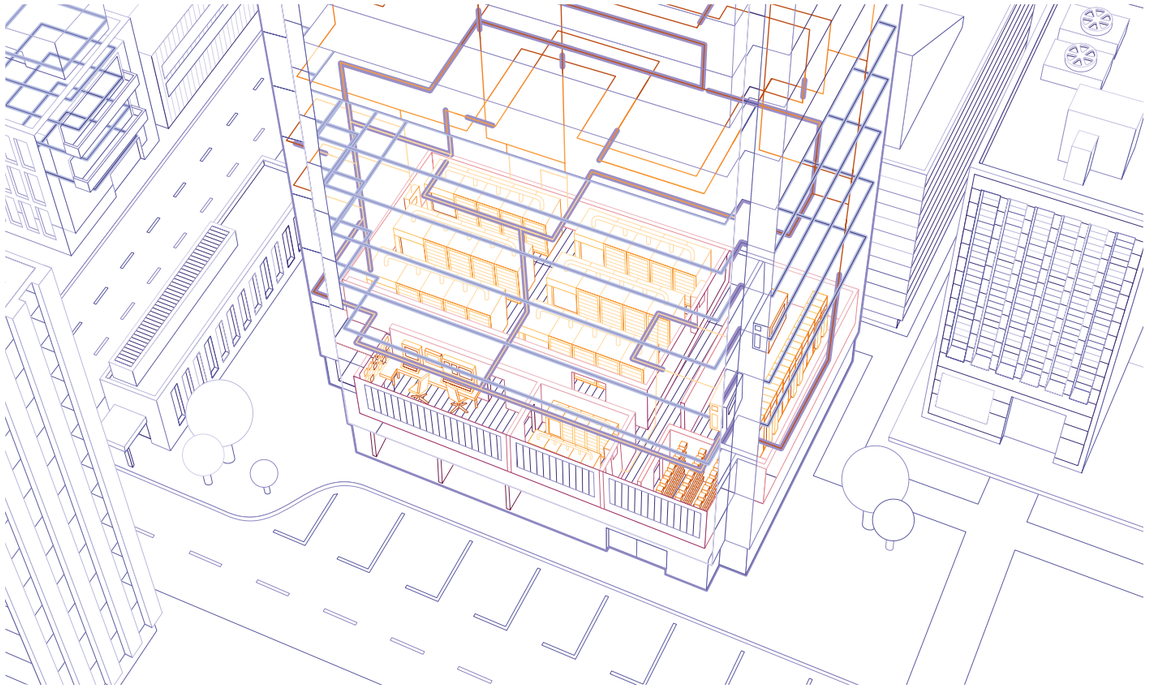
MNS® *i*RPP
Innovative power distribution to critical loads

Power and productivity
for a better world™

Intelligent, responsive power distribution and monitoring



Today’s data centers consume 100 or more times the power per square foot than an average office building. In such an environment, a single hour of downtime can cost millions of dollars. At the same time, electricity costs are on the rise and customers want to be billed only for the energy they use. Data center operators are under constant pressure to increase energy efficiency and pinpoint usage while maintaining 100 percent uptime.

ABB’s MNS® *i*RPP (intelligent RPP) helps meet the demands of power-intensive applications, delivering unsurpassed power monitoring and distribution with up to 128 poles in a safe, reliable, space-saving footprint.

MNS® *i*RPP is the ideal solution for data center engineers, managers and executives who must ensure continuous power to critical applications. It provides accurate power management that helps improve the bottom line.

Maximum uptime without outages

Power outages damage reputations, productivity and profits. ABB’s MNS® *i*RPP protects all three, providing years of safe, reliable operation and a complete vision for power distribution and monitoring. Our MNS® platform is designed to withstand harshest of environments including data center use helping ensure maximum reliability and uptime.

