	11	5.5	4
75	45	37	37	22	11	9
90	45	37	37	22	11	9
132	45 45	37 37	37 18.5	22 15	11 11	9
1280	720	640	640	360	184	160
1280	624	520	448	360	184	160
1280	560	480	464	360	184	160
1280	40 500/1	320 400/1	160 252/1	160 180/1	96 128/1	88 100/1
	252/4	252/4	180/4	180/4	128/4	100/1
	500/2	400/2	252/2	180/2	128/2	100/2
			40/4	40/4	40/4	40/4
20	16.5	16.5	13	13	64/8 6.5	64/8 6.5
200/200	125/125	125/125	100/80	100/80	40/32	40/32
			17	17	, 32	
			100/80	100/80		
	8.2	8.2	100/00	100/00		
	125/100	125/100				
24	10	10	11	11	<u>4</u>	4
200/200	63/63	63/63	80/63	80/63	25/16	25/16
7	2.5	2.5	1.5	1	0.5	0.5
12	3.6	3.6	2.1	1.4	0.705	0.705
65	50	40	30	25	15	10
6.5	6.3	4.0	4.5	2.8	1.6	0.6
20 000	20 000	20 000	20 000	20 000	20 000	20 000
1.1	0.36	0.36	0.27	0.27	0.11	0.11
1.3	0.50	0.50	0.35	0.35	0.15	0.15
1070	1070	1070	1.535	1.535	0.7510	0.7510
8-1/0	8-00	8-00	14-4	14-4	18-8	18-8
					0.0	0.0
6-170	6 2	<u>6</u> 2	2 1.2	1.2	0.8	0.8

Switch-disconnectors OT160...800



Technical data according to IEC 60947-3							-		9	witch type
				OT160EV	OT200E	OT250E	OT315E	OT400E	OT630E	ОТ800Е
Rated insulation voltage and rated operational voltage AC-20, DC-20	Pollution degree 3		٧	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	12	12
Rated thermal current and rated operational current AC-20, DC-20	In open air		Α	200	200	250	315	400	630	800
in ambient 40 °C ⁴⁾	In enclosure		Α	160	200	250	315	400	630	800
with minimum cable cross section		Cu	mm ²	70	95	120	185	240	2x185	2x240
Rated operational current, AC-21A		≤ 500 V	A	200	200	250	315	400	630	800
		690 V	A	160	200	250	315	400	630	800
Pated apprational current AC 22A		1000 V ≤ 500 V	A	160 200	200	250 250	315 315	400	630 630	800
Rated operational current, AC-22A		<u>≤ 500 V</u>	A	160	200	250	315	400	630	800
		1000 V	A	160	200	250	315	400	630	800
Rated operational current, AC-23A		≤ 500 V	A	160	200	250	315	400	630	800
· · ·		690 V	Α	160	200	250	315	400	630	800
		1000 V	Α	135	135	135	200	200	400	400
Rated operational current /		24110 V	Α	160/2	200/2	250/2	315/12)	400/12)	630/1	800/1
poles in series, DC-21A ¹⁾		220 V	Α	160/2	200/2	250/2	315/22)	400/2²)	630/1	800/1
		440 V	Α	160/3	200/3	250/3	315/3	360/3	630/2	800/2
		660 V	Α	160/4	200/4	230/42)	315/4	360/4	630/42)	650/4 ²
Rated operational current /		800 V	A	160/5	200/5	250/5	315/5	400/5	600/5	600/5
poles in series, DC-21B		1000 V	Α	160/6	200/6	250/6	315/6	400/6	600/6	600/6
Rated operational power, AC-23 ³⁾		230 V	kW	48	60	75	100	132	200	250
		400 V	kW	80	110	140	160	220	355	450
		415 V	kW	88	110	145	180	230	355	450
		500 V 690 V	kW kW	112	132 200	170 250	220 315	280 400	400 630	560 800
Rated breaking capacity		≤ 500 V	A	1 280	1 600	2 000	2 520	3 200	5 040	6 400
in category AC-23		690 V	A	1 280	1 600	2 000	2 520	3 200	5 040	6 400
category ite 25	Icc (r.m.s.)	100 kA, 500 V	kA	40.5	40.5	40.5	61.5	61.5	90	90
	Max. OFA	· .								
Rated conditional short-circuit current Icc (r.m.s.) and corresponding max. allowed	fuse size	gG/aM	А	315/315	315/315	315/315	500/450	500/450	800/1 000	800/1 000
cut-off current îc. The cut-off current îc. refers to values listed by fuse	Icc (r.m.s.)	80 kA, 690 V	kA	40.5	40.5	40.5	59	59	83.5	83.5
manufacturers (single phase test acc. to IEC60269)	Max. OFA_ fuse size	gG/aM	Α	355/315	355/315	355/315	500/500	500/500	800/1 000	800/1 000
Rated short-time withstand current	r.m.s. value Icw	≤ 1000 V 0,15 s	kA	15	15	15	31	31	38	38
		≤ 1000 V 0,25 s	kA	15	15	15	24	24	36	36
		≤ 1000 V 1 s	kA	8	8	8	15	15	20	20
Rated short-circuit making capacity	Peak value Icm	≤ 1000 V	kA	30	30	30	65	65	80	80
Rated capacitor power when	The capacitor	415 V	kVAr	80	100	115	145	180	250	310
no initial charge on the capacitor	ratings are	500 V	kVAr	96	120	135	175	215	300	375
	limited by the fuse links	690 V	kVAr	128	160	190	250	325	450	550
Power loss / pole	With rated current		W	3.2	4	6.5	6.5	10	25	40
Mechanical endurance	Divide by two for oper. cycles		Oper.	20 000	20 000	20 000	16 000	16 000	10 000	10 000
Weight without accessories	3-pole switch		kg	1.2	1.2	1.2	2.2	2.2	5.2	5.2
Terminal bolt size	Metric thread diameter x length		mm	M8x25	M8x25	M8x25	M10x30	M10x30	M12x40	M12x40
Terminal tightening torque	Counter torque required		Nm	15-22	15-22	15-22	30-44	30-44	50-75	50-75
Operating torque	3-pole switch disconnector		Nm	7	7	7	16	16	27	27

¹⁾ Further ratings on request.

²⁾ Category B.

³⁾ These values are given for guidance and may vary acc. to the motor manufacturer. 4) Acc. to IEC 60947-1, § 6.1.1.

Switch-disconnectors OT1000...4000



Technical data according to IEC 60947-3									S	witch type
				OT1000E	OT1250E	OT1600E	OT2000E	OT2500E	OT3200E	OT4000I
Rated insulation voltage and	Dallytian dagge 2		.,	1.000	1.000	1.000	1.000	1.000	1 000	1.000
rated operational voltage AC20/DC20	Pollution degree 3		V	1 000	1 000	1 000	1000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	8	8
										3 800,
Rated thermal current and	Ambient 40°C¹)	In open air	Α	1 000	1 250	1 600	2000	2 500	3 200	40005)
rated operational current AC20/DC20	Ambient 40°C¹)	In enclosure	Α	1000	1 250	1 600				
with minimum conductor cross section	Cu		mm²	2x300	2x400	2x500	3x500	4x500	4x1 000	5x1 000
Rated operational current, AC-21A		up to 690 V	Α	1000	1 250	1 600	2 0002)	2 500 ²⁾	3 200 ²⁾	3 800
,		1000 V	Α	1000	1 250	1 600				
							2)			3 800 ²⁾ ,
Rated operational current, AC-22A		up to 415 V	Α	1 000	1 250	1 600	2 000 ²⁾	2 500 ²⁾	3 2002)	40002)5)
		500 - 690 V	Α	1000	1 250	1 600	2 0002)3)	2 5002)3)		
Rated operational current, AC-23A		up to 500 V	Α	1000	1 250	1 250				
		690 V	Α	1000	1 250	1 250				
		400415 V	kW	560	710	710				
Rated operational power, AC-23A		440 V	kW	630	800	800				
(These values are given for guidance and		500 V	kW	710	900	900				
may vary acc. to the motor manufacturer)		690 V	kW	1000	1 200	1 200				
Rated breaking capacity, AC-23A		up to 500 V	Α	10 000	10 000	10 000				
		690 V	Α	10 000	10 000	10 000				
Rated conditional short-circuit current I	I (r.m.s.)	80 kA	kA	100	100	100				
(r.m.s.) and corresponding max. allowed	Max. OFA_fuse size			1 250/	1 250/	1 250/	1 250/			
cut-off current î. The cut-off current î.	gG/aM	≤ 415 V	Α	1 250	1 250	1 250	1 250			
refers to values listed by fuse	I (r.m.s.)	100 kA	kA	106	106	106				
manufacturers (single phase test acc.	Max. OFA_fuse size			1 250/	1 250/	1 250/	1 250/			
to IEC60269).	gG/aM	≤ 500 V	Α	1 250	1 250	1 250	1 250			
Rated short-time withstand current	r.m.svalue I	690 V, 0.25 s	kA	50	50	50	80	80	80	80, 1005)
	CW	690 V, 1 s	kA	50	50	50	55	55	80	80
	Peak value I _{cm}	690 V	kA	1104)	1104)	1104)	176	176	176	176, 220 ⁵⁾
	Max. distance from									
Rated short circuit making capacity	switch frame to			150	150	150	150	150	150	150
	nearest busbar/		mm	150	150	150	150	150	150	150
	cable support									
Rated capacitor power when	The capacitor	415 V	kVAr	460	575	575				
no initial charge on the capacitor	_ ratings are limited	500 V	kVAr	550	690	690				
	by the fuse links	690 V	kVAr	750	950	950				
D	At rated operational			10	20	40		0.5	0.5	120
Power loss/pole	current		W	19	29	48	55	85	95	130
	Dividel a la company form									
Mechanical endurance	Divide by two for		Oper.	6 000	6 000	6000	6000	6000	5000	5 000
	operation cycles									
Weight without accessories	3-pole		kg	14.1	14.1	15.2	22	22	24.7	28.9
	4-pole		kg	18	18	19.5	28	28	32.1	37.7
Terminal bolt size	Metric thread		mm	M12x50	M12x50	M12x60	M12x60	M12x60	M12x60	M12x60
	diameter x length									
	Counter torque									
Terminal tightening torque	required		Nm	5075	5075	5075	5075	5075	5075	5075
Operating torque	3-pole switch-		Nm	65	65	65	65	65	65	65
	disconnector									

¹⁾ Acc. to IEC60947-1, § 6.1.1.

²⁾ IEC 947-3, utilization category B, infrequent operation.
³⁾ Phase barriers or terminal shrouds must be used on both sides of the switch at voltages ≥ 500 V.

 $^{^{\}mbox{\tiny 4)}}$ The value is 92 kA for 4-pole switch-disconnectors.

⁵⁾ OT4000E_W8

Motorized switch-disconnectors, IEC



								Switch type
Technical data according to IEC 60947-				OTM40F	OTM63F		OTM100F	OTM125
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V	750	750	750	750	750
Dielectric strength		50 Hz 1min.	kV	6	6	6	6	(
Rated impulse withstand voltage			kV	8	8	8	8	
Rated thermal current and rated	Ambient 40°C²)	In open air	A	40	63	80	115	125
operational current AC20/DC20	Ambient 40°C²)	In enclosure	A	40	63	80	115	125
with minimum conductor cross section	Ambient 60°C	In enclosure Cu	A mm²	32 10	50 16	63 25	80 35	100 50
Rated operational current, AC-21A	1	up to 415 V	A	40	63	80	100	12
Rated operational current, Ac LIA		440690 V	A	40	63	80	100	125
Rated operational current, AC-22A		up to 415 V	A	40	63	80	100	125
		440500 V	Α	40	63	80	100	125
		690 V	Α	40	63	80	100	125
Rated operational current, AC-23A		up to 415 V	Α	23	63	75	80	90
		440 V	A	23	63	65	65	78
		500 V	A		45	58	60	70
Dated an austional accurant /		690 V 2448 V ¹⁾	A	12	20	20	40 100/1	50
Rated operational current / poles in series, DC-21A		2448 V ² /	A		63/1 63/2	80/1 80/2	100/1	125/2 125/2
poies in series, be ZIA		220 V	A		63/4	80/2	100/2	125/4
		440 V	A		16/4	16/4	100/4	143/4
		500 V	A		16/4	16/4		
		750 V	A		10/4	10/4		
Rated operational current /		2448 V ¹⁾	A		63/1	80/1	100/1	125/1
poles in series, DC-22A		110 V	A		63/2	80/2	100/2	125/2
, , , , ,		220 V	A		45/4	45/4	63/4	80/4
		440 V	A	10/4	10/4	10/4		
		750 V	Α	25/8	-,	-,		
Rated operational current /		2448 V ¹⁾	Α	32/1	63/1	80/1	100/1	125/1
poles in series, DC-23A		110 V	Α		63/2	80/2	100/2	125/2
		220 V	Α	32/4	45/4	45/4	63/4	63/4
		440 V	Α	10/4	10/4	10/4		,
		750 V	Α	16/8	,			
Rated operational power, AC-23A		220240 V	kW	5.5	11	22	22	22
(These values are given for guidance		400415 V	kW	11	22	37	37	45
and may vary acc. to the motor		440 V	kW	11	22	37	37	45
manufacturer)		500 V	kW	11	22	37	37	45
		690 V	kW	11	15	18.5	37	45
Rated breaking capacity, AC-23A		up to 415 V	Α	184	360	640	640	720
		440 V	Α	184	360	448	520	624
		500 V	Α	184	360	464	480	560
		690 V	Α		160	160	320	40
Rated breaking capacity/		2448 V	A		180/1	252/1	400/1	500/1
poles in series, DC-23A		220 V	A		180/4	180/4	252/4	252/4
		110 V	A		180/2	252/2	400/2	500/2
		440 V	A	40/4	40/4	40/4		
B		750 V	A	64/8	- 10		105	
Rated conditional short-circuit current I _{sc} (r.m.s.) and corresponding	I _{cc} (r.m.s.)	50 kA	kA_		13	13	16.5	16.5
max. allowed cut-off current î.	Max. OFA_ fuse size gG/aM	≤ 415 V	A	40/32	100/80	100/80	125/125	125/125
The cut-off current î, refers to values	I _{cc} (r.m.s.) Max. OFA fuse size gG/aM	100 kA	kA_		17	17		
listed by fuse manufacturers	I_ (r.m.s.)	≤ 500 V 10 kA	A kA		100/80	100/80	8.2	8.2
(single phase test acc. to IEC60269)	Max. OFA fuse size gG/aM	≤ 690 V	A				125/100	125/100
	I_ (r.m.s.)	50 kA	kA	4	11	11	10	123/100
	Max. OFA_ fuse size gG/aM	≤ 690 V	A	25/16	80/63	80/63	63/63	63/63
Rated short-time withstand current	r.m.svalue I	690 V, 0.25 s	kA	23/10	00/03	00/03	03/03	03/03
Nated Short time WithStand Carrent	r.m.svalue I	690 V, 1 s	kA	0.5	1	1.5	2.5	2.5
Rated short circuit making capacity	Peak value I	690 V/500 V	kA	0.71	1.4	2.1	3.6	3.6
	cm	400415 V	kVAr	15	25	30	40	50
Rated capacitor power (The capacitor ratings are limited by the fuse link.)			W	1.6	2.8	4.5	4.0	6.3
	At rated operational current							
ratings are limited by the fuse link.)	•		Oper.	20 000	20 000	20 000	20 000	
ratings are limited by the fuse link.) Power loss / pole	current Divide by two for operation cycles 3-pole		kg	0.11	0.27	0.27	0.36	0.36
ratings are limited by the fuse link.) Power loss / pole Mechanical endurance Weight without accessories	current Divide by two for operation cycles 3-pole 4-pole		kg kg	0.11 0.15	0.27 0.35	0.27 0.35	0.36 0.50	0.36
ratings are limited by the fuse link.) Power loss / pole Mechanical endurance	current Divide by two for operation cycles 3-pole 4-pole Cu-wire size suitable		kg kg mm²	0.11 0.15 0.7510	0.27 0.35 1.535	0.27 0.35 1.535	0.36 0.50 1070	0.36 0.50 1070
ratings are limited by the fuse link.) Power loss / pole Mechanical endurance Weight without accessories	current Divide by two for operation cycles 3-pole 4-pole		kg kg	0.11 0.15	0.27 0.35	0.27 0.35	0.36 0.50	0.36 0.50 1070 8-00

 $^{^{1)}}$ Below 48 V, two poles in parallel up to OTM80 are recommended particularly in polluted atmosphere. $^{2)}$ Acc. to IEC 60947-1, \S 6.1.1.

Motorized switch-disconnectors, IEC



										witch type
Technical data according to IEC 609	947-3			OTM160EV	OTM200E	OTM250E	OTM315E	OTM400E	OTM630E	OTM800E
Rated insulation voltage and rated operational voltage AC-20, DC-20	Pollution degree 3		V	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage		<u>-</u>	kV	12	12	12	12	12	12	12
Rated thermal current and rated operational current AC-20, DC-20	In open air		Α	200	200	250	315	400	630	800
in ambient 40 °C ⁴⁾	In enclosure		Α	160	200	250	315	400	630	800
with minimum cable cross section		Cu	mm²	70	95	120	185	240	2x185	2x240
Rated operational current, AC-21A		≤ 500 V	Α	200	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
		1000 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-22A		≤ 500 V	Α	200	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
		1000 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-23A		≤ 500 V	Α	160	200	250	315	400	630	800
		690 V	A	160	200	250	315	400	630	800
		1000 V	A	135	135	135	200	200	400	400
Rated operational current /		24110 V	A	160/2	200/2	250/2	315/12)	400/12)	630/1	800/1
poles in series, DC-21A ¹⁾		220 V	A	160/2	200/2	250/2	315/22)	400/22)	630/1	800/1
		440 V	A	160/3	200/3	250/3	315/3	360/3	630/2	800/2
Dated an austional assument /		660 V	A	160/4	200/4	230/42)	315/4	360/4	630/42)	650/4²
Rated operational current / poles in series, DC-21B		800 V	A	160/5	200/5	250/5	315/5 315/6	400/5 400/6	600/5	600/5
Rated operational power, AC-23		1000 V 230 V	kW	160/6 48	200/6	250/6 75	100	132	600/6 200	600/6 250
Rated operational power, AC-23		400 V	kW	80	110	140	160	220	355	450
(These values are given for		415 V	kW	88	110	145	180	230	355	450
quidance		500 V	kW	112	132	170	220	280	400	560
and may vary acc. to the motor		690 V	kW	144	200	250	315	400	630	800
manufacturer)										
Rated breaking capacity		≤ 500 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
in category AC-23		690 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
Rated conditional short-circuit current I _{cc}	I _{cc} (r.m.s.)	100 kA, 500 V	kA	40.5	40.5	40.5	61.5	61.5	90	90
(r.m.s.) and corresponding max. allowed	Max. OFA_fuse size	gG/aM	Α	315/315	315/315	315/315	500/450	500/450	800/1 000	800/1 000
cut-off current $\hat{\imath}_c$. The cut-off current $\hat{\imath}_c$.	I _{cc} (r.m.s.)	80 kA, 690 V	kA	40.5	40.5	40.5	59	59	83.5	83.5
refers to values listed by fuse	Max. OFA_ fuse	gG/aM	Α	355/315	355/315	355/315	500/500	500/500	800/1	800/1
manufacturers (single phase test acc. to IEC60269)	size	J .		•	·	•	•	•	000	000
Rated short-time withstand current	r.m.s. value I _{cw}	≤ 1000 V 0,15 s	kA	15	15	15	31	31	38	38
		≤ 1000 V 0,25 s	kA	15	15	15	24	24	36	36
		≤ 1000 V 1 s		8	8	8	15	15	20	20
Rated short-circuit making capacity	Peak value I	≤ 1000 V		30	30	30	65	65	80	80
Rated capacitor power when	The capacitor	415 V		80	100	115	145	180	250	310
no initial charge on the capacitor	ratings are	500 V		96	120	135	175	215	300	375
	limited by the fuse links	690 V	kVAr	128	160	190	250	325	450	550
Power loss / pole	With rated current		W	3.2	4	6.5	6.5	10	25	40
Mechanical endurance	Divide by two for oper. cycles		Oper.	20 000	20 000	20 000	16 000	16 000	10 000	10 000
Weight without accessories	3-pole switch		kg	1.2	1.2	1.2	2.2	2.2	5.2	5.2
Terminal bolt size	Metric thread diameter x length		mm	M8x25	M8x25	M8x25	M10x30	M10x30	M12x40	M12x40
Terminal tightening torque	Counter torque required		Nm	15-22	15-22	15-22	30-44	30-44	50-75	50-75
Operating torque	3-pole switch disconnector		Nm	7	7	7	16	16	27	27

¹⁾ Further ratings on request. ²⁾ Category B.

Motorized switch-disconnectors, IEC



										Switch type
Technical data according to IEC 60947-3				OTM1000E	OTM1250E	OTM1600E	OTM2000E	OTM2500E	OTM3200E	OTM4000E
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V	1 000	1 000	1 000	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	8	8
Rated thermal current and rated operational current AC20/	Ambient 40°C¹)	In open air	Α	1 000	1 250	1 600	2 000	2 500	3 200	3 800 ²⁾ , 4000 ⁵⁾
DC20	Ambient 40°C1)	In enclosure	Α	1 000	1 250	1 600				
with minimum conductor cross section	Cu		mm²	2x300	2x400					5x1 000
Rated operational current, AC-21A		up to 690 V		1 000	1 250			2 500 ²⁾		
		1000 V		1 000	1 250					
Rated operational current, AC-22A		up to 415 V		1 000	1 250					3 800 ²⁾ , 4000 ⁵⁾
		500 - 690 V	A	1 000	1 250		2 0002) 3)	2 500 ^{2) 3)}		
Rated operational current, AC-23A		up to 500 V		1 000	1 250					
		690 V		1 000	1 250					
Rated operational power, AC-23A		400415 V	kW	560	710					
(These values are given for guidance		440 V	kW	630	800					
and		500 V	kW	710	900	900				
may vary acc. to the motor manufacturer)		690 V		1 000	1 200					
Rated breaking capacity, AC-23A		up to 500 V	Α	10 000	10 000					
		690 V	Α	10 000	10 000	10 000				
Rated conditional short-circuit	I _{cc} (r.m.s.)	80 kA	kA	100	100	100				
current I _{cc}	Max. OFA_	≤ 415 V	Α	1 250/	1 250/	1 250/				
(r.m.s.) and corresponding max. allowed	fuse size gG/aM			1 250	1 250	1 250				
cut-off current î _c . The cut-off current î _c	I _{cc} (r.m.s.)	100 kA	kA	106	106	106				
refers to values listed by fuse manufacturers (single phase test	Max. OFA_	≤ 500 V	Α	1 250/	1 250/	1 250/				
acc. to IEC60269).	fuse size gG/aM			1 250	1 250	1 250				
Rated short-time withstand current	r.m.svalue I _{cw}	690 V, 0.25 s	kA	50	50	50	80	80	60	60
		690 V, 1 s	kA	50	50	50	55	55		
Rated short circuit making capacity	Peak value I _{cm}	690 V	kA	1104)	1104)	1104)	176	176	176	176
	Max. distance from switch frame to nearest busbar/ cable support		mm	150	150	150	150	150	150	150
Rated capacitor power when	The capacitor	415 V	kVAr	460	575	575				
no initial charge on the capacitor	ratings are		kVAr	550	690					
	limited by the fuse links		kVAr	750	950					
Power loss / pole	At rated operational current		W	19	29	48	55	85	95	120
Mechanical endurance	Divide by two for operation cycles		Oper.	6 000	6 000	6 000	6 000	6 000	5 000	5 000
Weight without accessories	3-pole		kg	14.1	14.1	15.2	22	22	32	36
<u> </u>	4-pole		kg	18	18					45
Terminal bolt size	Metric thread diameter x		mm	M12x50	M12x50					M12x60
	length									
Terminal tightening torque	Counter torque required		Nm	5075	5075	5075	5075	5075	5075	5075
Operating torque	3-pole switch- disconnector		Nm	65	65	65	65	65	65	65

 ¹⁾ Acc. to IEC60947-1, § 6.1.1.
 ²⁾ IEC 947-3, utilization category B, infrequent operation.
 ³⁾ Phase barriers or terminal shrouds must be used on both sides of the switch at voltages ≥ 500 V.
 ⁴⁾ The value is 92 kA for 4-pole switch-disconnectors.
 ⁵⁾ OTM4000E_W8_

Motor operators OTM40...4000

Data for motor operator of switch	h-diconnectors,		-					Switch type
OTM according to IEC 60947				OTM40125	OTM160250	OTM315400	ОТМ600800	OTM10004000
Rated operational voltage $\rm U_e$	Pollution degree 3		V AC/ DC	110240				
	50/60 Hz		V AC		220240	220240	220240	220240
Operating voltage range				0.851.1 x U _e	0.851.1 x U			
Operating time ¹⁾	90° I-0,0-I	110240 V AC/DC	ς.	0.51.0				
		24 V DC		0.61.3				
		220-240 VAC			0.51.0	0.51.0	0.51.5	1.02.0
Nominal current In ¹⁾		220-240 VAC			0,3	0,5	0,9	1,4
Current inrush ¹⁾		220-240 VAC	Α		1,5	2,5	4	10
Overload fuse	Type / In / Capacity	220-240 VAC	mA		T/315/H	T/500/H	T/1000/H	T / 2000 / H
	Size		mm		5x20	5x20	5x20	5x20
Operating rate	Max. continuous		cycles / min	1	1	1	1	0,5
	Max. short- time		cycles /	10	10	10	10	5
	≤ 10 cycles							
Overvoltage category				III		III	III	
Rated impulse withstand voltage U _{imp}			kV	4	4	4	4	4
Dielectric strength		50 Hz 1 min.	kV	1,5	1,5	1,5	1,5	1,5
Impulse command		Min. impulse duration		100	100	100	100	100
Terminals		duracion	1115	100	100	100	100	100
Voltage supply wiring for Ue				PE - N - L	PE - N - L			
Cross section		solid/ stranded	mm ^c	1.52.5	1.52.5	1.52.5	1.52.5	1.52.5
Short-circuit		max.MCB/	Δ	16	16	16	16	16
Protection device Control terminal for		fuse size						
the push -buttons				C-I-O	C - I - O	C-I-O	C-I-O	C - I - C
Push-button control					no SELV	no SELV	no SELV	no SELV
Cross section		solid/ stranded	mm²	1.5 - 2.5	1.5 - 2.5	1.52.5	1.52.5	1.52.5
Maximum cable length			m	100	100	100	100	100
Terminal for state information		solid/ stranded	mm-	1,5				
State information of locking					no SELV	no SELV	no SELV	no SELV
Common, voltage supply		11		3A/AC- 1/250V				
Handle attached or		14		3A/AC-				
Handle attached or motor operator locked		11-12-14	COS=1	1/250V	5A/250V	5A/250V	5A/250V	5A/250V
Locking motor operator		(C/O) 23-24 (NO)			5A/250V	5A/250V	5A/250V	
Short-circuit		MCB type				5A/25UV	5A/25UV	
protection device		and size	Δ	C/2A	C/2A	C/2A	C/2A	C/2A
Protection degree (front panel)				IP20	IP20	IP20	IP20	IP20
Operating temperature			°C	-25+55	-25+55	-25+55	-25+55	-25+55
Transportation and			°C	-40+70	-40+70	-40+70	-40+70	-40+70
storage temperature								

¹⁾ Under nominal conditions.

Technical data for OTDC16...1600, IEC





Technical data according to IEC 60947 for switch-disconnectors OTDC16...250

Switch size				OTDC16F	OTDC25F	OTDC32F	OTDC16U	OTDC25U	OTDC32
Rated insulation voltage Ui	Pollution degree 2		V	1250 1)	1250 ¹)	1250 ¹)	1250 1)	1250 ¹)	1250 ¹
	Pollution degree 3		V	1000 1)	1000 1)	1000 ¹)	1000 1)	1000 1)	1000 ¹
Rated impulse withstand voltage		-	kV	8	8	8	8	8	8
Rated thermal current Ith	In open air, no conditions 2)	rmal	А	25	32	45	40	50	63
	In enclosure 40	0°C	Α	25	32	45	32	40	50
	In enclosure 60	0°C	Α	25	32	32	25	32	40
with minimum cable or bar cross section	Cu		mm²	4	6	10	4	6	10
Rated operational	500	One circuit	٧						
current / poles in series	660	One circuit	٧	16/2	25/2	32/2	16/2	25/2	
DC-21B		Two circuits	٧		25/2	32/2	16/2	25/2	32/2
	1000	One circuit	٧	10/2	16/2	20/2	10/2 3)	16/2 ³⁾	
			V	16/3	25/3	32/3			
		Two circuits	٧	10/2	16/2	20/2	10/2 3)	16/2 ³⁾	20/2
		Three circuits	٧				10/2 3)		
	1500	One circuit	٧						
Rated short-time withstand current,	R.M.Svalue	-							
1000 V, 1 s	lcw		kA	0,4	0,6	0,8	1,0	1,0	1,0
Rated conditional short-circuit	Ip (r.m.s.), 1000 V		kA				10	10	10
current lp (r.m.s.)	Max fuse size,	gPV	Α				80	80	80
Power loss / pole	At rated current		W	0,15	0,3	0,5	0,1	0,2	0,35
Terminal cable size	Cu		mm²	2.516	2.516	2.516	2.516	2.516	2.516
Terminal bolt size	Metric thread length	diameter ×	mm						
Terminal tightening torque	Counter torqu	e required	Nm						

 $^{^{1)}}$ When used with external handle. For use with direct mounted handle, see installation instruction.

²⁾ Normal conditions defined in IEC 60947-1-6.1

 $^{^{\}rm 3)}$ U and UT types only. (Not applicable for US nor UST.)

OTDC S2.0-Series IEC



OTDC100...250_G_

Technical data according to IEC 60947 for switch-disconnectors OTDC100G_...250G

Switch size					Α	OTDC100G	OTDC160G	OTDC200G	OTDC250G
Rated insulation volt	age U _i	Pollution degree 2	2		V	1500	1500	1500	1500
Rated impulse withst	and voltage				kV	12	12	12	12
Rated thermal currer	nt I _{th} 1)	In open air, norma	al conditions 2)		Α	100	160	200	250
		In enclosure 40°C			Α	100	160	200	250
		In enclosure 50°C			Α	100	160	200	250
		In enclosure 60°C			Α	100	160	200	219
		In enclosure 70°C			Α	100	146	169	185
		In enclosure 80°C			Α	88	115	133	146
with cable or bar cr	oss section	Cu			mm²	35	70	95	120
Rated operational	DC-21B	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	250
current le 3),			2 circuits	4P (2P+, 2P-)	Α	100	160	200	250
poles in series		1500V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	250
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	250
DC	DC-PV1	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
		1500V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
	DC-PV2	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
		1500V	1 circuit	2P (1P+, 1P-)	Α	100	100	100	100
			2 circuits	4P (2P+, 2P-)	Α	100	100	100	100
Rated short-time with 1500V, 0,1	nstand current,	R.M.Svalue I _{cw}			kA	10	10	10	10
Rated short circuit m	aking capacity,	Peak value I _{cm}			kA	10	10	10	10
Power loss / pole		At rated current			W	1,01,3	3,13,5	5,05,5	7,78,4
Terminal bolt size		Metric thread dia	meter x length		mm	M8x25	M8x25	M8x25	M8x25
Terminal tightening	torque	Counter torque re	quired		Nm	1522	1522	1522	1522
Mechanical Endurance	ce	Cycles			-	10.000			
Operating altitude w	ithout derating				m	≤2000			
Operating torque		2P/4P			Nm	69	69	69	69

¹⁾ For more detailed derating, please consult us. Installation condition may have an influence on the derating by increasing the possible rated current. The given deratings are references based on specific test setup.

²⁾ Normal conditions defined in IEC 60947-1, section 6.1.

³⁾ For DC-22B utilization category ratings, please consult us.

OTDC S2.0-Series for higher short-circuit currents IEC



OTDC100...250_G_

Technical data according t	o IEC 60947 for switch-disconnectors	OTDC100G250G -ESS

Technical data acc	ording to IEC	60947 for s	witch-disco	nnectors OTDC	.00G	250GESS			C100230_G_
Switch size					Α	OTDC100GESS	OTDC160GESS	OTDC200GESS	OTDC250GESS
Rated insulation vo	ltage U _i	Pollution d	egree 2		V	1500	1500	1500	1500
Rated impulse with	stand voltage				kV	12	12	12	12
Rated thermal curre	ent I _{th} 1)	In open air,	normal cond	itions ²⁾	Α	100	160	200	250
		In enclosur	e 40°C		Α	100	160	200	250
		In enclosur	e 50°C		Α	100	160	200	250
		In enclosur	e 60°C		Α	100	160	200	219
		In enclosur	e 70°C		Α	100	146	169	185
		In enclosur	e 80°C		Α	88	115	133	146
with cable or bar	cross section	Cu			mm²	35	70	95	120
Rated operational	DC-21B	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	250
current le 5),			2 circuits	4P (2P+, 2P-)	Α	100	160	200	250
poles in series		1500V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	250
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	250
	DC-PV1	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
		1500V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
_			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
	DC-PV2	1000V	1 circuit	2P (1P+, 1P-)	Α	100	160	200	200
			2 circuits	4P (2P+, 2P-)	Α	100	160	200	200
		1500V	1 circuit	2P (1P+, 1P-)	Α	100	100	100	100
			2 circuits	4P (2P+, 2P-)	Α	100	100	100	100
Rated short-time w current, 1500V, 0,1	ithstand	R.M.Svalu	ie I _{cw}		kA	10	10	10	10
Rated short circuit capacity, 1500V	making	Peak value	I _{cm}		kA	10	10	10	10
Rated conditional s	hort-circuit	R.M.S valu	ue Iq		kA	30	30	30	30
current Iq Required protection	า	Max. ETI fu	se size gPV, L	/R= 1-3 ms	Α	250 ³⁾	250 ³⁾	250 ³⁾	250 ³⁾
Rated conditional s	hort-circuit	R.M.S valu	ue Iq, L/R = 1	.5 ms	kA	40	40	40	40
current Iq 4)		Allowed let	through pea	k	kA	15	15	15	15
		Allowed let	through ene	rgy I²t	kA²s	300	300	300	300
Power loss/pole		At rated cu	rrent		W	1,01,3	3,13,5	5,05,5	7,78,4
Terminal bolt size		Metric thre	ad diameter:	x length	mm	M8x25	M8x25	M8x25	M8x25
Terminal tightening	torque	Counter to	rque required	I	Nm	1522	1522	1522	1522
Mechanical Endurar	nce	Cycles			-	10.000			
Operating altitude derating	without				m	≤2000			
Operating torque		2P			Nm	69	69	69	69

¹⁾ For more detailed derating please consult us. Installation condition may have an influence on the derating by increasing the possible rated current. The given deratings are a reference based on specific test setup.

 $^{^{2)}\}mbox{Normal conditions}$ defined in IEC 60947-1, section 6.1.

³⁾ Fuse manufacturer, size and type: ETI, 250A, Cat.no 004110 followed by 567, 598 or 613. More details from the fuse manufacturer catalog.
⁴⁾ Any fuse which does not exceed stated values can be used.
⁵⁾ For DC-22B utilization category ratings, please consult us.

OTDC M-Series IEC





— OTDC315...800F_11

Technical data according	+0 IEC 60947 fa	r ewitch-disconnectors	OTDC315E 1000E
i echinical data according	10 156 60347 10	n switch-aisconnectors	0100313110001

Switch size						OTDC 315F_	OTDC 400F_	OTDC 500F_	OTDC 630F_	OTDC 800F_11	OTDC 800F_22	OTDC 1000F_22
Rated insulation voltage	e U,	Pollutio	n degree 3		V	1500	1500	1500	1500	1500	1500	1500
Rated impulse withstar					kV	12	12	12	12	12	12	12
Rated thermal current	1)	In open	air, normal o	conditions 2)	Α	315	400	500	630	800	800	1000
	ui	In enclo	sure 40°C		Α	315	400	500	630	630	800	1000
		In enclo	sure 50°C		Α	315	400	500	599	400	800	1000
		In enclo	sure 60°C		Α	293	352	415	498	523	664	830
		In enclo	sure 80°C		Α	195	232	275	328	347	440	550
with cable or bar cros	s section	Cu			mm²	185	240	2x150	2x185	2x240	2x241	4x150
Rated operational			1 circuit	2P (1P+, 1P-)	Α	315	400	500	630	800	800 3)	10003)
current le,		1000V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	630			
poles in series	DC 24D		3 circuits	6P (3P+, 3P-)	Α	315	400	500	630			
	DC-21B		1 circuit	2P (1P+, 1P-)	Α	315	400	500	630	800	800 3)	1000 3)
		1500V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	630			
			3 circuits	6P (3P+, 3P-)	Α	315	400	500	630			
		100011	1 circuit	2P (1P+, 1P-)	Α	315	400	500	500	500	800 3)	1000 3)
Di	D.C. D) (4	1000V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	500			
	DC-PV1		1 circuit	2P (1P+, 1P-)	Α	315	400	500	500	500	800 3)	1000 ³⁾
		1500V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	500			
			1 circuit	2P (1P+, 1P-)	Α	315	400	500	500/630 ³⁾	500	800 3)	
	D.C. D. (C.	1000V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	500			
	DC-PV2	45001/	1 circuit	2P (1P+, 1P-)	Α	315	400	500	500/630 ³⁾	500	800 3)	
		1500V	2 circuits	4P (2P+, 2P-)	Α	315	400	500	500			
		10001/	1 circuit	2P (1P+, 1P-)	Α	315	400	400	400	400		
	D.C. 200	1000V	2 circuits	4P (2P+, 2P-)	Α	315	400	400	400			
	DC-22B	15001/	1 circuit	2P (1P+, 1P-)	Α	315	400	400	400	400		
		1500V	2 circuits	4P (2P+, 2P-)	Α	315	400	400	400			
Rated short-time withs current, 1500V, 1s	tand	R.M.S	value Icw		kA	10	10	10	10	10	10	10
Rated short circuit mak capacity, 1500V	ring	Peak va	lue Icm		kA	10	10	10	10	10	10	10
Power loss/pole		At rated	current		W	7-8	12-13	18-20	30-32	48-52	22-24	37-40
Terminal bolt size			eter x length	mm	M10x30	M10x30	M12x40	M12x40	M12x40	M12x40	M12x40	
erminal tightening torque Counter torque required		Nm	30-44	30-44	50-75	50-75	50-75	50-75	50-75			
Mechanical Endurance		Cycles			-	10 000						
Operating altitude with	out derati	ing			m	≤2000						
Operating torque				2P		1119	1119	1119	1119	1119		
				4P	Nm	1830	1830	1830	1830		1830	1830
				6P		1835	1835	1835				

¹⁾ For more detailed derating please consult us. Installation condition may influence on the derating by increasing the possible rated current. The given deratings are references based on specific test setup.
²⁾ Normal conditions defined in IEC 60947-1, section 6.1.
³⁾ 4-pole-types with 2-poles in parallel _22 models, OTDCKIT800FS11 is included to the package – installation mandatory.

OTDC M-Series for higher short-circuit currents IEC





01003130301	 ,

Technical data accord	ing to IEC	60947 f	or switch-disconne	ctors OTDC315F_	1000FES	SS

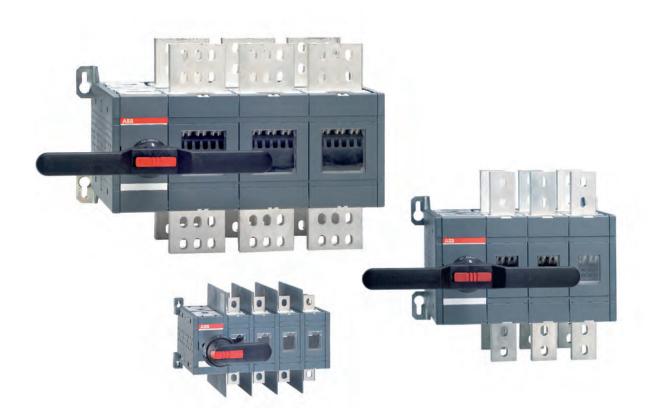
Switch size						OTDC 315F ESS	OTDC 400F ESS	OTDC 500F ESS	OTDC 630F ESS	OTDC 800F_22- ESS	OTDC 1000F_22 ESS
Rated insulation volt	age U,		Pollution degree	3	V	1500	1500	1500	1500	1500	1500
Rated impulse withs		je			kV	12	12	12	12	12	12
Rated thermal currer	nt Ith 1)		In open air, normal conditions ²⁾		Α	315	400	500	630	800	1000
			In enclosure 40°0	2	Α	315	400	500	630	800	1000
			In enclosure 50°C		Α	315	400	475	567	800	1000
			In enclosure 60°C	2	Α	293	352	415	498	664	830
			In enclosure 80°0	2	Α	195	232	275	328	440	550
with cable or bar c	ross sectio	n	Cu		mm²	185	240	2x150	2x185	2x240	4x150
Rated operational	DC 21P	1000V			Α	315	400	500	630	800 3)	1000 3)
current l _e	DC-21B	1500V			Α	315	400	500	630	800 3)	1000 3)
Poles in series	DC 5)/1	1000V	_		Α	315	400	500	500	8003)	1000 ³⁾
	DC-PV1	1500V	-	00 (10 : 10)	Α	315	400	500	500	800³)	1000 ³⁾
	D.C. DV (2)	1000V	1 circuit	2P (1P+, 1P-)	Α	315	400	500	500/630 ³⁾	800³)	-
	DC-PV2	1500V	_		Α	315	400	500	500/6303)	8003)	-
		1000V	_		Α	315	400	400	400	-	-
	DC-22B	1500V	_		Α	315	400	400	400	-	-
Rated short-time withstand 1		1	kA	10	10	10	10	10	10		
current I _{cw} , 1500V			0,1	kA	20	20	20	20	63	63	
Rated short circuit m capacity I _{cm} , 1500V	naking		Peak value, I _{cm}		kA	20	20	20	20	63	63
Rated conditional sh	ort-circuit		R.M.S value I _q		kA	30	30	30	30	-	-
current I _q , 1500V Required protection			Max. ETI fuse siz	e gPV, L/R= 3 ms	А	500 ⁴⁾	500 ⁴⁾	500 ⁴⁾	500 ⁴⁾	-	-
Rated conditional sh	ort-circuit	current	R.M.S value I_q , L	_/R = 5 ms	kA	70	70	70	70	-	-
I _q , 1500V ⁵⁾			Allowed let throu	ıgh peak	kA	29	29	29	29	-	-
			Allowed let throu	igh energy I²t	MA ² s	2,3	2,3	2,3	2,3	-	-
Rated conditional sh	ort-circuit	current	R.M.S value I _q , L	_/R = 0.5 ms	kA	100	100	100	100	100	100
I _q , 1500V ⁵⁾			Allowed let throu		kA	53	53	53	53	70	70
			Allowed let throu	0,	MA ² s	1,1	1,1	1,1	1,1	2,4	2,4
Power loss/pole			At maximum rate		W	7-8	12-13	18-20	30-32	22-24	37-40
Terminal bolt size			Metric thread dia mm			M10x30	M10x30	M12x40	M12x40	M12x40	M12x40
Terminal tightening torque			Counter torque r	Counter torque required		30-44	30-44	50-75	50-75	50-75	50-75
Mechanical Endurance			-	10000							
Operating altitude w	rithout der	ating			m	≤ 2000					
Operating torque			2P			1119	1119	1119	1119		
			4P		Nm	1830	1830	1830	1830	1830	1830
			6P			1835	1835	1835			

¹⁰ For more detailed derating please consult us. Installation condition may have an influence on the derating by increasing the possible rated current. The given deratings are references Normal conditions defined in IEC 60947-1, section 6.1.
 4-pole-types with 2-poles in parallel _22 models, OTDCKIT800FS11 is included in the package and installation is mandatory.
 Fuse manufacturer, size and type: ETI, 500A, Cat.no 004110 followed by 718, 723 or 728. More details from the fuse manufacturer catalog.

⁵⁾ Any fuse, which does not exceed stated values, can be used.

The growing importance of a secure power supply

ABB offers a wide variety of manual change-over switches, from 16 to 3200 Amperes in range. Manual change-over switches are available with three different transition types; Open, fast or closed.





Single terminal per pole construction

A single terminal per pole across the entire range also eliminates the need to use additional fixing sets to do connections and creating savings in terms of energy consumption and space occupied.



Modular and flexible

The modular and flexible construction, which can even include an adjustable periscopic haft, allows for different arrangements of the poles and handle, providing you with the opportunity to create unique space saving solutions for your customers.



UL/CSA certified performance

To complement our wide range of manual change-over switches, we also offer open transition manual change-over switches designed according to UL/CSA certification standards in a power range from 30 to 800 Amperes.

Technical data for OT16...125_C

Manual change-over switches



										itch siz
Data according to IEC 60947-3				OT16_	OT25_	OT40_	ОТ63_	ОТ80_	OT100_	OT125
Rated insulation voltage and rated		Pollution	٧	750	750	750	750	750	750	75
operational voltage AC20/DC20 Dielectric strength		degree 3 50 Hz 1min.	kV	6	6	6	6	6	6	
Rated impulse withstand voltage		30 HZ 1111111.	kV	8	8	8	8		8	
nated impulse withstand voitage	/ ambient 40°C	In open air	A	25	32	40	63		115	12
Rated thermal current and rated	/ ambient 40°C	· · · · · · · · · · · · · · · · · · ·	A	25	32	40	63		115	12
operational current AC20/DC20	/ ambient 60°C		A	20	25	32	50		80	10
with minimum conductor cross section	,	Cu	mm²	4	6	10	16		35	5
Rated operational current, AC-21A		up to 500 V	Α	16	25	40	63	80	100	12
		690 V	Α	16	25	40	63	80	100	12
Rated operational current, AC-22A		up to 500 V	Α	16	25	40	63	80	100	12
		690 V	A	16	25	40	63		100	12
Rated operational current, AC-23A		up to 415 V	A	16	20	23	45	75	80	9
		440 V	Α.	16	20	23	45	65	65	7:
		500 V	A	16	20	23	45		60	70
Data de a constitue de la cons		690 V	A	10	25 (1	12	20		40	125 (
Rated operational current / poles in series, DC-21A		up to 48 V ¹⁾	A	16/1	25/1	32/1	63/1	80/1	100/1	125/
		110 V 220 V	A A	16/2 16/3	25/2 25/3	32/2	63/2 63/4		100/2 100/4	125/
		440 V	A	16/4	16/4	16/4	16/4		100/4	100/
		500 V	A	16/4	16/4	16/4	16/4			
Rated operational current / poles in series, DC-22A		up to 48 V ¹⁾	A	16/1	25/1	32/1	63/1		100/1	125/
Rated operational current / poles in series, DC-22A		110 V	A	16/2	25/2	32/2	63/2		100/1	125/
		220 V	A	16/3	25/2	32/4	45/4		63/4	80/4
		440 V	A	10/3	10/4	10/4	10/4		03/4	80/-
Rated operational current / poles in series, DC-23A		up to 48 V ¹⁾	A	16/1	25/1	32/1	63/1		100/1	125/:
Rated operational current / poles in series, DC-23A		110 V	A	16/2	25/2	32/2	63/2		100/1	125/2
		220 V	A	16/2	25/2	32/2	45/4		63/4	63/4
		440 V	A	10/4	10/4	10/4	10/4		03/4	03/-
		230 V	kW	3	4	5,5	11	22	22	22
Rated operational power, AC-23A ²⁾		400 V	kW	7.5	9	11	22		37	45
The kW-ratings are accurate for 3-phase 1500 R.P.M. standard asychronous motors		415 V	kW	7.5	9	11	22	37	37	45
1300 K.T.I.H. Standard asychronous motors		500 V	kW	7.5	9	11	22	37	37	45
		690 V	kW	7.5	9	11	15	18.5	37	45
Rated breaking capacity in category AC-23		up to 415 V	Α	128	160	184	360	640	640	720
		500 V	A	128	160	184	360	464	480	560
		690 V	Α	80	88	96	160		320	400
Rated conditional short-circuit current I _p (r.m.s.) and	Ip (r.m.s.) 50 kA, 415 V	îc (peak)	kA	6.5	6.5	6.5	13		16.5	16.5
corresponding max. allowed cut-off current î _c (peak) value. The cut-off current î _c refers to values listed by	Max. OFA_ fuse size	gG/aM	A/A	40/32	40/32	40/32			125/125	125/125
fuse manufacturers (single phase test acc.	Ip (r.m.s.) 100 kA, 500 V	îc (peak)	kA				17			
to IEC60269).	Max. OFA_ fuse size	gG/aM	Α					100/80		
Rated short-time withstand current	lcw (r.m.s.)	690 V 1s	kA	0.5	0.5	0.5	1		2.5	2.5
Rated short-time making capacity ³⁾	Icm (peak)	690 V	kA	0.7	0.7	0.7	1.4		3.6	3.6
Power loss / pole	With rated current		W	0.3	0.6	1.6	2.8	4.5	4.0	6.3
Mechanical endurance	Number of oper. cycles4)		Cycles	10 000	10 000	10 000	10 000	10 000	10 000	10 000
			mm2	0.7E 10	0.75-10	0.75.10	1 5 25	1.5-35	10-70	10-70
Cable size	Cu-wire size suitable for terminal clamps	-								
	·		AWG	18-8	18-8	18-8	14-4	14-4	8-00	8-00
Terminal tightening torque	Counter torque required		Nm	0.8	0.8	0.8	2	2	6	6
	Typical for 3-pole									
Operating torque	switches		Nm	1	1	1	1.2	1.2	2	ã
Weight without accessories	3-pole switch		kg	0.25	0.25	0.25	0.64	0.64	0.90	0.90
	4-pole switch		kg	0.31	0.31	0.31	0.70	0.70	1.18	1.18
Data according to UL508 (Listed)										
Current			Α	16	25	40	60			
Horsepower, 3-phase		200 V	HP	3	7.5	10	15			
		208 V	HP	3	7.5	10	15			
		240 V	HP	5	7.5	10	15			
		480 V	HP	10	15	20	30			
		600 V	HP	10	20	25	30	40		

¹⁾ Below 48 V, two poles in parallel up to OT80 are recommended particularly in polluted atmosphere ²⁾ These values are given for guidance and may vary according to the motor manufacturer ³⁾ Short circuit duration >50ms, without fuse protection ⁴⁾ Operating cycle: O - I - O - II - O

Technical data for OT160...800_C

Manual change-over switches



									S	witch size
Data according to IEC 60947-3				OT_160_	OT_200_	OT_250_	OT_315_	OT_400_	OT_630_	OT_800_
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	1 000	1 000	1 000	1 000		1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	12	12
Rated thermal current and	/ ambient 40°C	In open air	Α	160	200	250	315	400	630	800
rated operational current AC20/DC20	/ ambient 40°C	In enclosure	Α	160	200	250	315	400	630	800
with minimum conductor cross section		Cu	mm²	70	95	120	185	240	2x185	2x240
Rated operational current, AC-21A		up to 500 V	Α	160	200	250	315		630	800
		690 V	Α	160	200	250	315		630	800
Rated operational current, AC-22A		up to 500 V	Α	160	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-23A		up to 415 V	Α	160	200	250	315	400	630	800
		440 V	Α	160	200	250	315	400	630	800
		500 V	Α	160	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
Rated operational current /		≤ 110 V	Α	160/2	200/2	250/2	315/11)	400/11)	630/1	800/1
poles in series, DC-21A ⁶⁾		220 V	Α	160/2	200/2	250/2	315/21)	400/21)	630/1	800/1
		440 V	Α	160/3	200/3	230/3	315/3	360/3	630/2	720/2
		660 V	Α	160/4	200/4	200/4	315/4	315/4	630/41)	630/41)
Rated operational power, AC-23A ²⁾		230 V	kW	45	60	75	100	132	200	250
The kW-ratings are accurate for 3-phase 1500 R.P.M. standard asychronous motors		400 V	kW	90	110	140	160	220	355	450
		415 V	kW	90	110	145	180	230	355	450
		500 V	kW	110	132	170	220	280	400	560
		690 V	kW	160	200	250	315	400	630	800
Rated breaking capacity in category AC-23		up to 415 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
		500 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
		690 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
Rated conditional short-circuit	lp (r.m.s.) 80 kA, 415 V	îc (peak)	kA	40.5	40.5	40.5	59	59	83.5	83.5
current Ip (r.m.s.) and cut-off current îc (peak) value. The cut-off current îc	Max. OFA_ fuse size	gG/aM	A/A	355/315	355/315	355/315	500/500	500/500	800/1 000	800/1 000
refers to values listed by fuse manufacturers (single phase test	lp (r.m.s.) 100 kA, 500 V	îc (peak)	kA	40.5	40.5	40.5	61.5	61.5	90	90
acc. to IEC60269).	Max. OFA_fuse size	gG/aM	Α	315/315	315/315	315/315	500/450	500/450	800/800	800/800
	Ip (r.m.s.) 80 kA, 690 V	îc (peak)	kA	40.5	40.5	40.5	59	59	83.5	83.5
	Max. OFA_fuse size	gG/aM	Α	355/315	355/315	355/315	500/500	500/500	800/1 000	800/1000
Rated short-time withstand current	lcw (r.m.s.)	690 V 0.15s	kA	15	15	15	31	31	38	38
		690 V 0.25s	kA	15	15	15	24	24	36	36
		690 V 1s	kA	8	8	8	15	15	20	20
Rated short-time making capacity ³⁾	Icm (peak)4)	690 V	kA	30	30	30	65	65	80	80
Power loss / pole	With rated current		W	2.4	4	6.5	6.5	10	25	40
Mechanical endurance	Number of oper. cycles ⁵⁾		Cycles	8 000	8 000	8 000	8 000		5 000	5 000
Terminal bolt size	Metric thread diameter x length		mm	M8x25	M8x25	M8x25			M12x40	M12x40
Terminal tightening torque	Counter torque required		Nm	15-22	15-22	15-22	30-44	30-44	50-75	50-75
Operating torque	3-pole change-over switches		Nm	7	7	7			27	
Weight without accessories	Manual change-over	3-poles	kg	2.5	2.5	2.5	4.7	4.7	12.8	12.8
	switches	4-poles	kg	3.2	3.2	3.2	5.8	5.8	15.6	15.6
Data according to IEC 60947-6-1										
Class of equipment				PC	PC	PC			PC	
Rated short-time withstand current	lcw (r.m.s.)	690 V 0.1s	kA	15	15	15	25	25	38	38
Rated operational current, AC-31B		up to 415 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-33B		up to 415 V	Α	160	200	250	315	400	630	800

¹⁾ Utilization category B

²⁾ These values are given for guidance and may vary acc. to the motor manufacturer ³⁾ Short circuit duration > 50ms, without fuse protection

⁴⁾ Max. distance from switch frame to nearest busbar / cable support 150 mm
5) Operating cycle: O - I - O - II - O
6) Further 1000 V ratings on request

Technical data for OT1000...3200_C

Manual change-over switches



Data according to IEC 60947-3								Swite	ch size , OT_
				OT_1000_	OT_1250_	OT_1600_	OT_2000_	OT_2500_	OT_3200_
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	1 000	1 000	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	12
Rated thermal current and	/ ambient 40°C	In open air	Α	1 000	1 250	1 600	2 000	2 500	3 200
rated operational current AC20/ DC20	/ ambient 40°C	In enclosure							
with minimum conductor cross section		Cu	mm²	2x300	2x400	2x500	3x500	4x500	4x1000
Rated operational current, AC-21A		up to 500 V	Α	1 000	1 250	1 600	2 0005)	2 5005)	3 2005
		690 V	Α	1 000	1 250	1 600			
Rated operational current, AC-22A		up to 500 V	Α	1 000	1 250	1 600			
		690 V	Α	1 000	1 250	1 600			
Rated operational current, AC-23A		up to 415 V	Α	1 000	1 250	1 250			
		440 V	Α	1 000	1 250	1 250			
		500 V	Α	1 000	1 250	1 250			
D : 1		690 V	Α	1 000	1 250	1 250			
Rated operational power, AC-23A ¹⁾		230 V	kW	315	400	400			
The kW-ratings are accurate		400 V	kW	560	710	710			
for 3-phase 1500 R.P.M. standard asychronous motors		415 V	kW	560	710	710			
asycinolous motors		500 V 690 V	kW kW	710	900	900			
Rated breaking capacity				1 000	1 200	1 200			
in category AC-23		up to 415 V	Α						
		500 V	<u> </u>	10 000	10 000	10 000			
Data di conditata da la la constata	In (1) 10 10 10 10 10 10 10 10 10 10 10 10 10	690 V	A	10 000	10 000	10 000			
Rated conditional short-circuit current	Ip (r.m.s.) 80 kA, 415 V	îc (peak)	kA	100	100	100			
Ip (r.m.s.) and cut-off current îc	Max. OFA_fuse size	gG/aM	A/A	1 250/1 250	1 250/1 250	1 250/1 250			
(peak)	Ip (r.m.s.) 100 kA, 500 V	îc (peak)	kA	106	106	106			
value. The cut-off current îc refers	Max. OFA fuse size	gG/aM	A	1 250/1	1 250/1	1 250/1			
to	11dx. 01 A_1036 3126	90/41-1	^	250	250	250			
values listed by fuse manufacturers (single phase test acc. to IEC60269).				250	250	250			
Rated short-time withstand current	Icw (r.m.s.)	690 V 0.15s	kA	50	50	50	50	50	
		690 V 0.25s	kA	50	50	50	50	50	
		690 V 1s	kA	50	50	50	55	55	65
Rated short-time making capacity ²⁾	Icm (peak)3)	690 V	kA	92	92	92	110	110	143
Power loss / pole	With rated current		W	19	29	48	55	85	95
Mechanical endurance	Number of oper. cycles ⁴⁾		Cycles	3 000	3 000	3 000	2 000	2 000	2 000
Terminal bolt size	Metric thread diameter x length		mm	M12x60	M12x60	M12x60	M12x60	M12x60	M12x100
Terminal tightening torque	Counter torque required		Nm	50-75	50-75	50-75	50-75	50-75	50-75
Operating torque	3-pole change-over switches		Nm	78	78	78	78	78	80
Weight without accessories	Manual change-over	3-poles	kg	32.3	32.3	34.8	48	48	57
	switches	4-poles	kg kg	40.2	40.2	43.3		60	72
Data according to IEC 60947-6-1									
Class of equipment				PC	PC	PC	PC	PC	
Rated short-time withstand current	Icw (r.m.s.)	690 V 0.1s	kA	50	50	50	50	50	
Rated operational current, AC-31B		up to 415 V	Α	1 000	1 250	1 600	2 000	2 000	
Rated operational current, AC-33B		up to 415 V	A	1 000	1 000	1 000			

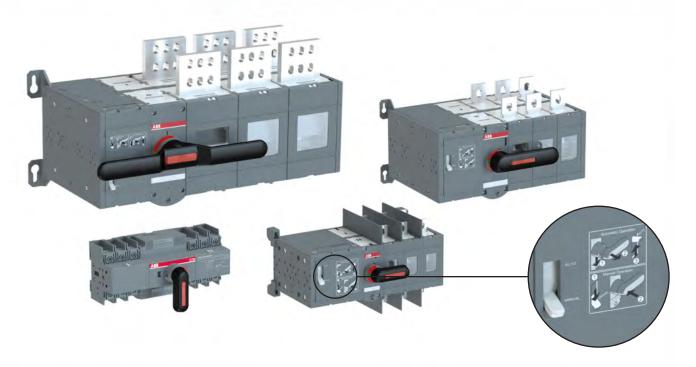
 $^{^{\}mbox{\tiny 1)}}$ These values are given for guidance and may vary acc. to the motor manufacturer

²⁾ Short circuit duration > 50ms, without fuse protection
3) Max. distance from switch frame to nearest busbar / cable support 150 mm
4) Operating cycle: O - I - O - II - O

 $^{^{5)}}$ Category AC-21B, up to 415V 1000 V ratings on request

Uninterrupted power supply with motorized functionality

ABB offers a wide variety of open transition motorized change-over switches from 40 to 3200 Amperes in range. All of our visually redesigned motorized change-over switches now come equipped with a new cover with clear operating instructions and enhanced motor operator performance.





High performance level

Ensuring a high performance level for you is of the utmost importance to us. In change-over applications where the loaded switch may need to be operated remotely, adequate durability has been ensured by testing against the IEC 60947-6-1 standard in the specification of endurance requirements.



Reduced installation time

ABB motorized change-over switches are fast and easy to install. The voltage sensing connectors have been designed to save time, as there is no need to drill holes into the busbars (see page 78 for relevant accessories). Also, the control and power cables are screw mounted, providing a safe and secure connection that stays tight even during transportation.



Safe and reliable

Our switches come equipped with a comprehensive range of inbuilt safety features such as mechanical interlock, which ensures the isolation of the two asynchronous power supplies. This eliminates risk of short-circuiting between them. The motorized change-over switches are also equipped with a handle for manual operation in case of emergency.



Space-saving design

ABB provides compact and cost-effective components for any and all installations. On average, our motorized change-over switches are 20% smaller than other similar products on the market.

Technical data for OTM40...125_C

Motorized change-over switches



Data according to IEC 60947-3								witch siz
				OTM40_			OTM100_	
Rated insulation voltage and rated		Pollution	V	800	800	800	800	800
operational voltage AC20/DC20		degree 3						
Dielectric strength		50 Hz 1min.	kV	6	6	6	6	6
Rated impulse withstand voltage			kV	8	8	8	8	8
Rated thermal current and rated	/ ambient 40°C	In open air	Α	40	63	80	115	125
operational current AC20/DC20	/ ambient 40°C	In enclosure	Α	40	63	80	115	125
	/ ambient 60°C	In enclosure	Α	32	50	63	80	100
with minimum conductor cross section	,	Cu	mm²	10	16	25	35	50
Rated operational current, AC-21A		up to 500 V	Α	40	63	80	100	125
Tated operational current, ric 217		690 V						
			Α	40	63	80	100	125
Rated operational current, AC-22A		up to 500 V	Α .	40	63	80	100	125
		690 V	Α	40	63	80	100	125
Rated operational current, AC-23A		up to 415 V	Α	40	63	80	80	90
		500 V	Α	40	60	60	60	70
		690 V	Α	40	40	40	40	50
Rated operational current / poles in series, DC-21A		up to 48 V	Α	40/1	63/1	80/1	100/1	125/1
		110 V	Α	40/2	63/2	80/2	100/2	125/2
		220 V	Α	40/4	63/4	80/4	100/4	100/4
Rated operational current / poles in series, DC-22A		up to 48 V	Α	40/1	63/1	80/1	100/1	125/1
		110 V	Α	40/2	63/2	80/2	100/2	125/2
		220 V	A	40/4	63/4	80/4	80/4	80/4
Rated operational current / poles in series, DC-23A		up to 48 V	A	40/1	63/1	80/1	100/1	125/1
rated operational current / poles in series, De EsA		110 V	A	40/2	63/2	80/2	100/1	125/2
		220 V	Ā	40/4	63/4	63/4	63/4	63/4
Rated operational power, AC-23A ¹⁾		230 V	kW	7.5	15	22	22	22
The kW-ratings are accurate for 3-phase 1500		400 V	kW	18.5	30	37	37	45
R.P.M. standard asychronous motors		415 V	kW	18.5	30	37	37	45
		500 V	kW	22	37	37	37	45
		690 V	kW	37	37	37	37	45
Rated breaking capacity in category AC-23		up to 415 V	Α	320	504	640	640	720
		500 V	Α	320	480	480	480	560
		690 V	Α	320	320	320	320	400
Rated conditional short-circuit current Ip (r.m.s.)	Ip (r.m.s.) 50 kA, 415 V	îc (peak)	kA	16.5	16.5	16.5	16.5	16.5
and corresponding max. allowed cut-off current îc		gG/aM	A/A	125/125			125/125	125/125
(peak) value. The cut-off current îc refers to values	Ip (r.m.s.) 18 kA, 690 V		kA	11	11	11	11	11
listed by fuse manufacturers (single phase test	Max. OFA_ fuse size	gG	A	125	125	125	125	125
acc. to IEC60269).	Ip (r.m.s.) 50 kA, 690 V		kA	10	10	10	10	10
•	Max. OFA_ fuse size	gG/aM	A/A	63/63	63/63	63/63	63/63	63/63
Rated short-time withstand current								
	lcw (r.m.s.)	690 V 1s	kA	2.5	2.5	2.5	2.5	2.5
Rated short-time making capacity ²⁾	Icm (peak)	690 V	kA	3.6	3.6	3.6	3.6	3.6
Power loss / pole	With rated current		W	1.6	2.8	3.5	4.0	6.3
Mechanical endurance	Number of oper.		Cycles	10 000	10 000	10 000	10 000	10 000
	cycles3)							
Cable size	Cu-wire size suitable			2.5-25/2x2.5-16		10-70	10-70	10-70
	for terminal clamps		AWG	14-4/2x14-6	8-00	8-00	8-00	8-00
Terminal tightening torque	Counter torque required		Nm	6	6	6	6	6
Operating torque	3-pole switches		Nm	5	5	5	5	5
Weight without accessories	3-pole switch		kg	1.37	1.37	1.37	1.37	1.37
	4-pole switch		kg	1.60	1.60	1.60	1.60	1.60
Data according to IEC 60947-6-1	1							
Class of equipment				PC	PC	PC	PC	PC
Rated short-time withstand current	Icw (r.m.s.)	690 V 0.1s	kA	5	5	5	5	5
Conditional short-circuit current	Icc (r.m.s.)	415 V	kA	50	50	50	50	50
Corresponding fuse rating	gG/aM fuse	415 V	Α .	125	125	125	125	125
Rated operational current, AC-31B		up to 415 V	Α .	40	63	80	100	125
Rated operational current, AC-32B		up to 415 V	Α	40	63	80	100	125
Rated operational current, AC-33B		up to 415 V		40	63	80	80	80

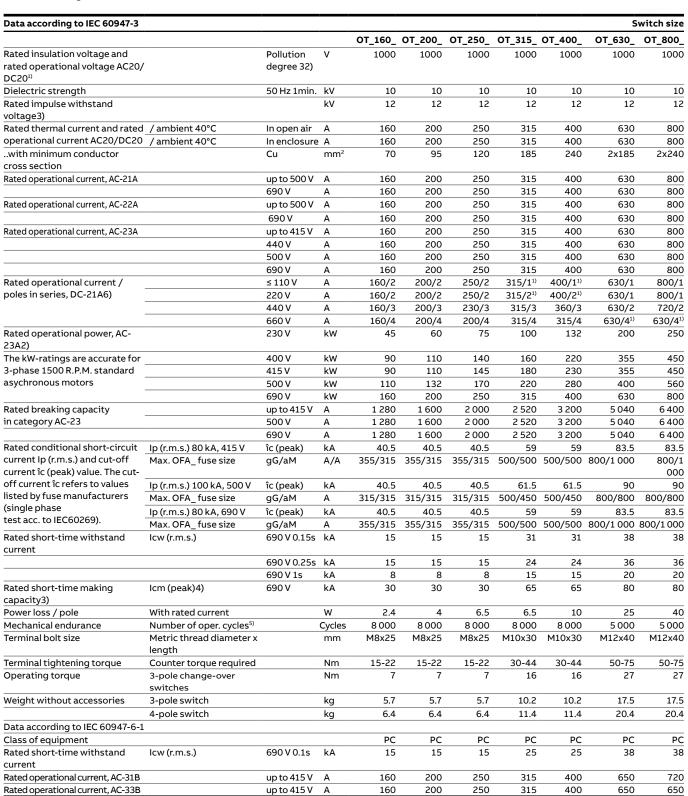
 $^{^{1)}}$ These values are given for guidance and may vary according to the motor manufacturer $^{2)}$ Short circuit duration > 50ms, without fuse protection

³⁾ Operating cycle: O - I - O - II - O

Technical data for OTM160...800 C

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Motorized change-over switches



¹⁾ Utilization category B



²⁾ These values are given for guidance and may vary acc. to the motor manufacturer

³⁾ Short circuit duration > 50ms, without fuse protection

 $^{^{}m 4)}$ Max. distance from switch frame to nearest busbar / cable support 150 mm

⁵⁾ Operating cycle: O - I - O - II - O

⁶⁾ Further ratings on request

Technical data for OTM1000...3200_C

Motorized change-over switches



Data according to IEC 60947-3								S	witch size
				OT_1000_	OT_1250_	OT_1600_	OT_2000_	OT_2500_	OT_3200_
Rated insulation voltage and rated operational voltage AC20/DC20 $^{1)}$		Pollution degree 3 ²⁾	V	1 000	1 000	1 000	1 000	1 000	1 000
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10
Rated impulse withstand voltage ³⁾			kV	12	12	12	12	12	12
Rated thermal current and rated	/ ambient 40°C	In open air	Α	1 000	1 250	1 600	2 000	2 500	3 200
operational current AC20/DC20	/ ambient 40°C	In enclosure	Α						
with minimum conductor cross section		Cu	mm²	2x300	2x400	2x500	3x500	4x500	4x1 000
Rated operational current, AC-21A		up to 500 V	Α	1 000	1 250	1 600	2 0005)	2 500 ⁵⁾	3 2005
		690 V	Α	1 000	1 250	1 600			
Rated operational current, AC-22A		up to 500 V	Α	1 000	1 250	1 600			
		690 V	Α	1 000	1 250	1 600			
Rated operational current, AC-23A		up to 415 V	Α	1 000	1 250	1 250			
		440 V	Α	1 000	1 250	1 250			
		500 V	Α	1 000	1 250	1 250			
		690 V	Α	1 000	1 250	1 250			
Rated operational power, AC-23A1)		230 V	kW	315	400	400			
The kW-ratings are accurate for		400 V	kW	560	710	710			
3-phase 1500 R.P.M. standard		415 V	kW	560	710	710			
asychronous motors		500 V	kW	710	900	900			
		690 V	kW	1 000	1 200	1 200			
Rated breaking capacity		up to 415 V	Α	10 000	10 000	10 000			
in category AC-23		500 V	Α	10 000	10 000	10 000			
		690 V	Α	10 000	10 000	10 000			
Rated conditional short-circuit	Ι _p (r.m.s.) 80 kA, 415 V	î¸ (peak)	kA	100	100	100			
current I _p (r.m.s.) and cut-off current î _c (peak) value. The cut-	Max. OFA_ fuse size	gG/aM	A/A	1 250/1 250	1 250/1 250	1 250/1 250			
off current $\hat{1}_c$ refers to values	I _p (r.m.s.) 100 kA, 500 V	î¸ (peak)	kA	106	106	106			
listed by fuse manufacturers (single phase	Max. OFA_ fuse size	gG/aM	Α	1 250/1 250	1 250/1 250	1 250/1 250			
test acc. to IEC60269).	I _n (r.m.s.) 80 kA, 690 V	î (peak)	kA						
	Max. OFA_ fuse size	gG/aM	Α						
Rated short-time withstand current	I _{cw} (r.m.s.)	690 V 0.15s	kA	50	50	50	50	50	
		690 V 0.25s	kA	50	50	50	50	50	
		690 V 1s	kA	50	50	50	55	55	65
Rated short-time making capacity ²⁾	I _{cm} (peak) ³⁾	690 V	kA	92	92	92	110	110	143
Power loss / pole	With rated current		W	19	29	48	55	85	95
Mechanical endurance	Number of oper. cycles ⁴⁾		Cycles	3 000	3 000	3 000	2 000	2 000	2 000
Terminal bolt size	Metric thread diameter x length		mm	M12x60	M12x60	M12x60	M12x60	M12x60	M12x100
Terminal tightening torque	Counter torque required		Nm	50-75	50-75	50-75	50-75	50-75	50-75
Operating torque	3-pole change-over switches		Nm	78	78	78	78	78	80
Weight without accessories	3-pole switch		kg	42	42	44	56	56	83
	4-pole switch		kg	50	50	52	70	70	
Data according to IEC 60947-6-1									
Class of equipment				PC	PC	PC			
Rated short-time withstand	I _{cw} (r.m.s.)	690 V 0.1s	kA	50	50	50			
current	Cii 1 /								
Rated operational current, AC-31B		up to 415 V	Α	1 000	1 250	1 600			
					1 000	1 000			

¹⁾ These values are given for guidance and may vary acc. to the motor manufacturer ²⁾ Short circuit duration > 50ms, without fuse protection ³⁾ Max. distance from switch frame to nearest busbar / cable support 150 mm ⁴⁾ Operating cycle: O - I - O - II - O ⁵⁾Category AC-21B, up to 415V

Motor operator performance data for OTM40...125_C

Motor operator

Data according to IEC 60947				Switch size
				40125
Rated operational voltage $\boldsymbol{U}_{\mathrm{e}}$	Pollution degree 3 50/60 Hz		V AC/DC V DC	110 - 240 24
Operating voltage range				0.85 - 1.1 x U
Operating time ¹⁾	90° I-0, 0-I, 0-II, II-0	110240 V AC/DC	S	0.5-1.0
		24 V DC	S	0.6-1.3
Operating transfer time ¹⁾	180° I-II, II-I	110240 V AC/DC	S	1.2-1.5
		24 V DC	S	1.4-2.1
OFF -time when operating I-II or II-I ¹⁾	180° I-II, II-I	110240 V AC/DC	S	0.4-0.8
		24 V DC	S	0.6-1.0
Nominal current In ¹⁾		110240 V AC/DC	A	0.2-0.5
		24 V DC	A	0.6
Current inrush ¹⁾		110240 V AC/DC	A	1.5-3.0
		24 V DC	Α	3.6
Operating rate	Cycle 0-I-0-II-0	Max. continuous	cycles/min	1
		Max. short-time ≤ 10	cycles/min	10
		cycles		
Overvoltage category				III
Rated impulse withstand voltage U _{imp}			kV	4
Dielectric strength		50 Hz 1 min.	kV	1.5
Impulse command		Min. impulse duration	ms	100
Terminals				
Voltage supply wiring for U _e				PE - N - L
Cross section		Solid/stranded	mm²	1.5 - 2.5
Short-circuit protection device		Max. MCB	A	C16
Control terminal				C-II-I-O
Cross section		Solid/stranded	mm²	1.5 - 2.5
Maximum cable length			m	100
Terminal for state information				
Terminal for state information	1234	Solid/stranded	mm²	1.5
Also used with the OMD automatic control unit	_	Rating	A	3
				AC-1/250V
Common, voltage supply	1			
Position of switch I	2			
Position of switch II	3			
Handle attached or motor operator locked	4			
Short-circuit protection device		Max. MCB	Α	C2
Control terminal for OMD automatic control unit				
Control terminal for OMD automatic control unit	1123	Solid/stranded	mm²	1.5 - 2.5
Common voltage cupply from mater apprator	1		V DC	24
Common, voltage supply from motor operator Close switch I or open switch II	2		V DC	24 24
ciose switch for open switch II			mW	500
Close switch II or open switch I	3		V DC	24
Close switch if or open switch i	3		mW	500
Operating temperature			°C	-25+55
Transportation and storage temperature			°C	-25+55 -40+70
Max. altitude			m	2 000

¹⁾ Under nominal conditions

Motor operator performance data for OTM160...3200_C

Motor operator

Data according to IEC 60947								Switch size
				160250	315400	630800	10001600	20003200
Rated operational voltage U	Pollution degree 3	50/60 Hz	V AC					220 - 24
			V AC/DC					110 - 12
			V DC					48
			V DC					2.
Operating voltage range							(0,85 - 1,1 x U
Operating time ¹⁾	90° I-0, 0-I, 0-II, II-0	220-240VAC	S	0.4-1.0	0.4-1.0	0.4-1.0	0.5-1.5	0.5-1.
		110-125VAC/DC	S	0.5-1.5	0.5-1.5	0.6-1.2	0.5-1.5	0.5-1.
		48VDC		0.5-1.5	0.4-1.0	0.6-1.6	0.5-1.5	0.5-1.
		24VDC		0.4-1.0	0.4-1.0	0.5-1.5	1.0-2.0	1.0-2.
Operating transfer time ¹⁾	180° I-0-II, II-0-I	220-240VAC	S	1.0-2.0	0.9-2.0	0.9-2.0	1.5-3.0	1.5-3.
operating transfer time	100 . 0, 0 .	110-125VAC/DC		1.1-2.5	1.2-2.6	1.2-3.0	1.5-3.0	1.5-3.
		48VDC		1.4-2.5	1.0-2.0	1.3-3.0	1.5-3.0	1.5-3.
		24VDC		1.0-2.0	1.0-2.0	1.1-2.5	2.0-3.5	2.0-3.
OFF -time when operating I-II or II-I ¹⁾	180° I-II II-I	220-240VAC		0.4-1.0	0.4-1.0	0.4-1.0	0.5-1.5	0.5-1.
	100 1 11, 11 1	110-125VAC/DC		0.4-1.1	0.5-1.5	0.6-1.5	0.5-1.5	0.5-1.
		48VDC		0.5-1.1	0.4-1.0	0.7-1.6	0.5-1.5	0.5-1.
		24VDC		0.4-1.0	0.4-1.0	0.5-1.5	0.8-1.7	0.8-1.
Nominal current I ₂ 1)		220-240VAC	A	0.4-1.0	0.4-1.0	0.5-1.5	1.8	1.
Nominal current I _n		110-125VAC/DC	Ā	0.5	0.5	0.7	3.0	3.0
		48VDC	A	1.1	2.1	2.6	5.3	5.3
		24VDC	A	3.3	4.2	4		8.0
Current inrush ¹⁾		220-240VAC	A	1.3	2.1	2.8	7.7	7.
Current initusii 7				2.1	2.5	4.6	13.3	13.3
		110-125VAC/DC 48VDC	A A	4.4	8.3	8.4	22.4	22.4
		24VDC	A	16.8	17.5		26.6	26.0
Overload fuse	Type / I _n /	220-240VAC	mA	T/315/H	T/500/H	7/1	T/2 000/H	T/2 000/F
	Capacity	110-125VAC/DC	mA	T/500/H	T/630/H	000/H T/1	T/4 000/H	T/4 000/H
		40)/DC	•	T/1 25/11	T/2 F/11	000/H	T/5 (11	T/5/1
		48VDC	Α	T/1,25/H	T/2,5/H	T/2,5/H	T/5/H	T/5/H
	C:	24VDC	A	T/4,0/H	T/5,0/H	T/5,0/H	T/10/H	T/10/H
	Size	220 2401/46	mm	5x20	5x20	5x20	5x20	5x20
Operating rate	Cycle 0-I-0-II-0,	220-240VAC	cycles/min	1	1	1		0.
	max. continuous	110-125VAC/DC	cycles/min	1	1	1		0.
		48VDC	cycles/min	1	1	1		0.:
		24VDC	cycles/min	1	1	1		0.5
	Max. short-time,	220-240VAC	cycles/min	10	10	10		
	≤ 10 cycles	110-125VAC/DC	cycles/min	10	10	10	5	
		48VDC	cycles/min	10	10	10	5	
		24VDC	cycles/min	10	10	10	5	
Overvoltage category								
Rated impulse withstand voltage U _{imp}			kV					4
Dielectric strength		50 Hz 1 min.	kV					1.5
Impulse command		Min. impulse						
		duration	ms					100
Terminals								
Voltage supply wiring for U _e								PE - N - I
Cross section		solid/stranded	mm²					1.5 - 2.
Short-circuit protection device		max. MCB	Α					C16
Control terminal (no SELV)								C - II - I - C
Cross section		solid/stranded	mm²					1.5 - 2.
Maximum cable length			m					100
State information of locking (no SELV Handle attached or motor operator	/)	11-12-14 (C/O)					5A/2	250V/cosφ=
locked								
Locking motor operator		23-24 (NO)					5A/2	250V/cosφ=
Short-circuit protection device		Max. MCB	Α					С
Protection degree								IP2
Operating temperature			°C					-25+5
<u> </u>								
Transportation and storage			°C					-40+70
<u> </u>			°C					-40+70 2 000

¹⁾ Under nominal conditions

Manual and motorized bypass switches

Technical data for OT and OTM160...800_Y_

Manual and motorized bypass switches



Data according to IEC 60947-3				0714160	0714200	0714050	0714045	OT14400		h size , OTM
						OTM250_				OTM800
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	1000	1000	1000	1000	1000	1000	100
Dielectric strength		50 Hz 1min.	kV	10	10	10	10	10	10	10
Rated impulse withstand voltage			kV	12	12	12	12	12	12	1
Rated thermal current and rated	/ ambient 40°C	In open air	Α	160	200	250	315	400	630	800
operational current AC20/DC20	/ ambient 40°C	In enclosure	Α	160	200	250	315	400	630	800
with minimum conductor cross section		Cu	mm²	70	95	120	185	240	2x185	2x240
Rated operational current, AC-21A		up to 500 V	A	160	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-22A		up to 500 V	Α	160	200	250	315	400	630	800
		690 V	Α	160	200	250	315	400	630	800
Rated operational current, AC-23A		up to 415 V	Α	160	200	250	315	400	630	800
		440 V	Α	160	200	250	315	400	630	800
		500 V	A	160	200	250	315	400	630	800
		690 V	A	160	200	250	315	400	630	800
Rated operational current /		≤ 110 V	A	160/2	200/2	250/2	315/14)	400/14)	630/1	800/1
poles in series, DC-21A1)		220 V	A	160/2	200/2	250/2	315/24)	400/24)	630/1	800/1
poles in series, De LIAI)		440 V	Ā	160/2	200/2	230/2	315/3	360/3	630/2	720/2
		660 V	A	160/3	200/3	200/4	315/4	315/4	630/44)	630/44
Rated operational power, AC-23A ²⁾		230 V	kW	45	60	75	100	132	200	250
The kW-ratings are accurate		400 V	kW	90			160			
3					110	140		220	355	450
for 3-phase 1500 R.P.M. standard asychronous motors		415 V	kW	90	110	145	180	230	355	450
asychronous motors		500 V	kW	110	132	170	220	280	400	560
		690 V	kW	160	200	250	315	400	630	800
Rated breaking capacity		up to 415 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
in category AC-23		500 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
		690 V	Α	1 280	1 600	2 000	2 520	3 200	5 040	6 400
Rated conditional short-circuit	Ip (r.m.s.) 80 kA, 415 V	îc (peak)	kA	40.5	40.5	40.5	59	59	83.5	83.5
current Ip (r.m.s.) and cut-off current îc	Max. OFA_ fuse size	gG/aM	A/A	355/315	355/315	355/315	500/500	500/500	800/1 000	800/1 000
(peak) value. The cut-off current îc	Ip (r.m.s.) 100 kA, 500 V	îc (peak)	kA	40.5	40.5	40.5	61.5	61.5	90	90
refers to values listed by fuse	Max. OFA_fuse size	gG/aM	Α	315/315	315/315	315/315	500/450	500/450	800/800	800/800
manufacturers (single phase test	Ip (r.m.s.) 80 kA, 690 V	îc (peak)	kA	40.5	40.5	40.5	59	59	83.5	83.5
acc. to IEC60269).	Max. OFA_fuse size	gG/aM	Α			355/315			800/1 000	800/1 000
Rated short-time withstand current	Icw (r.m.s.)	690 V 0.15s	kA	15	15	15	31	31	38	38
		690 V 0.25s	kA	15	15	15	24	24	36	36
		690 V 1s	kA	8	8	8	15	15	20	20
Rated short-time making capacity ³⁾	Icm (peak) ⁴⁾	690 V	kA	30	30	30	65	65	80	80
Power loss / pole	With rated current		W	2.4	4	6.5	6.5	10	25	40
Mechanical endurance	Number of oper.		Cycles	8 000	8 000	8 000	8 000		5 000	5 000
Terminal bolt size	Metric thread diameter x length		mm	M8x25	M8x25	M8x25	M10x30	M10x30	M12x40	M12x40
Terminal tightening torque	Counter torque required		Nm	15-22	15-22	15-22	30-44	30-44	50-75	50-75
Operating torque	Typical for 3-pole bypass switches		Nm	14	14	14	32	32	54	54
Weight without accessories	Manual bypass switches	3-pole switch	kg	4.3	4.3	4.3	8.2	8.2	19.9	19.9
		4-pole switch	kg	5.8	5.8	5.8	11.0	11.0	26.6	26.6

¹⁾ Further ratings on request ²⁾ These values are given for guidance and may vary acc. to the motor manufacturer ³⁾ Short circuit duration > 50ms, without fuse protection

 $^{^{4)}}$ Max. distance from switch frame to nearest busbar / cable support 150 mm $^{5)}$ Operating cycle: O - I - O - II - O

Manual and motorized bypass switches

Technical data for motor operators

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Motorized bypass switches, Motor operator

Data according to IEC 60947						Switch size
		"		160250	315400	630800
Rated operational voltage Ue	Pollution degree 3	50/60 Hz	V AC			220 - 240
Operating voltage range		·				0,85 - 1,1 x Ue
Operating time1)	90° I-0, 0-I, 0-II, II-0	220-240VAC	s	0.4-1.0	0.4-1.0	0.4-1.0
Operating transfer time1)	180° I-0-II, II-0-I	220-240VAC	S	1.0-2.0	0.9-2.0	0.9-2.0
OFF -time when operating I-II or II-I1)	180° I-II, II-I	220-240VAC	s	0.4-1.0	0.4-1.0	0.4-1.0
Nominal current In1)		220-240VAC	Α	0.2	0.5	0.7
Current inrush1)		220-240VAC	Α	1.3	2.1	2.8
Overload fuse	Type / In / Capacity	220-240VAC	mA	T/315/H	T/500/H	T/1 000/F
Operating rate	Cycle 0-I-0-II-0,	220-240VAC	cycles/min	1	1	1
Overvoltage category						II
Rated impulse withstand voltage Uimp			kV			4
Dielectric strength		50 Hz 1 min.	kV			1.5
Impulse command		Min. impulse				
		duration	ms			100
Terminals						
Voltage supply wiring for Ue						PE - N - L
Cross section		solid/stranded	mm2			1.5 - 2.5
Short-circuit protection device		max. MCB	A			C16
Control terminal (no SELV)						C - II - I - C
Cross section		solid/stranded	mm2			1.5 - 2.5
Maximum cable length		•	m			100
State information of locking (no SELV)						
Handle attached or motor operator locked		11-12-14 (C/O)			5A/	/250V/cosφ=1
Locking motor operator		23-24 (NO)			5A/	′250V/cosφ=1
Short-circuit protection device		Max. MCB	A			CZ
Protection degree						IP20
Operating temperature			°C			-25+55
Transportation and storage			°C			-40+70
temperature						
Max. altitude			m			2 000

¹⁾ Under nominal conditions

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Functionality in brief

 $The \ amplified \ diagram \ illustrate \ the \ basic \ functionality \ and \ application \ of \ these \ switch \ products.$

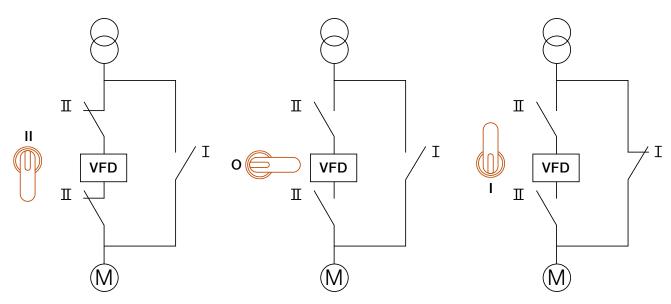


ABB Compact ATS

Compact without compromise

The Compact ATS by ABB is just that - it's a compact, economical and innovative all-in-one device that delivers all the safety and performance you would expect from an automatic transfer switch... and more. 100% ease and efficiency in a 40% more compact package. You can now get the high ABB quality you know and trust, at a competitive price.



Compact automatic transfer switches

— Automatic transfer switches functionality

OTM_C_D products overview	OTM_C20D_	OTM_C21D_			
Features	х	х			
Rated operational voltage Ue	154 V AC -	480 V AC +/- 20% + N			
Rated frequency		50 / 60 Hz +/- 10%			
Voltage sensing precision		5%			
Frequency sensing precision		1%			
Rated impulse withstand voltage, Uimp		6 kV			
Overvoltage category		III			
Pollution degree		2			
Protection rating for the front panel		IP20			
Operating temperature		– 20+ 60 °C			
Transportation and storage temperature	-25+ 80 °C				
Altitude		Max. 2000m			
Humidity With condensation		5 %98 %			
Humidity Without condensation		5 %90 %			
Operation Types					
Manual operation with handle	x	×			
Local operation with front panel keypad		X			
Automatic transfer switching equipment (ATSE)	x	X			
Applications					
Transfer between two transformers	x	×			
Transfer between a transformers and a generator		X			
Operation modes					
Automatic transfer and back-switching operation	x	X			
Automatic transfer and manual back-switching operation	×	X			
Source failure detections					
No voltage	x	X			
Undervoltage	Fixed 0.7Ue	0.7-0.95 Ue			
Overvoltage	Fixed 1.3Ue	1.05-1.3 Ue			
Phase missing	x	×			
Voltage unbalance		X			
Invalid frequency		X			
Configuration					
By DIP switches	x	X			
By rotary switches		X			
Two power status display	x	X			
Two switches status display	×	X			
Auto status display	×	X			
Alarm display	×	X			

Compact automatic transfer switches

— Automatic transfer switches functionality

OTM_C_D products overview	OTM_C20D_	OTM_C21D_
Time delays		
Delay on transfer ³⁾		0-30s
Back-switching delay		0-900s
Generator stop delay		30s,400s
Signals input and output		
Emergency Off with 24VDC signal input	x	х
Test signal input		х
Switch position signal	With auxiliary contacts	Without auxiliary contact
Alarm output signal		Х

 $^{^{\}scriptsize 3)}$ Overvoltage and undervoltage conditions

Compact ATS

Easy use and installation





02 DIN- Rail mounting



Compact automatic transfer switches OTM40...125_

Compact automatic transfer switches

						Switch size
Data according to IEC 60947-3			_	OTM40_	ОТМ63_	OTM125_
Rated insulation voltage and rated operational voltage AC20/DC20		Pollution degree 3	V	800	800	800
Dielectric strength	-	50 Hz 1min.	kV	6	6	6
Rated impulse withstand voltage		001122111111	kV	8	8	8
Rated thermal current and rated	/ ambient 40°C	In open air	A	40	63	125
operational current AC20/DC20	/ ambient 40°C	· · · · · · · · · · · · · · · · · · ·	A	40	63	125
	/ ambient 60°C		A	32	50	100
with minimum conductor cross section	/ ambient oo c	Cu	mm²	10	16	50
Rated operational current, AC-21A		up to 500 V	A	40	63	125
Rated operational current, AC-21A	-	690 V	A	40	63	125
Rated operational current, AC-22A		up to 500 V	A	40	63	125
Rated operational current, AC 22A	-	690 V	A A	40	63	125
Rated operational current, AC-23A		up to 415 V	A	40	63	90
Rated operational current, AC 23A	-	500 V	A	40	60	70
	-	690 V	A	40	40	50
Rated operational current / poles in series,	DC-21A	up to 48 V	A	40/1	63/1	125/1
kated operational current / poles in series,	DC-21A	110 V	A	40/1	63/2	125/1
	-	220 V	A	40/4	63/4	100/4
Rated operational current / poles in series,	DC 22A	up to 48 V	A	40/1	63/1	125/1
kated operational current / poles in series,	DC-22A	<u>'</u>	A	-		· ·
	-	110 V		40/2	63/2	125/2
Dated enerational current / poles in series	DC 224	220 V	Α	40/4	63/4	80/4
Rated operational current / poles in series,	up to 48 V	A	40/1	63/1	125/1	
	-	110 V	A	40/2	63/2	125/2
Detection of the second AC 22A1)		220 V	A	40/4	63/4	63/4
Rated operational power, AC-23A ¹⁾ The kW-ratings are accurate for 3-phase	-	230 V	kW	7.5	15	22
1500 R.P.M. standard asynchronous	-	400 V	kW	18.5	30	45
motors	-	415 V	kW	18.5	30	45
	-	500 V	kW	22	37	45
		690 V	kW	37	37	45
Rated breaking capacity in category AC-23	-	up to 415 V	A	320	504	720
	-	500 V	A	320	480	560
Debend on a distingual objects of contributions to		690 V	Α	320	320	400
Rated conditional short-circuit current Ip (r.m.s.) and corresponding max. allowed	Ip (r.m.s.) 50 kA, 415 V	îc (peak)	kA	16.5	16.5	16.5
cut-off current îc (peak) value.	Max. OFA_ fuse size	gG/aM	A/A	125/125	125/125	125/125
The cut-off current îc refers to values	Ip (r.m.s.) 18 kA, 690 V	îc (peak)	kA	11	11	11
listed by fuse manufacturers (single	Max. OFA_ fuse size	gG	Α	125	125	125
phase test acc. to IEC60269).	Ip (r.m.s.) 50 kA, 690 V	îc (peak)	kA	10	10	10
	Max. OFA_ fuse size	gG/aM	A/A	63/63	63/63	63/63
Rated short-time withstand current	Icw (r.m.s.)	690 V 1s	kA	2.5	2.5	2.5
Rated short-time making capacity2)	Icm (peak)	690 V	kA	3.6	3.6	3.6
Power loss / pole	With rated current		W	1.6	2.8	6.3
Mechanical endurance	Number of oper. cycles ³⁾		Cycles	10 000	10 000	10 000
Cable size	Cu-wire size suitable for terminal clamps		mm²	2.5-25/2x2.5-16	10-70	10-70
	·		AWG	14-4/2x14-6	8-00	8-00
Terminal tightening torque	Counter torque required	_	Nm	6	6	6
	Typical for 3-pole				_	
Operating torque	switches		Nm	5	5	5
Weight without accessories	3-pole switch		kg	1.75	1.75	1.75
	4-pole switch		kg	2.00	2.00	2.00

Introducing TruONE® ATS from ABB

A critical breakthrough for critical power

The all-new TruONE® is the world's first true purposebuilt automatic transfer switch, engineered to incorporate switch and controller in one seamless unit.

