UniGear *type ZS2*

Medium voltage, arc-proof, air-insulated, metal-clad switchgear

Industrial IT enabled

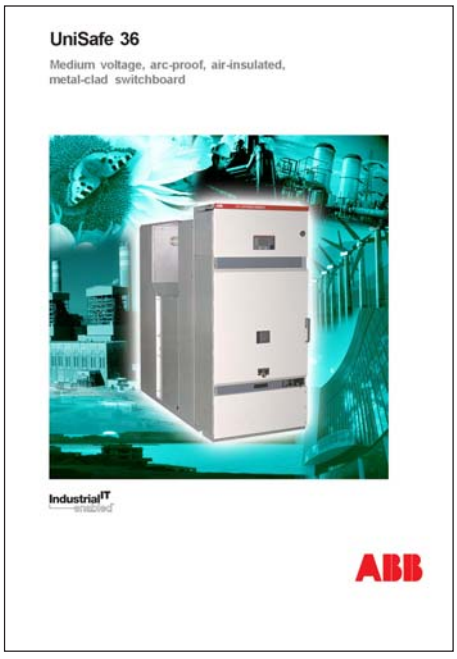
ABB

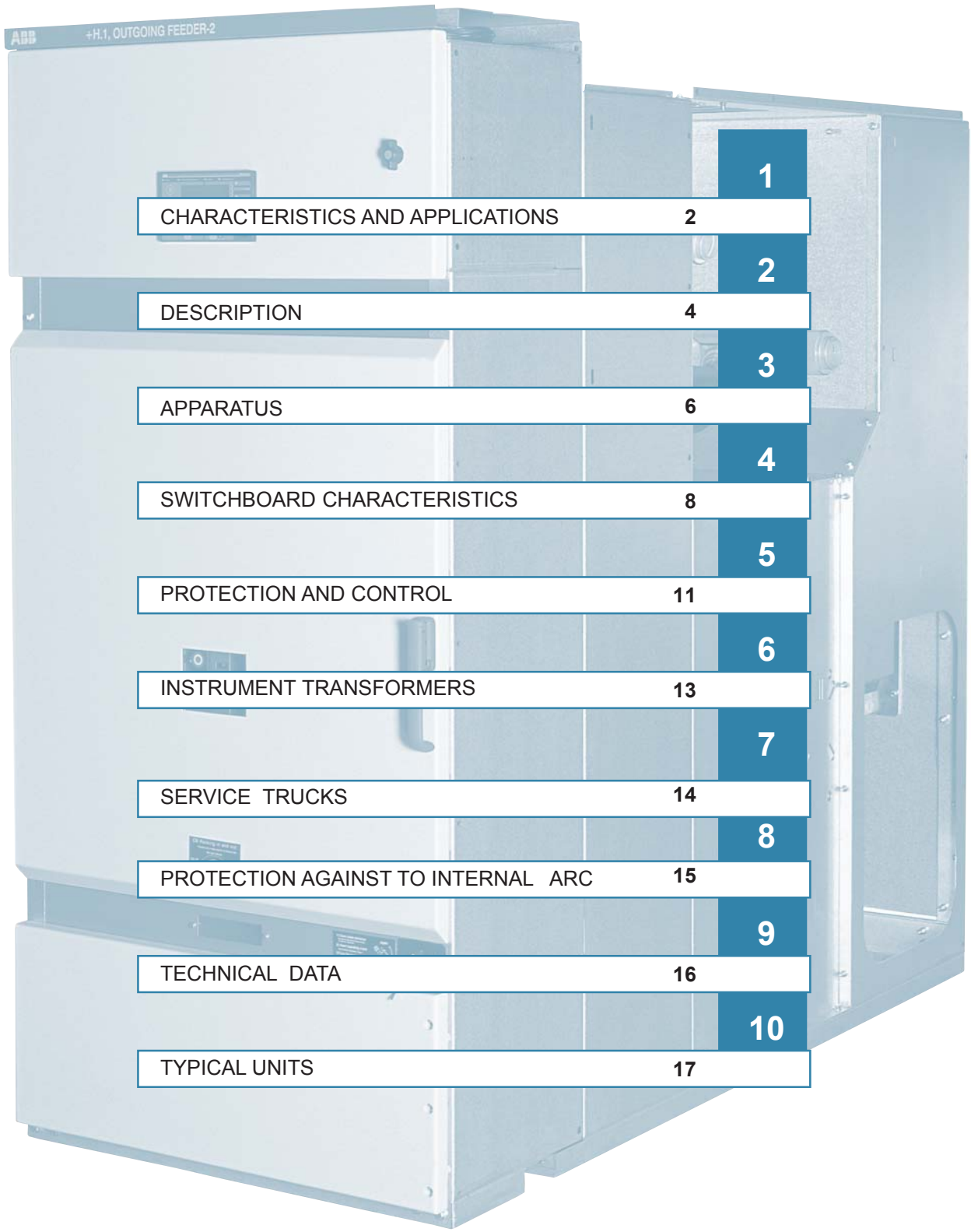
UniGear *type ZS2* is the new name of well-established **UniSafe 36** switchgear.