Product offerings include:

- Hot swappable branch circuits
- State-of-the-art, reliable components help minimize unplanned outages, ensuring high mean time between failures (MTBF)
- Pre-outage alarms, triggered by selectable parameters for main incomer and individual branch circuit breakers
- Plug-and-play branch circuit devices that make output replacement safe, fast and easy, reducing component downtime (MTTR)
- Industrial-grade, ABB-coordinated current limiting main and branch circuit breakers virtually eliminate nuisance tripping of the main/sub-main incomer. In case of a fault only the faulty branch circuit is disconnected, leaving remaining branch circuits/IT equipment unaffected
- Detection of overload through current measurement in each branch circuit
- User-friendly phase balancing capability
- The incoming supply to each branch circuit is integrated in the plug-in socket system, eliminating incoming cabling for each branch circuit
- Branch current sensor is mounted directly on the protection device, contact-free current measurement prevents potential errors

Business without barriers

No matter where you are in the world, ABB expertise is nearby.

ABB maintains an extensive global network of production facilities and service centers. Customers can be sure they are buying the same high-quality design, regardless of the factory's location.

Whether conducting a factory acceptance test, ordering replacement parts, attending a training session, or scheduling an on-site service call, our network reduces lead times, eliminates the need for middlemen, and limits the language, time zone, and travel issues that make doing business difficult.

Consider ABB as your single point of contact from purchase order to delivery, and ensure your project's success.

Optimize power usage

A thorough understanding of activity helps reduce operating costs and increase efficiency. MNS® *i*RPP continuously monitors power and energy from branch circuits and the main incoming supply, providing a constant, accurate picture of capacity, energy use and facility reliability.

MNS® *i*RPP assists with analysis of actual rack usage against the rack rated kW rating, helping data center operators manage capacity more efficiently.

- Determines whether a particular rack is being used efficiently and if it can support additional equipment
- Identifies areas for optimization (e.g., shut down passive racks) or areas that need increased capacity

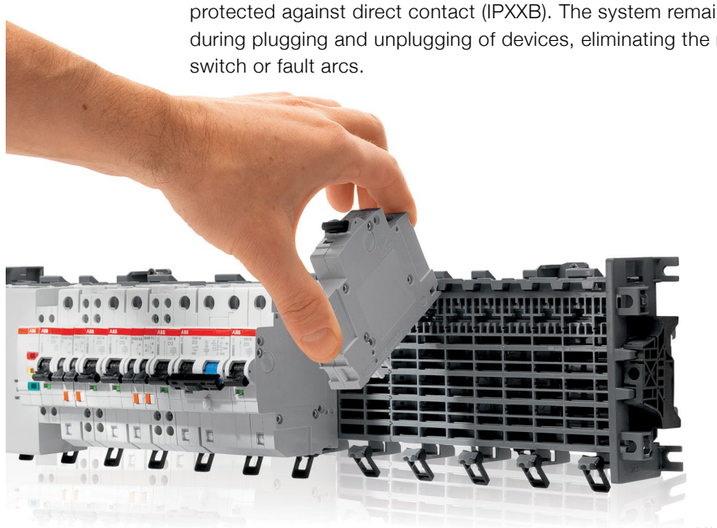
Intelligent monitoring and cost allocation

MNS® *i*RPP allows data center operators to easily track who is using IT equipment and how much power they consume. The information captured can also be used for trend analysis, billing and maintenance planning purposes. Similarly, intelligent RPPs allow companies to assign costs to internal consumers.

Safety in a compact footprint

The safety of your personnel is ABB's number one priority. MNS® *i*RPP's design is IEC 61439-1 and -2 compliant.

Branch circuit breakers are plugged on to the SMISSLINE TP plug-in socket system, allowing load-free plugging and unplugging of live devices and components without risk of electrical shock. The SMISSLINE TP plug-in socket system is fully protected against direct contact (IPXXB). The system remains fully touchproof during plugging and unplugging of devices, eliminating the risk of injury due to switch or fault arcs.