Performance tested beyond standard requirements, TruONE® stands ready to ensure the steady delivery of critical power at all times. Its self-contained design reduces the number of wires and connections, which speeds installation and minimizes the potential for connection failures to ensure best-in-class reliability. Its predictive maintenance and modular components reduce downtime and service costs. And its advanced connectivity is ready for the future. In addition, unlike typical ATS solutions, TruONE® allows emergency manual operation under load for immediate power restoration in the event of an equipment malfunction.



TruONE ATS OX200...1600E, open style

General performance

						Switch size	е		
Data according to IEC 60947-6-1 (Class PC equ	ripment)			OX200	OX250	OX315	OX400	OX500	
Rated insulation voltage, Ui (power circuit)			٧			1 000			
Rated insulation voltage, Ui (electronics)			V	500					
Rated frequency, f			Hz			50-60			
Rated impulse withstand voltage, Uimp (power	circuit)		kV		8 12				
Rated impulse withstand voltage, Uimp (electro	onics)		kV			6			
Conventional free air thermal current, Ith	/ ambient 40°C		Α	200	250	315	400	500	
Conventional enclosed thermal current, Ithe	/ ambient 40°C		Α	200	250	315	400	500	
Minimum enclosure size or equivalent volume		WxHxD	mm			600 x 800 x 3	00		
Contact transfer time I-II, II-I	Load interrupting time		ms	<50					
Operating transfer time I-II, II-I			ms			<500			
ATS current draw during transfer / time duration	on		A/ms		3	7 /<110		40 / <130	
Mechanical endurance	No. of operating cycles ³⁾			6012	6012	4012	4012	3012	
Power loss / pole			W	5.8	9.7	12.1	20.3	17.2	
Overvoltage category				II.	II				
Pollution degree (control circuit)			PD 3	up to 415 V /	PD 2 up to 500	V			
Environment category				E	Ē				
Minimum conductor cross section	Cu		mm²	95	120	185	240	2x150	
Terminal bolt size	Metric thread diameter x leng	gth	mm	M8 × 25	M8 × 25	M10 × 30	M10 × 30	M12 × 40	
Terminal tightening torque	Counter torque required		Nm	1522	1522	3044	3044	5075	
	2-pole switch		kg	12.4	12.4	13.3	13.3	16.9	
Weight without accessories	3-pole switch		kg	14	14	15.4	15.4	19.1	
	4-pole switch		kg	15.6	15.6	17.5	17.5	21.4	
Suitable for applications		Transfor	rmer - Tra	ansformer, Tr	ansformer - Gei	nerator4)			

2 pole construction - Operating performance and short-circuit capability

						Switch siz	e	
Data according to IEC 60947-6-1 (Class PC equ	ipment)	OX200	OX250	OX315	OX400	OX500		
Rated operational voltage, U	'		Vac			200 - 240		'
Operating voltage range, U		Vac 160 - 288						
Rated operational current, AC-31B	,	up to 240 V	Α	200	250	315	400	500
Rated operational current, AC-33B		up to 240 V	Α	200	250	315	400	500 ¹⁾
Rated breaking capacity in category AC-33		up to 240 V	Α	A 2000 2500 3150 4000 5000				
Barrier and the second state of the second sta	Iq (r.m.s.) 100 kA, 240 V	î (peak)5)	kA	39	39	56	56	90
Rated conditional short-circuit current Iq	Max. OFA_fuse size	gG/aM	A/A	315	315	500	500	1000
(r.m.s.) and corresponding protective devices (fuse or circuit breaker)	Iq (r.m.s.) 50 kA, 240 V		Vac 200 - 240 Vac 160 - 288 240 V A 200 250 315 400 240 V A 200 250 315 400 240 V A 2000 2500 3150 4000 240 V A 2000 2500 3150 4000 Jk) ⁵⁾ kA 39 39 56 56 M A/A 315 315 500 500 T5L630 T5L630 T5L630 T5L630 0.1s kA 12 12 18 18 0.3s kA 12 12 18 18					
(luse of circuit breaker)	ABB circuit breaker type			T5L630	T5L630	T5L630	T5L630	T6L1000
	Icw (r.m.s.)	240 V 0.1s	kA	12	12	18	18	18
Rated short-time withstand current	Icw (r.m.s.)	240 V 0.3s	kA	12	12	18	18	18
	lcw (r.m.s.)	240 V 0.5s	kA					18
Rated short-time making capacity ²⁾	Icm peak	240 V	kA	24	24	36	36	36

${f 3}$ and ${f 4}$ pole construction - Operating performance and short-circuit capability

						Switch size	•	
Data according to IEC 60947-6-1 (Class PC equ	ipment)			OX200	OX250	OX315	OX400	OX500
Rated operational voltage, U	'		Vac			200 - 415		
Operating voltage range, U			Vac			160 - 576		
Rated operational current, AC-31B	,	up to 415 V	Α	200	250	315	400	500
Rated operational current, AC-32B		up to 415 V	Α	200	250	315	400	500
Rated operational current, AC-33B		up to 415 V	Α	200	250	315	400	500
Rated breaking capacity in category AC-33		up to 415 V	Α	2000	2500	3150	4000	5000
Rated operational current, AC-33iA ⁶⁾		up to 415 V	Α	125	125	250	250	500
· ·	Iq (r.m.s.) 100 kA, 500 V	î (peak)5)	kA	49	49	69	69	90
Barrada a adulta a dalla a rata di a di a cara da di a	Max. OFA_fuse size	gG/aM	A/A	400 / 400	400 / 400	630 / 630	630 / 630	1000 / 100
Rated conditional short-circuit current Iq (r.m.s.) and corresponding protective devices	Iq (r.m.s.) 50 kA, 500 V						400 400 400 400 400 250 69	
(fuse or circuit breaker)	ABB circuit breaker type			T5L630	T5L630	T6L630	T6L630	T6L1000
(luse of circuit breaker)	Iq (r.m.s.) 85 kA, 500 V							
	ABB circuit breaker type							
	Icw (r.m.s.)	415 V 0.1s	kA	18	18	25	25	42
Rated short-time withstand current	Icw (r.m.s.)	415 V 0.3s	kA	18	18	25	25	30
	Icw (r.m.s.)	415 V 0.5s	kA					30
Rated short-time making capacity ²⁾	Icm peak	415 V	kA	36	36	52.5	52.5	89

 $^{^{\}mbox{\tiny 1)}}$ OX_B bottom entry versions only

³ Operating cycle: O - I - O - II - O
4 Contact ABB for applications with smaller than 20kVA gensets.

⁵⁾ Cut-off current îc (peak) value. The cut-off current îc refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).

⁶⁾ AC-33iA according to GB/T 14048.11

TruONE ATS OX200...1600E, open style

General performance

						Switch size	•			
Data according to IEC 60947-6-1 (Class PC e	equipment)			OX630	OX800	OX1000	OX1250 OX160 OX1			
Rated insulation voltage, Ui (power circuit)			V			1 000				
Rated insulation voltage, Ui (electronics)			V			500				
Rated frequency, f			Hz	50-60						
Rated impulse withstand voltage, Uimp (pov	ver circuit)		kV	12						
Rated impulse withstand voltage, Uimp (elec	ctronics)		kV			6				
Conventional free air thermal current, Ith	/ ambient 40°C		Α	630	800	1000	1250	1600		
Conventional enclosed thermal current, Ithe	/ ambient 40°C		Α	630	800	1000	1250			
Minimum enclosure size or equivalent volum	e	WxHxD	mm	600 x	800 x 300		800 x 1000 x 300			
Contact transfer time I-II, II-I	Load interrupting time ms <50									
Operating transfer time I-II, II-I			ms <500							
ATS current draw during transfer / time dura	ation		A/ms			40 / <130				
Mechanical endurance	No. of operating cycles ³⁾			3012	3012	3012	3012	3012		
Power loss / pole			W	28	47	14	26	49		
Overvoltage category						III				
Pollution degree (control circuit)					PD 3 u	o to 415 V / PD 2	up to 500 V			
Environment category						E				
Minimum conductor cross section	Cu		mm²	2 × 185	2 × 240	3x185	3x240	3x240		
Terminal bolt size	Metric thread diameter x le	ength	mm	M12 × 40	M12 × 40	M12 × 40	M12 × 40	M12 × 40		
Terminal tightening torque	Counter torque required		Nm	5075	5075	5075	5075	5075		
	2-pole switch		kg	16.9	16.9					
Weight without accessories	3-pole switch		kg	19.1	19.1	31.1	31.1	31.1		
	4-pole switch		kg	21.4	21.4	37.1	37.1	37.1		
Suitable for applications	·	Tra	nsformer - 1	Transformer, T	ransformer - Ge	nerator4)				

2 pole construction - Operating performance and short-circuit capability

				Swit	ch size
Data according to IEC 60947-6-1 (Class PC equip	ment)			OX630	OX800
Rated operational voltage, U			Vac	200	- 240
Operating voltage range, U			Vac	160	- 288
Rated operational current, AC-31B		up to 240 V	Α	630	800
Rated operational current, AC-33B		up to 240 V	Α	630 ¹⁾	8001)
Rated breaking capacity in category AC-33		up to 240 V	Α	63001)	80001)
Data di ann diti anni alcunt ainn it annont la (nun a)	Iq (r.m.s.) 100 kA, 240 V	î, (peak)5)	kA	90	90
Rated conditional short-circuit current Iq (r.m.s.) and corresponding protective devices (fuse or	Max. OFA_ fuse size	gG/aM	A/A	1000	1000
and corresponding protective devices (ruse or circuit breaker)	Iq (r.m.s.) 50 kA, 240 V	<u> </u>			
circuit breaker)	ABB circuit breaker type			T6L1000	T6L1000
	Icw (r.m.s.)	240 V 0.1s	kA	18	18
Rated short-time withstand current	Icw (r.m.s.)	240 V 0.3s	kA	18	18
	Icw (r.m.s.)	240 V 0.5s	kA	18	18
Rated short-time making capacity ²⁾	Icm peak	240 V	kA	36	36

3 and 4 pole construction - Operating performance and short-circuit capability

						Switch size		
Data according to IEC 60947-6-1 (Class PC equ	ipment)			OX630	0X800	OX1000	OX1250	OX1600
Rated operational voltage, U			Vac			200 - 415		
Operating voltage range, U			Vac			160 - 576		
Rated operational current, AC-31B		up to 415 V	Α	630	800	1000	1250	1600
Rated operational current, AC-32B		up to 415 V	Α	630	800/7207)	1000	1250	1500/1250 ⁷
Rated operational current, AC-33B		up to 415 V	Α	630	800/7207)	1000	1250	1250
Rated breaking capacity in category AC-33	up to 415 V	Α	6300	8000/72007)	10000	12500	12500	
Rated operational current, AC-33iA ⁶⁾	up to 415 V	Α	630	630	1000	1250	1250	
	Iq (r.m.s.) 100 kA, 500 V	î, (peak)5)	kA	90	90	95	95	95
Board on all the collaboration of the first of the	Max. OFA_fuse size	gG/aM	A/A	1000 / 1000	1000 / 1000	1600 / 1250	1600 / 1250	1600 / 1250
Rated conditional short-circuit current Iq	Iq (r.m.s.) 50 kA, 500 V							
(r.m.s.) and corresponding protective devices (fuse or circuit breaker)	ABB circuit breaker type			T6L1000	T6L1000			
(luse of circuit breaker)	Iq (r.m.s.) 85 kA, 500 V							
	ABB circuit breaker type					T7L1600	T7L1600	T7L1600
	Icw (r.m.s.)	415 V 0.1s	kA	42	42	65	65	65
Rated short-time withstand current	Icw (r.m.s.)	415 V 0.3s	kA	30	30	50	50	50
	Icw (r.m.s.)	415 V 0.5s	kA	30	30	50	50	50
Rated short-time making capacity ²⁾	Icm peak	415 V	kA	89	89	105	105	105

 $^{^{1)}}$ OX_B bottom entry versions only

²⁾ Short circuit duration > 50ms, without fuse protection

³⁾ Operating cycle: O - I - O - II - O

⁴⁾ Contact ABB for applications with smaller than 20kVA gensets

⁵⁾ Cut-off current îc (peak) value. The cut-off current îc refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).

⁶⁾ AC-33iA according to GB/T 14048.11 ⁷⁾ OX_B bottom entry type rating / OX_T top entry type rating

TruONE ATS OX200...1250E, enclosed style

Enclosed automatic transfer switches

					Swit	ch size		
Data according to IEC 60947-6-1 (Class PC ed	quipment)			OX200	OX250	OX315	OX400	
Rated operational voltage, U			Vac		200) - 415	,	
Operating voltage range, U			Vac		160	- 576		
Rated insulation voltage, Ui (power circuit)			V	1 000				
Rated insulation voltage, Ui (electronics)			V					
Rated frequency, f			Hz		50	- 60		
Rated impulse withstand voltage, Uimp (pov	wer circuit)		kV		8		12	
Rated impulse withstand voltage, Uimp (ele-	ctronics)		kV			6		
Conventional free air thermal current, Ith	/ ambient 40°C		А	200	250	315	400	
Conventional enclosed thermal current, Ithe	/ ambient 40°C		Α	200	250	315	400	
Enclosure size	WxHxD		mm		610 x 8	310 x 300		
Rated operational current, AC-31B		up to 415 V	Α	200	250	315	400	
Rated operational current, AC-32B		up to 415 V	Α	200	250	315	400	
Rated operational current, AC-33B		up to 415 V	Α	200	250	315	400	
Rated breaking capacity in category AC-33		up to 415 V	Α	2000	2500	3150	4000	
Rated conditional short-circuit	Iq (r.m.s.) 100 kA, 500 V	îc (peak)4)	kA	49	49	69	69	
current Iq (r.m.s.) and corresponding	Max. OFA_ fuse size	gG/aM	A/A	400 / 400	400 / 400	630 / 315	630 / 630	
protective devices (fuse or circuit breaker)	Iq (r.m.s.) 50 kA, 500 V							
	ABB circuit breaker type			T5L630	T5L630	T6L630	T6L630	
Rated short-time withstand current	Icw (r.m.s.)	415 V 0.1s	kA	18	18	25	25	
	lcw (r.m.s.)	415 V 0.3s	kA	18	18	25	25	
	Icw (r.m.s.)	415 V 0.5s	kA					
Rated short-time making capacity ¹⁾	Icm peak	415 V	kA	36	36	52,5	52,5	
Contact transfer time I-II, II-I	OFF time / load interrupting time		ms		<	50		
Operating transfer time I-II, II-I			ms		<	500		
ATS current draw during transfer / time dura	ation		A / ms		37 ,	/ <110		
Mechanical endurance	No. of operating cycles ²⁾			6012	6012	4012	4012	
Overvoltage category						III	,	
Pollution degree				PD 3	up to 415 V	/ PD 2 up to	500 V	
Minimum conductor cross section		Cu	mm²	95	120	185	240	
Terminal bolt size	Metric thread diameter x length		mm	M8 × 25	M8 × 25	M10 × 30	M10 × 30	
Terminal tightening torque	Counter torque required		Nm	1522	1522	3044	3044	
National Australia Company		3-pole switch	kg	52	52	59	59	
Weight without accessories		4-pole switch	kg	52	52	59	59	
Suitable for applications			Transfe	ormer - Trans	former, Tra	nsformer - G	Generator ³⁾	

¹⁾ Short-circuit duration > 50ms, without fuse protection

²⁾ Operating cycle: O - I - O - II - O

³⁾ Please contact ABB for applications with smaller than 20 kVA gensets
4) Cut-off current îc (peak) value. The cut-off current îc refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).

TruONE ATS OX200...1250E, enclosed style

Enclosed automatic transfer switches

					Swite	ch size			
Data according to IEC 60947-6-1 (Class PC ed	quipment)			OX630	OX800	OX1000	OX1250		
Rated operational voltage, U			Vac		200	- 415			
Operating voltage range, U			Vac		160	- 576			
Rated insulation voltage, Ui (power circuit)			V	1 000					
Rated insulation voltage, Ui (electronics)			V	500					
Rated frequency, f			Hz	50 - 60					
Rated impulse withstand voltage, Uimp (pov	ver circuit)		kV			12			
Rated impulse withstand voltage, Uimp (elec	ctronics)		kV	6					
Conventional free air thermal current, Ith	/ ambient 40°C		A	630	800	1000	1250		
Conventional enclosed thermal current, Ithe	/ ambient 40°C		Α	630	700	1000	1150		
Enclosure size	WxHxD		mm	610 x 8	10 x 300	810 x 10	010 x 300		
Rated operational current, AC-31B		up to 415 V	A	630	700	1000	1150		
Rated operational current, AC-32B		up to 415 V	Α	630	700	1000	1150		
Rated operational current, AC-33B		up to 415 V	Α	630	700	1000	1150		
Rated breaking capacity in category AC-33		up to 415 V	Α	6300	7000	10000	11500		
Rated conditional short-circuit	Iq (r.m.s.) 100 kA, 500 V	îc (peak)4)	kA	90	90	95	95		
current Iq (r.m.s.) and corresponding	Max. OFA_ fuse size	gG/aM	A/A	1000 / 1000	1000 / 1000	1600 / 1 250	1600 / 125		
protective devices (fuse or circuit breaker)	Iq (r.m.s.) 50 kA, 500 V								
	ABB circuit breaker type			T6L1000	T6L1000	T7L1600	T7L1600		
Rated short-time withstand current	Icw (r.m.s.)	415 V 0.1s	kA	30	30	50	50		
	Icw (r.m.s.)	415 V 0.3s	kA	30	30	50	50		
	Icw (r.m.s.)	415 V 0.5s	kA	30	30	50	50		
Rated short-time making capacity ¹⁾	Icm peak	415 V	kA	63	63	105	105		
Contact transfer time I-II, II-I	OFF time / load interrupting	time	ms		<	50			
Operating transfer time I-II, II-I			ms		< ;	500			
ATS current draw during transfer / time dura	ation		A / ms		40 /	<130			
Mechanical endurance	No. of operating cycles ²⁾			3012	3012	3012	3012		
Overvoltage category						III			
Pollution degree				PD 3 up to 415 V / PD 2 up to 500 V					
Minimum conductor cross section		Cu	mm²	2 × 185	2 × 240	3 × 185	3 × 240		
Terminal bolt size	Metric thread diameter x len	gth	mm	M12 × 40	M12 × 40	M12 × 40	M12 × 40		
Terminal tightening torque	Counter torque required		Nm	5075	5075	5075	5075		
Weight without accessories		3-pole switch	kg	80	80	109	109		
weight without accessories		4-pole switch	kg	80	80	115	115		

¹⁾ Short circuit duration > 50ms, without fuse protection

²⁾ Operating cycle: O - I - O - II - O

³⁾ Please contact ABB for applications with smaller than 20kVA gensets

⁴⁾ Cut-off current îc (peak) value. The cut-off current îc refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).

TruONE® feature comparison

Main features in the table below. Consult ABB for more information.





Yes

Yes



Feature comparison

Incorrect phase sequence

	Level 2 controls	Level 3 controls	Level 4 controls
Ampere sizes available	IEC: 200-1600 A	IEC: 200-1600 A	IEC: 200-1600 A
	UL: 30-1200 A	UL: 30-1200 A	UL: 30-1200 A
Rated voltage	200-480Vac	200-480Vac	200-480Vac
Rated frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Phase system	Single and Three	Single and Three	Single and Three
Number of poles	2, 3 and 4	2, 3 and 4	3 and 4
Switched	Yes	Yes	Yes
Overlapping	No	Yes	Yes
Product type			
Open transition (I-II)	Yes	Yes	Yes
Delayed transition (I-O-II)	Yes	Yes	Yes
Voltage and frequency settings			
Pick up Voltage Source 1	Fixed 2% above drop out	81-99%, 101-119%	81-99%, 101-119%
Drop out Voltage Source 1	+/-5, 10, 15, 20%	80-98%, 102-120%	80-98%, 102-120%
Pick up Voltage Source 2	Fixed 2% above drop out	81-99%, 101-119%	81-99%, 101-119%
Drop out Voltage Source 2	+/-5, 10, 15, 20%	80-98%, 102-120%	80-98%, 102-120%
Pick up Frequency Source 1	Fixed 1% above drop out	80.5-99.5%, 100.5-119.5%	80.5-99.5%, 100.5-119.5%
Drop out Frequency Source 1	+/-5, 10 %	80-99%, 101-120%	80-99%, 101-120%
Pick up Frequency Source 2	Fixed 1% above drop out	80.5-99.5%, 100.5-119,5%	80.5-99.5%, 100.5-119.5%
Drop out Frequency Source 2	+/-5, 10 %	80-99%, 101-120%	80-99%, 101-120%
Override momentary Source 1 Outage, sec	0, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30	0-60	0-60
Transfer from Source 1 to Source 2, sec	Fixed 2 seconds	0-3600	0-3600
Override momentary Source 2 Outage, sec	Fixed 1,5 seconds	0-60	0-60
Transfer from Source 2 to Source 1, min	0, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30	0-120	0-120
Generator stop delay, min	30 secs or 4 mins	0-60	0-60
Center-OFF delay, sec	0 or 4	0-300	0-300
Pre-transfer delay S1 to S2, sec	No	0-60	0-60
Post-transfer delay S1 to S2 , sec	No	0-60	0-60
Pre-transfer delay S2 to S1, sec	No	0-60	0-60
Post-transfer delay S2 to S1, sec	No	0-60	0-60
Load shed delay, sec	No	0-60	0-60
Source failure detections			
No voltage	Yes	Yes	Yes
Undervoltage	Yes	Yes	Yes
Overvoltage	Yes	Yes	Yes
Phase missing	Yes	Yes	Yes
Voltage unbalance	Yes	Yes	Yes
Invalid frequency	Yes	Yes	Yes

Yes

TruONE® feature comparison







Feature comparison

	Level 2 controls	Level 3 controls	Level 4 controls
Features	·		
Controls	DIP + keys	LCD + keys	Touch + keys
LED indications for ATS, S1 and S2 status	Yes	Yes	Yes
Open transition - Standard digital inputs/outputs	0/1	1/1	2 / 1
Delayed transition - Standard digital inputs/outputs	1/1	2/1	3/1
Programmable digital inputs/outputs	No	Yes	Yes
Auto config (voltage, frequency, phase system)	Yes	Yes	Yes
Source priority	Source 1, No priority	Source 1/2, No priority	Source 1/2, No priority
Manual re-transfer	Yes	Yes	Yes
In-phase monitor (synchro check)	Yes	Yes	Yes
Genset exercising: on-load, off-load	Yes	Yes	Yes
In-built power meter module	No	No	Yes
Load shedding	No	Yes	Yes
Real time clock	No	Yes	Yes
Event log	No	Yes	Yes
Predictive maintenance	No	No	Yes
Voltage and current harmonics measuring	No	No	Yes
Field-mount accessories			
Auxiliary contacts for position indication	Yes	Yes	Yes
Digital input/output modules	No	Yes	Yes
12-24 Vdc aux supply module for controller	No	Yes	Yes
Communication modules	No	Yes	Yes
Connectivity			
Modbus RTU (RS-485)	No	Yes	Yes
Modbus/TCP	No	Yes	Yes
Profibus DP	No	Yes	Yes
ProfiNet	No	Yes	Yes
DeviceNet	No	Yes	Yes
Ethernet IP	No	Yes	Yes
IEC 61850	No	Yes	Yes
Monitoring via ABB Ability™: EDCS	No	Yes	Yes
For applications			
Mains - Mains	Yes	Yes	Yes

Zenith ATS

ZTS T-series Automatic Transfer Switches 30-3000 A

Zenith ZTS T-series technical data 1600-3000 A

				Zenitl	h switch size (A)	'
Data according to UL1008		'	1600	2000	2600	3000
Rated operational voltage		Vac			200-480	
Operating voltage range		Vac			160 - 576	
Rated frequency		Hz		'	50-60	
Emergency systems - Motor loads or to	А	1600	2000	2600	3000	
Optional standby systems - Motor load	ds or total system	Α	1600	2000	2600	3000
Contact transfer time I-II, II-I	Load interrupting time	ms		,	,	
Operating transfer time I-II, II-I		ms				
ATS current draw during transfer / tim	A / ms					
Suitable for applications			Trar	nsformer - Transf	ormer, Transforr	mer - Genera

ZTG T-series:

General purpose ATS for commercial, industrial, and infrastructure applications.

30-1200 A, 200-480 Vac, 1 and 3 phase, open (standard) or delayed transition, with Type 1, 3R, 4, 4X, and 12 enclosures.

1600-3000 A, 200-480 Vac, 3 phase, open (standard) or delayed transition, with Type 1, 3R, 4, 4X, and 12 enclosures.



Advanced ATS for mission critical applications such as data centers, critical infrastructure or industry, finance, and healthcare.

30-1200 A, 200-480 Vac, 1 and 3 phase, open (standard) or delayed transition, with Type 1, 3R, 4, 4X, and 12 enclosures

1600-3000 A, 200-480 Vac, 3 phase, open (standard), delayed, or closed transition, with Type 1, 3R, 4, 4X, and 12 enclosures

400-1200A, 200-480 Vac, 1 and 3 phase, closed transition, with Type 1, 3R, 4, 4X, and 12 enclosures.

ZBTS T-series:

Bypass/isolation ATS for mission critical applications requiring maintenance bypass such as hospitals and other key infrastructure.

100-1200 A, 200-480 Vac, 1 and 3 phase, open (standard) or delayed transition, with Type 1, 3R, 4, 4X, and 12 enclosures

1600-3000 A, 200-480 Vac, 3 phase, open (standard), delayed, and closed transition, with Type 1, 3R, 4, 4X, and 12 enclosures.



Technical data

EasyLine - XLP

	1-pole				XLP00			XLP1			XLP2			XLP3
	Rated operational voltage Ue AC	(V)	-	500	690	-	500	690	-	500	690	-	500	690
	Rated operational voltage Ue DC	(V)	220	-	=	220	-	-	220	-	-	220	-	-
	Rated operational current le	(A)	160	160	125	250	250	200	400	400	315	630	630	500
-	Thermal current with fuse-link Ith	(A)	160	160	160	250	250	250	400	400	-	630	630	-
	Utilization category		DC22B	AC22B	AC21B									
Č	Rated insulation voltage Ui	(V)			1000			1000			1000			1000
12	Rated impulse withstand voltage U _{imp}	(kV)			8			8			8			8
	Rated conditional short circuit current	(kArms)			50			50			50			50
	Rated frequency	(Hz)			50 - 60			50 - 60			50 - 60			50 - 60
	Power loss (Ith) without fuselink, per phase	(W)												
	Electrical durability				200			200			200			200
	Mechanical durability				1400			1400			800			800
	Degree of protection from	Open			IP20			IP20			IP20			IP20
	the front according to IEC60529	Closed			IP30			IP30			IP30			IP30

	2-pole				XLP00			XLP1		XLP2				XLP3		
	Rated operational voltage Ue AC	(V)	-	500	690	-	500	690	-	500	690	-	500	690		
	Rated operational voltage Ue DC	(V)	220	=	-	440	-	-	440	-	-	440	=	-		
	Rated operational current le	(A)	160	160	125	250	250	200	400	400	315	630	630	500		
	Thermal current with fuse-link Ith	(A)	160	160	160	250	250	250	400	400	-	630	630	_		
	Utilization category		DC22B	AC22B	AC21B											
	Rated insulation voltage Ui	(V)			1000			1000			1000			1000		
	Rated impulse withstand voltage Uimp	(kV)			8			8			8			8		
1.11	Rated conditional short circuit current	(kArms)	50					50			50			50		
	Rated frequency	(Hz)			50 - 60			50 - 60			50 - 60			50 - 60		
	Power loss (Ith) without fuselink, per phase	(W)														
	Electrical durability				200			200			200			200		
	Mechanical durability				1400			1400			800			800		
	Degree of protection	Open			IP20			IP20			IP20			IP20		
	from the front according to IEC60529	Closed			IP30			IP30			IP30			IP30		

3-pole				XLP000			XLP00		XLP1		XLP2	'	XLP3
Rated operational voltage U _e AC	(V)	400	500	690	400	500	690	500	690	500	690	500	690
Rated operational current I _e AC	(A)	80	100	50	125	160	125	250	200	400	315	630	500
Thermal current with fuse link I_{th}	(A)			100			160		250		400		630
Rated insulation voltage U _i	(V)			690			1000		1000		1000		1000
Rated impulse withstand voltage U _{imp}	(kV)			6			8		8		8		8
Rated conditional short circuit current	(kArms)			50			50		50		50		50
Rated making and breaking capacity		AC23B	AC22B	AC21B	AC23B	AC22B	AC21B	AC23B	AC22B	AC22B	AC21B	AC22B	AC21B
Rated frequency	(Hz)			50 - 60			50-60		50 - 60		50 - 60		50 - 60
Power loss at I _{th} without fuse link/per phase	(W)			1,4W			3,5W		7,5W		13W		24W
Max allowed poweloss in the Fuse per phase	(W)			7,5W			12W		23W		30W		48W
Electrical durability				300			200		200		200		200
Mechanical durability				1700			1400		1400		800		800
Degree of protection from the	Open			IP20			IP20		IP20		IP20		IP20
front acc. to IEC60529	Closed			IP30			IP30		IP30		IP30		IP30

	4-pole		XLP00	XLP1	XLP2	XLP3
	Rated operational voltage Ue AC		500	500	500	500
	Rated operational current le		160	250	400	630
	Thermal current with fuse-link Ith		160	250	400	630
	Utilization category		AC22B	AC22B	AC22B	AC22B
	Rated insulation voltage Ui	(V)	1000	1000	1000	1000
2	Rated impulse withstand voltage U _{imp}	(kV)	8	8	8	8
MARK	Rated conditional short circuit current	(kArms)	50	50	50	50
	Rated frequency	(Hz)	50 - 60	50 - 60	50 - 60	50 - 60
	Power loss (Ith) without fuselink, per phase	(W)				
	Electrical durability		200	200	200	200
	Mechanical durability		1400	1400	800	800
	Degree of protection from	Open	IP20	IP20	IP20	IP20
	the front according to IEC60529	Closed	IP30	IP30	IP30	IP30

Technical data

InLine II - Designed for the future

ABB is proud to introduce the latest technology of Fuse Switch Disconnectors to ensure the best stability and highest safety in the power distribution network. The new generation InLine II also offers the highest level of personal safety during operation and service.

O1 ON Closed position

O2 OFF -

Open position

03 Replacement of fuses position

Advantages

High level of personal safety by:
Safe and reliable operation ON/OFF
Safe and simple replacement of the NH fuse links
Universal terminal bolts offering standing bolt or
fixed nut for high flexibility of cable connections
Variants with integrated V-clamps
Available in two alternative heights (ZLBM/
ZHBM), L-version (ZLBM) will save space in Cable

Distribution Cabinets by offering reduced depth Easy installation of current transformers in the H-version (ZHBM)

Variants with non corrosive steel materials (stainless steel)

Designed for intelligent communication to support a high level of stability in the power distribution network



01





	ZLBM/ZHBM 00	ZLBM/ZHBM 1	ZLBM/ZHBM 2	ZLBM/ZHBM 3
(V)	400/500/690	400/500/690	400/500/690	400/500/690
(A)	160/160/125	250	400	630
(V)	1000	1000	1000	1000
(kV)	8	8	8	8
(kArms)	100	100	100	100
(kArms)	100	100	100	100
	AC23B/AC22B/ AC21B	AC23B/AC22B/ AC21B	AC23B/AC22B/ AC21B	AC23B/AC22B/ AC21B
(Hz)	50	50	50	50
Open	IP20	IP20	IP20	IP20
Closed	IP30	IP30	IP30	IP30
	(A) (V) (kV) (kArms) (kArms)	(V) 400/500/690 (A) 160/160/125 (V) 1000 (kV) 8 (kArms) 100 (kArms) 100 AC23B/AC22B/AC21B (Hz) 50 Open IP20	(V) 400/500/690 400/500/690 (A) 160/160/125 250 (V) 1000 1000 (kV) 8 8 (kArms) 100 100 (kArms) 100 100 AC23B/AC22B/AC22B/AC21B/AC21B/AC21B AC21B (Hz) 50 50 Open IP20 IP20	(V) 400/500/690 400/500/690 400/500/690 (A) 160/160/125 250 400 (V) 1000 1000 1000 (kV) 8 8 8 (kArms) 100 100 100 (kArms) 100 100 100 AC23B/AC22B/AC22B/AC22B/AC22B/AC22B/AC22B/AC21B AC21B/AC21B AC21B/AC21B (Hz) 50 50 50 Open IP20 IP20 IP20

Electronic Fuse Monitoring

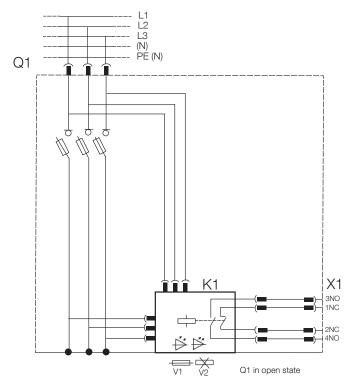
Real time monitoring and easy serviceability

The Electronic Fuse Monitor (EFM) gives a remote alarm at any fault conditions if a fuse is blown and allows faults to be located quickly.

- The EFM unit is self-supplied, which means no additional power supply is
- The EFM functionality is available up to 800 V AC.
- The fuse status is also visible on the product, with red and green LEDs.



InLine II with Electronic



Q1= Fuse switch disconnector K1= Fuse monitor (EFM)

V1= Fuses ok V2= Fuse(s) blown

X1= Multiplug terminals

Fuse status			Relay contact	ts	Relay contac	ts
	Green LED	Red LED	NO contact 1	1,12	NC contact 1	3,12
1. ON position			Open	Closed	Open	Closed
Fuses OK	*	•	X			X
Fuses BLOWN	•	*		Х	Х	
2. OFF position						
Fuses OK	•	•	X			X
Fuses BLOWN	•	•	Х			Х

Technical features

Control Fuse Base - BS type

Features:

- ABB fuse bases consisting of fuse carrier available in two ratings (20 & 32A) for accommodating BS type F1 size HRC (High Rupturing Capacity) fuselinks.
- Fuse bases conform fully to IEC 269/BS88.
- The VS fuse bases are with OFFN range of fuse links, having low powerloss provide protection for wide range of electrical equipments.

Construction:

- Fuse holders are made of high grade flame retardant, nonhygroscopic, phenolic moulding to IS 1300, BS 771 with a hard gloss surface, black finish.
- They are simple in construction with minimum number of components.
- Carrier contacts and base contacts are mounted using locating ridges formed on the mouldings, assuring perfect alignment.
- Type NS fuse-carriers have a single piece phosphor bronze clip, while type SM fusecarriers have a single piece pressed brass spin rivetted contact.
- The base is also made of a single piece extruded brass tinned contact having adequate size of cable hole to accommodate aluminium cable.

DIN Fuse Base

Technical Details

- Conforms to IEC 60269 / DIN 43620
- Range 6 to 630A (Size 00,1,2,3)
- Rated Voltage: 500V
- Breaking Capacity: 80 kA
- Rated Frequency: 50-60Hz







Wide range of enclosed switches

From 16 to 1600 Amperes, 690 V

Enclosed switches are designed and used as main switches for applications, which need to be isolated from the network. The range includes front operated and side operated switch disconnectors, switch fuses and change-over switches enclosed in plastic, steel sheet or stainless steel sheet and aluminum enclosures. They are rated for utilization categories including disconnecting as well as making and breaking the load. In addition the switch fuses equipped with fuse links protects the application and the cables from overload currents and short circuits.

Plastic enclosures

The plastic enclosures are most suitable for locations with high chemical and moisture requirements. In addition they are light and easy to install and handle.

Steel sheet enclosures

The steel sheet enclosures are hot dip galvanized and the surface is polyester powder painted. The enclosures are durable and robust for various environments.

Stainless steel sheet enclosures

The stainless steel sheet enclosures are made of

AISI 304 stainless steel. They are used particularly in the food and beverage industry and in locations where high hygienie is required. The smooth surface does not require any painting and is easy to clean.

Aluminum alloy enclosures

- Aluminum enclosures have very good impact strength and protection against UV light. They are suitable both for indoor and outdoor use in medium to heavy-duty applications.
- Safety for personnel reliable position indication
- Padlocking in the OFF-position with one, three
 or six (with the shackle L6) padlocks against
 unintentional start-up. The handle cannot be
 padlocked in the OFF-position if one of the
 contacts is not in the OFF position.
- The cover cannot be removed if the handle is padlocked.
- Door interlock in the ON-position.
- Arc proof, short circuit durability function: Expander washers in aluminium enclosures with le > 160 A and door locking release in large metal sheet enclosures type MSC.
- Door interlock defeatable with rectangular and pistol type handles.



Safety switches and enclosed switchdisconnectors

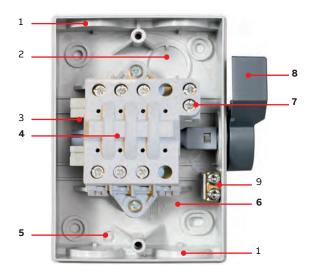
Overview

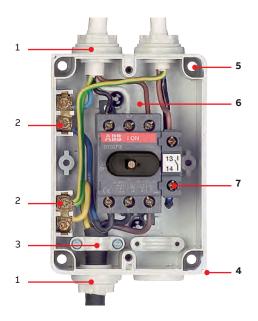
Side operated, type BW_, LBAS_, KSF_, KSE_

- Degree of protection: IP65, IEC 60529
- Degree of protection without cover: IP20
- Enclosure in PBT (Thermoplastic polyester) plastic, high impact strength and chemical resistant
- Flame class UL94 5VA, Glow wire 850° (IEC 60695-2-12)
- Resistance against UV-radiation: F 1, UL 746C
- Standard IEC 60947-3 for Switch-disconnectors
- European Standard EN60204 Safety of machinery
- Cable outlets M sized threaded knock-outs
- 2-, 3-, 4- and 6-pole versions
- Light grey/dark grey enclosure with grey handle
- Yellow enclosure have red handle
- Handle indication I-0/ON-OFF
- Suitable for 3-, 4- and 5-wire systems

Front operated, type OTP

- Degree of protection: IP65, IEC 60529
- Degree of protection without cover: IP20, IEC 60529
- Self-extinguishing plastic: UL94 V0
- Resistance against UV-radiation: F 1, UL 746C
- Standard IEC 60947-3 for Switch-disconnectors
- European Standard EN60204 Safety of machinery
- Cable outlets M or Pg sized threaded knock-outs
- Also blank gland plates available
- 3-, 4- and 6-pole versions
- Black or red-yellow handle
- Handle indication I-0/ON-OFF
- Suitable for 4- and 5-wire systems





1 Metric threaded knockouts, IP54 cable glands sealing plugs included | 2 Knockout in the back of the box | 3 Space for auxiliary contacts, (N.O./N.C.) | 4 Handle, axis and switch insert is one system factory assembled. Switch insert UL94 V0 and glow wire 960° (IEC 60965-2-12) | 5 Knockout for ventilation / Water drain holes | 6 Cable strip length | 7 Isolated neutral terminal with separate in/out connection | 8 Handle padlockable in "O" position as standard.Knockout for padlock in "I" position. Shackle for 6 padlocks | 9 PE-terminal

1 Knock-out openings for M threads on the top and bottom, separate threaded knock-out opening for control wires in enclosure sizes Width 130 mm and larger | 2 Terminals for 5-wire system: three phases + N + PE terminals | 3 Pull stoppers for two cables in 16 A enclosed switches | 4 Provision for sealing of the lid | 5 Enclosure mounting screws isolated from the inside housing | 6 Knock-out opening on the base for incoming cables | 7 Space for auxiliary contacts, (N.O./N.C.) (to be ordered separately)

Introduction

Kabeldon IP-system

Kabeldon IP-system consists of a unique, screenprotected busbar system which is combined with a broad range of switching devices and connectors.

Features of the Kabeldon IP-system are its simplicity and reliability. These are the most important factors when you want to achieve low operating costs and high delivery reliability in a distribution system.

Features - busbar system

- Busbars of continuously extruded aluminium sections, insulated with a layer of polyamid.
- The busbar has a screen-protected contact slot.
 This ensures safety regardless of where on the busbar the switching device is placed.
- Busbars are available with rated currents from 400 to 2500 A.
- IP2X: No entry of standard test finger to live parts.

Features – switching devices

- Can be arranged in any order, regardless of rated current.
- Switching devices 100 1600 A.
- All parts have a high degree of protection and are safe.
- Switching devices are mounted on and connected to the busbar system in the same operation.
- Switching devices can be connected when the system is live.
- Always voltage-free ("dead") when changing fuses.
- The width of Switching devices, connectors and busbars combine to form a modular system.
 Each module is 12.5 mm. The modular system makes planning easier.
- The compact design of the switching devices makes them suitable for use in many different types of distribution boards.
- All switching devices have a utilization category so that they can be used in cable distribution cabinets, substations and other low voltage distribution boards.





Cable distribution cabinets with switching devices and busbar systems.

Reference pictures

Application areas



 ${\bf Cable\ distribution\ boards\ at\ Hedens\ bandy\ rink,\ Gothenburg,\ Sweden.}$



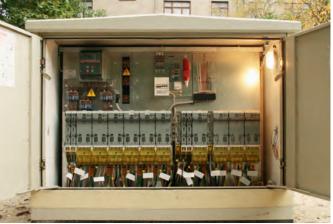
Distribution board in powder coated enclosure mounted on the wall in a switchgear room at a bakery, in Gothenburg, Sweden.



Cable distribution board, Sweden.



Kabeldon switching devices SLDL, Sweden, especially designed for CSS.



Kabeldon switching devices in a CSS, Latvia.



Examples of using Kabeldon products on the wall in low voltage switch gear, Sweden.

ABB's comprehensive range of

LV control products

The range of ABB control products ranks amongst the most extensive on the market with a full range of innovative solutions for control & protection, motor starting, intelligent motor management, measurement and monitoring and connection applications.

The business unit is comprised of 3 main product families :

- · Control & protection
- Electronic relays
- Safety devices

Our products

Our products are already among the most extensive in the market and we are constantly adding new products in order to meet ever changing customer needs.

Quality and reliability are built into every device to ensure total performance satisfaction, even in the most demanding applications.

We offer a very modern and competitive range of contactors, starters, manual motorstarters, a wide range of electronic relays and overload relays, together with an extended program of pilot devices.

Our offering

- Contactors
- · Manual motor starters
- · Thermal overload relays
- · Electronic overload relays
- · Intelligent motor management systems
 - Universal motor controllers
- Electronic products and relays
 - Timers
 - Measuring and monitoring relays
 - Power supplies
 - Interface relays & optocouplers
- Jokab safety systems
- · Pilot devices
- · Limit switches
- Softstarters



AF technology

Main benefits





Conventional AC coil Energy AF coil 80% Reduced coil consumption

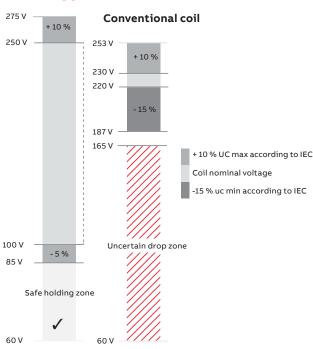
Reliable in all networks

The electronic system within the AF contactor continuously monitors the current and voltage apply to the coil. The contactor is safely operated in an always optimized condition and is hum-free.

Reduced coil consumption

AF coil and energy consumption is reduced up to 80%. This allows a reduction of the temperature rise, the size of control transformers and size of cabinets.

AF coil







Wide control voltage range

With conventional contactor technology, different contactors are needed for different network voltages. Thanks to the wide operating range of the AF contactor, it can operate just as well in Europe as in Asia or North America. The core coil of the AF contactor range covers 100-250 V AC / DC, 50 / 60 Hz.

Built-in surge suppression

With conventional contactor technology, it is recommended to use an external surge suppressor, an accessory that could cost as much as half of the contactor. With the AF technology, the surges are handled by the contactor and never reach the control circuit. One less product and one less complication to worry about.

Select AF contactor dedicated to your control circuit application







Direct coil control

Contactor coils are operated directly with an auxiliary contact or PLC-output or indirectly through an interface relay. For direct coil control, the switching capacity of coil operating device (auxiliary contact, solid state PLC-output, ...) must be verified versus the coil consumption at closing and at holding.

AF09...AF2850 - 4 to 400kW - AC / DC operated

			AF09AF370)	Coil cod
		275.17	2460 V	AC / DC	11
Ī	+ 10%	— 275 V	48130 V	AC / DC	12
ı	1 10 70	— 250 V	100250 V	AC / DC	13
			250500 V	AC/DC	14
			AF400AF1	250	
			2460 V	DC	68
			48130 V	AC / DC	69
		1001/	100250 V	AC / DC	70
ı	- 15%	— 100 V	250500 V	AC / DC	71
	1570	— 85 V			
			AF1350AF2	2850	
			100250 V	AC / DC	70

- · AC / DC operation
- · Wide control voltage range
- With built-in surge protection

AF09Z...AF38Z designed for PLC - 4 to 18.5 kW - 24 V DC operated

Voltage range Coil code 24 V DC

- Allow direct control by 24 V DC ≥ 250 mA PLC-output
- Pull-in consumption 6 W 250 mA
- Holding consumption 1.7 W
- · N.O. contact opening time 29 ms and closing time 53 ms
- · With built-in surge protection

AF09Z...AF38Z for specific applications - 4 to 18.5 kW - AC / DC operated



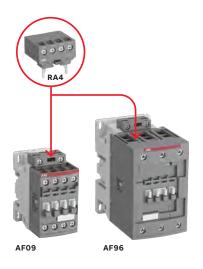
Voltage ran	ge	Coil code
1260 V	DC	20
2460 V	AC / DC	21
48130 V	AC / DC	22
100250 V	AC / DC	23

- Coil 20 covers 12 ... 20 V DC applications
- Coil allow direct control by 24 V DC ≥ 500 mA PLC-output
- Coil 21, 22 and 23 can withstand short voltage sags ans dips with reference to SEMI F47 conditions of use
- · With built-in surge protection

Select your AF coil interface for PLC

For contactors up to 2850 A AC-1 / general use

Coil interfaces are offered to operate all contactor sizes up to AF2850 with very low PLC output signals. They allow a galvanic isolation between the PLC circuit and the contactor coil circuit.





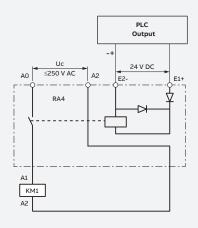
Interface relay

For control with 24 V DC \geq 20 mA PLC output. RA4 interface relay can be used for rated control circuit voltages Uc 24 ... 250 V 50/60Hz with the standard AF contactors up to 45 kW - 400 V / 60hp - 480 V and with NF contactor relays.

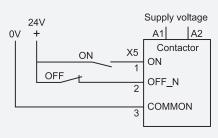
Built-in PLC interface

For control with 24 V DC \geq 10 mA PLC output. The built-in PLC interface operates the 100 ... 250 V AC / DC or 250 ... 500 V AC / DC AF contactor coil. Available for AF contactors from 55 kW - 400 V / 75 hp up to 560 kW - 400 V /900 hp 480 V and up to 2850 A AC-1 / General use. Dedicated coil code from AF116 up to AF370 and standard feature from AF400 up to AF2850.

Control circuit with interface relay



Control inputs with PLC plug



Protection and control

To keep things running you need control



- Fuseless motor protection up to 80 A $\,$
- Designed to perfectly combine with ABB contactors
- · Harmonized accessory range



- 3-pole and 4-pole AC / DC electronic control coil from 9 up to 2850 A AC-1, 500 kW AC-3
- GAF contactors for solar application
- UA...UA..RA for capacitor switching
- · AFS contactors for safety applications



- Up to 20 A AC-1 / 5.5 kW AC-3 400 V
- Flattest mini contactors on the market
- 3 different connecting terminals available
- · Wide accessories assortment



- Compact and powerful up to 7.5 kW AC-3
- Designed for OEMs
- Specially suitable for motor control application



- · Thermal and electronic type
- Up to 200 A (thermal) and 1250 A (electronic)
- · Direct mounting to AF contactors



- Monitoring of the winding temperature of motors which have PTC temperature sensors installed
- Evaluation of various motor conditions such as overheating, overload and insufficient cooling
- ATEX approval available for the use in hazardous areas



- Increases the short-circuit breaking capacity of downstream devices
- Ideal solution for group protection



- For machine or wall mounting motor starter
- Up to 7.5 kW
- Robust IP66 and type 4X enclosure



- Forward and reverse running, motor protection, emergency stop
- Space saving up to 90% with only 22.5mm width
- Up to 75% reduced time in wiring and installation: less error-prone wiring



- Provision of detailed operational, diagnostic and service data continuously
- Effective data source for modern predictive maintenance systems in any plant
- Seamless integration into ABB Ability™
 System 800xA platform



- · Co-ordination type 1 and 2 for
 - Direct-on-line starting
 - Reversing starters
 - Start-delta starters
- Full range of connecting kits

General overview motor protection and control

3-pole contactors

B mini contactors

Contactors











IEC (1)	AC-3 Rated operational power	er θ ≤ 60 °C (2), 400 V	kW	4	5.5	4	5.5	7.5	11	15	18.5	18.5	22	30	
UL/CSA	3-phase motor rating	480 V	hp	3	5	5	7.5	10	15	20	25	30	40	50	
AC / DC	Control supply		Type	_	_	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF5	2 AF65	
AC Cont	rol supply	☆	Туре	В6	В7	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF5	2 AF65	
DC Cont	rol supply	卓	Туре	BC6	ВС7	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF5	2 AF65	
IEC	AC-3 Rated operational current	θ ≤ 60 °C (2), 400 V	Α	8.5	11.5	9	12	18	26	32	38	40	53	65	
	AC-1 Rated operational current	$\theta \le 40 ^{\circ}\text{C}, 690 \text{V}$	Α	20 (400 V)	20 (400 V)	25	28	30	45	50	50	70	100	105	
UL/CSA	General use rating	600 V	Α	12 (300 V)	16	25	28	30	45	50	50	60	80	90	
NEMA	NEMA Size			_	_	00	0	_	1	_	_	2	_	_	

(1) 1000 V IEC ratings available for AF80, AF96 and AF146 ... AF2650 contactors. (2) θ \leq 55 °C for mini contactors and AF400 ... AF2650 contactors.

Main accessories											
Auxiliary contact blocks	Front mounting	CAF6	CA4-10 (1 x N.O.)								
			CA4-01 (1 x N.C.)								
	Side mounting	CA6	CAL4-11 (1 x N.O	. + 1 x N.C.)							
Timers	Electronic		TEF4-ON								
			TEF4-OFF								
Interlocking units (3)	Mechanical		VM4		VM96-4						
	Mechanical / Electrical		VEM4								
Connection sets	For reversing contactors	BSM6-30	BER16-4	BER38-4	BER65-4						
Surge suppressors	Varistor (AC/DC)	RV-BC6	Built-in surge pro	otection							
	RC type (AC)										
	Transil diode (DC)	RD7									

(3) See available reversing contactors VB6, VB7 and VAS09 ... VAS16.

Overload relays

Thermal relays	A Lie	Class 10 (Class 10A for TF140, TA200DU)	T16 (0.1016 A)	TF42 (0.1038 A)		TF65 (2267 A)	
Electronic relays	33.49	Class 10E, 20E, 30E	E16DU (0.1018.9 A)	EF19 (0.1018.9 A)	EF19 (0.1018.9 A) EF45 (945 A)	EF65 (2070 A)	
Accessories (for single mounting)		Thermal relays	DB16	DB42		DB65 (only for TF65)	
		Electronic relays	DB16E	DB19EF	DB45EF		

Manual motor starters

1222	Thermal / magnetic protection Class 10	MS116 (0.1032 A) Ics up to 50 kA for class 10A			MS165 (1080 A lcs up to	*	
		MS132 (0.1032 A) Ics up to 100 kA					
	Magnetic only types	MO132 (0.1632A)			MO165 (1680 A	.)	
					lcs up to	100 kA	
Accessories	For contactor mounting	BEA7/132	BEA16-4	BEA38-4		BEA65-4 (4)	



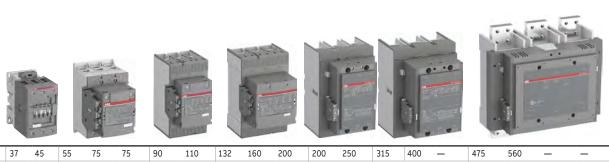












37	45	55	75	75	90	110	132	160	200	200	250	315	400	_	475	560	_	_	_
60	60	75	100	100	125	150	200	250	300	350	400	500	600	_	800	900	_	_	_
AF80	AF96	AF116	AF140	AF146	AF190	AF205	AF265	AF305	AF370	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650	AF2850
AF80	AF96	AF116	AF140	AF146	AF190	AF205	AF265	AF305	AF370	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650	AF2850
AF80	AF96	AF116	AF140	AF146	AF190	AF205	AF265	AF305	AF370	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650	AF2850
80	96	116	140	146	190	205	265	305	370	400	460	580	750	_	860	1060	_	_	_
125	130	160	200	225	275	350	400	500	600	600	700	800	1050	1260	1350	1650	2050	2650	2850
105	115	160	200	200	250	300	350	400	520	550	650	750	900	1210	1350	1650	2100	2700	2850
3	_	_	4	_	_	_	5	_	_	_	6	_	7	_	_	8	_	_	_

		,		,				
CAL19-11 (1 x N.O. + 1 x N.C.)				CAL18-11 (1 x N.O. + 1 x N.C.)				
VM19 (for same size contactors)				VM750H VM750V	VM1650H			
BER96-4	BER140-4	BER205-4	BER370-4	BEM460-30	BEM750-30			

TF96	TF140DU	TA200DU				
(4096 A)	(66142 A)	(66200 A)				
	θ ≤ 55 °C	θ ≤ 55 °C				
EF96	EF146	EF205	EF370 (115380 A)	EF460	EF750	EF1250DU
(20100 A)	(54150 A)	(63210 A)		(150500 A)	(250800 A)	(3501250 A)
DB96		DB200				
DB96						

3-pole contactors, for motor control and power switching







IEC (1)	AC-3 Rated operational power	θ ≤ 55 °C, 415 V	kW	4	5.5	7.5	11	15	18.5	
UL/CSA	3-phase motor rating	480 V	hp	5	7.5	10	20	25	30	
AC Contr	ol supply	\$	Type	А9	A12	A16	A26	A30	A40	
IEC	AC-3 Rated operational current	θ ≤ 55 °C , 415 V	Α	9	12	17	26	32	37	
	AC-1 Rated operational current	θ ≤ 40 °C, 690 V	Α	25	27	30	45	55	60	
UL/CSA	General use rating	600 V	Α	21	25	30	40	50	60	

(1) 1000 V IEC ratings available for A50 \dots A185 contactors.

Main accessories					
Auxiliary contact blocks	Front mounting	CA5-10 (1 x N.O.)			
		CA5-01 (1 x N.C.)			
	Side mounting	CAL5-11 (1 x N.O. + 1 x N.C.)			
Timers	Electronic	TEF5-ON			
		TEF5-OFF			
		TE5S (for star-delta starters - direct timing - separate mounting)			
Interlocking units	Mechanical	VM5-1			
	Mechanical / Electrical	VE5-1			
Surge suppressors	Varistor (AC/DC)	RV5 (24440 V)			
	RC Type (AC)	RC5-1 (24440 V)			

Overload relays



Thermal relays

Trip class 10A

TA25DU-M (0.10...32 A)

TA42DU-M (18...42 A)

Electronic relay T	Trip class 10E, 20E, 30E	E16DU-(0.3218.9 A)	E45DU-(945 A)
N	Mounting kit	DB16E	DB45E

Manual motor starters



Thermal / magnetic protection Class 10

MS116 (0.10...32 A)

lcs up to 50 kA for class 10 A

MS132 (0.10...32 A)

lcs up to 100 kA

MS165 (10...32A) Ics up to 100 kA

Magnetic only types

MO132 (0.16...32 A) Ics up to 100 kA

MO165 (16-32A) Ics up to 100 kA









22	30	37	45	55	75	90	110	132	160	200
40	60	60	60	75	100	125	150	200	250	300
A50	A63	A75	A95	A110	A145	A185	AF205	AF265	AF305	AF370
50	65	75	96	110	145	185	205	265	305	370
100	115	125	145	160	250	275	350	400	500	600
80	90	105	125	150	230	250	300	350	400	520

CAL18-11 (1 x N.O. + 1 x N.C.)

CAL19-11 (1 x N.O. + 1 x N.C.)

	VM300H VM300V	VM19
VE5-2		
RC5-2 (24440 V)	RC5-3 (250440 V)	

TA75DU-M (18...80 A)

TA80DU-M (29...80 A) TA110DU-M (66...110 A)

TA200DU-M (66...200 A)

E80DU-(2780 A)	E140DU (50140 A)	EF205DU (63210 A)	EF370DU (115380 A)
DB80E	DB140E		

Short-circuit protection devices

Tmax Circuit breaker and accessories

MS165 (42...65A) Ics up to 50 kA









MO165 (42-65A) Ics up to 50 kA MO165 (73-80A) Ics up to 30 kA

3-pole contactors, for motor control and power switching





AX09 AX40

							Size 1		Size 2
IEC (1)	AC-3 Rated operational power	Ø ≤ 55 °C, 415 V	kW	4	5.5	7.5	11	15	18.5
AC Contro	ol supply	卒	Туре	AX09	AX12	AX18	AX25	AX32	AX40
IEC	AC-3 Rated operational current	Ø ≤ 55 °C, 415 V	Α	09	12	18	25	32	40
	AC-1 Rated operational current	Ø ≤ 40 °C, 690 V	А	22	25	27	32	55	60
(1) 1000 V	IEC ratings available for AX260 A	X370 contactors.							
Main acce	essories								
Auxiliary contact blocks		Front mounting							
	•	Side mounting							
Timers	Ī	Electronic							
Interlockir	ng units	Mechanical							VM5-1
IIICEIIOCKII	ing units	Mechanical / Electrica	I						VE5-1
Surge sup	pressors	Varistor (AC / DC)							
	F	RC type (AC)						RC5-1 (24440 V)
Overload		Class 10A							
Thermal re	elays	Class IUA						TA25DU-M ((0.1032 A)
	a to							TA42DU-M	I (1842 A)
	relays	Class 10E,20E,30E			E16DU(0.10	18 9Δ)		E/150	DU(945A)

Manual motor starte	ers			
		Thermal / magnetic protection Class 10	MS116 (0.1032 A) lcs up to 50 kA for class 10 A	
000			MS132 (0.1032 A) lcs up to 100 kA	
				MS165 (1032A) Ics up to 100kA
partie partie		Magnetic only types	MO132 (0.1632 A) Ics up to 100 kA	
				MO165 (1632A) Ics up to 100kA
21 12 11				









AX80 AX95 AX185 AX370

Size			Size 5		Size 4			Size 3				
20	160	132	110	90	75	55	45	37	30	22		
AX37	AX300	AX260	AX205	AX185	AX150	AX115	AX95	AX80	AX65	AX50		
37	305	265	205	185	150	115	96	80	65	50		
60	500	400	275	250	190	160	145	125	115	100		
						CA5X-10 (1 × N.O.) CA5X-01 (1 × N.C.)						
CAL1			+ 1 x N.C.)	L18X-11(1 x N.O.	CA				_5X-11 (1 x N.O.	CAL		
							TEF5-ON TEF5-OFF					
VM1			VM300H									
					VE5-2 24440 V)	D)/5/						
						RV5 (
			50440 1)	1100 5 (2.	L+++0 V)	NC3 E (
			66200 A)	TA200DU-M (6		(2980 A)	TA80DU-M	(1880 A)	TA75DU-M			
						66110 A)	TA110DU-M (
380 A)	EF370 (115		(63210A)	EF205(50140A)	E80DU(2780A) E140DU(50140A)						

		Short-c	ircuit protection devices
		Tmax Circui	t breaker and accessories
	The state of the	5 5 5	2 - marin
MS165 (4265A) Ics up to 50kA			re location of the
MO165 (4265A) Ics up to 50kA			
MO165 (7380A) Ics up to 30kA			

3-pole contactors, for motor control and power switching









							40000		0 75						
		47-	Туре	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF52	AF65	AF80	AF96	
IEC AC-3	Rated operational Current pov	ver 220-230-240V	KW	2.2	3	4	6.5	9	11	11	15	18.5	22	25	
	θ ≤ 60 °C for AF09AF370 θ ≤ 55 °C for AF400AF2650	380-400 V	KW	4	5.5	7.5	11	15	18.5	18.5	22	30	37	45	
		415 V	KW	4	5.5	9	11	15	18.5	22	30	37	45	55	
		440 V	KW	4	5.5	9	15	18.5	22	22	30	37	45	55	
		500 V	KW	5.5	7.5	9	15	18.5	22	22	30	37	45	55	
		690 V	KW	5.5	7.5	9	15	18.5	22	22	30	37	45	55	
		1000 V	KW	-	-	-	-	-	-	-	-	-	-	-	
	Rated operational current	380-400 V	Α	9	12	18	26	32	38	40	53	65	80	96	
AC - 1	Rated operational current	θ ≤ 40 °C, 690 V	A	25	28	30	45	50	50	70	100	105	125	130	
UL/CSA		120V	hp	0.75	1	1.5	2	2	2	3	3	5	7.5	7.5	
OL/C3A	1-phase motor rating	240 V	hp		2	3	3			7.5	10	15	15	20	
	3-phase motor rating	200-208 V	hp		3	5	7.5	10	10	10	15	20	25	30	
		220-240 V	hp	2	3	5	7.5	10	10	15	20	25	30	30	
		440-480 V	hp	5	7.5	10	15	20	25	30	40	50	60	60	
		550-600 V	hp	7.5	10	15	20	25	30	40	50	60	75	75	
	General use rating	600 V	Α	25	28	30	45	50	50	60	80	90	105	115	
NEMA	NEMA Size			00	0	-	1	-	-	2	-	-	3	-	
Auxiliary co	ntact blocks	Front mounting				lO (1 x N O1 (1 x N									
		Side mounting		CAL4-	-11 (1 x N	.O.+ 1 x N	I.C.)								
Timers		Electronic				TEF4 -0	NC								
					Т	EF4 -0	FF								
Interlock un	its	Mechanical				VI	M4				VMS	96-4			
		Mechanical/ Electron	nical			VEI	M4								
Connection	sets	For reversing contac	tors			BER16	5-4		BER3	8-4	BER6	5-4	BER	96-4	
Surge suppr	essor	Varistor + RC (AC / D	(C)	Built -	in surg	e proto	ction								
Thermal ove	rload relays	cla	ass 10	TF42(0	.1038	3A)				Т	F65(22	267 A)	TF96	(4096 A	4)
	rioad relays	(Class 10A for TF140, TA2)													
Electronic o	verload relays	class 10E, 20E	E, 30E	EF19(0.	118.9	9A)			.18.9A) 45 A)		F65(20)70 A)	EF96(36100 A	A)
	Т	hermal /magnetic prote	ction ass 10	les in	N o to 50	IS116,(lcs	M up to 1	IS 165			
		Cia	133 10	ics u		IS132 (103	up to 1	OOKA			
						lcs u	p to 10	0 kA							
	10024														
E	120	Magnetic only 1	types		М	0132 (0.163	82 A)				O 165			
	0									lcs	up to 1	00 kA			
- 4	Eller Allers														
Accessories		For contactor mou	nting	E	BEA16-	4	BEA	38-4							













AF116	AF140	AF146	AF190	AF205	AF265	AF305	AF370	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650 A	AF2050	AF2650
30	37	45	55	55	75	90	110	110	132	160	220		257	315		
55	75	75	90	110	132	160	200	200	250	315	400		475	560		
55	75	75	90	110	132	160	200	220	250	355	425		500	600		
75	90	90	110	132	160	160	200	220	250	355	450		560	670		
75	90	90	110	132	160	200	250	250	315	400	520		560	700		
55	75	90	132	160	200	250	315	315	355	500	600		750	900		
		75	110	132	132	132	132	220	280	355	400					
116	140	146	190	205	265	305	370	400	460	580	750		860	1060	1060	
160	200	225	275	350	400	500	600	600	700	800	1050	1260	1350	1650	2050	2650
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
30	40	40	50	60	75	100	125	125	150	200	250	-				
40	50	50	60	75	100	125	150	150	200	250	300	-	400	450		
75	100	100	125	150	200	250	300	350	400	500	600		800	900		
100	125	125	150	200	250	300	350	400	500	600	70	-	1000	1150		
160	200	200	250	300	350	400	520	550	650	750	900	1210	1350	1650	2100	2700
	4						5			6	7			8		
·																

CAL19-11(1 x N.O.+ 1 x N.C.) CAL18-11(1 x N.O.+ 1 x N.C.)

 VM19 (For same size contactor)
 VM750H VM750V
 VM1650H

 BER140-14
 BER205-14
 BER370-4
 BEM460-30
 BEM750-30

TF140DU(66143 A)	TA 200DU(66200 A)					
EF146 (54150 A)	EF205(63210 A)	EF370(115380 A)	EF2460(150500 A)	EF750(250300 A)	EF1250DU (3751250 A)	

Short-circuit protection devices

MCCB and switch-fuses









4-pole contactors









IEC	AC-rated operational Current	θ ≤ 40 °C, 690 V	Α		
UL/CS	A General use rating	600 V	Α		
AC/D	Control supply	₽	Туре		
AC Co	4	Туре			
DC Control supply					
IEC	AC-1 Rated operational Current	θ ≤ 40 °C	Α		
	690 V	$\theta \leq 60 ^{\circ}C(1)$	Α		
		$\theta \leq 70 ^{\circ}\text{C}$	Α		
With conductor cross sectional area					
Rated operational voltage Ue max					

125	100	70	55	45	30	25
105	80	60	55	45	30	25
AF80	AF52	AF40	AF38	AF26	AF16	AF09
AF80	AF52	AF40	AF38	AF26	AF16	AF09
AF80	AF52	AF40	AF38	AF26	AF16	AF09
125	100	70	55	45	30	25
105	80	60	45	40	30	25
90	70	50	37	32	26	22
50	35	35	16	10	6	4
690	690	690	690	690	690	690

— Main accessories

Auxiliary contact blocks	Front mounting			
	Side mounting			
Timers	Electronic			
Interlock units	Mechanical			
	Mechanical/ Electronic			
Surge suppressor	Varistor + RC (AC / DC)			

	CA4-10(1 X N.O.), CA4-01(1 X N.C.)
	CAL4-11(1 X N.O. + 1 X N.C.)
	TEF4 -ON
	TEF4-OFF
VM96-4	VM4
	VEM4
	Built -in surge protction

AC Control supply	₽	Type	А9	A16	A26	A45	A50	A75
DC Control supply		AL9	AL16	AL26	AF45	AF50	AF75	
IEC AC-1 Rated operation	onal current θ ≤ 40 °C, 690 V	Α	25	30	45	70	100	125
					4 N.O. Ma	in poles		4 N.O. Main poles
Main accessories			i	2NO + 2NC Ma	in poles		2NO + 2NC Main Poles	
Auxiliary contact blocks	Front mounting							CA5-10 (1 x N.O.) CA5-01 (1 x N.C.)
	Side mounting						CAL	5-11 (1 x N.O. + 1 x N.C.)
Timers	Electronic							TEF5-ON TEF5-OFF
		_		TE5S (for	star-delta star	ters - dire	ect timin	g - separate mounting)
Interlocking units	Mechanical					VM5-1		
	Mechanical / Electrical					VE5-1		VE5-2
Surge suppressors	Varistor (AC/DC)							RV5 (24440 V)
	RC Type (AC)				RC5-1 (24.	440 V)		RC5-2 (24440 V)







 $[\]theta \le 55$ °C for EK550, EK 1000 contactors









1000	800	525	500	400	350	275	200	160	
-	540	420	350	300	250	230	175	160	
-	-	AF370	AF305	AF265	AF205	AF190	AF140	AF116	
EK1000	EK550	AF370	AF305	AF265	AF205	AF190	AF140	AF116	
EK1000	EK550	AF370	AF305	AF265	AF205	AF190	AF140	AF116	
1000	800	525	500	400	350	275	200	160	
800	650	425	400	350	300	250	175	145	
720	575	350	325	290	240	200	160	130	
2 X 300	2 X 240	2 X 185	300	240	240	150	95	70	
1000	1000	1000	1000	1000	1000	1000	690	690	

CAL19-11(1XN.O.+1XN.C.)	CAL16-11(1XN.O.+1XN.C.)
-------------------------	-------------------------

VM19(FOR SAME SIZE CONTACTOR)

VH800

RC-EH800

Installation contactor

Introduction

ABB offers a complete range of equipment for controlling, remote switching and protecting electrical installations in buildings as hotels, hospitals, shopping centers, office centers and domestic applications.

ESB and EN installation contactors are designed to match the Modular DIN rail components for common use in dedicated panels providing high safety and finger protection.

The range

The ESB range includes 6 ratings from 16 A to 100 A with 2 to 4-pole version. The EN contactor range offers 3 types from 20 A to 40 A with an additional manual switch in front.

Flexible use for many application

- Resistive loads such as electric heaters, water heaters, etc.
- Motors, pumps
- Lamp switching and controls (Building installtion)

Features and benefits

- AC/ DC coil connection
- High comfort due to hum-free operation
- High protection against overvoltages and current peaks
- Compact and optimized design, DIN rain mounting



Techincal description

ESB16 ESB20 ESB25 ESB40 ESB63 ESB100
- EN20 EN25 EN40 -
16A 20A 25A 40A 63A 100A

Aux contact block EH04-20 - 2NO

Aux contact block EH04-11 - 1NO + 1NO

Mini contactors





Þ						
coil consumption 3.5w	Туре	В6	В7	-	-	
coil consumption 3.5w	Туре	-	-	VB6	VB7	
coil consumption 3.5w	Type	В6	B7	VB6A ²⁾	VB7A ²⁾	
coil consumption 3.5w	Туре	вс6	BC7 B7D ¹⁾	-		
coil consumption 1.4 2.4 w	Type	BC6	ВС7	-		
coil consumption 3.5w	Туре	-	-	VBC6	VBC7	
coil consumption 3.5w	Туре	BC6	B7D	VBC6A ²⁾	VBC7A ²⁾	
extended coil voltage and temperature	Туре	-	ТВС7			
coil consumption 1.7w	Туре	B6S ¹⁾	B7S1)			
22-230-240 V	kW	2.2	3	2.2	3	
380-400V	kW	4	5.5	4	5.5	
400 V θ ≤ 40°C	Α	20	20	20	20	
220-240 V AC	hp	2	3	2	3	
440-480	hp	3	5	3	5	
	Α	12(300 V)	16(600 V)	12(300 V)	16(600 V)	
	coil consumption 3.5w coil consumption 3.5w coil consumption 3.5w coil consumption 1.4 2.4 w coil consumption 3.5w coil consumption 3.5w extended coil voltage and temperature coil consumption 1.7w 22-230-240 V 380-400V 400 V θ ≤ 40°C 220-240 V AC	coil consumption 3.5w Type coil consumption 3.5w Type coil consumption 3.5w Type coil consumption 1.4 2.4 w Type coil consumption 3.5w Type coil consumption 3.5w Type coil consumption 3.5w Type extended coil voltage and temperature coil consumption 1.7w Type 22-230-240 V kW 380-400V kW 400 V 0 ≤ 40°C A 220-240 V AC hp 440-480 hp	coil consumption 3.5w Type - coil consumption 3.5w Type B6 coil consumption 3.5w Type BC6 coil consumption 1.4 2.4 w Type BC6 coil consumption 3.5w Type - coil consumption 3.5w Type BC6 extended coil voltage and temperature Type - coil consumption 1.7w Type B65¹¹¹ 22-230-240 V kW 2.2 380-400V kW 4 400 V θ ≤ 40°C A 20 220-240 V AC hp 2 440-480 hp 3	coil consumption 3.5w Type - - coil consumption 3.5w Type B6 B7 Coil consumption 3.5w Type BC6 BC7 B7D ¹³ Coil consumption 1.4 2.4 w Type BC6 BC7 Coil consumption 3.5w Type - - Coil consumption 3.5w Type BC6 B7D extended coil voltage and temperature Type - TBC7 Coil consumption 1.7w Type B6S ¹³ B7S ¹³ Coil consumption 1.7w Type B6S ¹³ B7S ¹³ 22-230-240 V kW 2.2 3 380-400V kW 4 5.5 400 V \oplus ≤ 40°C A 20 20 220-240 V AC hp 2 3 440-480 hp 3 5	coil consumption 3.5w Type - - VB6 coil consumption 3.5w Type B6 B7 VB6A²) Coil consumption 3.5w Type BC6 BC7 B7D¹¹) - coil consumption 1.4 2.4 w Type BC6 BC7 - coil consumption 3.5w Type - - VBC6A²¹ extended coil voltage and temperature Type - TBC7 coil consumption 1.7w Type B6S¹¹) B7S¹¹ coil consumption 1.7w Type B6S¹¹) B7S¹¹ 22-230-240 V kW 2.2 3 2.2 380-400V kW 4 5.5 4 400 V θ ≤ 40°C A 20 20 20 220-240 V AC hp 2 3 2 440-480 hp 3 5 3	coil consumption 3.5w Type - - VB6 VB7 coil consumption 3.5w Type B6 B7 VB6A²² VB7A²² Type BC6 BC7 B7D³³ - - Type BC6 BC7 - - Type BC6 B7D VBC6A²³ VBC7A²³ Type BC6 B7D VBC6A²³ VBC7A²³ Type BC6 B7D VBC6A²³ VBC7A²³ Type B65³³ B7S³³ VBC7A²³ Type B65³³ B7S³³ S Type B65³³ B7S³³ S Type B65³³ B7S³³ S 22-230-240 V kW 2.2 3 2.2 3 380-4000 kW 4 5.5 4 5.5 400 V 6 ≤ 40°C A 20 20 20 20

 $\theta_{\mbox{\sc with integrated surge suppressor}}$ 2 with safety blocking function

Main accessories

Auxiliary contact blocks	Front mounting	CAF6
	Side mounting	CA6
Connection sets	For reversing contactors	BSM6-30
Surge suppressor	Varistor (AC/DC)	RV-BC6

Overload relay

Thermal overload relays	class 10	T16			
Thermal and phase failure protection, with single setup possible					
Electronic overload relays	class 10E, 20E, 30E	E16DU			
With single setup possible					

Manual motor starters

Thermal /magnetic protection	class 10	MS116, MS132
Magnetic only types		MO132
Connecting link to manual motor starters		BEEA7/132

Contactor relays



			Screw terminals	
AC Control supply	卓			
4-pole contractor relays	coil consumption 3.5w	Туре	К6	
DC Control supply				
4-pole contractors	coil consumption 3.5w	Туре	KC6	
4-pole interface contractors	coil consumption 1.4 2.4 w	Туре	KC6	
wide range types	extendedcoil volage and temperature	Туре	TKC6	
PLC types	coil consumption 1.7w 2.8 w	Туре	K6S	
IEC Rated operational power AC- 15	22-230-240	/ A	4	
TEC Rated operational power AC-13	380-400	/ A	3	
Rated operational power AC- 13	24\	/ A	2.5	

Main accessories

Main accessories					
Auxiliary contact blocks	Front mounting	CAF6			
	Side mounting	CA6-11K			









Flat pins				Soldering pins			
-	-	В6F	B6F	-	-	В7Р	В6Р
VB7F VB7AF ²⁾	VB6F VB6AF ²⁾	-	-	VB7P VB7AP ²⁾	VB6P VB6AP ²⁾	-	-
		-	-	-	-	-	-
-	-	BC7F	BC6F	-	-	B7DP ¹⁾	ВС6Р
-	-	BC7F	BC6F	-	-	ВС7Р	ВС6Р
VBC7F	VBC6F	-	-	VBC7P VBC7AP ²⁾	VBC6P VBC6AP ²⁾	-	-
VB7AF ²⁾	VBC6AF ²⁾	-	-				-
3 5.5 20 3 5	2.2	3	2.2	3	2.2	3	2.2
5.5	4	5.5	4	5.5	4	5.5	4
20	20	20	20	12	12	12	12
3	2	3	2	3	2	3	2
	3	5	3	5	3	5	3
16(600 V)	12(300 V)	16(600 V)	12(300 V)	16(600 V)	12(300 V)	16(600 V)	12(300 V)

	<u> </u>
-	-
CA6-11K-P	CA6-11K-F
•	-
•	-

MS116, MS132	MS116, MS132
MO132	MO132





Soldering pins	Flat pins
K6	K6F
KC6P	KC6F
KC6P	KC6F
4	4
3	3
2.5	2.5

CA6-11K-P	CA6-11K-F

M mini contactors





			The state of the s		Al-street	
			Screw terminals		Screw terminals	
					for ring to	ngue ferrules
AC Control supply						
3-pole contactors	Coil consumption (50 Hz) 5.3 VA	Туре	MC1AT	MC2AT	MC1AR	MC2AR
4-pole contactors	Coil consumption (50 Hz) 5.3 VA	Туре	MC1AT	MC2AT	MC1AR	-
DC Control supply	卓					
3-pole contactors	Coil consumption 3 W	Туре	MC1CT	MC2CT	MC1CR	-
3-pole low consumption contactors	Coil consumption 1.2 / 2 W	Type	MC1IT / MC1KT	MC2IT / MC2KT	MC1KR	-
3-pole extended limits coil contactors	Coil consumption 4 W	Type	MC1CTW	MC2CTW	-	-
4-pole contactors	Coil consumption 3 W	Type	MC1CT	-	MC1CR	-
4-pole low consumption contactors	Coil consumption 1.2 / 2 W	Type	MC1IT / MC1KT	-	MC1KR	-
4-pole extended limits coil contactors	Coil consumption 4 W	Type	MC1CTW	MC2CTW	_	-
EC Rated operational power AC-3	230 V	kW	2.2	3	2.2	3
	400 V	kW	4	5.5	4	5.5
	500 V	kW	4	5.5	4	5.5
	690 V	kW	4 (1)	4 (1)	4 (1)	4 (1)
Rated operational current AC-	1 400 V, θ ≤ 55 °C	Α	20	20	20	20
UL/CSA 3-phase motor rating	200 V AC	hp	3	3	3	3
	240 V AC	hp	3	3	3	3
	380-425 V AC	hp	3	5	3	5
	440-480 V AC	hp	5	7.5	5	7.5
	500-600 V AC	hp	5	10	5	10
General use rating		Α	20 (600 V)	20 (600 V)	20 (600 V)	20 (600 V)
Main accessories						
Auxiliary contact blocks	Front mounting		MACN / MARN			
	Side mounting		MACL / MARL			
Electronic timers			MREBC			
Connection sets	For reversing contactors		WKMIU			
Surge suppressors			MP0			
Overload relays						
Thermal overload relays		Class 10	T16			
Thermal and phase failure protection, v	vith single setup possible					

(1) Valid for N.O. contacts only.

Electronic timers

Surge suppressor

M mini contactor relays





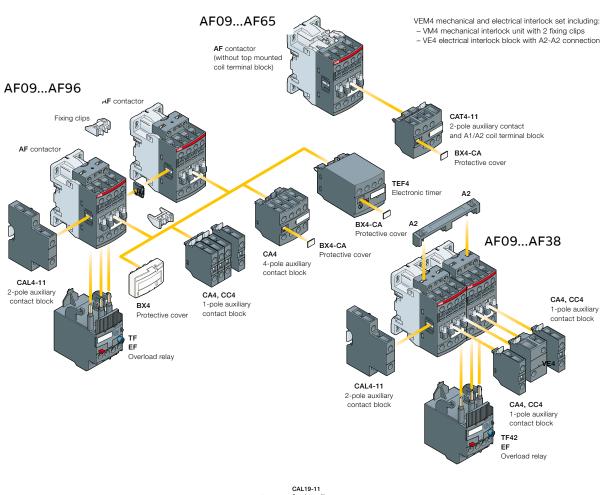
			A STATE OF THE STA	Jan
			Screw terminals	Screw terminals for ring tongue ferrules
AC Control supply	₽			
4-pole contactor relays	Coil consumption (50 Hz) 5.3 VA	Type	MCRAT	MCRAR
DC Control supply	卓			
4-pole contactor relays	Coil consumption 3 W	Type	MCRCT	MCRCR
4-pole low consumption contactor relays	Coil consumption 1.2 / 2 W	Type	MCRIT / MCRKT	MCRKR
4-pole extended limits coil contactor relays	Coil consumption 4 W	Type	MCRCTW	-
IEC Rated operational current AC-15	240 V	Α	6	6
	400 V	Α	4	4
Rated operational current DC-13	24 V	Α	5	5
UL/CSA Pilot duty			A600, Q600	
Main accessories				
Auxiliary contact blocks	Front mounting		MARN	
	Side mounting		MARL	
ela ancianta eta ancia			MADEDO	

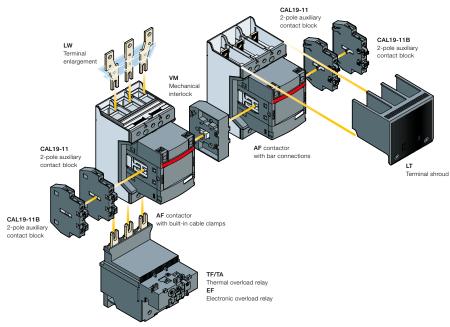
MREBC

MP0

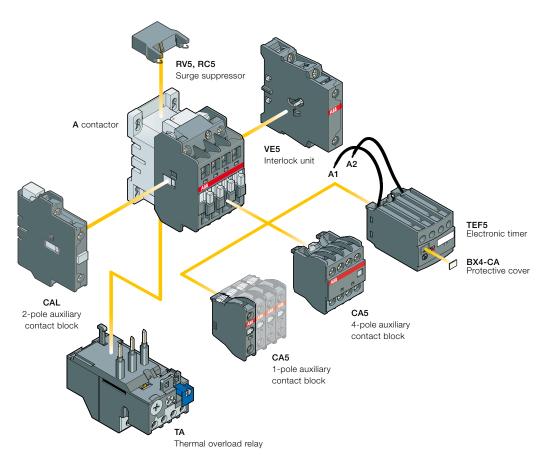
Contactors accessory overview

AF contactor main accessories

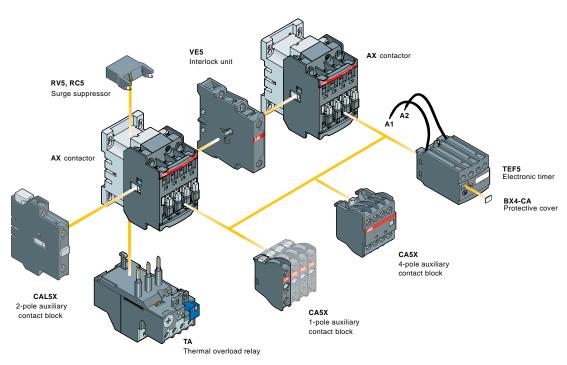




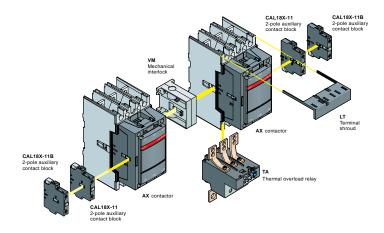
A range contactor main accessories



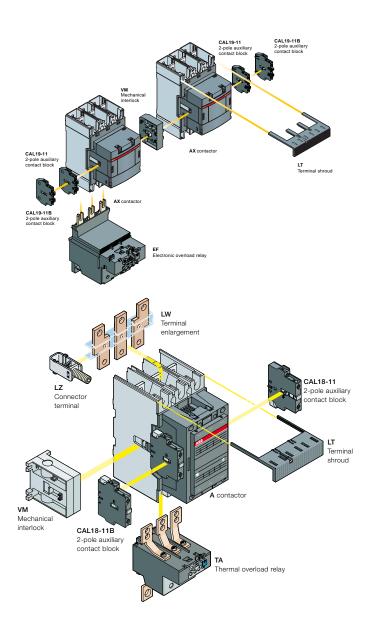
AX contactor main accessories



AX185, AX205



AX260 ... AX370



MS and MO manual motor starters

A complete motor protection concept









Fuseless protection saves costs, space and ensures a quick reaction under overload and short-circuit condition by switching off the motor within milliseconds. The full range of motor starters offer protection from 0.1 A to up to 100 A. The new family range has a harmonized range of accessories and offers the same features up to 80 A.



Protection and control

Protect equipment and installations

ABB offers a broad range of manual motor starters, for protection and control in almost every situation including hazardous areas, protecting installations from short-circuits, overloads and phase failures while also controlling the current flow through a simple ON/OFF switch.



Continuous operation

Secure uptime

Fuseless motor protection reduces maintenance costs and downtimes by avoiding fuse replacement after faults. Furthermore, MS132 and MS165 feature a magnetic trip indicator making troubleshooting easier.



Speed up your projects

Simplified design

Manual motor starters can be connected easily with ABB contactors or soft starters using the respective accessory. Additionally, the main range of accessories is shared across multiple starters (both with screw and Push-in Spring terminals available), making logistics and planning simpler.

MS and MO manual motor starters

A complete motor protection concept

Troubleshooting made easy

MS132 and MS165 feature a magnetic trip indicator. This way, every tripping event will be distinguished, making troubleshooting a lot easier and faster.

High performance in compact size

MS132 and MS165 manual motor starters cover short-circuit breaking capacities up to 100 kA. In addition, every manual motor starter is temperature compensated up to 60 $^{\circ}\text{C}.$



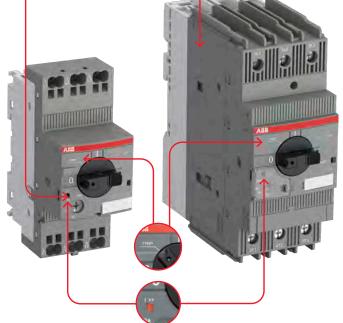
Right solution for your application

MS116 offers protection up to 32 A and a breaking capacity up to 100 kA - all in a 45 mm wide housing. They are designed to meet requirements of most standard applications



All-in-one

ABB offers fuseless protection against short-circuits, phase failures and overloads including disconnect function - all in one single compact product





Protection wherever you are

Manual motor starters are suitable for worldwide use. The wide range of certifications covers standards like IEC (CB), cULus, CCC, EAC and various ship approvals. MS132 and MS165 also apply to ATEX standards for hazardous areas.



Ready for IE3 motors

MS116/MS132/MO132/MS165/MO165 comply with the latest IE3 N/H and NE/HE motors. NE/HE requires utilization category AC-3e.



Just push it

With the new Push-in Spring terminals, one push is all you need for a faster than ever installation, an easier than ever wiring and a reliable as ever connection.













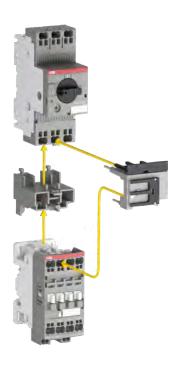


Just push it!

The next evolution in motor starter solutions is here.

So up to 18.5 kW, one push is all you need!







Direct on-line Starter



Reversing Starte



Star-Delta Starter

Save up to 50% wiring time with Push-in Spring compared to conventional spring solutions. And the connections are just as reliable. So for speed, ease and reliability, just push it.

Also available with Push-in technology







Sentry safety relays

— Monitoring relays

Time relays



Push-in Spring solution Complete range, complete efficiency

The Push-in Spring motor starting solution products provide you with a range of benefits.



2-in-1 Benefit from both Push-in mode and Spring mode and use ferruled cables or cables without ferrules in the same terminal.



Tool-free busbars

Parallel connection of manual motor starters without the need for tools (also certified for UL Type E/ Type F applications)



Just one tool for everything You only need a 3 mm

screwdriver in Spring mode as well as for de-wiring the complete solution.



Tool-free connecting links 100% tool-free mounting connecting links.



Compatible with screw range

Mount accessories for control circuits on the screw range up to 45 kW AC-3 400 V on manual motor starters and up to 45 kW AC-3 400 V, 130 A AC-1 on contactors.





Higher connecting capacity

The solution ranges up to 18.5 kW 400 V AC-3 and 50 A AC-1 (25 hp 480 V and 45 A 600 V general use).

Manual motor starters Overview



Standard range





Туре	MS116	MS132	MS165
Thermal and electromagnetic protection	Yes	Yes	Yes
Electromagnetic protection	-	-	-
Phase loss sensitivity	Yes	Yes	Yes
Switch position	ON/OFF	ON/OFF/TRIP	ON/OFF/TRIP
Magnetic trip indication	-	Yes	Yes
Lockable handle without accessories	-	Yes	Yes
Disconnecting feature	Yes	Yes	Yes
Width	45 mm	45 mm	55 mm
Rated operational current le	0.10 32 A	0.10 32 A	10 80 A
Setting range	0.10 32 A	0.10 32 A	10 80 A
Ambient air temperature	-25 +55 °C (1)	-25 +60 °C (1)	-25 +60 °C (1)

⁽¹⁾ Compensated

Accessories						
Auxiliary contac	t	HKF1, HK1			•	
Signaling	for tripped alarm	SK1				
contact	for short-circuit alarm	-		CK1		
Shunt trip		AA1				
Undervoltage re	lease	UA1				

Performance range

Table for short-circuit ratings for 400/415 V AC

		MS116			MS132, MS165		
Selection param	eters	'					
Rated operational power	Setting range for thermal release	Туре	Short-circ		Туре	Short-circuit breaking capacity	
			Icu	Ics		Icu	Ics
0.03 kW (1)	0.1 0.16 A	MS116-0.16	100 kA	50 kA	MS132-0.16 (2)	100 kA	100 kA
0.06 kW	0.16 0.25 A	MS116-0.25	100 kA	50 kA	MS132-0.25 (2)	100 kA	100 kA
0.09 kW	0.25 0.4 A	MS116-0.4	100 kA	50 kA	MS132-0.4 (2)	100 kA	100 kA
0.18 kW	0.4 0.63 A	MS116-0.63	100 kA	50 kA	MS132-0.63 (2)	100 kA	100 kA
0.25 kW	0.63 1.0 A	MS116-1.0	100 kA	50 kA	MS132-1.0 (2)	100 kA	100 kA
0.55 kW	1.01.6 A	MS116-1.6	100 kA	50 kA	MS132-1.6 (2)	100 kA	100 kA
0.75 kW	1.62.5 A	MS116-2.5	75 kA	50 kA	MS132-2.5 (2)	100 kA	100 kA
1.5 kW	2.54.0 A	MS116-4.0	75 kA	50 kA	MS132-4.0 (2)	100 kA	100 kA
2.2 kW	4.06.3 A	MS116-6.3	50 kA	50 kA	MS132-6.3 (2)	100 kA	100 kA
4.0 kW	6.310 A	MS116-10	50 kA	50 kA	MS132-10 (2)	100 kA	100 kA
5.5 kW	812 A	MS116-12	50 kA	25 kA	MS132-12	100 kA	100 kA
7.5 kW	1016 A	MS116-16	16 kA	16 kA	MS132-16 (2) / MS165-16	100 kA	100 kA
7.5 kW	14 20 A				MS165-20	100 kA	100 kA
7.5 kW	1620 A	MS116-20	16 kA	10 kA	MS132-20 (2)	100 kA	100 kA
11 kW	18 25 A				MS165-25	100 kA	100 kA
11 kW	2025 A	MS116-25	16 kA	10 kA	MS132-25 (2)	50 kA	50 kA
15 kW	2532 A	MS116-32	16 kA	10 kA	MS132-32 (2)	50 kA	25 kA
15 kW	23 32 A				MS165-32	100 kA	100 kA
22 kW	30 42 A				MS165-42	50 kA	50 kA
22 kW	40 54 A				MS165-54	50 kA	30 kA
25 kW	-						
30 kW	52 65 A				MS165-65	50 kA	30 kA
37 kW	62 73 A				MS165-73	30 kA	30 kA
45 kW	70 80 A				MS165-80	30 kA	30 kA

^{(1) 690} V AC

⁽²⁾ Available with Push-in Spring terminals.