The product is identical to Unisafe 36 without any technical difference.
Therefore all related technical documentation under the name of UniSafe 36 will be valid and applicable to the product with the name of UniGear *type ZS2*.

Name change was done because of product portfolio and classification reasons.

Supplementary official acclaimer letter from ABB, could be submitted along with the product and technical documentation, upon request.





CHARACTERISTICS AND APPLICATIONS

UniGear type ZS2 characteristics

- Metal-clad air insulated switchboard
- Designed for medium voltage distribution
- Factory-tested for indoor installations
- Arc-proof switchboard
- Earthed metallic partitions between compartments
- Mechanical safety interlocks
- Compartments made of pregalvanized steel sheets
- Front access for installation, maintenance and routine operations
- Conventional instrument transformers
- Wide range of functional units for any installation requirement
- Easy-to-assemble modular structure.

Transports

- Airports
- Ports
- Railways
- Underground transport.
- Light Rail Transport

Services

- Shopping Centres
- Supermarkets
- Hospitals
- Infrastructures and civil works.

Applications

Utilities and Power Plants

- Power stations
- Transformer stations
- Switching stations
- Main and auxiliary switch-boards.

Industry

- Pulp and Paper
- Textile
- Chemical
- Food
- Automotive
- Petrochemical.

DESCRIPTION

UniGear type ZS2 is the switchboard version made for applications over 24kV and up to 36 kV.

UniGear can be used for higher altitudes above 1000 m a.s.l. for rated voltage below 36 kV. The main characteristics of the UniGear switchboard remain the same.

Thanks to compactness, reduced footprint and the possibility of placing the switchboard against the installation room walls of UniGear.

All the operations can be carried out from the front of the switchboard.

The switchboard is also available in the Back to Back arrangement version for carrying out double busbar system configurations.

The entire busbar system (main and branches) is made with insulated round bars.

Apart from making the main busbar system installation operations extremely simple, these characteristics help to guarantee the performances required by a 36 kV air insulated switchboard.

In order to ensure easy access to the feeder compartment and, at the same time, not to increase the switchboard dimensions, the transformers for current measurement are specially positioned with a particular triangular shape.

This special layout of the transformers allows all the electrical parameters of the switchboard and ensures more space for the operators during erection and maintenance procedures.

Metal sheets segregate each compartment and the energised components are air insulated.

The arc-proof units have been tested in compliance with IEC 60298 Standards.

The installation requires very simple civil works. The switchboard can be wall-mounted.

The power cables terminals are accessible from the front.

Standard colour

RAL7035

Protection degrees

The protection degrees in compliance with IEC 60529 Standards are the following:

- IP4X on the external housing
- IP2X inside the compartments.

Cubicles with higher protection degrees (up to a maximum of IP52) can be manufactured upon request.

Compliance with Standards

The switchboard and its components comply with the following International and European Standards:

	IEC
Switchboard	60694
	60298
Circuit breakers	62271
SF6 gas	60376
Earthing switches	60129

Ambient conditions

The switchboard ratings are guaranteed under the following ambient conditions:

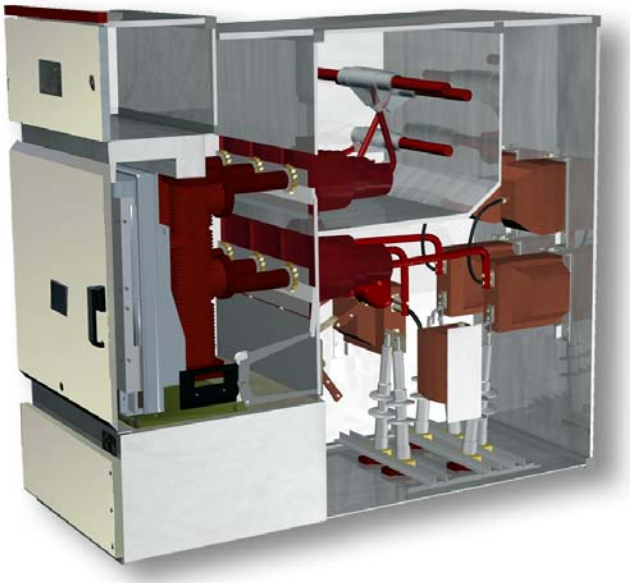
Minimum ambient temperature	– 5 °C
Maximum ambient temperature	+ 40 °C
Maximum relative humidity	95 %
Maximum altitude	1000 m a.s.l.
In presence of unpolluted and not corrosive atmosphere.	

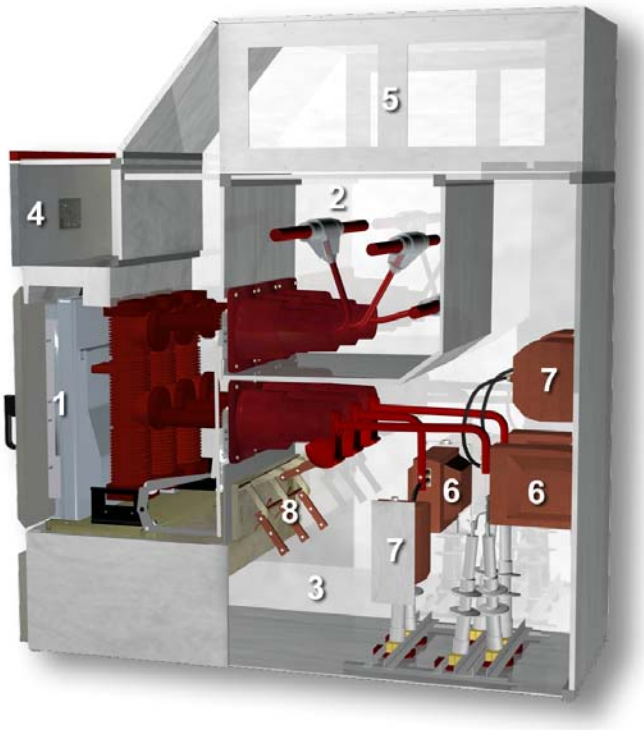
Main electrical characteristics

Rated voltage	**36 kV**
Rated current	... 2500 A
Rated short time withstand current	... 25 kA*

The electrical characteristics can change depending on different ambient conditions or on protection degrees higher than the standard values.

* Please contact ABB for 31.5kA (1sec) solution.





1 Circuit breaker compartment
2 Busbar compartment
3 Cable compartment
4 Low voltage compartment
5 Arc channel
6 Current transformers
7 Voltage transformers
8 Earthing switch

Above illustration represents 1000 mm wide panel. In case of 1200 mm wide panel, all current transformers and voltage transformers are mounted side by side on a seperate plate at the back of the panel in the cable compartment. Please contact ABB for detailed design drawing.

HD4 SF6 Circuit breaker

UniGear type ZS2 switchboard is equipped with SF6 HD4 circuit breaker.

The circuit breaker is fitted with a truck for the racking in and out with closed door.

The light and compact structure of UniGear guarantees sturdiness and high mechanical reliability. The stored energy, free-release mechanical operating mechanism allows opening and closing without the operator's intervention.

The operating mechanism and the poles are fixed to the metal structure, which acts also as a support for the kinematics automation of the moving contacts.

HD4 medium voltage circuit breakers use sulphur hexafluoride (SF6) for arc quenching and as an insulating medium.

HD4 breaking principle relies on compression and self-blast techniques in order to achieve the best performances at all service current values with minimum arc times and gradual arc extinction without chopping, restriking and operating overvoltages.

These features guarantee a long electrical life for the circuit breaker and limited dynamic, dielectric and thermal stresses on the network.

The poles, which form the breaking part, are maintenance-free, life-long sealed pressure systems in compliance with IEC 62271 Standards.

Compartments

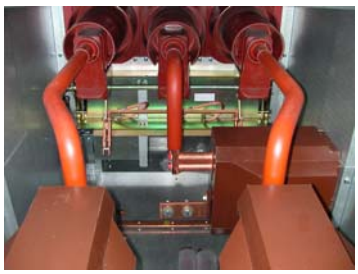
Each unit consists of three power compartments; busbars, feeder, circuit breaker and low voltage compartment for instruments,auxiliary circuit wiring.