Scalable for the future

Today's successful data centers must be scalable, flexible and readily adaptable to business changes, especially the ever-growing appetite for increased data. In many cases, data centers add more servers, which increases power and HVAC consumption. ABB LV Systems solutions including MNS® *i*RPP readily provide flexibility by allowing data center operators to safely install new feeders and HVAC equipment – **racking up without powering down.**

- Option with 250/400A power supply and flexible outputs
- User-friendly phase balancing capability
- Branch current measurement range of 0-80A
- Branch current sensor is mounted directly on the protection device, allowing rapid addition/uprating of branch circuits
- Branch circuit breakers can be easily moved between L1, L2 and L3 phases to achieve/maintain phase balance
- Inspection glass with phase indicator on the front of the device
- Option for various protection devices (MCB/RCB/RCBO, etc.)
- Simple network configuration and diagnostic options using PS501 Control Builder Plus for rapid planning, implementation and commissioning
- PLC AC500 supports communication protocols such as Profinet/Profibus DP/ DeviceNet/ Modbus RTU/Modbus TCP/Ethernet
- Standard top and bottom cable entry for more flexible installation options to suite non-raised or raised floor applications

Simple, cost-effective operation and maintenance

It is estimated that 80 percent of power outages are preventable through regular monitoring and maintenance of mission-critical equipment. Even the smallest repair to a single component can cause significant downtime. However, in the rush of day-to-day operations, switchgear maintenance is sometimes overlooked. ABB's data center products and systems are engineered to deliver extended, continuous, reliable operation that helps avoid outages and costly maintenance.

ABB LV systems' global MNS® platform delivers a maintenance-free mechanical structure designed to save hours of maintenance each year. This platform provides plug-in solutions for critical components to be replaced quickly and easily.

- Pre-outage alarms mean corrective measures can be taken to prevent most unplanned outages (real time continuous monitoring to enable predictive maintenance)
- plug-in output devices allow safe, quick and easy change or replacement, thus reducing the component non-availability time (MTTR)
- Branch circuit breakers are easily moved between L1, L2, and L3 phases, maintain phase balance
- Inspection glass with phase indicator on the front of the device.
- Simple network configuration and diagnostic options using PS501 Control Builder Plus

Functional overview

ABB MNS® iRPP comprises SMISSLINE TP as distribution chassis to provide IPXXB protection for the branch MCB and facilitate 'hot swap' of circuits. The current measurement system (CMS) provides the current consumption in each branch circuit and the energy analyzer provides the reference voltage, cosphi and frequency from the incoming supply. The data from both the CMS control unit and the energy analyzer are fed into PLC AC500, which then calculates parameters like kW, kWh, % load etc., for each branch.