MO132			

-	-
Yes	Yes
-	-
ON/OFF/TRIP	ON/OFF/TRIP
-	-
Yes	Yes
Yes	Yes
45 mm	55 mm
0.16 32 A	16 80 A
-	-
-25 +60 °C	-25 +60 °C

MSI	32-
-----	-----

Yes	
-	
Yes	
ON/OFF/TRIP	
Yes	
Yes	
Yes	
45 mm	
0.16 25 A	
0.10 25 A	
-25 +60 °C (1)	

HKF1, HK1	HKF1, HK1
SK1	SK1
	CK1
AA1	AA1
UA1	UA1

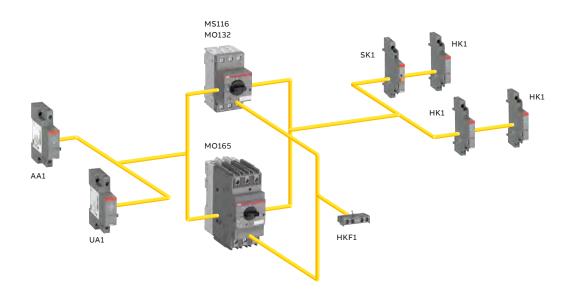
Performance range
MO132, MO165

Transformer	protection
MS132-T	

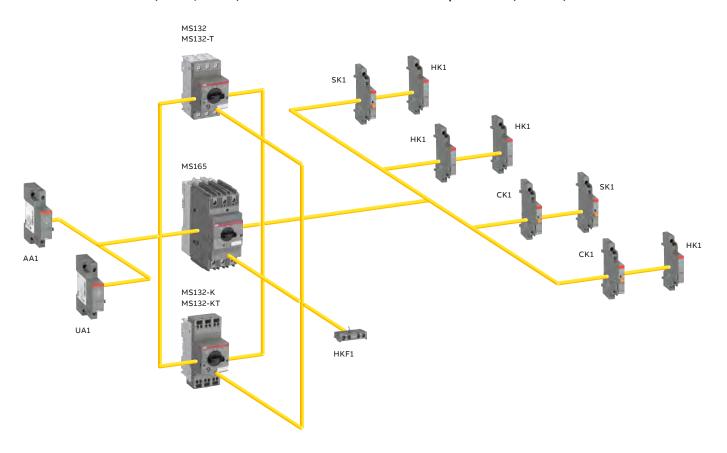
Туре	Short-circuit breaking capacity		Type	Short-circuit breaking capacity
	Icu	Ics		Icu / Ics
MO132-0.16	100 kA	100 kA	MS132-0.16T (2)	100 kA
MO132-0.25	100 kA	100 kA	MS132-0.25T (2)	100 kA
MO132-0.4	100 kA	100 kA	MS132-0.4T (2)	100 kA
MO132-0.63	100 kA	100 kA	MS132-0.63T (2)	100 kA
MO132-1.0	100 kA	100 kA	MS132-1.0T (2)	100 kA
MO132-1.6	100 kA	100 kA	MS132-1.6T (2)	100 kA
MO132-2.5	100 kA	100 kA	MS132-2.5T (2)	100 kA
MO132-4.0	100 kA	100 kA	MS132-4.0T (2)	100 kA
MO132-6.3	100 kA	100 kA	MS132-6.3T (2)	100 kA
MO132-10	100 kA	100 kA	MS132-10T (2)	100 kA
MO132-12	100 kA	100 kA	MS132-12T	100 kA
MO132-16 / MO165-16	100 kA	100 kA	MS132-16T (2)	100 kA
MO165-20	100 kA	100 kA		
M0132-20	100 kA	100 kA	MS132-20T (2)	100 kA
M0132-25 / M0165-25	50 kA / 100 kA	50 kA / 100 kA	MS132-25T (2)	50 kA
M0132-32	50 kA	25 kA	Transformer prote	ection:
MO165-32	100 kA	100 kA	The instantaneou	s short-circuit current
MO165-42	50 kA	50 kA	setting is 20 times the rated operational current.	
MO165-54	50 kA	30 kA		
MO165-65	50 kA	30 kA		
MO165-73	30 kA	30 kA		
MO165-80	30 kA	30 kA		

Accessories MS116, MS132, MS165, MO132, MO165, MS132-T

Manual motor starters with accessories (MS116, MO132, MO165)



Manual motor starters (MS132, MS165) and circuit breakers for transformer protection (MS132-T) with accessories



Note: The combination of MS132-K + UA1 + CK1 is not possible

MS132-T circuit breakers for transformer protection

Low voltage transformers are used to supply power to control and auxiliary circuits in distribution and automation boards and to provide galvanic isolation. These transformers may be damaged by an electrical failure (short-circuit or overload on the primary side), therefore a proper protection should be provided.

Complete portfolio

Manual motor starter accessories are suitable throughout the complete range. Moreover ABB offers special accessories for fast single-phase setup.







Troubleshooting made easy

MS132-T feature a magnetic trip indicator. This way, every tripping event will be distinguished, making troubleshooting a lot easier and faster.





Transformer protection

MS132-T is an inrush compensated circuit breaker for control transformer protection. With the right selection, it provides overcurrent protection on the primary side of the transformer. This avoids expensive protection on the secondary side.



Circuit breakers for transformers protection are specially designed for fuseless protection of control transformers on the primary side against overloads and short-circuits.

Selection table MS132-T with ABB control transformers:

Please refer to document no. 2CDC131111D0201



Application example

Protection of transformers for power supply of control and auxiliary circuits, both in distribution and automation boards (checking, signaling, interlock, etc).

Thermal and electronic overload relays











Thermal overload relays

Type	TA25DU-M	TA42DU-M	TA75DU-M	TA80DU-M	TA110DU-M	TA200DU-M
Туре	TAZSDU-N	TA42DU-M	TA75DU-141	1A80D0-N	TATIODO-N	TAZOODO-M
Current range	0.10 32 A	18 42 A	18 80 A	29 80 A	66 110 A	66 200 A
Trip class	10A	10A	10A	10A	10A	10A
Single mounting kit	DB25	DB80	DB80	DB80	DB200	DB200
For contactors	A09 A30	A30 A40	A50 A75	A95 A110	A95 A110	A145 A185
For contactors	AX09 AX32	AX32 AX40	AX50 AX80	AX95 AX150	AX95 AX150	AX185 AX205













Thermal overload relays

IEC: rated operational power AC-3	0.03 4.0 kW	4.0 18.5 kW	18.5 30 kW	37 45 kW	55 75 kW	90 110 kW
Fitting to contactors	B6, B7, AS	AF09 AF38	AF40, AF52, AF65	AF80, AF96	AF116, AF140, AF146	AF190, AF205
Туре	T16	TF42	TF65	TF96	TF140DU	TA200DU
Current range	0.10 16 A	0.10 38 A	22 67 A	40 96 A	66 142 A	66 200 A
Trip class	10	10	10	10	10A	10A
Separate mounting kit	DB16	DB42	-	-	-	-
Trip class			10			10













Electronic overload relays with integrated CT

IEC: rated operational power AC-3 400 V	0.03 4.0 kW	4 7.5 kW	4.0 18.5 kW	18.5 30 kW	37 45 kW	55 75 kW	90 110 kW	132200 kW
Fitting to contactors	B6, B7,	AF09AF16	AF26 AF38	AF40AF65	AF80, AF96	AF116, AF140	AF190, AF205	AF265AF370
Туре	E16DU	EF19	EF45	EF65	EF96	EF146	EF205	EF370
Current range	0.10 18.9 A	0.10 19 A	9 45 A	25 70 A	36 100 A	54 150 A	63 210 A	115 380 A
Separate mounting kit	DB16E	-	-	-	-	-	-	-
Trip class				10E, 20E, 30	DE selectable			



Electronic overload relays with external separate CT

IEC: rated operational power AC-3 400 V	475 560 kW
Fitting to contactors	AF1350, AF1650, AF2050
Туре	E125ODU
Current range	375 1250 A
Trip class	10E, 20E, 30E selectable













Electronic overload relays

Туре	E16DU	E45DU	E80DU	E140DU	EF205
Current range	0.10 18.9 A	9 45 A	27 80 A	50 140 A	63 210 A
Trip class			10E, 20E, 30E selectable		
Single mounting kit	DB16E	DB45E	DB80E	DB140E	-
For contactors	A09 A16	A26 A40	A50 A75	A95110	A145 A185
For contactors	AX09 AX18	AX32 AX40	AX50 AX115	AX150	AX185 AX205







90110 kW	5575kW	3745 kW
125150 hp	75100 hp	60 hp
AF190, AF205	AF116, AF140	AF80, AF96
TA200DU	TF140DU	TF96
66200A	66142 A	4096A
10A	10A	10
DB200	=	-









3745 k	W 5575 kW	90110 kW	132200 kW
60 h	o 75100 hp	125150 hp	200350 hp
AF80, AF9	6 AF116, AF140, AF146	AF190, AF205	AF265, AF305, AF370
EF	96 EF146	EF205	EF370
36100	A 54150 A	63210 A	115380 A
	10E, 20E, 30	E selectable	
		-	-



475560 kW
800900 hp
AF 1350, AF1650
FISCODII
E1250DU
3751250 A

Contactors for capacitor switching

 ${\tt UA..RA\ contactors\ for\ capacitor\ switching\ (UA16..RA\ to\ UA110..RA)\ with\ insertion\ of\ damping\ resistors}$

The insertion of damping resistor protects the contactor and the capacitor from the highest inrush currents.









Main pole - Utilization characterstics according to IEC

Contactor type		AC operated	UA16RA	UA26RA	UA30RA	UA50RA	UA63RA	UA75RA	UA95RA	UA110RA
Standards		-	IEC 60947-	1 / 60947-4	-1 and EN 6		0947-4-1	.,		
Rated operational voltage Ue	e max		690 V							
Rated frequency (without de	rating)		50 / 60 Hz							
Ac-6b utilization category										
Rated operational power	AC-6b(1)									
For air temprature close	θ ≤ 40°C	230-240 V	8 kvar	12.5 kvar	16 kvar	25 kvar	30 kvar	35 kvar	40 kvar	45 kvar
to contactor		400-415 V	12.5 kvar	22 kvar	30 kvar	40 kvar	50 kvar	60 kvar	70 kvar	80 kvar
#		440 V	15 kvar	24 kvar	32 kvar	50 kvar	55 kvar	65 kvar	75 kvar	85 kvar
<u>ַּרַ דְּילֶּדְ</u>		500-550 V	18 kvar	30 kvar	34 kvar	55 kvar	65 kvar	75 kvar	85 kvar	95 kvar
1 1 1 1		8 kvar	22 kvar	35 kvar	45 kvar	72 kvar	80 kvar	100 kvar	120 kvar	130 kvar
))););	θ ≤ 55°C	230-240 V	7.5 kvar	11.5 kvar	16 kvar	24 kvar	27 kvar	30 kvar	35 kvar	40 kvar
		400-415 V	12.5 kvar	20 kvar	27.5 kvar	40 kvar	45 kvar	50 kvar	60 kvar	70 kvar
7-7646		440 V	13 kvar	20 kvar	30 kvar	43 kvar	48 kvar	53 kvar	65 kvar	75 kvar
Multi- step capacitor		500-550 V	16 kvar	25 kvar	34 kvar	50 kvar	60 kvar	65 kvar	75 kvar	82 kvar
bank scheme		690 V	21 kvar	31 kvar	45 kvar	65 kvar	75 kvar	80 kvar	105 kvar	110 kvar
	θ ≤ 70°C	230-240 V	6 kvar	9 kvar	11 kvar	20 kvar	23 kvar	25 kvar	30 kvar	35 kvar
		400-415 V	10 kvar	15.5 kvar	19.5 kvar	35 kvar	39 kvar	41 kvar	53 kvar	60 kvar
		440 V	11 kvar	17 kvar	20.5 kvar	37 kvar	42.5 kvar	45 kvar	58 kvar	70 kvar
		500-550 V	12.5 kvar	20 kvar	25 kvar	46 kvar	50 kvar	55 kvar	70 kvar	78 kvar
		690 V	17 kvar	26 kvar	32 kvar	60 kvar	65 kvar	70 kvar	85 kvar	100 kvar
Max. permissible peak curre	nt Î	Unlimited								
Short circuit protection dev contactors gG type fuse(2)	ice for	80 A	125 A	200 A					250 A	
Max. electrical switching		240 cycles/h								
Electrical durability AC-6b (9 ≤ Ue									
	0 - 5005	250 000 opei								
500 V ≤ U	eθ ≤ 690°C	100 000 oper	ating cycles	5						

¹ For 220 V and 380 V, multiple by 0.9 the rated values at 230 V and 400 V respectively.

Example : 50 kvar / 400 V corresponding to $0.9 \times 50 = 45 \text{ kvar} / 380 \text{ V}$

²The fuse ratings given represent the maximum ratings ensuring type 1 coordination according to the definition of standard IEC 60947-4-1.

Starters MA (Direct Online) and SDA (Star Delta)

For industrial and agriculture applications



01

O1
The isolation and short-circuit protection functions must be performed by a fuse isolator switch, a fuse switch, Manual motor starter (MPCB) or circuit breaker externally. Fuse rating recommended in this document must and should be used.

ABB is a global leader in power and automation technologies that enable utility and industry customers to improve performance, while lowering the environmental impact.

ABB in India serves customers in many segments through a wide manufacturing and marketing network.

ABB's range of Starters MA-(Direct Online Starters) and SDA (Fully Automatic Star- Delta Starters) have been designed to meet both industrial and agriculture applications. These starters are made with renowned European technology comprising globally recognized MA/AX/A range contactors and TA Overload relays, which protect your motors from overload and single phasing.

Salient features

- Suitable for industrial & agriculture applications
- Conforms to IS 13947 (Part 4) & IEC 60947-4-1
- · Compact design of contactor with IP20 terminals
- Protection against overload and has built-in single phasing protection
- Overload relay with class 10-A tripping class
- Operating temperature from -5° C to 55° C
- Carbon sheet steel enclosure with powder coated and with IP42° protection

A combination starter performs the following functions:

- Circuit isolation
- Motor "ON OFF" control"
- · Overload protection

Direct online starter

"MA" DOL consists of MA range contactors and TA25 overload relays assembled in sheet steel double color powder coated enclosure. These starters protect the motor against overload and single phasing and enable START and STOP of the motors.

Universal Motor Controllers (UMC 100.3)

Intelligent motor management

ABB's intelligent motor controllers combine motor protection and control functions, fieldbus and Ethernet communication, and fault diagnosis in a single device. They provide detailed operational, diagnostic and service data continuously, giving any plant an effective data source for predictive maintenance systems.

UNIVERSAL MOTOR CONTROLLER UMC100.3

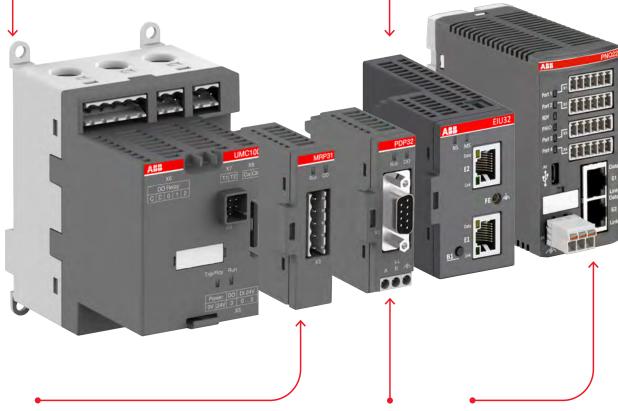
Basic device, expandable with different modules

- For motors up to 1000 V AC
- Tripping classes: 5E, 10E, 20E, 30E, 40E
- Built-in wide-range measuring system
- Supply voltages: 24 V DC, 110-240 V AC/DC
- Inputs: six digital inputs 24 V DC, one PTC input
- Outputs: three relay outputs, one digital transistor output

COMMUNICATION MODULE

EIU32.0 - EtherNetIP™ PNU32.0 - Profinet IO (S2)





COMMUNICATION MODULE

DNP31.0 - DeviceNet™ MRP31.0 - Modbus® RTU

Modbus[®]



COMMUNICATION MODULE

PDP32.0 - PROFIBUS® DP

PROFU[®]
PROCESS FIELD BUS
BUS

COMMUNICATION MODULE

MTQ22-FBP.0 - Modbus® TCP PNQ22-FBP.0 - PROFINET® IO





Expansion modules

Flexibility is assured with a wide variety of expansion modules

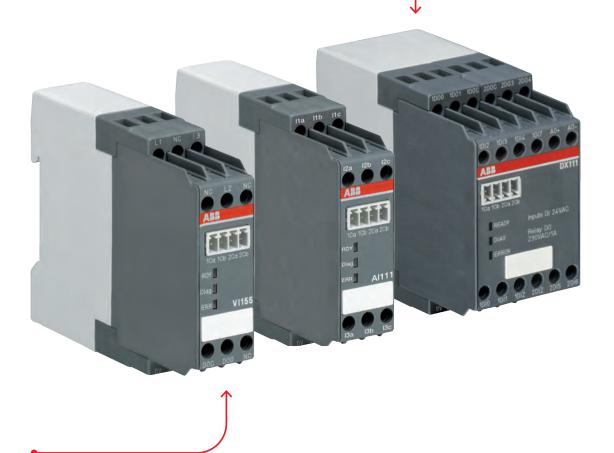
ANALOG / TEMPERATURE MODULE AI111.0

Expand the UMC with analog and temperature inputs

DIGITAL MODULES DX1XX-FBP.0

Compact modules that increase the number of digital inputs and outputs

- Inputs: DX111-FBP.0 eight digital inputs 24 V DC, DX122-FBP.0 eight digital inputs 110/230 V AC
- Outputs: four digital relay outputs, one configurable analog output

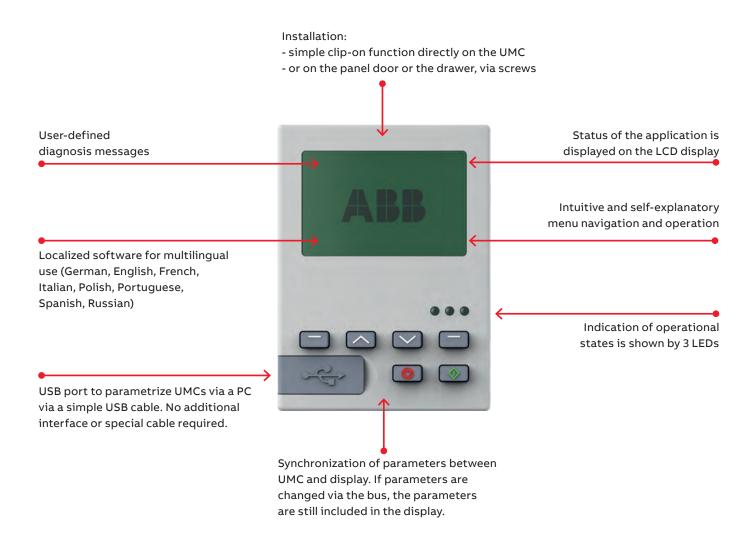


VOLTAGE MODULES VI150-FBP.0/VI155-FBP.0

Voltage modules for determining phase voltages, power factor (cos ϕ), active active power, apparent power, energy, harmonic content (THD)

Accessories

Get even more from the UMC with the operating panel, current transformers, and earth leakage sensors





CURRENT TRANSFORMERS CT4L / CT5L

Extend the integrated measuring system for larger motors

- For nominal motor currents > 63 A up to 850 A
- Linear transformer, 3-phase with terminal block



EARTH LEAKAGE SENSORS CEM11

Summation current transformer for connecting to a digital input, mounting with a bracket on a DIN rail or wall

- Four versions available with diameters from 20 mm to 120 mm
- $\bullet \ \ \text{Simple residual current adjustment with rotary switch, including test position}\\$
- · Flexible mounting

FIM UMC Edition

Configuration tool for UMC100.3

Based on the latest device integration standard, Field Device Integration (FDI), this innovative software combines the benefits of two major technologies – EDD and DTM. Whether it's used on Windows tablets, laptops or PCs, it is user-friendly and easy to maintain.







Easy to install, use and maintain on Windows tablets, laptops or PCs.

Scans, identifies and enables access to device within just three minutes.

Connect to UMC100.3 via a simple serial link (control panel with USB port) or Profibus DP.







Monitor

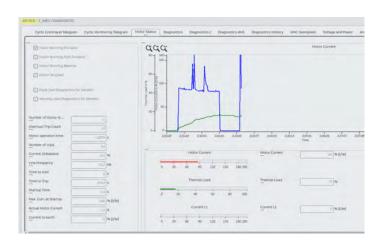


Operate

All required functions for a fast device setup are included and easy-to-use. Enter parametrization mode for configuring the UMC100.3, including the Custom Application Editor for creating individual motor control functions to suit your application.

Monitor all relevant data like motor status, current, voltage and many more. Comprehensive diagnosis for faults and warnings are included out of the box and make the FIM UMC edition an intelligent data hub for predictive applications.

Operate mode ensures easy testing of a setup. It includes start, stop and fault reset commands and shows the most important data. On and offline modes, bulk functions as well as project management are included.





Not convinced yet? Test the trial version.

Graphical user interface

Main areas of application

Benefit from ABB's Universal Motor Controller functionality in a wide variety of segments. Its flexibility, global recognition and comprehensive certification make it the top choice, no matter where you are.

01 Water supply and treatment plants

02 Mining facilities

03 Cement plants

Cement factories

- Robust and compact design
- Several inputs, e.g. for querying the position of the damper limit switches

Oil & gas, chemicals

- Programmability
- · Ground fault monitoring
- Undervoltage detection and configurable restart following voltage restart
- Protection of motors in hazardous environments (ATEX)
- · Use in IT networks

Pulp and paper

- · Conformal coating
- Modular design
- · Flexible communication

Mining

- Rated motor voltage of up to 1000 V
- Can be used at altitudes of up to 5000 m
- · Ground fault monitoring

Water supply and treatment

- · Pump controls as required
- Underload detection with Cos φ measuring
- · Pump cleaning application

Others

- · Steel plants
- Ships





02

03



01

Electronic compact starters: HF range

A Compact solution with great functionality in only 22.5 mm

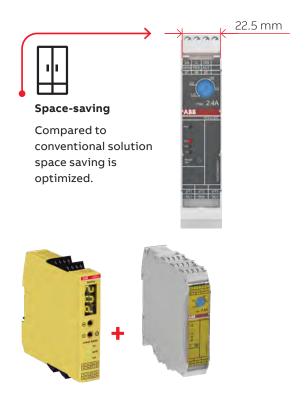
Electronic compact starters

Direct-on-line, reverse start, overload protection and emergency stop are all integrated in one compact device of only 22.5 mm width. Reliable 30 million switching cycles for motors up to 3 kW / 400 V AC, reduced wiring time and faults are additional benefits.



Short-circuit protection

Co-ordinated short-circuit protection for single and group mounting with manual motor starters is available.



Safety and ATEX

In combination with Sentry safety relays the HF-Starter reaches SIL3, PL e certification. Feel free to use safety tools like FSDT and Sistema. The libraries are online on ABB.com. Additionally safety variants are ATEX certified.



Control of cooling tanks

The HF range is used to control pumps and compressor for cooling.



Solar tracker

The panels follow the sun and need to be switched frequently in a small cabinet.



Snow canons

Similar to the solar tracker, the snow canon is switched left and right to ensure equal snow conditions.



Straightening metal

The metal is unrolled directly from the coil. The motor needs to be switched frequently.

Softstarters portfolio

Overview

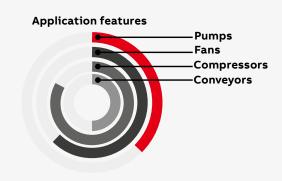


PSR - The compact range

PSR is our most compact softstarter with basic benefits and values. PSR can handle up to 100 starts per hour. Suitable for small motors.

Current: 3 A... 105 A

Main voltage: 208 V... 600 V



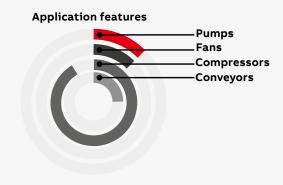


PSRC - For scroll compressor

PSRC is fast and easy to install with fixed settings. Designed for scroll compressors results in less stress on the compressor reducing the maintenance cost to a minimum.

Current: 3 A... 105 A

Main voltage: 208 V... 600 V



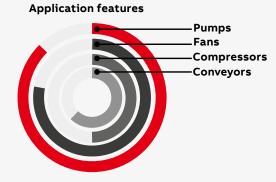


PSE - The efficient range

The new generation PSE is a true general purpose softstarter. It's a perfect balance between high starting capacity and cost efficiency. Now featuring built-in fieldbus communication.

Current: 18 A... 370 A

Main voltage: 208 V... 600 V





PSTX - The advanced range

PSTX is the most complete alternative for any motor starting application. Featuring built-in modbus and anybus modules that support all major communication protocols.

Current: 30 A... 1250 A

Main voltage: 208 V... 690 V



Application features

Softstarters selection

ABB softstarters offering consists of four ranges, covering every need. The products help you secure motor reliability, improve installation efficiency and increase application productivity.









Product range overview	PSR	PSRC	PSE	PSTX
Technology	Basic	Basic	General	Advanced
Motor size	Small – up to 105 A	Small – up to 105 A	Medium – up to 370 A	Large – up to 1250 A
Installation efficiency	Basic	Basic	Medium	High
Motor protection	-	-	Medium	High
Application	All	Scroll compressor	All	All
Application enhancement	Basic	Basic	Medium	High
Fieldbus Communication	Yes	Yes	Yes	Yes
Anybus Communication	-	-	-	Yes
Torque control	-	-	Yes	Yes
Heavy duty starts	-	-	Yes	Yes
Frame sizes	A, B, C, D	A, B, C, D	А, В, С	A, B, C, D, E, F

Selection process

1

Determine softstarter series

First, determine the softstarter series that fulfill the needs of the application and motor. Use the guide on the left to explore the three series and the power range each one covers.

2

Match the softstarter size with the motor current

When the softstarter series is selected, the correct size should now be determined. The selection of a softstarter is based on the current. Find the softstarter that corresponds to the motor current.

3

Fine tune and select the correct size

The last step is to fine tune the selection, and there are three different factors to consider:

- Normal or a heavy load: If the load is characterized as a heavy load, select the next size softstarter in the series.
- High ambient temperature
- · High altitude

Use the equations and the table on the right to find the correct de-rating equation.

Altitude formula

De-rate for altitudes between 1000-4000 m or 3280-13123 ft with the following equations for all softstarters:

In meters: % of Ie = 100 - (x-1000)/150

In feet: % of FLA = 100 - (y-3280)/480

Where x/y is the actual altitude in m/ft

Temperature equations

PSTX and PSR In Celsius: 40...60 °C: Reduce Ie with 0.8%/°C

PSTX and PSR In Fahrenheit: 104...140 °F: Reduce FLA with 0.44%/°F

PSE In Celsius: 40...60 °C: Reduce Ie with 0.6%/°C

PSE In Fahrenheit: 104...140 °F: Reduce FLA with 0.33%/°F

Typical applications		
Normal duty start	Heavy duty	
Bow thrusters	Centrifugal fan	
Centrifugal pump	Conveyor belt (long)	
Compressors	Crusher	
Conveyor belt (short)	Stirrer	
Elevator	Sawmill	

Softstarters benefits and features



SECURE MOTOR RELIABILITY

Increase your motors lifetime...

With ABB softstarters, starting currents are easily optimized to your load, application and motor size.

...by protecting it from electrical stresses.

Over ten motor protection features are included to keep your motor safe from overloads and network irregularities.

Softstarter features	PSR	PSE	PSTX
Current limit	-	•	•
Current limit ramp and dual current limit	-	-	•
Electronic motor overload protection	-	•	•
Dual overload protection	-	-	•
Underload protection	-	•	•
Power factor underload protection	-	-	•
Locked rotor protection	-	•	•
Current/Voltage imbalance protection	_	-	•
Phase reversal protection	-	-	•
Customer defined protection	-	_	•
Motor heating	-	-	•
PTC/PT100 input for motor protection	-	-	•
Overvoltage/undervoltage protection	-	_	•
Earth-fault protection	-	_	•

● = standard, O = option, – = not available



Reduce your installation time and panel size...

ABB softstarterss are easy to install thanks to their compact design and many built-in features.

...by having everything that you need built in.

Built-in bypass saves energy and space while reducing heat generation: a complete motor starting solution in one unit designed and verified by ABB.

Softstarter features	PSR	PSE	PSTX
Built-in bypass	•	•	•
Inside-delta connection possible	-	_	•
Graphical display and keypad	-	•	•
Detachable keypad	_	_	•
Motor runtime and start count	_	_	•
Programmable warning functions	_	_	•
Diagnostics	_	_	•
Overload time-to-trip	_	_	•
Overload time-to-cool	_	_	•
Analog output	_	•	•
Fieldbus communication	0	•	•
Event log	_	0	•
Multiple languages	_	_	17
Electricity metering	_	_	•

● = standard, O = option, - = not available



Reduce the number of production stops...

ABB softstarters reduce mechanical stress on your application which increases uptime.

...by letting the softstarter do more than just starting.

Torque control, pump cleaning, motor break and many more features enables you to use your process to its full potential.

Softstarter features	PSR	PSE	PSTX
Torque control	-	•	•
Torque limit	-	-	•
Coated PCBA	-	•	•
Limp mode	_	_	•
Jog with slow speed forward/ reverse	_	-	•
Dynamic brake	_	_	•
Stand still brake	_	-	•
Sequence start	_	_	•
Full voltage start	_	-	•
Kick start	_	•	•
Automatic pump cleaning	-	_	•

● = standard, O = option, - = not available

Limit switches



ABB limit switches are the easiest reliable way to convert mechanical movements into electrical signals. Use our wide offer to match your application.



Reliable in extreme conditions

Ready for anything

Plastic or metal casing limit switches are designed to operate in the most difficult environments. A high degree of protection up to IP67 and the positive contact opening, guarantee reliable operation.



Continuous operation

Keep your installation running 24h a day

Limit switches secure your uptime. Their high mechanical durability can handle up to 30 million operations with contacts that are mechanically linked to actuators.



Easy to install

Easy to use

Limit switches are easy to install and to use thanks to their three different types of electrical connections and cable length, in order to satisfy every design specifications.

Limit Switches - Range overview

Product selection guide





Design		Compact, Pre-wired		Standard		
Material		Plastic	Metal	Plastic	Metal	
Types		LS20P, LS21P	LS20M, LS21M	LS32P, LS33P, LS35P	LS32M, LS33M, LS35M	
Dimensions (W x H x D)		30 x 49 x 16	30 x 49 x 16	30 x 53 x 30	30 x 55 x 33	
Rounded values f	or body only. For precises dir	nensions with actuator, please	refer to ordering details pages			
Degree of Prote	ection	IP67	IP67	IP65	IP66	
Double electrical insulation		yes	-	yes	-	
Standards		IEC/EN 60947-1 IEC/EN60947-5-1 UL508 CSA C22-2 No. 14		IEC/EN 60947-1 IEC/EN60947-5-1 UL508 CSA C22-2 No. 14		
EN 50041		-		-		
EN 50047		-		Yes for Heads: 10, 11, 12, 13, 31 and 41 For shapes please see ordering details pages		
Contact block (1)		1 N.O. + 1 N.C.		1 N.O. + 1 N.C.		
Contact type (2)		Snap Action (Zb)		Snap Action (Zb)		
Cable entry / Cable type (3)		Bottom (LS21) or Side (LS20) entry		Bottom entry		
		UL 62 - PVC cable		1 x ISO M16x1.5		
		4 x AWG 18 4 x 0.75 < < 1 mm ²	5 x AWG 18 5 x 0.5 < < 1 mm²	1 x ISO M20x1.5		
		Length: 1 m		1 x 1/2" NPT		
Orientable Head		Yes for Heads : 41, 42, 45, 46, 51 and 71		yes		
Increment		180°		90°		
Heads type (4)	Plain plungers	2	2	2	1	
	Roller Plungers	5	5	2	2	
	Roller lever plunger	-	-	2	2	
	Roller lever	5	5	2	2	
	Adjustable roller lever	2	2	2	2	
	Rod lever	1	1	2	2	
	Spring Lever	2	2	2	2	
Minimum order quantity 1		1	1	1	1	

⁽¹⁾ Other configuration (2 N.C.) available on request. Please consult your ABB local sales organization.

Note : Please note that extra Lead Time and Minimum Order Quantity may apply.

⁽²⁾ Other configuration (Slow Action: Simultaneous, Overlapping or non-overlapping) available on request. Please consult your ABB local sales organization.
(3) Other configuration (LS2.: Cable length up to 10 m; LS3., LS4.: Pg11 and Pg13.5 gland thread) available on request. Please consult your ABB local sales organization.
(4) Other configuration (rotated head, special material, ...) available on request. Please consult your ABB local sales organization.



Standard reinforced			
Plastic	Metal		
LS43P, LS45P	LS43M, LS45M		
41 x 74 x 41	40 x 77 x 43		
IP65	IP66		
yes	-		
IEC/EN 60947-1 IEC/EN60947-5-1 UL508 CSA C22-2 No. 14			
Yes for Heads: 11, 12, 13, 41, 42, 71 and 72 For shapes please see ordering details pages			
-			
1 N.O. + 1 N.C.			
Snap Action (Zb)			
Bottom entry			
-			
1 x ISO M20x1.5			
1 x 1/2" NPT			
yes			
90°			
1	1		
2	2		
2	2		
2	2		
2	2		
2	2		
2	2		
1	1		
<u> </u>			



— 01 Elevators



02 Material handling and conveyors



03 Industrial process

Pilot devices

Reliable products, easy to select and install



ABB pilot devices are engineered for total reliability. Our products are tested to extremes and proven in the toughest environments. Their innovative design simplify the entire process, from selection to installation. Enclosures, signal towers and signal beacons complete the portfolio.



Continuous operation

Engineered for tough environments

ABB pilot devices are designed with protection degree of up to IP69K and 4X, guaranteeing reliability in extreme environments – making ABB pilot devices ideal for use in demanding industries such as construction and food and beverage. An innovative design that automatically cleans contacts ensures high reliability for all products.



Global availability

Simple selection and stock management

ABB's core offering includes the pilot devices most in demand, so product selection is easier, stock management is simpler and product availability is higher.

Support for exporters is world-class, thanks to ABB's standardized global range, certified to comply with all major international standards.



Easy to install

Save time and space

The unique design of ABB's modular ranges enable tool-free installation that is quick and simple. It provides high flexibility for last-minute changes. With its all-in-one construction, the compact range reduces installation space and saves time.

Pilot devices

Reliability that lasts

Continuous operation

Longer lifetime

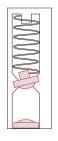
• ABB pilot Devices are engineered and tested to sustain frequent use over time in any environment

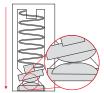
High mechanical durability

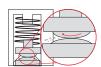
· Tested to achieve mechanical life time of up to 10 million operations

Ensuring electric connectivity

· Self-cleaning contacts ensure reliable operation without the need for maintenance, increasing uptime







The built-in wiping mechanism cleans the contacts when operated to remove dust and oxidation on the contacts and improve conductivity.

Dust and water proof

All ABB pilot devices are impenetrable to dust and are extremely resistant to water exposure.

IP66-classed pilot devices can withstand highpressure water jets and are suitable for tough outdoor use.

IP67

IP67-classed pilot devices can withstand immersion in one metre of water for 30 minutes. They are suitable for use in the harshest environments with water and dust.

IP69K

IP69K pilot devices can withstand both rough treatment and intensive, high-temperature cleaning. They are ideal for environments with high sanitary requirements, such as the food and beverage industry.

Find full test description in general technical data section.

01 Mechanical durability test

02 Total protection against any kind of dust

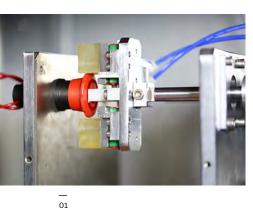
03 Powerful water jets projected against the front from a distance of 3 meters

Testing that goes beyond the standards



Watch the video

Trust ABB to produce products that work in any environment.







02

03

Modular plastic range

Flexible configuration

A versatile selection of operators with high levels of flexibility and a broad choice of electrical ratings. Find the perfect solution for almost every application.





Compact range

All-in-one solution

The most efficient solution available, reducing installation time and cost. The compact range have the highest level of dust and water resistance on the market.





Fewer order codes make selection easy and save time.

All-in-one design makes installation fast.

Interface relays and optocouplers

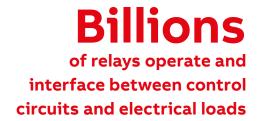
A proven technology used worldwide

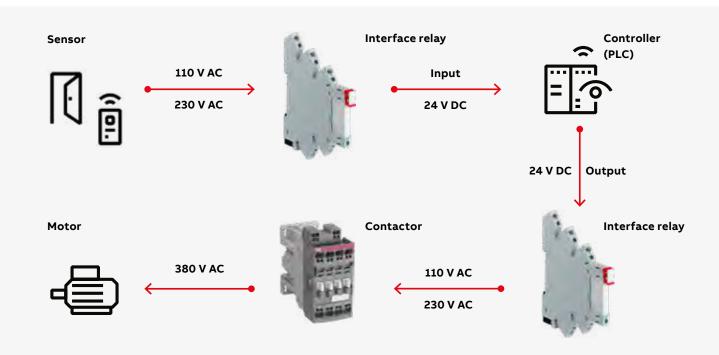
Relays are universally applicable and are utilized in a diverse array of applications. They are a significant element in contemporary industrial processes and are used in applications where galvanic isolation, signal separation, voltage coupling and signal amplification are required.



Optocouplers are predominantly used in applications where a high switching frequency is necessary. Furthermore, optocouplers do not contain any moving parts and are therefore bounce-free, immune to vibrations and possess a long electrical life. This wide selection of relays adheres to the highest global standards and satisfies the requirements for a diverse number of applications and needs.

ABB offers a complete range of interface relays and optocouplers for increased flexibility and choice. This portfolio includes pluggable relays for easy interchangeability and optocouplers for an extended electrical life. The portfolio includes electromechanical relays and optocouplers - the electromechanical relays operate using an electromagnetic field, whereas optocouplers use light.





Time relays

Have the perfect timing- everywhere

Available in three different ranges to cover every application, the CT range time relays are used to provide reliable timing functions worldwide. In both industrial and building applications, the time relays of the CT range have proven their excellent functionality in daily use under the toughest conditions.

Choose ABB as the partner for all your low voltage timing control needs to leverage our wide variety of product options. From economic to high-end solutions – the range offers maximum value. Time relays are found everywhere, for example in air conditioning systems, heaters and fans in industrial and in residential buildings. On-delay, off-delay and a range of other functions cover all requirements.



Shock
and vibration resistant
CT-S relays are perfect
for use in rolling stock

- · Control panels
- Pump controls
- Star-delta motor starting
- Movable equipment like cranes
- Machine tools
- · Automatic doors
- Car park barriers
- Assembly machines
- HVAC

- Compressor controls
- · Transportation
- Industrial refrigeration
- Packaging machines
- · Backing ovens
- Water and wastewater
- Wind
- Industrial cleaning processes



Primary switch mode power supplies

Excellent reliability in harsh environments

Available in five different ranges to cover every application requirement, ABB's CP range power supplies are used to power valuable assets worldwide.









Emergency lighting



lighting



Communication



Printing industry



Packaging industry









Choose ABB as your power supply partner and leverage our wide variety of product options. From economic to high-end solutions, the CP range offers maximum value. Their excellent reliability in daily use is well proven even under the toughest of conditions.









Measuring and monitoring relays

Increase process availability and take action

The relays inform users about abnormal conditions and allow them to take necessary corrective actions before severe and costly failures can occur.



Measuring and monitoring relays monitor and detect operating conditions with regard to phase, current, voltage, frequency, temperature, liquid level or insulation faults. The relays inform users about abnormal conditions and allow them to take necessary corrective actions before severe and costly failures can occur.

ABB offers the broadest range of measuring and monitoring relays in the industry - so you can source your critical components from a global supplier. Increase the reliability of your process equipment with controllers that deliver intelligent signals and settings to ensure maximum availability. Ensure continuous operation, engineer time savings and benefit from ABB's global support for measuring and monitoring relays.







Time relays for industrial applications

Offer overview



CT-C: the compact range

The CT-C range combines lower cost with higher value and performance by offering essential functions in a space-saving 17.5 mm housing. The range offers a choice of 11 devices, including single and multifunctional types, with timing functions that range from 0.05 seconds to 100 hours. Equipped with a wide voltage range, the CT-C range is suitable for a huge variety of applications worldwide.



CT-S: the high-performance range

The advanced CT-S range is ABB's universal range of electronic timers. It includes 22 single-function devices and 16 multifunction time relays, offering flexibility in operation with up to 13 functions. The devices feature seven or ten time ranges, adjustable from 0.05 seconds to 300 hours. Additionally, every device is available in two different connection technologies: familiar double-chamber cage connection terminals (screw terminals) and ABB's vibration-resistant Easy Connect technology (push-in terminals).

Time relays for industrial applications

Type selection

		multi-functional	single-functional	multi-functional	single-functional
Timing function		ст-с		CT-S	
\boxtimes	ON-delay	CT-MFC, CT-MKC	CT-ERC	CT-MVS, CT-MFS, CT-MBS, CT-WBS	CT-ERS
	OFF-delay	CT-MFC, CT-MKC, CT-ARC	CT-AHC	CT-MVS, CT-MFS, CT-MBS	CT-APS, CT-AHS, CT-ARS
	ON- and OFF-delay			CT-MVS, CT-MXS, CT-MFS, CT-MBS	
1Л⊠	Impulse-ON	CT-MFC, CT-MKC	CT-VWC	CT-MVS, CT-MFS, CT-MBS, CT-WBS	
1/1	Impulse-OFF	CT-MFC, CT-MKC, CT-ARC		CT-MVS, CT-MFS, CT-MBS	
1Л≌	Impulse-ON and OFF			CT-MXS	
Л⊠	Flasher starting with ON	CT-MFC, CT-MKC	CT-EBC	CT-MFS, CT-MBS, CT-WBS	
Л	Flasher staring with OFF	CT-MFC, CT-MKC	CT-EBC	CT-MFS, CT-MBS, CT-WBS	
Л≌	Flasher starting with ON or OFF			CT-MVS	
ĭ	Pulse generator starting with ON or OFF		CT-TGC	CT-MXS	
1几	Pulse former	CT-MFC, CT-MKC		CT-MVS, CT-MFS, CT-MBS	
A	Star-delta change-over		CT-SDC, CT-SAC		CT-SDS
∆1∏	Star-delta change-over with impulse			CT-MVS.2x, CT-MFS, CT-MBS	
+	☐1☐ ☐1☐ ☐ further functions (depending on device)			CT-MVS, CT-MXS, CT-MFS, CT-MBS, CT-WBS	
Alterna	ting without time delay		CT-PAC		

 $\label{lem:condition} A \ detailed \ explanation \ of the \ different timing \ functions \ can \ be \ found \ in \ the \ chapter \ "Timing \ functions".$

Synonyms

Used expression	Alternative expression(s)		
1 c/o contact	SPDT		
2 c/o contacts	DPDT		
voltage-related	wet / non-floating		
volt-free	dry / floating		

Benefits and advantages



Sealable transparent cover

Protection against unauthorized changes of time and threshold values.

Benefits and advantages



Easy Connect technology

- Tool-free wiring and excellent vibration resistance.
- Push-in terminals provide connection of wires up to $2 \times 0.5 1.5 \text{ mm}^2$ (2 x 20 -16 AWG), rigid or fine-strand with or without wire end ferrules.
- Excellent vibration resistance the right solution for harsh environments.



Double-chamber cage connection terminals

Double-chamber cage connection terminals provide connection of wires up to 2×0.5 - 2.5 mm^2 (2×20 -14 AWG) rigid or fine-strand, with or without wire end ferrules.



LEDs for status indication

All actual operational states are displayed by front-face LEDs, simplifying commissioning and troubleshooting.

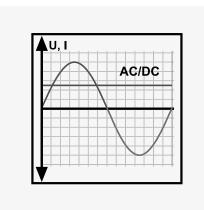


Integrated marker label

Integrated marker labels allow the product to be marked quickly and simply. No additional marker labels are required.

Offer overview

Measuring and monitoring relays monitor and detect operating conditions with regard to phase, current, voltage, frequency, temperature, liquid level or insulation faults. The relays inform users about abnormal conditions and allow them to take necessary corrective actions before severe and costly failures can occur. Depending on the product model, measuring and monitoring relays are categorized into seven product families.

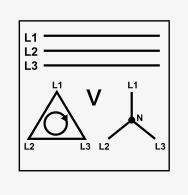


Single-phase current monitoring relays

- Monitoring of motor current consumption
- · Monitoring of lighting installations and heating circuits
- Monitoring of transportation equipment overload
- Monitoring of locking devices, electromechanical brake gear and locked rotors

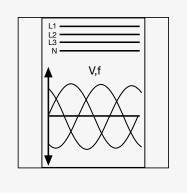
Single-phase voltage monitoring relays

- Speed monitoring of DC motors
- Monitoring of battery voltages and other supply networks



Three-phase monitoring relays

- · Voltage monitoring of mobile three-phase equipment
- Protection of personnel and installations against phase reversal
- Monitoring of the supply voltage of machines and installations
- Protection of equipment against damage caused by unstable supply voltage
- · Switching to emergency or auxiliary supply
- Protection of motors against damage caused by unbalanced phase voltages and phase loss
- · Suitable for HVAC applications

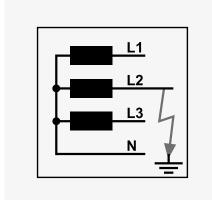


Grid feeding monitoring relays

The CM-UFD.M* range monitors all voltage and frequency parameters in a grid and ensures the safe feeding of decentrally produced electrical energy into the grid.

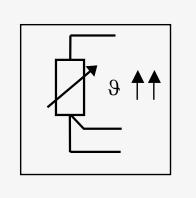
- Monitoring of the voltage with up to 2 thresholds for over- and undervoltage
- Monitoring of the frequency with up to 2 thresholds for over- and underfrequency
- ROCOF (rate of change of frequency) and vector shift detection
- In compliance with several local standards

Offer overview



Insulation monitoring relays

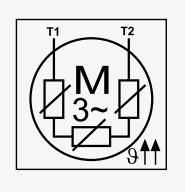
- Monitoring of electrically isolated supply mains for insulation resistance failure
- Detection of initial faults
- Protection against earth faults



Temperature monitoring relays

Acquisition, messaging and regulation of temperatures of solid, liquid and gaseous media in processes and machines

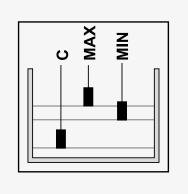
- Motor and system protection
- · Control panel temperature monitoring
- · Frost monitoring
- Temperature limits for process variables, e.g. in the packing or electroplating industry
- Control of systems and machines like heating, air-conditioning and ventilation systems, solar collectors, heat pumps or hot water supply systems
- · Bearing, gear oil and coolant monitoring



Thermistor motor protection

CM-MSE and CM-MSS provide full protection of motors with integrated PTC resistor sensors.

Protection of motors against thermal overload, e. g. caused by insufficient cooling, heavy load starting conditions, undersized motors, etc.



Liquid level monitoring relays

- Protection of pumps against dry running
- Protection against container overflow
- Control of liquid levels
- Detection of leaks
- Control of mixing ratios

Offer overview



CM-N range: Multifunctional range

- · 45 mm wide housing
- Output contacts: 2 c/o (SPDT) contacts
- Continuous voltage range (24-240 V AC/DC) or single-supply
- Setting and operation via front-face operating controls
- · Adjustment of threshold values and switching hysteresis via direct reading scale
- · Adjustable time delays
- Integrated and snap-fitted front-face marker label
- Sealable transparent cover (accessory)



CM-S range: Universal and multifunctional range

- Only 22.5 mm wide housing
- Output contacts: 1 or 2 c/o (SPDT) contacts
- One supply voltage range or supplied by measuring circuit
- Setting and operation via front-face operating controls
- Adjustment of threshold values and switching hysteresis via direct reading scale
- Integrated and snap-fitted front-face marker
- Snap-on housing: The relays can be placed on a DIN rail tool-free just snap it on or remove it tool-free
- Sealable transparent cover (accessory)



CM-E range: Economy range

- Only 22.5 mm wide housing
- Output contacts: 1 c/o contact or 1 n/o contact
- One supply voltage range
- One monitoring function
- · Cost-efficient solution for OEM applications
- Preset monitoring ranges



CM-TCN range: Smart temperature monitoring relays

- 45 mm wide housing
- Output contacts: 3 c/o contact
- Wide supply voltage range (24-240 V AC/DC)
- A wide range of settings, that can be adjusted flexibly
- NFC parametrization via smartphone app
- Back-lit LCD for easy reading and parametrization
- Embedded Modbus RTU communication interface

Benefits and advantages



For the monitoring of currents and voltages in single-phase AC/DC systems, ABB's CM-range contains a wide selection of powerful and compact devices, all in an only 22.5 mm wide housing. This product range includes current and voltage monitoring relays for over- and undercurrent and voltage protection – from 3 mA to 15 A, and from 3 V to 600 V.



Read the status of the relay at a glance: clear visualization of the device status via LEDs. Easy to adjust with rotary wheels and variants with push-in terminals make a quick and easy installation and setting possible.



Reliable in harsh conditions

All relays work reliably in environments with low temperatures down to -25 °C. Additionally, the housing fulfills the UL 94 V-0 flammability standard requirements. Together with the vibration resistant push-in terminals, the relay is not only reliable, no matter the environment temperature, but is also durable to shock and vibration. Save time as retightening is no longer needed, and enhance the reliability and safety of the equipment.



Easy installation

Like all devices from the measuring and monitoring portfolio, the single-phase monitoring relays are easily configurable via front facing potentiometers. Easy threshold configuration without calculation is accomplished by direct reading scales. For further configuration options, additional settings can be made via dip-switches, offering the flexibility to configure, for example, the working principle of the relays and the output configuration. The device can be set up before installation in the application and easy adjustments during the process are possible.

Benefits and advantages



Characteristics current and voltage monitoring relays1)

- Monitoring of DC and AC currents: 3 mA to 15 A
- Monitoring of DC and AC voltages from 3-600 V
- TRMS measuring principle
- One device includes 3 current measuring ranges
- One device includes 4 voltage measuring ranges: 3-30 V; 6-60 V; 30-300 V; 60-600 V
- · Over- and undercurrent monitoring
- · Over- and undervoltage monitoring
- ON or OFF-delay configurable
- · Open- or closed-circuit principle configurable
- Threshold values for >U and/or <U adjustable
- · Latching function configurable

- Thresholds for >I and/or <I adjustable
- Fixed hysteresis of 5 %
- Start-up delay T_v adjustable 0; 0.1-30 s
- Tripping delay T_v adjustable 0; 0.1-30 s
- 1 x 2 c/o contacts (common signal) or 2 x 1 c/o contact (separate signals for >I and <I) configurable
- 1 x 2 c/o contacts (common signal) or 2 x 1 c/o contact (separate signals for >U and <U) configurable
- 22.5 mm width
- 3 LEDs for the indication of operational states
- · Various approvals and marks
- 1) depending on device



Applications

- Protection of electronic or electromechanical devices against over- and under voltage or over- and under current
- DC motor speed control

- Battery monitoring
- Monitoring of AC or DC supplies
- · Monitoring of heating or lighting circuits



Current monitoring, single-phase

The ABB current monitoring relays CM-SRS.xx reliably monitor the occurrence of currents that exceed or fall below the selected threshold value. The functions overcurrent or undercurrent monitoring can be preselected. Single- and multifunction devices for the monitoring of direct or alternating currents from 3 mA to 15 A are available.

Current window monitoring (Imin, Imax)

The window monitoring relay CM-SFS.2x is available if the application requires the simultaneous monitoring of overand undercurrents.

Voltage monitoring, single-phase

The ABB voltage monitoring relays CM-SRS.xx are used to monitor direct and alternating voltages within a range of 3-600 V. Over- or undervoltage detection can be preselected.

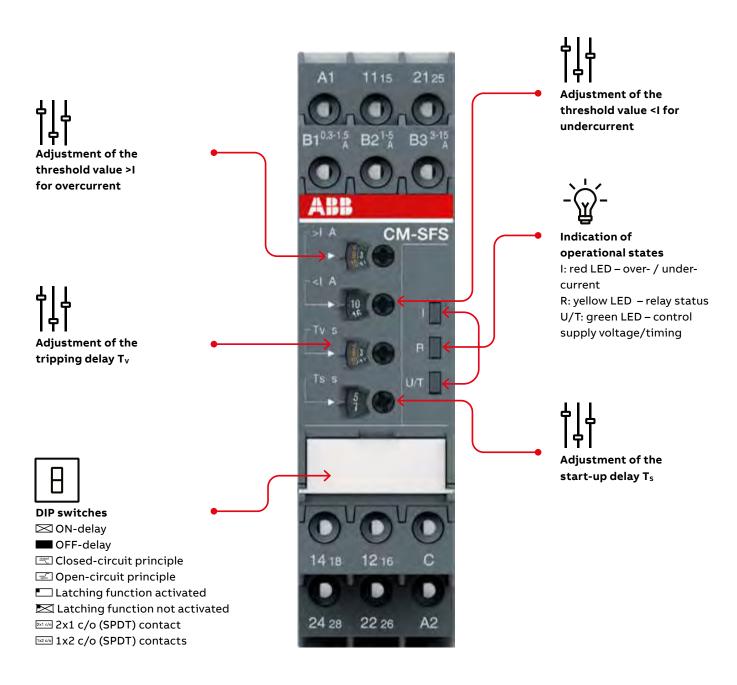
Voltage window monitoring (U_{min}, U_{max})

For the simultaneous detection of over- and undervoltages, the window monitoring relay CM-EFS.2 can be used.

Operating controls

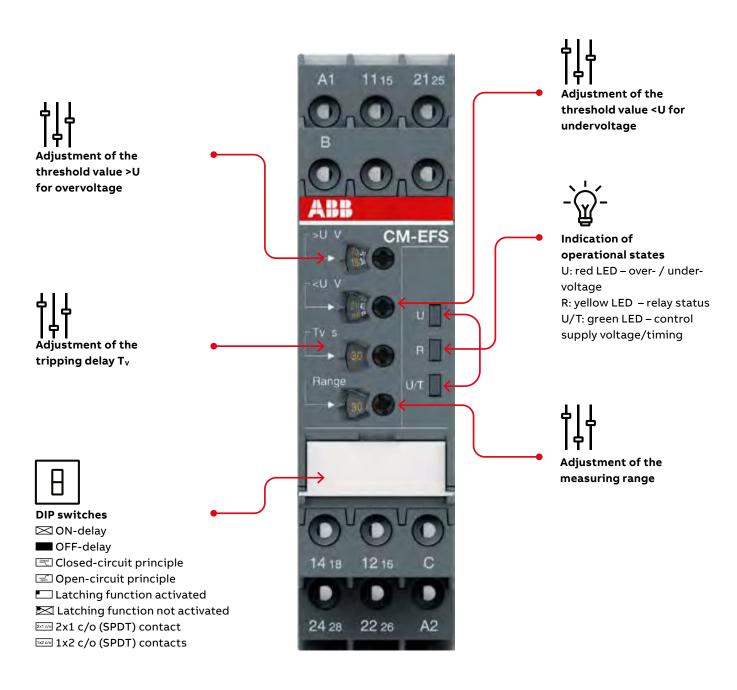
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Current monitoring relays



Operating controls

Voltage monitoring relays



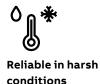
Benefits and advantages



For the monitoring of voltages in a three-phase system or network, ABB's CM range contains a wide selection of powerful and compact devices. This product range includes voltage monitoring relays for phase sequence, phase loss, unbalance and monitoring of over- and under voltage from 160 V to 820 V.



Read the status of the relay at a glance: clear visualization of the device status via LEDs. Easy to adjust with rotary wheels and variants with push-in terminals make a quick and easy installation and setting possible.



All relays work reliably in environments with low temperatures down to -25°C. Additionally, the housing fulfills the UL 94 V-0 flammability standard requirements. Together with the vibration resistant push-in terminals, the relay is not only reliable no matter the environment temperature but is also durable to shock and vibration. Save time as retightening is no longer needed and enhance the reliability and safety not only for the equipment.



Like all devices from the measuring and monitoring portfolio, the three-phase monitoring relays are easily configurable via front facing potentiometers. Easy threshold configuration without calculation is accomplished by direct reading scales. For further configuration options, additional settings can be made via dip-switches, offering the flexibility to configure, for example, the working principle of the relays and the output configuration. The device can be set up before installation in the application and easy adjustments during the process are possible.

Benefits and advantages



Characteristics

- True RMS (TRMS) measuring principle
- Device for the use in mains with a frequency of 45-440 Hz and where harmonics are to be expected¹⁾
- · Adjustable phase unbalance threshold value
- · Adjustable ON-delay/OFF-delay time
- · Powered by the measuring circuit
- 1 n/o contact, 1 or 2 c/o contacts
- $\bullet\,$ LEDs for the indication of operational states

- Multifunctional and singlefunctional devices
- Phase failure detection
- · Phase sequence monitoring
- Over- and undervoltage monitoring (fixed or adjustable)
- Wide-range operating voltage guarantees world-wide operation
- · Various approvals and marks

(1) devices CM-MPS.23 and CM-MPS.43



Applications

- Control for connection of moving equipment (e.g. air conditioning compressors, refrigerated trucks and containers, and cranes)
- Control against reverse motor operation (lifting, handling, elevators, escalators, etc.)
- Control of sensitive three-phase supplies
- Overheating of the motor due to asymmetrical voltage
- Protection of a plant against destruction due to overvoltage
- Direction of rotation of the drive

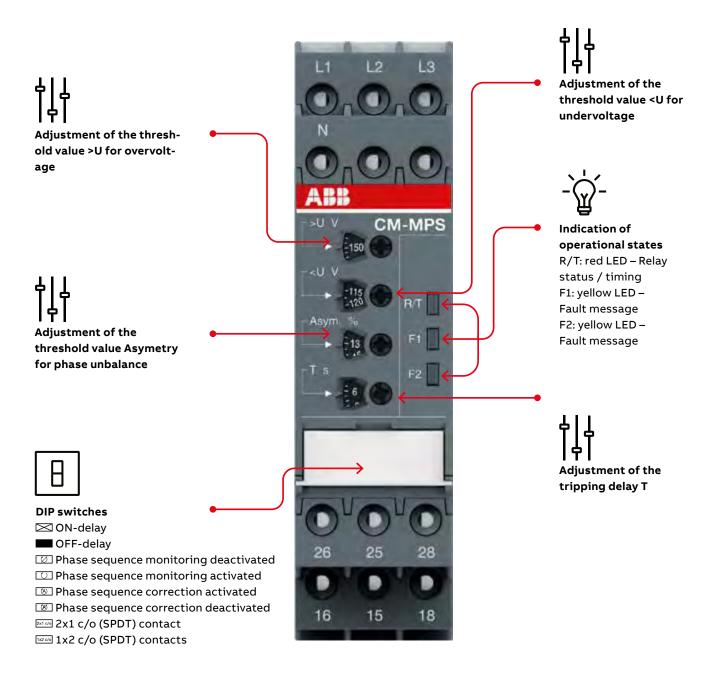






Operating controls

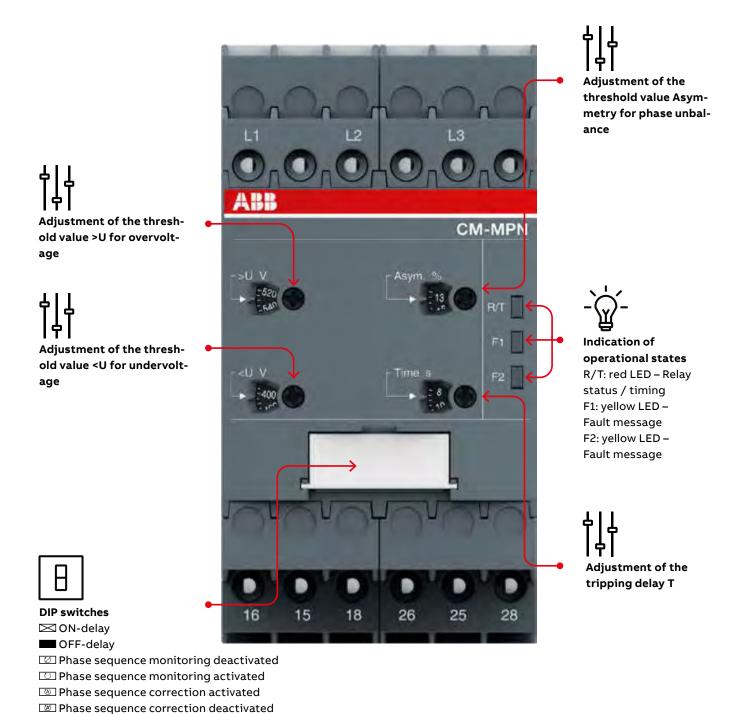
S-range housing



Operating controls

N-range housing

2x1 c/o (SPDT) contact 2x2 c/o (SPDT) contacts



Benefits and advantages



ABB's grid feeding monitoring relays detect unusual events in the public power grid and keeps it stable by automatically disconnecting and reconnecting the renewable power plant. The CM-UFD displays all relevant measuring data and events and can communicate them via a build-in communication interface. The cloud-based service Ability™ EDCS enables customers to monitor the conditions in real-time, send the values into the cloud and access the diagnostics remotely.



Optimum interface

Reduce downtime by up to 70%

Operate the device via LCD or remotely with the Modbus RTU. Users are informed immediately in case of an event in the public grid. Redundant microcontrollers ensure reliable measuring values and tripping.



Cut installation time by up to 60%

There's no need to learn every possible adjustment and its effects on your system – ABB's trained staff supports your business and answers your technical questions promptly.



Commission & configure up to 60% faster

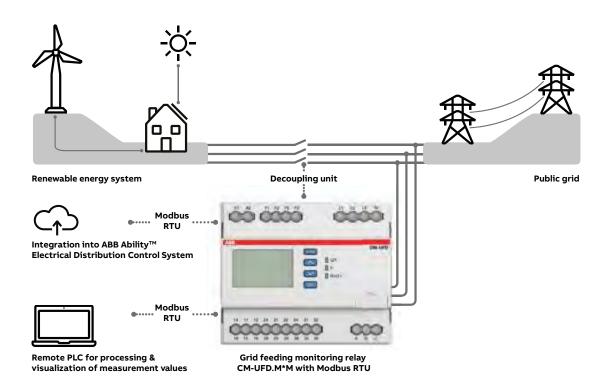
Simple instructions, presets for local grid feeding standards, and ABB's intuitive menu structure make installation quicker. Commissioning and troubleshooting errors are prevented.

Benefits and advantages



ABB's CM-UFD range are multi-functional grid feeding monitoring relays, installed between the renewable energy system and the public grid. The innovative relays guarantee grid stability and prevent blackouts. If the public grid's voltage or frequency moves out of the permitted ranges, the device uses a decoupling unit (e.g. contactor or breaker Tmax XT) to separate the renewable energy system from the public grid. As soon as the grid is stable again, the system is automatically reconnected.

The CM-UFD range provides different monitoring functions in accordance with several local grid feeding standards to detect over-/undervoltage and over-/underfrequency.





Advantages

- · Highly accurate measurement and setting
- Modbus RTU communication interface and ABB Ability[™] EDCS connectivity
- Functional safety single fault tolerances
- · Clear multiline, backlit LCD
- · Intuitive and user-friendly menu
- Event storage
- Pre-settings meet several local standards
- Type-tested to a number of local grid feeding standards by TÜV Süd



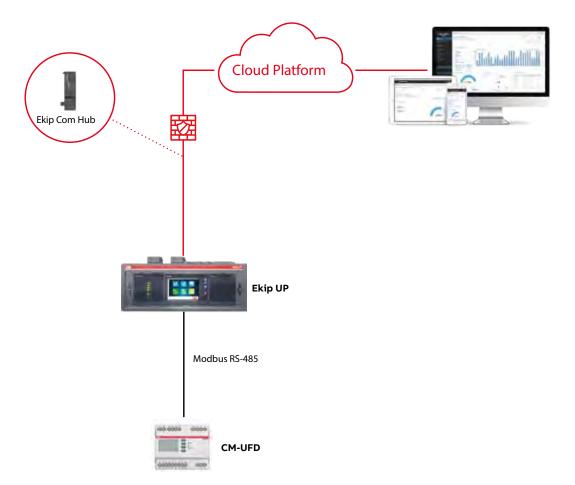
Functionality

The device measures the ten-minute average value, voltage increases and decreases, as well as any changes in grid frequency. The rate of change of frequency (ROCOF) and vector shift monitoring to detect a loss of mains event can be easily configured.

Benefits and advantages

The cloud-based service Ability™ EDCS enables customers to monitor the condition of CM-UFD.M*M in real-time and access the diagnostics remotely. This functionality is very important when operating in the field of critical power. Parametrize with ABB Ekip Connect and access data no matter where you are.

Example architecture



The grid feeding monitoring relays can be connected to the cloud directly by using Ekip Com Hub module. Another option is to connect via Modbus RTU when there is some other device equipped with the Ekip Com Hub like the Emax 2 air-circuit breaker.

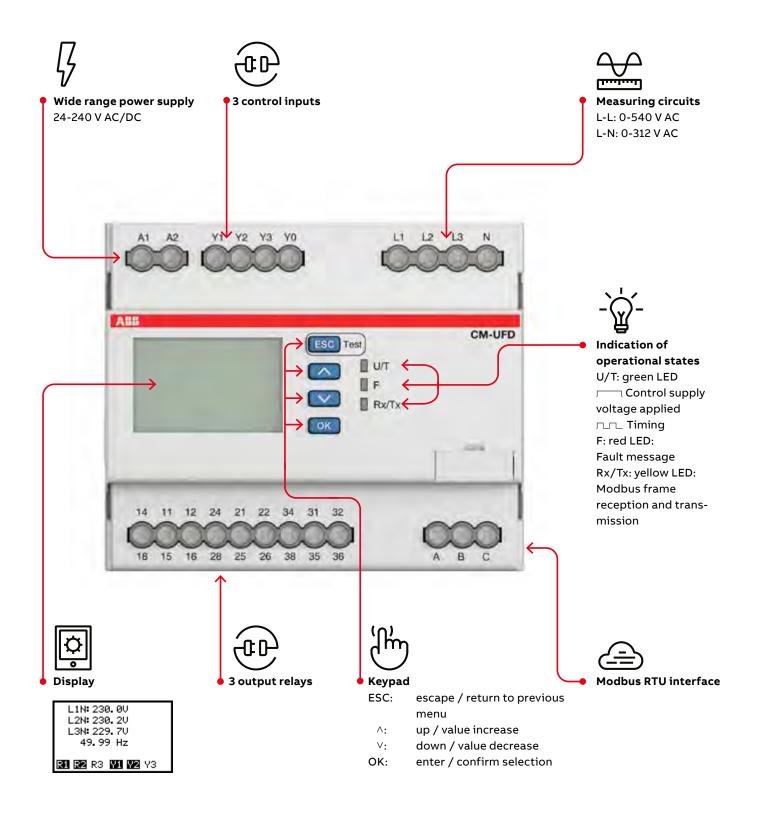
In addition to the Ekip Connect 3 software, the following hardware is required:

- Ekip UP (min. firmware 2.23)
- Ekip Com Hub (min. firmware 1.18)
- Ekip Com Modbus RTU (min. firmware 2.28)
- Ekip Supply
- Ekip T&P cable
- CM-UFD.M*M (min. firmware 1.0.1)



For further information regarding integration into ABB Ability™ EDCS, please use the application note "2CDC112280M0101 CM-UFD.M*M integration into ABB Ability™ EDCS".

Operating controls



Benefits and advantages



The insulation monitoring relays of the CM-IWx range guarantee a continuous insulation monitoring of an IT system. The devices recognize insulation faults as they develop and warn immediately if the value has fallen below the minimum set threshold. This ensures a reliable operation of the system and prevents operational interruption caused by a second, more severe, insulation fault which may lead to a short circuit tripping the main circuit breaker.



Continuous operation

Keep the system online and reduce downtime with early pre-warnings which enable time for maintenance planning. Monitor voltage free networks for early fault detection. Due to variants with rail and ship approval, the devices have a wide range of applications.



Safety and protection

Safe and reliable detection of insulation faults according to the latest standards is what ABB's insulation monitoring relays deliver. The portfolio extends from standard to more challenging applications and can prevent fire due to fast and reliable earth fault detection. Built-in self-diagnosis and interrupted wire detection further ensure safety.



Read the status of the relay at a glance: clear visualization of the device status via LEDs. Easy to adjust with rotary wheels and variants with push-in terminals make a quick and easy installation and setting possible.

Benefits and advantages



Overview

The CM-IWx product family offers a convincing solution for monitoring ungrounded AC, AC/DC and DC networks according to EN/IEC 61557-8. An IT network is supplied either by an isolating transformer or a voltage source, such as a battery or generator. In these systems, no active conductor is directly connected to earth potential.

The high reliability of an IT system is guaranteed thanks to continuous insulation monitoring. The insulation monitoring device recognizes insulation faults (at least one conductor has a galvanic connection to earth potential) as they develop and immediately reports if the insulation resistance has fallen below a given threshold. Therefore, maintenance activities can be scheduled and executed while the plant keeps running.



Main benefits

- · Increase plant availability and avoid costly unplanned stops of a plant / machine by quickly detecting faults first
- Prevents fires due to detection of a creeping deterioration of the insulation resistance
- The adjustment of the setting values is simple and done in a user-friendly way with rotary switches on the front of the device
- Device status is displayed with LEDs that are easy to read and understand
- Devices for standard and more challenging applications are available
- Variants with rail and ship approvals are available



Benefits and advantages

CM-IWS.1 - for unearthed AC, DC or mixed AC/DC systems



The CM-IWS.1 serves to monitor insulation resistance in accordance with IEC 61557-8 in unearthed IT AC systems, IT AC systems with galvanically connected DC circuits, or unearthed IT DC systems with a voltage up to 250 V AC and 300 V DC. It can be configured to the requirements of the applications and therefore has multi-functional uses. The device is available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

- For monitoring the insulation resistance of unearthed IT systems up to $U_n = 250 \text{ V}$ AC and 300 V DC
- · Test function
- · According to IEC/EN 61557-8
- Rated control supply voltage 24-240 V AC/DC
- Prognostic measuring principle with superimposed square wave signal
- One measuring range 1-100 $k\Omega$
- 1 c/o (SPDT) contact, closed-circuit principle
- Precise adjustment by front-face operating controls in $1\,k\Omega$ steps

- · Interrupted wire detection
- Fault storage / latching configurable by control input
- Screw connection or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- · Tool-free mounting on DIN rail as well as demounting
- 22.5 mm width
- 3 LEDs for status indication

CM-IWS.2 – for unearthed pure AC systems



The CM-IWS.2 serves to monitor insulation resistance in accordance with IEC 61557-8 in unearthed IT AC systems with a voltage up to 400 V AC. The CM-IWS.2 can be configured to the requirements of the applications and therefore has multi-functional uses. The device is available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

- For monitoring the insulation resistance of unearthed IT systems up to U_n = 400 V AC
- Test function
- According to IEC/EN 61557-8
- Rated control supply voltage 24–240 V AC/DC
- Measuring principle with superimposed DC voltage
- One measuring range 1-100 $k\Omega$
- Fault storage / latching configurable by control input
- Precise adjustment by front-face operating controls in 1 $k\Omega$ steps

- Screw connection or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 1 c/o (SPDT) contact, closed-circuit principle
- 22.5 mm width
- 3 LEDs for status indication

Benefits and advantages

CM-IWN.1 - for unearthed AC, DC or mixed AC/DC systems



The CM-IWN.1 serves to monitor insulation resistance in accordance with IEC 61557-8 in unearthed IT AC systems, IT AC systems with galvanically connected DC circuits, or unearthed IT DC systems with a voltage up to 400 V AC and 600 V DC. The measuring range can be extended up to 690 V AC and 1000 V DC by using the coupling unit CM-IVN. It can be configured to the requirements of the applications and therefore has multifunctional uses. The CM-IWN.1 is available with two different terminal versions. You can choose between the proven screw connection technology (double chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

- For monitoring the insulation resistance of unearthed IT systems up to U_n = 400 V AC and 600 V DC, expansion to 690 V AC and 1000 V DC with CM-IVN
- · Test function
- · According to IEC/EN 61557-8
- Rated control supply voltage 24-240 V AC/DC
- Prognostic measuring principle with superimposed square wave signal
- Two measuring ranges 1-100 $k\Omega$ and 2-200 $k\Omega$
- Precise adjustment of the measuring value in 1 or 2 kW steps
- One (1 x 2 c/o) or two (2 x 1 c/o) threshold values Ran1/R1 (warning) and Ran2/R2 (pre-warning) configurable

- Precise adjustment of the threshold values in 1 k Ω steps (R1) and 2 k Ω steps (R2)
- Interrupted wire detection configurable
- · Non-volatile fault storage configurable
- Open- or closed-circuit principle configurable
- Screw connection or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 45 mm width
- 3 LEDs for status indication

CM-IWM.10 and CM-IWM.11 - for unearthed AC, DC or mixed AC/DC systems with up to 1500 V measurement voltage

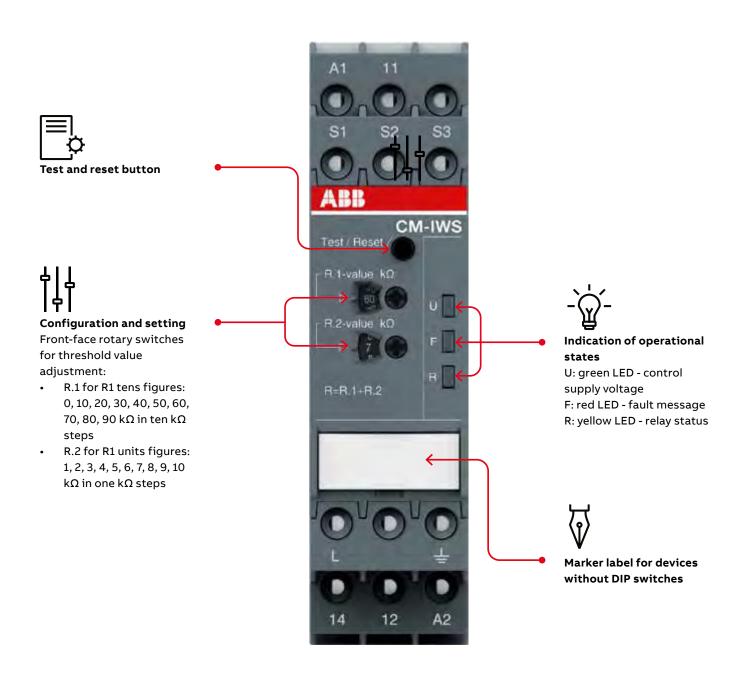


The insulation monitors CM-IWM.10 and CM-IWM.11 provide the best and up-to-date insulation monitoring of modern IT systems in an optimum and state of-the-art way fulfilling the relevant standards. The devices can be used in the most flexible way for AC, DC and AC/DC systems even with large leakage capacity to earth (PE). The adjustment of the setting values is simple and done in a user-friendly way on two rotary switches on the front of the device. Via LEDs the measured value, device parameters and device status are indicated easy to read.

- Insulation monitoring according to IEC/EN 61557-8
- Detection of symmetric and asymmetric insulation faults
- 1 c/o contact each for pre-warning and warning
- Measuring circuits can be disconnected via control terminals, e.g. for mains couplings
- Pre-warning threshold setting range: 20 $k\Omega$... 2 $M\Omega$
- Warning threshold setting range: 1 k Ω ... 250 k Ω
- Open- or closed-circuit principle configurable
- Setting the maximum earth leakage capacitance to shorten the response time
- Simple, clearly arranged adjustment of the device with screwdriver
- LED chain to indicate the current insulation resistance
- Display of active measuring circuits
- Automatic and manual device self-test
- Alarm storage selectable
- External test and reset push button can be connected
- 90 mm width

Operating controls

CM-IWS



Operating controls

CM-IWN

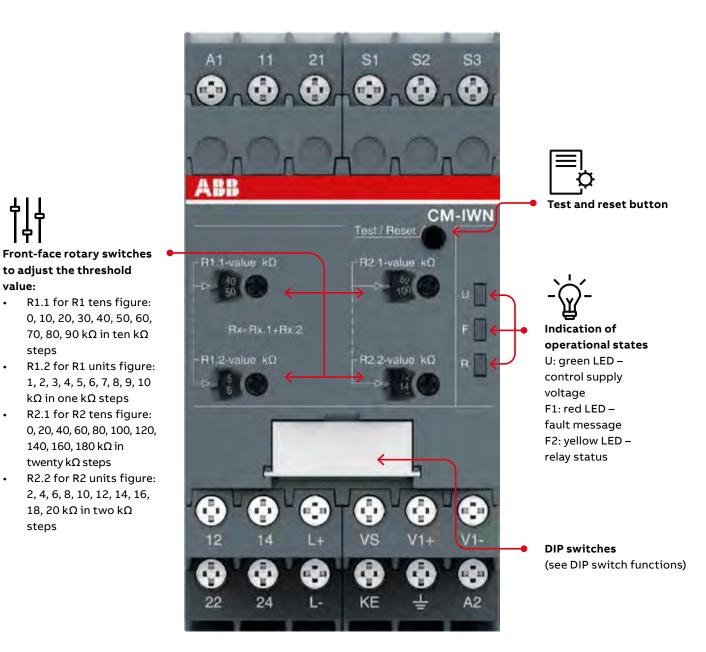
value:

steps

steps

140, 160, 180 $k\Omega$ in

 $twenty\,k\Omega\,steps$



Benefits and advantages



The thermistor motor protection relays of the CM-MSx range protect motors with PTC sensors against high temperature. These sensors are incorporated in the motor windings, thus measuring the motor heat directly.



By using thermistor motor protection relays from ABB, the down and commissioning time can be reduced. The relay is continuously monitoring the sensor circuit to detect short-circuit or interrupted i.e. wire faults, thus contributing to maintenance and time saving in case of faults. In addition, the clear error messages of the front LEDs makes it possible to distinguish between the various fault causes.



Direct motor protection through temperature monitoring of the motor winding offers 100 % motor protection, even under the most difficult ambient conditions. The ABB thermistor motor protection relays give you access to worldwide markets and are approved by local and international standards for many applications such as industry, renewable energies, the marine sector and dangerous and explosive environments. To prove that, the CM-MSS thermistor motor protection relays are certified according to ATEX Ex II (2) G and D for environments with explosive gas or dust loads.



Due to the compliance with the latest standards, there is no need to make any adjustments on the device. All relays come with two different connection possibilities - screw or push-in - to make any adjustments on the installation a breeze. Thanks to direct measurement of the motor temperature, dimensioning of the thermistor motor protection relay, considering the size of the motor, is not necessary.

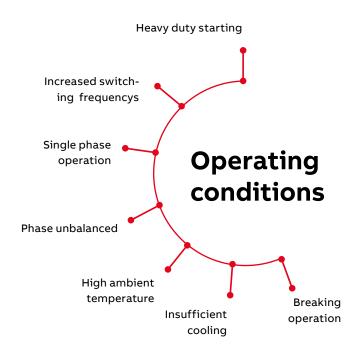
Applications



Direct temperature monitoring

Generally, motor damage caused by overload or overheating situations can be prevented in different ways. Compared to the indirect temperature measuring which monitors the motor current, the temperature inside the motor can be measured by direct temperature measuring. This enables direct control and evaluation of different operating conditions:

Therefore, the consequences from overheating, such as abrasion as well as electrical failures, can be prevented. The direct measuring principle is carried out by a combination of the thermistor motor protection relay and three PTC sensors which are installed directly in the motor by the manufacturer. Those 3 PTC sensors are placed directly at the thermal hotspots, the motor windings.





Motor protection using current- and temperature-dependent protective devices

IEC 60204 stipulates that motors must be protected from overheating at a rating of 0.5 kW and higher. The protection can be provided or executed by overload protection, overtemperature protection or current limiting. For motors with frequent starting and braking, and in environments where cooling may be impaired (e.g. by dust), it is recommended to use the overtemperature protection option in the form of a protective device coordinated with this mode of operation.

On rotor-critical motors, overtemperature detection in the stator windings can lead to delayed and hence inadequate protection. In this case, the standards stipulate additional protection, e.g. by means of an overload relay. This combination of thermistor motor protection and an overload relay is recommended for full motor protection in case of frequent starting and braking of motors, irregular intermittent duty or excessive switching frequency.



Operating mode

The thermistor motor protection relays are used to monitor the temperature of motors or generators equipped with PTC sensors type A according to the latest product standard IEC/EN 60947-8. The sensors are built-in into the motor windings, measuring the motor heating. In case of an increase of the temperature in the motor, the resistance of the PTC sensors increases as well. If the motor heats-up excessively (>2.83 k Ω), the output relay(s) de-energize(s) and the corresponding LED displays the overtemperature. A short circuit and an interrupted wire within the sensor circuit can also be detected. A reset is only possible after cooling down of the motor (<1.1 k Ω) or after a wire interruption, or a short circuit within the sensor circuit has been removed. A reset after tripping can be done manually with the Test / Reset button, externally with a push button between S1 and 1T2/2T2, or automatically by jumpering S1-1T2/2T2.

Offer overview



CM-MSE

- Auto reset
- Connection of several sensors (max. 6 sensors connected in series)
- Monitoring of bimetals
- 1 n/o contact
- Excellent cost / performance ratio

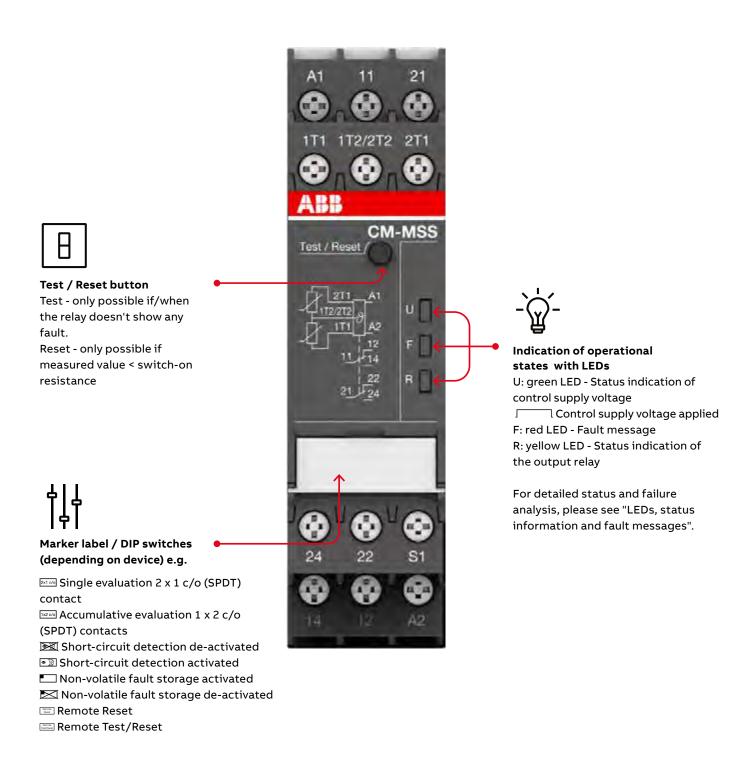


CM-MSS¹⁾

- Different types of contacts available
 - 1 x 2 c/o (SPDT) contacts
 - 2 x 1 c/o (SPDT) contact
- $1\,\text{n/o}$ and $1\,\text{n/c}$ contact
- 1 or 2 measuring circuits
- Different types of reset functions
 - Automatic
 - Manual
 - Remote
- Rated control supply voltages
 - 24 V AC/DC
- 24-240 V AC/DC
- 110-130 V AC, 220-240 V AC
- Various approvals and marks

 $^{^{} ext{(1)}}$ Depending on device the characteristics vary, for detailed overview see "Selection table" on page 189.

Operating controls



Temperature monitoring relays with potentiometer Benefits and advantages



The temperature monitoring relays of the CM-TCS range are able to measure temperatures of solids, liquids and gaseous media using PT100 sensors. Overtemperature and undertemperature monitoring, as well as open- or closed-circuit principle is configurable for all devices. As soon as the temperature falls below or exceeds the set threshold value, the output relays change their positions and the front-face LED's display the current status.



By using temperature monitoring relays, both the downtime and the commissioning time can be reduced. The relay is continuously monitoring the sensor circuit to detect short-circuit or interrupted wire faults. The high accuracy of the measuring input leads to a fast detection of exceeding threshold values. In case of fault, maintenance effort is reduced and time saved.



All relays work reliably in environments with low temperatures down to -40 °C. Additionally, the housing fulfills the UL 94 V-0 flammability standard requirements. Together with the vibration resistant push-in terminals, the relay is not only reliable no matter the environment temperature but is also durable to shock and vibration. Save time as retightening is no longer needed and enhance the reliability and safety not only for the equipment.



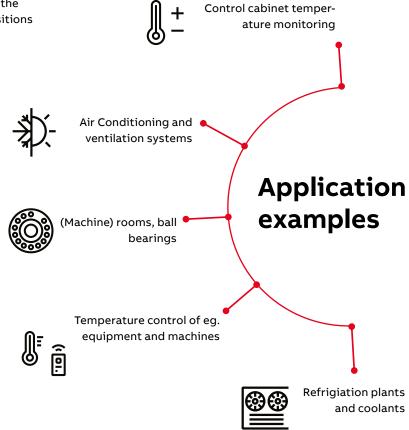
Like all devices from the measuring and monitoring portfolio, the CM-TCS relays are easily configurable via front facing potentiometers. Easy threshold configuration without calculation is accomplished by direct reading scales. For further configuration options, additional settings can be made via dip-switches, offering the flexibility to configure, for example, the working principle of the relays and the output configuration. The device can be set up before installation in the application and easy adjustments during the process are possible.

Temperature monitoring relays with potentiometer Applications

The temperature monitoring relays CM-TCS monitor overtemperature, undertemperature, or temperatures between two threshold values (window monitoring) with a PT100 sensor.

As soon as the temperature falls below or exceeds the threshold value, the output relays change their positions according to the configured functionality.

The current status is displayed by frontfaced LEDs. Regardless of the selected configuration, the device is monitoring its measuring circuit for interrupted wires or short-circuits.





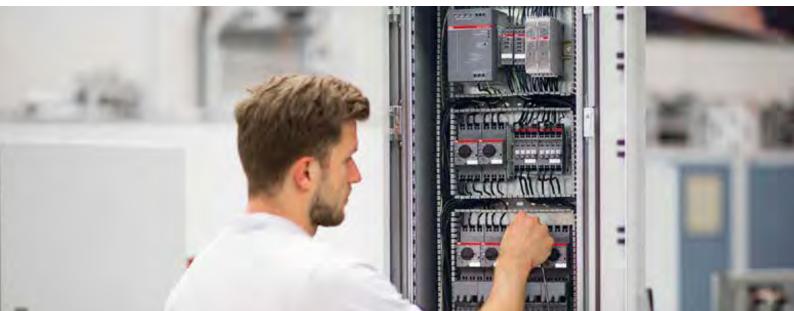




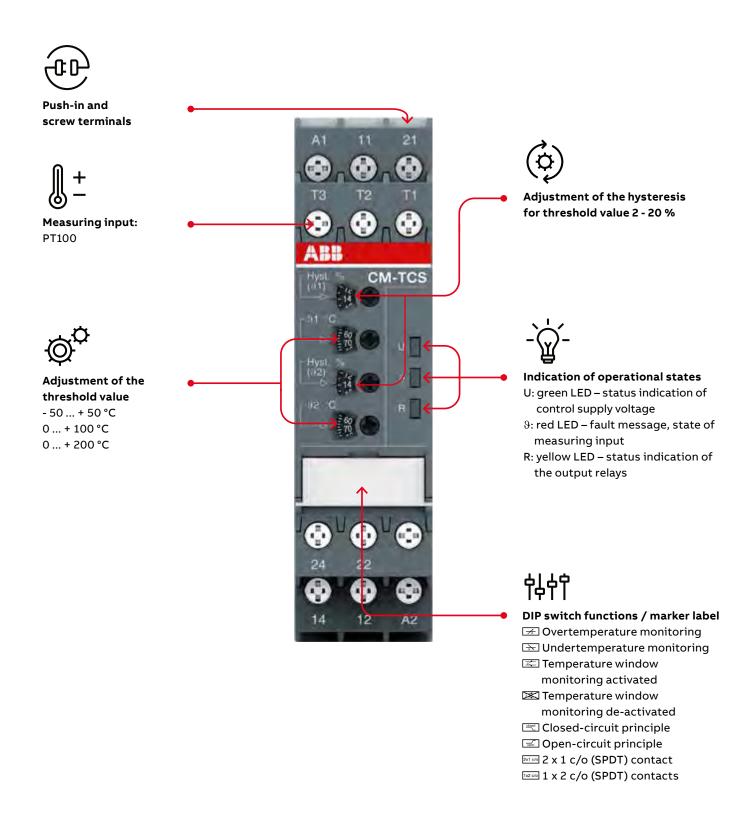








Temperature monitoring relays with potentiometerOperating controls



One look, one touch - one device

Features and benefits



Set up these innovative temperature monitoring relays exactly as you need, either via a back-lit LCD or smartphone app. Parametrization and configuration are just one touch away with the ABB EPiC app – even in a non-powered state – reducing installation time by 80%. And with just one relay covering a wide range of application, stocks can be reduced significantly, making ABB's Smart monitoring relays a true game changer.

Easy to install

One look - back-lit LCD for easy reading and parametrization

Everything you need at a glance: the LCD at the front of the relay shows the currently measured values and maintenance data. And with just one push, the symbol-based menu structure can be accessed via the push-rotate button. Simply set the thresholds and parameters with the help of an intuitive and future-ready interface.



One touch - NFC parametrization via smartphone app

One touch is all that is needed for fast, easy and intuitive configuration with the ABB EPiC smartphone app. Simply touch the relay with your mobile phone: Parameter settings can be edited and stored in the app and then copied to different devices, even if they are not in the powered state. Available in a range of different languages, installation and configuration have never been so easy.

One device - for thermal protection and condition monitoring

Smart temperature monitoring relays ensure that your application remains operational by detecting potential failures in advance. They protect the life of your assets by providing early detection of unacceptable temperature rises and the need for maintenance. The relay is configurable over a wide range of settings and can be adjusted flexibly. Set a pre-alarm and alarm thresholds according to application needs. Increase personal safety by monitoring temperature remotely with Modbus RTU or ABB AbilityTM Energy and Asset Manager.



One look - back-lit LCD

Easy reading and setup with one push

Just one look is all it takes to see the status and measured values of the relay, easily navigate through the symbol-based menu and even configure the device with the new, back-lit LCD at the front of the relay.



Start screen

Know the status at one glance.



Symbol-based menu structure

Due to the symbol-based menu structure, there is no need for any translation, which helps avoid misunderstandings and dramatically increases efficiency in after sales support.



Pre- and user-defined settings

For frequently used applications, the device offers predefined settings to save installation time. Parameters can be individually set and saved in one of four user settings.







Push-rotate adjustment

Adjust the relay with a simple screw driver by pushing and rotating the potentiometer to navigate through the menu.



Diagnostic data

Event history, operating hours counter, statistics and others are easily accessible from the menu



Back-lit LCD

The back-lit LCD at the front of the relay shows the currently measured values and maintenance data and makes setup easy.



Password & parameter log

Improved security is achieved through the recorded password and parameter log.