Main busbars

The busbar compartment houses the main busbar system, which is connected to the circuit breaker fixed insulating contacts by means of branches. The main busbars are made of insulated electrolytic copper.
The system is air-insulated and busbars are insulated tubular bars.

Branch connectors

The feeder compartment houses the branch system for connecting the power cables to the circuit breaker fixed insulating contacts.
The branch connectors are made of electrolytic insulated round copper.



Feeder compartment : Lower bushings, current transformers and branch connectors.

Earthing switch

Each feeder unit can be equipped with an earthing switch for the earthing of the power cables.
The same device can also be used for the earthing of the busbar system (measuring, bus tie and rise units). The device has short circuit current making capacity.
On request, its opening and closing operations
can be prevented by means of key or padlocks.
The earthing switch is properly mechanicaly interlocked with circuit breaker and manually operated from the front

Cables

The cable compartment is easily accessible from the front thus making it possible to have a wall-standing installation. The units can be equipped with single or three core cables depending on the current rating and the cable cross-section.

Earthing busbar

The earthing busbar is made of electrolytic copper.
It runs through the whole switchboard length thus guaranteing a high safety degree both for the personnel and the installation.

Bushings and shutters

The bushings consist of insulating monoblocs, which house the power contacts for the connection between circuit breaker and feeder / busbar compartments.
The shutters are automatically operated when the circuit breaker is drawn from test to service position and vice versa.
On request, two independent padlocks can lock each shutter seperately.

Automatic shutters

Access to the cable compartment is achieved either from front or optionally from side during the installation of the cubicles at site

Safety interlocks

The UniGear switchboard is fitted with all the interlocks and accessories needed to guarantee the high level of safety and reliability both for the installation and operators.

The Safety interlocks can either be the standard ones (1-2-3) or those available on request (4-5). The former are foreseen by the standards and are therefore necessary to guarantee the correct operation sequence. The latter can be supplied on request and they must be foreseen by the installation service and maintenance procedures. Their presence guarantees the highest level of reliability even in the case of accidental error and allows what ABB defines as an “error-free” system of interlocks.

Interlocks on earthing switch operating mechanism

Keys

The use of key interlocks is very important in realising the interlocking logics between units of the same switchboard, or of other medium , low and high voltage switchboards. The logics are realised by means of distributors or by ringing the keys.

Locking magnets

The locking magnets are used to make automatic interlock logics without human intervation. The magnets operate with active logics and therefore the lack of auxiliary voltage makes the lock become non-operative.

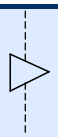
Withdrawable circuit breaker control wiring plug&socket

SWITCHBOARD CHARACTERISTICS

Standard safety interlocks (mandatory)

		Lock	Condition	Mechanical / Electrical Interlock	Standard/ Optional
1	A	Circuit breaker racking-in/out	Closed Circuit breaker	M	S
	B	Circuit breaker closing	Undefined truck position	M	S
2	A	Circuit breaker racking-in	Unplugged Circuit breaker multi contact plug	E	S
	B	Circuit breaker multi contact plug unplugging	Truck in service or undefined position	M	S
3	A	Earthing switch closing	Truck in service or undefined position	M	S
	B	Circuit breaker racking-in	Closed earthing switch	M	S

Additional safety interlocks



		Lock	Condition		
4	A	Circuit breaker compartment door opening	Truck in service or undefined position	E	O
	B	Circuit breaker racking-in	Open circuit breaker compartment door	M	O
5	A	Feeder compartment door opening	Open earthing switch	M	O
	B	Earthing switch opening	Open feeder compartment door	M	O

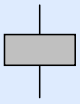
Keys

6	Circuit breaker racking-in lock	Can only be removed with the truck in the racked-out position	M	O
7	Earthing switch closing lock	Can only be removed with the earthing switch open	M	O
8	Earthing switch opening lock	Can only be removed with the earthing switch closed	M	S
9	Insertation of the earthing switch operating lever	Can always be removed	M	S

Padlocks

10	Circuit breaker compartment door opening	M	O
11	Feeder compartment door opening	M	O
12	Insertation of the Circuit breaker racking-in/out crank lever	M	O
13	Insertation of the earthing switch operating lever	M	O
14	Shutters opening or closing	M	O

Locking magnets



15	Circuit breaker racking-in/out	E	S
16	Earthing switch opening and closing	E	O
17	Circuit breaker compartment door opening	E	O

Optional Accessory devices

18	Circuit breaker-switchboard unit compatibility matrix	The Circuit breaker multi-contact plug and relative switchboard unit socket are equipped with a mechanical matrix, that disables circuit breaker racking-in into switchboard unit with an inappropriate rated current
19	Circuit breaker mechanical operating mechanism	The Circuit breaker compartment is equipped with a mechanical device, that enables circuit breaker closing and/or opening directly by means of the front operating mechanism pushbuttons, keeping the door closed. The controls can be operated with the circuit breakers in the service and racked-out position.