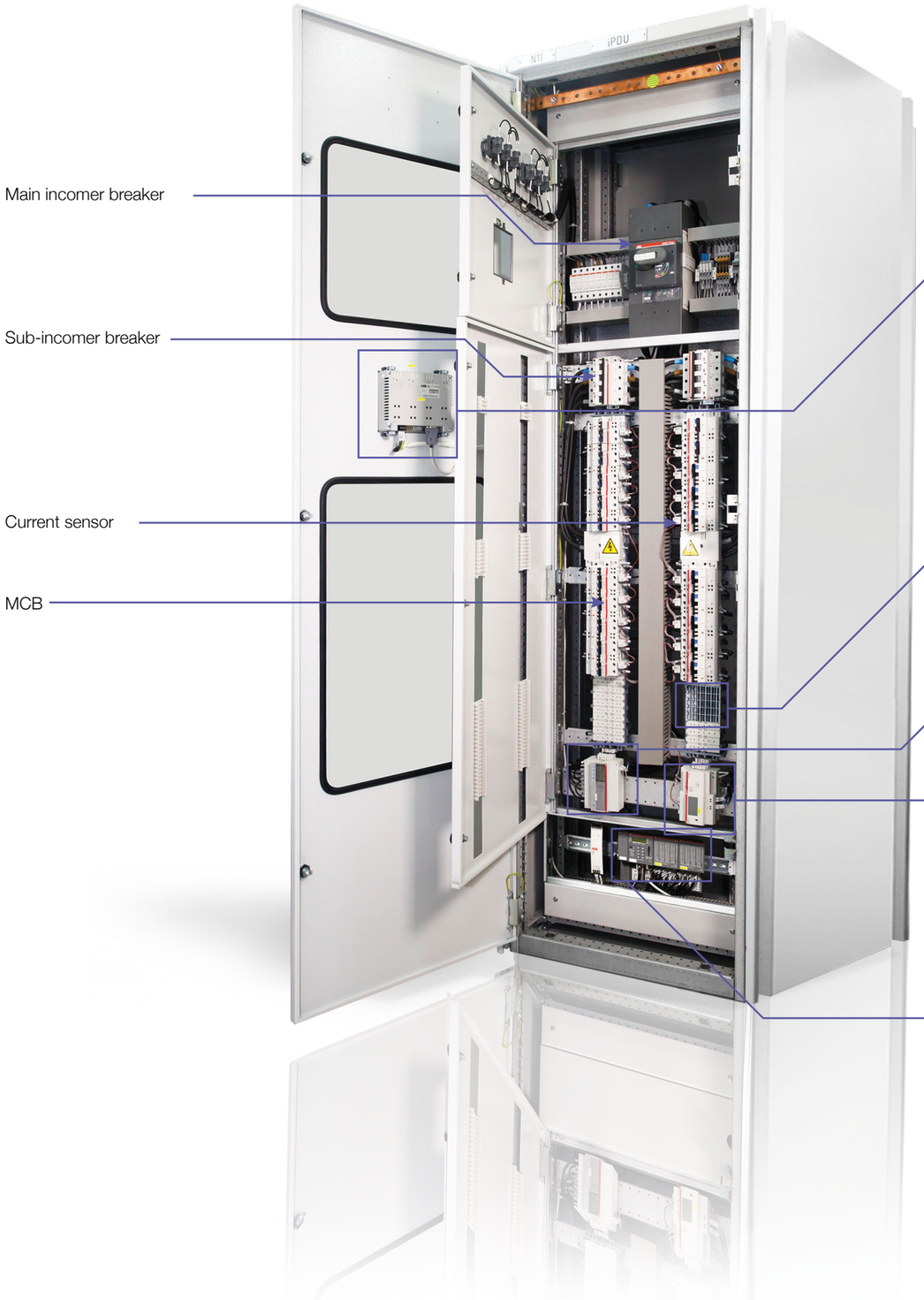
		MNS® *i*RPP
No. of branch circuits per system		64
Accuracy	Voltage	±1%
	Current	±0.5%
	Power	±1%
Measured voltage		150-480VAC L-L
		90-277VAC L-N
Operating temperature		0 to 60ºC
Power supply		24VDC
Communication		RS485 Port or TCP/IP
Protocol		Modbus RTU
Power and energy measurements	Mains	▪
	Branch circuits	▪
Branch circuit metering	Current per circuit	▪
	Max. current demand	▪
	Average current demand	▪
	Power per circuit	▪
	Max. demand	▪
	Energy per circuit (kWH)	▪
	List of top 20 energy readings	▪
	List of top 20 real time current readings	▪
Mains metering	Max. current per phase	▪
	Present current demand, per phase	▪
	Energy (kWH)	▪
	Real power per phase (kW)	▪
	Real power total(kW)	▪
	Power factor	▪
	L-L & average of L-L voltage of 3 phases	▪
	L-N & average of L-N voltage of 3 phases	▪
	Frequency	▪
Demand values	Total active power present	▪
	Total active power max	▪
Power quality measurements	Over voltage	▪
	Under voltage	▪
THD	Voltage	▪
	Current	▪
Alams	Current	▪
	Voltage	▪
	Power	▪