One touch - setup via smartphone app

Powerless configuration with NFC

Configuration and parametrization of temperature monitoring relays has never been simpler. One touch is all that is needed for fast, easy and intuitive configuration with the ABB EPiC mobile phone app.





Near Field Communication (NFC)

NFC is an international transmission standard based on radio-frequency identification technology for the contact-less exchange of data. This technology is already integrated into most electronic devices like tablets and smartphones and part of everyday life, e.g. for contactless payment.



ABB EPiC smartphone app

Electrification Products intuitive Configurator (EPiC) is a mobile application that makes it possible to configure and check the status of ABB low voltage products. The app is available for free - just download it and connect to your smart monitoring relays, circuit breakers and other devices.



Easy visualization

Monitor the status of the relay and read the measured values in the app.



Store and send parameters

Store a set of parameters in the app and distribute them globally and copy them to other devices.



Powerless adjustment

Parametrize and configure the relays even while not connected to a power supply, e.g. on office desks.



One touch setup

Handle the relays with just one touch-just hold the smartphone against the front of the relay.



Copy and paste functionality

Simply copy the settings from one device to another–with just one touch to the relay.



Event history

Examine the history of the device and recent events.

Built-in connectivity

Communication via embedded Modbus RTU

The smart temperature monitoring relay CM-TCN.012 supports the data transfer using the Modbus RTU communication protocol. The communication interface RS-485 is embedded in the relay and does not require installation of any accessories.



— CM-TCN manual

Modbus communication map and information about the device configuration can be found in the CM-TCN user manual



The communication interface makes it possible to:



Read the temperature measurements, relays state and temperature sensors status.



Access the condition monitoring data such as event history, operating hours counter, maintenance counter, statistics.



Configure the smart monitoring relay remotely.



Reset the history and settings (trip counter, event history, etc)



Read system information (serial number, firmware version)



Control output relays and trigger them in case of the communication bus error

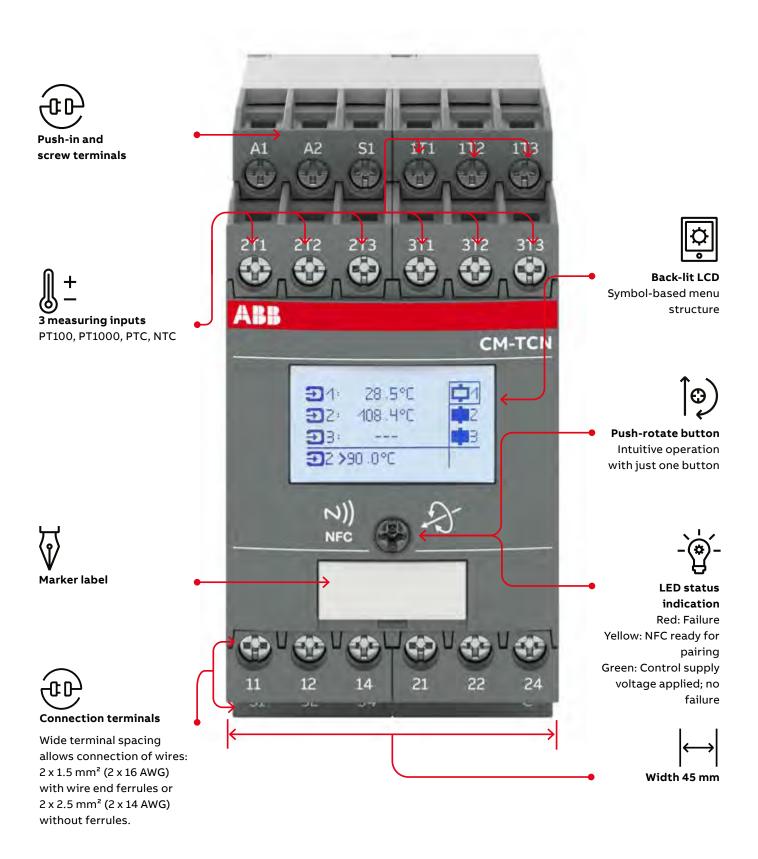








Operating controls



Liquid level monitoring relays

Benefits and advantages



ABB's liquid level monitoring relays are the ideal solution to regulate and control liquid levels and ratios of mixtures of conductive fluids. The assortment includes single- or multifunctional devices which can be used for overflow protection, dry-running protection of pumps, filling and draining applications as well as max. and min. level alarming.



Global availability

The liquid level monitoring relays are designed to provide a wide supply voltage range, making global differences irrelevant. Additionally, the CM-ENS range meets a broad range of standards and requirements. Together with ABB's global support and sales network, using CM-ENS gives customers the confidence of worldwide sourcing – no matter where they build, install or operate their equipment.



High immunity against electromagnetic disturbances is ensured due to advanced measuring technology. Additionally, the housing fulfills the UL 94 V-0 flammability standard requirements. Together with the vibration resistant push-in terminals, the relay is not only reliable no matter the environment temperature but is also durable to shock and vibration. Save time as re-tightening is no longer needed and enhance the reliability and safety not only for the equipment.



Like all devices from the measuring and monitoring portfolio, the CM-ENS relays are easily configurable via front facing potentiometers. Easy threshold configuration without calculation is accomplished by direct reading scales. The device can be set up before installation in the application and easy adjustments during the process are possible.

Liquid level monitoring relays

Benefits and advantages



Operating principle

Liquid level control relays CM-ENS are designed to monitor levels of conductive liquids and media and is used, for example, for liquid level control in pump systems. The measuring principle is based on the resistance change sensed by single-pole electrodes. To avoid electrolytic phenomena, an AC current runs across the probes.

A selector switch on the front panel allows selection of the required function and the sensitivity range.



Suitability

Suitable for		Not suitable for	
spring water	acids, bases	chemically pure water	ethylene glycol
drinking water	liquid fertilizers	fuel	concentrated alcohol
sea water	milk, beer, coffee	oils	paraffin
sewage	non-concentrated alcohol	explosive areas (liquid gas)	lacquers



Characteristics

CM-ENS.1x

- Control of one or two liquid levels (min/max)
- Fill or drain function
- Adjustable response sensitivity 5-100 $k\Omega$

CM-ENS.2x

- Control of one or two liquid levels (min/max)
- Fill (UP) or Drain (DOWN), adjustable via front-face potentiometer
- Adjustable response sensitivity 0.1-1000 $k\Omega$

CM-ENS.31

- Control of one or two liquid levels (min/max)
- Fill (UP) or Drain (DOWN), adjustable via front-face potentiometer
- Adjustable response sensitivity 0.1-1000 $k\Omega$
- Selectable ON- or OFF-delay
- 2 c/o (SPDT) contacts

All CM-ENS devices

- Devices with wide rated control supply voltage 24-240 V AC/DC
- Cascadable
- High EMC immunity
- 3 LEDs for the indication of operational states
- Screw connection technology or Easy Connect Technology
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting and demounting on DIN rail
- 22.5 mm (0.89 in) width

Primary switch mode power supplies

Overview

Modern power supply units are a vital component in energy management and automation technology. As your global partner in these areas, ABB pays the utmost attention to the resulting requirements. Innovation is the key to ABB's power supply product program.

Power supplies for industrial applications



CP-E range: economy range

The CP-E range offers enhanced functionality while the number of different types has been considerably reduced. Now all power supply units can be operated at an ambient temperature of up to +70 °C. The CP-E range 24 V devices over 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis. Optimized for worldwide applications, the CP-E power supplies can be supplied within a wide range of AC or DC voltages. The output voltage is continuously adjustable, ensuring optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length. For decoupling of parallel connected power supplies below or equal to 56 V, redundancy modules are available in order to achieve true redundancy.



CP-T range: three-phase range

The CP-T range of three-phase power supply units perfectly complements ABB's existing power supply offering in terms of design and functionality, giving you more advanced options for your three-phase applications. Solid state output for function monitoring and remote diagnostics is available. The range is to be used in 340 - 575 V AC or 480 - 820 V DC supply systems. Its continuously adjustable output voltage ensures optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length.



CP-S.1 range: high-efficiency range

CP-S.1 power supplies: high efficiency and reliability delivered in a compact footprint. Designed for a huge variety of applications, including machine building segments, this advanced range boosts an integrated 150 % power reserve for five seconds and operates at an efficiency of up to 94 %. With overheat protection, active power factor correction, a broad certified AC and DC input range and extensive worldwide approvals including marine, the all-new CP-S.1 power supplies are a preferred choice for multiple industrial applications.

Primary switch mode power supplies

Overview

Power supplies for industrial applications



CP-C.1 range: high-performance range

The CP-C.1 power supplies are ABB's high-performance and most advanced range. With excellent efficiency, high reliability and innovative functionality, the CP-C.1 range is ready to take on the most demanding industrial applications. These power supplies have a 150 % integrated power reserve and operate at an efficiency of up to 94 %. They are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, the CP-C.1 power supplies are the preferred choice for professional DC applications. Giving the power to control.



CP-B range: short time buffers

ABB offers an innovative and completely maintenance- free product range for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

- Ultra cap based buffer modules for short time UPS systems
- Rated input voltage 24 V DC
- Rated currents 3 A, 10 A and 20 A
- 10 A buffer module with increased capacity to buffer up to 9 min (10 % load)
- LEDs for status indication
- · Higher than 90 % efficiency
- Signaling and status outputs
- Buffering times at 100 % load current from 13 s to 50 s (depending on device)

Power supplies for building applications



CP-D range: distribution panel design

The CP-D range of power supply units in MDRC design (modular DIN rail components) fits into all domestic installation and distribution panels. With their width of only 18 to 90 mm, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels. The range is optimized for worldwide applications: The CP-D power supplies can be supplied with 90-264 V AC or 120-375 V DC. The continuously adjustable output voltage (CP-D > 10 W) ensures optimal adaption to the application, e.g. compensating the voltage drop caused by a long line length. An additional redundancy unit CP-D RU to establish true redundancy is available.



CP-T range

Benefits and advantages



Characteristics

- Rated output voltages 24 V, 48 V DC
- Output voltage adjustable via front-facing rotary potentiometer "OUTPUT Adjust"
- Rated output currents 5 A, 10 A, 20 A, 40 A
- Rated output powers 120 W, 240 W, 480 W, 960 W
- · Three-phase operation (see derating note)
- Two-phase operation (25 % derating possible, see derating note)
- Supply range 3 x 400–500 V AC (3 x 340-575 V AC, 480-820 V DC)
- Typical efficiency of 93 %
- · Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 $^{\circ}$ C $^{1)}$
- Open-circuit, overload and short-circuit stable
- · Integrated input fuse
- Redundancy unit CP-C.1-A-RU (-C) offering true redundancy, available as accessory
- · LEDs for status indication
- Signalling contact "13-14" (solid-state) for output voltage OK on 24 V devices
- · Various approvals and marks



Main benefits

Signalling output

Some devices of the CP-T series offer a solid-state output for function monitoring and remote diagnostics.

Wide input range

Optimized for worldwide applications: The CP-T power supplies can be used in 340 - 575 V AC or 480 - 820 V DC supply systems.



Adjustable output voltage

The CP-T range features a continuously adjustable output voltage. Thus, they can be optimally adapted to the applications, e.g. compensating the voltage drop caused by a long line length.







^{1) 480} W variants: -30...+70°C

CP-S.1 power supply range

Benefits and advantages



CP-S.1 power supplies: high efficiency and reliability delivered in a compact footprint. Designed for a huge variety of applications, including machine building segments, this advanced range boosts an integrated 150 % power reserve for five seconds and operates at an efficiency of up to 94 %. With overheat protection, active power factor correction, a broad certified AC and DC input range and extensive worldwide approvals including marine, the all-new CP-S.1 power supplies are a preferred choice for multiple industrial applications.



Outstanding power to space ratio

In comparison to other power supply ranges on the market, ABB's CP-S.1 range achieves space savings up to 50 %. Together with the high-efficiency and reduced power losses features, CP-S.1 is a space and cost saving solution for applications where size matters.



System reliability

The power reserve functionality provides additional power of starting heavy loads. CP-S.1 offers 150 % of the nominal current for five seconds to start e.g. heavy loads reliably. Together with ABBs redundancy modules CP-C.1-A-RU as well as buffer modules CP-B range - buffering the load in case of power losses on grid side - increase the availability and finally the system reliability further. Coated PCBA completes CP-S.1 range offering for OEM machine builders.



Global availability

CP-S.1 range can be used in multiple installations in the world. A certified wide AC and DC input voltage range as well as a variety of approvals incl. marine, giving you the confidence of world-wide sourcing – no matter where you build, install or operate your equipment.

CP-S.1 power supply range

CO2 reduction



CP-S.1 power supplies operate at an astonishing efficiency of up to 94%. By increasing the efficiency by just 2 %, 1,4 tons of CO_2 can be saved over the lifetime of ten years of a 40 A power supply at nominal load. This corresponds to the CO_2 emissions of 167.000 numbers of smartphone charges.



1400

kilograms of CO₂ reduction over the lifetime



>160,000

Smartphones charged



Main benefits

Complete offering

A complete 24 V DC offering from 3 A up to 40 A in metal enclosure suits perfectly to OEM machine building requirements.

Small footprint

CP-S.1 power supplies can save the valuable installation space of the control cabinet due to compact design and high efficiency.

Robust design

Coated PCBA and marine certification enable CP-S.1 power supplies being the perfect match for e.g. Wind, Solar, Marine applications.

Redundancy units

True redundancy could be achieved by using the optional redundancy unit CP-C.1-A-RU.



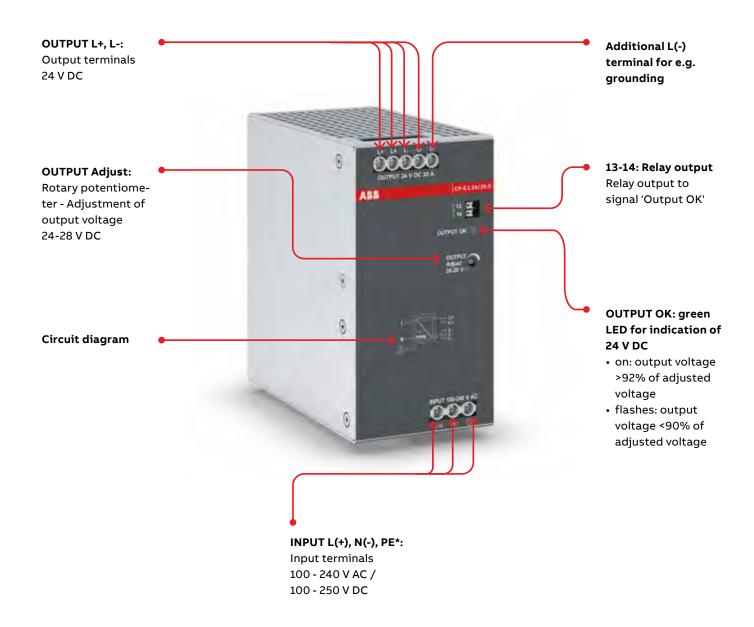






CP-S.1 power supplies

Operating controls

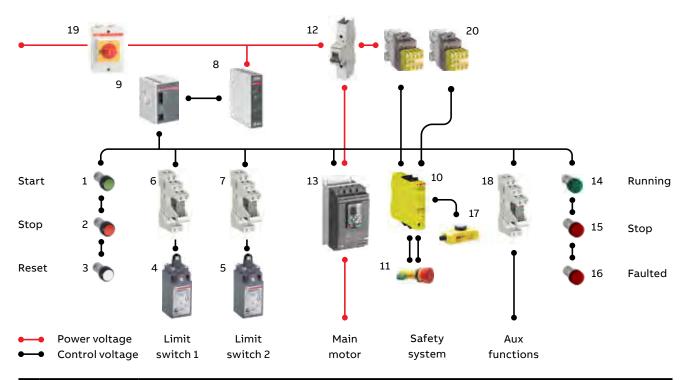


CP-S.1 power supplies

Application example Softstarter and Safety*)

A sawmill or lumber mill is a facility where logs are processed into lumber. Modern sawmills use a motorized saw to cut logs lengthwise to make long pieces, and crosswise to determine length according to standard or custom sizes (dimension lumber). The "portable" sawmill is of simple operation. The log lies flat on a steel bed, and the motorized saw cuts the log horizontally along the length of the bed by the operator manually pushing the saw. The simplest type of sawmill consists of a chainsaw and a custom-made jig ("Alaskan sawmill"), with similar horizontal operation. Energy management is a point of great interest.

Application example: Softstarter and Safety (SIL3/PLe, motor power/starting: <15 kW)



#	Order code	Desription	
1	1SFA619100R1012	Pushbutton CP1-10G-10	
2	1SFA619100R1041	Pushbutton CP1-10R-01	
3	1SFA619100R1015	Pushbutton CP1-10W-10	
4	1SBV010510R1211	Limit switch 30 mm wide, 1 ISO M 16x1.5 cable entry on the bottom, plain plastic plunger actuator and 1 N.O. + 1 N.C. snap action (Zb type) contacts	
5	1SBV010510R1211	Limit switch 30 mm wide, 1 ISO M 16x1.5 cable entry on the bottom, plain plastic plunger actuator and 1 N.O. + 1 N.C. snap action (Zb type) contacts	
6	1SVR405600R1000	Pluggable interface relay CR-P024DC1 1c/o, A1-A2 = 24 V DC, 250 V/16 A with socket	
7	1SVR405600R1000	Pluggable interface relay CR-P024DC1 1c/o, A1-A2 = 24 V DC, 250 V/16 A with socket	
8	1SVR320661R1000	Power supply CP-S.1 24/10.0, In: 100-240 V AC, 100 - 250 V DC, Out: 24 V DC	
9	1SVR427060R1000	Buffer module CP-B 24/10.0, 24 V DC / 10 A, energy storage 13.700 Ws	
10	2TLA010050R0000	Sentry safety relay SSR10 24 V	
11	2TLA030054R0100	Emergency stop INCA 1	
12	2CCS861002R0064	High-performance miniature circuit breaker S801S-C6-R	
13	1SFA898103R7000	Softstarter PSTX30-600-70	
14	1SFA619403R5022	Pilot light CL2-502G 24 V AC/DC	
15	1SFA619403R5021	Pilot light CL2-502R 24 V AC/DC	
16	1SFA619403R5021	Pilot light CL2-502R 24 V AC/DC	
17	2TLA030053R0000	Reset button Smile 11 RA	
18	1SVR405600R1000	Pluggable interface relay CR-P024DC1 1 c/o, A1-A2 = 24 V DC, 250 V/16 A with socket	
19	1SCA022399R6590	Safety switch OTP16KA3M	
20	1SBL176082R3022	2x Contactor AFS16Z-30-22-30 24 V DC	

^{*)} Disclaimer: This bill of material shows one possible combination of devices. It should not be used in real projects without taking technical and other guidelines into account. Please select the size of devices including power supplies according to the specific requirements of the application.

CP-C.1 range

Benefits and advantages



The high-performance CP-C.1 power supplies are ABB's most advanced range. With excellent efficiency, high reliability and innovative functionality, it is ready to take on the most demanding of industrial applications These power supplies have a 150 % integrated power reserve, operate at an efficiency of up to 94 % and are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, CP-C.1 power supplies are the preferred choice for professional DC applications. ATEX and IECEx approvals are available for the use in hazardous areas.



Continuous operation

- Power reserve design to allow performance with up to 150 % more current
- Redundancy setup of the application possible to allow parallel operation
- Long lifetime
- · High peak currents for switching on capacitive loads are supported



Project cost reduction

- Up to 94 % efficiency saves money for energy during operation
- · Less need for external cooling in the cabinet
- Small size to reduce space needed in panel



- Extended ambient temperature range during operation -40...+70 °C with coated PCBA version
- IECEx/ATEX approvals for hazardous locations available
- High MTBF values

CP-C.1 range

Benefits and advantages



Characteristics

- Rated output voltage 24 V DC
- Power reserve design delivers up to 150 % at T₂ ≤ 40 °C
- Output voltage adjustable via front-facing rotary potentiometer "OUTPUT Adjust", 22.5-28.5 V
- High efficiency of up to 94 %
- · Low power dissipation and low heating
- Free convection cooling (no forced cooling)
- Devices with coated PCBAs for harsh environments and with extended temperature range
- · Open-circuit, overload and short-circuit stable
- · Integrated input fuse
- OUTPUT OK signaling output "13-14" (relay), Power reserve signaling output "I > I, (transistor)
- Redundancy unit offers true redundancy, available as accessory
- · Various approvals and marks



Main benefits

The primary switch mode power supply CP-C.1 has a wide range of certified AC and DC input voltages. Furthermore, the CP-C.1 is equipped with capacitors that ensure a hold-up time of at least 50 ms. This enables worldwide usage and permits safe operation in fluctuating networks and battery-powered applications.

With their robust metallic housing and the reliable construction, CP-C.1 power supplies are suitable for applications in industrial environments. The CP-C.1-C units have coated PCBAs, which enables their use in harsh industrial environments. The power reserve of up to 150 % enables trouble-free starting of heavy loads eliminating the need for an oversized power supply.

Signaling output

To communicate the status of the power supply, the CP-C.1 is equipped with a relay output to signal OUTPUT OK as well as a transistor output $I > I_R$ to indicate when the power reserve is active. These signals can be used for communication with a higher level control system, e.g. a PLC.

Depending on the logic of the higher level control system, an appropriate action is initiated by forwarding the signal. The receptor of this signal could be a contactor, a signal tower, or an interface relay.

CP-B range

Benefits and advantages



ABB's ultra-capacitor based CP-B buffer modules serve to ensure a short-term uninterrupted power supply system with a voltage of 24 V DC by buffering the load in case of power loss.

The buffer modules feature a technology for storing energy: the use of ultracapacitors obviates the need for maintenance and exempts deep discharge in comparison to batteries.



- Buffering 24 V DC supply of up to 572 s
- · Maintenance-free, ultra-capacitor technology
- Temperature resistant
- No discharge
- Small footprint

CP-B range

Benefits and advantages

Power supply systems have to be highly reliable in most areas of energy management and automation technology. Often, batteries are used for supporting the supply system in case of mains failures. Batteries have limited lifetimes depending on environmental parameters and have to be maintained regularly, which causes extra work and costs.

Using the ultra-capacitor technology, ABB offers an innovative and completely maintenance-free new product for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

The CP-B range is an ultra-capacitor buffer energy storage system for power supply units which ensures a short term uninterrupted power supply system. In case of power loss, the energy stored in the capacitor guarantees that the load is continually provided for up to several hundred seconds depending on the load current.



Characteristics

• 3 buffer modules for buffering 24 V DC:

CP-B 24/3.0 (3 A / 1 kWs1)

CP-B 24/10.0 (10 A / 13.7 kWs1)

CP-B 24/20.0 (20 A / 8 kWs¹⁾)

- LEDs for status indication
- · Relay contacts for status messaging
- Very high backup times (e.g. with CP-B 24/10.0 up to 9 minutes and 30 s minutes at 1 A load current)
- Short charging times
- High efficiency, higher than 95 %
- Wide temperature range
- DIN rail mountable, compact housing
- Extended temperature range -40...60 °C

		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0
Order code		1SVR427060R0300	1SVR427060R1000	1SVR427060R2000
Rated input voltage		24 V DC	24 V DC	24 V DC
Rated current		3 A DC	10 A DC	20 A DC
Energy storage (min.)		1.000 Ws	13.700 Ws	8.000 Ws
Typical charging time at load	100 %	65 s	134 s	135 s
current	0 %	56 s	82 s	62 s
Typical	100 %	13 s	50 s	15 s
buffering time ¹⁾	50 %	28 s	115 s	30 s
at load current	25 %	66 s	246 s	60 s
	10 %	148 s	572 s	150 s

¹) buffering time ≈

energy storage x 0.9

current x output voltage

¹⁾ internal energy buffer

Electronic protection devices EPD24

Benefits and advantages



With its narrow width of only 12.5 mm, EPD24 can fit everywhere – it can even be mounted side-by-side.

Its adjustable and fixed current ratings, projectable protection through current limitation as well as a single trip curve for all types of loads allow for use in a wide field of applications.



Highlights

- Safety and reliability
- Operational continuity
- Worldwide use thanks to relevant certifications
- · Compact and effective

Electronic protection devices EPD24

Applications



Features

- Selective load protection, one electronic tripping characteristic.
- Active current limitation for safe connection of capacitive loads up to 20,000 μF and on overload/short circuit
- Current ratings 0.5...12 A
- Reliable overload disconnection with 1.1 x $\rm I_{_{\rm N}}$
- Manual ON/OFF button
- Clear status and failure indication through LED and integrated auxiliary contact
- Integral fail-safe element adjusted to current rating
- Width per unit only 12.5 mm
- · Rail mounting
- Ease of wiring through busbar LINE+ and 0 V as well as signal bars
- UL- and CSA-approvals allow international use of the devices



Applications

- · Packaging machines
- Automation
- Automation & Process Control
- · Automotive Manufacturing
- · Chemical, Oil & Gas
- Medical Equipment
- · Pharmaceutical & Food
- Power Engineering DC 24 V
- Renewable Energy
- Steel Production











Interface relays and optocouplers

Offer overview

Relays are universally applicable and are utilized in a diverse array of applications. They are a significant element in contemporary industrial processes and are used in applications where galvanic isolation, signal separation, voltage coupling and signal amplification are required.

The ABB portfolio includes electromechanical relays and optocouplers. The electromechanical relays operate using an electromagnetic field whereas optocouplers use light. Optocouplers are predominantly used in applications where a high switching frequency is necessary. Furthermore, optocouplers do not contain any moving parts and are therefore bounce-free, immune to vibrations and possess a long electrical life.



CR-S range

The slim line of interface relays and optocouplers

The pluggable interface relays and optocouplers of the CR-S range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The CR-S range combines the flexibility of a modular system and the ability of switching high currents on a small footprint thus can be used in applications where space saving is essential. The CR-S range also includes complete versions consisting of a relay, socket and marker.



CR-P range

The pluggable pcb interface relays and optocouplers

The pluggable interface relays of the CR-P range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The CR-P range offers highest current switching in an IP67 rated relay housing. Furthermore, nine different coil voltages are available to suit world wide applications and even gold contact versions are available which is essential when it comes to switch sensitive signals. The CR-P range also includes complete versions consisting of a relay, socket, holder, marker and function module.

Interface relays and optocouplers

Offer overview



CR-M range

The pluggable miniature interface relays

The pluggable interface relays of the CR-M range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The CR-M range offers up to 4 contacts in one relay and a built in test button which makes a circuit check fast and easy. 12 different coil voltages are available to suit world wide applications and even gold contact versions are available which is essential when it comes to switch sensitive signals. The CR-M range also includes complete versions consisting of a relay, socket, holder, marker and where applicable a function module.



CR-U range

The pluggable universal interface relays

The pluggable interface relays of the CR-U range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The CR-U range offers up to 3 contacts in one relay and a built in test button which makes a circuit check fast and easy. 12 different coil voltages are available to suit world wide applications.



R600 range

Boxed interface relays and optocouplers

Boxed interface relays of the R600 range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The relay itself is built in thus the perfect solution because this design fulfills highest vibration requirements. The compact design and different connection terminal possibilities further optimize your panel installation.

Applications of interface relays

A proven technology used worldwide

Relays are universally applicable and are utilized in a diverse array of applications. They are a significant element in contemporary industrial processes and are used in applications where galvanic isolation, signal separation, voltage coupling and signal amplification are required.



Circuit multiplication

A single voltage signal may be used to simultaneously perform up to four different switching operations. Each output contact can be used to switch load circuits with different voltage and current levels.



Galvanic isolation

Interface relays are excellently suited to ensure safe galvanic isolation, i.e. separation between control circuit and load circuit.

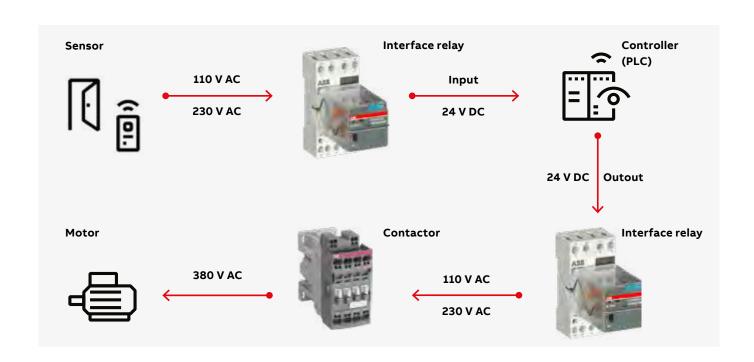


Voltage conversion

Interface relays allow for small voltage signals to switch much larger loads. For example: a 24 V DC 10 mA signal can be used to switch a 230 V AC 16 A load.

Billions

of relays operate and interface between control circuits and electrical loads.



Pluggable interface relays and optocouplers

Socket and terminal connection types

Standard sockets



01 Standard socket CR-P



02 Standard socket CR-M

Position of connection terminals:

Coil connection (A1-A2) on lower side of the socket, contact connections (n/o and n/c contacts) on the lower and upper side of the socket.

Logical sockets



03 Logical socket CR-P

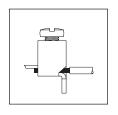


04 Logical socket CR-M

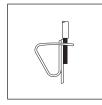
Position of connection terminals:

Coil connection (A1-A2) on lower side of the socket, all contact connections (common contacts, n/o and n/c contacts) on the upper side of the socket.

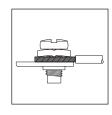
Terminal connection types



05 Screw type



06 Spring type



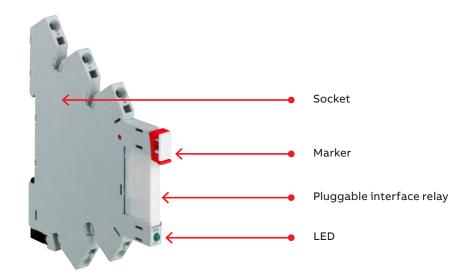
07 Fork type

A variety of sockets are available for interface relays and optocouplers to meet the needs of different applications such as vibration- intensive environments.

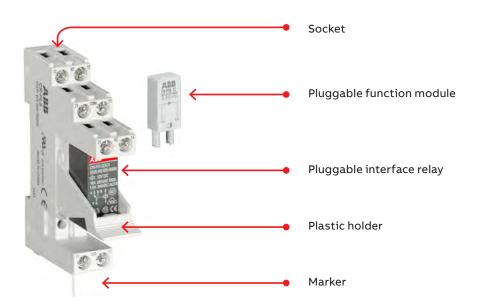
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Pluggable interface relays and optocouplers Relay components

CR-S range



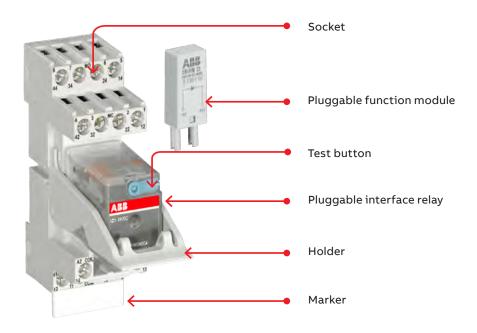
CR-P range



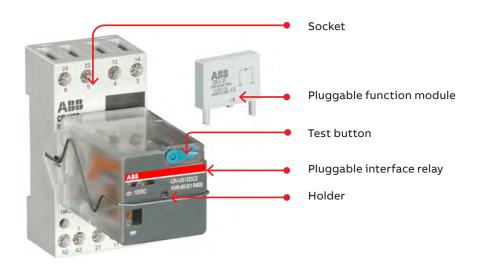
Pluggable interface relays and optocouplers

Relay components

CR-M range

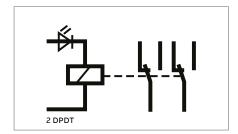


CR-U range



Boxed interface relays and optocouplers R600 range

Overview



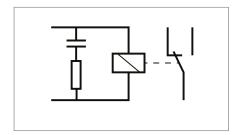
Complete product line

 $1\,\text{n/o}, 1\,\text{n/c}, 1\,\text{c/o}, 2\,\text{c/o}$ output configuration. Standard contact material for switching high current signals as well as gold-plated contacts for reliable switching of low current signals.



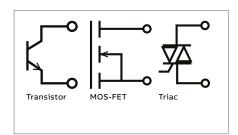
Marine certification

The R600 range offers the LR approval, which allows usage of the boxed interface relays and optocouplers in many applications around the marine segment. The performance of the R600 range has been proven by successfully passing tests required for operating under harsh conditions.



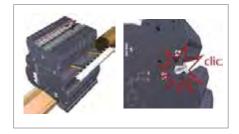
Safe operation

High resistance to vibration and shock thanks to the relay soldered inside of the housing. Wrong relay replacement or relay lose not possible . Devices with immunity to leakage currents.



Longevity

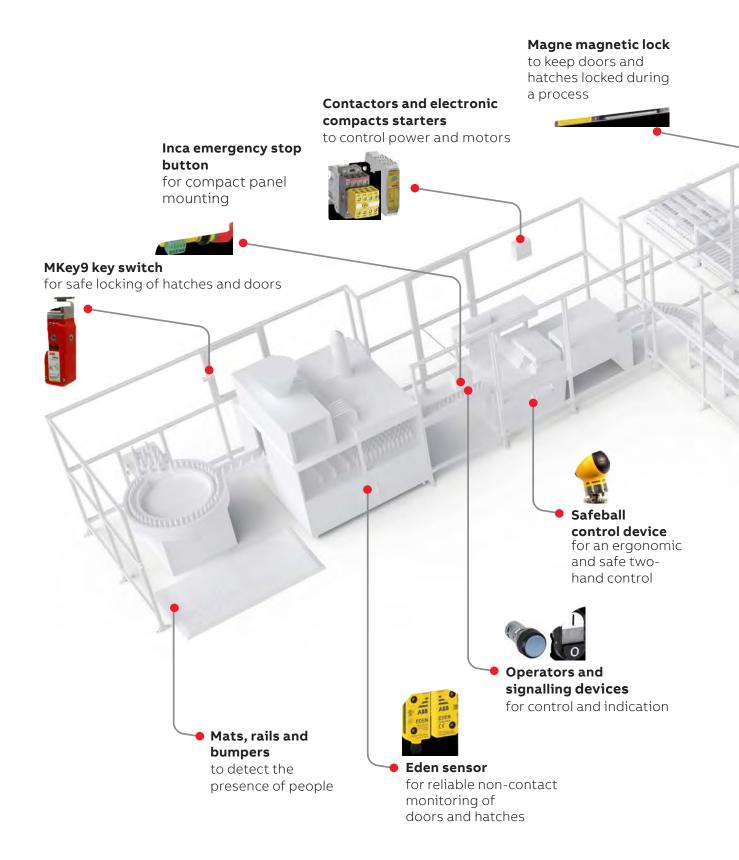
Optocoupler with transistor, MOS-FET and Triac output ensure a longer lifetime, higher reliability and quiet operation.

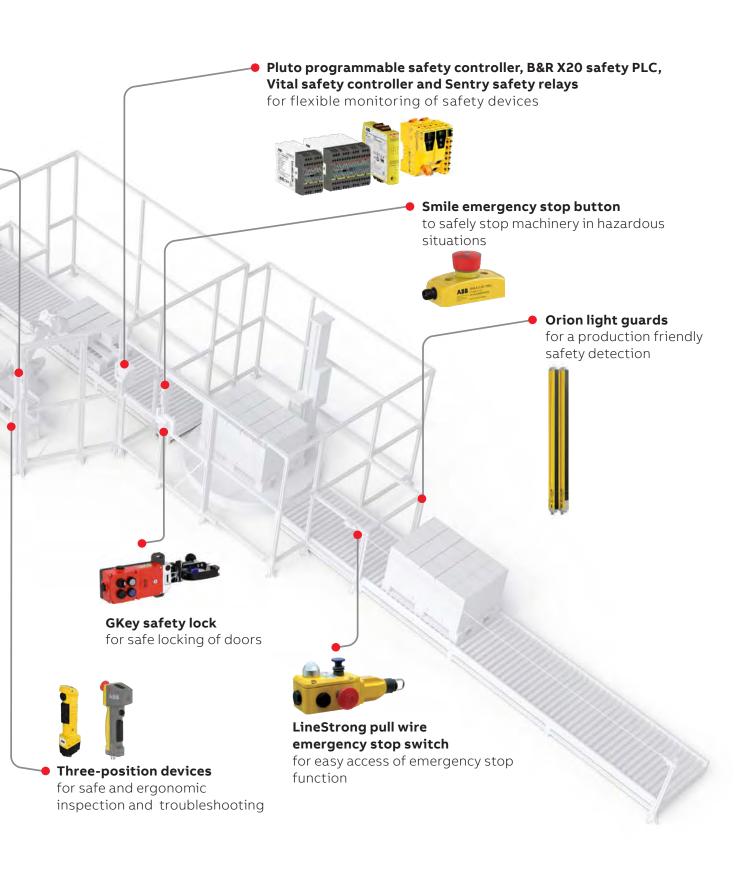


Easy to mount

The R600 interface relays and optocouplers are easy to mount by snapping onto a DIN-rail according to IEC/EN 60715. Time saving wiring thanks to a jumper bar.

We deliver and support the world with premium, intelligent machine safety solutions.





Logic units

The ABB safety products offering includes a range of logic units to suit different types and sizes of safety applications

Sentry

Safety relays

Sentry is a range of safety relays that are powerful and easy to use. There are basic Sentry models for simple applications and easy output expansion, as well as highly flexible models with extremely accurate timer functions and a display in the front for configuration and trouble shooting.

Vital

Safety controllers

Vital is a configurable safety controller that does not require any programming. It uses the ABB Jokab Safety DYNlink system that enables Vital to supervise multiple safety functions that normally would have required several safety relays in order to reach the highest level of safety.

Pluto

Programmable safety controllers

Pluto is a programmable safety controller that is cost effective, powerful and compact. Pluto can control most types of safety devices on the market, as well as DYNlink safety devices, analog sensors, encoders, contactors, valves and many more. Models with safety bus communication simplify the design of safety systems, thanks to our All-Master concept.

A wide range of gateways allows communication with other networks and also remote monitoring of a Pluto system.

Programming is easily done in the free of charge software Pluto Manager.

B&R X20 SafeLOGIC

Safety PLC

B&R is part of ABB and offers safety PLC's for processing lines and machines automated with B&R.

The very compact X20 system offers a wide range of different modules and is especially efficient to wire and maintain thanks to its 3-part modularity.

SafeLOGIC is the ideal safety extension for a B&R automated application. It is not intended as a standalone model (as opposed to Pluto).

B&R supports all ABB safety sensors with potential free contacts. For this use case, the B&R SafeIO module provides a unique pulse signal which ensures best cable diagnostic.

B&R supports all ABB safety sensors with OSSD interface. For this use case, the B&R SafeIO module provides a filter that handles the short interruptions in the OSSD signals.

B&R also supports all ABB safety sensors with DYNlink interface

Please contact your B&R sales office for more information.



Sentry





Pluto



Vital

X20 SafeLOGIC

General machinery

With a wide range of sensors and control devices ABB Safety Products has suitable safety solutions to most safety functions for machine builders and OEM.



Eden Non-contact sensor

Easy to install, highest level of safety and high reliability.



Orion

Optical safety device

Reduce complexity, cost and downtime.



Safeball Two-hand control device

Ergonomic design, easy to install and highest level of safety.



Smile/Inca **Emergency stop**

Compact design and easy to install. LED's give good diagnostics.



Safety mats, edges and bumpers Pressure sensitive devices

Custom made with durable design.



Magne

Magnetic process lock

Robust and reliable design that is easy to install.



Contactors and electronic compact Power and motor control

Compact and time saving solutions.



Food and beverage

ABB has a long experience of developing safety products and solutions adapted for the harsh environment and requirements in food and beverage industry.





Sense

Magnetic non-contact switch

Reliable in harsh environment, easy to install and highest level of safety.



EStrong

Emergency stop

Robust design and reliable in harsh environments.



MKey

Mechanical key switch

Reliable in harsh environments, strong holding force, robust design and flexible mounting.



Orion (Wet)

Optical safety device with Wet protective housing

Easy to install, minimized cabling and reliable in harsh environments.



HD5

Three-position device

Ergonomic design, reliable in harsh environment and highest level of safety.

Robotics

Thanks to a close cooperation with ABB Robotics and as a longtime member of the ISO international robotics committee, ABB Safety Products has many products and solutions well suited for the robotics industry.



Eden

Non-contact sensor

Easy to install, highest level of safety and high reliability.



Magne

Magnetic process lock

Robust and reliable design that is easy to install.



Orion

Optical safety device

Advanced functionalities, easy to install and reduced down-time.



JSHD4

Three-position device

Ergonomic design and anti-tamper function.



Operators, pilot lights and signalling devices

Pilot devices

Robust and reliable.



GKey Safety lock

Easy to install, highest level of safety and high reliability.



Safety production

ABB Jokab Safety

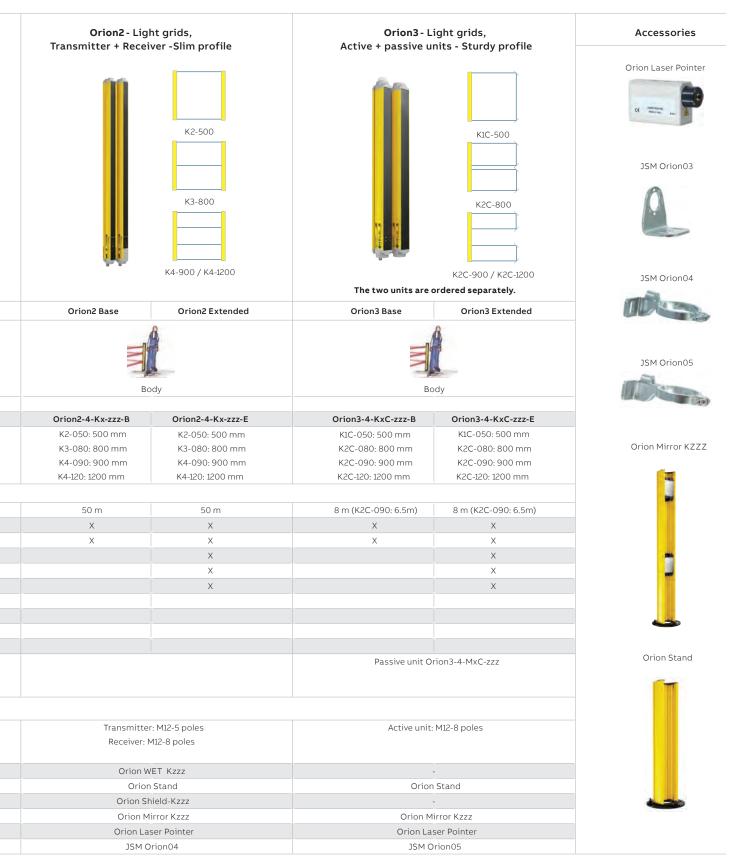
Orion overview

Rotation bracket



	Orion1 Extended requires special cables.			
	Orion1 Base		Orion1 Extended	
Type of detection	Finger		Finger	
	Filigei	Hand	Filigei	Hand
Resolution	14 mm	30 mm	14 mm	30 mm
Type 4	Orion1-4-14-zzz-B	Orion1-4-30-zzz-B	Orion1-4-14-zzz-E	Orion1-4-30-zzz-E
Protected height	150 -1800 mm (150 mm steps) zzz= 015-180 cm (15 cm steps)	150 -1800 mm (150 mm steps) zzz= 015-180 cm (15 cm steps)	300 - 1800 mm (150 mm steps) zzz= 030-180 cm (15 cm steps)	300 - 1800 mm (150 mm steps) zzz= 030-180 cm (15 cm steps)
Function				
Range	6 m	19 m	7 m	20 m
Auto/Manual reset	Х	X	X	X
EDM	X	X	×	X
Muting			×	×
Override			×	X
Integrated muting lamp				
Blanking			×	X
No dead zone			×	X
Coding			×	×
Cascading			X	X
Don't forget to order			Cables for Transmitter (M12-C02PT2T) and Receiver (Blanking or no function: M12-C02PT6RB, Muting: M12-C02PT62RM)	
Accessories				
Cables (female connector on the cable)	Transmitter: M12-5 poles Receiver: M12-8 poles		Transmitter: M12-5 poles Receiver Blanking: M12-12 poles Receiver Muting: M12-12 + M12-5 poles	
Protective tube	Orion WET zzz		-	
Protective stand	Orion Stand		Orion Stand	
Lens shield	Orion S	hield-zzz	-	
Deviating Mirror	Orion1 Mirror + Orio	n Stand + JSM Orion11	Orion1 Mirror + Orion Stand + JSM Orion11	
Laser pointer	Orion Laser Pointer		Orion Laser Pointer	

JSM Orion03



Introduction and overview

- Gateway communication with all

main fieldbuses

Selection guide

The safety controllers from ABB can monitor anything from a single safety function to complete manufacturing lines.

	Pluto	Vital	Sentry
Image			
	A Section of the second of the	The state of the s	PRA STATE OF THE PARTY OF THE P
Туре	Programmable safety controller	Safety controller	Safety relay
Description	A cost-effective, powerful and compact programmable safety controller for all types of safety applications.	A configurable safety controller that can monitor all safety devices on smaller machines.	Powerful and easy-to-install safety relays suitable for all common types of safety devices.
Application(s)	Monitoring of multiple safety devices and several safety functions, as well as control of machines and/or processes. Many I/Os and programmable logic.	Monitoring multiple safety devices with all the advantages of the DYN-link system.	Monitoring safety devices with one safety function, as well as expansion of safety outputs, with or without time delay.
Compatible safety devices	All types of conventional safety devices and DYNlink devices	DYNlink devices	All types of conventional safety devices
Advantages	 Easy-to-use while still allowing advanced programming Free software Easy system modification 	 Monitor up to 30 sensors in series maintaining Cat. 4/PL e No programming 	 Easy and fast to install with push-in terminals Universal models for all common applications

- Extensive status information

Advanced timer functionsMultireset of up to 10 safety

relays

Programmable safety controller

Pluto

Pluto is a cost effective, powerful and compact programmable safety controller used in a variety of applications: in large and small systems for process and functional safety.

Pluto can control most types of safety devices on the market, as well as ABB Jokab Safety DYNlink safety devices, analog sensors, encoders, contactors, valves and many more. Programming is done easily in the complimentary software, Pluto Manager.

The models with safety bus communication simplify the design of safety systems, thanks to our All-Master concept. A wide range of gateways allows communication with other networks and also remote monitoring of a Pluto system.





Speed up installation

(1)

Optimum interface



Continuous operation

Great flexibility

Up to 32 Pluto units can exchange data on the same safety bus, and the unique All-Master system allows simple scaling, splitting and modification.

Powerful yet compact

Unexpected features for its size, like real programming and speed monitoring, enables replacement of more complex PLC systems in some applications.

More sensors and less cabling

The DYNlink solution allows series connection of up to 10 safety devices on each input.
StatusBus and light button feature also reduces cabling to a minimum.

Programming software free of charge

Pluto Manager is an easy to use PC based programming software provided free of charge.

Easy programming

Ready-made TÜV approved function blocks for safety functions make it easy to reach PL e/SIL3. Ladder logic and text programming allow the design of more advanced functions and the control of complete machines.

Communication with external networks

Pluto gateways provide a two-way communication between the Pluto safety bus and other field buses.

Easy modification

Easy and quick replacement of units without any configuration.

Flexible monitoring

Online monitoring from any Pluto in the system and remote monitoring and control with an Ethernet gateway.

Features

Pluto

I/Os

Failsafe inputs (I) are used to connect the safety devices to be monitored. Some of them can be used as analog inputs and counter inputs. The choice is made in the Pluto program when the I/Os are configured. Depending on the model, the analog inputs can be low resolution 0-27 V or high resolution 0-10 V/4-20 mA. The fast counter inputs can handle frequencies up to 14 kHz.

Failsafe inputs/non-failsafe outputs (IQ) are terminals that can be used as failsafe inputs or communication outputs (non-failsafe). The choice is made in the Pluto program when the I/Os are configured. A specific configuration is "light button" which means that both the contact and the LED indicator of an illuminated push-button are connected to only one IQ, thus saving one I/O.

Failsafe outputs (Q) are individually safe and independently programmable outputs. There are both relay and transistor outputs. The transistor outputs deliver a negative voltage (-24 VDC) that facilitates the detection of a short circuit with other voltage potentials and increases safety. The transistor outputs are primarily intended for electromechanical components such as contactors and valves.

DYNlink solution

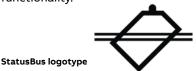
The DYNlink circuit is a unique solution that allows up to 10 DYNlink devices to be connected in series to a Pluto input while still reaching up to Cat. 4/PL e/SIL3. This saves inputs and cabling, since to reach the same level with standard two-channel safety devices, two inputs are necessary and series connection is not possible.

The DYNlink solution checks the signal 200 times/second and a fault such as a short circuit will be detected before any safety device is used.

Examples of DYNlink devices are Eden and Smile Tina. Most two-channel safety devices can be connected to the DYNlink solution using Tina adapters.

StatusBus functionality

The StatusBus functionality is available with some DYNlink devices and allows to collect the status of each individual safety device, even when connected in series. A single input on Pluto can collect the status of up to 30 safety devices. The devices are connected using standard cable and M12-5 connectors. No specific bus cable or extra communication module is necessary. All Pluto models offer the StatusBus functionality.



Safety bus with All-Master function

The unique All-Master system allows simple scaling, splitting and modification of the safety system.

In a traditional safety PLC network, there is one Master and additional Slave units. But for Plutos connected to a safety bus, all units are Masters and make their own decisions, while still having the possibility to listen to what is happening to the other Plutos on the safety bus. This enables great flexibility when it comes to modification of the safety system. It also enables very simple replacement of a broken Pluto, since all Plutos have a copy of the application software of all other Plutos on the safety bus stored locally. If the replacement Pluto is given the same ID as the broken Pluto (using IDFIX), the software is downloaded from the safety bus with a simple button on the front of Pluto.

Up to 32 Pluto units can be connected to the Pluto safety bus. The Pluto S20 and S46 are stand-alone models and cannot be connected to the Pluto safety bus. All other models have bus functionality. The Safety bus functionality is necessary in order to use a Pluto gateway.

Features

Pluto

Pluto Manager

Pluto Manager is the programming software for Pluto, downloaded free of charge from our website http://new.abb.com/low-voltage/products/safety-products/program-mable-safety-controllers/pluto

An update function in Pluto Manager helps you to always have the latest version installed as long as you have an Internet connection. Pluto Manager is a user friendly PC software that allows a simple configuration of the Pluto I/Os and programming in ladder logic and with TÜV approved function blocks.



Examples of what the available function blocks can handle:

- Two-channel safety devices, with or without Reset and Monitoring.
- Single channel functions with Reset.
- Muting functions
- Encoders and counters
- Communication with Gateways and StatusBus

Examples of ladder logic functions provided:

- Boolean instructions, Edge/inverted edge detection, Latch function, Toggle
- Timers
- Addition, Subtraction, Multiplication, Division
- Remanent memories
- Registers: 16 and 32 bit
- Sequence programming
- Option handling
- Online monitoring

In Pluto Manager there is a unique Option handling function suitable for series production of machines with different customer options. All versions of a machine type can have the same PLC program. To handle the different customer options, check boxes are used to set memories that activate the different functions of the code.

Current monitoring

Pluto A20 has a special current monitoring function. The function is mainly used to check if the connected muting lamps are working.

Remote monitoring and control

Remote monitoring allows the connection to a remote Pluto system via the Internet and an Ethernet gateway. Pluto Manager is used for the monitoring.

This function can be used for:

- Support of local maintenance personnel during troubleshooting
- Regular monitoring of the status of the machine or process
- Follow-up of operational data like number of cycles/day or runtime.

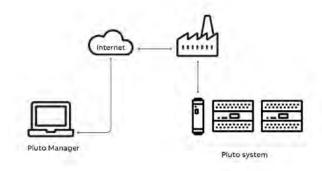
Pluto Manager also offers remote control of a Pluto system using the Internet and an Ethernet gateway.

With the remote control function it is possible to:

- Download a program from PC to the remote Pluto
- Configure addressing of AS-i and StatusBus slaves, write IDFIX code

The security of the remote control function is guaranteed by use of the K-button on Pluto. A change in a remote Pluto system cannot be made without a person at the remote Pluto confirming the action by pressing the K-button.

Configuration of the gateway itself, e.g. switching remote control on/off, can only be made via the programming port on the gateway and not via the Ethernet port.



Safety controller

Vital

Vital is a configurable safety controller that does not require programming. It uses the DYNlink system, which allows up to 30 safety devices to be connected in series to the same circuit, while achieving PL e.

This enables a single Vital to supervise all safety functions on many machines that otherwise would have required a programmable safety controller or multiple safety relays.

Vital is also commonly used to supervise all emergency stops for larger machine lines.





Speed up your projects

Easy connection

Reduced installation and engineering time thanks to simple installation with serial connection using M12 connectors.

No programming required

The use of only one safety module without any programming simplifies engineering, commissioning and replacement.

Less components

Significantly less components needed to achieve PL e/SIL 3.



Continuous operation

LED diagnostics

Integrated LED diagnostics reduces down time when troubleshooting.

Detachable connection blocks

Detachable connection blocks simplify replacement.

Exchange without configuration

The configuration is made with jumpers in the detachable connection blocks. In case of exchange, the new unit automatically gets the correct configuration.



Safety and protection

Easy to reach highest safety level

The DYNlink solution makes it possible to maintain the highest level of safety with up to 30 sensors connected in series.

Extensive fault detection

The DYNlink solution enables unique fault detection features and prevents 2-channel faults.

Safety relay

Sentry

The Sentry safety relays are powerful and easy to use safety relays, suitable for all common types of safety applications.

The Sentry series contains basic models for simple applications and easy output expansion, as well as highly flexible models with extremely accurate timer functions.

Sentry safety relays are used in both simple and more advanced safety solutions when safety devices need to be monitored according to the requirements of functional safety standards.





Continuous operation

LEDs and display

LEDs in 3 colours allow for more status messages and simplify troubleshooting. Models with display offer preset configurations and extensive fault information.

Advanced timer functions

Timer functions with an accuracy of ± 1% minimize unnecessary downtime.

Multi-reset

The multi-reset function enables reset of up to 10 Sentry safety relays using just one reset button.



Speed up your projects

Twice as fast to install

Push-in terminals are twice as fast compared to regular spring loaded connectors.

Handles ferruled and rigid cables

Both ferruled and rigid cables are easy to just push into the push-in terminals by hand.

No tools required for installation

No tools are required for connecting a cable in the push-in terminals. Just use the cable to push into the opening.



Easy to install

Detachable terminal blocks

Detachable terminal blocks speed up connection and replacement.

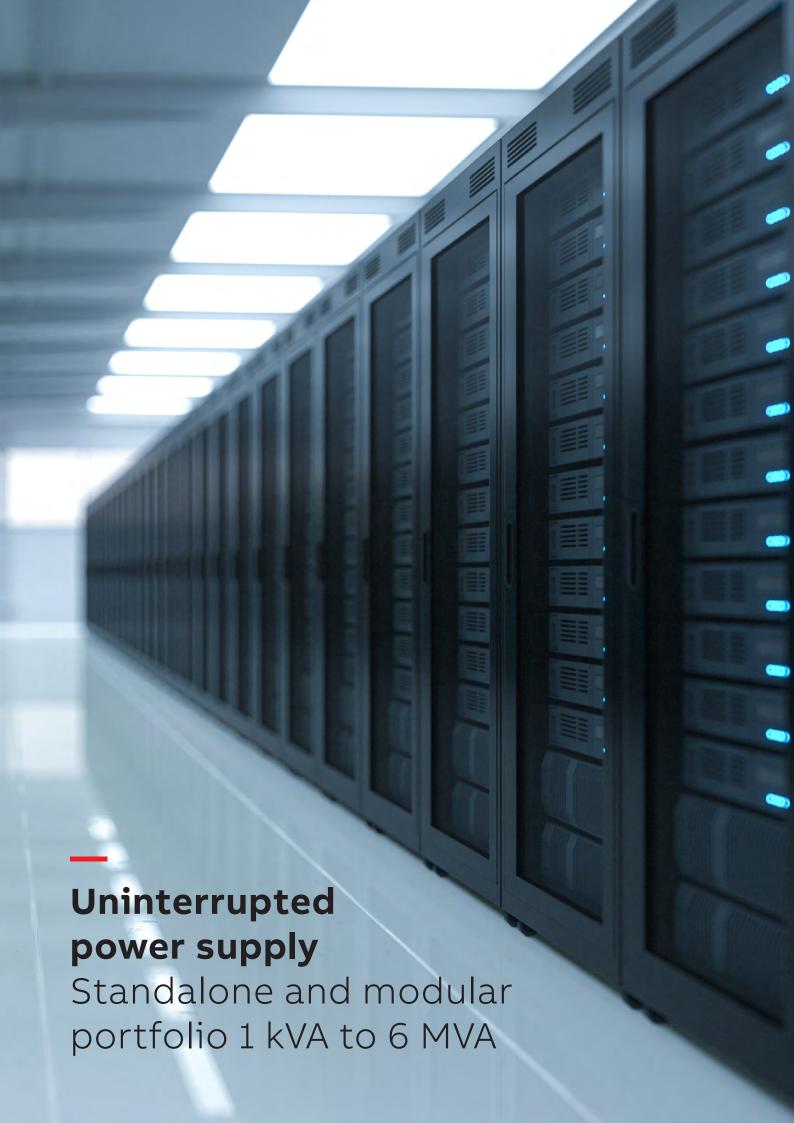
Switch for reset selection

Manual or automatic reset easily selectable by switch.

Powerful outputs

Powerful outputs allow to drive larger contactors and simplify installation by saving the use of an intermediary contactor.





ABB's UPS manufacturing principles

In ABB, quality is an integral part of our business ethos. Quality guides our actions to ensure we meet our responsibilities and obligations to our customers, our employees, our partners, our suppliers and to our shareholders.

ABB's commitment to deliver high quality

- Deliver on-time and on-quality products, systems and services that meet or exceed our customers' expectations.
- Identify and understand our customer's expectations, measure customer perceptions and implement improvements to increase customer satisfaction.
- Enable and engage our employees at all levels in a relentless drive to improve operational performance along the value chain from suppliers to customers.
- Increase the motivation and skills of our employees to add value to our customers and our businesses through continual training and development.
- Leverage our partners' and suppliers' strengths to improve our products and our businesses from product design through production, installation and operation.
- Embed social responsibility and company ethics policies in our business practices.
- Continually improve environmental, health and safety performance through all products, operations, systems and services.

Manufacturing

Quality in manufacturing begins with the order from the customer. We practice made-to-order manufacturing – a lean approach that exploits just-in-time supply and that treats each and every customer order as a single, valuable entity. Each product is individually tested before leaving the factory with a 100 percent pretest on modules individually and a 100 percent final test on modular and standalone UPSs.

Quality only becomes quality when it is measured and for this reason we employ key performance indicators (KPIs) some of which are:

- Safety
- Quality from the suppliers (part-per-million defect rates and on-time delivery)
- Quantity of products / items produced for new business and for service departments (after sales)
- · Internal first-pass yield
- On-time delivery of the finished product



01 ABB sustainable factory for UPS - Quartino, Ticino, Switzerland

Product quality assurance

In ABB, we believe in getting it right the first time – and keeping it that way. For that reason, we engage in component homologation as well as the identification of critical components. Suppliers are fully vetted and qualified, on an ongoing basis, and our test verification plan and type testing assures our quality standards even further.

The ABB product development gate model is deployed all the way through to product launch – from initial conception through development to final full release, and after – right up to gate seven. The gate model involves every part of the organization and this ensures that every aspect of the new product is covered, guaranteeing the very best quality.

Should non-conformities arise, ABB has a comprehensive set of monitoring tools with which to examine the issue. This is backed up by a three-level support model:

- Level 1: solving problems in the field
- Level 2: statistical analysis and mitigation action definition
- Level 3: root cause analysis



Environmentally friendly

ABB has stated policies that drive the company to be as environmentally friendly as possible. One example of this is our product test bay used for all UPS final testing, which features an energy recovery system. This so-called GREEN (Generating Recycled Ecological Energy Network) test bay is a facility that recycles the greater part of the energy used during a UPS test. Only nine percent of the energy used is from the mains; 91 percent is recovered energy. This re-use is far more beneficial than having a traditional resistor load that merely turns the energy into heat, thus wasting it.

Further, the modern ABB building has an efficient heating / cooling system (energy management) as well as strict rules for recycling and managing discards.

Certification

Product certification

• Accredited third-party certification:

	UPS standards	Low-voltage devices standards
Safety	IEC/EN 62040-1	IEC / EN 60950-1
ЕМС	IEC/EN 62040-2	IEC/EN 61000-6-2 IEC/EN 61000-6-4 IEC/EN 61000-4-2 IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6
Performance	IEC / EN 62040-3	
Environmental aspects	IEC/EN 62040-4	

Factory certification

- ISO 9001 and 14001
- OHSAS18001

ABB's modular UPS design

Ensuring high availability and best-in-class power technology

01 In DPA, each UPS module has all the hardware and software it needs for autonomous operation.

ABB's approach to modular power protection

Despite all the precautions taken during the design and operation of data centers and related control processes, situations can arise in which external power is compromised – either in terms of quality or availability. Such events could result in data loss, nonavailability of essential services, risk to hardware and very high financial losses. This makes a highly dependable UPS mission-critical. Therefore, the most critical loads should be protected by the very best UPS design – Decentralized Parallel Architecture (DPATM).

ABB, a pioneer and leader in large, modular UPSs, provides a full range of modular DPA power protection products as well a standalone solutions. In the following four pages, we will focus on our approach to modular power protection and describe how these modular solutions can help ensure a supply of clean, reliable power to the customer's application.

DPA architecture

Key benefits

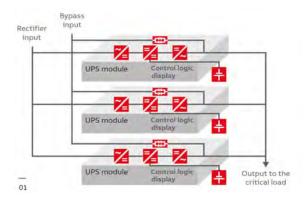
- · Distributed control and power
- · No single point of failure
- Independent online swappable modules

In DPA, each UPS module contains all the hardware and software required for full UPS system operation. Modules share no common components and each module is a fully functional UPS, so a DPA parallel system offers extremely high system reliability and uptime is maximized. UPS modules can be paralleled to provide redundancy or to increase the system's total capacity.

Some modular UPS systems with a centralized parallel architecture (CPA) have centralized control or hardware. This renders them very vulnerable should a fault occur on one of these centralized components; one fault can bring down the entire UPS system.

With DPA, on the other hand, the UPS is modularized and each module has all the hardware and software needed for autonomous operation – rectifier, inverter, battery converter, static bypass switch, back-feed protection, control logic, display, and mimic diagram for monitoring and control. With all the critical components duplicated and distributed between individual units, potential single points of failure are eliminated. In the unlikely event of one UPS module failing, the failed module will be automatically isolated and the overall system will continue to operate normally.

Modular UPS with no common components (Decentralized Parallel Architecture)



01 Scalability in DPA 250 S4

Online swappable modules (OSM)

Key benefits

- · Replace or add modules with no downtime
- · Simple power upgrade
- · No downtime during maintenance

True "online-swap" modularity enables the safe removal and insertion of UPS modules without risk to the critical load and without the need to either transfer it onto raw mains or remove power from it. Modules can therefore be replaced or added without any system downtime. It is simple to upgrade power capability as critical load power requirements grow. Additionally, modules can easily be removed for service or replaced if faulty, without compromising the availability of the system. Only a truly redundant architecture like DPA allows online modules to be swapped out while the system is running.

This unique aspect of modularity directly addresses continuous uptime requirements, significantly reduces mean time to repair (MTTR), reduces inventory levels of spare parts and simplifies system upgrades. This approach pays off too when it comes to serviceability and availability, as there is no downtime and the service personnel do not need special skills.

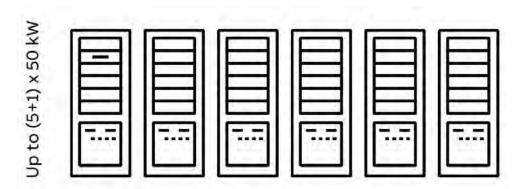
Scalability

Key benefits

- · Vertical and horizontal scalability
- · Cost-effective "rightsizing"
- · Easy configuration and reconfiguration

The ability to scale the system means the UPS can be sized exactly to fit prevailing needs and modules can simply be added as requirements grow. This means that you only power, cable and cool what you need.

The DPA 500, for example, allows five 100 kW modules to be mounted in one cabinet and six cabinets to be configured in parallel to provide a top rating of 3 MW. Power consumption is the topic of greatest concern for data center operators and the energy savings made by this modular approach over the service life time of the UPS are substantial. Human error is reduced too: Because things are so simple, wiring errors are eliminated, and configuration and reconfiguration are child's play.



Up to 6 x 250 kW frames in parallel

ABB's modular UPS design

Ensuring high availability and low total cost of ownership

Availability

Key benefits

• 99.9999% (6 nines) availability

By combining the benefits of Decentralized Parallel Architecture, parallel redundancy and online swap modularity, ABB's UPSs have a high mean time between failure (MTBF) and a low mean time to repair (MTTR). This delivers six nines availability – a highly desirable quality required by data centers in pursuit of zero downtime.

The surest way to increase availability of power is to introduce redundancy to the UPS system and to minimize its maintenance and repair time.

MTBF and MTTR are common parameters in the UPS industry and both impact system availability. Availability is formally defined as:

MTBF/(MTBF+MTTR) ×100%

The modular DPA concept allows the modules to work as one system but without interdependence. Quick and simple repair by swapping modules, which can be held as spares on-site or at a nearby service center, minimizes the system's MTTR.

Low total cost of ownership

Key benefits

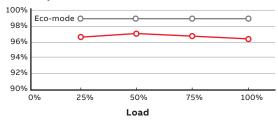
- · Over 97% true online efficiency
- Eco-mode efficiency ≥99%
- · Cost-effective scalability to "right size" system
- · Low service costs

The modularity and scalability described help minimize the cost of ownership, but costs are held down too by implementing designs that have best-in-class energy efficiency.

ABB's DPA 250 S4, for example, operates with an efficiency of over 97 percent. Its efficiency curve is very flat so there are significant savings in every working regime. Further energy savings can be made by operating the UPS in eco-mode, which increases the efficiency to ≥99 percent.

Online double conversion efficiency

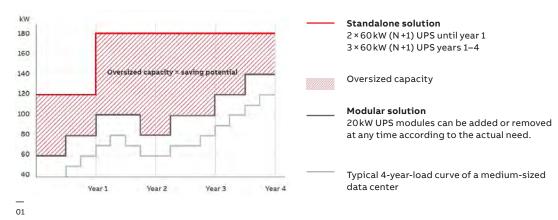
Efficiency



01 Example of a changing (increasing) load up to 120 kW in 4 years.

02 Vertical modularity minimizes space requirements and maximizes predictability of future space requirements. In the example shown, 2m² is saved.

The UPS capacity can be changed with changing load, eliminating the need to oversize the UPS upfront.

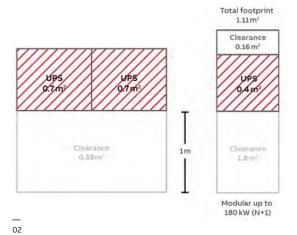


Modularity lends itself well to keeping UPS footprint small, too – ideal for data centers, where real estate can be restricted and expensive. A modular UPS rack has a small footprint and when extra modules are added, no extra floor space is taken up.

But the advantages of DPA modularity go further as installation and servicing costs are also kept low: A straightforward modular concept simplifies and speeds every step of the deployment process – from planning, through installation and commissioning to full use. DPA modularity also reduces costs as service engineers need less training and spend less time on-site, and any risks of data or production loss are minimized. Inventory levels of spare parts are reduced.

Highly dependable UPSs are mission-critical for many parts of industry. DPA delivers unmatched UPS availability and serviceability, scalability, flexibility and low energy usage.

There are no better UPS architectures available to those users whose critical electrical loads represent a valuable commercial asset that must be kept powered at all costs.



UPS product overview 1 kVA to 10 kVA

Single phase UPS





GENERAL DATA	PowerValue 11T	Powervalue 11 RT G2 IN
UPS frame rated power	1/2/3/6/10 kVA	1/2/3/6/10 kVA
UPS module rated power	-	-
UPS output rated PF	0.9	1.0
Max. No. of parallel frames	-	Up to 4 units (6 - 10kVA)
Max. No. of parallel modules across frames	-	· · · · · · · · · · · · · · · · · · ·
Max. system power	10 kW	40 kW
Wiring	1-ph + N + PE	1-ph +N+PE
UPS type	Standalone tower	Rack or tower convertible
Topology	Online double conversion	Online double conversion
NPUT		
Nominal input voltage	220/230/240 VAC (1–3 kVA) 208/220/230/240 VAC (6–10 kVA)	208, 220, 230, 240 VAC
Voltage range	100-300 VAC (1-3 kVA) 110-300 VAC (6-10 kVA)	120–300 VAC (1–3 kVA) 100–276 VAC (6–10 kVA)
Frequency range	45–55 Hz (1–3kVA) 46–54 Hz (6–10kVA)	45–55 Hz
Current THD at 100% load	12% with full resistive load (1–3 kVA) < 5% with full resistive load (6–10 kVA)	< 5%
Power factor at 100% load	≥0.95 (1–3 kVA) ≥0.99 (6–10 kVA)	≥ 0.99
OUTPUT		
Rated output voltage (load dependent)	220/230/240 VAC (1–3 kVA) 208/220/230/240 VAC (6–10 kVA)	
Voltage THD (with linear load)	< 3% linear load, < 6% non-linear load (1–3 kVA) < 3% linear load, < 5% non-linear load (6–10 kVA)	< 2% linear load, < 5% non linear load (1–3 kVA) < 2% linear load, < 4% non linear load (6–10 kVA)
Rated frequency	50 Hz	50 Hz
EFFICIENCY		
Line-interactive	-	_
Double conversion	Up to 90%(1-3 kVA) 92% for 6 kVA 93% for 10 kVA	Up to 92% (1–3 kVA); 94% (6–10 kVA)
Eco-mode	Up to 95% (1–3 kVA) Up to 98% (6–10kVA)	Upto 98%
COMMUNICATIONS		
User Interface	LCD	LCD
Communication ports	SNMP; ModBus; AS400; Environmental monitoring sensor probe	USB, RS-232, SNMP slot, potential-free contacts

UPS product overview 10 kVA to 5 MVA

3 Phase Standalone UPS







GENERAL DATA	PowerScale 33 (Transformerless)	PowerWave 33 (Transformerless)	SG Series (Transformer based)
UPS frame rated power	10/15/20/25/30/40/50 kVA	60/80/100/120/160/200/ 250/300/400/500 kW	10–500 kVA
UPS module rated power	_	-	_
UPS output rated PF	0.9	1.0	0.9
Max. No. of parallel frames	Up to 20 units	Up to 10 units	Up to 6 units
Max. No. of parallel modules across frames	-	-	-
Max. system power	1000 kVA	5000 kW	3000 kVA
Wiring	3ph + N + PE	3ph + N + PE	3ph + N +PE
UPS type	Standalone tower	Standalone tower	Standalone tower
Topology	Online double conversion	Online double conversion	Online double conversion
INPUT			
Nominal input voltage	220 / 380, 230 / 400, 240 / 415 VAC	220 / 380, 230 / 400, 240 / 415 VAC	380/400/415 VAC 340–460 VAC
Voltage range	161/280 – 264/460 VAC	138/240 – 264/460 VAC	340-460 VAC
Frequency range	35 – 70 Hz	35 – 70 Hz	45–66 Hz
Current THD at 100% load	≤ 3%	≤ 4%	< 2%
Power factor at 100% load	≥ 0.99	≥ 0.99	0.99
ОИТРИТ			
Rated output voltage (load dependent)	220 / 380, 230 / 400, 240 / 415 VAC	220 / 380, 230 / 400, 240 / 415 VAC	3x 380/400/415 VAC
Voltage THD (with linear load)	< 2%	< 2%	< 1.5%
Rated frequency	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)
EFFICIENCY			
Line-interactive	_	_	-
Double conversion	Up to 95.5%	Up to 96%	up to 94.6%
Eco-mode	98%	99%	up to 98.7% (eBoost)
COMMUNICATIONS			
User Interface	LCD + mimic diagram	Graphical touch screen (optional on 160 – 200 kW), LCD+mimic diagram (on 60– 200 kW only)	System Graphical Diyplay LCD
Communication ports	USB (optional), RS-232, SNMP slot, potential-free contacts (optional)	USB, RS-232, SNMP slot, potential-free contacts	RS232, SNMP (Modbus IP, RS232, RS485 & BacNet IP)
Software	Monitoring and shutdown software	available as option	

UPS product overview 10 kVA to 1.5 MVA

3 phase Modular UPS











GENERAL DATA	DPA UPScale RI	DPA UPScale ST	ConceptPower DPA S3	DPA 250 S4
UPS frame rated power	10/20/40/80 kW	40/60/80/120/200 kW	200 kW	300 kW
UPS module rated power	10/20 kW	10/20 kW	40 kW	50 kW
UPS output rated PF	1.0	1.0	-	1.0
Max. No. of parallel frames	1 subrack	Up to 4 frames	Up to 6 frames	Up to 6 frames
Max. No. of parallel modules across frames	4 modules	20 modules	30 modules	36 modules
Max. system power	80 kW	400 kW	1200 kW	1500 kW
Wiring	3ph + N + PE	3ph + N + PE	3ph + N + PE	3ph + N + PE
UPS type	Modular (DPA)	Modular (DPA)	Modular (DPA)	Modular (DPA)
Topology	Online double conversion	Online double conversion	Online double conversion	Online double conversion
INPUT				
Nominal input voltage	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC
Voltage range	150/260 – 264/460 VAC	150/260 – 264/460 VAC	161/280 – 264/460 VAC	161/280 – 264/460 VAC
Frequency range	35 – 70 Hz	35 – 70 Hz	30 – 70 Hz	35 – 70 Hz
Current THD at 100% load	< 3%	< 3%	< 3%	< 3%
Power factor at 100% load	≥ 0.99	≥ 0.99	≥ 0.99	≥ 0.99
OUTPUT				
Rated output voltage (load dependent)	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC	2220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC
Voltage THD (with linear load)	< 1.5%	< 1.5%	< 2%	< 2%
Rated frequency	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)
EFFICIENCY				
Line-interactive	-	-		-
Double conversion	Up to 96%	Up to 96%	Up to 95.5 %	Up to 97.6% module efficiency, up to 97.4% system efficiency
Eco-mode	98%	98%	98%	99%
COMMUNICATIONS				
User Interface	Module level LCD+mimic diagram, Remote system display optional	Module level LCD+mimic diagram, System graphical display	Module level LCD+mimic diagram, System graphical display	Module level LCD+mimic diagram, System graphical display
Communication ports	USB, RS-232, SNMP slot, potential-free contacts	USB, RS-232, SNMP slot, potential-free contacts	USB, RS-232, SNMP slot, potential-free contacts	USB, RS-232, SNMP slot, potential-free contacts
Software	Monitoring and shutdown	software available as option	on	

UPS product overview 1 kVA to 6 MVA

3 phase Modular UPS







GENERAL DATA	Conceptpower DPA 500	MegaFlex DPA
UPS frame rated power	500 kW	1000/1500 kW
UPS module rated power	100 kW	250 kW
UPS output rated PF	1.0	1.0
Max. No. of parallel frames	Up to 6 frames	Up to 4 frames
Max. No. of parallel modules across frames	30 modules	24 modules
Max. system power	3000 kW	6000 kW
Wiring	3ph + N + PE	3ph + N + PE
UPS type	Modular (DPA)	Modular (DPA)
Topology	Online double conversion	Online double conversion
INPUT		
Nominal input voltage	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC
Voltage range	161/280 – 264/460 VAC	161/280 – 264/460 VAC
Frequency range	35 – 70 Hz	40 – 70 Hz
Current THD at 100% load	< 3.5%	<4%
Power factor at 100% load	≥ 0.99	≥ 0.99
ОИТРИТ		
Rated output voltage (load dependent)	220/380, 230/400, 240/415 VAC	220/380, 230/400, 240/415 VAC
Voltage THD (with linear load)	< 2%	< 2%
Rated frequency	50 or 60 Hz (selectable)	50 or 60 Hz (selectable)
EFFICIENCY		
Line-interactive	-	-
Double conversion	Up to 96%	Up to 97.4%
Eco-mode	99%	99%
COMMUNICATIONS		
User Interface	Module level LCD+mimic diagram,	Module level LCD+mimic diagram,
Communication ports	System graphical display USB, RS-232, SNMP slot, potential-free contacts	System graphical display USB, RS-232, potential-free contacts, ABB network card
		,

Ty-Fast® Fastening solutions

Easily bundle, secure and manage your cables

ABB offers a complete range of all plastic cable ties to fasten cables in the most demanding applications.

Ty-Fast® all plastic ties

The all-plastic cable ties are available in lengths from 100mm to 1220mm and widths from 2,5mm to 12,2mm, offering a loop tensile strength up to 1200 N. These cable ties will satisfy bundling requirements up to 375,5mm. Made of halogen and silicone free Polyamide 6.6, Ty-Fast® cable ties are available in natural and black UV-resistant and heat stabilized material.

Ty-Fast® cable ties meet shipbuilding classification such as DNV-GL, Lloyd's Register of Shipping, Bureau Veritas. Ty-Fast® cable ties have a CE declaration, supported by compliance to the low voltage directive and EN/IEC 62275. On top the Ty-Fast® range is also compliant to UL 62275.

State-of-the-art robotic and raw material handling equipment assures product and material integrity throughout the manufacturing process.

The integrally formed polyamide pawl combines low insertion and high locking strength.

The low profile head significantly reduces the potential for snagging during installation.

Quick and easy pull through increases productivity, reduces operator fatigue.

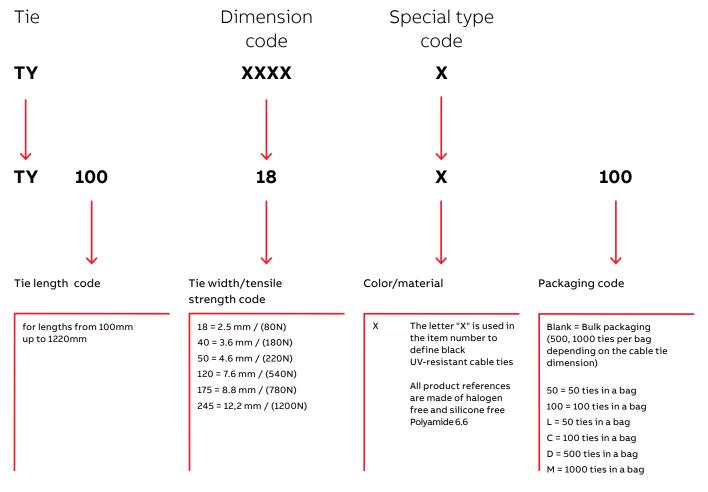
Tail with finger grip design that helps operator grasp and pull ties snugly.

Sure grip tab keeps the tail from popping out while being treated, then holds it securely for final tightening by hand or tool.

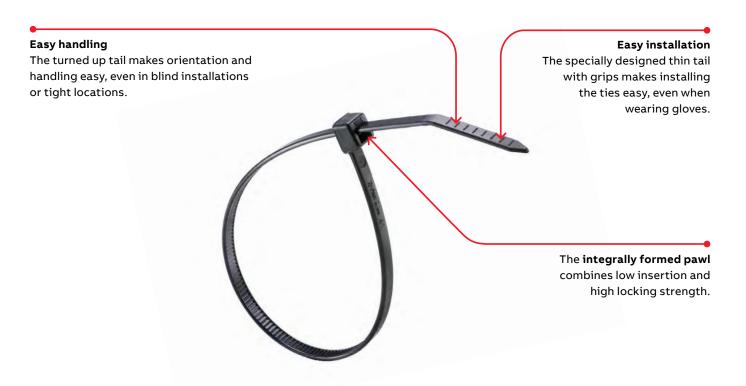


All plastic cable ties

Ty-Fast® product code structure



Note: Nylon (Polyamide 6.6) is inherently susceptible to environmental conditions. Ty-Fast® cable ties are moisturised to optimum performance levels at machine-side and should be stored in cool dry areas out of direct sunlight. Cable ties are packaged in plastic bags to contain moisture and should remain sealed until ready for use.

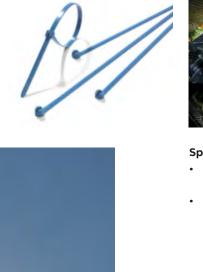


Ty-Rap®

Detectable ties

- Detectable with metal detectors, X-Ray equipment
- Help achieve the HACCP EU directive
- Bright blue color also helps visual detection
- Nylon (Polyamide) version with metal particles
- Polypropylene version with particles of metal: which is floating + has increased resistance to chemicals / acidity







Ty-Rap® cable ties

UV-resistant and flame retardant for rail applications

- "Grip of Steel" Non-magnetic stainless steel locking barb - marine grade type 316
- Rounded edges to prevent sharp edges from damaging
- Smooth, notchless body, making the cable ties stronger
- Ribbed and stippled surface to prevent the tie from slipping under vibration conditions and external shock
- UV-resistant and flame retardant Ty-Rap® cable ties are certified to the latest standard for the train industry:
- NFF 16-101 standard, EN 45545-2
- Different dimensions up to a tensile strength of 540N



Special cable ties for extreme conditions

- Polypropylene: increased chemical resistance
- Fluoropolymer (ETFE) for extreme applications:
 - resistant to radiation: nuclear plants
 - to very low pressure/vacuum: aerospace
 - to high temperature (+150°C) and chemicals
- Fluoropolymer (ECTFE) for extreme
 - applications with low smoke requirements





Wire termination & connectors

ABB is a recognized leader in providing electrical connectors suitable for the majority of all electrical applications.

Main products & benefits:

Color Keyed®

System solution designed to meet the most stringent testing requirements. Our Color-Keyed lugs are made of 99.9% pure, oxygen free copper. The Color-Keyed color coded crimping system assures the right die is used with the right lug resulting in an accurate, reliable crimp

Dragon Tooth® insulation piercing connectors

ABB insulation piercing connectors make a permanent, low resistance connection for splicing, tapping, and terminating magnet wire from 32 AWG to 460,000 CMA copper and from 20 AWG to 460,000 CMA aluminum conductors in motor and transformer applications.

Shield-Kon® connectors

One-piece solderless, wraparound shield connectors terminate shielded cable in seconds with uniform precision while preventing cable damage that may be caused by soldering.

Sta-Kon® & Spec-Kon® terminals

Sta-Kon and Spec-Kon terminals, made of high-conductivity copper with corrosion-resistant plating, include marked stud and wire sizes, a long chamfered barrel to eliminate missed crimps, a deep internal serration to produce a larger contact area, and selective annealing, to leave the barrel soft for crimping while the tongue remains strong. Sta-Kon is our UL / imperial terminals range and Spec-Kon our IEC / metric portfolio.

Comfort crimp compression tool

The most comfortable and ergonomically friendly crimp tool on the market. Requires the lowest handle force of any tool in its class. Shure-Stake mechanisms ensure a complete crimp cycle before releasing and results in a proper/completed crimp every time.



Our offering



Compression connectors



Compression connectors







Shielded connectors



Spec-Kon (IEC/ metric) wire terminals



Sta-Kon (imperial / UL) wire terminals



Wire termination tools



Compression connector tools

The Furse

Total Solution approach

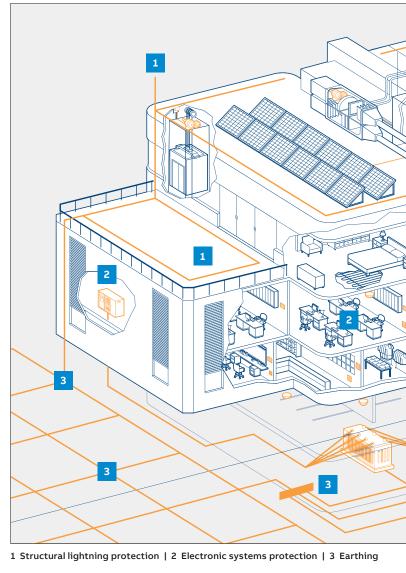
1. Structural lightning protection

From Furse air termination systems including air rods and strike plates to capture lightning strikes, through to our comprehensive range of down conductors and lightning protection components which channel lightning energy safely to a Furse earth termination network.

Including:

- · Air termination systems
- · Lightning protection conductors
- · Conductor clips, clamps & holdfasts
- Bimetallic connection components





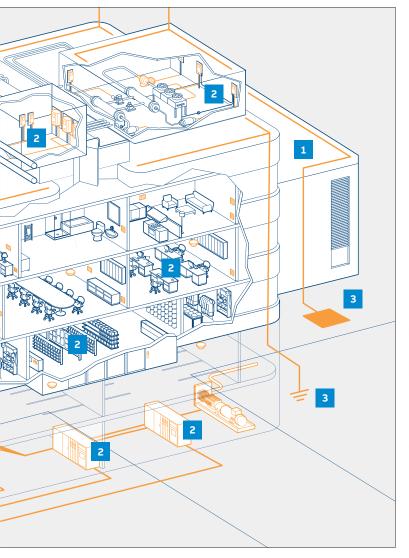
2. Electronic systems protection

Our extensive range of equipotential bonding and transient overvoltage Surge Protection Devices (SPDs) providing fully coordinated protection against transient overvoltages. SPDs are able to cover all incoming and outgoing metallic service lines including power, data, signal and telecoms.

Including:

- · Lightning equipotential bonding SPDs
- · Mains power transient overvoltage SPDs
- Data, signal & telecommunication lines SPDs
- DC power & photovoltaic system SPDs





3. Earthing

The combination of Furse earth electrodes, clamps, conductors and equipotential bonding bars which provide lightning and transient overvoltage energy with an effective, low resistance route from lightning protection system to earth.

Including:

- Earth rods & conductor systems
- · Mechanical earth clamps & bonds
- · FurseWELD exothermic welding
- · Earth bars & equipotential bonding







Furse technical design teams ensure all designs for lightning protection, earthing and transient overvoltage protection meet relevant National and International standards, whilst our sales engineers provide key updates on lightning protection matters.

Including:

- · Lightning protection system design
- Site surveys & earthing analysis
- Lightning protection seminars & training
- · Technical guides & StrikeRisk software



Surge protection devices for data and communication technology

Selection table

PROFIBUS Systems HART Systems				A STORY	OVR RS485 Flat/DIN Mount	
					7TCA085400R0311	
Ethernet	1 81		withPoE:	a lai	Cat-5 (100 Mbps) OVR Cat-5e 7TCA085400R0289 7TCA085400R0290	
Video						
Surveillance CCTV*		5V CCTV with BNC connector, power, and telemetry line			OVR CCTV/B* Video signal 7TCA085400R0296	
4 - 20 mA current loops			Screw terminals 30 V		OVR SL30L/4-20 7TCA085400R0371	
Bus Interface			Female coaxial connector:		OVR SL06 MODBUS and CAN-Bus	
			Screw terminals:		OVR TN Flat Mount 7TCA085400R0345	
Telephone ISDN DSL	The same of the sa	RJ11, RJ45	terrimais.	The state of the s	OVR TN/R311-6/6 6P6C Connector 7TCA085400R0359	1
	A SECOND	LSA-PLUS connection		the state of the s	OVR KT1 Single module 7TCA085400R0305	
TV: Satellite, Cable	Supp Corr DAILTY Device Corr DAI			Surprise of BMIVE Devices of BMIVE Devic	OVR CATV/F Cable 7TCA085400R0293	
2 wire systems (30V)*				Control of the last of the las	OVR 30E Flat Mount 7TCA085400R0353	
3 wire systems (30V)*					OVR SL30/3W Slim Mount 7TCA085400R0331	
Hazardous Areas ATEX/IEC approved					OVR SL15X 15 Volt 7TCA085400R0386	
Resistance Temperature Detectors (RTD)					OVR RTD Flat/DIN Mount 7TCA085400R0313	

^{*} also available in other system voltages, see HK T2 K4



OVR SL RS485 Slim DIN Mount



OVR RS485Q Multiple Lines (DIN Mount) 7TCA085400R0312



7TCA085400R0310 Cat-6 (1000 Mbps) OVR Cat-6e 7TCA085400R0291 7TCA085400R0292



OVR RS485 Telemetry signal 7TCA085400R03101



OVR 240-16A Power line 7TCA085460R0361



OVR CME4 Earth Bar 7TCA085400R0414



OVR WBX4/GS Enclosure 7TCA085410R0049



OVR SL50 7TCA085400R0364



US/E1 GHQ6310009R0001





OVR SL TNL Slim Mount with LED $\,$

7TCA085400R0418



OVR TNQ Multiple Lines (max. 4 double vains) 7TCA085400R0344



OVR ISDN/RJ45-4/8 8P4C Connector 7TCA085400R0359



OVR K10T1 10 modules 7TCA085400R0307



OVR KE10 Earth Bar 7TCA085400R0304



OVR SMATV/F Satellite 7TCA085400R0336



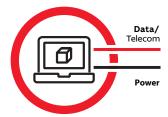
OVR TV/EURO Antenna 7TCA085400R0334



OVR SL30 Slim Mount 7TCA085400R0363



OVR 30Q Multiple Lines 7TCA085400R0341



WARNING Equipment is ONLY protected if all incoming lines have protection fitted



OVR SL30X 30 Volt 7TCA085400R0387



OVR SL RTD Slim (DIN Mount) 7TCA085400R0315



OVR RTDQ Multiple Lines (DIN Mount) 7TCA085400R0314

Adaptaflex

Flexible non-metallic conduit systems

Adaptaflex have a wide selection of flexible non-metallic conduit systems available in many different materials, ranging from lightweight to heavyweight.

As standard, our conduit ranges are offered in nominal conduit sizes from 10mm up to jumbo size 106mm for larger cable carrying capacity. Our solutions offer a wide range of specifications and specialist properties, including Fast Fit, Low Fire Hazard (LFH), Enhanced Low Fire Hazard (ELFH) and EMI screening. Additionally, many of our conduit systems have industry recognised approvals including British Kitemark, CE Approval, UL 1696, NF, LUL, DB, Lloyds Register amongst others.

As well as our flexible non-metallic conduits, we also offer a range of fittings specifically designed to maintain system integrity including straights, 90° and 45° elbows, with metric, PG, PF and NPT threads. To top it off, we also have a host of accessories including locknuts, sealing washers and multiway adapters, to help facilitate quick and easy system installation.



Features & benefits include:

- · Non-metallic conduit systems do not corrode/rust
- Wide variety of fittings, large choice of solutions
- Lightweight and quick to install (cut & assemble fittings)
- · High fatigue life
- · Flexibility allowing quick return to original shape
- Adaptalok Fast Fit "Push Twist Pull" installation
- · UNEF, Metric, PG, Gas & NPT threads
- · Proven patented design over 20 years in service

Non-metallic conduits



Polyamide conduits (Type PA)



Modified polyamide conduits



Polypropylene conduits (Type PP)



Polyetherketone (Type PK)



PVC conduits



EMI screening conduits

Non-metallic Adaptalok ATS & Hi-Spec fittings





External male Adaptalok ATS fittings



Internal female Adaptalok ATS fittings



Swivel coupler and panel mounting fittings



Female thread fittings for Jacob glands



Fittings for Polyetherketone (Type PK) conduits



Composite fittings

Non-metallic accessories



Locknuts



Sealing washers



Multiway adapters



End caps, sleeves and removal tools



Hinged fittings



Conduit clip

Adaptaflex

Flexible metallic conduit systems

Adaptaflex have a wide selection of flexible metallic conduit systems manufactured either in galvanized steel or stainless steel.

As standard, our conduit ranges are offered in nominal conduit sizes from 3mm up to 75mm for larger cable carrying capacity. Our solutions offer a wide range of specifications and specialist properties, including Liquid Tight, Low Fire Hazard (LFH) and EMI screening. Additionally, many of our conduit systems have industry recognised approvals including British Kitemark, CE Approval, UL 1696, NF, LUL, DB, Lloyds Register amongst others.

As well as our flexible metallic conduits, we also offer a range of fittings specifically designed to maintain system integrity including fixed and swivel fittings, straights, 90° and 45° elbows. To top it off, we also have a host of accessories including locknuts, enlargers, reducers and converters, to help facilitate quick and easy system installation.