Footprint

Standard cubicle depth – 600mm. Standard cubicle height – 2200mm

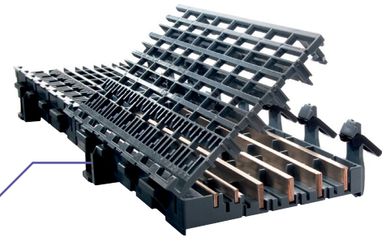
Branch circuit poles	Access	Cubicle width/mm
84	Front, front & rear	600
128	Front, front & rear	800

MNS® *i*RPP product overview



HMI CP660

The CP600 series is highly flexible and is specifically designed for advanced applications in complex systems or processes. It gives better information representation to ease human-machine interaction



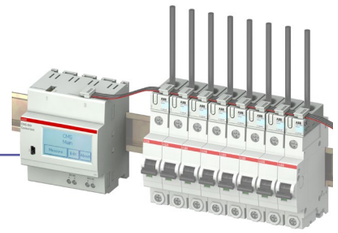
SMISSLINE-TP

The world's first pluggable socket system, SMISSLINE TP ensures that load-free devices and components can be safely snapped on and off under voltage without additional personal protective equipment and without the need for shutting down the complete RPP.

Energy analyzer – A44 Platinum

The energy analyzer has dual function. First, it provides the voltage and pf reference value to the PLC for calculating all the power/energy values for the branch circuits. Second, it provides the following data for the complete RPP:

- Active power
- Apparent power
- Reactive power
- Current
- Voltage
- Frequency
- Power factor
- Harmonics
- Total harmonic distortion



Current measurement system (CMS)

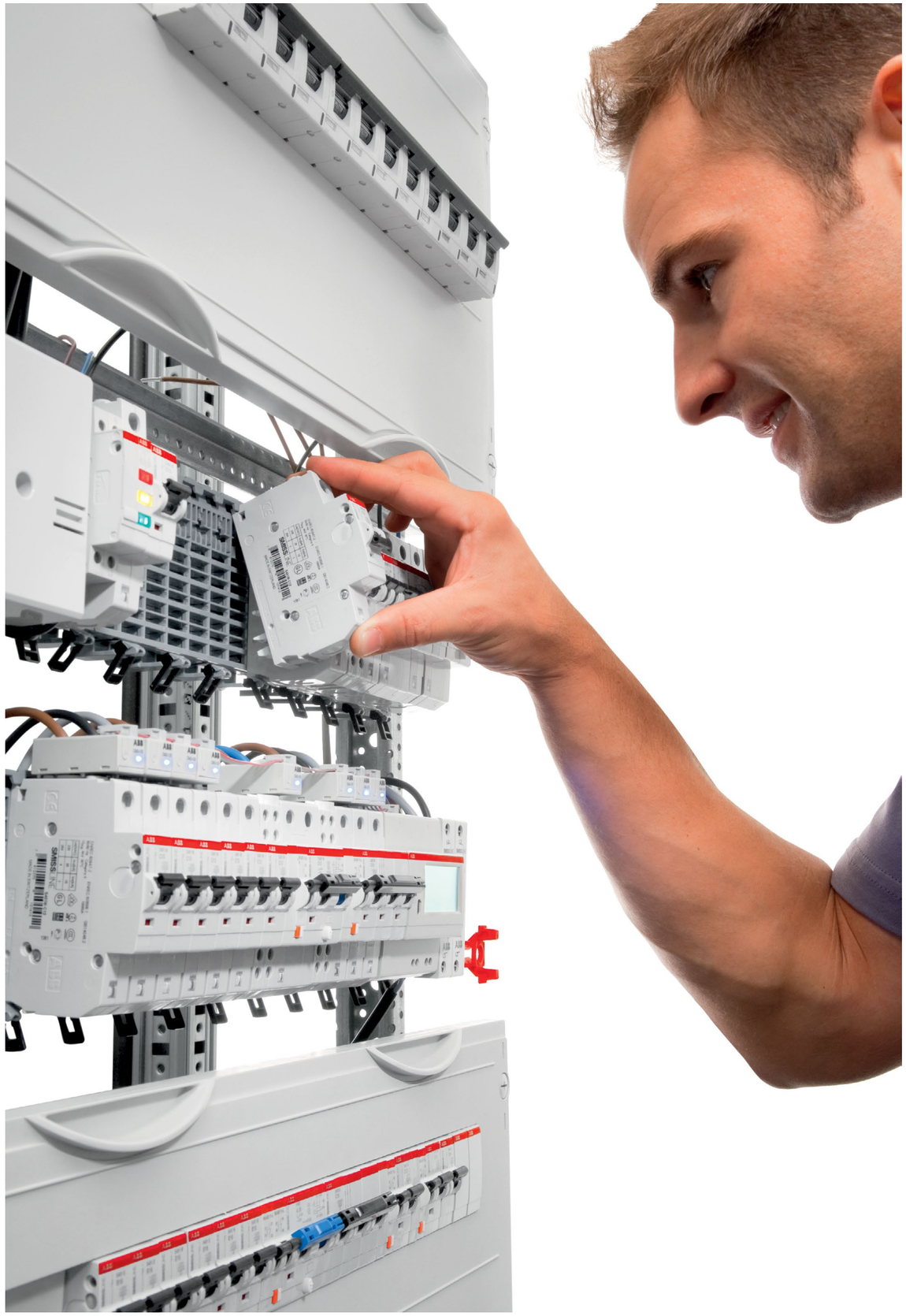
CMS is the most compact, neat and hassle-free current measurement system available on the market. The sensors get mounted directly on the SMISSLINE MCB & there is no need of conventional expensive and cumbersome cabling.