Features & benefits include:

- · High compression/crush strength
- · Tensile strength pull off load under tension
- Impact resistance
- · Inherent fire protection on uncoated versions
- · Corrosion resistant stainless steel options
- · Braided High level EMI screening with tinned copper overbraiding

Metallic conduits



Steel conduit



Liquid resistant covered steel



Liquid tight covered steel with anti-microbial options



EMI screening solutions with under or overbraided options

Metallic fittings









Fittings for liquid resistant covered steel conduits



Fittings for liquid tight and antimicrobial conduits



Fittings for braided steel conduits

Metallic accessories



Couplers and connectors



Type 45/90 elbows



Locknuts



P-Clip







Type E. R & C - enlargers. reducers and converters

Kopex-Ex solutions

Ex metallic conduit systems

Kopex-Ex cable protection systems have been specifically designed to provide the optimal safe solution for protecting cables in hazardous areas. Our wide selection of metallic conduit systems are manufactured either in galvanized steel or stainless steel, providing liquid tight solutions for especially demanding hazardous environments.

All metallic conduit systems meet the strictest worldwide standards for use in explosive hazardous atmospheres including ATEX, IECEx and EAC Ex.

As well as our metallic conduits, we also offer a range of fittings specifically designed to maintain system integrity including fixed and swivel fittings, straights, 90° and 45° elbows. This also includes a wide range of cable glands to facilitate the installation and termination of most cable types, armoured and non-armoured in all applications, including EMC and heat-trace applications. To top it off, we also have a host of accessories including locknuts, enlargers, reducers and converters, to help facilitate quick and easy system installation.





Features & benefits include:

- Steel/stainless steel core with polymer jacket, offering high IP rating and mechanical protection
- High compression/crush strength
 Tensile strength pull off load under tension
- · Impact resistance
- · Inherent fire protection on uncoated versions
- Corrosion resistant stainless steel options
- Braided-Highlevel EMI screening with tinned copper overbraiding
- Single entry fittings for a more manageable & costeffective solution to hazardous area installations

Ex metallic conduits



Oil resistant PVC conduits



Low Fire Hazard (LFH) conduits



High temperature, high flexibility conduits

Ex metallic fittings



Ex d e - HA-G1 barrier gland



Ex d e - HA-G1 90° elbow gland



Ex d e - HA-U universal gland



Ex e - EXQ fitting



Ex e - 90° EXS fitting



Ex e - 45° EXR fitting

Ex metallic accessories



Stopping plugs





Ex d e - Thread converters



Ex d e - Metallic couplers



Hex locknut

Kopex-Ex solutions

Ex non-metallic conduit systems

Kopex-Ex cable protection systems have been specifically designed to provide the optimal safe solution for protecting cables in hazardous areas. Our range of non-metallic conduit systems meet the strictest worldwide standards for use in explosive hazardous atmospheres including ATEX, IECEx, UL/CSA and EAC Ex.

The corrugated construction incorporates high fatigue life whilst providing good flexibility. For more demanding applications there is a wide-ranging high specification series of conduit with enhanced low fire hazard properties. In addition a range of fittings are specifically designed to maintain system integrity.



Features & benefits include:

- Corrugated non-metallic conduit offering high flexibility and moderate mechanical protection
- Allows the construction of Exharnesses for more intricate or complex routing requirements
- · For Ex e applications
- · Non corrosive materials
- Wider variety of fittings-much larger solutions choice
- Quicker to install (cut & assemble fittings)
- Lighter in weight
- Better fatigue life
- Return to shape

Ex non-metallic conduit systems







Overbraided conduit (EXBB)



Type EXPQ -Straight metallic fitting for use with EXB conduit



Type EXBQ - Straight metallic fitting for use with EXBB conduit

Accessories for hazardous and industrial areas

Thread converters

- Nickel plated brass and stainless steel
- Convert metric PG and NPT thread forms

Stopping plugs

- Nickel plated brass, stainless steel or nylon.
- Also available with Hex head or Dome head.

Other accessories

A full range of accessories is also available to support installations including:

- Earth tags
- · Sealing joint washer
- · Hex locknuts
- · Serrated washers



Stopping Plugs



Thread converters & couplers



Standard accessories

T&B Liquidtight systems®

ABB is introducing T&B Liquidtight Systems®, a complete solution for flexible metallic cable protection, to the world. Thomas & Betts has been a market leader in flexible metallic liquid-tight conduits, fittings and accessories for many years in North America. ABB is now introducing a complete range of T&B Liquidtight products to the global market that meet international requirements. The ABB T&B Liquidtight Systems flexible metallic conduit solutions include a broad product range that is unmatched in the market, including solutions for general purpose, oil resistant, wide or extreme temperature, and aluminum applications.

T&B liquidtight systems® provides global industrial solutions for Flexible Metallic Conduit (FMC) Protection Systems across a wide variety of application requirements. The T&B liquidtight systems® is founded on the market leading Ser. 5200/5300 liquidtight "T&B fittings", with highest quality flexible metallic conduits and seal gaskets. System ingress protection to UL 50/50E, CSA C22.2 and IEC 60529 IP ratings provides the ideal solution when connecting the T&B liquidtight systems® for indoor or outdoor installations to switchgear electrical enclosures, control cabinets, pushbutton stations, motor junction boxes and more.

T&B Liquidtight Systems*



Main benefits

- Global approvals and certifications including UL, CSA, IEC/EN, CE, RoHS
- Widest range of trade sizes in the industry from 3/8" to 6" (12mm to 155mm)
- Highest quality liquid tight fittings including steel/malleable iron, aluminum, stainless steel, high temperature, brass nickel plated and push-in variants
- Flexible metallic conduits with the highest quality cores and smooth extruded jackets
- Protection from corrosion, oils, chemicals, solvents, water hose down, UV, low smoke & toxicity environments
- System Ingress ratings per UL50/50E, CSA and IEC IP, matching enclosure system ingress ratings
- Complete global technical documentation and time saving selection tools

Our offering



ABB T&B flexible metallic conduits



ABB T&B metallic fittings



T&B accessories

Harnessflex

Superior protection for automotive wiring harnesses

Established in 1984, Harnessflex is a leading designer and manufacturer of flexible conduit systems and connector interfaces, protecting critical electrical and electronic wiring assemblies in the automotive industry.

Harnessflex offers complete system solutions for the routing and protection of electrical wiring against damage by mechanical abrasion, liquid ingress and corrosion salts. Using a Harnessflex conduit system ensures that vulnerable connectors are not exposed to the elements, impact of foreign bodies or jet washing, all of which can cause vehicle malfunction and failure.

Our success has come from our systematic commitment to providing an extensive range of high-grade quality components. Combining a full range of slit and un-slit conduit, fittings and connectors, we also offer a large range of hinged system components and connector interfaces.



Applications

- Agricultural vehicles
- Construction vehicles • Engine manufacturers
- Harness Manufacturers

Conduits

Our conduit range is available in many different materials, including lightweight, with enhanced low fire hazard properties and increased tolerance to extreme temperatures.



· Military vehicles

· Truck & bus manufacturers

· Tanker & trailer manufacturers

· Specialist vehicle components

Hinged Fittings

Hinged fittings are designed to protect against liquid ingress and ensure correct assembly, featuring an internal backstop that eliminates any problems caused by unevenly cut conduit.



Connector Interfaces

Harnessflex connector interfaces are designed for use in areas where electrical connectors are vulnerable to high pressure washing.



Sealed Fittings

Sealed fittings that are designed to protect against high pressure washdown, excessive cable strain and mechanical abrasion.



TempGuard Range

Cable protection solutions for the automotive market that are tested to be able to withstand extremely high temperatures (up to 200°C).



Accessories

A range of accessories that compliments the Harnessflex product offering.

Harnessflex connector interfaces

Quick reference chart

















Туре		TE AMP Superseal			TE AMP Superseal 90°				TE AMP Junior & Mini timer				TE AMP Junior & Mini timer 90°			
Part no.	Tempguard Part no.	Interface	1 Connector	Part no.	Tempguard Part no.	Interface	2 Connector	Part no.	Tempguard Part no.	Interface	3 Connector	Part no.	Tempguard Part no.	Interface	4 Connector	
CI08-AS1	CIH08-AS1	1 way	282079-2*	CI08-90-AS1	CIH08-90-AS1	1 way	282079-2*	CI08-AM2	CIH08-AM2	2 way	347887-3*	CI08-90-AM2	CIH08-90-AM2	2 way	347887-3*	
CI08-AS2	CIH08-AS2	2 way	282080-1*	CI08-90-AS2	CIH08-90-AS2	2 way	282080-1*	CI08-AM3	CIH08-AM3	3 way	1-827578-1*	CI08-90-AM3	CIH08-90-AM3	3 way	1-827578-1*	
CI08-AS3	CIH08-AS3	3 way	282087-1*	CI08-90-AS3	CIH08-90-AS3	3 way	282087-1*	CI08-AM4	CIH08-AM4	4 way	281804-1*	CI08-90-AM4	CIH08-90-AM4	4 way	281804-1*	
CI08-AS4	CIH08-AS4	4 way	282088-1*	CI08-90-AS4	CIH08-90-AS4	4 way	282088-1*	CI10-AM2	CIH10-AM2	2 way	347887-3*	CI10-90-AM2	CIH10-90-AM2	2 way	347887-3*	
CI10-AS2	CIH10-AS2	2 way	282080-1*	CI10-90-AS2	CIH10-90-AS2	2 way	282080-1*	CI10-AM3	-	3 way	1-827578-1*	CI10-90-AM3	-	3 way	1-827578-1*	
CI10-AS3	CIH10-AS3	3 way	282087-1*	CI10-90-AS3	CIH10-90-AS3	3 way	282087-1*	CI10-AM4	-	4 way	281804-1*	CI10-90-AM4	-	4 way	281804-1*	
CI10-AS4	CIH10-AS4	4 way	282088-1*	CI10-90-AS4	CIH10-90-AS4	4 way	282088-1*	CI12-AM2	CIH12-AM2	2 way	347887-3*	CI12-90-AM2	-	2 way	347887-3*	
CI12-AS1	CIH12-AS1	1 way	282079-2*	CI12-90-AS2	CIH12-90-AS2	2 way	282080-1*	CI12-AM3	CIH12-AM3	3 way	1-827578-1*	CI12-90-AM3	CIH12-90-AM3	3 way	1-827578-1*	
CI12-AS2	CIH12-AS2	2 way	282080-1*	CI12-90-AS3	CIH12-90-AS3	3 way	282087-1*	CI12-AM4	CIH12-AM4	4 way	281804-1*	CI12-90-AM4	CIH12-90-AM4	4 way	281804-1*	
CI12-AS3	CIH12-AS3	3 way	282087-1*	CI12-90-AS4	CIH12-90-AS4	4 way	282088-1*									
CI12-A54	CIH12-AS4	4 way	282088-1*													













Туре		TE Econoseal TE Econoseal Series 90°								al Series 90°			TE/De	eutsch - DT Series	
Part no.	Tempguard Part no.	Interface	8 Connector	Part no.	Tempguard Part no.	Interface	9 Connector	Part no.	Tempguard Part no.	Interface	9 Connector	Part no.	Tempguard Part no.	Interface	Connector
CI08-ES2P	_	2 way	174354-2	CI08-90-ES2P	_	2 way	174354-2	CI08-90-ES2R	_	2 way	174352-2	CI08-DT2	CIH08-DT2	2 way	DT06-2S-E005
CI08-ES3P	_	3 way	174359-2	CI10-90-ES2P	-	2 way	174354-2	CI10-90-ES2R	-	2 way	174352-2	CI08-DT3	CIH08-DT3	3 way	DT06-3S-E005
CI10-ES4P	_	4 way	174259-2	CI12-90-ES2P	-	2 way	174354-2	CI12-90-ES2R	_	2 way	174352-2	CI08-DT4	CIH08-DT4	4 way	DT06-4S-E005
CI08-ES2R	_	2 way	174352-2	CI08-90-ES3P	-	3 way	174359-2	CI08-90-ES3R	-	3 way	2822390-1	CI08-DT6	CIH08-DT6	6 way	DT06-6S-E005
CI08-ES3R	-	3 way	2822390-1	CI10-90-ES3P	-	3 way	174359-2	CI10-90-ES3R	-	3 way	2822390-1	CI12-DT2	CIH12-DT2	2 way	DT06-2S-E005
CI10-ES4R	_	4 way	174257-2	CI12-90-ES3P	-	3 way	174359-2	CI12-90-ES3R	-	3 way	2822390-1	CI12-DT3	CIH12-DT3	3 way	DT06-3S-E005
				CI10-90-ES4P	-	4 way	174259-2	CI10-90-ES4R	-	4 way	174257-2	CI12-DT4	CIH12-DT4	4 way	DT06-4S-E005
				CI12-90-ES4P	-	4 way	174259-2	CI12-90-ES4R	-	4 way	174257-2	CI12-DT6	CIH12-DT6	6 way	DT06-6S-E005
				CI16-90-ES4P	-	4 way	174259-2	CI16-90-ES4R	-	4 way	174257-2	CI12-DT8	CIH12-DT8	8 way	DT06-8S-E005
												CI16-DT12	CIH16-DT12	12 way	DT06-12SA-E005

















Type	FCI Au	Bosch Compact				Bosch Compact 90°						Aptiv Series		
Part no.	Tempguard Part no.	Interface Connector	Part no.	Tempguard Part no.	Interface	16 Connector	Part no.	Tempguard Part no.	Interface	(16) Connector	Part no.	Tempguar Part no.	d Interface	Connector
CI08-90-FCS02	CIH08-90-FCS02	2 way 54200210	CI08-BC2	CIH08-BC2	2 Way	1 928 403 137*	CI08-90-BC2	CIH08-90-BC2	2 Way	1 928 403 137*	CI08-DE001	-	3 way	13532244
CI08-90-FCI02	CIH08-90-FCI02	2 way 54200210	CI08-BC3	CIH08-BC3	3 Way	1 928 403 110*	CI08-90-BC3	CIH08-90-BC3	3 Way	1 928 403 110*	C108-MP2	-	2 way	12162194
CI08-90-FCI03	CIH08-90-FCI03	3 way 54200312	CI08-BC4	CIH08-BC4	4 Way	1 928 403 112*	CI08-90-BC4	CIH08-90-BC4	4 Way	1 928 403 112*	C108-MP3	-	3 way	15300003
CI08-90-FCI04	CIH08-90-FCI04	4 way 54200413	CI12-BC2	CIH12-BC2	2 Way	1 928 403 137*	CI12-90-BC2	CIH12-90-BC2	2 Way	1 928 403 137*	C108-MMP2	-	2 way	12162852
CI12-90-FCI02	CIH12-90-FCI02	2 way 54200210	CI12-BC3	CIH12-BC3	3 Way	1 928 403 110*	CI12-90-BC3	CIH12-90-BC3	3 Way	1 928 403 110*	C108-WP2	-	2 way	12015792
CI12-90-FCI03	CIH12-90-FCI03	3 way 54200312	CI12-BC4	CIH12-BC4	4 Way	1 928 403 112*	CI12-90-BC4	CIH12-90-BC4	4 Way	1 928 403 112*	CI08-PTD2	-	2 way 15	5397337/15397327
CI12-90-FCI04	CIH12-90-FCI04	4 way 54200413	CI28-BC40	CIH28-BC40	40 Way	1 928 404 777*					CI08-GT153	-	3 way	15336121
CI08-90-FCI14	CIH08-90-FCI14	14 way 54201415									16-GT284	-	4 way	135214559
CI12-90-FCI14	CIH12-90-FCI14	14 way 54201415												
CI16-90-FCI14	CIH16-90-FCI14	14 way 54201415												
CI20-90-FCI14	CIH20-90-FCI14	14 way 54201415												

CONNECTOR KEY:

- 1 TE Amp Superseal
- 2 TE AMP Superseal 90°
- 3 TE AMP Junior & Mini timer
- 4 TE AMP Junior & Mini timer 90°
- 5 TE AMPSEAL 16

90° TE Econoseal 90°

- 6 7 TE AMPSEAL 16 90°
- 8 TE Econoseal
- 10 TE/Deutsch DT Series 11 TE/Deutsch - DT Series 90°
- TE/Deutsch DRC50 Series
- 13 Heavy Duty Series
- 14 FCI Automotive Apex 2.8
- 15 FCI Automotive Apex 2.8 90°
- 15 Bosch Compact
- Bosch Compact 90°
- Aptiv Series
- 19 Kostal 90° 21 Sumitomo

18 Kostal

18 Aptiv Series 90°

20 Kostal SLK Series 90°













SEAL 16 90'	TE AMP						_					AMPSEAL 16	167		
7 Connector	Interface	Tempguard Part no.	Part no.	7 Connector	Interface	Tempguard Part no.	Part no.	6 Connector	Interface	Tempguard Part no.	Part no.	5 Connector	Interface	Tempguard Part no.	Part no.
776427-1*	2 way	CIH12-90-AT2LP	CI12-90-AT2LP	776427-1*	2 way	CIH08-90-AT2LP	CI08-90-AT2LP	776427-1*	2 way	CIH08-90-AT2PL	CI08-90-AT2PL	776427-1*	2 way	CIH08-AT2PL	CI08-AT2PL
776427-1*	2 way	-	CI12-90-AT2LR	776427-1*	2 way	CIH08-90-AT2LR	CI08-90-AT2LR	776523-1*	3 way	CIH08-90-AT3PL	CI08-90-AT3PL	776523-1*	3 way	CIH08-AT3PL	CI08-AT3PL
776523-1*	3 way	CIH12-90-AT3LP	CI12-90-AT3LP	776523-1*	3 way	CIH08-90-AT3LP	CI08-90-AT3LP	776487-1*	4 way	CIH08-90-AT4PL	CI08-90-AT4PL	776487-1*	4 way	CIH08-AT4PL	CI08-AT4PL
776523-1*	3 way	CIH12-90-AT3LR	CI12-90-AT3LR	776523-1*	3 way	CIH08-90-AT3LR	CI08-90-AT3LR	776427-1*	2 way	CIH12-90-AT2PL	CI12-90-AT2PL	776487-1*	4 way	CIH12-AT4PL	CI12-AT4PL
776487-1*	4 way	-	CI12-90-AT4LP	776487-1*	4 way	CIH08-90-AT4LP	CI08-90-AT4LP	776523-1*	3 way	CIH12-90-AT3PL	CI12-90-AT3PL	776433-1*	6 way	CIH12-AT6PL	CI12-AT6PL
776487-1*	4 way	-	CI12-90-AT4LR	776487-1*	4 way	CIH08-90-AT4LR	CI08-90-AT4LR	776487-1*	4 way	CIH12-90-AT4PL	CI12-90-AT4PL	776532-1*	8 way	CIH12-AT8PL	CI12-AT8PL
776433-1*	6 way	CIH12-90-AT6LP	CI12-90-AT6LP	776433-1*	6 way	CIH08-90-AT6LP	CI08-90-AT6LP					776494-1*	12 way	CIH12-AT12PL	CI12-AT12PL
776433-1*	6 way	-	CI12-90-AT6LR	776433-1*	6 way	CIH08-90-AT6LR	CI08-90-AT6LR					776523-1*	8 way	CIH16-AT8PL	CI16-AT8PL
776487-1*	4 way	-	CI16-90-AT4LP									776494-1*	12 way	CIH16-AT12PL	CI16-AT12PL
776487-1*	4 way	-	CI16-90-AT4LR												
776433-1*	6 way	-	CI16-90-AT6LP												
776433-1*	6 way	-	CI16-90-AT6LR												







TE/Deutsch - DTP04 Series 90°





TE/Deutsch - DRC50 Series



Part no

CI25-FCI50



FCI Automotive Apex 2.8

54200210

54200312 54200413

54200312

54200413 54201415

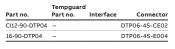
54201415

54200612

54201016

Interface

	TE	/Deutsc	h - DT Series 90°
Part no.	Tempguard Part no. Ir	terface	Connector
CI08-90-DT2	CIH08-90-DT2	2 way	DT06-2S-E005
CI08-90-DT3	CIH08-90-DT3	3 way	DT06-3S-E005
CI08-90-DT4	CIH08-90-DT4	4 way	DT06-4S-E005
CI08-90-DT6	CIH08-90-DT6	6 way	DT06-6S-E005
CI12-90-DT2	CHI12-90-DT2	2 way	DT06-2S-E005
CI12-90-DT3	CIH12-90-DT3	3 way	DT06-3S-E005
CI12-90-DT4	CIH12-90-DT4	4 way	DT06-4S-E005
CI12-90-DT6	CIH12-90-DT6	6 way	DT06-6S-E005
CI12-90-DT8	CIH12-90-DT8	8 way	DT06-8S-E005
CI12-90-DT12	CIH12-90-DT12	12 way	DT06-12SA-E005
CI16-90-DT8	CIH16-90-DT8	8 way	DT06-8SA-E005
CI16-90-DT12	CIH16-90-DT12	12 wav	DT06-12SA-E005



Part no.	Part no.	Interface	Connector
CI122812-DRC50	-	-	DRC26-50S0*
CI201220-DRC50	-	-	DRC26-50S0*
CI202820-DRC50	-	-	DRC26-50S0*
CI251225-DRC50	-	-	DRC26-50S0*
CI252825-DRC50	-	-	DRC26-50S0*

*	CI08-FCI02	CIH08-FCI02	2 way
*	CI08-FCI03	CIH08-FCI03	3 way
*	CI08-FCI04	CIH08-FCI04	4 way
*	CI12-FCI02	CIH12-FCI02	2 way
*	CI12-FCI03	CIH12-FCI03	3 way
	CI12-FCI04	CIH12-FCI04	4 way
•	CI12-FCI14	CIH12-FCI14	14 way
r	CI16-FCI14	CIH16-FCI14	14 way
В	16-FCI14	H16-FC14	14 way
В	CI16-FCI06	CIH16-FCI06	6 way
Ε	CI17-FCI10	CIH17-FCI10	10 way

Tempguard Part no.





	neavy Duty Series		
Part no.	Interface	Connector	
CI08-HDSCS-B	_	HDSCS-B	
CI12-HDSCS-B	-	HDSCS-B	
CI20-HDSCS-E	-	HDSCS-E	
CI20-F90-HDSCS-E	_	HDSCS-E	





50 way DTB 5000 MH



Part no.

CI08-90-DE001 -

CI08-90-MP3

CI12-90-MP2

CI12-90-MP3

CI12-90-MMP2

CI08-90-WP2

CI12-90-WP2

CI08-90-PTD2

CI12-90-PTD2

CI08-90-GT153

CI12-90-GT153 -

CI12-90-GT284 -

CI16-90-GT284 -

C108-90-MMP2 -



Aptiv Series 90°

3 way 12129615/12110293*

3 way 12129615/12110293*

2 way 12052613/12065863*

2 way 12052613/12065863*

2 way 15397337/15397327

2 way 15397337/15397327

Connector

13532244

12162852

12162194

12162852

15336121

15336121

15326631

15326631

Part no.

CI16-LK20

CI08-90-K2C

CI08-90-K3C

CI12-90-K2C

CI12-90-K3C

CI12-90-K10C



Part no.



Kostal

Part no

CI08-90-SLK28-2 -

CI08-90-SLK28-3 -

Connector

9430010

9441391

9442291

9302231

9442291

9331031





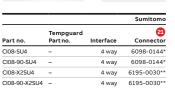
Kostal SLK Series 90°

Interface Connector

2 way 09-4440-2*

3 way 09-4440-3*

9441491



CI08-SLK28-2 28 way CI12-90-SLK28-4 -CI08-SLK28-3 -28 way 9441391 Kostal 90° Interface

2 way

3 way

2 way

3 way

10 way

Interface

20 way

20 way



			Millflex ABS
	Tempguard		
Part no.	Part no.	Interface	Connector
CI08-MF2	-	2 way	_
CI10-MF2	_	2 way	-
CITO MES		2	

Tempguard

Part no.





6189-1134

			DIN 72585	
Part no.	Tempguard Part no.	Interface	Connector	
CI08-72585	-	4 way	1-967325-1	

Part no. Interface

3 way

2 way

2 way

2 way

3 way

3 way

3 way

3 way

^{*} Both connectors need to be fitted with TPA 1205 2845.

OCAL

Corrosion Resistant Conduit Systems

With outstanding performance in corrosive environments, Ocal® PVC-coated conduit and fittings extend the life of your electrical system for many years beyond the lifespan of standard rigid conduit systems.

A complete corrosion protection solution

- Industry-leading thread protection through a hotdipped galvanizing process, and industry-leading UL® Listed type 4X PVC-coated conduit bodies.
- ABB supplies Ocal PVC-coated conduit with hot-dip galvanized threads. Hot-dip galvanizing is the process through which the steel shell is dipped in molten zinc, causing the zinc to penetrate the steel.
- ABB supplies Ocal PVC-coated conduit with a full undisturbed zinc coating under the PVC coating, fulfilling the requirement of NEMA RN-1 regarding the restriction of harmed or eroded zinc coating over the conduit.
- UL Listed including UV resistance testing.
- Ocal supplies "double-coat" coated fittings, enhancing corrosion protection by applying coating to the interior and exterior of the fittings before PVC coating.

Features

 Ocal® UL verified Nema 4X conduit body: The Ocal UL 4X conduit body, including covers with a leakproof O-ring seal, has been UL verified to meet the latest NEMA standard for both corrosion and damage from liquids.







Cable glands and accessories

Everything you need, anywhere in the world...

A one-stop solution for high quality cable glands













Our range offers high-specification protective cable glands suitable for harsh conditions, including high or extreme temperature ranges, oil and UV exposure, food & beverage use or highly corrosive environments. Solutions are also readily available for a broad range of general purpose uses.

Available approvals and certifications

Our products are designed to comply with required standards providing superior performance no matter where they are applied.















Cable gland products by industries



Food & beverage cable glands

ABB's high quality cable glands can help extend the life of electrical systems in a food and beverage plant's challenging environments while reducing system changeover and downtimes.



Rail cable glands

ABB cable glands comply to the latest European safety standard EN45545 and achieve the highest fire performance HL3 rating for both interior and exterior locations, suitable for rail vehicle and infrastructure usage.



Hazardous area cable glands

ABB hazardous area cable glands are designed and manufactured to meet the demands of rigorous and arduous operating environments in addition to ATEX and IECEx standards.



Industrial cable glands

ABB industrial cable glands can be installed anywhere. Supported by global certifications and type approvals, we have a solution for most applications.

Power distribution, cable management, connection & protection

Designed to perform in the oil & gas industry



High performance & reliability during demanding conditions is the starting point for us for all our products and services in the oil & gas industry.

Intensive testing and certification by recognized authorities result in a portfolio meeting highest international standards and legislation. With over 145,000 people in 100 countries, ABB can quickly support local needs in a global offshore / oil & gas environment.











Ex proof conduit systems and fittings.



- Liquid tight, flexible metallic and non-metallic conduit.
- Flameproof Ex d, Ex e fittings.
- Non-metallic, conduit systems for really dynamic applications.
- Ideal for running multiple cores from one point to
 another
- Available for oil-resistant, high-temperature and low and limited fire hazard applications.



Ex proof metallic cable glands.

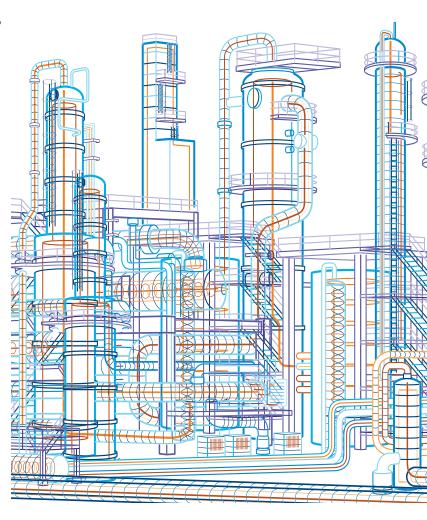


- Ex d, Ex e single or double compression glands.
- Ex d, Ex e compound barrier glands.
- ATEX / IECEx certified.
- Wide range of cable sizes.
- IP66, IP68 ratings.



C2 Series - Ex d e single compression cable glands

- Flameproof Ex d and Increased safety Ex e
- Suitable for use in Zone 1, 2, 21 and 22
- · For use with non-armored circular cable types
- Wide cable range
- · Deluge proof



Designed to perform.

ABB understands continuous operation and reliability are essential for your business. Our solutions are designed to support you to:

- · Maintain a safe environment for personnel and areas classified as hazardous.
- Battle extreme temperatures, UV resistance and other harsh conditions.
- · Protect your cables and wire from liquid ingress & corrosion.
- Reduce your total cost of ownership | ease of design & installation and low energy & maintenance cost.

Ty-Met™

Stainless steel cable ties.

- Ballock, ladder type, releasable, identification, tooling.
- Strong, safe installation with dual locking mechanism.
- Coated version | halogen free, non-toxic polyester.
- Uncoated version | for extreme / high temperature applications: -80°C to +300°C.
- Corrosion resistant 316 grade stainless steel.
- · Ultraviolet resistant, weather & fire-proof, resistant to radiation, chemicals, absolutely fireproof.



Ty-Rap®

High performance nylon cable ties.

- Withstand temperatures between -40°C to 150°C
- Tensile strength up to 540N.
- Flame retardant, Ultraviolet resistant.
- Extra-high temperature resistant nylon.
- Flammability ratings UL94V-2 and V-0.
- Provides a smooth and low-profile look.

Color-Keyed®

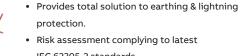
Compression connectors.



- Solid, homogenous connection via special system utilizing compression tools with matching dies that forms connector & wire.
- Made of 99.9% pure, oxygen free copper.
- Assured high conductivity, conforms IEC 61238.
- Straight 1 hole / 2 hole :10 400mm² M5 to M24 45° / 90°: 10mm² till 240mm² M6 to M16.



Earthing and lightning protection.



- IEC 62305-2 standards.
- Soil resistivity surveys by team of experienced surveyors are key to creating effective earthing system.
- · Latest CDEGS software to optimise designs and provide range of customised detailed reports.

Power distribution, cable management, connection & protection

Designed to perform in the oil & gas industry



Key business drivers for oil & gas industry:

- Maintaining a safe environment in process areas classified as hazardous locations (Zone 1, 2 and 21, 22).
- Unforgiving time schedules to meet investment deadlines.
- Battling corrosion.
- Managing unpredictable raw material costs.
- Adapting to changing technologies used to find energy
- Increating environmental and community demands.





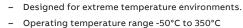






Adaptaflex

Metallic flexible conduit systems.

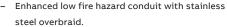




- remember and the particular
- Impact resistance.

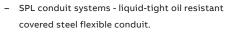








- Inherent fire protection on uncoated versions.
- Weather resistant.





LFH-SP conduit systems.

Metallic and non-metallic IP40 - IP69K on specialist fittings.



Nylon flexible conduit systems.



 Provide excellent flexing and fatigue life in extreme operating temperature ranges.



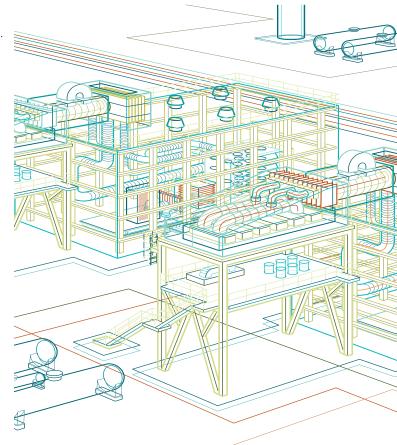
- Extreme resistance to lubricants and corrosive chemicals.
- PA / PR conduit systems, polyamide (Nylon)
 6, self extinguishing, halogen free, very high ultraviolet resistance.
- Conduit diameters non-metallic: 13mm 106mm.



Adaptalok ATS™ system.

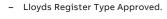


- Ingress protection ratings: IP66 / 67 / 68 / 69K.
- Integral face seal washer guaranteed fit, cannot be lost or fitted incorrectly.
- Elastomer with 3 visible confirmation points.
- One piece fast fit (Push Twist Pull) installation.
- Visual fitting guides highly visible elastomer markings on lugs.
- Proven clip design pitch independent, secure fitment to coarse and fine pitch conduits.



Adaptaflex

Adaptaflex product approvals.





- BSI Kitemark to IFC 61386
- CE marked to Low Voltage Directive.



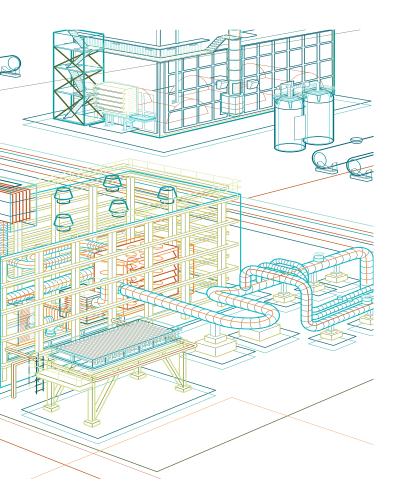
 UL Listed to UL514B and CSA Approved (Liquid Tight Type SPUL).



Designed to perform.

ABB understands continuous operation and reliability are essential for your business. Our solutions are designed to support you to:

- Maintain a safe environment for personnel and areas classified as hazardous.
- Battle extreme temperatures, UV resistance and other harsh conditions.
- Protect your cables and wire from liquid ingress & corrosion.
- Reduce your total cost of ownership | ease of design & installation and low energy & maintenance cost.



Ocal "

OCAL-BLUE ® PVC-coated conduit & fittings system.



- PVC-coated, hot-dipped galvanised conduit and threads
- Complies fully with UL® 6, NEMA RN-1 and ANSI
- Superior corrosion protection against harsh elements.
- Interior blue polyurethane provides corrosion protection around copper wire or fiber optics.

T&B° Fittings

Star Teck® Extreme® jacketed metal-clad and Teck cable termination fittings.



- Suitable for extreme locations.Form a strong mechanical grip and water and/or
- Form a strong mechanical grip and water and/or oil-resistant termination.
- Provide grounding continuity of cable armor.
- Patented powergrip grouding ring for easy installation.
- Designed to accommodate a broad range of cables.
- Built-in sealing device provides a 360° seal when enclosure surface is rough or uneven.
- NEMA 4, 4X (stainless steel), 6P ratings. UL Listed and CSA Certified.

T&B° Fittings

Star Teck® Extreme Director™ cable fittings.



- Truly adjustable series of range-taking fittings for flexibility in space-constraint locations.
- Exclusive swash-plate design, angle adjustable from 90° to 180°.
- Accept a range of jacketed metal-clad and teck cable diameters.
- Easy to install (Install Insert Rotate Done) and disconnect.
- UL Listed, NEMA 4, Class I Div 2 / Zone 2 and Class II Div 2 / Zone 22 when installed.

T&B° Fittings

52® series high temperature flexible metal liquid-tight fittings.



- Withstand temperature range between -60° to 150°C.
- Steel or malleable iron construction, electrozinc plated and chromate coated for corrosion protection.
- Plastic sealing ring to provide a water-tight / oil-tight seal.
- Available in straight, 450 and 90° versions

T&B° Fittings

Ex proof flexible couplings - XP Flex couplings.



- Explosion-proof and dust-ignition proof for use in hazardous locations.
- Flexible design makes it easy to achieve tight bends in conduit systems in confined spaces or vibration-prone locations.
- Corrosion resistant | ideal for washdown areas.
- Flexible bronze construction with arc-resistant inner sleeve and brass fittings.
- Terminated with two threaded female end fittings and male close nipples.
- UL Listed and CSA Certified for hazardous locations. Class 1 Div 1 and Div 2, Class II Div 1, Class III.

System pro M

Portfolio overview

With the ABB System pro M portfolio, we offer a complete system solution including MCBs, RCCBs, RCBOs, SDs, busbars accessories and consumer units.

MCB - Miniature Circuit Breaker

- · Protect installations against overloads and short-circuit, guaranteeing reliability and safety of operations
- SB200 M MCB with breaking capacity of 10kA
- B characteristic, 1/2/1P+N pole configurations in all sizes up to 40A.
- C characteristic in 1/2/3/4/1P+N/3P+N Pole configurations in all sizes up to 63A
- D characteristic in 1/2/3/4 Pole configurations in all sizes up to 63A

RCCB - Residual Current Circuit Breaker

- Sensitive only to earth fault current, therefore they have to be connected in series with a MCB or a fuse to protect them against over-currents and short-circuits
- FB200 RCCB with sensitivity 30/100/300mA in AC type and 2/4P configuration up to 63A, corresponding to all requirements in residential applications

RCBO

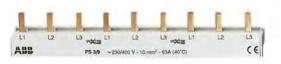
- · Combined protection against both earth-fault currents and overloads or short-circuits in one single device
- · DS201 M RCBO with breaking capacity 10kA
- · C characteristics, AC and APR types, 30/100/300mA sensitivity and 2P+N configuration up to 40A

SD - Switch disconnector

- · Opening a disconnector ensures isolation of downstream circuit
- SDB200 with 2/3/4P configurations in all sizes up to 63A

Accessories

• Busbar with 12/56/57 pins in 1/2/3/4P to ensure easy and reliable wiring



Busbar







Signal/ Auxiliary contacts



S2C-A Shunt trip



мсв

RCCB







RCBO

SD

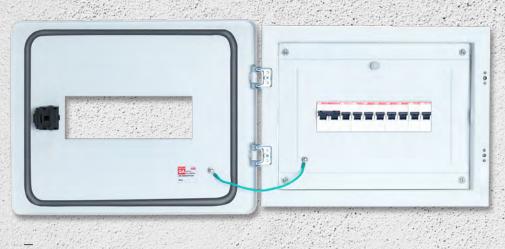


ABB ITUS distribution enclosures

A collaborative effort

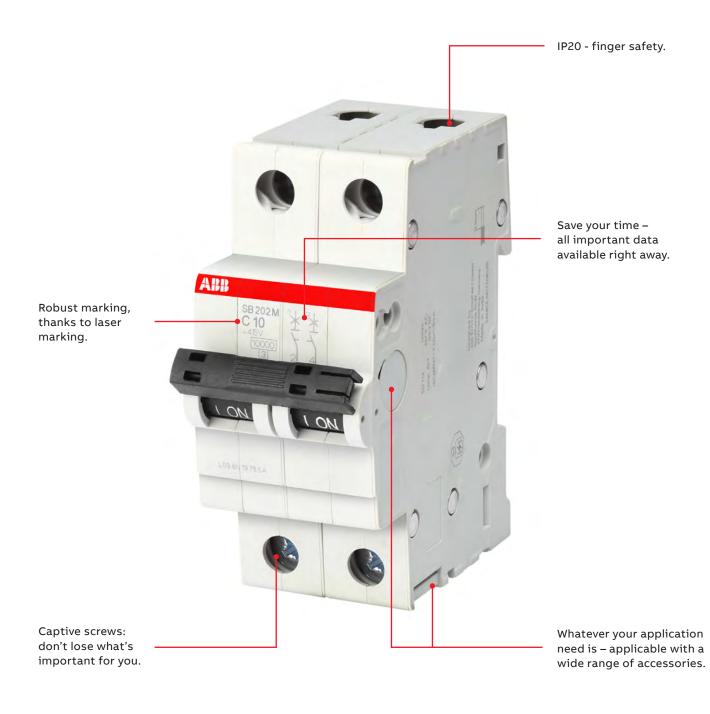
Meeting the right requirements

ABB ITUS series Distribution Enclosures put no limits to your imagination. Gone are the days when enclosures were meant only for archaic needs. With the ABB ITUS series enclosures, you can rest assured that it will not only perform at its peak, but also blend in with the rest of your interiors. Using ABB's innovative designs, domain expertise and standards, ABB ITUS is ready to help you to be today's trendsetter.



Miniature Circuit Breaker SB200 M

The details make the difference





State-of-the-art design (Aesthetics & Ergonomics)

Elegant in appearance. Knob designed for easy operation.



Laser marking

All printing of the SB200 M MCBs, like the approvals on the product identification, are printed by a laser. Laser printing ensures a friction, scratch and solvent resistant marking on the MCBs. Easy identification of the products in case of maintenance or replacement, due to safe laser printing.



Housing cover with fire retardant material

High performance, 100% recyclable plastic material with fire retardant, high melting point, low water absorption & high dielectric strength properties. ABB is taking care of the environment... with the latest generation of thermoplastics, it is possible to recycle the MCBs – especially the thermoplastic housing material can be re-used. SB200 is 100% free of halogens.



IP20 protection

IP 20 - finger safe terminals. The System pro M compact® MCBs are equipped with 25 mm² cylinder lift twin terminals, a well-proven and reliable technology - designed for sophisticated industrial use. The cross wiring can easily be done by inserting the System pro M compact® busbars into the rear terminal part and then the incoming wires into the front part of the terminal.



Labelling area

Provision for providing label enables easy identification of circuit during installation, operation & maintenance.



Accessories mountable

Wide range of add-on accessories having 30 different types of accessories. Max possibility of Mounting: 4 different accessories on the right side and 1 on the left side ensures highest flexibility of functions. Universal contact, motorised unique accessory like mechanical tripping devices available only with ABB.

Miniature Circuit Breaker SB200 M

Technical data



General data	
Standards	IEC/IS 60898-1, IEC/IS 60947-2
Poles	B: 1P, 1P+N, 2P C: 1P, 2P, 3P, 4P, 1P+N, 3P+N D: 1P, 2P, 3P, 4P
Rated short-circuit capacity (Icn)	10 kA
Rated ultimate short-circuit breaking capacity Icu (acc.to IEC 60947-2)	15 kA
Tripping characteristics	B, C, D
Reference temperature for tripping characteristics	30°C
Energy limiting class (B-,C- Curve)	3
Rated voltage Ue	1P:240/415 V AC 1P + N:240 V AC 24P:415 V AC 3P + N:415 V AC
Rated current In	B: 6, 10, 16, 20, 25, 32, 40 A C&D: 0,5, 1, 1,6, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63 A
Rated frequency	50 Hz
Max. Power frequency recovery voltage (Umax)	1P: 264 V AC; 60V DC; 1P+N:264 V AC; 24P: 457 V AC; 2P: 120V DC; 3P+N: 457 V AC
Min. operating voltage	12 V AC
Rated insulation voltage Ui acc. to IEC/EN 60664-1	250 V AC (phase to ground) , 440 V AC (phase to phase)
Rated impulse withstand voltage Uimp. (1.2/50µs)	4 kV (test voltage 6.2kV at sea level, 5kV at 2.000m)
Dielectric test voltage	2 kV (50 / 60Hz, 1 min.)
Overvoltage category	III
Pollution degree	3
Electrical endurance	In < 32A: 20.000 ops.(AC), In ≥ 32A: 10.000 ops.(AC); 1.000 ops. (DC); 1 cycle (2s - ON, 13s - OFF, In ≤ 32A), 1 cycle (2s - ON, 28s - OFF, In >32A)
Mechanical data	
Housing	Insulation group II
Toggle	Insulation group II, black, sealable
Contact position indication	White Marking on toggle (I ON / O OFF)
Protection degree acc. to EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20.000 ops.
Shock resistance acc. to IEC/EN 60068-2-27	25 g - 2 shocks - 13 ms
Vibration resistance acc. to IEC/EN 60068-2-6	5g - 20 cycles at 51505 Hz with load 0.8In
	28 cycles with 55°C/90-96% and 25°C/95-100%
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	20 0,000 1111100 0,000 0010 0110 0,000 100 1
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30 Ambient temperature	-25 +55°C

Installation	
Terminal	Cage terminal
Cross-section of conductors (top / bottom) Solid, Stranded	25 mm²/ 25 mm²
Flexible	16 mm² / 16 mm²
Cross-section of busbars (top / bottom)	10 mm²
Tightening torque	2 Nm
Screwdriver	No. 2 Pozidrive
Mounting	On DIN rail 35 mm acc. to EN 60715 by fast clip
Mounting position	Any
Supply	Optional
Dimensions and weight	
Mounting dimensions acc. to DIN 43880	Mounting dimension 1
Pole dimensions (H x D x W)	85 x 69 x 17.5 mm
Pole weight	ca. 115 g
Combination with aux. elements	
Auxiliary contact	yes
Signal contact	yes
Shunt trip	yes
Undervoltage release	yes
Overvoltage release	yes
Rotary handle	yes
Mechanical tripping device	yes
Padlock enabled	yes
Motor operating device	yes
Approvals	
ISI approved	yes

Miniature Circuit Breaker SB200 DC

Right product for right application

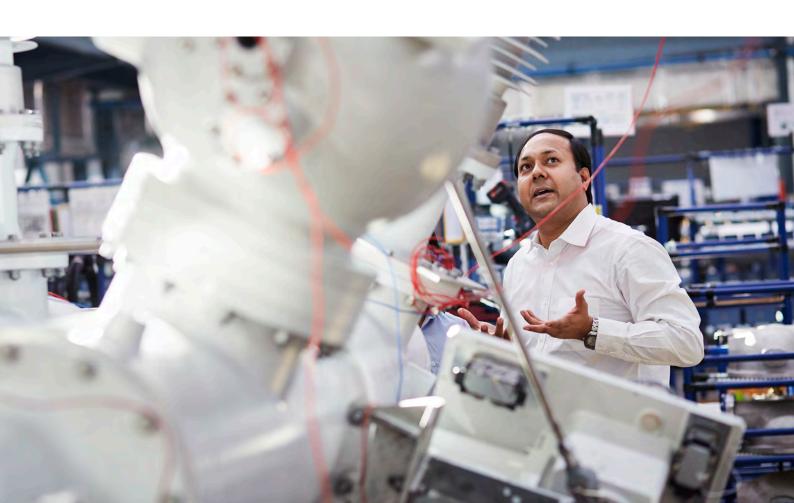
The range impresses with its performance, approvals and high in-built short-circuit breaking capacity for DC applications. Can be used in SP version at 250V DC and DP version upto 500V DC.



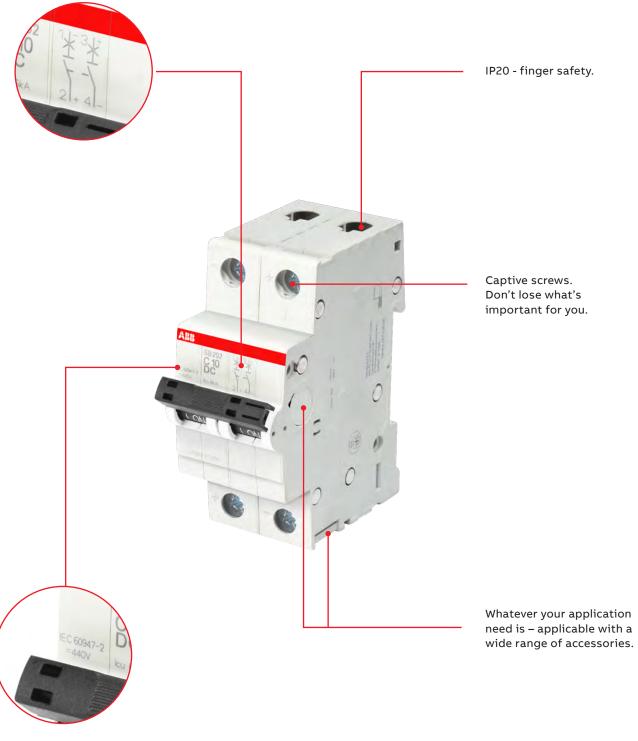








Polarity marking.



Approvals and standard.



State-of-the-art design (Aesthetics & ergonomics) Elegant in appearance and the knob is designed for easy operation.



Laser marking

All printing of the SB200 MCBs, like the approvals on the product identification are printed by a laser. The laser printing ensures a friction, scratch and solvent resistant marking on the MCBs. Easy identification of the products in case of maintenance or replacement, due to safe laser printing.



Housing cover with fire retardant material

High performance 100% recyclable plastic material with fire retardant, high melting point, low water absorption & high dielectric strength properties. ABB is taking care of the environment... with the latest generation of thermoplastics, it is possible to recycle the MCBs – especially the thermoplastic housing material can be re-used. SB200 is 100% free of halogens.





IP20 protection

IP 20 - finger safe terminals.
The System pro M compact® MCBs are equipped with 25 mm² cylinder lift twin terminals, a well-proven and reliable technology - designed for sophisticated industrial use.
The cross wiring can be easily done by inserting the System pro M compact® busbars into the rear terminal part and then the incoming wires into the front part of the terminal.



Labelling area

Provision for providing label enables easy identification and polarity marking of circuit during installation, operation & maintenance.



Accessories mountable

Wide range of add-on accessories having 30 different types of accessories. Max. possibility of mounting: 4 different accessories on the right side and 1 on the left side ensures highest flexibility of functions. Universal contact, motorised unique accessory like mechanical tripping devices available only with ABB.



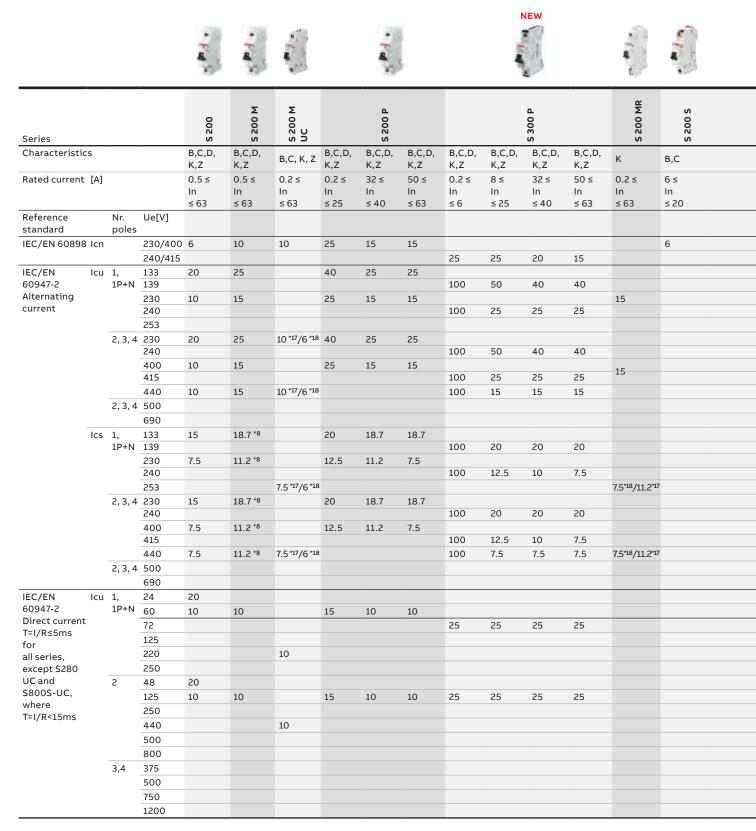
Miniature Circuit Breaker SB200 DC

Technical data



General data	
Standards	IS/IEC 60947-2
Poles	1P, 2P
Rated short-circuit capacity Icu	6 kA
Rated service short-circuit breaking capacity Ics	6 kA
Tripping characteristics	7-15 x ln
Reference temperature for tripping characteristics	55°C
Rated voltage Ue	1P: 250 V DC 2P: 500 V DC
Rated current In	1,6, 2, 3, 4, 6, 10, 16, 20, 25, 32, 40, 50, 63 A
Max. power frequency recovery voltage (Umax)	1,1 x Ue
Min. operating voltage	12 V DC
Rated impulse withstand voltage Uimp. (1.2/50µs)	4 kV (test voltage 6.2kV at sea level, 5kV at 2.000m)
Dielectric test voltage	2 kV (50 / 60Hz, 1 min.)
Pollution degree	3
Electrical endurance	1.000 ops.
Mechanical data	
Housing	Insulation group I
Toggle	black sealable in ON-OFF position
Contact position indication	White Marking on toggle (ION / OOFF)
Protection degree acc. to EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20.000 ops.
Shock resistance acc. to IEC/EN 60068-2-27	25 g - 2 shocks - 13 ms
Vibration resistance acc. to IEC/EN 60068-2-6	5g - 20 cycles at 51505 Hz with load 0.8In
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	28 cycles with 55°C/90-96% and 25°C/95-100%
Ambient temperature	-25 +55°C
Storage temperature	-40 +70°C
Installation	
Terminal	Cage terminal
Cross-section of conductors (top / bottom) Solid, Stranded	25 mm²/ 25 mm²
Flexible	16 mm² / 16 mm²
Cross-section of busbars (top / bottom)	10 mm²
Tightening torque	2 Nm
Screwdriver	No. 2 Pozidrive
Mounting	On DIN rail 35 mm acc. to EN 60715 by fast clip
Mounting position	Any
Supply	Note polarity of device

Dimensions and weight		
Mounting dimensions acc. to DIN 43880	Mounting dimension 1	
Pole dimensions (H x D x W)	85 x 69 x 17.5 mm	
Pole weight	ca. 115 g	
Combination with aux. elements		
Auxiliary contact	yes	
Signal contact	yes	
Shunt trip	yes	
Undervoltage release	yes	
Overvoltage release	yes	
Rotary handle	yes	
Mechanical tripping device	yes	
Padlock enabled	yes	
Motor operating device	yes	





 $^{^{*1}\,}$ only up to 40 A; 10 kA up to 50/63 A

^{*2} only for "D" characteristic

^{*3} values are not for all rated currents

^{*4 600} V DC for 100, 125 A

^{*5 1000} V DC for 100, 125 A

^{*6 3} poles

^{*7 4} poles

^{*8} max. values. Detailed values on page 2/12

^{*9} relevant product standard: E DIN VDE 0645 (based on IEC/EN 60898-1 and IEC/EN 60947-2)

^{*10} by 250 V DC 1-pole, 600 V 3- and 4-pole

^{*11} by 600 V DC 2-pole

^{*13 &}gt; 25 A

^{*12 ≤ 25} A

^{*14} char. B, C

^{*15} only 2 poles (connection in series) *16 UL 1077 only

^{*17 ≤ 40} A

^{*18 &}gt; 40 A

^{*19 ≤ 35} A

^{*20 10-80} A

				4	P								
		SU 200 M		SU 200 MR	S 200 UDC	S200CT	SN 201 L	S200CL	SN 201	S200C	SN 201 M	S200CM	S200 80-100A
C,Z	К	C,Z	K	К	K,Z	С	В,С	В,С	B,C,D	В,С	В,С	В,С	в,с
0.2 ≤ In ≤ 40	0.2 ≤ In ≤ 35	50 ≤ In ≤ 63	40 ≤ In ≤ 63	In	1 ≤ In ≤ 63	2 ≤ In ≤ 40	2 ≤ In ≤ 32	80 ≤ In ≤ 100					
						3	4.5	4.5	6	6	10	10	6
													20
15	15	15	15	15									6
													20
15	15	15	15	15									6
													10
11.25	11.25	7.5	7.5	7 5*10 (44 0*17									6
				7.5* ¹⁸ /11.2* ¹⁷									10
11.25	11.25	7.5	7.5	7540 (44 047									6
				7.5*18/11.2*17									
15	15	10	10										
15	15	10	10										

<u> </u>								F			NEW				
Series				S 200	S 200 M	S 200 M UC		S 200 P			S 300 P		S 200 MR	S 200 S	
Characteristic	S			B,C,D, K,Z	B,C,D, K,Z	B,C, K, Z	B,C,D, K,Z	B,C,D, K,Z	B,C,D, K,Z	B,C,D, K,Z	B,C,D, K,Z	B,C,D, K,Z	К	B,C	
Rated current	[A]			0.5 ≤ In ≤ 63	0.5 ≤ In ≤ 63	0.2 ≤ In ≤ 63	0.2 ≤ In ≤ 25	32 ≤ In ≤ 40	50 ≤ In ≤ 63	0.2 ≤ In ≤ 25	32 ≤ In ≤ 40	50 ≤ In ≤ 63	0.2 ≤ In ≤ 63	6 ≤ In ≤ 20	
IEC/EN	lcs	1,	24	20											
60947-2 Direct current		1P+N	60	10	10		15	10	10						
T=I/R≤5ms			72			_				12.5	10	7.5			
for			125 220			10									
all series, except S280			250			10									
UC and		2	48	20											
S800S-UC,			125	10	10		15	10	10	12.5	10	7.5			
where T=I/R<15ms			250												
1-1/ K-151115			440			10									
			500												
			800												
		3,4	375												
			500			_									
			750 1200												
UL 1077/	Int.	1	1200	10 *16			10	10	10	10	10	10			
C22.2		1P+N		10			10	10	10	10	10	10			
No 235	-		277	6 *16	6	6	10	10	10	10	10	10	10		
Alternating current		2, 3, 4		10 *16			10	10	10	10	10	10			
current			480 Y/277	6 *16	6	6	10	6	6	10	10	10			
UL 1077/	Int.		60	10 *16	10					10	10	10			
C22.2 No 235	cap.	1P+N	125												
Direct current			250			10									
		2, 3, 4			10					10	10	10			
			250			10									
UL 489/ C22.2	Int	1	500 240			10									
No 5	cap.		277												
Alternating	·	2, 3, 4													
current		_,_, .	480 Y/277												
UL 489/ C22.2	Int.	1	48												
No 5	cap.		60												
Direct current			125												
		2	96												
			125												
			250												

^{*1} only up to 40 A; 10 kA up to 50/63 A *2 only for "D" characteristic

^{*3} values are not for all rated currents

^{*4 600} V DC for 100, 125 A

^{*5 1000} V DC for 100, 125 A

^{*6 3} poles *7 4 poles

^{*8} max. values. Detailed values on page 2/12
*9 relevant product standard: E DIN VDE 0645 (based on IEC/EN 60898-1 and IEC/EN 60947-2)

^{*10} by 250 V DC 1-pole, 600 V 3- and 4-pole

^{*11} by 600 V DC 2-pole

^{*12 ≤ 25} A *13 > 25 A

^{*14} char. B, C

^{*15} only 2 poles (connection in series)

^{*16} UL 1077 only

^{*17 ≤ 40} A *18 > 40 A *19 ≤ 35 A *20 10-80 A

					7	-		A N				1	
		SU 200 M		SU 200 MR	S 200 UDC	S200CT	SN 201 L	S200CL	SN 201	S200C	SN 201 M	S200CM	S200 80-100A
C,Z	K	C,Z	K	К	K,Z	С	В,С	В,С	B,C,D	В,С	В,С	В,С	В,С
0.2 ≤ In ≤ 40	0.2 ≤ In ≤ 35	50 ≤ In ≤ 63	40 ≤ In ≤ 63	0.2 ≤ In ≤ 63	1 ≤ In ≤ 63	2 ≤ In ≤ 40	2 ≤ In ≤ 32	80 ≤ In ≤ 100					
15	15	10	10										
15	15	10	10										
10	10	10	10	10 10 *19									
		10	10	10									
10	10	10	10	10 *19									
					14 14 *17								
10	10	10	10		14 *15 14 *15 *17								









							-10			767	769
Series				S 750 DR			80088			S800N	S800C
Characteristic	cs			E selective, K selective	B,C,D	К	KM	UCB	UCK	B,C,D	B,C,D,K
Rated current	[A]			16 ≤ In ≤ 100	0.5 ≤ In ≤ 125	0.5 ≤ In ≤ 125	20 ≤ In ≤ 80	0.5 ≤ In ≤ 125	0.5 ≤ In ≤ 125	6 ≤ In ≤ 125	10 ≤ In ≤ 125
Breaking capacity	[kA]										
Reference standard		Nr. poles	Ue[V]								
IEC/EN 60898	3 Icn		230/400		25 *20					20 *20	15 *23
IEC/EN	lcu	1,	133								
60947-2 Alternating		1P+N		25							
current			240		50	50	50 *6			36	25
			253		20	20	20.16			20	15
			254		30 15 (up to 80 A)	30 15 (up to 80 A)	30 *6			20	15
			289		10 (100125 A)	10 (100125 A)				10	
			400		6 (up to 80 A) 4.5 (100125 A)	6 (up to 80 A) 4.5 (100125 A)	6 *6			4.5	
			580								
		2, 3, 4	230								
		L, J, +	400	25							
			415		50	50	50 *6			36	25
			440		30	30	30 *6			20	15
			500		15 (up to 80 A) 10 (100125 A)	15 (up to 80 A) 10 (100125 A)					
			580							10	
			690		6 (up to 80 A) 4.5 (100125 A)	6 (up to 80 A) 4.5 (100125 A)				4.5	
			1000		,	,					
	lcs	1,	133								
		1P+N	230	12.5							
			240		40	40				30	18
			253								
			254			22.5 (up to 80 A) 15 (100125 A)	22.5			15 (up to 80 A) 10 (100125 A	10
			289		11 (up to 80 A) 5 (100125 A)	11 (up to 80 A) 5 (100125 A)				8 (up to 80 A) 5 (100125 A	
			400		4 (up to 80 A) 3 (100 125 A)	4 (up to 80 A) 3 (100 125 A)	4			3	
			580			,					
		2, 3, 4	230								
			400	12.5	40	40					
			415				40 *6			30	18
			440		22.5 (up to 80 A) 15 (100 125 A)	22.5 (up to 80 A) 15 (100 125 A)					15
			500		11 (up to 80 A) 5 (100125 A)	,				8 (up to 80 A) 5 (100125 A)	
			690		4 *3	4 *3	4			3	
			1000								

^{*1} only up to 40 A; 10 kA up to 50/63 A *2 only for "D" characteristic *3 values are not for all rated currents

^{*5 1500} V DC for 4P

 ^{*6 3} poles
 *7 4 poles
 *8 max. values. Detailed values on page 2/12

^{*9} relevant product standard: E DIN VDE 0645 (based on IEC/EN 60898-1 and IEC/EN 60947-2)

^{*10} by 250 V DC 1-pole, 600 V 3- and 4-pole *11 by 600 V DC 2-pole

^{*12 ≤ 25} A













S800B	S800HV	S800U	S804U- UCZ	S804U- PVS	S800PV- SP
B, C, D, K	С, К	Z, K	UCZ	PVS	PV-SP
32 ≤ In ≤ 125	C: 10 ≤ In ≤ 32 K: 0.5 ≤ In ≤ 125	10 ≤ In ≤ 100	10-80	5	5 ≤ In ≤ 125
10 *23					
16		30			
	1.5 (0.5 5 A), 4 (6 63 A) 3 (80 125 A)				
16					
		50			
	1.5 (0.5 5 A) 4 (6 63 A) 3 (80 125 A)				
10					
		25			
	1.5 (0.5 5 A) 2.5 (6 63 A) 2 (80 125 A)				
 10					
		40			
	1.5 (0.5 5 A) 2.5 (6 63 A) 2 (80 125 A)				

^{*13 &}gt; 25 A *14 char. B, C *15 only 2 poles (connection in series) *16 UL 1077 only

^{*17 ≤ 40} A *18 > 40 A *19 ≤ 35 A *20 10-80 A

^{*21} for \$804U-UCZ only ^{*22} for \$804U-PVS only ^{*23} D125 only IEC/EN60947-2









Series			S 750 DR				\$8008 8		S800N	S800C
Characteristics			E selective, K selective	B,C,D	K	KM	UCB	UCK	B,C,D	B,C,D,K
Rated current [A]			16 ≤ In ≤ 100	0.5 ≤ In ≤ 125	0.5 ≤ In ≤ 125	20 ≤ In ≤ 80	0.5 ≤ In ≤ 125	0.5 ≤ In ≤ 125	6 ≤ In ≤ 125	10 ≤ In ≤ 125
Breaking [kA]]									
Reference standard	Nr. poles	Ue[V]								
IEC/EN Icu		24								
60947-2	1P+N	60								
Direct current T=I/R≤5ms for all series,		75								
		125		30	30				20	10
		220								
except \$280		250					50	50		
UC and	2	48								
S800S-UC, where		125								
T=I/R<15ms		150								
1 1/10 151115		250		30	30				20	10
		440								
		500					50	50		
		800								
	3,4	225								
		300								
		375		30 *6	30 *6	30 *6			20 *6	10 *6
		500		30 *7	30 *7				20 *7	10 *7
		750					50 *6 50 (63 125 A)	50 *6 *7 50 (63 125 A) *7		
		1000					50 (10 50 A)	⁷ 50 (10 50 A) [*]		
		1200								

 $^{^{\}ast1}\,$ only up to 40 A; 10 kA up to 50/63 A

¹² only for "D" characteristic
¹³ values are not for all rated currents
¹⁵ 1500 V DC for 4P

^{*6 3} poles *7 4 poles

^{*8} max. values. Detailed values on page 2/12

^{*9} relevant product standard: E DIN VDE 0645

⁽based on IEC/EN 60898-1 and IEC/EN 60947-2) *10 by 250 V DC 1-pole, 600

V 3- and 4-pole

^{*11} by 600 V DC 2-pole *12 ≤ 25 A

^{*13 &}gt; 25 A

¹⁴ char. B, C 15 only 2 poles (connection in series) 16 UL 1077 only

^{*17 ≤ 40} A

^{*18 &}gt; 40 A $^{*19} \le 35 \text{ A}$

^{*20 10-80} A

^{*21} for S804U-UCZ only *22 for S804U-PVS only













S800B	S800HV	s800U	\$804U- UCZ	S804U- PVS	S800PV- SP
B, C, D, K	С, К	Z, K	UCZ	PVS	PV-SP
32 ≤ In ≤ 125	C: 10 ≤ In ≤ 32 K: 0.5 ≤ In ≤ 125	10 ≤ In ≤ 100	10-80	5	5 ≤ In ≤ 125
10					
10					
					5
10 *6					5
10 *7					
					5 *5









Characteristics						4	9		4	4
Rated current A			S 750 DR			28008			N0088	S800C
Rated current A	eristics		E selective,	B, C, D	K	T.	UCB	UCK		B, C, D, K
No	rrent [A]				0.5 <	20 <	0.5 <	0.5 <	6 <	
1948 609 72	real pag		In	In	In	In	In	In	In	In
Direct current										
T=I/R≤5ms				20	20				20	10
Series S				30	30				20	10
Part							50	50		
UC and S800S-UC, where 250 30 30 30 50 50 50 50		48								
S800S-UC, where T=I/R<15ms 440 440 500 800 30 *** 50 *** 50 ** 50 ** 50 *** 50 *	280									
Where T=I/R<15ms 440 500 50 50 10°<	JC.			30	30				20	10
Second S							50	50		
Second S	ms						50	50		
Solid Soli	3.4			30 *6	30 *6	30 *6			20 *6	10 *6
1000 1000	3, .									
1200 1200		750								
UL 1077/ C22.2 Cap. 1P+N 240 30 30 (0.563 A)							50 (10 50 A) *7	50 (10 50 A) *7		
C22.2										
No 235 Alternating current 277 14 14 (0.563 A) (0.563 A) 347 6 (0.563 A) 6 (0.563 A) 2,3,4 240 480 14 (0.5 14 (0.5 14 (0.5 10 (51 A) A) A) 7/277 63 A) 277 63 A) 277 600Y/347 6 (0.563 A) (0.563 A) UL 1077/ Int. 1, 60 C22.2 cap. 1P+N 125 No 235 Direct current 250 2,3,4 125 250 (0.563 A) (0.563 A)				20	20					20 (< 100
Current 10 (51 A) (0.563 A) (0.563 A) (0.563 A) 10 (51 A)				(0.563 A)	(0.563 A)					•
Company Comp	ng			(0.563 A)	(0.563 A)					10 (< 100
480	23/			6 (0.563 A)	6 (0.563 A)					
Y/277 63 A) *27 63 A) *27 A)	2, 3, ¬			14 (0.5	14 (0.5					10 (≤100
UL 1077/		Y/277								
C22.2 cap. 1P+N 125 10 (≤1 No 235 A) Direct current 250 2, 3, 4 125 250 10 (2P			347							
No 235 Direct current 250 2, 3, 4 125 250 10 (2P										
2, 3, 4 125 250 10 (2P	•									10 (≤ 100 A)
250 10 (2P										
≤100	2, 3, 4									10 (2P, ≤ 100 A)
375 10 (3P		375								10 (3P, ≤ 100 A)
≤100										10 (4P, ≤ 100 A)
UL 489/ C22.2 Int. 1 240										
No 5 cap. 277 Alternating 2, 3, 4, 240										
Alternating 2, 3, 4 240 current 480	2, 3, 4									
Y/277										
UL 489/ C22.2 Int. 1 60	C22.2 Int. 1									
No 5 cap. 2 125 Direct current	ırrent									
4 600										
UL489B 4 1000 Direct current		1000								

^{*1} only up to 40 A; 10 kA up to 50/63 A

^{*2} only for "D" characteristic

^{*3} values are not for all rated currents *5 1500 V DC for 4P

^{*6 3} poles

^{*7 4} poles *8 max. values. Detailed values on page 2/12

^{*9} relevant product standard: E DIN VDE 0645 (based on IEC/EN 60898-1 and IEC/EN 60947-2)

^{*10} by 250 V DC 1-pole, 600 V

³⁻ and 4-pole

^{*11} by 600 V DC 2-pole

^{*12 ≤ 25} A













B, C, D, K C, K Z, K UCZ PVS PV-SP 32 c C-10 c ln s 32 ln s 125 K: 6 s ln s 129 In s 125 In s 12	S800B	уноовs	S800U	5804U- UCZ	5804U-	\$800PV-
32 s						
In 125 N. 6 sim s 125 sing 100 sing 125 sing 100 sing 125 sing 125 sing 100 sing 125	B, C, D, K	C, K		UCZ	PVS	PV-SP
15 (3P, 10 32 A) ⁻²⁰¹	32 ≤ In ≤ 125	C: 10 ≤ In ≤ 32 K: 6 ≤ In ≤ 125	In	10-80	5	In
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50			≤ 100			≤ 125
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) '48 15 (3P, 10 32 A) '48 30 50						
15 (3P, 10 32 A) ¹²⁸ 15 (3P, 10 32 A) ¹²⁸ 30 50						5
15 (3P, 10 32 A) ¹²⁸ 15 (3P, 10 32 A) ¹²⁸ 30 50						
15 (3P, 10 32 A) ¹²⁸ 15 (3P, 10 32 A) ¹²⁸ 30 50						
15 (3P, 10 32 A) ¹²⁸ 15 (3P, 10 32 A) ¹²⁸ 30 50						
30 50						5 *5
30 50						
30 50						
30 50						
30 50						
30 50						
30 50						
50		15 (3P, 10 32 A) *28				
50						
50						
50						
50						
50						
50						
			30			
			50			
3				10		
					3	

 $^{^{*13}}$ > 25 A *15 only 2 poles (connection in series) *16 UL 1077 only *17 \leq 40 A

^{*18 &}gt; 40 A *19 ≤ 35 A *20 10-80 A

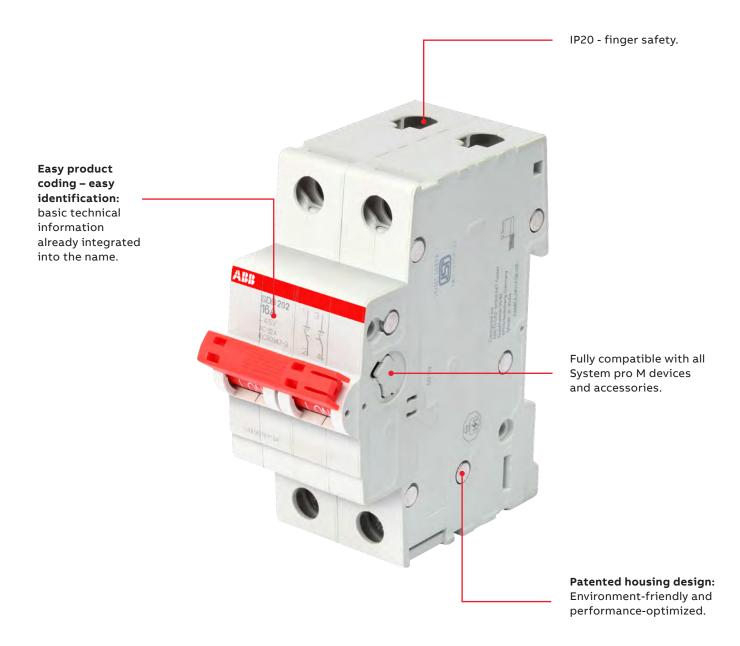
^{*23} by 75V DC 1-pole

^{*24} by 150V DC 2-pole *25 by 225V DC 3-pole *26 by 300V DC 4-pole *27 certification 50A ongoing

^{*28 3}P, 10 ... 32 A - only valid with XT2L 125 TMF 35-400

Switch Disconnector SDB200

The details make the difference





Patented Housing Design

By using state-of-the-art housing material, ABB is taking care of the environment. With the latest generation of halogen-free thermoplastics for SDB200, it is possible to recycle the switch disconnectors completely without environmental pollution. The material works for the stability.



Highest performance

With a rated voltage of 253/440 V AC, a rated conditional short-circuit current of 25 kA, terminals with protection from misconnection, a "Real CPI" switching position display, as well as full compatibility with all MCB accessories, the SDB200 is unique in its field of application. SDB200 complies with IEC/EN 60947-3.



IP20 protection

IP 20 - finger safe terminals.
The System pro M compact® MCBs are equipped with 25 mm² cylinder lift twin terminals, a well-proven and reliable technology - designed for sophisticated industrial use.
The cross wiring can be easily done by inserting the System pro M compact® busbars into the rear terminal part and then the incoming wires into the front part of the terminal.



Laser printing

All labels on the SDB200, as the approvals on the dome, technical details and the product identification, are printed by a laser. The laser printing ensures a friction, scratch and solvent resistant marking on the switch disconnectors for easy identification in case of maintenance or replacement. For control and acceptance procedure, it is important to see all markings also in the mounted position.



ISI and CE marking

In addition to the international standards and markings IEC, the product is certified as per latest Indian Standards (ISI)



Wide range of accessories

SDB200 is fully compatible to the complete range of System pro M compact accessories like:

- Auxiliary contacts, to be mounted on the left side, the right side or bottom fitting
- Shunt trips
- · Undervoltage release
- · Motor operating devices

Switch Disconnector SDB200

Technical data



General data	
Standards	IS/IEC 60947-3
Poles	2P, 3P, 4P
Rated current In	40, 63 A
Utilization category	AC-22A, DC-21B
Rated voltage Ue	24P:415 V AC
Insulation voltage Ui	250/440 V AC
Max. power frequency recovery voltage (Umax)	24P : 457 V AC; 2P: 120V DC
Min. operating voltage	12 V AC
Rated frequency	50 Hz, DC
Suitable for isolation	yes
Rated conditional short-circuit current	10 kA in series with NH 00 ≤ 63 A gG
Overvoltage category	III
Pollution degree	3
Rated impulse withstand voltage Uimp. (1.2/50µs)	4 kV (test voltage 6.2kV at sea level, 5kV at 2.000m)
Dielectric test voltage	2 kV (50 / 60Hz, 1 min.)
Overvoltage category	III
Pollution degree	3
Electrical endurance	le < 32 A: 20,000 ops. (AC), le ≥ 32 A: 10,000 ops. (AC), 1,000 ops (DC)
Mechanical data	
Housing	Insulation group II
Toggle	Insulation group II, red, sealable
Contact position indication	White marking on toggle (ION / OOFF)
Protection degree acc. to EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20.000 ops.
Shock resistance acc. to IEC/EN 60068-2-27	25 g - 2 shocks - 13 ms
Vibration resistance acc. to IEC/EN 60068-2-6	5g - 20 cycles at 51505 Hz with load 0.8In
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	28 cycles with 55°C/90-96% and 25°C/95-100%
Ambient temperature	-25 +55°C
Storage temperature	-40 +70°C

Installation	
Terminal	Cage terminal
Cross-section of conductors (top / bottom) Solid, Stranded	25 mm²/ 25 mm²
Flexible	16 mm² / 16 mm²
Cross-section of busbars (top / bottom)	10 mm²
Tightening torque	2 Nm
Screwdriver	No. 2 Pozidrive
Mounting	On DIN-Rail 35 mm acc. to EN 60715 by fast clip
Mounting position	Any
Supply	Any
Dimensions and weight	
Mounting dimensions acc. to DIN 43880	Mounting dimension 1
Pole dimensions (H x D x W)	85 x 69 x 17.5 mm
Pole weight	ca. 115 g
Combination with aux. elements	
Auxiliary contact	yes
Signal contact	yes
Shunt trip	yes
Undervoltage release	yes
Overvoltage release	yes
Rotary handle	yes
Mechanical tripping device	yes
Padlock enabled	yes
Motor operating device	yes
Approvals	
ISI approved	yes

Command and signaling

E 200 switches



Technical data E200 80...125 A

10011111001 0000 00011111071			
Electrical Data			
Standards	DIN EN 60947-3 (VDE0660-107); IEC/EN 60947-3		
Number of poles	1P, 2P, 3P, 4P		
Rated current I _e	80125 A		
Rated voltage U _e	240/415 V AC; 60 V DC		
Rated frequency f	50/60 Hz; DC		
Utilization category	I ₂ 80 125 A AC-22A (14-pole)		
	DC-21B (1/2-pole)		
	Acc. to DIN EN 60947-3 (VDE0660-107); IEC/EN 60947-3		
Protection fuse	NH 00 gG ≤ Rated current E200		
Positive opening	Acc. to DIN VDE 0113		
Rated conditional short-circuit current	80 100 A (1- to 4-pole): 25 kA, 125 A (1- to 4-pole): 6 kA		
Surge withstand capability U _{imp}	4 kV (EN 60947-1)		
Min. voltage U _{min.}	12 V AC/DC bei 0.1 VA		
Min. contact loading	24 V AC; 4 mA		
Mechanical Data			
Housing	Grey, RAL 7035		
Toggle	Red (RAL 3000) / grey (RAL 7000), sealable		
Contact position indication	On toggle (I ON / 0 OFF), on dome (I / 0)		
Protection degree acc. to IEC/EN 60529	IP10, IP40 in enclosure with cover		
Electrical endurance	80 100 A: 1,500 ops., 125 A: 1,000 ops.		
Mechanical endurance	20,000 ops.		
Environmental conditions acc. to IEC/EN	Constant climate 23/83, 40/93, 55/20 [°C/RH]		
60068-2-30	Alternating climate 25/95 - 40/93 [°C/RH]		
Ambient temperature	-25 +55 °C		
Storage temperature	-40 +70 °C		
Installation			
Terminal size	2.5 to 50 mm ²		
Cross-section busbar	≥ 16 mm²		
Tigthening torque	2.5 Nm		
Screw driver	Nr. 2 Pozidriv		
Mounting	On DIN rail 35 mm acc. to EN 60715 by fast clip		
Mounting position	Any		
Supply	Any		
Dimensions and weight			
Mounting dimensions acc. to DIN 43880	Mounting dimension 1		
Pole dimensions (H x D x W)	85 x 70 x 17.5 mm		
Pole weight	Ca. 95 g		
Accessories	-		
Auxiliary contact	Max. 3x S2C-H 6R		
Approvals	CE and RoHS conform		
	Approvals: VDE, CCC, KEMA, EAC		

Residual Current Circuit Breaker FB200

A range designed to ensure efficiency and protection.



Bi-directional cylindrical terminal ensures higher safety of connecting operations, making them easier.

Test push-button to verify the correct functioning of the device.

Information on the device is laser printed to make it clearly visible and long lasting.

Laser-marked order code on the front to make easier future orders.



ISI and CE marking

In addition to international standards and markings IEC, the product is certified as per latest Indian Standards (ISI).



High performance

- Rated breaking capacity and rated residual breaking capacity laser printed on the device: Im=IΔm= 1000 mA
- Co-ordination with a 63 A rated current with conditional shortcircuit capacity Inc=10000 A.



Accessories mountable

Wide a range of add-on accessories having 30 different types of accessories. Max. possibility of mounting: 4 different accessories on the right side and 1 on the left side ensures highest flexibility of functions. Universal contact, motorised unique accessory like mechanical tripping devices available only with ABB.



Termination

The availability of two terminals offers different connection solutions thanks to the possibility to connect two independent cables in the same device: the second terminal can be used for an auxiliary circuit or for the supply of devices with small section cables without connecting them together with the main circuit.



Auto reclosing

The FB200 can be coupled with the auto reclosing unit F2C-ARH in order to ensure continuity of service for the whole installation of your home, avoiding lack of supply.



Dual termination

Two terminals are available, the fore one for cables up to 25 mm², the back one for cables up to 10 mm² or for busbars.

RCCB FB200

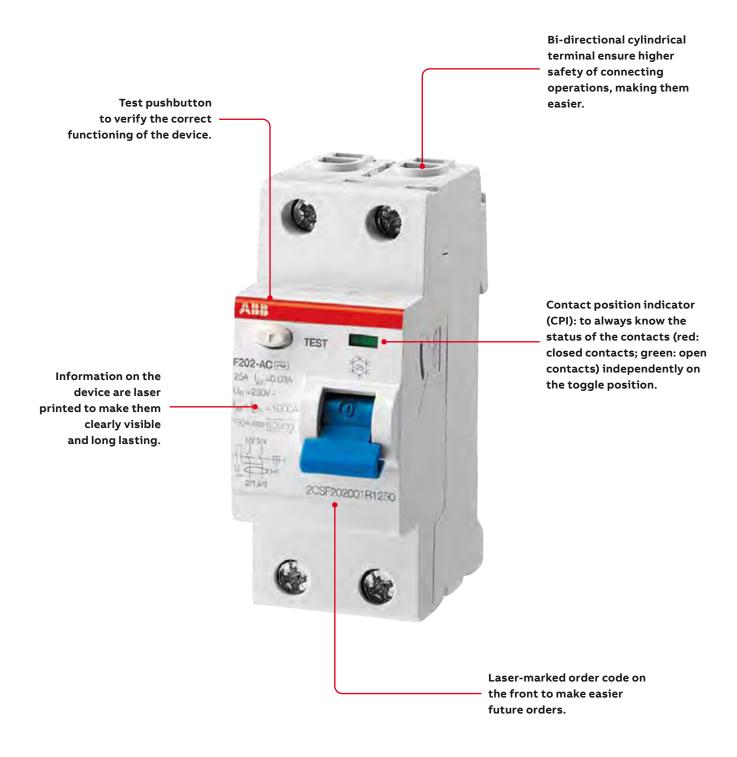
Technical data



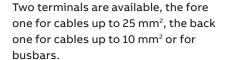
General data	
Standards	IEC 61008; IS 12640-1: 2008
Poles	2 P, 4 P
Rated current In	25 A, 40 A, 63 A
Rated residual operating current IΔn	30 mA, 100 mA, 300 mA
Type (wave form of the earth leakage sensed)	AC
Rated voltage Ue	240 / 415 V AC
Rated insulation voltage Ui acc. to IEC/EN 60664-1	500 V AC
Max. operating voltage of circuit test	254 V AC
Min. operating voltage of circuit test	110 V AC
Rated frequency	50 Hz
Rated conditional short-circuit current Inc=IΔc	10 kA (with a SCPD)
Rated residual breaking capacity IΔm=Im	1 kA
Rated impulse withstand voltage (1.2/50) Uimp	4 kV
Dielectric test voltage	2,5 kV
Surge current resistance (wave 8/20)	250 A
Electrical endurance	10.000 ops.
Mechanical Data	10.000 0p3.
Toggle	Black, sealable in ON-OFF position
Contact position indication	White Marking on toggle (I ON / O OFF)
Protection degree acc. to EN 60529	IP20, IP40 in enclosure with cover
Mechanical endurance	20.000 ops.
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	Humid heat: 28 cycles with 55°C/95100%; constant climate conditions: 23°C/83%
Auchitentation	- 40°C/93% - 55°C/20%; variable climate conditions: 25°C/95% - 40°C/95%
Ambient temperature	-5+40°C
Storage temperature	-40+70°C
Installation	Fille fold the street of the desired of the second of the street of the
Terminal	Failsafe bi-directional cylinder-lift terminal at top and bottom (shock protected)
Cross-section of conductors (top / bottom) Solid, Stranded	25 mm²/ 25 mm²
Cross-section of busbars (top / bottom)	10 mm² / 10 mm²
Tightening Torque	2,8 Nm
Screwdriver	No. 2 Pozidrive
Mounting	On DIN-Rail 35 mm acc. to EN 60715 by fast clip
Mounting position	Any
Supply	Optional
Dimensions and weight	
Pole dimensions (H x D x W)	2P: 85 x 69 x 35 mm; 4P: 85 x 69 x 70 mm
Pole weight	2P. 200 q: 4P: 350 q
Combination with aux. elements	
	yes
Signal contact	yes
Shunt trip	yes
Undervoltage release	yes
Overvoltage release	yes
Padlock enabled	yes
Auto reclosing unit	yes
Motor operating device	yes
Approvals	,
ISI approved	VAS
ioi approved	yes

RCCB F 200. The details make the difference

A range designed to ensure efficiency and protection









RCCBs F200 can be used in ambient conditions where the temperature of the surrounding atmosphere has values between -25 °C (snowflake laser printed on the front of the device) and +55 °C.



The availability of two terminals offers different connection solutions thanks to the possibility to connect two independent cables in the same device: the second terminal can be used for an auxiliary circuit or for the supply of devices with small section cables without connecting them together with the main circuit.



All the safety ensured by the international marks: approvals' marking in a visible area, even if RCDs is installed and with the panel-door closed.



High performances:

- rated breaking capacity and rated residual breaking capacity laser printed on the device: Im=I∆m= 1000 A
- coordination with a 100 A rated current SCPD (short-circuit protective device) = 10 000 A.



The F 202 can be coupled with the autoreclosing unit F2C-ARH in order to ensure continuity of service for the whole installation of your home avoiding lack of supply.

RCCBs

F200 technical features



Standards						
Electrical	Type (wave form of the earth leakage sens	sed)				
features	Number of poles					
	Rated current In		Α			
	Rated sensitivity I∆n		Α			
	Rated voltage Ue	IEC	V			
		UL/CSA	V			
	Insulation voltage Ui		V			
	Row Operating voltace of circuit test UL/	CSA				
	Operating voltage of circuit test Ut	IEC	V			
		UL/CSA	V			
	Rated frequency		Hz			
	Rated conditional short-circuit current Inc= $I\Delta$ (3)	SCPD - fuse gG 100 A	kA			
	Rated residual breaking capacity $I\Delta m=Im$		kA			
	Rated impulse withstand voltage (1.2/50)	Uimp	kV			
	Dielectric test voltage at ind. freq. for 1 m	in.	kV			
	Overvoltage category					
	Pollution degree					
	Surge current resistance (wave 8/20)		Α			
Mechanical	Housing					
features	Toggle					
	Contact position indicator (CPI)					
	Electrical life					
	Mechanical life					
	Protection degree	housing				
		terminals				
	Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30 °C/RH					
	Shock resistance acc. to IEC/EN 60068-2-					
	Vibration resistance acc. to IEC/EN 60068					
	Ambient temperature	IEC	°C			
	(with daily average ≤ +35 °C) Storage temperature		°C			
Installation	Terminal type					
mstanation	Terminal type Terminal size top/bottom for cable	IEC	mm²			
	Terrimar size top, bottom for casic	UL/CSA	AWG			
	Terminal size top/bottom for busbar	IEC	mm²			
		UL/CSA	AWG			
	Tightening torque	IEC	Nm			
		UL/CSA	in-lbs.			
	Stripping length of the cable	0_,00.1	1231			
	Tool					
	Mounting					
	Mounting position					
	Supply from					
	Withdrawal from busbar					
Dimensions	Dimensions (H x D x W)	2P	mm			
and weight	•	4P	mm			
-	Weight	2P	g			
	3 ·	4P	g			
Combination	Combinable with:	auxiliary contact	<u> </u>			
with		signal contact/auxiliary switch				
auxiliary elements		shunt trip				

- ① Ground-fault sensing and relaying equipmentcomponent (up to 63 A)
- $\ensuremath{\textcircled{2}}$ prior to connection of aluminium conductors (≥ 4 mm²) ensure that their contact points are cleaned, brushed and coated with grease
- ③ S750-E 63A, S750DR-E/K 63A and other SCPD coordination values see Chapter 3 of Solutions for electrical distribution in buildings technical details
- 4 F200 left neutral has not the UL certification and the UL mark
- ⑤ Only for versions with marking according to EN 61008-1; EN 61008-2-1

 ⑥ Neutral conductor can be wired
- anywhere for 2P devices

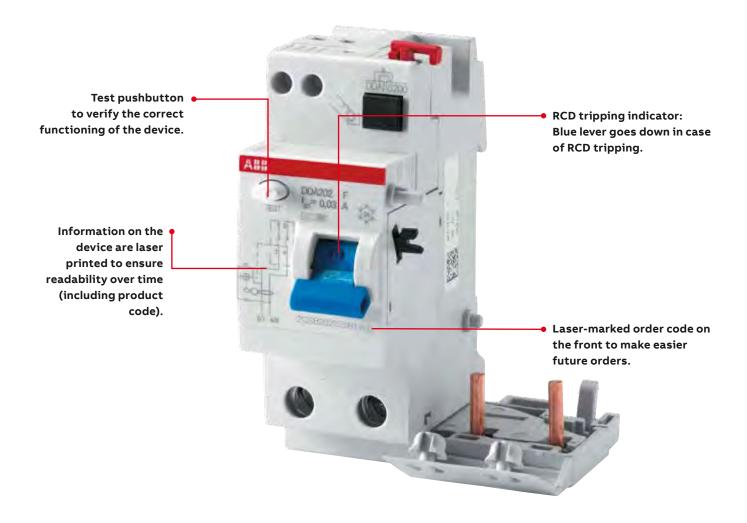
RCCBs

F200 technical features

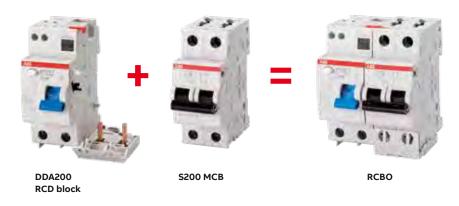
F200 AC	F200 A	F200 A AP-R	F200 A S	F200 A 110V	F200 A 400 Hz	F200 A 16 2/3 Hz	F200 F
IEC/EN 61008-1	; IEC/EN 61008-	2-1, UL 1053 ①		IEC 61008-1; IEC 61008-2-1; UL 1053	IEC/EN 61008-1; IEC/EN 61008-2-1	IEC/EN 61008-1; IEC/EN 61008-2-1	IEC/EN 61008, IEC EN 62423 2 nd ed
AC	Α	Α	Α	Α	Α	Α	F
2P 6, 4P (for 12	5 A only 4P)			2P, 4P	4P	2P, 4P	2P, 4P
16, 25, 40, 63, 80), 100, 125	25, 40, 63, 80, 100, 125	40, 63, 80, 100, 125	25, 40, 63, 80, 100	25, 40	63	25, 40, 63
0.01-0.03-0.1-0.		0.03	0.1-0.3-0.5-1	0.03	0.03	0.03-0.3-0.5	0.03
 230/400 - 240/4							
 480Y/277 (up to	100 A)			-	-		-
 500							
			_	110-277			
Left neutral: 19	6 (300 for 30 mA neutral: 100 (15	0 for 30 mA) - 25		110-254	170-254	110 (170 for 30 mA) - 254	170/259
In ≤ 100; Right n Left neutral: 19		' ;			-		-
50/60					50/400	16 2/3	50/60
10 (for 125 A fus	e is gG 125 A)				•	•	10
 1 (1.25 for 125 A)						1
4	,						_
2.5							
III, disconnector	abilities						-
2							
NA		3000	5000	NA	NA	NA	3000
RAL 7035		3000	3000				3000
RAL 5015							
yes							
10000 (2000 for	· 125 A)			10000	10000	10000	10000
20000 (5000 for				20000	20000	20000	20000
IP4X							
IP2X							
28 cycles with 5	5°C/90-96% and	d 25°C/95-100%					
25g - 2 shocks -		•					
0,1 mm o 1 g - 2		5 Hz					
-25+55 (-25+				-25+55	-25+55	-25+55	-25+55
	,						
-40+70							
failsafe bi-direc	tional cylinder-li	ft terminal at top	and bottom (sh	ock protected) (cage	for In > 63 A) ②		
25/25 (35/35 si	-				25/25	25/25	25/25
18-4 (up to 63 A)			-	-	-	-
10/10 (not for Ir					10/10	10/10	10/10
18-8 (up to 63 A)			-	-	-	-
2.8 (3 for In = 12	5 A)			2.8	2.8	2.8	2.8
25 (up to 63 A)				-	-	-	-
12 mm (for In=8	0-100 A 12,7 mm	n Top terminals a	nd 14,9 mm Botto	om terminals)			
12 111111 (101 111-0							
Nr. 2 Pozidriv							
Nr. 2 Pozidriv)715 (35 mm) by	means of fast cli	p device				
Nr. 2 Pozidriv	0715 (35 mm) by	means of fast cli	p device				
Nr. 2 Pozidriv on DIN rail EN 60		means of fast cli	p device				
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo	ttom		p device ne bottom (not fo	or 125 A)			-
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo	ttom			or 125 A)	-	-	- 85 x 69 x 35
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit	ttom hout using any t	tools only from tl		or 125 A)	- 85 x 69 x 70	- 85 x 69 x 70	
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit 85 x 69 x 35	ttom hout using any t	tools only from tl		or 125 A)	- 85 x 69 x 70	- 85 x 69 x 70	85 x 69 x 35
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit 85 x 69 x 35 85 x 69 x 70 (85 200	ttom thout using any t	tools only from tl	ne bottom (not fo	or 125 A)			85 x 69 x 35 85 x 69 x 70
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit 85 x 69 x 35 85 x 69 x 70 (85 200	ttom thout using any t x 69.5 x 72 for 12	tools only from tl	ne bottom (not fo	or 125 A)	-	-	85 x 69 x 35 85 x 69 x 70 225
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit 85 x 69 x 35 85 x 69 x 70 (85 200 360 (380 for In 5	ttom thout using any t x 69.5 x 72 for 12	tools only from tl	ne bottom (not fo	or 125 A)	360	360	85 x 69 x 35 85 x 69 x 70 225 375
Nr. 2 Pozidriv on DIN rail EN 60 Any from top and bo it is possible wit 85 x 69 x 35 85 x 69 x 70 (85 200 360 (380 for In = yes (no for 125 A	ttom thout using any t x 69.5 x 72 for 12 80 and 100 A ar	tools only from tl	ne bottom (not fo	or 125 A)	- 360 yes	- 360 yes	85 x 69 x 35 85 x 69 x 70 225 375 yes

DDA 200 The details make the difference

A range designed to ensure efficiency and protection



DDA200 RCD block mounted with S200 MCB.





Flexibility

DDA200 is suitable for mounting with S200 extensive range of MCBs, covering applications up to 63A with breaking capacity up to 25kA.



RCD block DDA200 can be used in ambient conditions where the temperature of the surrounding atmosphere has values between -25 °C (snowflake laser printed on the front of the device) and +55 °C.



Possibility to connect a remote test button for 63A versions.



No misuse

Mistakes in assembling the MCB on the DDA200 are avoided thanks to a mechanical key that avoids mounting an MCB with higher rated current than the RCD block.

RCD-blocks

DDA 200 technical features



DDA 200

		<u> </u>
Standards		
Type (wave form of the earth leakage sensed	d)	
Rated current I _n		[A]
Number of poles		
Rated voltage U _e	2P	[V]
	3P	
	4P	
Insulation voltage U _i		[V]
Pollution degree		
Operating voltage of circuit test U,	2P	[V]
	3P	
	4 D	
	4P	
Rated frequency		[Hz]
Rated breaking capacity according to	IEC EN 61009	[A]
Rated breaking capacity according to	IEC EN 60947-2	[A]
Rated residual breaking capacity I _{Am}		[kA]
Rated inpulse withstand capacity (1,2/50) U	J	[kV]
Dielectric test voltage at ind. freq. for 1 min.		[kV]
Surge current resistance (wave 8/20)		[A]
Rated sensitivity I		[A]
Housing		
Toggle		
Electrical life		
Mechanical life		
Protection degree	housing	
	terminals	
Environmental conditions (damp heat) acc. t	to IEC/EN 60068-2-30	[°C/RH]
Shock resistance acc. to IEC/EN 60068-2-27		
Vibration resistance acc. to IEC/EN 60068-2	2-6	
Ambient temperature (with daily average ≤ +	+35 °C)	[°C]
Storage temperature		[°C]
Terminal type	2P	

- ① All RCD-blocks DDA 200 with rated current 63 A are provided with two additional terminals for remote tripping
- 2) DDA200 A AE is provided with two additional terminals for remote release in positive safety.

 A remote control circuit should be

A remote control circuit should be connected to those terminals where circuit breakers or push buttons with normally closed contacts should be inserted.

	3P/4P I _n =63 A	
Terminal size	2P	[mm²]
	3P/4P I _n =25 and 40 A	[mm²]
	3P/4P I _n =63 A	[mm²]
Tightening torque	2P	[Nm]
	3P/4P I _n =25 and 40 A	[Nm]
	3P/4P I _n =63 A	[Nm]
Stripping length of the cable		
Mounting		
Mounting position		
Dimensions	2P	[mm]
HxPxL	3P/4P I _n =25 and 40 A	[mm]
	3P/4P I _n =63 A	[mm]
Weight	2P	[g]
	3P/4P I _n =25 and 40 A	[g]
	3P/4P I _n =63 A	[g]
Combinable with	S 200 L	
	S 200	
	S 200 M	
	S 200 P	

3P/4P I_n=25 and 40 A

RCD-blocks

DDA 200 technical features

150 (5N 61000)	DDA 200 A	DDA 200 A AP-R	DDA 200 A AE	DDA 200 A S	DDA 200 F	DDA 200 B
IEC/EN 61009-:	1 Ann. G; IEC/EN	61009-2-1			IEC/EN 61009 App.G, IEC/EN 62423 2 nd ed	IEC/EN 61009-1 Ann. G; IEC/EN 61009-2-1, IEC EN 62423
AC	Α	A	A	A	F	В
25, 40, 63 ①		25, 40, 63 ①	63 ②	63 ①	40, 63 A1 (to mount with MCB with In = 0,563A)	25-40-63
2P, 3P, 4P					2P	2P, 3P, 4P
230 (400 for sp	ecial execution (@400 V)	230	230	230	230
230/400			400	400	-	400
230/400			230/400	230/400	-	230/400
500						
2						
110-254 for spe	ecial execution @ 54 for 30 mA; 40 0 V)		184-264	195-254 (170-254 for 30 mA)	254/170	195-254 (170-254 for 30 mA)
	140 for 30 mA; 1:	10-254 for special	310-440	195-440 (300-440 for 30	-	310-440 (300-440 for 30 mA)
				mA)		
•		10-254 for special	184-264	195-440 (300-	-	195-254
execution @110) V)			440 for 30 mA)		(300-440 for 30 mA)
50/60						
same of the cou						
same of the cou	·					
same of the cou	ıpled MCB					
4						
2,5						
NA		3000	NA	5000	3000	3000 (5000 for selective types)
0.01-0.03-0.1-0	.3-0.5-1	0.03	0.03-0.3-0.5-1	0.1-0.3-0.5-1	-	0.03 - 0.3 - 0.5
RAL 7035						
RAL 7035						
10000						
20000						
IP4X						
IP2X						
	55°C /90-96% an	d 25°C/95-100%				
25g - 2 shocks -		14 L3 C/ 33 100 70				
	20 cycles at 51	150 5 Hz				
-25+55	20 Cycles at 51	1505 HZ				
-40+70						
-4UT/U					Top: failsafe bi-directional cylinder-lift terminal (shock protected)	bi-directional cylinder-lift
bi-directional c	ylinder-lift				Bottom: failsafe cylinder-lift terminal (shock protected)	
	ylinder-lift				Bottom: failsafe cylinder-lift	-
bi-directional c					Bottom: failsafe cylinder-lift terminal (shock protected)	- bi-directional
bi-directional c cage type bi-directional c	ylinder-lift				Bottom: failsafe cylinder-lift terminal (shock protected) -	
cage type bi-directional c	ylinder-lift e) up to 25				Bottom: failsafe cylinder-lift terminal (shock protected) -	bi-directional
cage type bi-directional c (rigid or flexible (rigid or flexible	ylinder-lift e) up to 25 e) up to 16				Bottom: failsafe cylinder-lift terminal (shock protected) - -	bi-directional cylinder-lift -
cage type bi-directional c (rigid or flexible (rigid or flexible	ylinder-lift e) up to 25 e) up to 16				Bottom: failsafe cylinder-lift terminal (shock protected) - -	bi-directional cylinder-lift -
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible	ylinder-lift e) up to 25 e) up to 16				Bottom: failsafe cylinder-lift terminal (shock protected) - -	bi-directional cylinder-lift - (rigid or flexible) up to
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8	ylinder-lift e) up to 25 e) up to 16				Bottom: failsafe cylinder-lift terminal (shock protected) - - -	bi-directional cylinder-lift - (rigid or flexible) up to
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8	ylinder-lift e) up to 25 e) up to 16 e) up to 25			h for Inc. (2.4)	Bottom: failsafe cylinder-lift terminal (shock protected) - -	bi-directional cylinder-lift - (rigid or flexible) up to
cage type bi-directional c (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 m	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit	tional terminals for re		ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected) - - -	bi-directional cylinder-lift - (rigid or flexible) up to
cage type bi-directional c (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit	tional terminals for re y means of fast clip d		ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected) - - -	bi-directional cylinder-lift - (rigid or flexible) up to
cage type bi-directional c (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 35	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70
cage type bi-directional of (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 35 85 x 69 x 70	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 35 85 x 69 x 70 175	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70 350
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 70 175	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 35 85 x 69 x 70 175	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70 350
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 70 175	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70 350 375
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 70 175 175 325	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70 350 375 395
cage type bi-directional c (rigid or flexible (rigid or flexible (rigid or flexible 2.8 1.2 2.8 12,5 mm (10,2 r on DIN rail EN 6 Any 85 x 69 x 35 85 x 69 x 70 175 175 325 yes	ylinder-lift e) up to 25 e) up to 16 e) up to 25 mm for the addit			ly for In=63A)	Bottom: failsafe cylinder-lift terminal (shock protected)	bi-directional cylinder-lift - (rigid or flexible) up to 2 - 2.8 85 x 69 x 70 85 x 69 x 70 85 x 69 x 70 350 375 395 yes

RCD-blocks

DDA 800 technical features



DDA 800

	Standards		
Electrical	Type (wave form of the earth leakage sensed)		
features	Poles		
	Rated current In		A
	Rated sensitivity I∆n		A
	Rated voltage Ue		٧
	Insulation voltage Ui		٧
	Operating voltage of circuit test Ut		٧
	Rated frequency		Hz
	Rated breaking capacity (Icn) acc. to IEC /EN 60)947-2	A
	Rated residual breaking capacity I∆m	with S 800 C	kA
		with S 800 N kA with S 800 S kA	
		with S 800 S	kA
	Rated impulse withstand voltage (1.2/50) Uimp)	kV
	Dielectric test voltage at ind. freq. for 1 min.		kV
	Surge current resistance (wave 8/20)		A
Mechanical	Toggle		
features	Electrical life		
	Mechanical life		
	Protection degree	housing	
		terminals	
	Environmental conditions (damp heat) acc. to I	EC/EN 60068-2-30	°C/RH
	Ambient temperature (with daily average ≤ +35	°C)	°C
	Storage temperature		°C
	Terminal size for cables	flexible	mm²
		rigid	mm²
	Tightening torque		Nm
	Mounting		
Dimensions	Dimensions (H x D x W)	2P	mm
and weight		3P	mm
		4P	mm
	Weight	2P	g
		3P	g
		4P	g
	Combinable with:	S 800 N	
with MCBs		S 800 S	

^{*} only on 3P and 4P versions.

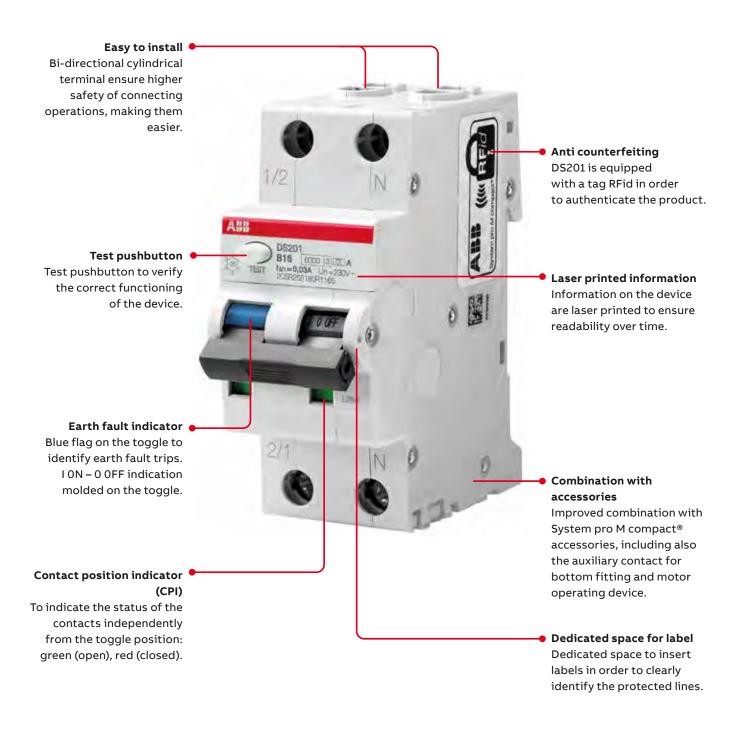
RCD-blocks

DDA 800 technical features

DDA 800 AC	DDA 800 A		DDA 800 A AP-R	DDA 800 A S	
IEC/EN 60947-2 Ann. B					
AC	А		A	Α	
2P, 3P, 4P					
63	63	100	63-100	63	100
0.03-0.3	0.03-0.3-0.5	0.3-0.5	0.03	0.3-1	0.3-0.5*-1
230/400 - 240/415 - 400/690					
690					
195-690					
5060					
according to the breaking capacity of	f the associated MC	В			
according to the Icu of the associated	d MCB				
according to the Icu of the associated	d MCB				
according to the Icu of the associated	d MCB				
6					
2.5					
NA			3000	5000	
blue operating just from OFF positio	n				
10000					
20000					
IP4X					
IP2X					
28 cycles with 55°C/90-96% and 25°C	C/95-100%				
-25+60					
-40+70					
650					
670					
min. 3 / max. 4					
on DIN rail EN 60715 (35 mm) by mean	ns of rapid fixing de	evice			
108.2 x 82.3 x 81					
108.2 x 82.3 x 117					
108.2 x 82.3 x 117					
300 for 63 A - 415 for 100 A					
400 for 63 A - 640 for 100 A					
460 for 63 A - 765 for 100 A					
yes					
yes					

RCBO DS201

Compact solutions for a complete protection





Easy installation

The terminals available on DS201 make easier the supply operation in parallel with cables and busbars as they are composed by two different seats: a front seat for 25 mm² cables and a back seat for 10 mm² busbars. Supply is possible either from top or bottom side.



Mounting clip

Stable fixing on DIN rail, easy and fast mounting and dismounting operations thanks to the standard mounting clip.



Display the operational status

Easy troubleshooting and reduced downtime for maintenance operations thanks to both the blue indicator, that signals the differential tripping to immediately identify any earth fault (it cannot be activated in case of manual operation on the toggle) and the contact position indicator (CPI) that helps to always know the status of the contacts (red: closed contacts; green: open contacts).



Reliable in extreme conditions

RCBO DS201 can be used in ambient conditions where the temperature of the surrounding atmosphere has values between -25 °C (snowflake laser printed on the front of the device) and +55°C.



Additional laser printing

Additional information are laser printed on the lateral side of the device, including also the wiring diagram and the EAN code respectively for an easier installation and for an easier stock management.



RFid

Product Made in Italy, with RFid tag on the product side containing a unique serial number assigned to ABB according to the standard ISO/ IEC FCD 15693-3 in order to authenticate the product.





Standards						
					DS201L	DS201
Number of poles		Standards			IEC/EN 61009-1; IEC/EN 61009-2-1	IEC/EN 61009-1; IEC/EN 61009-2-1
Rated current A		Type (wave form of the earth leak	kage sensed)		A - AC - APR	A - AC - APR
Rated sensitivity An	features	Number of poles			1P + N	1P + N
Rated voltage U V 230-240 230-240 230-240 101		Rated current In		Α	6 ≤ In ≤ 32	1 ≤ In ≤ 40
Insulation voltage Ui		Rated sensitivity I∆n		Α	0.01 - 0.03 - 0.3	0.01 - 0.03 - 0.1 - 0.3
Pollution degree		Rated voltage Ue		٧	230-240	230-240
Pollution degree		Insulation voltage Ui		V	500 V AC	500 V AC
Operating voltage of circuit test V		Overvoltage category			III	III
Uit Rated frequency		Pollution degree			2	2
Rated breaking capacity act. to IEC/FM 61009-1 Rated breaking capacity act. to IEC/FM 60347-2 (only act. to IEC/FM 60348-2 (only				V	110 (170 for 30mA) - 264	110 (170 for 30mA) - 264
Acct. to IEC/EN 61009-1 Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60047-2 (only referring to short circuit test) Acct. to IEC/EN 60049-1 Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring to short circuit test) Acct. to IEC/EN 60048-2 (only referring test) Acct. to IEC/EN 60048-2 (only		Rated frequency		Hz	50/60	50/60
Acc. to IEC/EN 60947-2 (only referring to short circuit test) Service Ics KA 4.5 7.5			Icn	А	4500	6000
Referring to short circuit test)			ultimate Icu	kA	6	10
Idam according to EN 61009-1 Rated residual breaking capacity Idam A 4500 6000 up to 25 A; 4500 for 32A and Idam according to EC 61009-1 I			service Ics	kA	4.5	7.5
Amaccording to IEC 61009-1			IΔm	A	4500	6000
Dielectric test voltage at ind. freq. for 1 min. kV 2 kV (50 / 60Hz, 1 min.) 3 3 3 3 3 3 3 3 3			IΔm	Α	4500	
Thermomagnetic release - Characteristic		Rated impulse withstand voltage	e (1.2/50) Uimp	kV	4 kV	4 kV
C S I S I S I S I S I S I S I I		Dielectric test voltage at ind. free	q. for 1 min.	kV	2 kV (50 / 60Hz, 1 min.)	2 kV (50 / 60Hz, 1 min.)
Energy limiting class acc. to English Engli			B: 3 In ≤ In ≤ 5 In			
In In In In In In In In		characteristic			•	•
EN 61009-1 Surge current resistance (wave 8/20)						
Mechanical features					3	3
Features Toggle Insulation group II, Black RAL 9005, sealable in ON-OFF positions Insulation group II, Black RAL 9005, sealable in ON-OFF positions				A		
Sealable in ON-OFF positions sealable in ON-OFF positions Contact position indication Earth fault trip indication Earth fault trip indication Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operations Double flag on toggle Electrical life Operations Electrical life Operation		Housing			Insulation group I - II, RAL 7035	Insulation group I - II, RAL 7035
Earth fault trip indication Electrical life Operations Operati	features	Toggle				
Electrical life operations 10000 10000 20000 Protection degree acc. to EN housing terminals IP2X IP2X IP2X Shock resistance acc. to IEC/EN 60068-2-27		Contact position indication			Green/Red Window	Green/Red Window
Mechanical lifeoperations2000020000Protection degree acc. to EN 60529housing terminalsIP4XIP4XShock resistance acc. to IEC/EN 60068-2-27IP2XIP2XVibration resistance acc. to IEC/EN 60068-2-60.1 mm or 1g - 20 cycles at 51505 Hz0.1 mm or 1g - 20 cycles at 51505 HzEnvironmental conditions (damp heat) acc. to IEC/EN 60068-2-30°C/RH28 cycles with 55°C/90-96% and 25°C/95-100%28 cycles with 55°C/95-100%Reference temperature for setting of thermal element°C3030 (20 for K tripping char)Ambient temperature (with daily average ≤ +35 °C)°C-25+55-25+55		Earth fault trip indication			Blue flag on toggle	Blue flag on toggle
Protection degree acc. to EN 60529 $1P4X$ $1P4X$ $1P4X$ $1P2X$		Electrical life		operations	10000	10000
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Mechanical life		operations	20000	20000
Shock resistance acc. to IEC/EN $25g - 2 \text{ shocks} - 13\text{ms}$			housing		IP4X	IP4X
Vibration resistance acc. to IEC/EN 60068-2-6 Vibration resistance acc. to IEC/EN 60068-2-6 $0.1 \text{mm or } 1 \text{g} - 20 \text{cycles at}$ 51505Hz Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30 Reference temperature for setting of thermal element Ambient temperature (with daily average $\leq +35^{\circ}$ C) **C/RH** 28 cycles with 55°C/90-96% and 25°C/95-100% 28 cycles with 55°C/90-96% and 25°C/95-100% 30 (20 for K tripping char) -25+55		60529	terminals		IP2X	IP2X
51505 Hz 51505 Hz 51505 Hz 51505 Hz Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30 Reference temperature for setting of thermal element Ambient temperature (with daily average ≤ +35 °C) °C 51505 Hz 28 cycles with 55°C/90-96% and 25°C/95-100% 28 cycles with 55°C/90-96% and 25°C/95-100% 30 (20 for K tripping char) -25+55		•			25g - 2 shocks - 13ms	25g - 2 shocks - 13ms
acc. to IEC/EN 60068-2-30 25°C/95-100% 25°C/95-100% Reference temperature for setting of thermal element Ambient temperature (with daily average ≤ +35 °C) °C -25+55 -25+55		Vibration resistance acc. to IEC/	EN 60068-2-6			
element Ambient temperature (with daily average ≤ +35 °C) °C -25+55 -25+55			heat)	°C/RH		
		·	ng of thermal	°C	30	30 (20 for K tripping char)
Storage temperature °C -40+70 -40+70		Ambient temperature (with daily	average ≤ +35 °C)	°C	-25+55	-25+55
		Storage temperature		°C	-40+70	-40+70







 DS201 M	DS201 M 110V	DS201 T
 IEC/EN 61009-1; IEC/EN 61009-2-1	IEC 61009-1; IEC 61009-2-1	IEC/EN 61009-1; IEC/EN 61009-2-1
A - AC - APR - F	A	A - APR
1P + N	1P + N	1P + N
4 ≤ In ≤ 40	6 ≤ In ≤ 40	6 ≤ In ≤ 40
0.01 - 0.03 - 0.1 - 0.3	0.03	0.03
230-240	230-240	230-240
500 V AC	500 V AC	500 V AC
III	III	III
2	2	2
110 (170 for 30mA) - 264	110 - 264	170 - 264
50/60	50/60	50/60
10000	10000	6000
15	15	10
11.2	11.2	7.5
6000	6000	6000
0000	0000	0000
6000 up to 25 A; 4500 for 32A and 40A	6000 up to 25 A; 4500 for 32A and 40A	6000 up to 25 A; 4500 for 32A and 40A
4 kV	4 kV	4 kV
2 kV (50 / 60Hz, 1 min.)	2 kV (50 / 60Hz, 1 min.)	2 kV (50 / 60Hz, 1 min.)
•		
•		•
•		
3	NA	3
NA for A, AC versions; 3000 for APR and F version	NA	NA for A; 3000 for APR version
Insulation group I - II, RAL 7035	Insulation group I - II, RAL 7035	Insulation group I - II, RAL 7035
Insulation group II, Black RAL 9005, sealable in ON-OFF positions	Insulation group II, Black RAL 9005, sealable in ON-OFF positions	Insulation group II, Black RAL 9005, sealable in ON-OFF positions
Green/Red Window	Green/Red Window	Green/Red Window
Blue flag on toggle	Blue flag on toggle	Blue flag on toggle
10000	10000	10000
20000	20000	20000
IP4X	IP4X	IP4X
IP2X	IP2X	IP2X
25g - 2 shocks - 13ms	25g - 2 shocks - 13ms	25g - 2 shocks - 13ms
0.1 mm or 1 g - 20 cycles at 51505 Hz	0.1 mm or 1 g - 20 cycles at 51505 Hz	0.1 mm or 1 g - 20 cycles at 51505 Hz
28 cycles with 55°C/90-96% and 25°C/95-100%	28 cycles with 55°C/90-96% and 25°C/95-100%	28 cycles with 55°C/90-96% and 25°C/95-100%
30 (20 for K tripping char)	30	30
-25+55	-25+55	-25+55





					DS201L	DS201
Installation	Terminal type		top / bottom		failsafe bi-directional cylinder-lift terminal (shock protected)	failsafe bi-directional cylinder-lift terminal (shock protected)
	Terminal size for cab	oles	top / bottom	mm²	25/25	25/25
	Terminal size for bus	sbars	top / bottom	mm²	10/10	10/10
	Tightening torque		top / bottom	Nm	2.8	2.8
	Stripping length of t	he cable		mm	12	12
	Mounting				on DIN rail EN 60715 (35mm) by means of mounting clip	on DIN rail EN 60715 (35mm) by means of mounting clip
	Mounting position				Any	Any
	Supply from				Top/Bottom terminals	Top/Bottom terminals
Dimensions	Dimensions (H x D x	W)		mm	85 x 69 x 35	85 x 69 x 35
and weight	Weight			g	200	200
	Combinable with	Auxiliary co	ntact		yes	yes
with auxiliary elements	accessories and auxiliaries	Signal contact	act / auxiliary		yes	yes
elelilelits		Shunt trip			yes	yes
		Auxiliary co fitting	ntact for bottor	n	yes	yes
		Undervoltag	ge release		yes	yes
		Overvoltage	release		yes	yes
		Motor opera	ating device		yes	yes





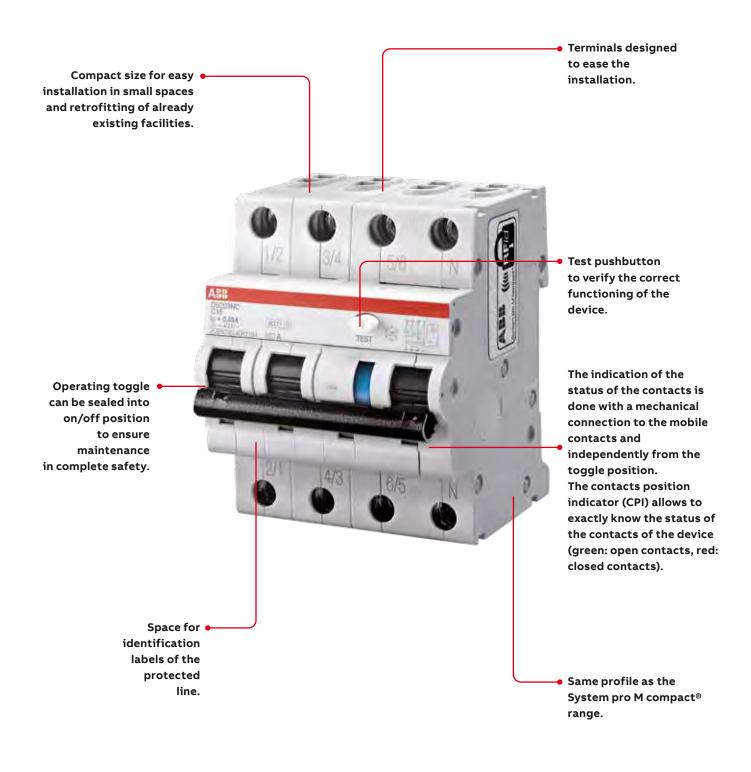


DS201 M	DS201 M 110V	DS201T
failsafe bi-directional cylinder-lift terminal (shock protected)	failsafe bi-directional cylinder-lift terminal (shock protected)	failsafe bi-directional cylinder-lift terminal (shock protected)
25/25	25/25	25/25
10/10	10/10	10.X
2.8	2.8	02.VIII
12	12	12
on DIN rail EN 60715 (35mm) by means of mounting clip	on DIN rail EN 60715 (35mm) by means of mounting clip	on DIN rail EN 60715 (35mm) by means of mounting clip
Any	Any	Any
Top/Bottom terminals	Top/Bottom terminals	Top/Bottom terminals
85 x 69 x 35	85 x 69 x 35	85 x 69 x 35
200	200	200
yes	yes	yes

				DS202C	DS202C M	DS202C M	DS202C M 110V	
	Standards			IEC/EN 61009-	1; IEC/EN 61009-	-2-1	IEC 61009-1; IEC 61009-2-1	
Electrical	Type (wave form of the earth leak	age sensed)		Α	A	APR	Α	
eatures	Poles			2P	2P	2P	2P	
	Rated current In			6 ≤ In ≤ 32	6 ≤ In ≤ 32	6 ≤ In ≤ 32	6 ≤ In ≤ 32	
	Rated sensitivity I∆n			0.03-0.3	0.01-0.03-0.3	0.03-0.3	0.03	
	Rated voltage Ue		V	230-240	230-240	230-240	230-240	
	Insulation voltage Ui		V	500	500	500	500	
	Operating voltage of circuit test	Ut	V	110 (170 for 30 mA) - 254	110 (170 for 30 mA) - 254	110 (170 for 30 mA) - 254	110-254	
	Rated frequency		Hz	5060	5060	5060	5060	
	Rated breaking capacity acc. to IEC/EN 61009	ultimate Icn	А	6000	10000	10000	10000	
	Rated breaking capacity acc. to IEC/EN 60947-2	ultimate Icu	kA	10	10	10	10	
	2P @230 VAC	service Ics	kA	6	7.5	7.5	7.5	
	Rated residual breaking capacity	lΔm	kA	6	6	6	6	
	Rated impulse withstand voltage	(1.2/50) Uimp	kV	4	4	4	4	
	Dielectric test voltage at ind. free	q. for 1 min.	kV	2.5	2.5	2.5	2.5	
	Thermomagnetic release	B: 3 ln ≤ lm ≤ 5 ln						
	characteristic	C: 5 ln ≤ lm ≤ 10 ln						
	Surge current resistance (wave 8	/20)	Α	NA for A, AC ve	rsions; 3000 for	APR version		
	Toggle	,		black sealable in ON-OFF position				
eatures	Flag indicators		o indicator (blue)					
	riag maleators				on indicator (gree			
	Electrical life			10000	10000	10000	10000	
	Mechanical life			20000	20000	20000	20000	
	Protection degree	housing		IP4X	IP4X	IP4X	IP4X	
	occour. acg. cc	terminals		IP2X	IP2X	IP2X	IP2X	
				1 28 cycles with 55°C/90-96% and 25°C/95-100%				
	Reference temperature for setting	g of thermal element	°C	30	30	30	30	
	Ambient temperature (with daily	average ≤ +35 °C)	°C	-25+55	-25+55	-25+55	-25+55	
	Storage temperature		°C	-40+70	-40+70	-40+70	-40+70	
nstallation	Terminal type	top		failsafe bi-dire (shock protect	ctional cylinder-l ed)	ift terminal at to	p and bottom	
		bottom		failsafe bi-directional cylinder-lift terminal at top and botto (shock protected)			p and bottom	
	Terminal size top/bottom for cab	oles	mm²	25/25	25/25	25/25	25/25	
	Terminal size top/bottom for bus		mm²	10/10	10/10	10/10	10/10	
	Tightening torque top/bottom		Nm	2.8	2.8	2.8	2.8	
	Mounting			on DIN rail EN	50715 (35 mm) by	means of fast cl	ip device	
	Mounting position			Any	Any	Any	Any	
	Connection			from top and bottom	from top and bottom	from top and bottom	from top and	
Dimensions	Dimensions (H x D x W)	1	mm	85 x 69 x 35	85 x 69 x 35	85 x 69 x 35	85 x 69 x 35	
and weight	Weight		g	239	239	239	239	
Combination	Combinable with:	auxiliary contact		yes	yes	yes	yes	
with		signal contact		yes	yes	yes	yes	
auxiliary		shunt trip		yes	yes	yes	yes	
elements		P.		-	,	•	-	

RCBO DS203NC. The effective choice

The benefits of a product with the highest quality standards





Use with cables and with busbars

Terminals with two slots allow to use different types of conductors: one housing is designed for cables up to 25 mm², the other for busbars or cables up to 10 mm².



RFid

Radio frequency tracking via a radio frequency tag to facilitate logistics and to be assured of the originality of the product.



Differential trip indicator

In case of tripping due to earth fault, a blue flag appears on the toggle thus immediate showing the cause of trip of the device. This feature helps in troubleshooting on the network and reduces the downtime for maintenance.



Laser print information

All the necessary technical and installation information are laser printed on the front and side of units ensuring visibility along the time, including order code on front of device for future orders.



Mounting clip

The mounting clip eases the installation and removal from the DIN rail, even when used in a battery of devices with busbars on bottom terminals (without need of remove other devices).



Approval stamps

DS203NC residual current circuit breakers with overcurrent protection can meet the different installation habits in the various countries and are approved by the most important certification bodies like IMQ, VDE, EAC, KEMA.

			DS203NC L	DS203NC
Standards			IEC/EN 61009-1; IEC/EN 61009-2-1	IEC/EN 61009-1; IEC/EN 61009-2-1
Electrical features				
Type (wave form of the earth leakage sensed)			AC, A, APR	AC, A, APR, S
Number of poles			3P+N	3P+N
Rated current In		Α	6≤ In ≤ 32A	6≤ In ≤ 32A
Rated sensitivity I∆n		mA	30-300	30-100-300
Rated voltage Ue		V	400-415V	400-415V
Insulation voltage Ui		V	500 V AC	500 V AC
Overvoltage category			III	III
Pollution degree			2	2
Operating voltage of circuit test Ut		V	195 (300 for 30 mA) - 440	
Rated frequency		Hz	50/60	50/60
Rated breaking capacity acc. to IEC/ EN 61009	ultimate Icn	А	4500	6000
Rated breaking capacity acc. to IEC/EN 60947-2	ultimate Icu	kA	6	10
	service Ics	kA	4.5	5
Rated residual breaking capacity I∆m acc. To EN 61009		kA	4.5	6
Rated residual breaking capacity I∆m acc. to IEC 61009		kA	4.5	4.5
Rated impulse withstand voltage (1.2/50) Uimp		kV	4	4
Dielectric test voltage at ind. freq. for 1 min.		kV	2.5	2.5
Thermomagnetic release -	B: 3 ln ≤ lm ≤ 5 ln			•
characteristic	C: 5 ln ≤ lm ≤ 10 ln		•	
	K: 10 ln ≤ lm ≤ 14 ln			•
Surge current resistance (wave 8/20	0)	А	NA for A, AC versions; 3000 for APR version	NA for A, AC versions; 3000 for APR version; 5000 for S version
Mechanical features				
Housing			Insulation group II, RAL 7035	Insulation group II, RAL 7035
Toggle			black, sealable in ON-OFF positions	black, sealable in ON-OFF positions
Flag indicator			Differential trip indicator: blue on toggle	Differential trip indicator: blue on toggle
Contact position indication			CPI on window	CPI on window
Electrical life		operations		10000
Mechanical life		operations		20000
Protection degree	housing		IP4X	IP4X
	terminals		IP2X	IP2X
Shock resistance acc. to IEC/EN 60068-2-27			30g - 2 shocks - 13ms	30g - 2 shocks - 13ms
Vibration resistance acc. to IEC/ EN 60068-2-6			0,35mm or 5g - 20 cycles at 51505 Hz without load	0,35mm or 5g - 20 cycles at 51505 Hz without load
Environmental conditions (damp he 60068-2-30	eat) acc. to IEC/EN	°C/RH	28 cycles with 55°C/90-96% and 25°C/95-100%	28 cycles with 55°C/90-96% and 25°C/95-100%
Reference temperature for setting of	of thermal element	°C	30	30
Ambient temperature (with daily av		°C	-25+55	-25+55
		-		

			DS203NC L	DS203NC
Installation				
Terminal type	top/bottom		failsafe bi-directional cylinder-lift terminal (shock protected)	failsafe bi-directional cylinder-lif terminal (shock protected)
Terminal size for cables	top/bottom	mm²	25/25	25/25
Terminal size for busbars	top/bottom	mm²	10/10	10/10
Tightening torque	top/bottom	Nm	2.8	2.8
Mounting			on DIN rail EN 60715 (35 mm) by means of mounting clip	on DIN rail EN 60715 (35 mm) by means of mounting clip
Supply from			Top/bottom terminals	Top/bottom terminals
Dimensions and weight				
Dimensions (H x D x W)		mm	85 x 69 x 70.4	85 x 69 x 70.4
Weight		g	480	480
Combination with auxiliary elemen	its			
Combinable with accessories and	Auxiliary contact		yes	yes
auxiliaries, by means of interface contact	Signal contact		yes	yes
SN201-IH	Shunt trip		yes	yes
	Undervoltage release		yes	yes
	Overvoltage release		yes	yes



DS800S

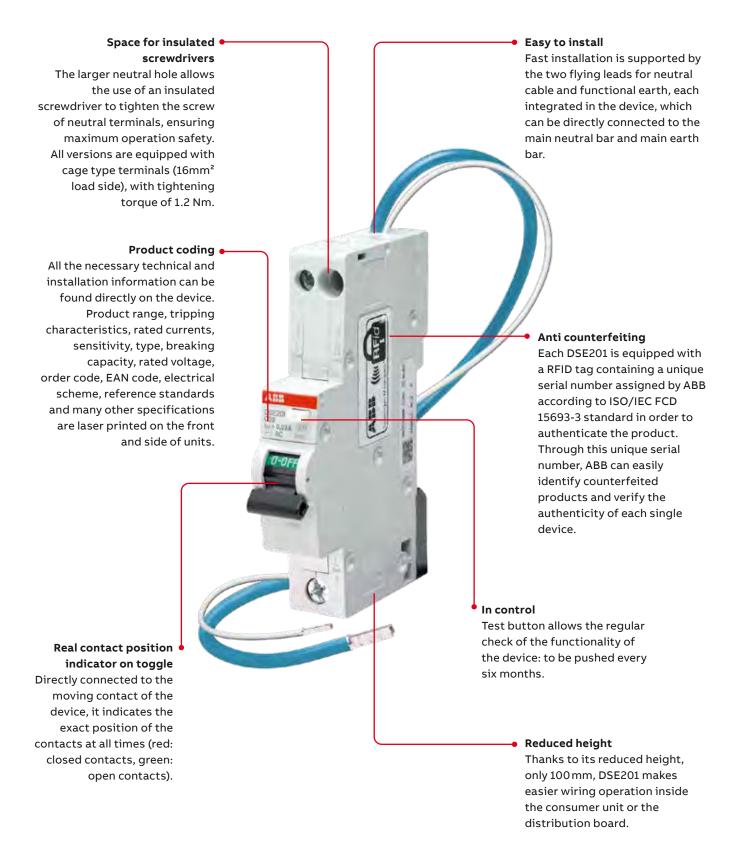
	Chandanda		
	Standards		
Electrical features	Operating characteristic: type (wave form of the earth	leakage sensed)	
	Poles		
	Rated sensitivity I∆n		Α
	Rated current In		A V
	Rated voltage Ue		V
	Insulation voltage Ui		V
	Operating voltage of circuit test Ut Rated frequency		Hz
	Rated literatery Rated ultimate short-circuit breaking capacity Icu	240/415 V AC	kA
	Rated ditililate short-circuit breaking capacity icu	254/440 V AC	kA
		289/500 V AC	kA
		400/690 V AC	kA
	Rated service short-circuit breaking capacity Ics	240/415 V AC	kA
	Rated service short electric breaking capacity les	254/440 V AC	kA
		289/500 V AC	kA
		400/690 V AC	kA
	Rated impulse withstand voltage (1.2/50) Uimp	400/030 1710	kV
	Dielectric test voltage at ind. freq. for 1 min.		kV
	Thermomagnetic release	B: 3 ln ≤ lm ≤ 5 ln	
	characteristic	C: 5 ln ≤ lm ≤ 10 ln	
		D**: 10 ln ≤ lm ≤ 20 ln	
		K**: 8 In ≤ Im ≤ 14 In	
	Surge current resistance acc. to VDE 0432 Part 2 (wave		A
Mechanical	Toggle	0, 20,	
features	Electrical life		
	Mechanical life		
	Protection degree	housing	
		terminals	
	Environmental conditions (damp heat) acc. to IEC/EN 6	50068-2-30	°C/RH
	Ambient temperature (with daily average ≤ + 35 °C)		°C
	Storage temperature		°C
Installation	Terminal size for cables	flexible	mm²
		rigid	mm²
	Tightening torque		Nm
	Mounting		
Dimensions	Dimensions (H x D x W)	2P	mm
and weight		3P	mm
		4P	mm
	Weight	2P	g
		3P	g
		4P	g
	Combinable with:	auxiliary contact	
with auxiliary elements		signal contact/auxiliary switch	
cicilicitts		shunt trip	
		undervoltage release	

^{* 1}A on 2P and 4P versions, while 0.3A only on 4P ones. ** as specified in standard IEC/EN 60947-2 the device withstands Im \leq 6 In with guaranteed non intervention.

	DS800N A	DS800S A S	DS800N A S	DS800S A AP-R	DS800N A AP-R
IEC/EN 60947-2			,	,	
A		А		A	
2P, 3P, 4P		2P,4P		2P, 3P, 4P	
0.3		0.3-1(*)		0.03	
125					
230/400-240/415	5-400/690				
690					
195-690					
5060					
50	36	50	36	50	36
30	20	30	20	30	20
10	10	10	10	10	10
4.5	4.5	4.5	4.5	4.5	4.5
40	30	40	30	40	30
15	10	15	10	15	10
5	5	5	5	5	5
3	3	3	3	3	3
6					
2.5					
•	•		•	•	•
<u>-</u>	-	-		-	<u> </u>
_	•				
NA	NA	5000	5000	3000	3000
	ble in ON-OFF position + k	olue (RCD) operating just f	rom OFF position		
10000	ble in ON-OFF position + b	olue (RCD) operating just f	rom OFF position		
10000 20000	ble in ON-OFF position + b	olue (RCD) operating just f	rom OFF position		
10000 20000 IP4X	ble in ON-OFF position + b	olue (RCD) operating just f	rom OFF position		
10000 20000 IP4X IP2X			rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55	ble in ON-OFF position + b		rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60			rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55' -25+60 -40+70			rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650			rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670			rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4	°C/90-96% and 25°C/95-1	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607	C/90-96% and 25°C/95-1	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55' -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607 108,2 x 82,3 x 133	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 60° 108,2 x 82,3 x 133 108,2 x 82,3 x 196	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 60° 108,2 x 82,3 x 13° 108,2 x 82,3 x 19° 108,2 x 82,3 x 22°	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607 108,2 x 82,3 x 133 108,2 x 82,3 x 196 108,2 x 82,3 x 223	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55' -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607 108,2 x 82,3 x 133 108,2 x 82,3 x 196 108,2 x 82,3 x 223 790 1140	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607 108,2 x 82,3 x 133 108,2 x 82,3 x 223 790	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55' -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 607 108,2 x 82,3 x 133 108,2 x 82,3 x 196 108,2 x 82,3 x 223 790 1140	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 60° 108,2 x 82,3 x 133 108,2 x 82,3 x 223 790 1140 1440	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		
10000 20000 IP4X IP2X 28 cycles with 55° -25+60 -40+70 650 670 min. 3 / max. 4 on DIN rail EN 60° 108,2 x 82,3 x 133 108,2 x 82,3 x 223 790 1140 1440 yes	C/90-96% and 25°C/95-1 (15 (35mm) by means of ra	00%	rom OFF position		

eRCBO, the value of quality

Made with attention to details



With its breaking capacity of 6kA in only one module width and 100mm height, the DSE201 series is the perfect solution for a complete protection in residential and light commercial applications. At home, in the office or in a shop, these devices are essential for the safety of people, utilities and equipment, protecting not only against earth fault residual currents - due to loss of isolation or accidental contact with live parts - but also against overcurrents.



Double slot terminal

On the line side, the availability of a terminal with two slots allows to use different types of conductors: one housing is designed for cables up to 25 mm², the other for busbars or cables up to 10 mm².



Easy and flexible

The double clip eases dismounting even when the unit is installed in a high density system. A single device can be removed from the cluster without disconnecting other units. The same screwdriver used to tighten terminals can also be used to unlock the DIN rail fixing device of the unit.



Environmentally friendly

The user manual is an integral part of the package. The information have been printed inside the box to make easy the reading and to reduce consumption of paper.

DSE201

Technical features and overall dimensions

Electrical features			
Standards			IEC 61009-1; IEC 61009-2-2; AS/NZS 61009
Type (wave form of the earth leakage sensed)			AC, A
Number of poles			1P+N
Rated current I _n		Α	6≤ In ≤ 50
Rated sensitivity $I_{\Delta n}$		mA	30
Rated voltage U _e		V	230-240
Insulation voltage U _i		V	500 V AC
Overvoltage category			III
Pollution degree			2
Max. operating voltage		V	264
Min. operating voltage for protection against I∆n residual sinusoidal alternating currents		V	85
Operating voltage of circuit test		V	195 - 264
Rated frequency		Hz	50/60
Rated breaking capacity acc. to IEC 61009	ultimate I _{cn}	Α	6000
Rated residual breaking capacity $I_{\Delta m}$		kA	6
Rated impulse withstand voltage (1.2/50) U_{imp}		kV	4 kV (test voltage 6.2kV at sea level, 5kV at 2000m)
Dielectric test voltage at ind. freq. for 1 min.		kV	2.5 kV (50 / 60Hz, 1 min.)
Thermomagnetic release - characteristic	B: $3 I_n \le I_m \le 5 I_n$		
	C: 5 l _n ≤ l _m ≤ 10 l _n		
Mechanical data			
Housing			insulation group II, RAL 7035
Toggle			insulation group IIIA, black, sealable in ON-OFF positions
Contact position indication			CPI on toggle (I ON / 0 OFF)
Electrical life		operations	10000
Mechanical life		operations	20000
Protection degree	housing		IP4X
	terminals		IP2X
Shock resistance acc. to IEC/EN 60068-2-27			30g - 2 shocks - 13ms
Vibration resistance acc. to IEC/EN 60068-2-6			0.35mm or 5g - 20 cycles at 51505 Hz without load
Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30		°C/RH	28 cycles with 55°C/90-96% and 25°C/95-100%
Reference temperature for setting of thermal element		°C	30
Ambient temperature (with daily average ≤ +35 °C)		°C	-25+55
Storage temperature		°C	-40+70

DSE201

Technical features and overall dimensions

Installation			
Terminal type	top (load side)		failsafe cage (shock protected)
	bottom (line side)		failsafe bi-directional cylinder-lift terminal (shock protected)
Terminal size for cables	load side (top)	mm²	16
	line side (bottom)	mm²	25
Terminal size for busbars	load side (top)		only for wire connection
	line side (bottom)	mm²	10 (Standard ABB busbar / distribution board system)
Tightening torque	top (load side)	Nm	1.2
	bottom (line side)	Nm	2.8
Stripping length of the cable	top (load side)	mm	11
	bottom (line side)	mm	12.5
Neutral load cable	Туре		low smoke halogen free
	Lenght	mm	750
	Section	mm²	2.5 mm² up to 20 A; 4 mm² up to 50 A
	Color		blue (available also black)
Functional earth cable	Туре		low smoke halogen free
	Lenght	mm	750
	Section	mm²	0.75
	Color		white
Mounting			on DIN rail EN 60715 (35 mm) by means of fast clip device in consumer unit Type A according to IEC 61439-1&3, BS EN 61439-1&3, in distribution board Type B according to IEC 61439-1&3, BS EN 61439-1&3.
Supply from			bottom terminal
Dimensions and weight			
Dimensions (H x D x W)		mm	100 x 68.9 x 17.6
Weight		g	180
Combination with auxiliary elements			
Combinable with accessories and aux	iliaries no		

AFDD S-ARC1:

Arc Fault Detection Device Integrated with MCB

Easy to install

Twin terminals for separate feeding with busbar and cables.
Connection possible both from top and bottom side.

Test pushbutton and self test

Test pushbutton to verify the correct functioning of the arc fault detection device.
Internal self test is also continuously running in order to check the arc detection circuit.

LED for troubleshooting

LED troubleshooting indicator to monitor the operation of the AFDD and give indication of the cause of the trip. Possibility to recall in memory the last tripping due to arc fault and overvoltage.

Contact position indicator (CPI)

To always know the status of the contacts (red: closed; green: open) Independent from the toggle position



Anti counterfeiting

RFid tag containing a unique serial number assigned to ABB in order to authenticate the product.

Laser printed information

Information on the device are laser printed to ensure readability over time.

Combination with auxiliary elements

Platform suitable for combination with System pro M compact® accessories.

The S-ARC1 is the new 1P+N Arc Fault Detection Device (AFDD) with an integrated Miniature Circuit Breaker (MCB) in only two module width. Besides the overcurrent protection of the MCB, the S-ARC1 provides additional protection against series, parallel and earth arc faults. The series is perfectly integrated with ABB's System pro M compact® range. Combined with a Residual Current Circuit Breaker (RCCB) as upstream device, the S-ARC1 provides the best solution for complete protection of electrical installations in buildings.



LED for easy troubleshooting

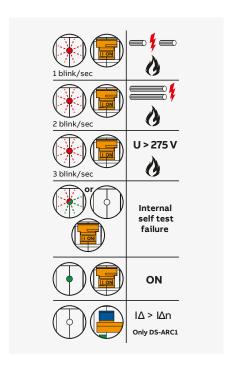
LED to monitor the correct working conditions of the device and have an easier troubleshooting in case of trip. Consequently the downtime for maintenance can be reduced.

- Toggle ON: GREEN LED
- Toggle OFF: LED OFF
- Different indications after the trip, after reclosing the toggle
- Possibility to recall in memory the last tripping due to arc fault and overvoltage



LED color	Blink/ sec	Signalling duration	Cause of trip
Green		Permanent	Manual trip, manual test , overcurrent
Red blinking	1	5 sec	Series arc
Red blinking	2	5 sec	Parallel arc
Red blinking	3	5 sec	Over voltage

In case of internal self test failure, the led can switch off or start blinking green/red alternatively.



Dedicated sticker for LED

Dedicated sticker that summarizes the LED function is present in addition to the instructions sheet.



Double slot terminals

Fail-safe terminals to avoid improper connection. Two slots of different dimensions (25 mm² and 10 mm²) available to allow the connection both with cables and busbars. Connection possible both from top and bottom side. Standard System pro M compact® clip ensures a stable fixing on DIN rail and easy and fast mounting and dismounting operations.



Compatibility with busbars

A quick and easy installation is possible in one step using a standard ABB System pro M compact® busbar: no additional cables required for the wiring.



All information on the device

Main technical information are laserprinted on the front and left side of product to ensure long readability.

AFDD

Technical features and overall dimensions

				S-ARC1	S-ARC1 M	
	Standards			IEC/EN 62606;	IEC/EN 60898-1	
Electrical	Number of poles			1P	' + N	
Functions	Rated current I		Α	6 ≤ I	n ≤ 40	
	Rated voltage U _e		V	230	- 240	
	Insulation voltage U		V	500 V AC		
	Overvoltage category				III	
	Pollution degree				2	
	Min. operating voltage		V	1	70	
	Threshold for protection against overvoltage		V	2	75	
	Rated frequency		Hz	50)/60	
	Rated breaking capacity acc. to IEC/EN 60898-1	ultimate I _{cn}	Α	6000	10000	
	Rated breaking capacity acc. to IEC/EN 60947-2	ultimate I _{cu}	kA	7.5	10	
	(only referring to short circuit test)	service I _{cs}	kA	6	7.5	
	Rated making and breaking capacity of one indivi	dual pole I _{cn1}	Α	60	000	
	Rated impulse withstand voltage (1.2/50) U _{imp}		kV		4	
	Dielectric test voltage at ind. freq. for 1 min.		kV	2.5 (50/60) Hz, 1 min.)	
	The war are a west a well-are a shown at a winting	B: $3 I_{n} \le I_{m} \le 5 I_{n}$				
	Thermomagnetic release – characteristic	C: 5 I _n ≤ I _m ≤ 10 I _n		•		
	Energy limiting class			3		
Mechanical	nousing			Insulation gro	oup I, RAL 7035	
main features	Toggle			Insulation group II, Orange RAL 2004, sealable in ON-OFF-posit		
	Contact position indication			Green/re	ed window	
	Electrical life			10000 operations		
	Mechanical life			20000 operations		
	Protection degree acc. to EN 60529	housing		IP4X		
	Protection degree acc. to EN 00329	terminals		IF	2X	
	Shock resistance acc. to IEC/EN 60068-2-27			25 g – 2 sh	ocks – 13 ms	
	Vibration resistance acc. to IEC/EN 60068-2-6			0.2 mm or 5 g – 20 cy	cles at 5 150 5 Hz	
	Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30		°C/ RH	28 cycles with 55°C/90 –	96% and 25°C/95 – 100%	
	Reference temperature for setting of thermal element		°C	3	30	
	Ambient temperature (with daily average ≤ +35 °C)		°C	-25.	+55	
	Storage temperature		°C	-40	+70	
Assembly	Terminal type	top/bottom			al cylinder-lift terminal protected)	
	Terminal size for cables	top/bottom	mm²	25	5/25	
	Terminal size for busbars	top/bottom	mm²	10)/10	
	Tightening torque	top/bottom	Nm	2	2.8	
	Stripping length of the cable		mm	:	12	
	Mounting			on DIN rail EN 60715 (35 mr	n) by means of mounting cli	
	Mounting position			any		
	Supply from			Top/botto	m terminals	
Dimensions	Dimensions (H x D x W)		mm	85 × 6	69 × 35	
and weight	Weight		g	1	80	

AFDD

Technical features and overall dimensions

Installation				
Terminal type	top/bottom		failsafe bi-directional cylinder-lift terminal (shock protected)	failsafe bi-directional cylinder-lift terminal (shock protected)
Terminal size for cables	top/bottom	mm²	25/25	25/25
Terminal size for busbars	top / bottom	mm²	10/10	10/10
Tightening torque	top / bottom	Nm	2.8	2.8
Stripping length of the cable		mm	12,5	12,5
Mounting			on DIN rail EN 60715 (35mm) by means of mounting clip	on DIN rail EN 60715 (35mm) by means of mounting clip
Mounting position			Any	Any
Supply from			Top/Bottom terminals	Top/Bottom terminals
Dimensions and weight				
Dimensions (H x D x W)		mm	85 x 69 x 35 mm	85 x 69 x 35 mm
Weight		g	180	180
Combinable with accessories and auxiliaries	Auxiliary conta	ct, signal	contact/auxiliary switch, shunt trip, und	ervoltage release, overvoltage release

AFDD DS-ARC1:

Arc Fault Detection Device Integrated with RCBO

Easy to install

Twin terminals for separate feeding with busbar and cables.
Connection possible both from top and bottom side.

Test pushbutton and self test

White test pushbutton to verify the correct functioning of RCD. Orange test pushbutton to verify the correct functioning of AFDD.

Internal self test is also continuously running in order to check the arc detection circuit.

LED for troubleshooting

LED troubleshooting indicator to monitor the operation of the AFDD and give indication of the cause of the trip. Possibility to recall in memory the last tripping due to arc fault and overvoltage.

Contact position indicator (CPI)

To always know the status of the contacts (red: closed; green: open) Independent from the toggle position

Anti counterfeiting

RFid tag containing a unique serial number assigned to ABB in order to authenticate the product.

> Laser printed information Information on the device are laser printed to ensure readability over time.

Combination with auxiliary

elements

Platform suitable for combination with System pro M compact® accessories. Combination possible also with auxiliary for bottom fitting.

The DS-ARC1 is the new 1P+N Arc Fault Detection Device (AFDD) with an integrated residual current circuit breaker with overcurrent protection (RCBO) in only three module width.

The series offers a complete protection against arc faults and overvoltage, reducing the risk of fire. The integrated RCBO is adding protection against overcurrent and earth fault currents: compact solution for a complete protection of people and valuable assets.



LED for easy troubleshooting

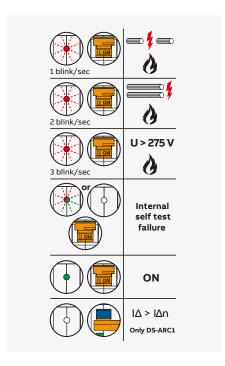
LED to monitor the correct working conditions of the device and have an easier troubleshooting in case of trip. Consequently the downtime for maintenance can be reduced.

- Toggle ON: GREEN LED
- Toggle OFF: LED OFF
- Different indications after the trip, after reclosing the toggle
- Possibility to recall in memory the last tripping due to arc fault and overvoltage



LED color	Blink/ sec	Signalling duration	Cause of trip
Green		Permanent	Manual trip, manual test , overcurrent
Red blinking	1	5 sec	Series arc
Red blinking	2	5 sec	Parallel arc
Red blinking	3	5 sec	Over voltage

In case of internal self test failure, the led can switch off or start blinking green/red alternatively.



Dedicated sticker for LED

Dedicated sticker that summarizes the LED function is present in addition to the instructions sheet.



Double slot terminals

Fail-safe terminals to avoid improper connection. Two slots of different dimensions (25 mm² and 10 mm²) available to allow the connection both with cables and busbars. Connection possible both from top and bottom side. Standard System pro M compact® clip ensures a stable fixing on DIN rail and easy and fast mounting and dismounting operations.



Compatibility with busbars

A quick and easy installation is possible in one step using dedicated busbars for DS-ARC1 installation no additional cables required for the wiring.



Earth fault indicator

Blue flag on the toggle to identify earth fault trips, making the troubleshooting easier while reducing the downtime for maintenance operations. In case of earth fault trip, after reclosing the toggle, the LED becomes green.

AFDD

DS-ARC1 arc fault detection device with integrated RCBO – technical data

				DS-ARC1	DS-ARC1 M	
	Standards			IEC/EN 62606; IEC/EN 610	009-1; IEC/EN 61009-2-1	
Electrical Functions	Type (wave form of the earth leakage sensed)			A		
unctions	Number of poles			1P +	N	
	Rated current I _n		Α	6 ≤ In	≤ 20	
	Rated sensitivity IΔn		Α	0.03		
	Rated voltage U_e		V	230 – 240		
	Insulation voltage U _i		V	500 V	/ AC	
	Overvoltage category			III		
	Pollution degree			2		
	Operating voltage of RCD circuit test U_t		V	170 –	264	
	Threshold for protection against overvoltage		V	27	5	
	Rated frequency		Hz	50/	60	
	Rated breaking capacity acc. to IEC/EN 61009-1	ultimate I	Α	6000	10000	
	Rated breaking capacity acc. to IEC/EN 60947-2	ultimate I	kA	7.5	10	
	(only referring to short circuit test)	service I	kA	6	7.5	
	Rated residual breaking capacity $I_{\Delta m}$	cs	Α	600	00	
	Rated impulse withstand voltage (1.2/50) U _{imp}		kV	4		
	Dielectric test voltage at ind. freq. for 1 min.		kV	2.5 (50/60 I	Hz, 1 min.)	
		B: 3 l ₀ ≤ l _m ≤ 5 l ₀			· · · · · · · · · · · · · · · · · · ·	
	Thermomagnetic release – characteristic	C: 5 I _n ≤ I _m ≤ 10 I _n				
	Energy limiting class			3		
echanical	33 3			Insulation grou		
lain features				Insulation	·	
	Toggle			Orange RAL 2004, sealab	le in ON-OFF-positions	
	Contact position indication			Green/red	window	
	Earth fault trip indication			Blue flag o	n toggle	
	Electrical life			10000 op	erations	
	Mechanical life			20000 op	erations	
	Protection degree acc. to EN 60529	housing		IP4	Х	
	Protection degree acc. to EN 00329	terminals		IP2	X	
	Shock resistance acc. to IEC/EN 60068-2-27			25 g – 2 shoo	cks – 13 ms	
	Vibration resistance acc. to IEC/EN 60068-2-6			0.2 mm or 5 g – 20 cyc	les at 5 150 5 Hz	
	Environmental conditions (damp heat)		°C/	28 cycles with 55°C/90 – 9	6% and 25°C/95 – 100%	
	acc. to IEC/EN 60068-2-30		RH			
	Reference temperature for setting of thermal element		°C	30)	
	Ambient temperature (with daily average ≤ +35 °C)		°C	-25		
	Storage temperature		°C	-40		
ssembly				failsafe bi-directional cylir		
,	Terminal type	top/bottom		protec	•	
	Terminal size for cables	top/bottom	mm²	25/	25	
	Terminal size for busbars	top/bottom	mm²	10/	10	
	Tightening torque	top/bottom	Nm	2.8	3	
	Stripping length of the cable		mm	12	2	
	Mounting			on DIN rail EN 60715 (35 mm)	by means of mounting cli	
	Mounting position			an	у	
	Supply from			Top/bottom	terminals	
imensions	Dimensions (H x D x W)		mm	85 × 69	× 52.5	
nd weight	Weight		g	24	0	

Earth Leakage Relay

Front panel mountable



ELR front panel residual current relay

Front panel residual current relays are electronic devices used in combination with an external toroidal transformer. They are according to the protection standard IEC/EN 60947-2 Annex-M.

The sensitivity can be set from 0.03 A to 30 A, while the tripping time from 0 to 5 seconds.

Residual current relays are available in versions 48x48 mm, 72x72 mm, and 96x96 mm.

The Fail Safe function is available for versions ELR48P, ELR72P and ELR96P: the contacts switch when there is no auxiliary power. The ELR96PF version is equipped with Fail Safe function, fault memory LED, and a frequency filter, that ensure continuity of service in the presence of harmonics.

ELR96PD has (in addition to these functions) a digital display for an instantaneous view of the residual current IAn



Compliance to IEC/EN 60947-2 Annex M

The new range of ELR products from ABB comply with IEC/EN 60947-2 Annex M and is tested within a configuration that includes residual current relay, toroid, shunt-trip, MCCB/MCB available in ABB offer.



The new range of ELR front panel residual current relays has been tested in combination with miniature circuit breaker (S200 range) and moulded case circuit breakers (Tmax series up to T5 630 A) conforming with IEC/EN 60947-2 Annex M.

In order to ensure compliance to IEC/EN 60947-2 Annex M ABB has considered the following parameters:



Operational time: time that elapses between the occurrence of a fault and the intervention of the relay contacts.

Cumulative operational time: time that elapses between the occurrence of a fault and the intervention (opening) of the associated circuit breaker.

Non-operation time: delay, adjustable on the device, which defines how long the fault should last before the relay contacts switch. This value is important to ensure selectivity and resistance to unwanted tripping of the associated circuit breaker.

Technical features

		ELR48P	ELR72	ELR72P	ELR96	ELR96P	ELR96PF	ELR96PD
Operating voltage	[V]	24, 48,	24, 48,	24, 48, 110	24, 48, 110,	24, 48, 110,	110,	110,
		110, 230 a.c./	110, 230 a.c./	230, 400 a.c./	230, 400 a.c./	230, 400 a.c./	230, 400 a.c.	230, 400 a.c.
		24, 48, 115 d.c.	24, 48, 110 d.c.	24, 48 d.c.	24, 48 d.c.	24, 48 d.c.	24, 48 d.c.	24, 48 d.c.
Frequency	[Hz]	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60
Frequency filter		-	-	-	-	-	Yes	Yes
Туре		Α	Α	Α	Α	А	Α	А
Operating temperature	[°C]	-10+60	-10+60	-10+60	-10+60	-10+60	-10+60	-10+60
Power consumption	[W]	<7	<7	<7	<7	<7	<7	<7
Sensitivity setting I∆n	[A]	from 0,03 to 30	from 0,03 to 30					
Tripping time setting Dt	[s]	from 0 to 5	from 0 to 5					
Contacts	[no.]	2	1	2	1	2	2	2
Contact capacity	[A]				5 (250 V a.c.)			
Dimensions	[mm]	48 x 48	72 x 72	72 x 72	96 x 96	96 x 96	96 x 96	96 x 96
Digital display		-	-	-	-	-	-	Yes
Protection degree (with cover)		IP52	IP52	IP52	IP52	IP52	IP52	IP52
Protection degree (without cover)		IP40	IP40	IP40	IP40	IP40	IP40	IP40
Protection degree (terminals)		IP20	IP20	IP20	IP20	IP20	IP20	IP20
Standards		IEC EN 60947-2 Annex M	IEC EN 60947-2 Annex M	IEC EN 60947-2 Annex M				

Residual current relays

DIN rail mountable



RD3 residual current relays

The RD3 family of electronic residual current relays provides residual current protection and monitoring functions according to IEC/EN 60947-2:2006 annex M and can be used in conjunction

with all S 200 automatic devices and Tmax range moulded case devices up to T5, for industrial installations.

The RD3 residual current relays can provide status indications through two output contacts.

Technical features

	RD3/RD3-48	RD3M/RD3M-48	RD3P/RD3P-48
Operating voltage	RD3: 230-400 Vac +10% / -15%	RD3M: 230-400 Vac +10% / -15%	RD3P: 230-400 Vac +10% / -15%
	RD3-48: 12-48 Vac/Vdc +10% /	RD3M-48: 12-48 Vac/Vdc +10% /	RD3P-48: 12-48 Vac/Vdc +10% /
	-15%	-15%	-15%
Auxiliary supply frequency	50-60 Hz	50-60 Hz	50-60 Hz
Network monitored frequency	50-150 Hz a	50-150 Hz a	50-150 Hz a
Frequency filter	-	Yes	Yes
Туре	A (up to IDn=5 A)	A (up to IDn=5 A)	A (up to IDn=5 A)
	AC (for higher current)	AC (for higher current)	AC (for higher current)
Operating temperature	-25+70 °C	-25+70 °C	-25+70 °C
Power consumption	<3.6 W (RD3, RD3M, RD3P),	<3.6 W (RD3, RD3M, RD3P),	<3.6 W (RD3, RD3M, RD3P),
	<600 mW RD3-48, RD3M-48,	<600 mW RD3-48, RD3M-48, RD3P-	<600 mW RD3-48, RD3M-48, RD3P-
	RD3P-48)	48)	48)
Sensitivity settings IDn	0.03-0.1-0.3-0.5-1-2-3-5-10-30 A	0.03-0.1-0.3-0.5-1-2-3-5-10-30 A	0.03-0.1-0.3-0.5-1-2-3-5-10-30 A
Tripping time settings Dt	0-0.06-0.2-0.3-0.5-1-2-3-5-10 s	0-0.06-0.2-0.3-0.5-1-2-3-5-10 s	0-0.06-0.2-0.3-0.5-1-2-3-5-10 s
Pre-alarm threshold	-	60%	60%
Max. resistance connection between toroidal transformer and relay	3 W	3 W	3 W
Max. length connection of remote reset button	15 m	15 m	15 m
Output Contact capacity (7-8-9); (10-11-12)	8 A, 250 V a.c.	8 A, 250 V a.c.	8 A, 250 V a.c.
Led bar indicator	-	-	Yes
Max. cable terminals section	2.5 mm²	2.5 mm²	2.5 mm²
Modules	3	3	3
Dimensions	52.8 × 85 × 64.7 mm	52.8 × 85 × 64.7 mm	52.8 × 85 × 64.7 mm
Protection degree	IP20	IP20	IP20
Standards	IEC/EN 60947-2 annex. M	IEC/EN 60947-2 annex. M	IEC/EN 60947-2 annex. M

a RD3 can detect, as a monitor, sinusoidal earth fault currents in networks with frequencies between 50 Hz and 150 Hz.

Toroidal Transformers

 $The \ choice \ of \ toroidal \ transformers \ is \ made \ according \ to \ the \ useful \ diameter \ and \ the \ minimum \ value \ of \ the \ leakage \ current \ to \ be \ detected.$

Type	Toroid useful diameter [mm]	Max rated current [A]	Min measurable current [mA]
TRM	29	65	1
TR1	35	75	1
TR2	60	85	1
TR3	80	160	1
TR4	110	250	1
TR4/A	110	250	1
TR160	160	400	1
TR160/A	160	400	1
TR5	210	630	1
TR5/A	210	630	1

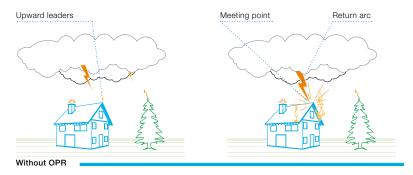
Туре	Toroid useful diameter [mm]	Min measurable current [mA]	Maximum capacity [A]
TRM	29	30	160
TR1	35	30	250
TR2	60	30	400
TR3	80	100	800
TR4	110	100	1250
TR4/A	110	300	1250
TR160	160	300	2000
TR160/A	160	500	2000
TR5	210	300	3200
TR5/A	210	500	3200

Table 2 shows the technical features of the toroidal transformers.

Table 1 shows toroidal transformers selection for use with ELR according to IEC/ EN 60947-2 Annex M in combination with

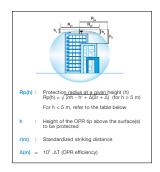
OPR - Optimized pulse pod

External lightning protection









	LPL I	LPL II	LPL III	LPL IV
Rolling sphere radius r(m)	20	30	45	60



The OPR efficiency (ΔT)

Lightning is one of the most spectacular meteorological phenomena. Generated by the interaction of clouds elements (water and ice), it can kill, injure and damage. The unique efficiency of the OPR Early streamer emission is based on the difference (ΔT), measured in a laboratory, in between the emission time of the OPR and the one from a simple rod. The OPR ESE air terminal is composed of a striking point connected to a down conductor to conduct the lightning to the ground.

Complete autonomy

During a storm the ambient electric field may rise from 600 V to 10-20 kV/m. When the electric field reach this level representing a minimum risk for a lightning, the OPR begins to get activated and generates high voltage pulses, helping to create and propagating an upward leader. After a strike on the OPR, the lightning current is driven to ground by the down conductor to the earth termination system.

Radius of protection

The radius of protection (Rp) of the OPR is calculated according to the NF C 17-102 (edition 2011). It depends on the OPR efficiency (ΔT) expressed in micro-seconds. The maximum value for ΔT is 60 μs .

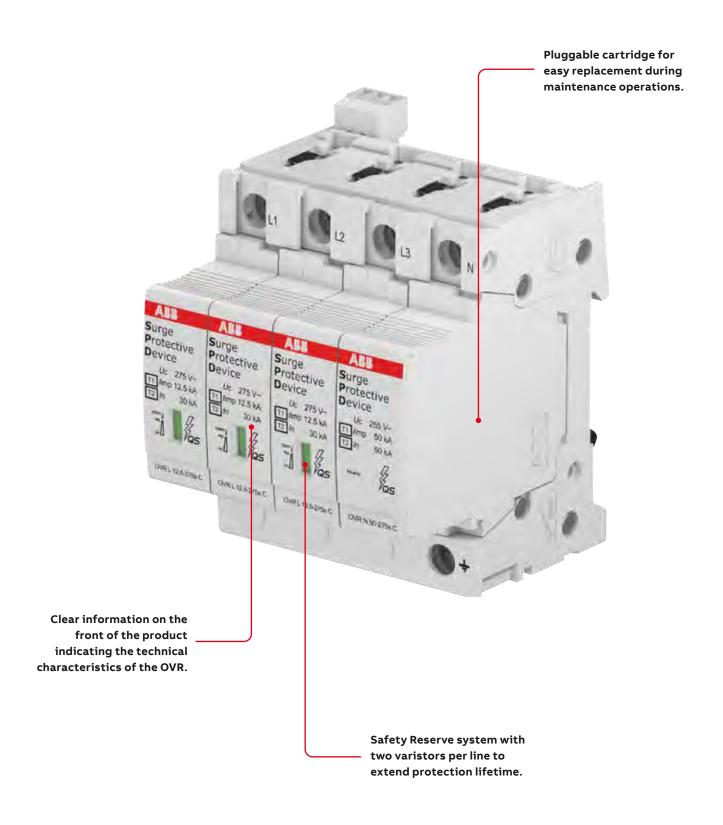
The risk assessment shall be calculated according to the NF C 17-102 Annex A / IEC 62305-2 and will define the protection level (LPL I, II, III or IV) which will be used in the determination of the OPR radius of protection.

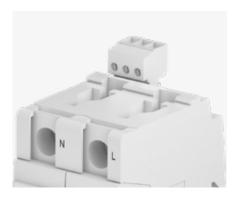
OPR radius of protection

Protection level OPR		- 1	(r = 20 m)		II	(r = 30 m)		III (r = 45 m)			IV (r = 60 m)	
	OPR 30	OPR 45	OPR 60	OPR 30	OPR 45	OPR 60	OPR 30	OPR 45	OPR 60	OPR 30	OPR 45	OPR 60
h (m)										Radius of protect		on Rp (m)
2	19	25	31	22	28	35	25	32	39	28	36	43
3	29	38	47	33	42	52	38	48	58	43	57	64
4	38	51	63	44	57	69	51	65	78	57	72	85
5	48	63	79	55	71	86	63	81	97	71	89	107
6	48	63	79	55	71	87	64	81	97	72	90	107
8	49	64	79	56	72	87	65	82	98	73	91	108
10	49	64	79	57	72	88	66	83	99	75	92	109
15	50	65	80	58	73	89	69	85	101	78	95	111
20	50	65	80	59	74	89	71	86	102	81	97	113
45	43	65	76	58	75	89	75	90	105	89	104	119
50	40	65	74	57	75	88	75	90	105	89	104	120
55	36	65	72	55	75	86	74	90	105	90	105	120
60	30	65	69	52	75	85	73	90	104	90	105	120

OVR T1-T2, T2 and T2-T3 ranges. The details make the difference

A complete range for your surge protection





OVR T1-T2 12.5, T2 and T2-T3 ranges are using same terminal as Pro M compact devices to guarantee a complete coordination and time saving in wiring operation.



The pluggable feature of ABB OVR T1-T2, T2 and T2-T3 surge protective devices (SPDs) facilitates maintenance. Should one or more worn cartridges need to be replaced, the wires do not have to be removed.



The end-of-life indicator of the SPD signals the status of the device.

A mechanical indicator turns from green to red when the SPD reaches the end of its life, when the end-of-life indicator is fitted.



A safety reserve system for an extended protection. T1-T2s and T2s. These Surge Protective Devices are equipped with two varistors per pole. If one varistor is damaged, the SPD gives advanced warning that it is approaching the end of its life while the other varistor continues to protect the equipment, allowing to perform Preventive Maintenance.



QuickSafe MOV technology extended to SPD dedicated to D.C photovoltaic applications, bringing seft-protected feature (no back-up needed) up to 10 kA PV short circuit current.

Pro- tected lines	Impulse current	Max. dis- charge current	Nominal current	Follow current interrupt- ing rating	Voltage protec- tion level	Nominal voltage	Max. cont. op- erating voltage	Order details	
	limp 10/350	lmax 8/20	In	Ifi		Un	Uc		
	kA	kA	kA	kA	Up kV	V	v	Time and	Order code
T T1				KA	KV			Type code	Order code
	L-T2 OVR p	Jiuggabie	-						
Uc275 V									
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s P TS QS	2CTB815710R0000
1+1	12.5	80	20	-	1.4	230	275	OVR T1-T2 1N 12.5-275s P TS QS	2CTB815710R0100
3	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3L 12.5-275s P TS QS	2CTB815710R0600
3+1	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 3N 12.5-275s P TS QS	2CTB815710R0700
4	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 4L 12.5-275s P TS QS	2CTB815710R1100
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s P QS	2CTB815710R1200
1+1	12.5	80	20	-	1.4	230	275	OVR T1-T2 1N 12.5-275s P QS	2CTB815710R1300
3	12.5	80	20	_	1.4	230/400	275	OVR T1-T2 3L 12.5-275s P QS	2CTB815710R1800
3+1	12.5	80	20	_	1.4	230/400	275	OVR T1-T2 3N 12.5-275s P QS	2CTB815710R1900
4	12.5	80	20	-	1.4	230/400	275	OVR T1-T2 4L 12.5-275s P QS	2CTB815710R2300
Uc 440 V		80	20		1.4	230/400	213	OVK 11-12 4L 12.5-2755 F Q3	2C1B615710R2300
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s P TS QS	2CTB815710R2900
1+1	12.5	80	20	_	1.9	400	440	OVR T1-T2 1N 12.5-440s P TS QS	
3	12.5	80	20		1.9	400/690	440	OVR T1-T2 3L 12.5-440s P TS QS	2CTB815710R3500
3+1	12.5	80	20		1.9	400/690	440	OVR T1-T2 3N 12.5-440s P TS QS	
4	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 4L 12.5-440s P TS QS	2CTB815710R4000
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s P QS	2CTB815710R4100
1+1	12.5	80	20	-	1.9	400	440	OVR T1-T2 1N 12.5-440s P QS	2CTB815710R4200
3	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3L 12.5-440s P QS	2CTB815710R4700
3+1	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 3N 12.5-440s P QS	2CTB815710R4800
4	12.5	80	20	-	1.9	400/690	440	OVR T1-T2 4L 12.5-440s P QS	2CTB815710R5200
Neutral									
1	50	100	50	0.1	1.4	230	275	OVR T1-T2 N 50-275s P QS	2CTB815710R5300
1	50	100	50	0.1	1.9	400	440	OVR T1-T2 N 50-440s P QS	2CTB815710R5300
Cartridg	es								
1	12.5	80	20	-	1.4	230	275	OVR T1-T2 12.5-275s C QS	2CTB815710R2600
1	12.5	80	20	-	1.9	400	440	OVR T1-T2 12.5-440s C QS	2CTB815710R5500
1	50	100	50	-	1.4	230	275	OVR T1-T2 N 50-275s C QS	2CTB815710R2700
1	50	100	50	_	1.9	400	440	OVR T1-T2 N 50-440s C QS	2CTB815710R5600

Pro- tected lines	Impulse current		Nominal current	Follow current interrupt- ing rating	Voltage protec- tion level	Nominal voltage	Max. cont. op- erating voltage	Order details	
	limp 10/350	lmax 8/20	In	Ifi	Up	Un	Uc		
	kA	kA	kA	kA	kV	V	V	Type code	Order code
Type 2 (OVR plug	gable							
Uc 275 V									
1	2	40	20	-	1.25	230	275	OVR T2 40-275 P TS QS	2CTB803871R1700
1+1	2	40	20	-	1.25	230	275	OVR T2 1N 40-275 P TS QS	2CTB803972R0500
3	2	40	20	-	1.25	230/400	275	OVR T2 3L 40-275 P TS QS	2CTB803873R2500
4	2	40	20	-	1.25	230/400	275	OVR T2 4L 40-275 P TS QS	2CTB803873R5200
1	2	40	20	-	1.25	230	275	OVR T2 40-275 P QS	2CTB803871R2300
1+1	2	40	20	-	1.25	230	275	OVR T2 1N 40-275 P QS	2CTB803972R1100
3	2	40	20	-	1.25	230/400	275	OVR T2 3L 40-275 P QS	2CTB803873R2400
4	2	40	20	-	1.25	230/400	275	OVR T2 4L 40-275 P QS	2CTB803873R5600
1	2	40	20	-	1.4	230	275	OVR T2 40-275s P TS QS	2CTB815704R0000
1+1	2	40	20	-	1.4	230	275	OVR T2 1N 40-275s P TS QS	2CTB815704R0200
3	2	40	20	-	1.4	230/400	275	OVR T2 3L 40-275s P TS QS	2CTB815704R0600
4	2	40	20	-	1.4	230/400	275	OVR T2 4L 40-275s P TS QS	2CTB815704R1100
1	2	40	20	-	1.4	230	275	OVR T2 40-275s P QS	2CTB815704R1200
1+1	2	40	20	-	1.4	230	275	OVR T2 1N 40-275s P QS	2CTB815704R1400
3	2	40	20	-	1.4	230/400	275	OVR T2 3L 40-275s P QS	2CTB815704R1800
4	2	40	20	-	1.4	230/400	275	OVR T2 4L 40-275s P QS	2CTB815704R2300
1	6.25	80	20	-	1.4	230	275	OVR T2 80-275s P TS QS	2CTB815708R0000
1+1	6.25	80	20	-	1.4	230	275	OVR T2 1N 80-275s P TS QS	2CTB815708R0200
3	6.25	80	20	-	1.4	230/400	275	OVR T2 3L 80-275s P TS QS	2CTB815708R0600
4	6.25	80	20	-	1.4	230/400	275	OVR T2 4L 80-275s P TS QS	2CTB815708R1100
1	6.25	80	20	-	1.4	230	275	OVR T2 80-275s P QS	2CTB815708R1200
1+1	6.25	80	20	-	1.4	230	275	OVR T2 1N 80-275s P QS	2CTB815708R1400
3	6.25	80	20	-	1.4	230/400	275	OVR T2 3L 80-275s P QS	2CTB815708R1800
4	6.25	80	20	-	1.4	230/400	275	OVR T2 4L 80-275s P QS	2CTB815708R2300

Pro- tected lines	Impulse current	Max. dis- charge current Imax 8/20	Nominal current		Voltage protec- tion level	Nominal voltage Un	Max. cont. op- erating voltage	Order details		
	limp 10/350		In	Ifi			Uc			
	10/330 kA	kA	kA	kA	Up kV	V	V	Type code	Order code	
Nectoral	KA	KA	KA	KA	KV	V		Type code	Order code	
Neutral 1	2	80	30	0.1	1.4	230	275	OVR T2-T3 N 80-275 P QS	2CTB803973R1900	
1	6.25	80	30	0.1	1.4	230	275	OVR T2-13 N 80-275 P QS	2CTB803973R1900 2CTB815708R2500	
		- 60	30	0.1	1.4	230	213	OVR 12 N 60-2135 F Q3	2C1B613706R2300	
Cartridge 1	2	80	30	-	1.4	230	275	OVR T2-T3 N 80-275 C QS	2CTB803876R0000	
1	2	40	20	_	1.25	230	275	OVR T2 40-275 C QS	2CTB803876R1000	
1	6.25	40	20		1.4	230	275	OVR T2 40-275s C QS	2CTB803870R1000	
1	6.25	80	20	_	1.4	230	275	OVR T2 80-275s C QS	2CTB815708R2600	
1	6.25	80	30	_	1.4	230	275	OVR T2 N 80-275s C QS	2CTB815708R2800	
Uc 350V	0.23	- 00			1.7	230	213	OVK 12 14 00 2753 C Q5	LCTB013700K2000	
1	2	40	20	_	1.5	230	350	OVR T2 40-350 P QS	2CTB803881R2300	
1	2	40	20	_	1.5	230	350	OVR T2 40-350 P TS QS	2CTB803881R1700	
1+1	2	40	20	_	1.7	230	350	OVR T2 1N 40-350 P QS	2CTB803982R1100	
1+1	2	40	20	-	1.7	230	350	OVR T2 1N 40-350 P TS QS	2CTB803982R0500	
3	2	40	20	-	1.5	230/400	350	OVR T2 3L 40-350 P QS	2CTB803883R2400	
3	2	40	20	-	1.5	230/400	350	OVR T2 3L 40-350 P TS QS	2CTB803883R2500	
3+1	2	40	20	-	1.7	230/400	350	OVR T2 3N 40-350 P QS	2CTB803983R1100	
3+1	2	40	20	-	1.7	230/400	350	OVR T2 3N 40-350 P TS QS	2CTB803983R0500	
Neutral						,				
1	2	80	30	0.1	1.4	230	350	OVR T2 N 80-350 P QS	2CTB803983R1900	
Cartridge	es							·		
1	2	80	30	0.1	1.4	230	350	OVR T2 N 80-350 C QS	2CTB803886R0000	
1	2	40	20	-	1.5	230	350	OVR T2 40-350 C QS	2CTB803886R1000	
Uc 440V										
1	2	40	20	-	1.8	400	440	OVR T2 40-440 P QS	2CTB803871R1200	
1	2	40	20	-	1.8	400	440	OVR T2 40-440 P TS QS	2CTB803871R0500	
3	2	40	20	-	1.8	400/690	440	OVR T2 3L 40-440 P TS QS	2CTB803873R2700	
4	2	40	20	-	1.8	400/690	440	OVR T2 4L 40-440 P QS	2CTB803873R5100	
4	2	40	20	-	1.8	400/690	440	OVR T2 4L 40-440 P TS QS	2CTB803873R5300	
3+1	2	40	20	-	2.1	400/690	440	OVR T2 3N 40-440 P QS	2CTB803973R1400	
3+1	2	40	20	-	2.1	400/690	440	OVR T2 3N 40-440 P TS QS	2CTB803973R1500	
3	2	40	20	-	1.8	400/690	440	OVR T2 3L 40-440 P QS	2CTB803873R2800	
1	2	40	20	-	1.8	400	440	OVR T2 40-440s P TS QS	2CTB815704R2900	
3+1	2	40	20	-	1.8	400/690	440	OVR T2 3N 40-440s P TS QS	2CTB815704R3700	
1	2	40	20	-	1.8	400	440	OVR T2 40-440s P QS	2CTB815704R4100	
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s P TS QS	2CTB815708R2900	
3	6.25	80	20	-	1.8	400/690	440	OVR T2 3L 80-440s P TS QS	2CTB815708R3500	
3+1	6.25	80	20	-	1.8	400/690	440	OVR T2 3N 80-440s P TS QS	2CTB815708R3700	
4	6.25	80	20	-	1.8	400/690	440	OVR T2 4L 80-440s P TS QS	2CTB815708R4000	
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s P QS	2CTB815708R4100	
3	6.25	80	20	-	1.8	400/690	440	OVR T2 3L 80-440s P QS	2CTB815708R4700	
3+1	6.25	80	20	-	1.8	400/690	440	OVR T2 3N 80-440s P QS	2CTB815708R4900	
4	6.25	80	20	-	1.8	400/690	440	OVR T2 4L 80-440s P QS	2CTB815708R5200	
1+1	2	40	20	-	1.9	400	440	OVR T2 1N 40-440 P TS QS	2CTB803972R1400	

Pro- tected lines	Impulse current	Max. dis- charge current	Nominal current	Follow current interrupt- ing rating	Voltage protec- tion level	tec- voltage	Max. cont. op- erating voltage Uc	Order details		
	limp 10/350	lmax 8/20	In	Ifi	Up					
	kA	kA	kA	kA	kV	V	V	Type code	Order code	
Neutral										
1	6.25	80	30	0.1	2	400	440	OVR T2 N 80-440s P QS	2CTB815708R5400	
1	2	80	30	0.1	1.4	400	440	OVR T2-T3 N 80-440 P QS	2CTB803973R2000	
Cartridg	es		,		,					
1	2	80	20	-	1.8	400	440	OVR T2 40-440 C QS	2CTB803876R0400	
1	2	40	20	-	1.8	400	440	OVR T2-T3 40-440s C QS	2CTB815704R5500	
1	6.25	80	20	-	1.8	400	440	OVR T2 80-440s C QS	2CTB815708R5500	
1	6.25	80	30	-	1.4	400	440	OVR T2-T3 N 80-440 C QS	2CTB803886R0100	
1	6.25	80	30	-	2	400	440	OVR T2 N 80-440s C QS	2CTB815708R5700	
Type Ta	2-T3 OVR I	Pluggable	2							
Uc 275V		33.								
1	2	20	5	-	0.9	230	275	OVR T2-T3 20-275 P QS	2CTB803871R2400	
1	2	20	5	-	0.9	230	275	OVR T2-T3 20-275 P TS QS	2CTB803871R2500	
1+1	2	20	5	-	1.4	230	275	OVR T2-T3 1N 20-275 P QS	2CTB803972R1200	
1+1	2	20	5	-	1.4	230	275	OVR T2-T3 1N 20-275 P TS QS	2CTB803972R1300	
3	2	20	5	-	0.85	230/400	275	OVR T2-T3 3L 20-275 P QS	2CTB803873R3400	
3	2	20	5	-	0.85	230/400	275	OVR T2-T3 3L 20-275 P TS QS	2CTB803873R3500	
3+1	2	20	5	-	1.4	230/400	275	OVR T2-T3 3N 20-275 P QS	2CTB803973R1200	
3+1	2	20	5	-	1.4	230/400	275	OVR T2-T3 3N 20-275 P TS QS	2CTB803973R1600	
Neutral										
1	-	80	30	0.1	1.4	230	275	OVR T2-T3 N 80-275 P QS	2CTB803973R1900	
Cartridg	es									
1	-	20	5	-	1.4	230	275	OVR T2 20-275 C QS	2CTB803876R1200	
1	-	80	30	-	1.4	230	275	OVR T2-T3 N 80-275 C QS	2CTB803876R0000	
Uc 440V										
1	2	20	5	-	1.4	400	440	OVR T2-T3 20-440 P QS	2CTB803871R1100	
1	2	20	5	-	1.4	400	440	OVR T2-T3 20-440 P TS QS	2CTB803871R1300	
3+1	2	20	5	-	1.4	400/690	440	OVR T2-T3 3N 20-440 P QS	2CTB803973R1300	
Neutral							-			
1		80	30	0.1	1.4	400	440	OVR T2-T3 N 80-440 P QS	2CTB803973R2000	
Cartridg	es	-								
1	-	80	5	-	1.4	400	440	OVR T2 20-440 C QS	2CTB803876R0600	
1	-	80	30	-	1.4	400	440	OVR T2-T3 N 80-440 C QS	2CTB803886R0100	

Protection and safety

OVR surge protective devices selection tables

Protected lines	Total Discharge Current	Impulse current	Max. discharge current	Nominal current	Short-cir- cuit current rating	Voltage protection level	Nominal voltage	Max. cont. operating voltage	Order details		
	Itotal 10/350	limp 10/350	lmax 8/20	In	Iscpv	Up	Un	Uc			
	kA	kA	kA	kA	Α	kV	V	V	Type code	Order code	
Type T1-T2 OVR pluggable PV application											
Uc 1100 V DC											
1+1 DC	5	5	40	20	11.000	3.8	1000	1100	OVR PV T1-T2 5-1000 P QS	2CTB812050R1000	
1+1 DC	5	5	40	20	11.000	3.8	1000	1100	OVR PV T1-T2 5-1000 P TS QS	2CTB812051R1000	
1+1 DC	6,25	12.5	40	20	11.000	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P QS	2CTB812120R1000	
1+1 DC	6,25	12.5	40	20	11.000	3.8	1000	1100	OVR PV T1-T2 12.5-1000 P TS QS	2CTB812121R1000	
Cartridge	s										
1+1 DC	5	5	40	20	11.000	-	1000	1100	OVR PV T1-T2 5-1000 C QS	2CTB812052R1000	
1+1 DC	6,25	6,25	40	20	11.000	-	1000	1100	OVR PV T1-T2 12.5-1000 C QS	2CTB812122R1000	
1+1 DC	6,25	6,25	40	20	11.000	-	1000	1100	OVR PV T1-T2 12.5-1000 M C QS	2CTB812122R1001	
Uc 1500 V	DC										
1+1 DC	5	5	30	20	11.000	5	1500	1500	OVR PV T1-T2 5-1500 P QS	2CTB812050R1500	
1+1 DC	5	5	30	20	11.000	5	1500	1500	OVR PV T1-T2 5-1500 P TS QS	2CTB812051R1500	
1+1 DC	5	10	30	20	11.000	5	1500	1500	OVR PV T1-T2 10-1500 P QS	2CTB812100R1500	
1+1 DC	5	10	30	20	11.000	5	1500	1500	OVR PV T1-T2 10-1500 P TS QS	2CTB812101R1500	
Cartridge	s										
1+1 DC	5	5	30	20	11.000	-	1500	1500	OVR PV T1-T2 5-1500 C QS	2CTB812052R1500	
1+1 DC	5	5	30	20	11.000	-	1500	1500	OVR PV T1-T2 10-1500 C QS	2CTB812102R1500	
1+1 DC	5	5	30	20	11.000	-	1500	1500	OVR PV T1-T2 10-1500 M C QS	2CTB812102R1501	

Protection and safety

OVR surge protective devices selection tables

Protected lines	Impulse current	Max. discharge current	Nominal current	Short-circuit current rating	Voltage protec- tion level	Nominal voltage	Max. cont. operating voltage	Order details	
	limp 10/350	lmax 8/20	In	Iscpv	Up	Un	Uc		
	kA	kA	kA	Α	kV	V	V	Type code	Order code
Type 2 O	VR plug	gable PV a	pplication	ons					,
Uc 1000 V	DC								
1+1 DC	-	40	20	10.000	4	1000	1000	OVR PV T2 40-1000 P	2CTB802400R1000
1+1 DC	-	40	20	10.000	4	1000	1000	OVR PV T2 40-1000 P TS	2CTB802401R1000
Cartridge	s								
1+1 DC	-	40	20	10.000	-	1000	1000	OVR PV T2 40-1000 C	2CTB802402R1000
Uc 1500 V	DC								
1+1 DC	-	40	15	10.000	5	1500	1500	OVR PV T2 40-1500 P	2CTB802400R1500
1+1 DC	-	40	10	10.000	5	1500	1500	OVR PV T2 40-1500 P TS	2CTB802401R1500
Cartridge	s								
1+1 DC	2	40	10	10.000	-	1500	1500	OVR PV T2 40-1500 C	2CTB802402R1500



OVR PV T2 40-1000 P TS

The new ABB OVR data and telecom SPD range overview

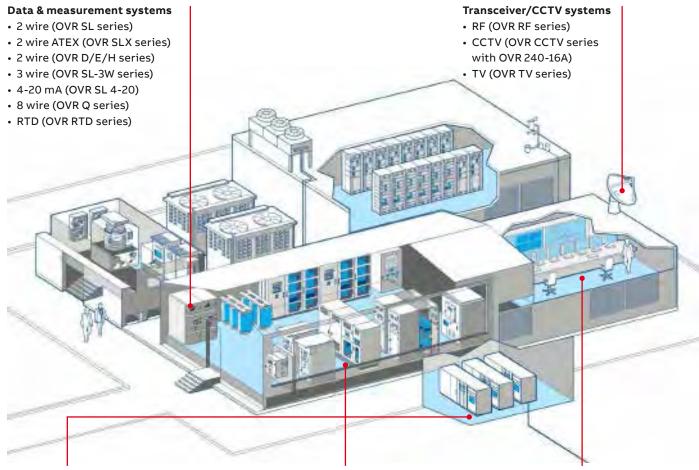
Protecting critical electronic systems

The new ABB OVR data/telecom range of SPDs are designed to protect equipment connected to data and telephone lines to complement the OVR power SPD products and offer a complete system protection solution (power & data) against surges. The comprehensive range includes protection for twisted pair data lines (including hazardous environments), computer networks, telecom systems including PBX and ISDN, CCTV, TV and RF systems.