PLC AC500

ABB's flagship PLC offers a wide range of performance levels and scalability within a single, simple concept. It is designed to perform with ease varied communication tasks including flexibility, real time capability and the highest possible data transmission speed.

Technical data

Reference standards		**Low voltage switchgear and controlgear assemblies**	**IEC 61439-1 and -2**
Electrical data	Rated voltages	Rated insulation voltage Ui	690VAC
		Rated operational voltage Ue	415VAC
		Rated impulse withstand voltage Uimp	6/8kV
		Overvoltage category	II/III
		Degree of pollution	3
		Rated frequency	Up to 60 Hz
	Rated current	**Main incomer**	
		Rated current In	250/400A
		Rated ultimate SC breaking capacity Icu	50kA, 415VAC
		SMISSLINE-TP socket system	
		Rated current	Top/bottom fed – 100A Center fed – 200A
		Rated conditional short circuit current Icc	Main circuit and N+PE additional bars: 32.5kA, 400 V
	No of SP branch circuits		42, 84, 144
	Form of separation		2
Mechanical characteristics	Dimensions	Cubicle & frames	DIN 41488
		Recommended height	2200 mm
		Recommended width	600, 800mm
		Recommended depth	600mm
		Basic grid size	E = 25 mm, DIN 43660
	Degrees of protection	According to IEC 60529	External from IP 30 to IP 42 Internal IPXXB
	Steel components	Frame incl. internal subdivisions	2.0/2.5 mm
		Cladding, internal	1.5/2.0 mm
		Cladding, external	1.5 mm
	Surface protection/ paint	Frame incl. internal subdivisions	Zinc or Alu-zinc coated
		Cladding, internal	Zinc or Alu-zinc coated
		Cladding, internal	Zinc or Alu-zinc coated and powder coated RAL 7035
	Plastic components	Halogen-free	



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Publication No. ITPMC00202

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