To protect the electronic equipment inside a building, all cables that enter or leave the building must be protected.

Cables leaving the building can also provide a route back into the building for transients.





Mains power supply

• See OVR power SPD series

Telecom systems

- PBX (OVR KT series)
- RJ11 (OVR TN series)
- RJ45 (OVR ISDN series)

• 2 wire (OVR TN, OVR SLTN)

• 8 wire (OVR TNQ)

Information technology systems

- Cat 6 + PoE (OVR Cat-6 series)
- Cat 6 + PoE (OVR Cat-6 Series
- (OVR Cat-5e series)
 RS485/HART/Profibus
 (OVR RS485 series)

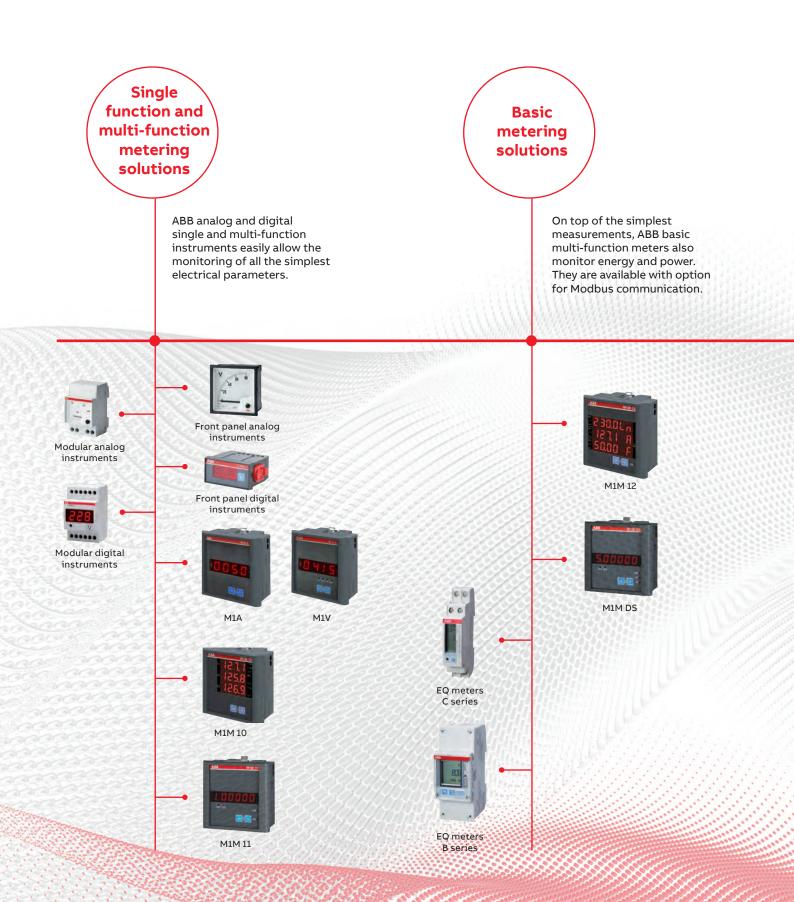
Protection and safety

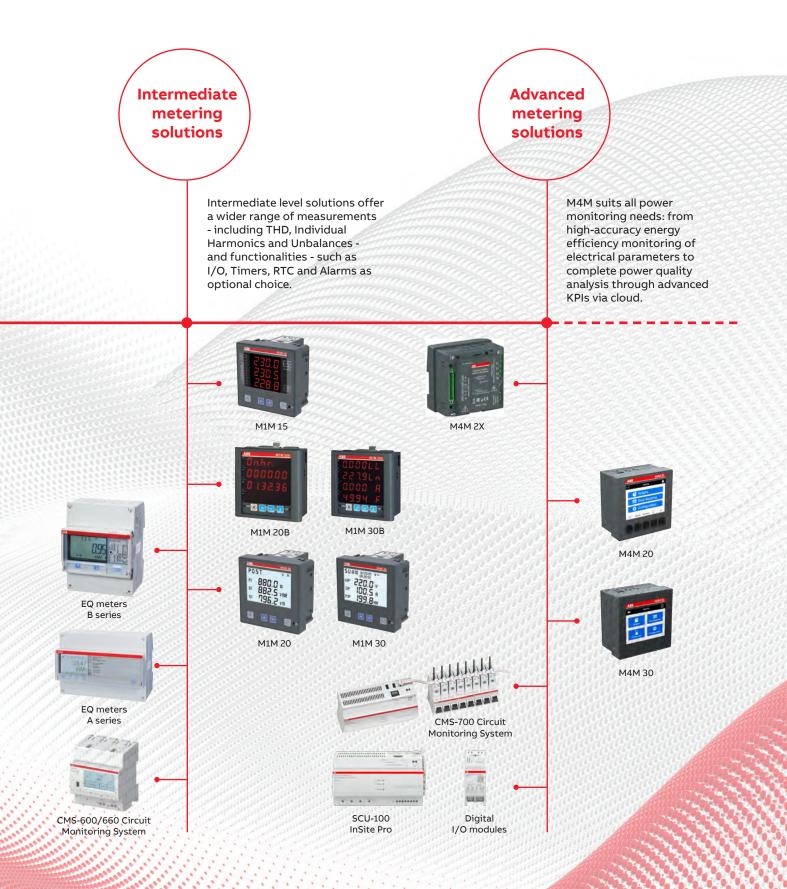
Short Selection Guide - Surge Protection Devices OVR



ABB Energy Efficiency Portfolio

Metering solutions from basic to advanced

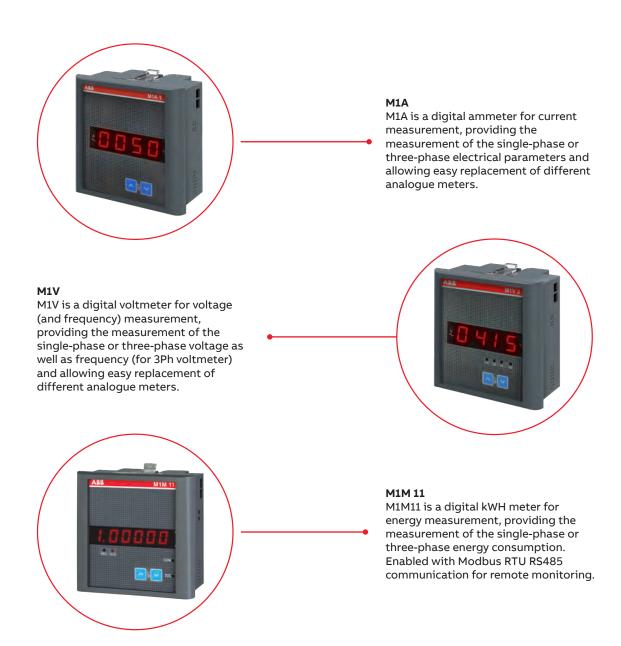




Explore the new single function, multi-function and dual source meters range for basic monitoring applications inside both commercial buildings and industries.

M1A M1V and M1M 11

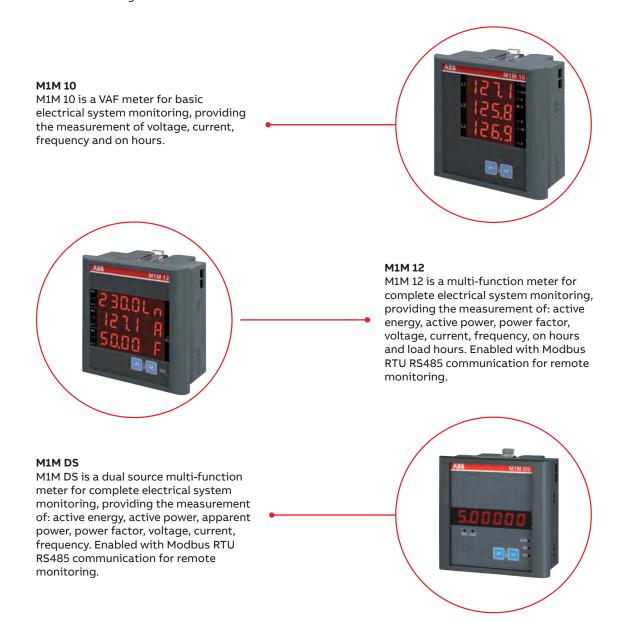
The M1 series is a single phase and three-phase digital panel meter for reliable and accurate true-RMS measurement of electrical parameters - voltage, current and energy for building, commercial and industrial applications.



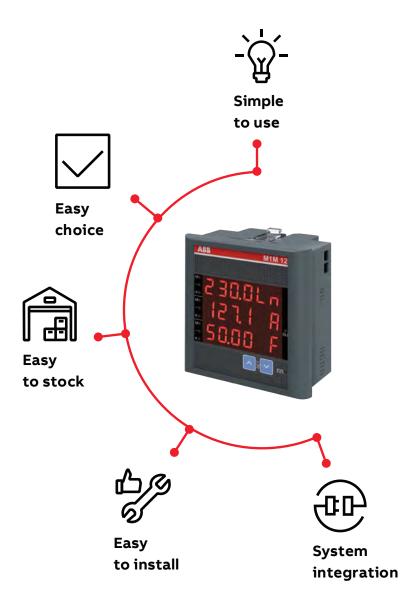
Easily replace the different analogue meters in sub-distribution switchboards using a single M1M; making stand-alone metering simple.

M1M 10, M1M 12 and M1M DS

M1M 10, M1M 12 and M1M DS offer exactly what is basically needed to monitor in an electrical system. Thanks to True RMS measurement of the main parameters, both average and per phase measurement suitable for Star, Delta or 1-phase systems can be easily measured. M1M allow quick stand-alone metering of the 3 different phases, as well as statistical metering of active energy consumptions along with dual source monitoring.



Making difference with M1M range of meters in sub-distribution switchboards.





Commercial buildings



Industrial plants



Public buildings

Value proposition

Simple to use

- Intuitive visualization of the parameters on the bright LED display
- Enhanced clarity in data reading and device configuration

Easy choice

Maximum 2 steps to select the correct product for your application

Easy to install and stock

- Compact product design and optimized volumetric weight of packaging
- No tools required for product mounting thanks to mounting clips

System integration

 Remote monitoring in any Modbus RTU supervision system, thanks to the optional RS485 port



M1M DS

Your benefits



For distributors

- Save space needed for internal stock
- Fast selection of the correct product for your orders
- Handle a minimum set of order codes



For panel builders

- Reduce the time needed for meter installation on the panel
- Fast selection of the correct product for your application
- Increase the number of projects covered with the same product



M1M Power Meters

Introducing the new ABB power meters ranges M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30, an easy solution for any standard application in buildings and industry.

M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 are the new ABB ranges of power meters, offering exactly what is needed to monitor the electrical system and analyze the power quality in a single device.

The new M1M power meters allow to easily and cost-effectively cover the main sub-metering and power quality monitoring requirements in commercial and industrial buildings, either small or mid/large-sized, e.g. inside power factor correction boards, motor control center or sub-distribution switchboards.

ABB's complete multi-function meters product line, now including M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30 ranges, are capable to cover all needs, from basic electrical parameters measurement to advanced power quality analysis.

ABB's power meters are simple to use, with a common and intuitive user experience from installation to operations, allowing to fully exploit the reliable, IEC-compliant measurements.

Thanks to their connectivity capabilities, M1M can get leverage on the integration in ABB scalable energy and asset management solutions to monitor, optimize and control the complete electrical system, such as System pro M compact[®] InSite and ABB Ability™ Energy and Asset Manager cloud-computing platform.



Commercial buildings



Industrial plants



Public buildings











M1M 15 M1M 20B M1M 30B M1M 20 M1M 30



Explore the new ranges

Five new different M1M product families M1M 15, M1M 20B, M1M 30B, M1M 20 and M1M 30, have been commonly designed in order to perfectly fit in a scalable way any monitoring need, with high focus on intuitiveness, quality and common user experience. All M1M power meters are compliant to IEC 61557-12 power metering and monitoring devices (PMD) standard, ensuring reliability of all electrical parameters and power quality KPIs measurements.

M1M 15

M1M 15 is a LED display complete multi-function meter for electrical system monitoring, mainly targeting measurement of basic electrical parameters and applications for cost allocation of energy consumptions.

M1M 20B

M1M 20B is a LED display power meter including THD and import/ export

(4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.





M1M 15 M1M 20B



M1M 30B

M1M 30B is a LED display power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.

M1M 20

M1M 20 is a LCD display power meter including THD and import/export (4 quadrants) measurement for basic power quality analysis applications such as power factor management and local energy generation monitoring.

M1M 30

M1M 30 is a LCD display power meter providing complete features in terms of power quality analysis such as measurement up to 40th harmonic and internal memory for datalogging, allowing to target e.g. demand management applications.







The complete M1M range, offering all the measurement features required for basic power quality monitoring and submetering in a single power meter; making measurement simple.



ABB meters to cover all needs

Select in maximum two steps, the right and most competitive power meter to cover all basic electrical system measurement needs. Thanks to integrated functionalities and communication protocols, the same product version fits an increased number of projects and wide applications range.



Easy to use

Common user experience

Common and intuitive menu structure all over the different ranges on clear and large backlit LCD/ LED displays, helping to reduce the time needed to operate the power meters. Feedback on correct operations and quick reactivity on the system events are ensured by alarms icons and frontal LEDs on all product versions.





Optimized installation process

Compact power meters, ensuring a very limited footprint inside the panel, provide a common, vertical disposition of the terminals for easy wiring of cables directly from the sides. No special tool is required for product mounting thanks to mounting clips.



Reliable and accurate measurement

Complete set of measurement functionalities, from multi-function meters to intermediate power meters, compliant with accuracy standard IEC 61557-12 to allow improving energy efficiency of the electrical system. Remote communication on main communication protocol, Modbus RTU and Modbus TCP/IP.



Your benefits

For distributors

- Reduce selection time of the correct product thanks to reduced range complexity
- Manage a limited number of order codes from
- · A single supplier
- Save space needed for internal stock
- Have the product on stock when needed and reduce delivery time

For panel builders

- One supplier only for all measurement products covering wide range of projects
- Increase competitiveness in projects
- Reduce time needed for product selection thanks to simple range composition
- Reduce time for installation and operations
- Minimum space requirements in the panel

M4M Network Analyzers

Discover the benefits

M4M as a stand-alone network analyzer guarantees all power monitoring needs in the energy distribution system: from high-accuracy energy efficiency monitoring of electrical parameters to complete power quality analysis. Thanks to its connectivity capabilities, M4M can get leverage on the integration in ABB scalable energy and asset management solutions. Thanks to MID certification, M4M allows now to fulfill all legal requirements for accounting and energy acquisition.



-50% Time for integration in the ABB turnkey solution

Full connectivity

Natively integrated in sub-distribution management System pro M compact® InSite and ABB Ability™ Energy and Asset Manager cloud-solution, M4M benefits from the scalability of the ABB digital solutions: from stand-alone visualization and commissioning to monitoring, optimization and control of the complete electrical system.



Reliable and accurate power monitoring

Energy efficiency

ABB's M4M range of network analyzers gathers data from the electrical system and provides a complete power quality analysis and high accuracy energy monitoring.

MID certification available to ensure certified and tamper-proof measurement for billing applications and fulfilment of legal requirements for accounting and energy acquisition.



-40% Time for installation and commissioning

Simple and Intuitive

M4M makes configuration and operations simple and fast, from easy installation and wiring thanks to compact dimensions, all-removable terminals and Rogowski coils, to intuitive use and data access thanks to touchscreen color display, mobile APP and desktop software.



Improve reactivity and reduce uncoordinated maintenance

Realtime supervision

M4M network analyzers make information easy to access from any area of the system, providing a comprehensive range of accurate data and notifications that enhance reactivity to the events on the electrical system and allowing to avoid overloads, outages and Un-Un-coordinated maintenance.



Full Connectivity

Cloud-based power monitoring

Connectivity-based solutions increase awareness of resources and process behaviors: asset management can then be optimized through the control and monitoring of operations and costs.

M4M network analyzers ranges allow full connectivity and easy integration of sub-metering and power quality monitoring features, thanks to a complete set of communication protocols, matching

high-accuracy standard requirements. M4M exploits the scalability of the ABB solution, from stand-alone visualization and commissioning via HMI or EPiC mobile APP and desktop software, to monitoring, optimization and control of the complete electrical system via ABB AbilityTM.

At ABB, we leverage internet of things' devices to drive digital transformation of buildings, by providing a scalable portfolio for energy and asset management.



Propose a single solution to optimize costs and energy needs, thanks to M4M, which is automatically integrated in System pro M compact® InSite and ABB Ability™ Energy and Asset Manager cloud-solution, enabling real-time monitoring widgets, historical trend

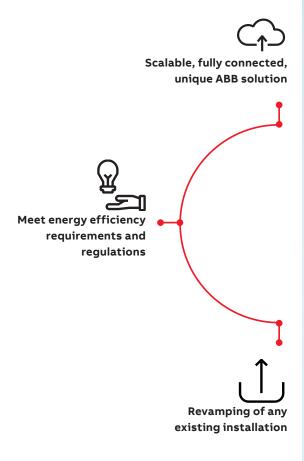


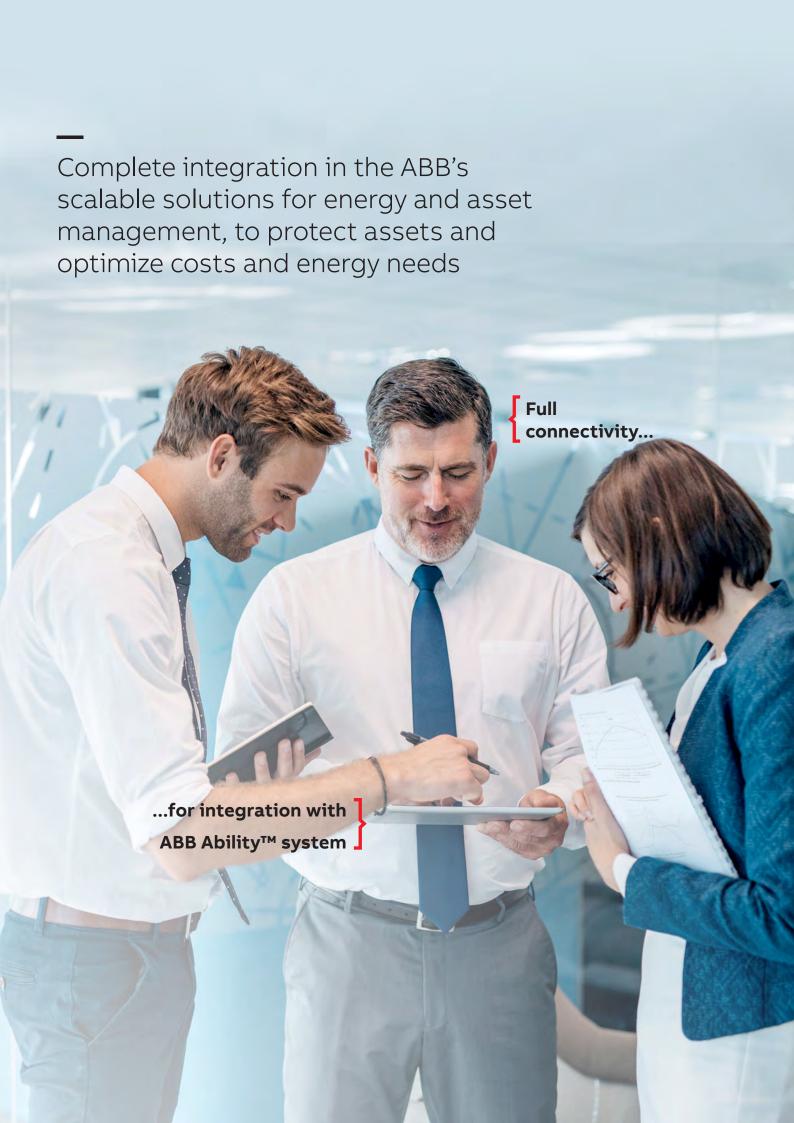
analysis and power quality reporting.

Propose projects compliant with energy efficiency regulations. High-accuracy network analyzers class 0,5 according to IEC 61557-12, connecting to the cloud complete set of electrical parameters and power quality KPIs: from THD to individual harmonics.



Rogowski coil acceptance to integrate measurement functionalities and power quality analysis in any existing installation, easily transmitted to the cloud also in brownfield projects.





Simple and intuitive

Setting up a new benchmark

Thanks to its great user experience design, every user can become familiar with and competent in using the device at the very first contact.

M4M network analyzers reduce installation and commissioning time by up to 40%, thanks to easier configuration and simpler operations.

Easy installation and wiring are ensured by compact dimensions, all-removable terminals and Rogowski coils, while touchscreen color display and mobile APP integration increase the intuitiveness of use.

M4M network analyzers represent the new benchmark in terms of easiness of use and intuitiveness, throughout the whole device lifecycle.



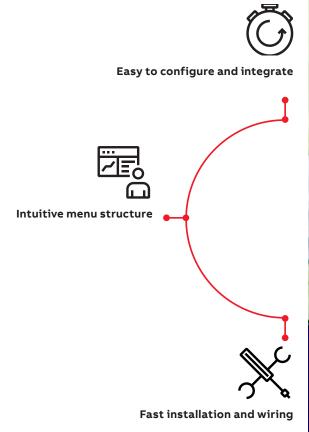
Smart commissioning both locally and remotely, via mobile app and desktop software, thanks to Bluetooth and embedded communication protocols, allowing to copy-paste the configuration of several devices and to simply integrate products in the system.



Touchscreen color graphic display and easy-to access app-structured menu make network analyzers' configuration and operation simple and quick, with interactive pop-ups and complete notifications.



All-removable terminals with vertical disposition allow fast installation and wiring of the compact 57mm-wide M4M, suitable for installation in any panel. Rogowski coils enable faster CT cabling with zero downtime.





Energy efficiency

Power from data

Buildings are responsible for 36% of global final energy consumption and nearly 40% of total direct and indirect CO2 emissions, as reported by International Energy Agency.

Building owners and engineers need to re-design electrical network of their facilities and buildings in order to considerably reduce unnecessary energy use and achieve better efficiency.
M4M can easily be integrated in the System pro M
compact® InSite for sub-distribution
management and ABB Ability™ Energy and Asset
Manager cloud-solution, providing a unique,
turnkey solution for monitoring, optimization and
control of the electrical system, from protection
to measurement, from field measurements to
services.

M4M network analyzers provide a complete set of measurements and KPIs needed to set up a high-quality and effective energy management strategy.



Get a turnkey solution with System pro M compact® InSite for sub-distribution managment and ABB Ability™ Energy and Asset Manager cloud-solution, enabling access to data collected from electrical distribution system, including power metering data from M4M, for

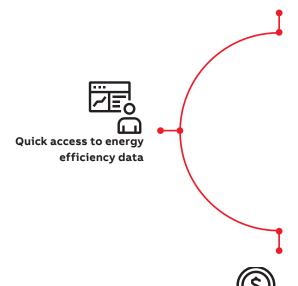


Monitor, optimize and contro

Reduce energy wastage



straightforward benchmark analysis. Increase efficiency by avoiding penalties from utility, thanks to the high reliability of measurement, compliant with main IEC accuracy standard. Datalogging of 1-year historical data, including max demand, load profiles and energy.





MID certification, allowing fiscal billing and ensuring certified and tamper-proof measurement for fulfilment of legal requirements for accounting and energy acquisition.

Reduce time needed to understand data, from intuitive stand-alone product interface to the complete energy management system.



Real-time supervision

Taking informed actions

From 5 to 20% of production inefficiency is caused by downtime. A research conducted by <u>Aberdeen</u> reported the cost per hour of an unplanned downtime can cost up to \$8,600.

M4M allows you to improve reactivity to any event on the electrical system in order to avoid overloads, outages and un-coordinated maintenance. Collected data and user-defined alarms can flow into a remote system via embedded communication protocols (Modbus RTU, Modbus TCP/IP, Profibus DP-VO, BACnet/IP), making them easy to access from any area of the system.

M4M network analyzers support facility managers and building owners to keep under control the electrical system performances.



Alarms can be linked with user-defined logics to a complete set of power quality KPIs, acting on the system via embedded programmable I/O.

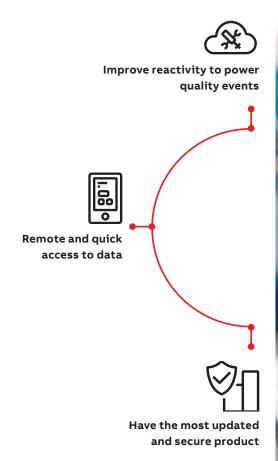
Measurement of neutral line and calculation of ground current to avoid overloads and outages.



Remote and quick access to measured parameters, notifications and user-defined alarms from any area of the system through a smartphone, a tablet or a PC thanks to Bluetooth and embedded communication protocols, making maintenance faster.



Remote FW upgrade of M4M can be easily done via Ekip Connect software without any impact on operations, guaranteeing to have the most updated and the most secure device, at any time.





Explore the M4M ranges

M4M network analyzers are available in different versions, which ensure all power monitoring needs, from basic to more complete power quality analysis.



EQUIPPED WITH GRAPHIC COLOR DISPLAY AND 5 PUSHBUTTONS KEYBOARD, M4M 20 RANGE ALLOWS COMPLETE MONITORING AND BASIC POWER QUALITY ANALYSIS.



EQUIPPED WITH TOUCHSCREEN COLOR DISPLAY, M4M 30 RANGE ALLOWS COMPLETE POWER QUALITY ANALYSIS AND ENERGY EFFICIENCY EVALUATIONS.



M4M 2X ON DIN-RAIL WITHOUT DISPLAY, ENSURING HIGH FLEXIBILITY TO PROJECT SPECIFICATIONS, COMPARED TO STANDARD NETWORK ANALYZERS.

MID-certification

Availability of MID approval to ensure certified and tamper-proof measurement for billing applications.

Graphic color display

M4M 20 and M4M 30 are equipped with a graphic color display and common app-based menu for an intuitive visualization.

Bluetooth-enabled

All M4M network analyzers are equipped with Bluetooth module for smart commissioning via mobile app.

Full communication

A complete set of embedded communication protocols, including Modbus RTU, Modbus TCP/IP, Profibus DP-V0 and BACnet/IP

Input/Output

Control on the system thanks to I/O options including digital outputs, programmable I/O or programmable analogue outputs.

Datalogger

Data logging features are available, from complete notification logs to flash memory and RTC for 1-year data logging of trends.

Rogowski version

M4M Rogowski versions are compatible with ABB's R4M Rogowski coils for easy retrofit in existing installations.







01 M4M Homepage

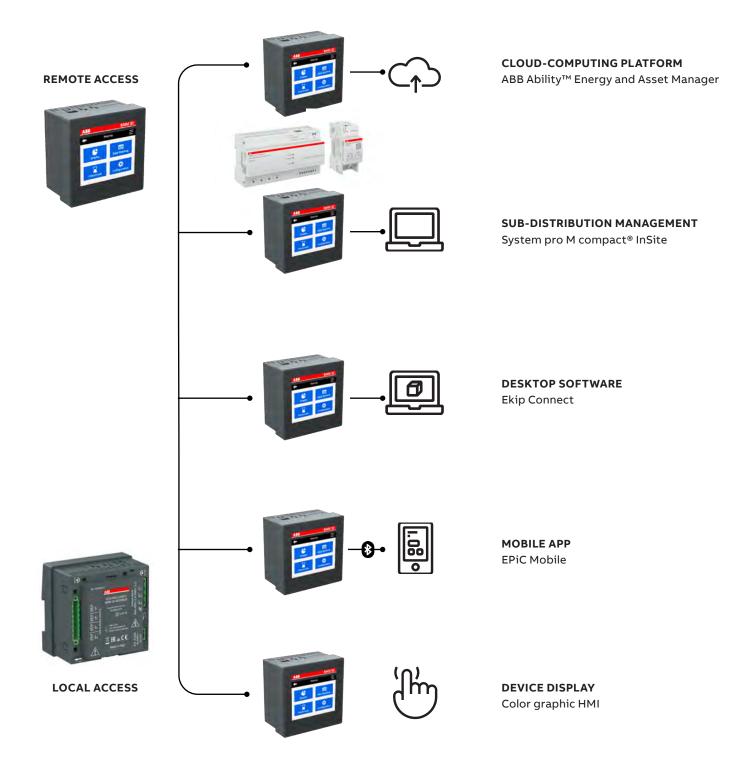
02 Trending graphs of load profiles

03 R4M Rogowski coils

04 M4M with MID certification

Access to M4M network analyzers

M4M network analyzers offer the strongest scalability to access the measurement data, from color graphic display to smartphone app and desktop software, up to webserver and cloud-platform when integrated in the ABB digital solutions.



Explore the EQ meters

Information is the key

Energy consumption awareness is key to reduce energy costs and improve energy efficiency on your machines and electrical assets. Energy meters allow to identify areas for improvement and to generate benefits for owners, facility managers and users. They enable to run smarter buildings in a more energy and cost-efficient manner.

With Energy Meters, you can also split the bill received from the utility within different household thanks to the MID certification.

Sub-metering provides a detailed picture of the energy consumption and the specific areas where energy is used.

EQ meters have the following instrumentation values as a

- Active power
- Voltage
- Current
- · Power factor

Discover the full range of ABB products designed to monitor energy consumption and energy costs in residential, commercial and industrial buildings.



The A series

Is an advanced meter product range for installations up to 80 A direct connected or transformer connected both for current and voltage (CT/VT).



The B series

Is a basic meter product range for installations up to 65 A direct connected or transformer connected (CT).

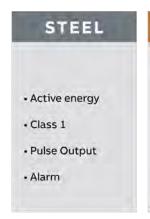


The C series

Are products, without communication, intended for stand-alone energy measurement up to 40 A direct connected.

Explore the EQ meters

Information is the key











Functionalities





Wide operating conditions:

- · -25° and +70° for C series
- -40° and +70° for B and A Series
- B21/B23 112-100 can work without derating at 4.000 meter altitude (AC Voltage test)

Environmental classification to MID:

- M2 for mechanical environment
- E2 for electromagnetic sification environment



Optimum interface

New versions can be integrated into ABB Ability $^{\text{TM}}$ EDCS thanks to plug & play technology.

Mbus and Modbus communication protocols are available



Complete offer

A vast offer of functionalities, such as:

- Apparent Energy Measurement
- Tariff Control, Import / Export energy...and many morel



Global availability

EQ meters meet different international standards:

- · MID approval
- · IEC approval for worldwide
- · GOST standards for Russia
- · METAS certification on reactive energy for Switzerland

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Beyond connected

Scalable and connected solutions

01
Connected sub
distribution board
installed in an office

O2 Sub distribution solutions architecture scheme Digitalization is changing the world of energy distribution making it safer, smarter and more sustainable.

A fundamental aspect of this is that technology is making it easier to collect useful data and to use it for analysis.

Connectivity based solutions increase awareness of resources and process behaviors: asset management can then be optimized through the control and monitoring of operations and costs.

It fosters a more conscious utilization of resources that improves energy efficiency and ali gns with challenging sustainability targets.

ABB's solutions for sub distribution protect, monitor, measure and eventually make your installation smart and fully connected.

With our scalable solutions any size of public, commercial or industrial building can easily be connected to the cloud or data can be acc essed via the web server.

Thanks to its flexibility, also existing installations can be easily revamped within a day and without replacing any existing components, reducing installation and configuration time nearly to zero, and in turn, minimizing operational downtime costs.

Once the system is installed and connected, the data collected on the intuitive web user interface can be used for a variety of needs, from reducing energy consumption to identifying potential risks for operational continuity.

Receiving customized alerts and config uring automatic actions are just some of the functionalities to optimize the management of energy and assets. Constant diagnostics and real time notifications ensure total transparency over how the electrical system is performing.

Compliance with highest energy efficiency standards and complete control over the total facility consumptions to save up to 2 0% of energy and reduce CO2 emissions by 15%. All that is guaranteed with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



ABB AbilityTM

ABB AbilityTM

ABB Connect Partner Hub
Configuration, specification
& collaboration

Sub distribution
board

DIN rail protection
& accessories

Digital Input/
Output signals

Control Unit
System pro M
compact® InSite

Con

Beyond connected

System overview



InSite web server



Cloud ABB Ability™

Easily access real time data on the InSite web server or via the cloud using ABB Ability™ Energy Manager cloud solution. Monitor and analyze data gathered from the electrical system in the applications or even on multiple sites. Control your sub distribution remotely, for instance by creating automated actions.



Energy & power meters

To perform full energy management in the electrical distribution, knowing the energy flow in the system is key. ABB's extensive portfolio of energy efficiency devices, including energy meters & network analyzers, is designed for every type of residential, commercial and industrial application. All the data can be gathered by System pro M compact InSite® automatically, connecting it to their embedded communication protocols.

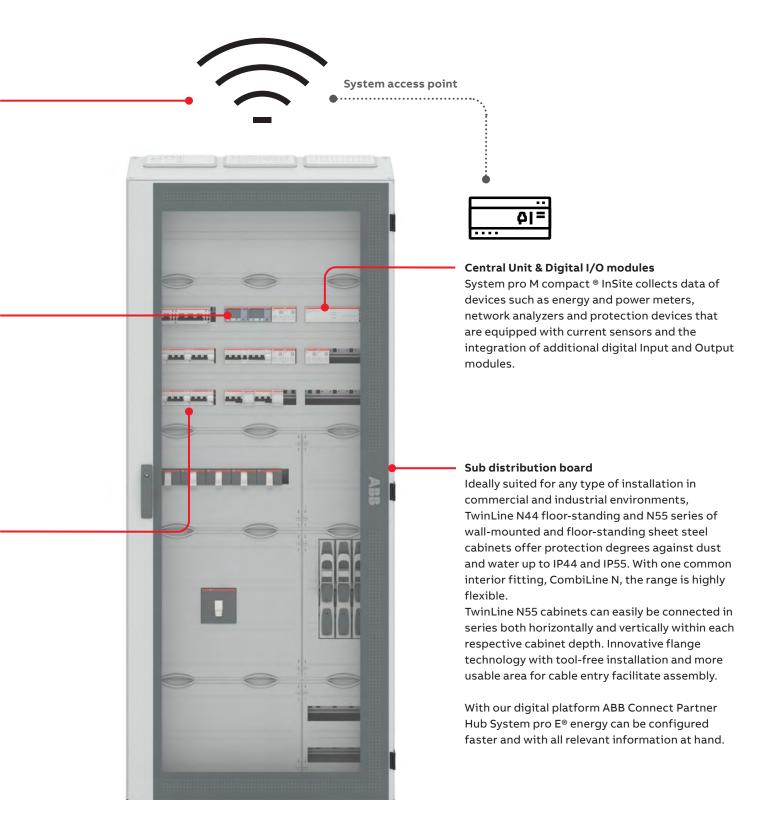


DIN rail protection devices & accessories

Complete protection can be achieved by the comprehensive ABB DIN rail protection portfolio including MCBs, RCDs, SPDs, AFDDs.

The offer is completed with a wide range of accessories: auxiliary and signal contacts, shunt trips, motor operating devices, and many more.

All the information coming from protection devices can be gathered in System Pro M compact® InSite through the digital input module, while through the digital output module it is possible to control the devices on the filed manually or through automated logics



Safe and reliable energy distribution

Find the perfect fit for every application

ABB's safe, smart and sustainable solutions for sub distribution are designed to improve energy and facility management in all types and sizes of commercial and industrial buildings.

Thanks to their scalability, our flexible and connected solutions can be tailored to businesses' specific requirements.

Small commercial buildings
 Existing installations of small shops, hotels, offices and restaurants with few panels can be easily upgraded with plug and play assembly.

Total transparency over the complete energy distribution system and utility consumption like gas and water improves energy management and reduces operational costs significantly.

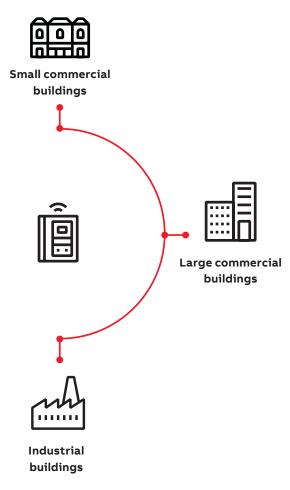
Large commercial buildings Office towers, mixed use commercial buildings, airports, shopping malls, hospitals or large hotels can be managed more efficiently.

Sub-metering and energy costs allocation of different occupiers, for instance single stores in a shopping mall, can be integrated with the collected sub distribution data into the local webserver or cloud platform that manages the overall site.

Industrial Buildings

Our scalable solutions ensure service continuity and predictive maintenance for forecasts developments, particularly in industrial areas where it is important to reduce or prevent unplanned outages and related costs, for example in food and beverage production lines.

Supervision systems or more complex installations that are already in place such as SCADA or BMS can easily be complemented.









Beyond connected, no matter the project stage

Whether you're retrofitting an old building, adding a new installation or any stage in between – we offer flexible and scalable solutions to save time in all stages of the design process.

Meet your needs for improving energy impact, reducing supervision costs and adding value to the structure.

Using safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- Scalable, fully connected solutions that can be implemented across all project stages
- Increased efficiency of electrical systems and compliance to highest energy efficiency standards to save up to 20% of energy and to cut CO2 emissions by 15%
- Replicable and easy configuration to save time comparing product features and select the right solution
- Updated and secured system thanks to FW update to ensure data security guaranteed by encrypted SNMP V3 and SSL certificate





Beyond connected, with simple and intuitive commissioning

Flexible assembly of sub distribution boards, optimized wiring and smooth coupling of devices to speed up the installation process.

Whether you're installing new systems, integrating electrical plants, or revamping pre-existing electrical systems - we offer scalable solutions that improve installation efficiency and save on time and costs without impacting the existing design configuration.

Discover how easy and effortless installation can be with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- Retrofit existing installations within one day with zero component replacement
- Quick assembly and easy installation
- Fast and error-free configuration thanks automatic recognition of installed devices, directly communicated to the system access points
- Connect the system to the cloud in only 10 minutes
- Configurations of similar systems can be transferred between one another



Beyond connected, always one step ahead of maintenance

Easily access data from wherever you are and effectively manage the consumption of your facility.

Whether it's an old building, a new building or at any stage in between – we offer simple solutions to save on time and costs through configurable automatic control to optimize facility and energy management.

Improve energy efficiency and increase the value of the facility by up to 5% while lowering maintenance and operational costs with ABB's safe, smart and sustainable solutions for sub distribution that go beyond connectivity.



- Monitor and check real-time or historical data from both protection and measurement devices online
- Customized alerts, automatic actions and easy access to data enabling early detection of potential issues and allowing fast reactions
- Guarantee continuous operations by proactively planning maintenance interventions to avoid unexpected downtime costs and improve the facility value by up to 5%
- Configure and program automatic actions to promptly react to selected events with no need of manual interventions and hence, optimize facility management
- Manage the consumption of the facility to reduce operational costs save up to 20% of energy

ABB Connect Partner Hub

Far more than a conventional website, with ABB Connect Partner Hub you can interact with ABB, improve your knowledge and collaborate with other professionals.

It helps to find product information, connects you directly to an online network of expert contacts and a range of digital services such as online training, project and plant management.



Create, design and collaborate in real time

Build a project to bring your designs to life with your partners and clients. Share documents with fellow collaborators, import BOM, view activities in real time and fast track your plans to implementation.



Share your feedback and ideas with us

We are curious to know your ideas. Leave your feedback and suggestions and help us improve our products and solutions.



Design and develop your solution, in one place

Create your own applications for the platform by making the development process simpler, produce tailored apps for each customer and integrate new features and provide added value for your clients.



InSite web server

Once you made your sub distribution board smart by installing System pro M compact® InSite you can connect it to the local network so data gathered by its control unit, digital I/O modules and current sensors can be accessed via the web server. Access to several pre-configured pages is provided automatically.

These allow you to monitor, compare and structure your real-time and historical data. Also, automatic actions can be set to react promptly to selected events.

In the InSite web server you will find the following structure:



Monitor

Access real-time data of all the devices available in the system (Control Unit, I/O modules, meters, etc.)



Control

Rename channels or switch them on or off remotely.



Analytics

Analyze data, access historical values, access alarms, export data of selected periods and compare products.



Configuration

Change the hierarchy of the devices, set alarms, create automated actions using if-then logics and thresholds.

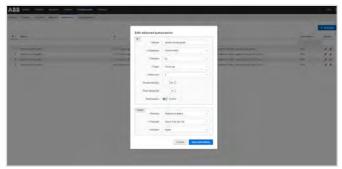


ABB Energy Management

ABB Ability™ Energy Manager

ABB Ability™ Energy and Asset Manager is the state-of-the-art cloud solution for monitoring, supervising and analyzing site equipment, as well as the site's electrical distribution system, resulting in improved performance, efficiency and safety. Through its scalable and flexible approach, ABB Ability™ Energy and Asset Manager ensures full-range integration of main electrical low- and medium-voltage equipment installed in the distribution and sub-distribution switchboards. With a single easy-to-use interface, ABB Ability™ Energy and Asset Manager assists the user by means of a cloud computing or hybrid platform, enabling analysis of relevant data and optimization of installation.



ABB Ability™ Energy and Asset Manager also provides access on a multi-site level, allowing you to monitor and compare the performance of different facilities at the same time. It allows profiling of users according to the level of access they require.

A new approach to energy and asset management
With an intuitive web app interface accessible via
smartphone, tablet or PC, ABB Ability™ Energy and Asset
Manager makes it simple to:

In addition, upgrades and changes can be organized at any time via the ABB Ability $^{\text{TM}}$ Marketplace. With just a click, the customer can customize their solution according to their needs anytime, anywhere.



Monitor

Oversee site performance, supervise the electrical system and allocate costs.



Explore

Visualize the system structure, verify assets health and get actionable insights following predictions and prescriptions.



Analyze

Schedule and analyze automatic data exports, improve the use of assets and make the right business decision.



Act

Set up alerts to notify key personnel while remotely implementing an effective efficiency strategy, managing maintenance activities and scheduling next actions.



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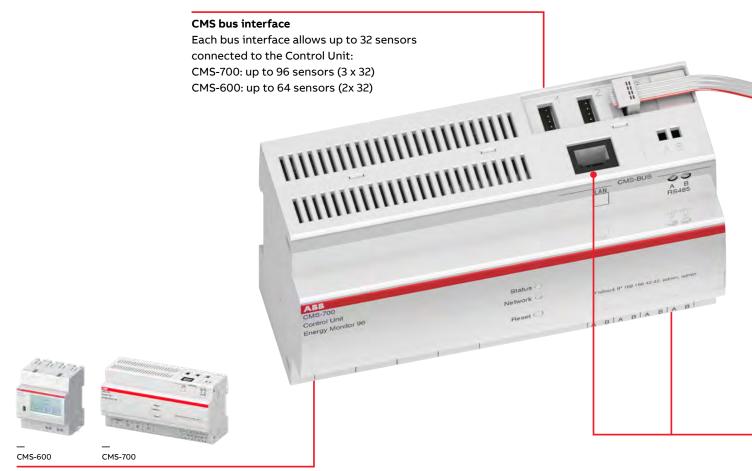
CMS System overview

Designed down to the finest detail

The quality of a measurement and monitoring system dependens on the strengths of the individual components and how well they interact. ABB's new CMS sets new and high standards.

Compactness, technology, measurement results, user friendliness and flexibility - every component and every feature of the CMS has been fully optimized in terms of practicality and functionality.

CMS-700 control unit in combination with open core CMS sensors



Control Unit

The control unit evaluates the measurement data picked up by the sensors, and makes it available via the provided interfaces.

Two different units are available depending on the application: CMS-600 and CMS-700.



Connection technology

Connecting the sensors to the control unit is extremely easy and requires no special tools. All sensors are connected to the control unit via a flexible flat cable and insulation piercing connectors. The positioning of sensors can be fully customized and placed where measurement is required.



Sensors

CMS sensors can be placed anywhere in the system, without any limitation. Easy initializing is guaranteed by the unique ID assigned to each sensors via Control Unit in just a few simple steps. All measurement functions are available right after commissioning.



Serial interfaces

Depending on the selected control unit, the following communication interfaces are available: RS485 (Modbus RTU), LAN (TCP/IP and Modbus TCP), SNMP v1/v2 and v3 encrypted.

The web server integrated in the CMS-700 makes it possible to display the values via any Internet browser and to automatically export the files (via e-mail or FTP server).

CMS-700 Control Unit

Plug & play energy monitoring

The CMS-700 control unit is the reliable solution for maximum transparency of energy consumption.

Using CMS-700 it is possible to measure and calculate electrical parameters from both the mains and the branches, in order to provide the most comprehensive set of information on the system.

A maximum of 3x32 sensors can be connected to the CMS-700, allowing to simultaneously obtain AC and DC current as well as active energy from up to 96 branches.

At the mains side, the control unit allows to access the complete set of measurement data.

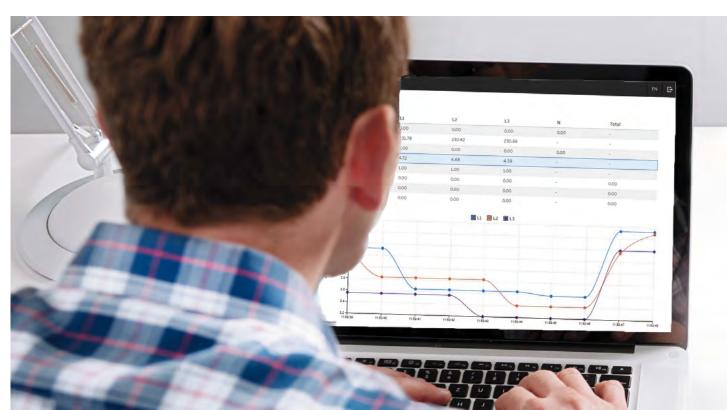
Complete set of embedded communication protocols is available to ensure smooth network

implementation: Modbus RTU, Modbus TCP/IP and SNMP, including encrypted SNMP v3 for utmost data security.

As well as helping in the identification of potential savings related to energy consumption, CMS-700 allows to detect risky situations before they lead to service interruptions or load failures, improving system reliability and supporting continuous operations.

Smart commissioning of the system is guaranteed thanks to the CMS-700 integrated webserver, with no need of any external software to put into operation the CMS system.

Energy monitoring using the CMS-700 web server interface





Access to CMS-700

Integrated web server

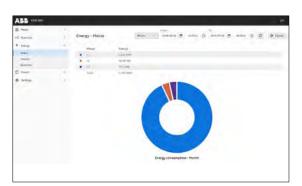
Thanks to the CMS-700 built-in web server, any web browser can be used to carry out the smart commissioning of the system, as well as easy visualization of online and historical measurement data.

Every parameter from both mains and branches can be visualized as instantaneous or historical value, with intuitive graphs that allow the user to quick analyze the measurement data. Data export to CSV files, mail or FTP is possible, according to user requirements.

The integrated alarm function can be fully managed via the webserver ensuring quick notification, via email or FTP, to unusual system status. This improves reactivity to potential issues and supports continuous operations. The whole commissioning phase of the CMS system can be carried out via the CMS-700 WebUI, from the sensor identification to the automatic data export settings. Moreover, the WebUI enables the FW update of the control unit at any time, ensuring to have the most advanced functionalities and the most secure device.









Access to CMS-700

ABB Ability™ Energy and Asset Manager

CMS-700 is automatically recognized in the ABB Ability™ Energy and Asset Manager, allowing the easy integration of its functionalities via the ABB Ability™ cloud.

To set up the network and cloud connectivity in a new installation – or to upgrade existing facilities – just "plug & play" modules or devices are needed. The cloud connection for the whole switchboard can be established via Emax 2, Tmax XT or Ekip UP equipped with Ekip Com Hub, or through EL Gateway with DIN-rail mounting module.

The ABB Ability™ Energy and Asset Manager is an innovative cloud-computing platform designed to make asset monitoring, control and optimization simple, gathering data from the devices installed in the power distribution system, including CMS-700.

The cloud-based platform also provides access on a multi-site level, simultaneously monitoring and comparing the performance of different facilities, as well as collecting and exporting data and historical trend analysis with on-demand queries or scheduled automatic reports.

Architecture with an ABB Ability™ Edge Industrial Gateway

And Albitory Edge-inducted gateway.

Hoditory SS-459

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Hoditory SS-459

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Architecture using the Ekip Com Hub internal module



02

CMS-600 Control Unit

Compact current monitoring

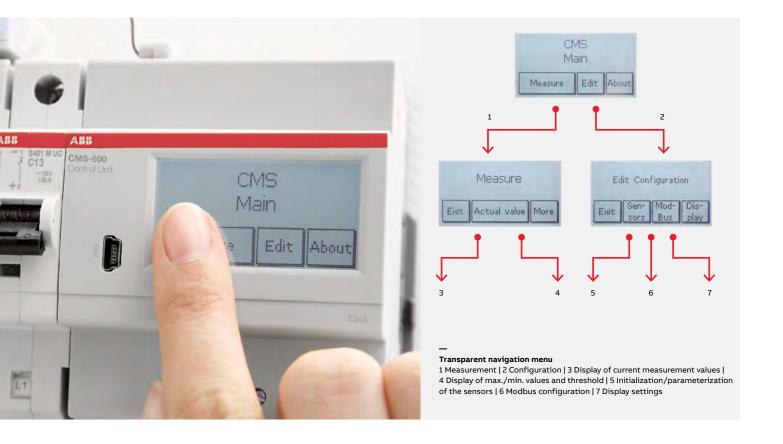
The CMS-600 control unit is the compact solution for professional monitoring of the currents of each individual line.

The CMS-600 is able to measure AC and DC currents of up to 64 branches. Up to 64 sensors can be installed on 2 independent lines to each control unit.

For quick and easy use, the control unit is equipped with an illuminated touch display that simplifies the parameterization and control of the sensors. RS485 Modbus RTU interface allows users to remotely query and process measurement data, making the CMS-600 control unit easy to be integrated into an existing Modbus architecture.

Easy navigation of CMS-600 is ensured by the highly intuitive touch screen display. It takes just a few clicks to access al the desired functions and menus. User does not require any special training neither for system commissioning nor for operation.

Ideal in simple monitoring applications, CMS-600 can be used to monitor current level of individual lines in order to easily detect load level and overload conditions.



CMS sensors

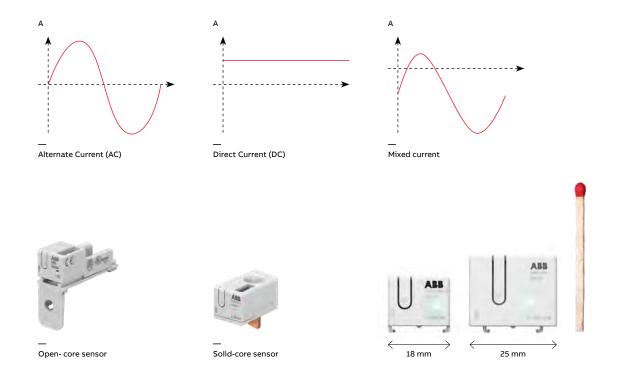
High-level performance in a tiny space

Available in 18 or 25mm versions, CMS sensors guarantee maximum performance with ultimate compactness.

* All accuracy specifications refer to the relevant full scale value and apply at 25° C. Reduced size, high performance: alternating (AC), continuous (DC) or mixed (TRMS) currents - CMS sensors detect and measure all types of currents up to 160A (TRMS).

Since each sensor is equipped with its own microprocessor for signal processing, the

measurement data is transmitted in digital format to the control unit via the bus interface. This minimizes the amount of cables required in the switchboards and maximizes the reliability of the measured value transmission.



Open-core sensors

The special U-shape form of the open-core sensors allows the retrofitting of existing installation, making sensors easy to adapt to different applications while keeping continuity of service. AC accuracy* of $\leq \pm 1,0$ % allows open-core sensors to be used in various monitoring applications.

Solid-core sensors

Available in 18mm and 25mm types, solid-core sensors offer AC measurement accuracy* of \leq ± 0.5%. This accuracy makes solid-core sensors suitable for all applications where high measurement precision is needed.

Maximum compatibility

Mounting flexibility for simple integration

Depending on the application, you can choose between two sets of sensors - one specifically designed for ABB installation devices, the other with an universal design to be installed on cables or DIN-rail.

Sensors for ABB devices





System pro M installation, SMISSLINE The sensors of the CMS-120LA and CMS-120FH series can be used for easy retrofit installation on S200 MCBs, SMISSLINE devices and E90 fuseholders (1000VDC).





Mounting on S800 devices

The sensors of the CMS-100S8 and CMS-200S8 series can be mounted on all S800 highperformance switches with cage terminals.



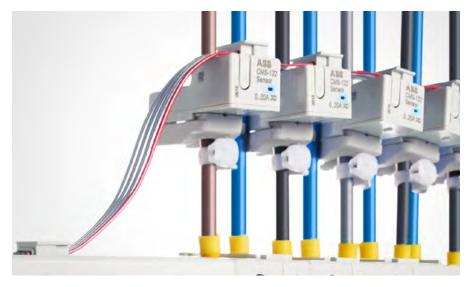
Universal sensors





Mounting on DIN-Rail The sensors of the CMS-120DR, CMS-100DR and CMS-200DR series are installed directly on a DIN rail using an enclosed adapter.





on the cable If space is a problem, the sensors of the CMS-120CA series, CMS-CMS100CA and 200CA can be fixed directly on the cable to be measured using clamps (not supplied).

System pro M compact® InSite

Connected solution for sub-distribution

System pro M compact® InSite is a range of connected devices to support energy and asset management in electrical distribution.

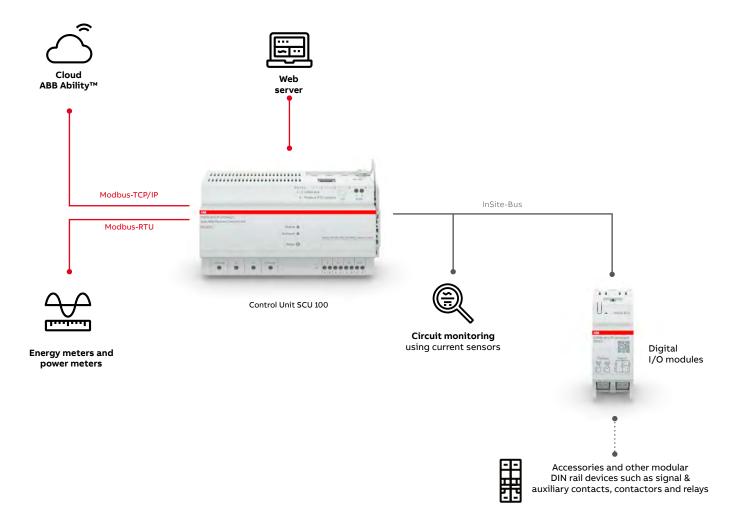
The solution delivers highest data security standards (encrypted SNMP V3 and SSL certificate) as well as continuous upgrades thanks to regular firmware updates. Central to the System pro M® InSite range is the SCU100 control unit, that has been specifically developed to allow users to better manage energy and assets in sub distribution boards. It can gather data from up to 16 energy and power meters, as well current sensors for branch measurement.

ABB's ready-made, pre-assembled InSite kit packages are designed to make sub and final electrical distribution smarter with minimal effort. Any size of installation in commercial or industrial application can easily be upgraded,

reducing installation and configuration time to nearly zero, and in turn, minimize costly operational downtime.

To enable monitoring and control of the complete energy distribution system, the range is completed with a flexible choice of input and output modules, which can be easily connected to ABB's System pro M compact® accessories of MCBs and RCDs, as well as other DIN-Rail products with digital inputs or outputs. They can also be connected to pulse meters – such as gas or water – to collect utilities consumption.

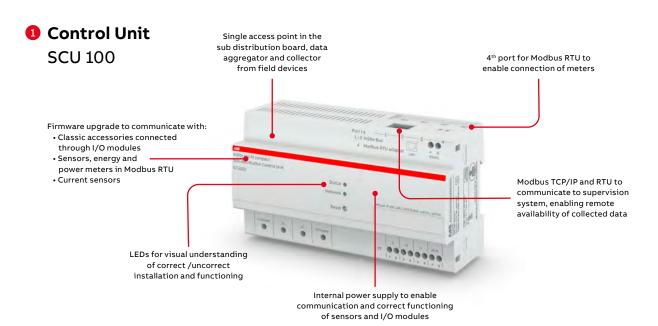
Based on a wide set of data, available functionalities range from simple monitoring of the installation to analysis of historical data, customized alarms and implementation of automated actions to reduce energy consumption, identify potential risks and ensure operational continuity.



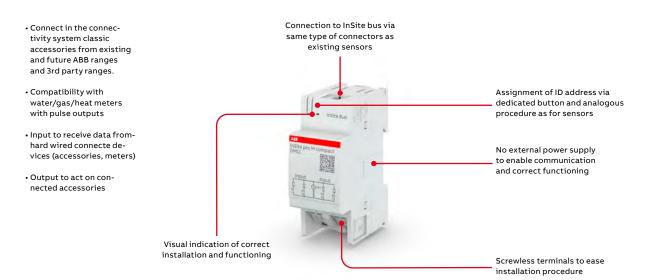


What to include in the panel:

- 1 Control Unit
- 2 Digital I/O modules
- 3 Current sensors
- 4 Flat cable

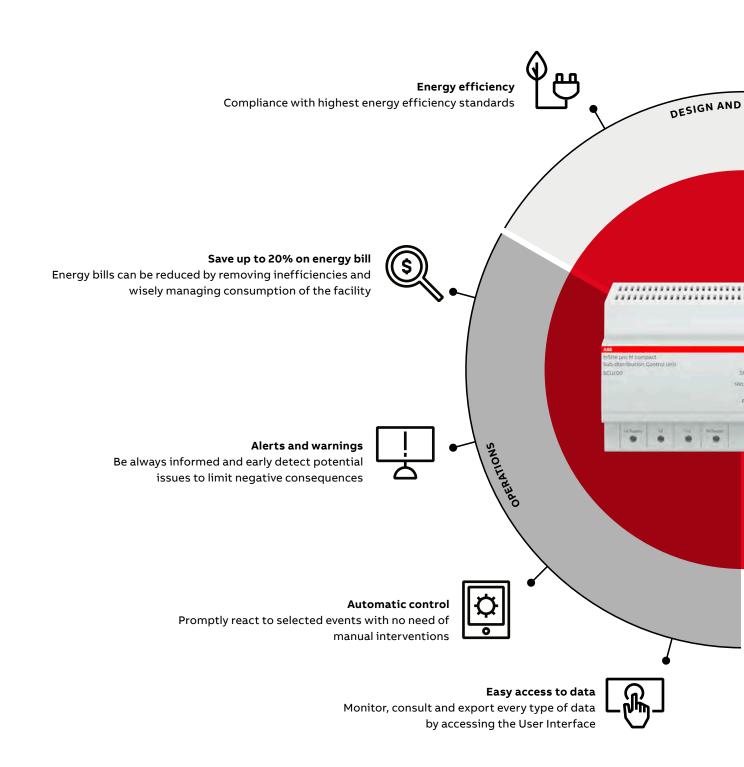


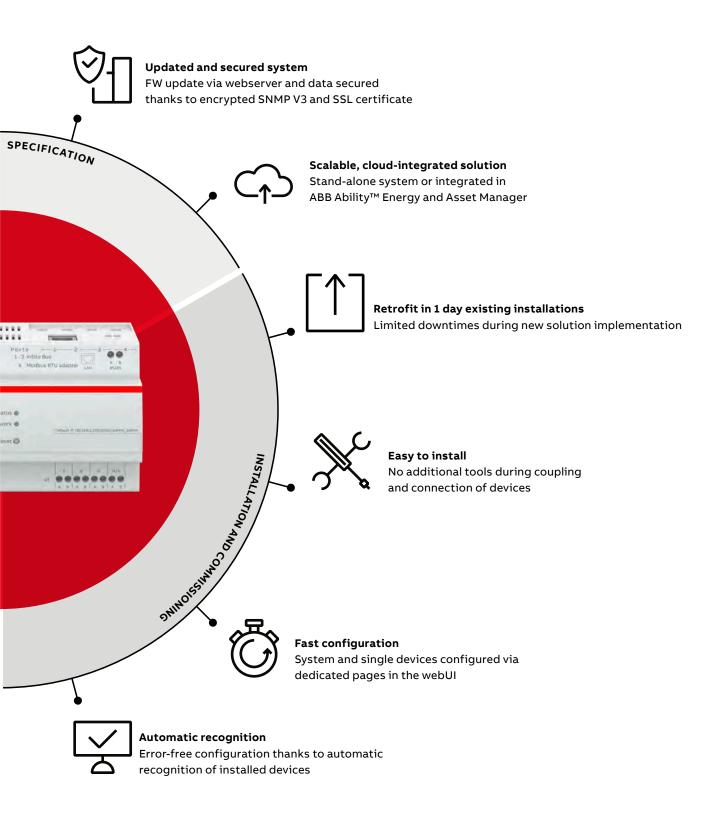
② Digital Input/Output modules DM00, DM10, DM11



System pro M compact® InSite

Main benefits for customers





Applications

Flexibility and modularity

The CMS range offers users a simple and compact solution to guarantee energy efficiency and up-to-date system status, responding to the specific needs of different customers.

The design of the CMS system is based on extreme flexibility and modularity, making it suitable for applications in different sectors.

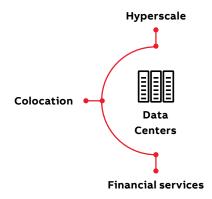
In data centers, CMS system can be installed to get clear visibility of energy consumption and detect risky situations before they lead to service interruptions or load failures.

Retrofitting at single branch level allows to carry out brownfield extension in existing installations at any time.

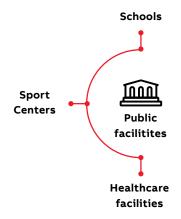
Commercial and public buildings can also leverage the CMS system to achieve higher energy efficiency and to have more detailed monitoring of their facility.

Offices, shopping malls, hotels, retail or chain stores can increase their awareness of energy consumption to improve performance.

Public facilities, such as schools, sport centers and healthcare facilities, can secure service continuity and develop predictive maintenance forecasts.













Applications

Current and power monitoring in data centers

Within critical power applications such as data centers, CMS-700 provides a reliable solution for measuring individual branch load circuits and presenting energy and power dashboards. In addition, it protects data centers against current-related system outages with an integrated alarm function.

In this example the busbar trunking system, mounted overhead or under the raised floor of the server racks, is equipped with master and slave plug-in tap-off units. The proposed solution, suitable for new and existing installations, includes CMS-700 control unit in the

master tap-off unit to measure the incoming side. Open-core CMS sensors are integrated into daisy-chained slave tap-off units to carry out energy monitoring of every single phase to the rack PDU.

The integrated webserver ensures an easy configuration and allows you to remotely check realtime online values as well as historical data without any additional external software.

On the other hand, Modbus and SNMP communication protocols allow the easy integration into higher level systems like DCIM or SCADA.



Design and Specification

Through this solution, the customer can simply and easily ensure optimal load distribution and efficient energy consumption



Installation

I can easily extend the solution when expanding the busbar trunking system, as well as retrofit into existing installations.

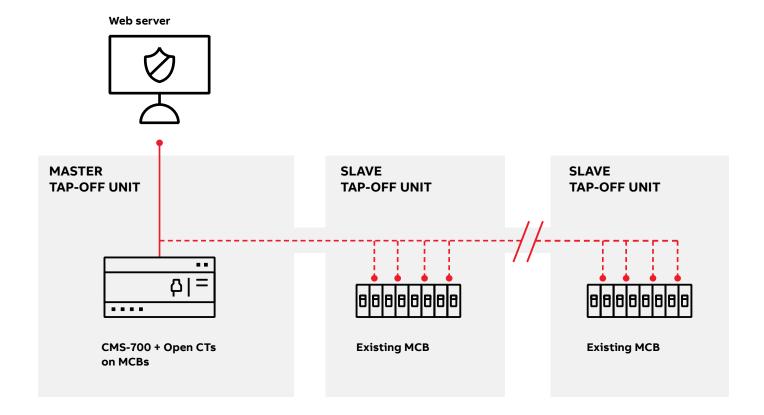


Operation

I can reduce downtime and improve system reliability by early detecting potential issues.



RJ45 Ethernet cable
CMS bus



Applications

Multi-site supervision for chain stores

Stores can be situated as single locations or as a shop in a shopping mall.

Current solutions gather data from all the different stores in order to analyze energy management, monitor energy consumption and improve energy efficiency. To aggregate and compare data from multiple locations, a cloud-based solution is essential.

Monitoring any store requires only an analogue installation. Water and gas consumption data

are gathered from dedicated meters and sent digitally to the E-Hub.

Electrical data and measurements are collected from energy meters, breakers and CMS-700 devices and transmitted to the E-Hub via Modbus RTU. At the core of the solution, the Ekip E-Hub mounted on the DIN rail gathers all the incoming data.

Data from all the stores then goes to the cloud via Ethernet or wireless connections for further analysis.



Design and Specification

While guaranteeing fast payback, this solution can ensure compliance or higher class on efficiency standards.



Installation

Deploying a multi-site monitoring solution, I can reduce installation time and components.

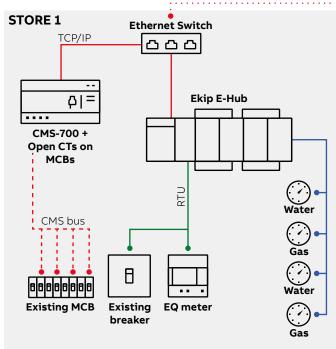


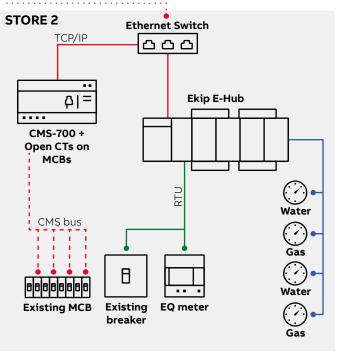
Operation

Introducing a single intuitive digital solution, I can guarantee continuous operation and allocate effectively energy consumptions.









Applications

Retrofitting and upgrading public buildings

For public buildings such as schools, a retrofit solution can bring rapid benefits without replacing existing components.

With accurate performance monitoring of the installation, devices can be managed more efficiently, producing savings in maintenance and energy costs.

In this scenario, the Ekip UP and the Ekip E-Hub collect data from field devices.

The Ekip UP is connected to the breakers and, via an Ethernet switch, to the Ekip Signalling.

The breakers measure energy and power quality, while Ekip Signalling modules send information about status, alarms and the number of operations.

The CMS-700 in the panel is responsible for branch monitoring and is connected to the Ekip UP via Modbus TCP/IP. In order to monitor consumption, another panel is provided with the Ekip E-Hub to gather data from gas, water and energy meters and from breakers.

This data, together with information collected by the Ekip UP, then goes to the cloud and is made available on ABB Ability EDCS for further analysis.



Design and Specification

I will easily upgrade the existing facilities, ensuring a very fast payback.



Installation

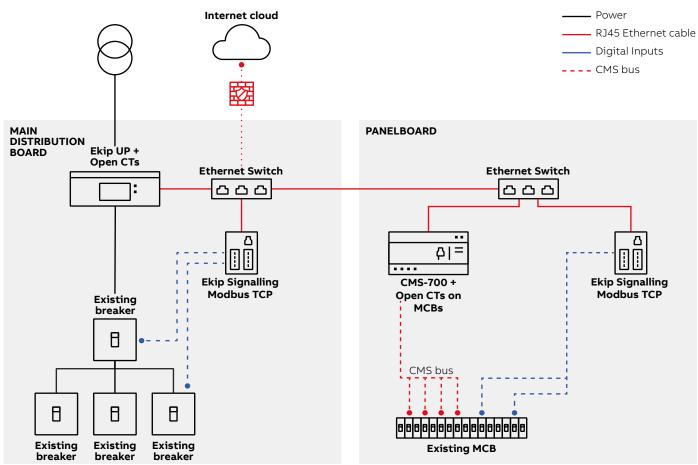
Through plug&play components and commissioning, I can upgrade the existing distribution and panel boards. I don't have to replace anything.



Operation

With this solution I can start saving on operating costs, also on multi-site, through an intuitive and simple solution while catching up with efficiency standards and regulations.





Current transformers and shunts

ABB offers a wide range of current transformers for alternating current and shunts for direct current.

If current in a circuit is too high to be applied directly to a measuring instrument, a current transformer is used to reduce the current accurately proportional to the current in the circuit, which can be conveniently connected to measuring and recording instruments.

Explore the full range and discover the most suitable current transformers or shunts for your needs.





CT and CTA

- Used to transform primary currents into .../5A low secondary currents
- Available both with wound (CTA) and through primary (CT)
- CT PRO XT and CT MAX guarantee maximum safety against overvoltage and overheating
- From 20A to 100A primary

CTO split core

- Split core measurement CT through primary
- Easy installation, time and space saving, avoiding bar disconnection
- Terminal caps and fastening accessories, both on bar and on wall
- From 20A to 6,000A

Current transformers and shunts

Performance and flexibility.

The new CT PRO XT and CT MAX range of current transformers has been specially designed for easy and safe switchboard installation, testing and maintenance operations, thanks to the compact size of the products and their flexible assembly system. Moreover, the integrated electronic protection circuit in the CT PRO XT SELV and CT MAX SELV versions guarantee protection against risks deriving from no-load operation of the secondary.





TRF M modular

- Modular current transformers with Ø 29 mm through primary, secondary .../5A
- Easy installation and quick DIN-Rail plug, thanks to the compact size
- From 20A to 600A



Rogowski coils

- Retrofit in existing installations, with zero downtime, ideal for critical power applications
- Save up to 70% time for current transformers cabling compared to standard CTs
- Minimum space requirements: 8mm diameter coil
- Measurement up to 10,000A with same product code, ensuring optimized logistics



Shunts

- Shunts have 60 mV voltage and must be used with a maximum load of 0.25 Ω in combination with measuring instruments in d.c.
- Both horizontal and vertical mounting are possible
- From 10A to 1,000A

ITUS

Distribution Enclosures

A fresh look

Advances in building design and building methods mean making considerable improvements in utility systems that match the requirements of residential, commercial and industrial infrastructure.

Thanks to its simple, compact design, customization capabilities and multiple protection provisions, the ABB ITUS series with its seamless form, new finish and improved space provisions offers the maximum flexibility for your domain requirements.

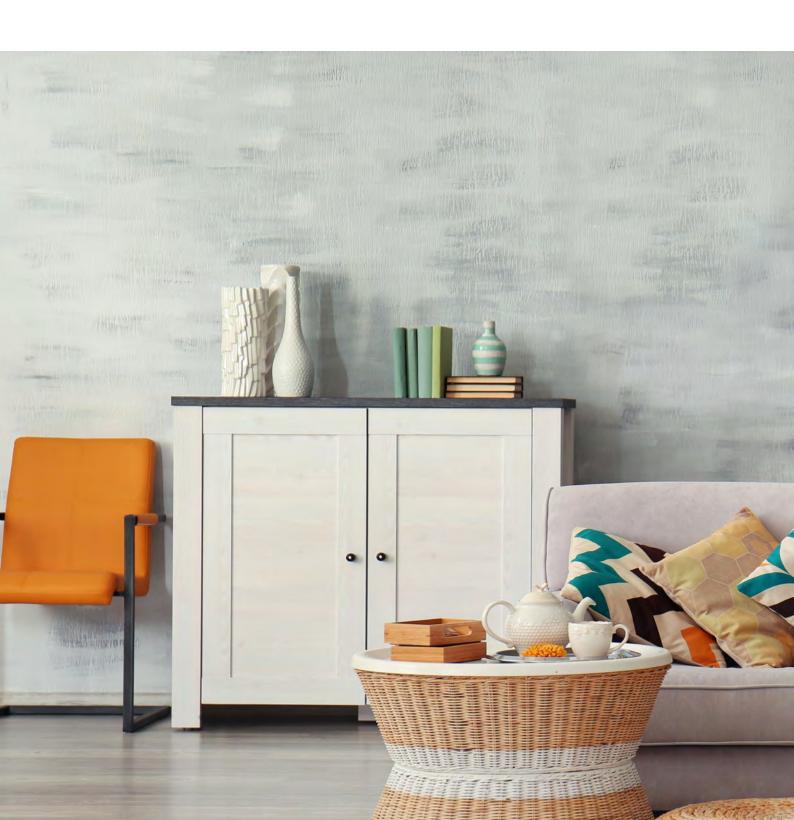
Blending in seamlessly to your interiors, keeping pace with new innovative enclosure aspects is what ABB ITUS helps to achieve.

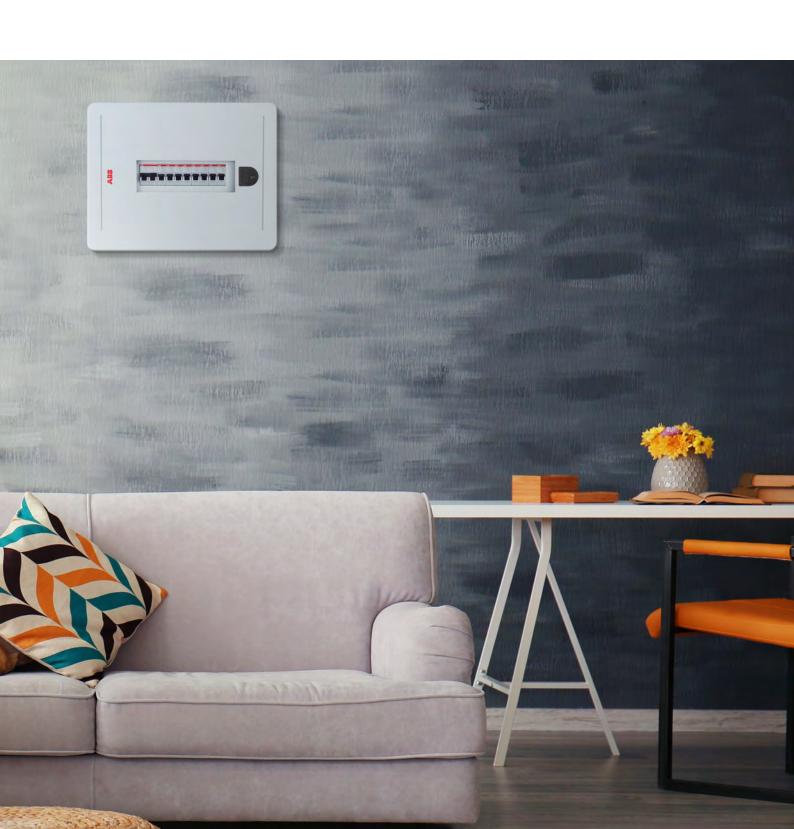


A collaborative effort

Meeting the right requirements.

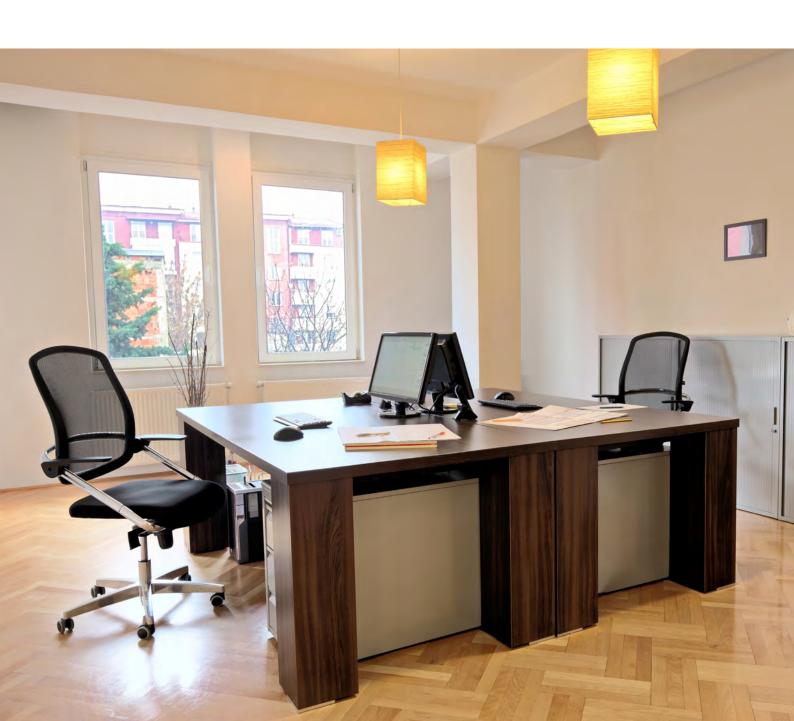
ABB ITUS series Distribution Enclosures put no limits to your imagination. Gone are the days when enclosures were meant only for archaic needs. With the ABB ITUS series enclosures, you can be rest assured that it will not only perform at its peak, but also blend in with the rest of your interiors. Using ABB's innovative designs, domain expertise and standards, ABB ITUS is ready to help you to be today's trendsetter.





Aesthetics

At ABB, we strive to push the barriers of thought with our new line of Distribution Enclosures that cater to the needs of every utility, be it domestic, commercial or industrial. ABB ITUS reflects our abilities not just purely on performance, but also with a revolutionary design that perfectly blends with every wall along any corner.



Tried and proven

Moving with the times

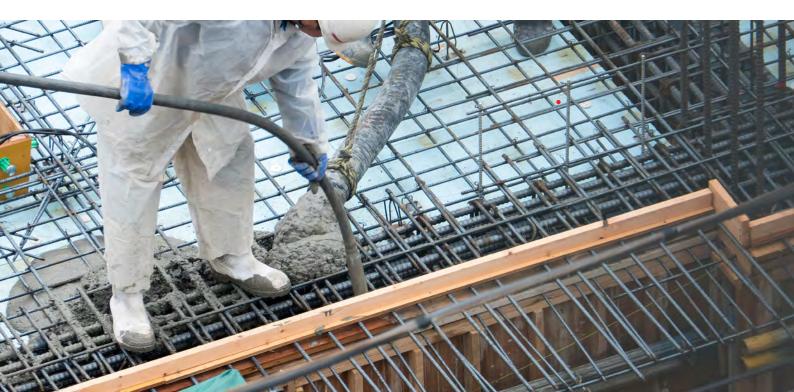
As new interiors use advanced construction procedures and methods, ABB ITUS Distribution Enclosures have been redesigned to meet MIVAN type of construction. It is developed using thicker L bends that ensure enhanced strength and is able to maintain form factor, thus withstanding internal pressures making it adaptable to all framework structure scenarios.

Set under the total type tested assembly standards of safety and quality. ABB ITUS meets all compliance measures of IEC61439-3, which covers short-circuit, temperature rise, ingress protection (IP) and mechanical strength (IK) test conditions. To avoid corrosion, the Distribution Enclosure is powder coated and exposed to humidity factors and thermal shocks ranging from -40°C up to 150°C. This ensures that the Distribution Enclosure meets our quality standards and fulfills your high expectations from ABB.





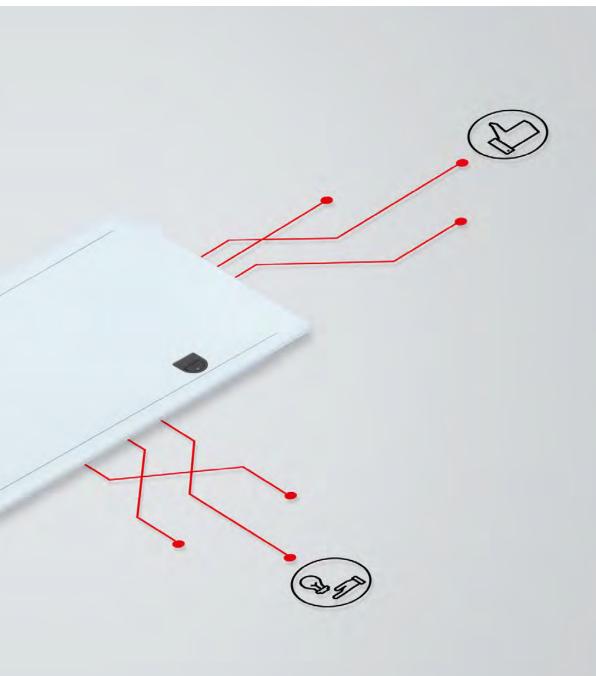
- New L bend gland plate welded · Non-projection bolts
 - · Sealing caps provided to prevent concrete entry during construction phase
 - IP 30 single door, IK 08 with
 - IP 43, IP 43 arc, IK 54 double door IK 09 certified



Open for customisation

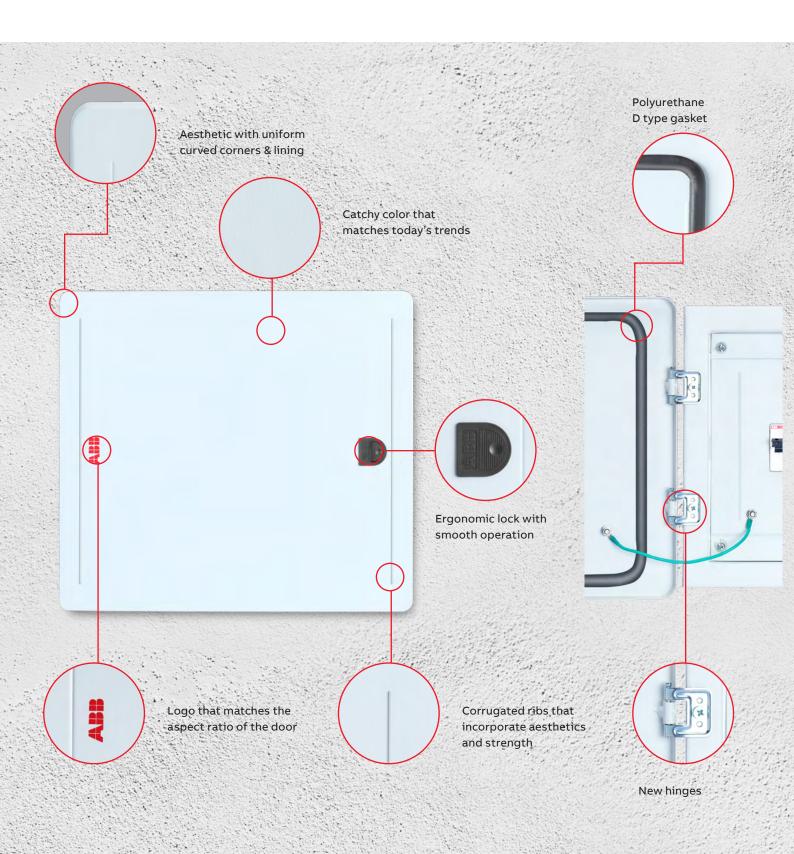
ABB ITUS Distribution Enclosures with flexibility for customisation enables synergy between different applications.

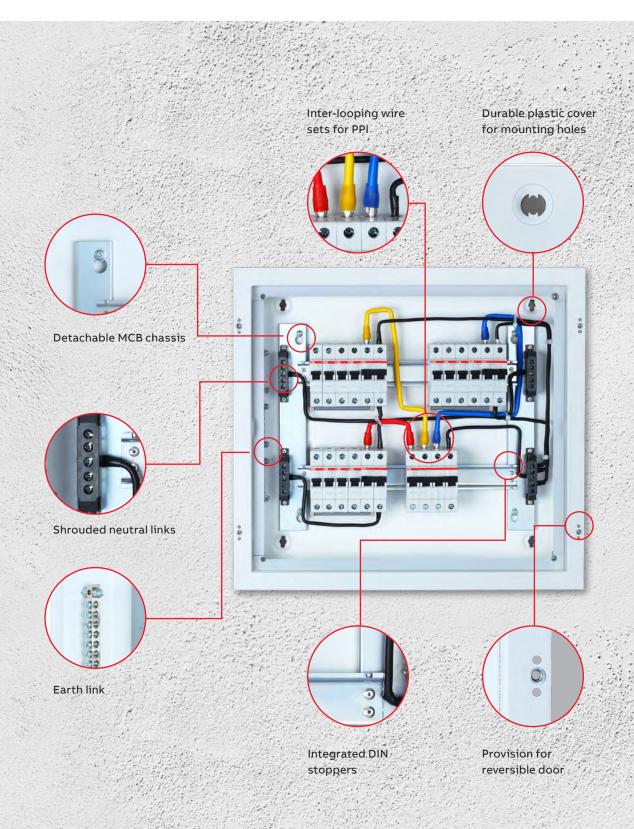




Features and benefits

ABB ITUS Distribution Enclosures with its innovative design and technical features ensures complete fulfillment of all customer needs.

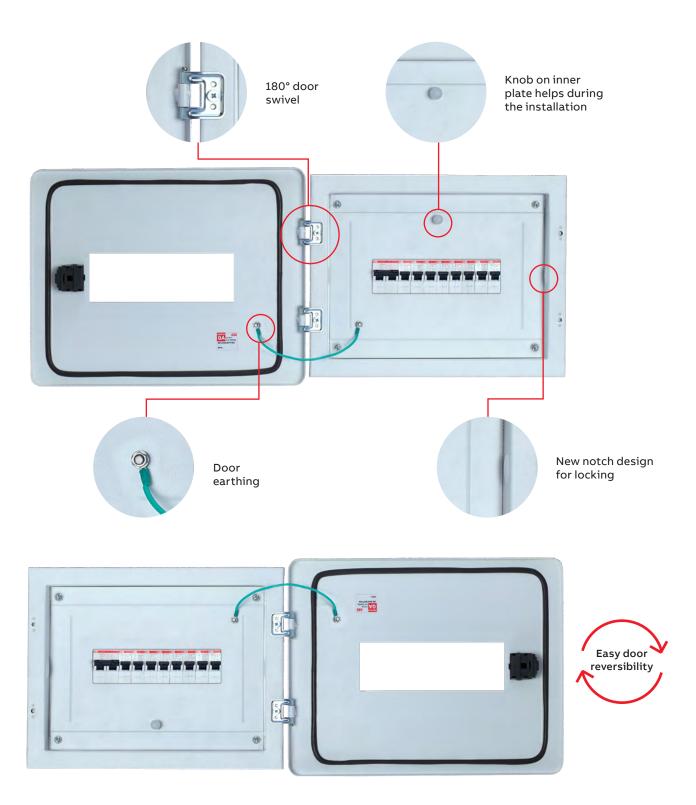


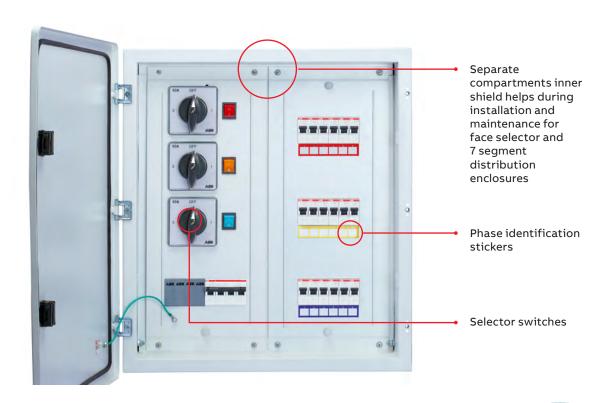


Features and benefits

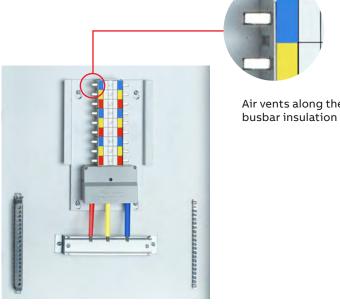
Flexibility

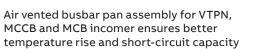
ABB ITUS has undergone several improvements over its predecessors in order to address the continuous changes in customer dynamics.













ITUS distribution enclosures

Complete range

Туре		SPN	SPN TPN PPI DB			Flexy DB	
Configuration		SPN DB	TPN DB	Horizontal	Vertical	Flexy tier DB	
Incomer		DP/4M (MCB/ Isolator/RCD)	4P/8M MCB/ Isolator/RCD as incomer	4P/8M (MCB/Isolator/ RCD) as incomer, 3 DP MCB/ Isolator/RCD as sub-incomer	4P/8M (MCB/Isolator/ RCD) as incomer, 3 DP MCB/ Isolator/RCD as sub-incomer		
Outgoing (No. of ways)	IP30 (without door)	6,8,10,12,14, 6,18,20,22	4,6,8,12	-	-	-	
ways)	IP 43 (metal door)	6,8,10,12,14, 6,18,20,22	4,6,8,12	6,8,12	6,8,12	2 row of 13 module 3 row of 13 module 4 row of 13 module 2 row of 14 module 3 row of 14 module 4 row of 14 module	
	IP 43 (metal door with acrylic)	6,8,10,12,14, 6,18,20,22	4,6,8,12	-	-	-	
	IP 54 (metal door)	6,8,10,12,14, 16,18,20,22	4,6,8,12	-	-	-	



Verti	ical TPN DB		Segment DB	Special purpose DBs	Plug & Socket	oneway enclosure
MCB/Isolator/ RCD incomer	XT1	хтз	8 Segment DB	Phase Selector DB	1	_
4P/8M (MCB/ Isolator/RCD)	4 pole MCCB (T-max XT1) up to 160A	4 pole MCCB (T-max XT3) up to 250A	4P + 8M incomer (MCB/ Isolator/RCD) & 4 pole sub- incomer (MCB/Isolator/RCD)	4P / 8M MCB/ Isolator/RCD	-	-
-	-	-	-	-	2M 20A 2P + E 4M 30A 3P + E	2,4,6,8
4,6,8,12	4,6,8,12	4,6,8,12	4,6,8,12	4,6,8,12	1	_
-	-	-	-	-	-	_
-	-	-	-	-	-	_

Distribution boards

Elegance series



Туре		SPN TPN PPI DB		Flexy DB				
Configuration		SP N DB	MCB/ISOlator/ RCD incomer	Horizontal	Vertical	Flexy tier DB	MCB/ Isolator/ RCD incomer	
Incomer		2 pole (MCB/ Isolator/RCD)	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/ Isolator/RCD as sub-incomer	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/ Isolator/RCD as sub-incomer	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/Isolator/RCD as sub-incomer		4P/8M (MCB/ Isolator/ RCD)	
Outgoing (No.of ways)	IP30 (without door)	4,6,8,10,12,14,16,20	4,6,8,12	-	-	-	-	
	IP 43 (metal door)	4,6,8,10,12,14,16,20	4,6,8,12	6,8,12,16	6,8,12	2 row of 13 module 3 row of 13 module 4 row of 13 module 2 row of 14 module 3 row of 14 module 4 row of 14 module	4,6,8,12	
	IP 43 (metal door with acrylic)	4,6,8,10,12,14,16,20	4,6,8,12	-	-		-	
	IP 54 (metal door)	4,6,8,10,12,14,16,20	4,6,8,12	-	_	-	-	









Cement spill protector

Insulated busbar

Door earthing

Anti insertion marking

Vertical TPN DB		Segment DB	Special purpose DBs	Plug & Socket	oneway enclosure
XT1	хтз	8 Segment DB	Phase Selector DB	_	-
4 pole MCCB (T-max XT1) up to 160A	4 pole MCCB (T-max XT3) up to 250A	4P + 8P incomer (MCB/ Isolator/RCD) & 4 pole Sub-incomer (MCB/ Isolator/RCD)	4P / 8M MCB/ Isolator/RCD	-	_
-	-	-	-	1M 20A 2P + E 3M 30A 3P + E 4M 60A 3P + E	2,4,6,8
4,6,8,12	4,6,8,12	4,6,8,12 (optional RAL 9003)	4,6,8,12		
-	-	-	-		
-	-	-	-		

Distribution boards

Classic series

Туре		SPN	TPN	PPI	I DB	Flexy DB		
Configuration		SP N DB	MCB/ISOlator/ RCD incomer	Horizontal	Vertical	Flexy tier DB	MCB/Isolator/ RCD incomer	
Incomer		2 pole (MCB/ Isolator/RCD)	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/Isolator/ RCD as sub- incomer	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/Isolator/RCD as sub-incomer	8 pole (MCB/ Isolator/RCD) as incomer, 3 DP MCB/Isolator/RCD as sub-incomer		4P/8M (MCB/ Isolator/RCD)	
Outgoing (No.of ways)	IP30 (without door)	4,6,8,10,12,14,16,20	4,6,8,12	-	-	-	-	
	IP 43 (metal door)	4,6,8,10,12,14,16,20	4,6,8,12	6,8,12,16	6,8,12	2 row of 13 module 3 row of 13 module 4 row of 13 module 2 row of 14 module 3 row of 14 module 4 row of 14 module	4,6,8,12	
	IP 43 (metal door with acrylic)	4,6,8,10,12,14,16,20	4,6,8,12	-	-		_	
	IP 54 (metal door)	4,6,8,10,12,14,16,20	4,6,8,12	-	-	-	-	



Vertical TPN DB		Segment DB	Special purpose DBs	Plug & Socket	oneway enclosure
XT1	хтз	7 Segment DB	Phase Selector DB	-	-
4 pole MCCB (T-max XT1) up to 160A	4 pole MCCB (T-max XT3) up to 250A	4P + 8P incomer (MCB/ Isolator/RCD) & 4 pole Sub-incomer (MCB/Iso- lator/RCD)	4P / 8M MCB/ Isolator/RCD	-	-
-	-	-	-	1M 20A 2P + E 3M 30A 3P + E 4M 60A 3P + E	2,4,6,8
4,6,8,12	4,6,8,12	4,6,8,12 (optional RAL 9003)	4,6,8,12	1	-
-	-	-	-	-	-
-	-	-	-	-	-

MISTRAL65

A versatile range suitable for every application

Efficiency, safety, integration: the new MISTRAL65 series rests on the strengths which have consolidated ABB's image over the years for its expertise and reliability in the area of products for protection, control, monitoring, measurement, safety and energy efficiency. These innovative IP65 rated consumer units complete ABB's wide product range for the residential, commercial and industrial sector.

The range includes solutions with transparent or opaque doors which open up to 180°, and a choice of between 4 and 72 modules, meeting the most recent regulatory requirements and ensuring an enormous variety of application types.









Designed for harsh environments

The MISTRAL65 consumer units come with IP65 protection degree, providing a dust-tight and resistant to jetting water resistance.

Mechanical strength of the MISTRAL65 consumer units are IK09 (10 joule) and IK08 for the precut parts.





Eco-compatible materials

Innovating today does not just mean looking for functional and technologically advanced solutions. For ABB, being innovative means embracing a longer-term perspective by using eco-compatible materials for our products which respect the environment even at the end of their life cycle. For this reason, 100% recyclable, in case of MISTRAL65 even halogen-free, thermoplastics have been used for the consumer units.

Their environmental compatibility has been assessed using the Life Cycle Assessment (LCA) method, an objective tool for analysing energy and environmental impact which analyses the energy and materials used and the emissions released during production.

MISTRAL65H:

Consumer units and switchboards for smarter outdoor installations

Resistance to salt, dust or UV rays is an essential feature in outdoor applications. Saline environments, chemical industries, sandy/dusty or PV applications require specifically robust products to guarantee reliable distribution of energy to where it is required.







Made for harsh environments and outdoor installations

The MISTRAL65H consumer units and switchboards are self-extinguishing and resistant to abnormal heat and fire up to 750°C (GWT). They provide shock resistance IK10 (20 Joules) and IP65 degree of protection.

Available in 4 sizes and with a wide range of accessories the MISTRAL65H enclosures have been specifically designed for heavy duty environments.





Certified robustness

The new MISTRAL65H consumer units and switchboards are perfectly suitable for heavy duty environments and outdoor installations as they have been tested and certified for:

- Dust/sand resistance (factory internal tested)
- Saline environments (according to IEC 60068-2-52)
- Weathering (according to IEC 600068-2-5)
- Permanent sun exposure (IEC 600068-2-5)
- Self-extinguishing and resistant to abnormal heat and fire up to 750°C (GWT)
- Shock resistance: IK10 (20 Joules)
- Degree of protection: IP65
- Opaque and transparent doors
- Common accessories with the MISTRAL65 standard range



Fast and easy installation of consumer units

The project design also aimed to optimise cabling, assembly and installation times of the consumer units. Everything has been designed to make the installer's job quicker and easier, allowing them to implement functional and tidy consumer units.



Fast and easy installation of consumer units

In the multi-row versions, the centre distance of the DIN rails can be varied from 150 mm to 125 mm, further increasing the versatility of the product and using the same standard accessories. The frame is extractable for quick and easy bench cabling.

The ample internal space makes the cables more accessible, facilitating cabling and giving the possibility to anchor the cable-ties to special eyeholes on the frame.

The consumer units are designed to house optional dedicated terminal blocks in two different color schemes to allow quick and tidy cabling, and making separate power supplies easily recognisable, when used.

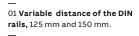
The range is completely coordinated with ABB MCBs and MCCBs, all of which can be easily installed simply by moving the rail provided for their housing.







02



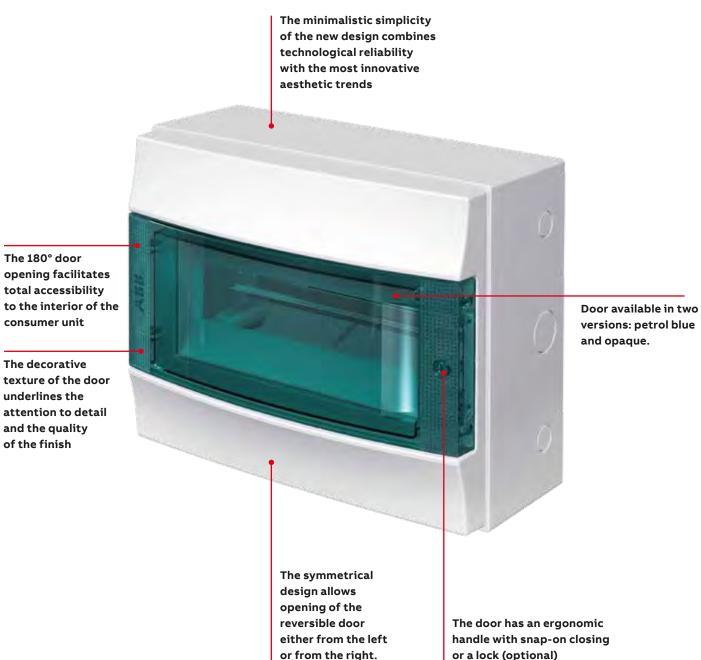
02 Withdrawable frame, adjustable DIN rail depth to ease the installation of any DIN device.

03 **Fast and easy installation** using wall fixing brackets.



Design and simplicity "all in one".

The refined design is marked by some particular characteristics, for example the perfect symmetry, which allows either the whole consumer unit or just the front panel to be rotated, easily changing the door opening side.



or a lock (optional)

Design and simplicity "all in one".

MISTRAL65 is equipped with smooth surfaces on top and bottom sides. Knockouts are available on both sides of the enclosure. Interior slots allow the consumer unit to be fixed to the wall in points which are not visible from the outside, thus contributing to an aesthetically clean installation. Special snap-in closure plugs guarantee protection class II (double insulated).

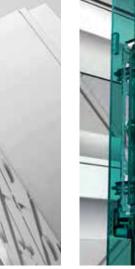
The possibility to add an additional module by removing two pre-trimmed elements is an extremely useful solution which allows additions to be managed easily and tidily when unforeseen installation requirements are called for.



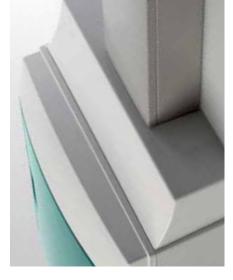












Mistral65H is equipped on one side with knockouts for cable glands, the other side with a smooth surface.

The standard door with ergonomic handle and snap-on closure can be equipped with a lock and key on request, ensuring only authorised persons have access and avoiding tampering or incorrect operations.

An accessory for trunking entry can be positioned at the top or bottom of the consumer unit, connecting and protecting the conductor bundles. A series of internal knockouts allows it to house any type of trunking.

For simplicity and effectiveness



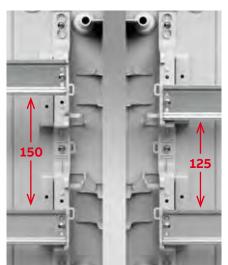
For simplicity and effectiveness

The extractable frame simplifies and speeds up bench cabling operations. The slotted holes in the frame allow it to be quickly fixed inside the enclosure.

In order to create space at the top or bottom of the consumer unit, the centre distance of the DIN rails can be modified from the standard distance of 150 mm to 125 mm. The closure panels, which are completely reversible, can be unhooked, reversed and reinstalled with a simple click.

Spaces have been created inside the consumer units to make cabling even easier, with cable clips and holes for fastening the conductors to the frame with simple cable-ties.













3 different terminal systems available

The MISTRAL range of consumer units is supplied with a wide range of terminal systems: Terminal bars with screws and the two versions of terminal blocks offering screw or screwless couplings.

The consumer units can be installed side by side, with cable gland accessories protecting the conductors' path between adjacent units.

The accessories include blind panels and base plates allowing installation of other types of devices aside from modular DIN rail products such as contactors, manual motor starters or devices on the front of the panel.

Endless installation possibilities

Our product development was inspired by the objective of allowing a wide range of products and solutions with different functions and dimensions to be installed in a single IP65 consumer unit, thus meeting the widest range of needs even in small commercial or industrial applications.

MCBs, MCCBs and devices installed in the front of the panel in an integrated, rational and functionally appropriate position.



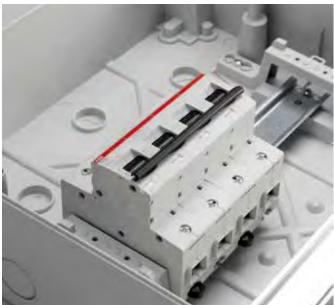
Endless installation possibilities

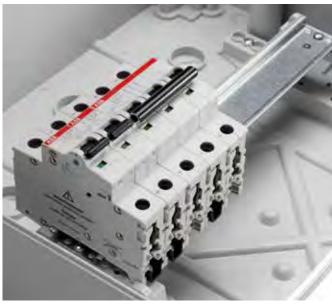
The frame allows for two different DIN rail positions.

This allows products with different depths to be installed, for example MCCBs which, thanks to this solution, are perfectly aligned with other devices in the panel

Among these components with greater depth dimensions which can benefit from this flexibility of the frame, we must remember high-performance MCBs with greater than standard depth.









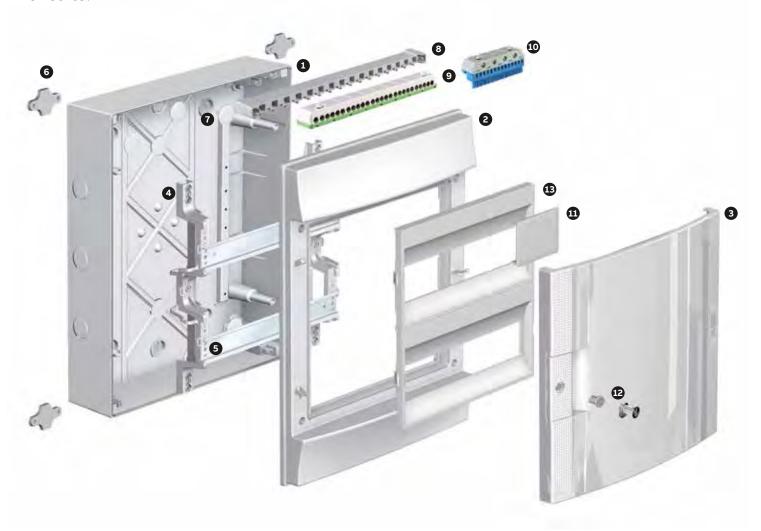
The first depth level allows standard products to be housed; these include most modular products currently available on the market.

Among the accessories, the availability of blank panels and base plates allows non-modular equipment to be installed on the front of the consumer unit, such as control buttons and indicator lights.

All details at a glance

The simplicity of the consumer units makes adapting them to various system requirements easy.

Optional terminal blocks which can be installed in the top or bottom of the consumer unit allow the cabling to be performed in a tidy manner and their different colors facilitate recognition of any separate circuits.



- 1. Box for wall mounting
- 2. Reversible front panel
- 3. RAL 7035 opaque door
- 4. Fixed support for DIN rail
- 5. DIN rail

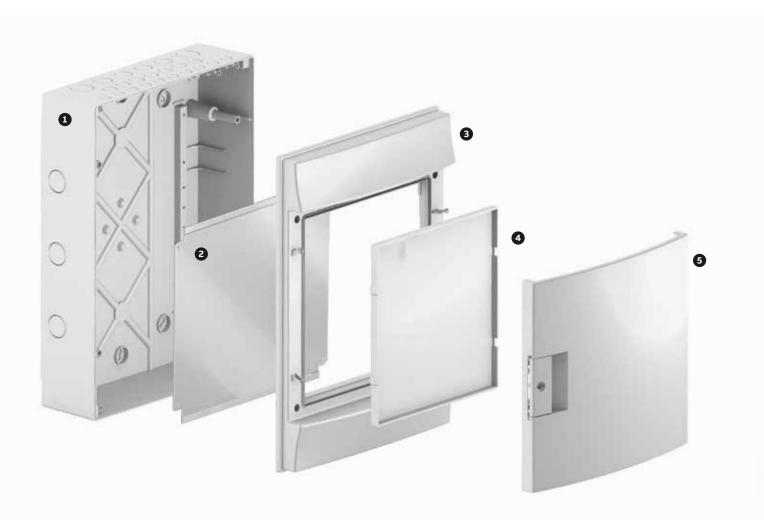
- 6. Wall fastening brackets
- 7. Plugs, protection class II
- 8. Terminal block carriers
- 9. Terminal blocks with screw coupling
- 10. Terminal blocks with screwless coupling
- 11. Module cover
- 12. Finish or closure elements (lock and key optional)
- 13. Reversible panels

MISTRAL65H Switchboard

All details at a glance

The switchboards consist of an empty box and a door to integrate all your interior fittings. A full closing panel is available (snap mounting), which works as an inner door in a typical automation application.

Specific metal plates designed to host Tmax XT MCCBs are available for all the enclosure sizes.



- 1. Box for wall mounting
- 2. Metal plate
- 3. Reversible front panel
- 4. Inner door
- 5. RAL 7035 opaque door

MISTRAL65H Switchboard

Harsh environment series



Smooth surface on one side, knock-outs for cable entries on the other

Every front panel is supplied with captive screws, giving practical and safety advantages

The perfect symmetry of the front allows the opening to be completely reversed

MISTRAL65H switchboards have been designed for heavy duty applications

MISTRAL65H Switchboard

Harsh environment series

Resistance to salt, dust and UV rays.

MISTRAL65H Switchboard is equipped on one side with knockouts for cable glands, the other side with a smooth surface.

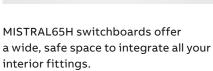
Tmax XT kits are available to install XT1 and XT2 breakers.













Wide range of accessories.



Inner doors allow integration of signaling devices and push buttons for automation applications.

Gemini: the improved range

Robust and flexible thermoplastic enclosures



Gemini is compliant to IEC62208 and UL 508A standards. IP66 certifies Gemini is completely protected against the infiltration of solid bodies and is resistant to the penetration of jets of water similar to sea waves.





Easy to install

Ready-to-use solutions are available to quickly install all the devices without using tools.



High degree of protection

Extremely sturdy, even against 20 joules impact, dust and water jets (IK10 and IP66 degree of protection), able to operate in a wide range of temperatures (25 up to 100°C), exceptionally resistant to UV and chemical agents and compliant with IEC 62208 and UL 508A standards.



Adaptable to customers' requirements

Available in 6 sizes and with transparent or blind door, with full metal and plastic base plates. Gemini can be used even in very difficult application circumstances and extreme weather conditions.



Eco-friendly

Thanks to co-injection technology, Gemini's thermoplastic not only ensures sturdiness, mechanical features and resistance to oils but it also reduces at the same time the environmental impact at the end of its useful life since it's 100% recyclable.

The thermoplastic co-injection molding process

It's like a "sandwich" of two materials: a compact external covering and an expanded core. This technology ensures the highest level of mechanical protection against impacts (IK10).



Easy to install

Versatile and simple. To meet any application.

Offering the best technology for more reliable energy distribution solutions, by protecting people, equipments and resources.

ABB's Gemini enclosures provide a real system of integrated and complementary functions making them configurable into different applications: for automation, distribution and combined automation and distribution.

Gemini is designed to be perfectly compatible with ABB components for low voltage control and monitoring. In mixed applications, the Gemini enclosure is designed to be fitted with System pro M modular devices and Tmax XT moulded-case circuit breakers. To respect safety standards, all the enclosure components are easy to fit and can be fixed to the base plate or to the box frame without using any tools.

Wiring operations are carried out from the front followed by snapping the base plate or the distribution frame onto the box.

The patented frame is fitted with the cable duct incorporated in the uprights.

Gemini is also flexible thanks to six different box sizes and internal space to accommodate from 24 to 216 DIN modules. For control and command applications, three typologies of base plates are available: standard metal, perforated metal and insulated.

Lightweight thermoplastic material makes handling operation easier compared to traditional enclosure, for easier handling.



- Few parts: snap-on fixing, no tools needed
- Pre-assembled hinges
- Door with 180 degree rotation
- Frame with integrated vertical wiring duct
- Frontal cabling: comfort in the wiring process
- A wide range of accessories for automation and distribution applications

01 Gemini doors open at an angle of more than 180° giving easy access to the devices installed inside the switchboard.

02 No tools are needed for installation. The doors hook onto the hinges with special hinge pins and are reversible.

03 The frame can be extracted to make wiring operations easier at the workbench.

04 The fixing hooks supplied in the standard versions are applied without having to use tools.

05 Fixing hooks and feet allow the frame to be snap-mounted inside the box.















High degree of protection

Designed to operate in harsh environments

Gemini is developed and designed by ABB together with the direct collaboration of panel builders, installers and designers in order to create insulating enclosures to better face extreme weather conditions.

Gemini represents the best solution for both distribution and automation (control and command) applications.

For a valid enclosure, the degree of protection is an important factor. Gemini thermoplastic enclosures are totally protected against the infiltration of solid bodies thanks to an IP66 degree of protection (IP30 with the door open and with the appropriate components installed) and a double insulation, even in the event of indirect contact.

They are suitable for environments with extreme temperatures, in outdoor applications and severe conditions.

Thermoplastic material retains its characteristics for a long time since it's not subject to corrosion from chemical and atmospheric agents such as dust and sand. In Mining or Construction applications as well as manufacturing plants, Gemini withstands harsh chemicals with high levels of performance.

Typical examples of some Gemini applications can be seen in Manufacturing sites, Solar power plants, greenhouses, chemical plants and in any other environments where distribution and automation demand specific safety requirements and service continuity.

It is particularly recommended in photovoltaic and greenhouse applications, also because of its strong resistance to UV rays.



- IP66 degree of protection (IP30 with the door open and with the appropriate components installed)
- Double insulation from dust and water jets, even in the event of indirect contact
- Adaptation to environments with extremely high or low temperatures (-25°C to 100°C), in outdoor applications and in severe conditions
- Resistance to aggressive chemical agents and UV radiation
- Resistance to fire and abnormal heat (GWT up to 750°C).
- Insulation Voltage: 1000 Vac; 1500 Vdc
- UL Type 1, 3R, 4, 4X, 12

Additional tests completed

- Dust/sand resistance (factory internal tested)
- Saline environments (according to IEC 60068-2-52)
- Weathering (according to IEC 60068-2-5)
- Permanent sun exposure (IEC 60068-2-5)







Photovoltaic

In a typical photovoltaic plant the direct current section comprises a generator consisting of strings composed of photovoltaic modules connected in series. The Gemini series of IP66 enclosures are ideal for use as field combiners or as parallel switchboards, i.e. for outdoor installation near the modules. ABB has a range which is currently unique on the market, and has developed a family of plug & operate solutions, i.e. a series of finished, wired and certified switchboards to meet the needs of a huge range of plant types: from single string for residential applications to large-scale solar fields (for more information see specific documentation on abb.com).

Adaptable to customers' requirements

Widest range and numerous accessories for a complete solution

With Gemini, you can benefit from a wide range of enclosures with different dimensions and the possibility to arrange the devices into the DIN-Rail as you need. Moreover, Gemini enclosures have a wide range of accessories for both automation and distribution applications, ensuring maximum versatility and integration.





Accessories

- Various locking systems can be installed (triangular, squared, with handles and ciphered type
- Ventilation and anti-condensation kits: protecting devices from the effects of heat and humidity
- · Wall brackets, pole mounting kit and
- pedestal make it easier to install the enclosures in any context.
- · Kit for installing Tmax XT circuit-breakers
- The universal drill bit can be used to create the holes to install the cable glands for cable derivations
- Doors with single central handle (as per picture beside) can be fitted with half cylinder locking systems and/or padlock

01



02



03



01 Doors with central single handle are also available.

O2 Wall-mounted installation is possible using the special mounting brackets.

03 ABB logo with its minimal graphic design fits well to hinged doors .

04 Pole-mounted or mounted on a special pedestal installation is also possible.

05 The standard doublebit locks supplied can be replaced by the version with ciphered key and handle or with square or triangular impression.



04

General purpose enclosures

Basic configuration - Gemini switchboards

In the basic configuration, Gemini switchboards are composed of boxes in six different sizes ranging from 335x400x210 mm to 840x1005x360 mm (WxHxD, external measurements) and with opaque or transparent doors. In both versions, the doors are reversible and clip onto the hinges without the need to use tools; the fact that they open at an angle of more than 180° means that it is easy to work on the components installed inside the switchboard. The seal applied by extrusion along the sides of the doors guarantees IP66 degree of protection. Access to the inside of the switchboard is protected by a standard double bit

lock that can be replaced by locks of another type available in the accessories. Boxes and doors can be requested either separately or as combined "box + door" codes, to make filling out the order form more flexible. Inside the packages, the door is always wrapped separately and inserted inside a pocket that protects it from accidental damage until wiring is completed and the switchboard is installed. Hole-cover plugs to guarantee IP protection and double insulation for wall mounting are also supplied with the pack together with the instruction sheet.

Specifications	
Protection	IP66 (IEC EN 60529) Class II insulation
Strength	Thermoplastic material moulded in co-injection Resistance to abnormal heat and fire up to a temperature of 750 °C (IEC EN 60695-2-11) IK10 (IEC EN 50102) degree of resistance to impacts Protection against chemical and atmospheric agents (water, saline solutions, acids, basic agents, mineral oils, UV rays) Operating temperature -25 °C ÷ +100 °C
Performances	Rated service voltage up to 1000 V Rated insulating DC voltage up to 1000 V Rated insulating AC voltage up to 1500 V
Flexibility of use	6 sizes from 335x400x210 mm to 840x1005x360 mm (WxHxD, external dimensions) DIN 24 to 216 modules
Installation	Snap-on mounting of all components in compliance with safety Standards
Quality and environment	Compliance with CEI EN 62208 international reference Standard, qualification for the requirements of CEI EN 61439-1 Standard, IMQ mark according to EN 62208 Standard. 100% recyclable EN 60068-2-52 resistance to marine environments EN60068-2-5 resistance direct sun exposure UL Listed: UL508A, UL50, UL50E Nema: Types 1, 3R, 4, 4X, 12



Gemini doors open at an angle of more than 180° giving easy access to the devices installed inside the switchboard.



No tools are needed for installation. The doors hook onto the hinges with special hinge pins and are reversible.



The special structure of the inner perimeter of the box ensures further protection against the penetration of water. The box is supplied with a spirit level.

General purpose enclosures

General characteristics of SR2 Enclosures

The range of SR2 enclosures is a complete offer of monobloc enclosures for constructing small and medium-sized electric automation, switching and control switchboards.

The SR2 enclosures come from the experience ABB has gained over the years in building IP65 metal structures (in accordance with the IEC 60529 Standard), together with the innovative new production process used for construction and patented by ABB.

The typical use of SR2 Enclosures is to make switchgear and controlgear switchboards for a very wide variety of industrial machines: from large machinery with automated production lines or parts of these, down to the typical installations of on-board machine switchboards, boilers, heating plants and so on.

They conform to the EN 62208 Standard "Empty enclosures for low voltage protection switchgear and controlgear assemblies" and allow realization of electrical equipment conforming to the prescriptions of the IEC 60204-1 Standard "Safety of machinery. Electrical equipment of machines" and of the EN 60439-1 Standard and the new EN 61439-1-2 Standard "Low voltage protection switchgear and controlgear for assemblies". The degree of protection, in accordance with the IEC 60529 Standard "Degrees of protection of enclosures (IP Code)", is IP65.

The SR2 enclosures have also passed the control required to obtain the UL (Underwriters Laboratories) and CSA (Canadian Standards Association) Type 12 marks.

The SR2 enclosures also allow secondary distribution switchboards to be made, thanks to the possibility, in the 400, 600 and 800 mm widths, of installing the whole range of apparatus and modular circuit-breakers on DIN rails combined with special pre-drilled and hinged modular front panels, thereby allowing construction of AS/ANS type electrical switchgear conforming to the IEC 60439-1 Standard and the new EN

61439-1-2 Standard. A single line of metalwork structures therefore allows construction of automation and secondary and end distribution electrical switchboards thanks to the availability of a series of accessories (modular panels, DIN rails) and to the possibility of stacking the enclosures.





General purpose enclosures

General characteristics of SR2 Enclosures

The SR2 enclosures are available in two versions (blind door or glazed door) and in 23 different dimensions, as well as a further 19 combinations obtained by stacking the enclosures, up to a maximum height of 2000 mm, which guarantee ample selection possibilities for the various end applications.

The SR2 enclosures have been designed to fulfil all the typical needs of the builder or installer of switchgear in the best way possible and the user is presented with a unique ensemble of functional characteristics:

- wide dimensional range
- certified IP65 degree of protection
- internal galvanised sheet mounting plate with 20/10 thickness (made to allow threaded holes to be made easily), adjustable in depth by using a special accessory
- fairlead plate screwed on (at top and bottom) made of 15/10 thick galvanised sheet, with a sealing gasket applied inside
- complete reversibility of the enclosure, so the door can open either on the right or on the lefthand side
- possibility of installing all the apparatus and modular circuit-breakers on a DIN rail combined with a hinged modular panel

The standard colour is RAL 7035 orange peel. On request, the SR2 enclosures can be ordered in a wide range of RAL colours (see page 24/143).

Both the enclosures with glazed door or blind door can be stacked:

stacking is done simply by removing the fairlead plates and inserting the IP65 sealing gasket (GZ....), made of neoprene with closed cells.

Assembly of the stacked enclosures is carried out by means of the same holes used for the fairlead plates.

The door is supplied with the enclosure (single code) so as to reduce the number of articles and assembly times.





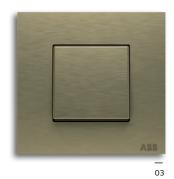
Millenium

Ultra slim design in different finishes

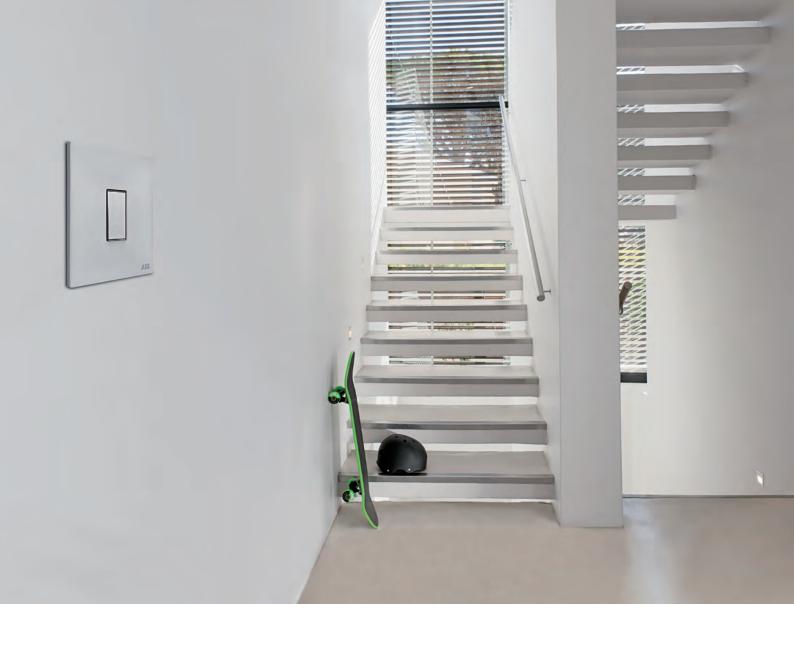
Thanks to a combined system, the switches of the Millenium series provide a comprehensive range of solutions for single rooms or whole building concepts. The square and ultra slim switches do not only add quality and style to the overall building, but are also easy to install.







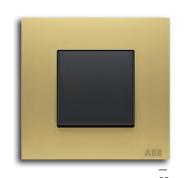












01 Stainless Steel

02 Silk Black *

03 Antique Gold

04 Matt Gold

05 Stainless Steel and Silk Black

06 Silk Black and Stainless Steel

07 Antique Gold and Stainless Steel

08 Matt Gold and Silk Black

* Silk Black not suitable to installation outdoors ** Cover frame made of real glass

Innovation, design and technology

Millenium's design and functionality convert into numerous technical and installation advantages

Modern and contemporary 4 finishes made in real stainless steel material AISI 304 and 2 finishes made in glass to complete the elegant finishes of Millenium: Stainless Steel, Silk Black, Antique Gold and Matt Gold.

Designed by the famous European designer Josep LLuscá.





Slim line design, only 4 mm high with straight and square lines at the forefront. Rocker with attractive chrome profile that gives a distinctive glance. Range with wide rocker and metal finish. Screwless front plate ultra slim design.

Range with wide rocker and metal finish. Screwless front plate ultra slim design.





ABB warranty policy for Millenium

- 10 years for mechanical switches and socket outlets
- 1 year for electronic devices

Switches as per BIS standards and with ISI marking.



Sustainability and maximum respect for the planet

Nowadays it is not enough to simply design on the basis of aesthetics. The responsibility of manufacturers towards the environment means that they have to think about ecological designs.

At ABB, we are convinced that the intelligent use of technology makes sustainability and maximum respect for the planet possible. So our products care for both people and the world around them.

These are some of the environmental improvements offered by Millenium:

- Millenium light signals are based on LED technology, leading to a saving in energy consumption of 50%, and extending their life to up to 10 years.
- Recyclable packaging, optimised to reduce raw material consumption.
- Optimization of Millenium's design, production and distribution process in order to reduce the impact in the environment.
- All our products comply with ROHS.







Millenium range has been designed following the requirements of norm ISO 14006 Environmental management systems / guidelines for incorporating Ecodesign certificate.

Full range of ABB i-bus® KNX, ABB-free@home® sensors, innovative, intuitive and visually elegant. Millenium gives the answer to the future by providing comfort, safety, and energy saving.



Millenium collection is a grid type system enabling combination of colours and products of different dimensions and functionality. The three type of switch dimensions together with the ABB i-bus® KNX, ABB-free@home® sensors and other functions, have to be composed with the required frame, in order to have the right assortment of functionality and design. In ABB i-bus® KNX sensors, we have the possibility to adjoin to the frame the special metal mounting plate that allows to reduce the height so as to maintain the ultra slim line for KNX functionalities.







Mounting plate

Premium rocker switch

01 KNX 6gang sensor

02 KNX 6gang with IR sensor

03 KNX 180° movement detector

04 KNX room temperature controller



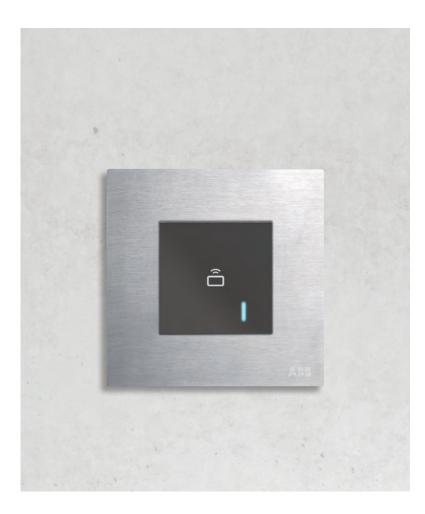






01

Access control: the right choice for hotels applications



ABB's access control KNX-based solutions are perfectly adaptable not only to the needs of hotel industry operators, but also to the hospitality sector in general (apartment hotels, B&Bs, holiday apartments, and resorts).

Advantages

ABB access control is based on MIFARE transponder technology, exploiting its flexibility and security:

- Simplified and centralized management of all hotel functions from the front desk via the supervision software.
- Energy efficiency and cost savings (activation of the room's electrical devices only when occupied by the guest).
- Safety, thanks to room access via transponder
- Additional guest services integrated, managing access to every hotel common area.

01 Transponder reader

02 Transponder holder

03 Set of 10 MIFARE transponder cards

04 MiniMAC 4.1 software









Freedom is a wonderful feeling

With Millenium collection ABB-free@home® all functions in the home can be managed automatically – according to time schedule, temperature and movement detector – or be called up at the touch of a button. Every combination of the various functions is possible. More comfortable living.

ABB-free@home® makes daily life easier.

01 Switch 1/2gang, Stainless Steel

02 Switch 2/4gang, Stainless Steel

03 Movement detector, Stainless Steel

04 Room temperature controller, Stainless Steel

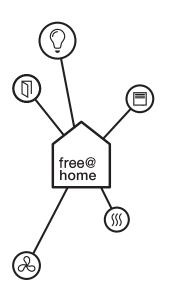












Blind (2)

Airconditioning

) Light (

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Door communication



Heating

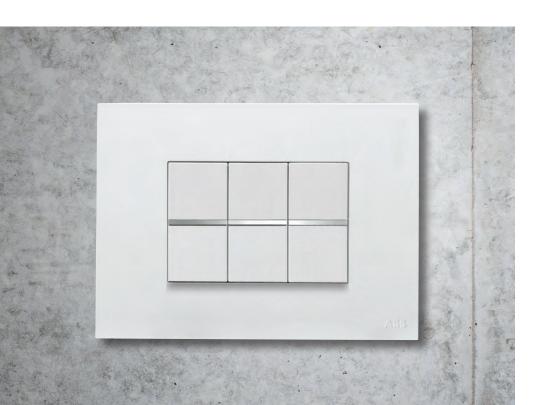


Now scan the QR code to find out more about the advantages of ABB-free@home® abb.com/freeathome

Zenit

The highlight of modular series

Zenit is the most comprehensive modular range for all kind of homes and commercial buildings. A number of appreciated designs and beautiful finishes that add value to the facility, with advanced features that provide greater comfort and performance level. With Zenit you can make any type of installation, can enjoy benefit of technical advantages that make it easier and faster. This range has the guarantee of a brand renowned for its quality such as ABB.





The top in design and performance

For its aesthetics and details

Simple, elegant, the top in design.

Zenit is born with a high-rise design. With rectilinear lines, very trendy finishes and full of details that enhance its aesthetics. It reaches the highest levels in quality and infinite values.





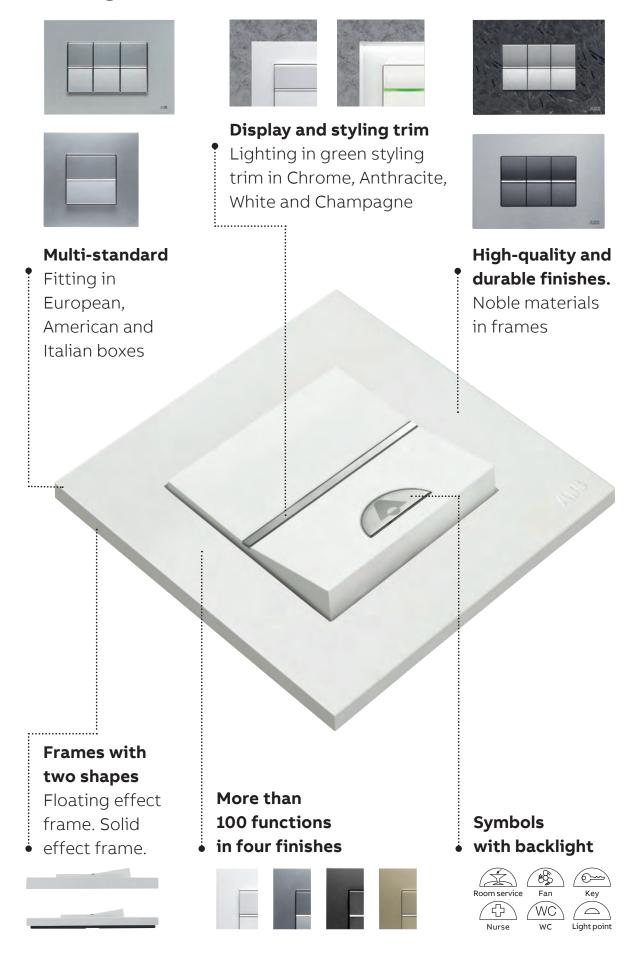
Eco-design

The Zenit switch range has been designed following the Product Design and Development Environmental Management regulations: Eco-design.

Switches as per BIS standards and with ISI marking.

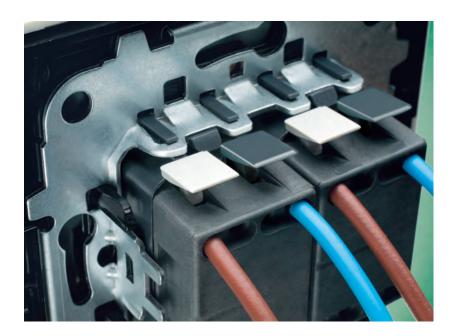


Wide range



Functions for all spaces

Zenit can be installed everywhere, in spaces that require new solutions, with new applications and all installation facilities.



Up to 40% savings

- Contacts with an automatic connection terminal providing ease and up to 40% savings in installation time.
- The Zenit rocker mechanisms are 16A and they offer top quality with a reduced number of reference to stock.
- More robust and compact mechanisms to be inserted from the front.
- Designed to hold the switches firmly, avoiding balancing problems.
- They have reduced depth, only 21 mm, which allows more connection space for wires.
- With larger press clamps and smoother to make the automatic connection more comfortable and safer.
- They have been manufactured with high quality and recyclable material.



More benefits

- Galvanized steel mounting plates with unique anti-corrosion treatment with top and bottom nerves for a rigid positioning of the mechanism.
- The mounting plate is supplied separately from the frame in order to create the atmosphere you want.
- Zenit mechanisms are designed so they can be removed from the front.
- Galvanized steel metal mounting plate to ensure the durability of the installation.



Less consumption

- The covers are easily removed to change the lighting pilot facilitating the installation from the front.
- In Zenit, we have replaced our traditional neon pilot for a LED located in the horizontal display that emits a diffused light; it looks more attractive; it consumes less energy and lasts 10 years.

Automatic connection



1. Strip the cable about 14 mm and introduce it into the terminal.



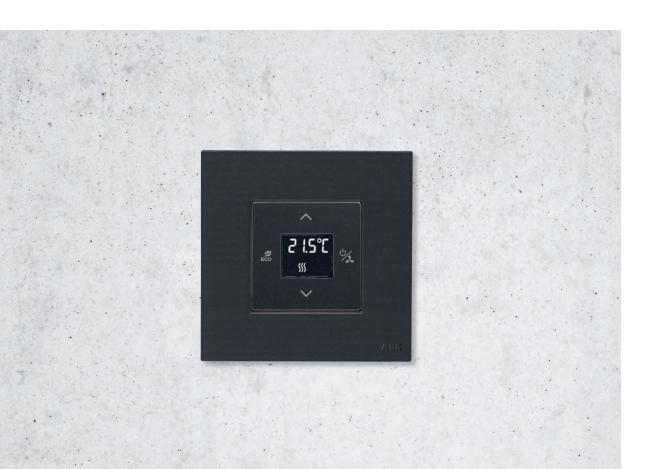
2. Press the push button and insert the cable.



3. Release the push button and check fixation. To disconnect the cord, press press the push button again on top and bottom.

Zenit & ABB-free@home®

Making home automation easier than ever. Simply smart. Zenit and ABB-free@home® transform the house or the apartment into an intelligent home. Whether it's blinds, lights, heating, air-conditioning, door communication or scenes. Easy to remote control via a switch on the wall, with the laptop or with the smartphone. Very convenient. Extremely comfortable. Very energy efficient. Especially attractive: Only minimal costs are involved when compared with conventional electrical installations.



Zenit & ABB i-bus® KNX

Perfect climate. A perfect hotel room is never too warm, never too cool and always filled with fresh air – it stimulates all of your senses. The invisible technology, ABB i-bus® KNX, makes this possible. Everyone can get to grips with it straightaway thanks to the room temperature controller with its clear design. As a result, you can control the heating, ventilation and air-conditioning with the touch of a finger and a glance at the display – it's as simple and clear as that.

Measurable efficiency, all costs under control

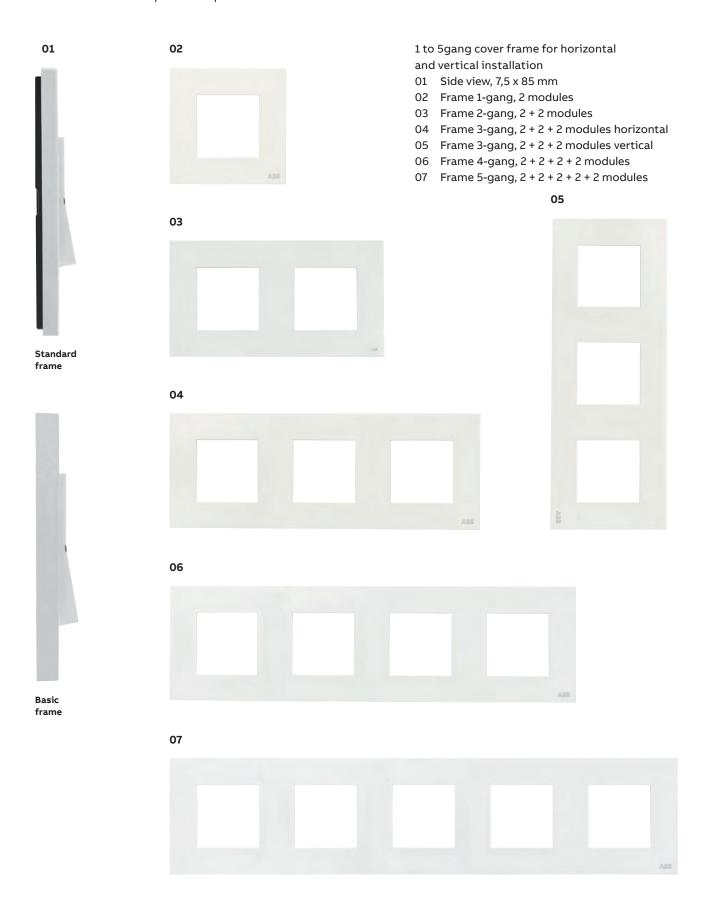
Comfortable cost reductions. You don't always have the same number of people staying in a hotel room. This is why it is important to adjust the resources to the use in order to increase efficiency. Intelligent presence detectors with a direct KNX connection adjust the indoor climate and light sensitively. With their extensive coverage and discreet design, they blend seamlessly into the architecture – almost invisible but highly effective.

Maximum safety for guests and investments

More than a feeling. Intelligent technology is behind all that is safe. Only a fully networked building creates an environment which protects the people and values. The ABB i-bus® KNX brings everything together. By integrating all applications, the result is stability for everyone.



ZenitFrames for European square boxes



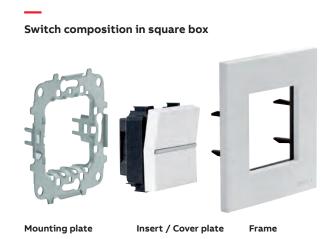
Zenit

Frames for European square boxes

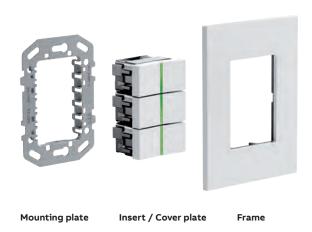


Easy and intuitive installation system,

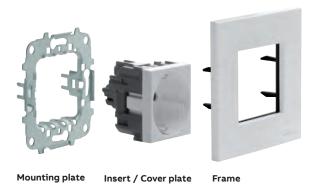
providing maximum values in performance, comfort and functionality



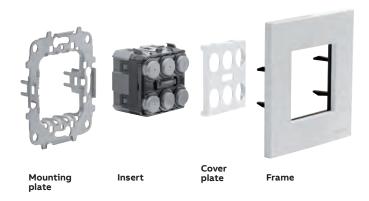
Switch composition in rectangular box



Schuko socket outlet composition in square box

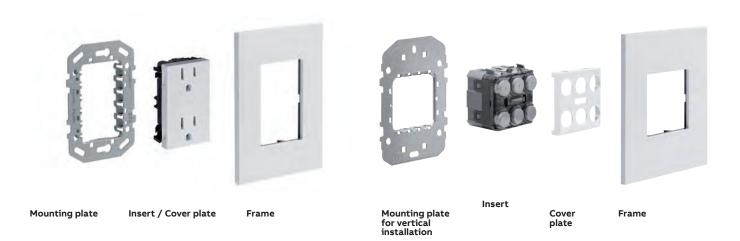


KNX and free@home sensor composition in square box



NEMA socket outlet composition in rectangular box

KNX and free@home sensor composition in rectangular box



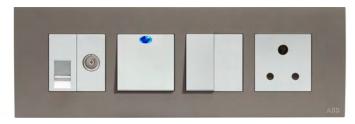
IVIE

Sleek and convex design in different finishes

Thanks to the complete system,
The Ivie series provides a
comprehensive range of solutions
for building concepts. The convex
and sleek design not only provides
quality and style to the overall
building, but is easy to install.



01



02



03

Different finishes and combinations:

- 01 Anthracite grey mechanisms in Silver plate
- 02 Silver mechanisms in Anthracite Grey plate
- 03 Anthracite grey mechanisms in White plate

Flexibility in design which provides total control

The IVIE range is the first Indian range to incorporate wired and wireless home automation systems together. This range can be integrated with ABB-free@home® home automation system, which is the most intelligent way of managing spaces with energy saving.











ABB-free@home® sensor for switching control, blind control, dimming and scene control.







Innovation, design and technology range with real international concepts

IVIE's design and functionality convert into numerous technical and installation advantages.



Modern and latest finishes in white, silver, anthracite and colours of your choice.



Double shrouded internal mechanism under the rocker, totally preventing visibility of sparks.



Convex profile plate with less projected sleek design is a perfect match for any architecture. Dust-free surface and a slim design, not only add to the quality, but also provide a stylish look.



Terminal screws with Combihead for star/flat screw drivers.



Large variety of sockets, equipped with shutters for increased safety.
Compatible for 6/16A two pin plug.



Universal regulator with 360 degree rotation.

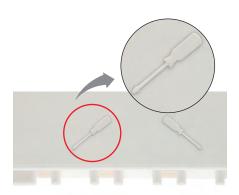




IP20 Finger Proof for total safety, user friendly terminal design-easy terminal accessibility by top entry to load connection.



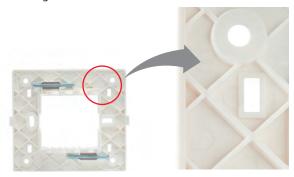
ISI marking on switch socket and fan regulator.



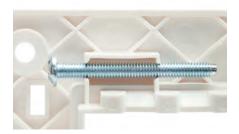
Visual signs provided in inner grids to guide proper fitment of easy installation and easy removal during fitment of mechanism with inner grid.



Independent shutter for earth and phase+neutral for child safety and easy connection.



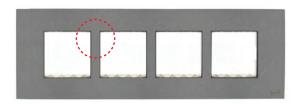
Resin frame with extra ribs provides better mechanical strength, insulation resistance and corrosive proof.



Mounting screws press fitted in back side screw holder to prevent losing of the same.



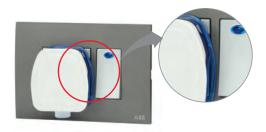
Laser marking and arrow showing the correct orientation of the mechanism.



Two module partition is provided for sturdiness with extra ribs to ensure better strength of the frame.



IVIE incorporates full range of ABB-free@home® home automation and gives answers to the future by providing comfort, safety and energy savings.



Suitable design for a variety of plug tops no overlapping on the mechanism fitted next to the socket.

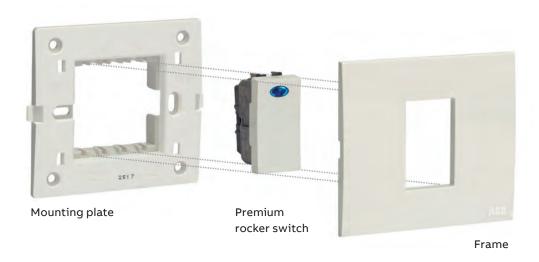


ABB warranty policy for IVIE range:

- 10 years for mechanical switches and sockets
- One year for electronic devices

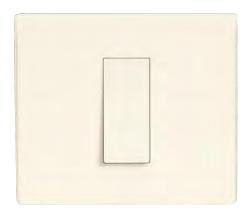
IVIE installation system

IVIE series is a grid type system enabling combination of colours and products of different dimensions and functionalities, together with ABB-free@home® sensors that have to be composed with the required frame, in order to have the right assortment of functionality and design.

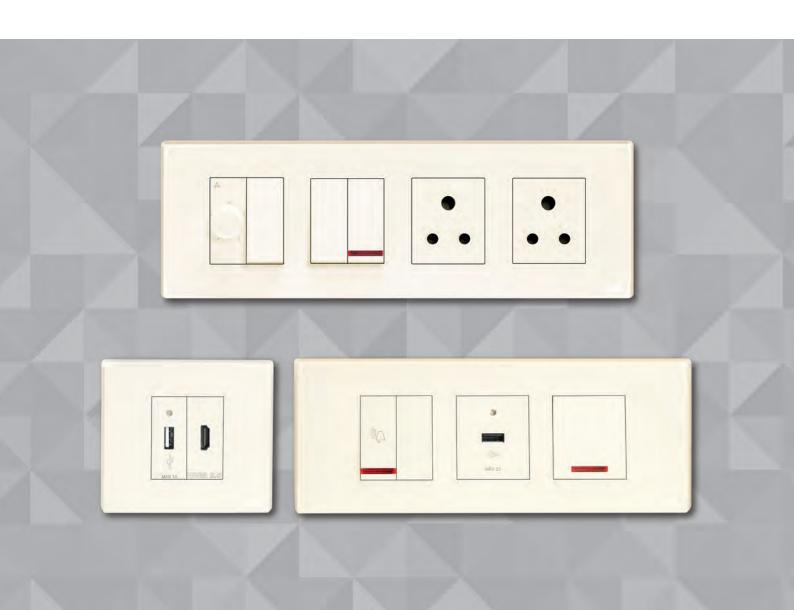




Key features



- Plastic parts which hold current carrying parts are made of PA6 20% glass filled rating upto 16A
- All switches are marked with IS 3854:1997
- Terminals are designed in such a way that wire is tightened without damage
- Bi-metal silver contact tips for less spark and longer life
- 6A & 6/16A marked with IS 1293, up to 16A
- Non-flammable thermoplastic resin parts and a very high insulating resistance after humidity test



Features and benefits





Internal arc shield provided in switch mechanism



Terminal screws with Combinead for star /flat screw drivers.



Easy terminal accessibility by top entry to load connection.



ISI marking on switch socket and fan regulator and laser marked.



Laser marking and arrow showing the correct orientation of the mechanism.





20A DP switch in one module (space optimisation)

Features and benefits



Large variety of sockets, equipped with shutters for increased safety.



Universal regulator with 360 degree rotation.



6/16A sockets are equipped with dual shutters which can take two pin plugs.



HDMI moduler ports equipped with female connector for easy termination.



USB charger current rating 1A and 2A, visible LED indication, Dual color LED indication for on load & without load operation.



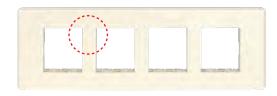


Communication mechanisms – RJ-11, RJ-45 cat6. Self-moving shutter to screen the jack when it is not in use.

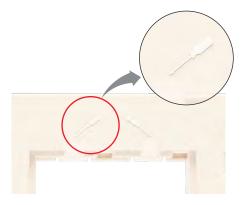
Features and benefits



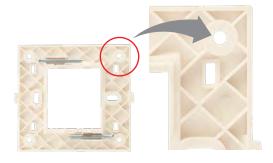
Mounting screws press fitted on the screw holder on inner frame to avoid losing the screws.



Two module partition is provided for sturdiness with extra ribs to ensure better strength of the frame and overlap of plugs.



Visual signs provided in inner grids to guide proper fitment for easy installation and easy removal during fitment of mechanism with inner grid.



Resin frame with extra ribs provides better mechanical strength, insulation resistance and corrosion proof.



ABB warranty policy for Tvisha range:

- 10 years for mechanical switches and sockets
- Two year for electronic devices

ABB Tvisha Anti-bacterial range



ABB Tvisha

- Anti-bacterial products are tested and confirmed as per stringent guidelines of ISO 22196.
- All front touchable parts are having anti-bacterial features.



To help combat the spread of germs, ABB has developed anti-bacterial treated ABB Tvisha range of wiring devices, to keep the surfaces of our switches and cover frames safer.

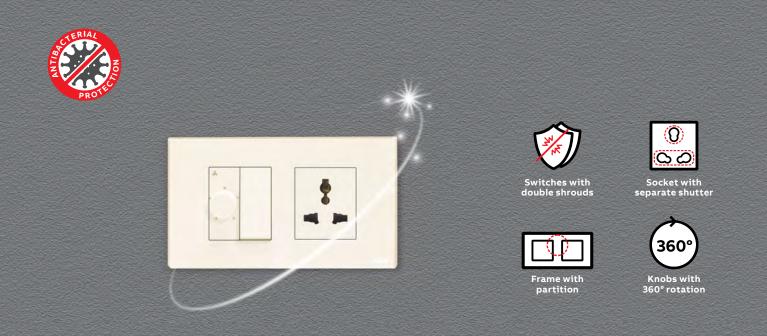
By incorporating anti-bacterial additive compounds based on silver ions into the product material, we can help inhibit the growth of bacteria on frequently touched switches and cover frames.

When used, they provide a complete antibacterial solution.

Some of the key benefits of the additives are :

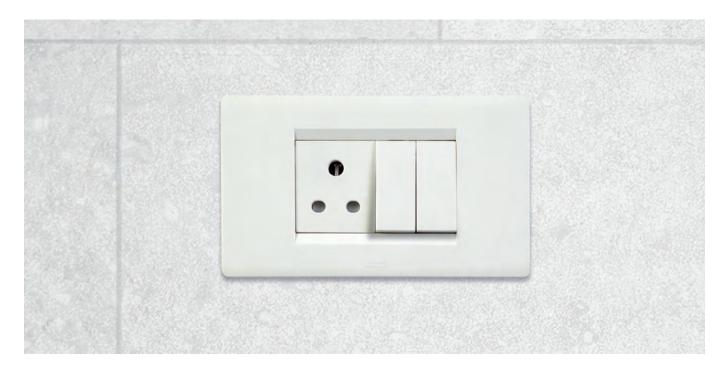
- · Non-migratory in nature
- · Non-toxic in nature
- Imparts bacteria controlling properties to Plastic surfaces
- Food grade and ecologically safe





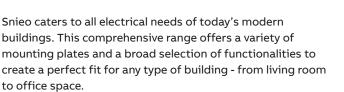
Snieo series

The complete range



Snied

Snieo combines modern design with high-performance materials such as premium thermoplastic resin. Our switches are made of fire retardant substances with superior electrical properties. Chamfered edges prevent dust accumulation and well-crafted sockets provide an enduring grip for a variety of plugs.



Switches

- All metal parts are independent and the completely revertless design increases durability
- · Silver tip contacts for better conductivity
- All plastic parts are made of premium thermoplastic resin
- · Up to 20A marked with fluorescent lamp load

Sockets

- Specially designed sockets, which perfectly match two and three-pin plug tops
- Specially designed shutter which slides smoothly even with two-pin plugs
- Conducting parts of copper, phosphorous, bronze and brass
- · All sockets are equipped with child safety shutter





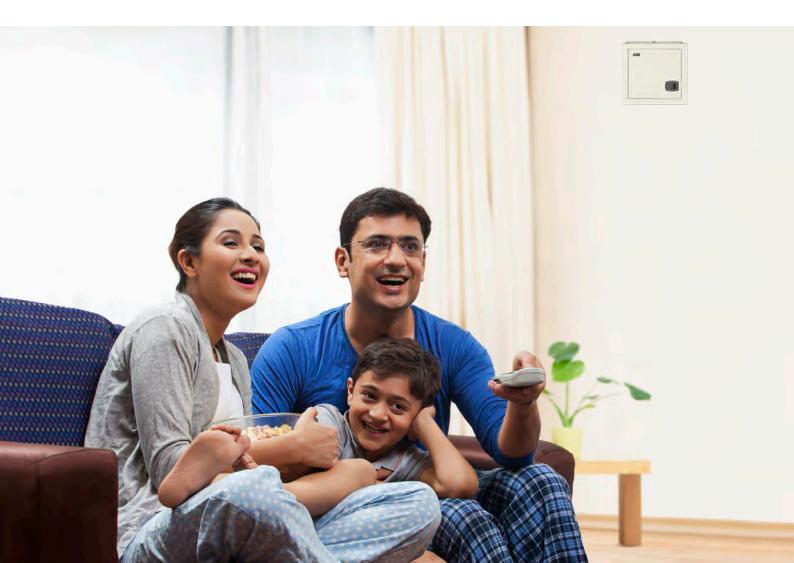




Formula DIN-Rail portfolio

A solution you can rely on





Formula DIN-Rail portfolio

The right choice for you

Formula DIN-Rail range offers the right solutions for a lot of electrical installations without losing the ABB quality standards. So we provide tangible benefits and concrete values for your daily installation business.



Completeness

Formula DIN-Rail range is a complete system solution, including MCBs, RCCBs and Isolators dedicated for residential and similar applications.



Easy wiring

Mounting and installation of all Formula DIN-Rail range products is possible with the same tools, thanks to harmonized terminals, tightening torque and wire stripping length.



Easy installation

Thanks to bottom-side terminals equipped to accommodate the Fork-Type Busbar, enabling easy and hassle-free installations



Easy selection

The technical information on the website enables you to make the right choice from the Formula DIN-Rail range



Environment-friendly

By using the state-of-the-art housing material, ABB is taking care of the environment. 100% halogen-free, without environmental pollution.

Formula DIN-Rail range is the right solution for electrical professionals who are looking to provide optimum protections in residential applications without compromises. With the Formula DIN-Rail range of MCBs, RCCBs and Isolators, we help you to improve safety and performance according to the necessary requirements.



Residential applications

• The range complies to the standards of residential applications and local regulations



Safety

• Perfect choice for your protection of the installation and safety of the user



• Longer electrical life and higher breaking capacity will ensure the long running, uncompromised performance



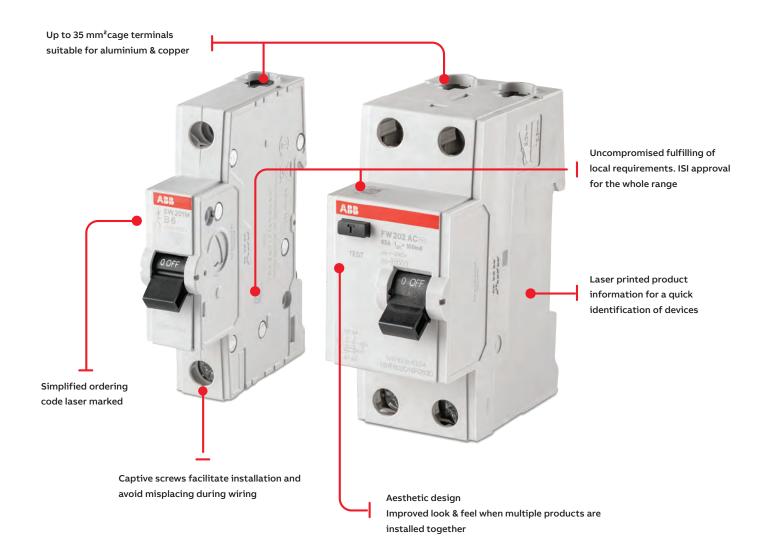
• Guaranteed safety and reliability, thanks to multiple automated testing of each single product



• The warranty period for MCBs is 7 years from the date of ABB's invoice, if the components are used in ABB's enclosure.

Formula DIN-Rail portfolio

Portfolio features



MCB - Miniature circuit breaker

- Protect installations against overloads and short-circuit, guaranteeing reliability and safety of operations
- SW200 M MCBs with breaking capacity of 10 kA in B/C characteristics and 1/2/3/4P configurations up to 63A

Isolators

- Opening a disconnector ensures isolation of downstream circuit
- SDW200 with 2/3/4P configurations in 40/63A

RCCB - Residual current circuit breaker

- RCCB is the safety device to detect earth leakage current and trip the circuit
- Sensitive only to earth fault current, therefore they have to be connected in series with a MCB or a fuse to protect them against over-currents and short-circuits
- FW200 RCCBs with sensitivity 30/100/300mA in AC type and 2/4P configuration up to 63A, corresponding to all requirements in residential applications

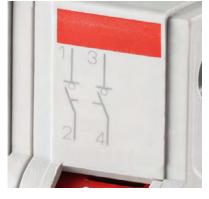
Formula DIN-Rail portfolio

Benefits



Dual termination

Fork-type busbars for easy mounting and installation



Wiring diagram

Wiring diagram for easy reference



Space for a better circulation

Perfectly designed breathing channels between the poles for proper heat dissipation and better thermal performance



Line load reversibility

Freedom for connecting incomer at the top or bottom





Positive contact indication

Ergonomically designed knob for smooth operation. Clear visibility of **ON /OFF** marking on the toggle



IP20 protection

Additional protrusion to ensure safety and avoid any accidents







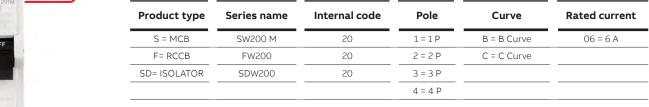












Formula SW200 M Miniature circuit breakers

Technical details

	Standard product	IS/IEC 60898-1	
	Poles	1P, 2P, 3P, 4P	
	Tripping characteristic	B, C	
	Rated current In	663 A	
	Rated frequency	50 Hz	
	Rated voltage Ue	1P : 240/415 V AC 24P : 415 V AC	
A. JAH	Breaking capacity Icn	10 kA	
6 69	Terminal size for cable	Solid, Stranded - 35 mm² Flexible - 25 mm²	
	Electrical life	In < 32A: 20,000 ops., In ≥ 32A: 10,000 ops	
W. I	Mechanical life	In < 32A: 20.000 ops, In ≥ 32A: 10.000 ops.	
	Ambient temperature	25+55° C	
	Storage temperature	-40+70° C	
	Protection degree	IP20	
	Approval	ISI	
	Tightening torque	2.0 Nm	
	Cable length	12.5 mm	
	Screw driver	No. 2 pozidrive	



Formula DIN-Rail portfolio

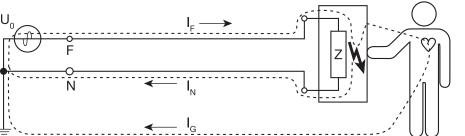
RCCB assures protection of people and installations against earth fault currents.



A residual current circuit-breaker is an amperometric protection device which trips when there is a leakage of current to earth.

Placing RCCB in the installation will help you to meet Govt. regulations which is mandatory to protect loads above 2kW and also safeguard the installation and user from electric shock and unwanted energy waste

- Protect persons against electric shock by direct contact (30mA)
- Protect persons against electric shock by indirect contact (100mA or 300mA)
- Protect installations against the risk of fire (300mA)





Formula FW200

Residual current circuit breakers

Technical details

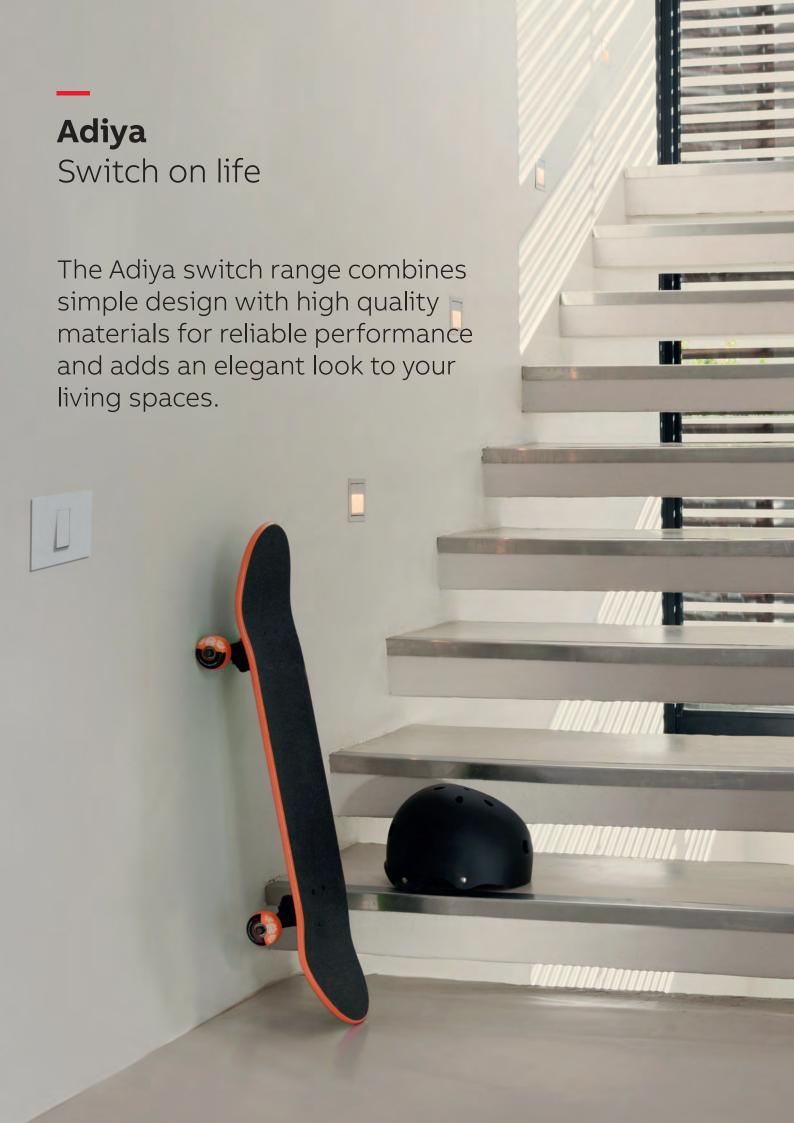
RCCB	Standard product	IS 12640-1(2016); IEC 61008-1	
	Poles	2P, 4P	
	Type	AC	
	Rated current In	25 A, 40 A, 63 A	
4	Rated sensitivity I\Dan	30 mA, 100 mA, 300 mA	
	Rated frequency	50 Hz	
PR 200 MG.	Rated voltage Ue	2P: 240VAC, 4P : 240/415VAC	
	Rated conditional short-circuit current Inc	10 kA (with a SCPD same rated In)	
	Terminal size for cable	Solid, Stranded - 35 mm² Flexible - 25 mm²	
eat.	Electrical life	10,000 operations	
	Mechanical life	10,000 operations	
	Ambient temperature	-25+55° C	
	Storage temperature	-40+70° C	
	Protection degree	IP20	
	Approval	ISI	
	Tightening torque	2.0 Nm	
	Cable length	12.5 mm	
	Screw driver	No. 2 pozidrive	

Formula SDW200

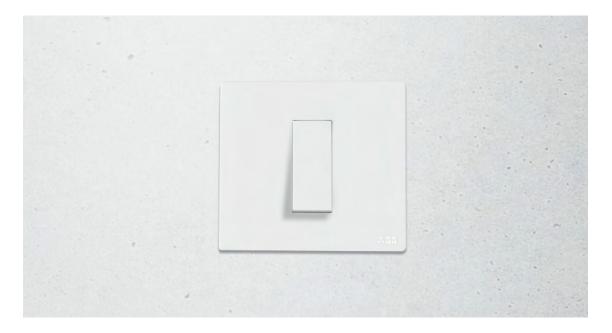
Isolators

Technical details

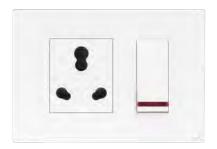
	Standard product	IS/IEC 60947-3
	Poles	2P, 3P, 4P
	Rated current In	40 A, 63 A
	Utilization category	AC-22A
	Rated frequency	50 Hz
0	Rated voltage Ue	240 / 415 V AC
	Insulation voltage Ui	250 V AC (phase to ground) , 440 V AC (phase to phase)
As Assert	Max. power frequency recovery voltage (Umax)	24P : 457 V AC
6	Suitable for isolation	Yes
aces aces	Electrical life	10,000 cycles
	Mechanical life	20,000 cycles
6 1	Ambient temperature	-25+55° C
()	Storage temperature	-40+70° C
0	Protection degree	IP20
	Approval	ISI
	Tightening torque	2.0 Nm
	Cable length	12.5 mm
	Screw driver	No. 2 pozidrive



Long-term reliability and safety with high quality materials



Enhanced safety features with unique dual shutter design, heat and impact resistant polycarbonate as well as UV-resistant materials combine durability with a stylish look. High specification electrical contacts material ensure long-term reliability.



Adiya

Features and benefits



Switches

- 240V, AC, normal gap constructions, flush type, screw type terminal
- · Available with and without indicator light
- Non-flammable thermoplastic resin parts and very high insulating resistance after humidity test
- Up to 16AX rated (suitable for fluorescent lamp load)
- · Marked with IS 3854
- · Snap fit with modular plates, very easy to install
- · Improved design can be easily wired in square plates
- Bi-metal silver contact tips for less spark and longer life
- Terminals are designed in such a way that wire is tightened without damage
- · Available in 6A, 16A, 20A and 32A





Sockets

- 240V, AC, flush type, screw type terminal, shuttered
- Non-flammable thermoplastic resin parts and very high insulating resistance after humidity test
- · Marked with IS 1293, up to 16A
- Snap fit with modular plates, very easy to install
- · Brass current carrying parts
- Terminals are designed in such a way that wire is tightened without damage
- All sockets designed to match 2-pin plug tops
- Available in 6A, 6/16A, 6/20A, 6/25A and 6/13A international socket

Adiya

Features and benefits



Fan regulator

- Step fan regulator capacitance type regulates speed of fan in 4 step 1 module and 5 step 2 module
- Polycarbonate material varies between 1.5 mm and 2.5 mm
- Capacitor power loss is approximately NIL, so there is no power consumption of fan regulator
- Improves the power factor
- Long life: more than 10000 cycles
- · Conforms to IS 11037
- 360° rotation no lock failure



Communication mechanisms - RJ-11, RJ-45 cat6

- · Rugged jack locking mechanism
- Polycarbonate material varies between 1.5 mm and 2.5 mm
- Self-moving shutter to screen the jack when it is not in use; additional for RJ-45 jacks
- Centered jack with shutter, aesthetically matches with other products, cat6 jacks on par with latest networking data transfer systems (gigabytes)



USB charger, HDMI mechanisms

- Current rating 1A and 2A
- · Visible LED indication
- HDMI 2.0 female connector
- · Back connectivity with pre-terminated female connector





- Extra slim plates but strong and flexible which match perfectly with any surface
- Plastic resin material varies between 1.5 mm and 2.5 mm
- Made of thermoplastic resin having very good mechanical strength and insulation resistance
- · Glossy and dust-free surface
- Available from 1M, 2M, 3M power, 4M, 6M, 8M, 12M, 16M and
 18 modules



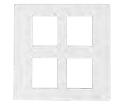


ABB Honora

Distribution enclosure

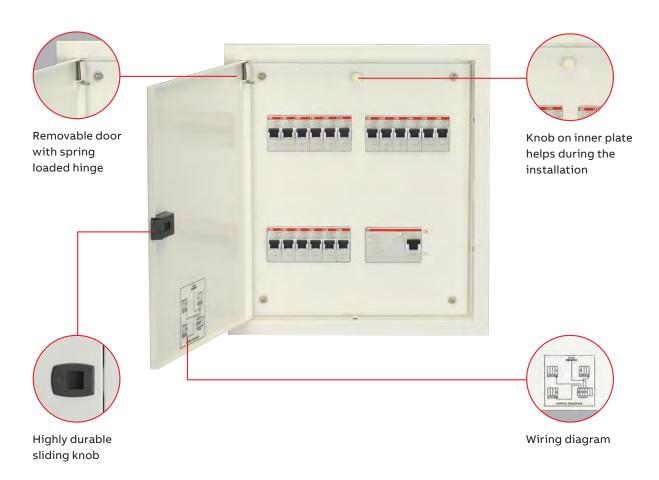
Features and benefits

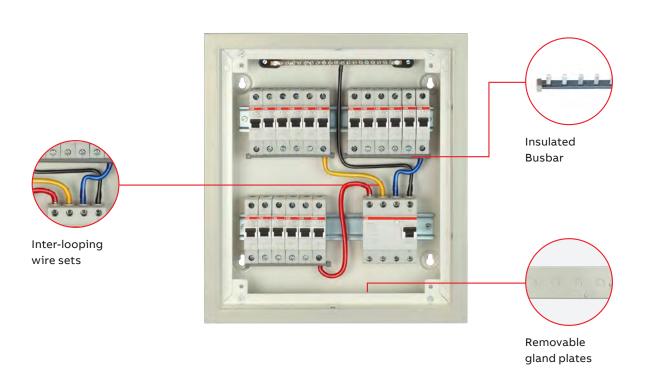
ABB Honora distribution enclosures. Glossy white finish will be blending with your interiors as per the new trends in wall color.

This series is available in glossy white finish (RAL9016) universal mounting type can be mounted flush or wall. These are provided with top and bottom removable gland plates with adequate amount of knock outs which enables easy installation and connection of conduits. Offers two types of protection IP30 without door and IP43 with metal.









Light switches

Modern light management Saving costs with innovation

01 Busch-Watchdog Presence tech

02 Busch-Watchdog Presence tech BasicLINE Corridor

03 Busch-Watchdog Presence tech BasicLINE

04 Busch-Presence detector

05 Busch-Watchdog Presence tech BasicLINE mini

For pass-through and large areas

Lights in corridors and large areas where people only pass-by should be only switched on when a person is detected and switched off as soon as they leave the area or after a selected delay time. The persons do not need to actuate a button or switch. Switch off of the lighting is assured. This saves both energy and costs.

With only one Busch-Watchdog Presence tech BasicLINE Corridor a detection range of 24m detection area at 3m installation height is possible. The use of a special housing makes the Busch-Watchdog suitable also for use in outdoor areas.

For toilets and small rooms

Lighting control depending on the occupancy in toilets, cabinets and other small rooms can avoid unnecessary expenses and alert about remained people after hours. In internal toilets the ventilation is comfortable to implement with an on/off delay.

The Busch-Watchdog Presence tech BasicLINE mini and the new Busch-Presence detector mini KNX are extremely flat and easy to install in the false ceiling.







Large areas



Toilets



Cabinets small rooms

The choice of the right model depends on the height of the ceiling, the size of the room, the installation situation and the type of movement to be detected. ABB offers the right solution for each situation:



ABB Welcome

Door entry system

A holistic concept.

Already today Busch-Jaeger fulfils the desire for harmoniously matching indoor concepts and holistic installation solutions. As standard. This allows all indoor stations of door communication to be integrated into every style of living.

That is why the ABB-WelcomeTouch and the ABB-Welcome indoor station with handset is available in studio white matt, aluminium silver and anthracite matt. And the ABB-Welcome indoor audio station with display is available in studio white, aluminium silver, anthracite, alpine white and white.















08

Mobile door communication.

As supplement to the permanently installed indoor stations, up to four additional participants can be connected to the ABB-Welcome system via the IP gateway. These devices can be smartphones, tablet PCs or a Busch-ComfortTouch®. The devices can be mixed.

There is only one system controller irrespective of whether audio or video systems are set up. Starting from a specific number of participants, additional power supplies are necessary. Detailed information on the system setup is available in the ABB-Welcome system manual (0001-0-1292). The system controller already has connections for the door opener and for one outdoor light. Both are switched via the indoor station.

riser mains).



a private branch exchange (PBX).

System controller	Auxiliary power supply	Switch actuator, door/light	Bell transformer, 12 V AC 1.3 A	IP gateway
83300-500	83310-500	83330-500	83315-500	83341-500
Supply device and controller		For connecting an	Power supply for an electric	Makes communication
of the ABB-Welcome system.	of the ABB-Welcome	electronic door opener, switching the light, or connecting a light relay (floating output 230 V, 3 A).	door opener.	possible between the ABB-Welcome door communication and the local IP network.
Video indoor distributor MDRC	Video indoor distributor FM	Video outdoor distributor	Switch actuator, flush-mounted	Telephone gateway
83320/2-500	83320/2 U-500	83325/2-500	83335 U-500	83350-500
Chair an		2 5 - 5 P.	44	
For the distribution of the video signal with line junctions (e.g. in a riser mains).	For the distribution of the video signal with line junctions (e.g. in a	For connecting several outdoor video stations to the system controller.	Switch actuator for connection to the door communication bus.	Telephone gateway for connecting an ABB- Welcome system with the analog inputs of

ABB Welcome

Door entry system

— 01 One-family house

02 Multi-family house

03 Apartment building

04 High rise building

05 Residential Complex

No matter in single family house, multi-family house, highrise building with more than 200 apartments or in residential complex with higher security requirement to screen incoming calls, Welcome M provide solution for all the requirements.





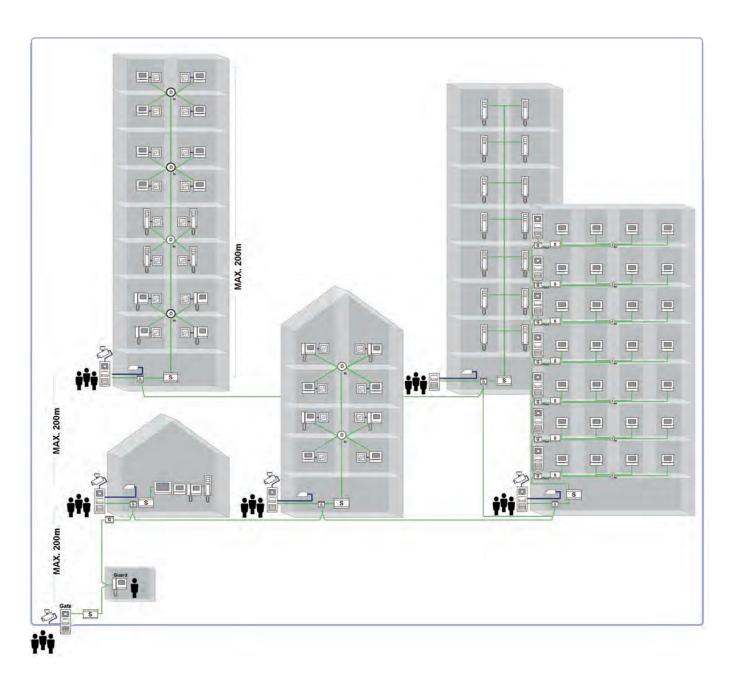




— 03



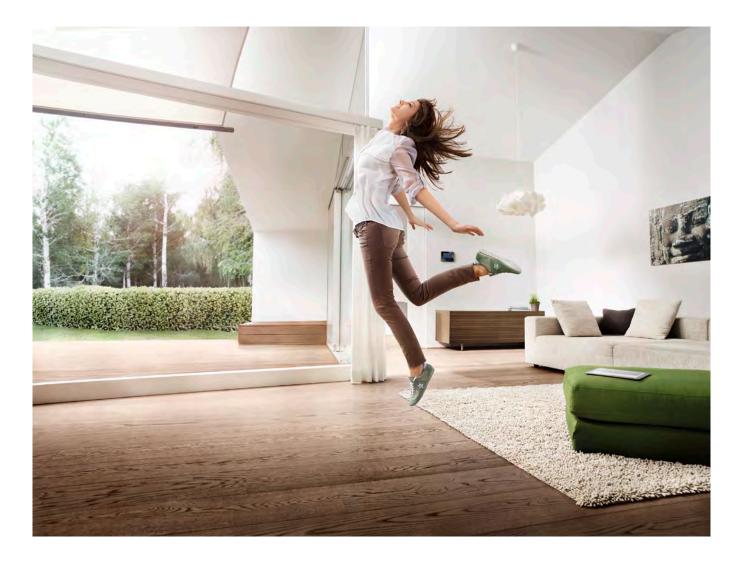




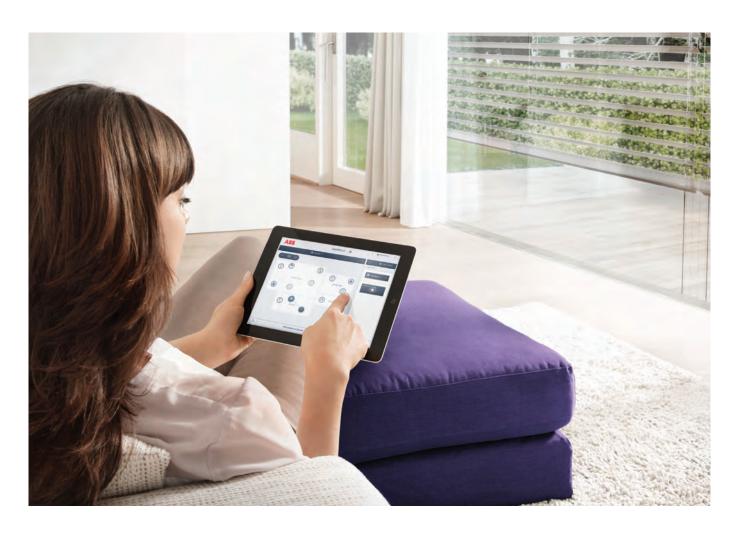


Free@home

The door opener to your customers



Making home automation easier than ever. ABBfree@home® sets new standards for easy installation, commissioning and operation.



Comfortable

Complete scenes are easy to adjust and also easy to be changed later by electricians and end customers alike.



Blind



Light



Heating



Air-conditioning



Door communication









Commissioning

Intuitive commissioning with all conventional Internet browsers as well as an app for iOS and Android.

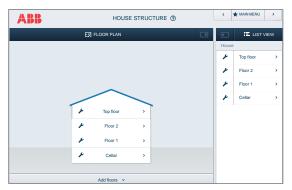
Free@home

Adjusting everything via an app



- Easy to operate
- Business segment with an assured future
- Competitive advantage

The entire system can be individually configured with the free app (iOS/Android) via smartphones or tablets as well as via browser on the computer.



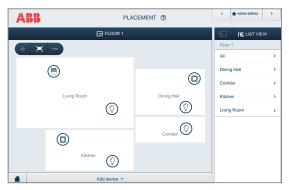
First step – the house

First, the floor plan with floors and rooms is created.



Third step - linking

And finally, the elements can be combined as needed.



Second step - the allocation

The sensors are integrated in the app in the floor plan and allocated in the system. This simultaneously allocates the devices to the floors and rooms, as basis for later operation by the customer.

Free@home

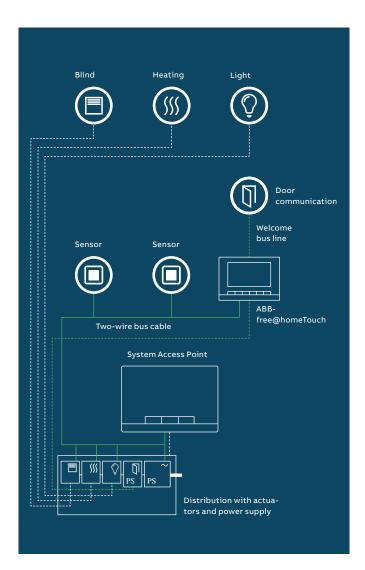
Two possibilities central or decentralized

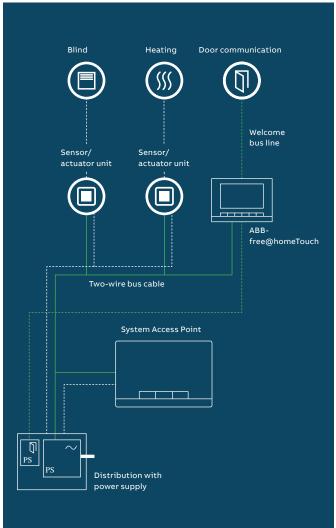
Central control with DIN rail mounting actuator

The installation of central DIN rail mounting actuators in the switch cabinet makes the installation of the sensors even easier – as only the bus line is located in the flush-mounted box. With this method, the costs for each channel can be reduced.

Sensor/actuator unit for decentralized control

All in one. To save space the sensor and actuator are located in one flush-mounted box of the switch combination. The function of both components is preconfigured. This makes programming of the basic functions unnecessary – but possible if required. This enables the lights and blinds to be controlled even before project planning of the system has been carried out. The 230-Volt line is wired as usual.





KNX and ABB i-bus KNX

Intelligent Building Control



In many areas of our private and working lifes, the increasing level of automation is a trend that confronts us on a daily basis without actually being noticed.

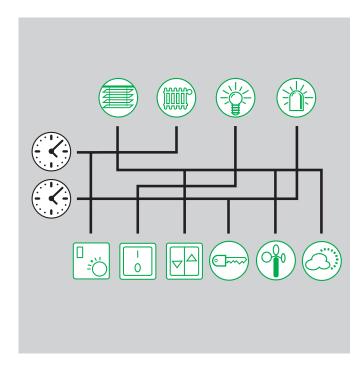
Automation in buildings aims to combine individual room functions with one another and to simplify the implementation of individual customer preferences.

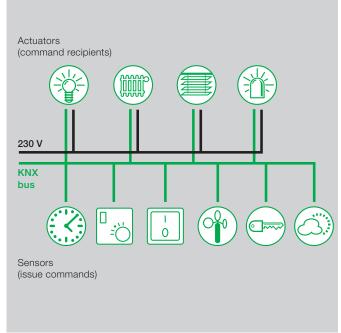
KNX is the logical development for implementing traditional and new requirements in electrical

building installations and thus replacing conventional installation techniques. The intelligent installation bus system efficiently performs the conventional functions and offers an additional broad range of expanded features, which could not be realized without a bus system. ABB offers consultants, system integrators and electrical installers a comprehensive product range with ABB i-bus® KNX, in order to meet the challenges posed to electrical building installations both today and in the future.

The conventional solution: Many separate cables, separate functionality, little flexibility

The intelligent solution: KNX – a system, a standard, many interoperable functions for maximum flexibility





What does KNX stand for?

KNX – The standard

The KNX system is the leading intelligent control system for buildings world-wide.

KNX resulted from the merger of major bus systems, including the well-known EIB (European Installation Bus) that has been successfully on the market since 1992.

What does KNX stand for?

- KNX is the first globally standardized system for the automation of residential and nonresidential buildings in accordance with the international standard (ISO/IEC 14543-3), the European standard (CENELEC EN 50090, CEN EN 13321-1 and 13321-2), the Chinese standard (GB/Z 20965) and the US standard (ANSI/ ASHRAE 135).
- KNX has established a clearly defined system platform where the KNX products of different manufacturers can be operated with one another.
- Both the data protocol and the devices are certified compliant to the KNX standard.

- KNX thus guarantees the networkability, interoperability, is both upward and downward compatible and thus future-proof.
- Just one common software tool is required for planning, engineering and commissioning of all KNX installations.
- Both the manufacturers and the KNX
 Association support professionals during planning, commissioning and maintenance world-wide.
- Comprehensive training opportunities are available for beginners and experienced users in certified training centres.
- More than 170 internationally certified manufacturers are members of the KNX association.
- More than 22,000 qualified KNX partners plan, install and integrate KNX systems worldwide.
- Thousands of buildings, ranging from private houses to airport complexes around the world, are equipped with more than 10 million KNX products.



What does KNX do?

Application

The use of new materials and the application of renewable energies are considered as the most significant innovations in the building industry over the last few years. The growing desire for comfort and functionality simultaneously with the limited availability of resources and increasing energy costs provide the basis for intelligent building control in modern constructions.

KNX interconnects all the components in the electrical installation to form a networked system and thus guarantees the transparency and utilization of information across the installation. In this system, all users "communicate" via a single bus cable. Thus it is possible to integrate all the different fuctional subsystems within the building into a seamless solution.

KNX bus systems can be used both in residential and non-residential buildings.

Applications:

- Lighting
- Climate control
- Sun protection
- Security
- Energy management
- Operation
- Automation
- Communication



ABB i-bus®KNX

What links ABB and KNX?

ABB is represented in over 100 countries with more than 100,000 employees. Our company benefits from over 25 years of experience in intelligent building control systems.

ABB develops, produces and sells a complete range of innovative products for building installation.

ABB plays a leading role in the KNX Association. ABB i-bus® KNX conforms to the international KNX standards and thus belongs to the leading technology worldwide for intelligent building control.



How does ABB i-bus® KNX work?

Intelligent building control in detail

Within the KNX bus system, all sensors (e.g. buttons or motion detectors) are interconnected to the actuators (e.g. dimming actuators, roller shutter actuators) via a data cable as opposed to directly wired switches and consumers (conventional installation). The actuators control the power circuit to the consumer.

Communication for all devices is implemented using data telegrams on the same bus cable. The

sensors send commands, actuators "listen in" and execute a defined function as soon as they are addressed.

A broad range of functions can be parameterized with ABB i-bus® KNX, such as group commands, logical sequences, control and regulation tasks.



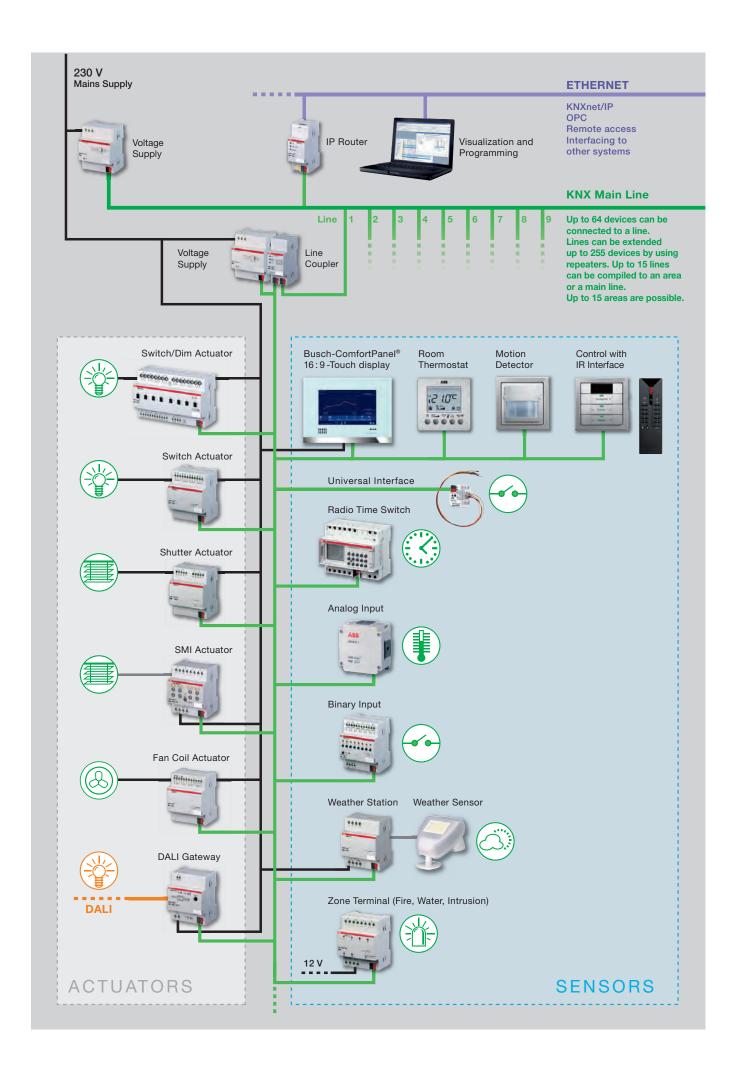






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