The REF542*plus* unit integrates all the secondary functions relevant to a switchgear unit in a single module fitted with watchdog.
Thanks to the flexibility of its software, the unit is able to satisfy a vast range of installation requirements.
The high level of functionality of the REF542*plus* unit is supported by a simple and easy-to-use user interface.

Thanks to the use of the REF542*plus* unit, each medium voltage UniGear panel becomes an integrated and independent unit able to carry out all the required functions.

- Integration of all the functions in a single instrument: protection, measurement, controls, signalling, interlocking, automation and communication.
- Single interface between switchboard and operator for all the installation panels: feeder, transformer, motor, generator, power correction banks, bus-tie and measurements units.
- Single type of spares parts and accessories: a single hardware unit.
- Reduced maintenance: drastic reduction in preventive maintenance, great limitation of the faults caused by tampering and errors.
- Easy modification and upgrading of the functions: by means of the unit configuration software, even with the switchboard in service.

Hardware

The device consists of a central unit housed inside the auxiliary compartment of the switchgear and of a user interface located on the door of this compartment.
The two pieces of apparatus are connected together by means of a simple communication cable. The user interface can be replaced keeping the central unit in service and guaranteeing all the measurement, control and protection functions during maintenance work.
All the connections are made by means of plug-socket connectors to optimise service and maintenance operations.

Machine-user interface

The UniGear switchboard becomes extremely simple to operate by means of the user interface made available by the REF542*plus* unit.

All the apparatus control operations, readout of measurements, detection of signals and parameterisation of the functions can be carried out directly from the front of the unit or by means of a laptop computer connected to the optic communication gate located on the front.

Central unit

The central unit consists of modular electronic modules with the functions described below.

- **Feeder.** The apparatus is fitted with a multivoltage internal feeder and can operate from 48 to 220 Volt d.c. Thanks to its digital technology, consumption is very low.
- **Digital inputs.** Each unit is fitted with a minimum of 14 digital inputs to interface the apparatus contained in the switchboard, such as the circuit-breaker and the earthing switch. These can be increased up to a maximum of 42. They operate between 20 and 250 Volt d.c. and are freely programmable.
- **Digital outputs.** The digital outputs consist of free contacts made available by bistable relays. Each unit is provided with at least 8 outputs to operate the switchgear apparatus and the minimum signals required. These can be increased up to a maximum of 24. They operate up to 250 Volt d.c./a.c. and are freely programmable.
  The output dedicated to the circuit-breaker opening control can carry out control of circuit continuity.
  By means of the static outputs with which it is fitted (from 1 to a maximum of 3), it is possible to interface conventional supervision systems by means of active and reactive power measurement with impulse emitter.
- **Analogue inputs.** Each unit is fitted with 8 analogue inputs to carry out measurements and protections.
  The signals coming from conventional current (/1 and /5A) and voltage (/100 and /110V) transformers, or from measurement sensors (Rogowski coil and resistive divider) can be acquired.
- **Analogue outputs.** The 4 analogue outputs the unit can be provided with make it possible to interface conventional supervision systems by means of the integrated measurement functions.
  Each output can be freely programmed as 0...20mA or 4...20mA.

Communication

The REF542*plus* unit can be connected with supervision and process systems by means of the integrated communication function.

This means the apparatus becomes the window through which the system accesses all the switchgear information and makes the following functions possible:

- Monitoring
- Control
- Parameterisation of the protection functions
- Measurements
- Storage of events
- Monitoring of all operating apparatus
- Disturbance oscillography.

The following protocols are available for connection to the supervision and automation systems:

- ABB SPA-bus
- LON-bus in accordance with ABB Lon Application Guide (LAG 1.4);
- IEC 60870-5-103 (in accordance with VDEW specifications);
- MODBUS RTU.

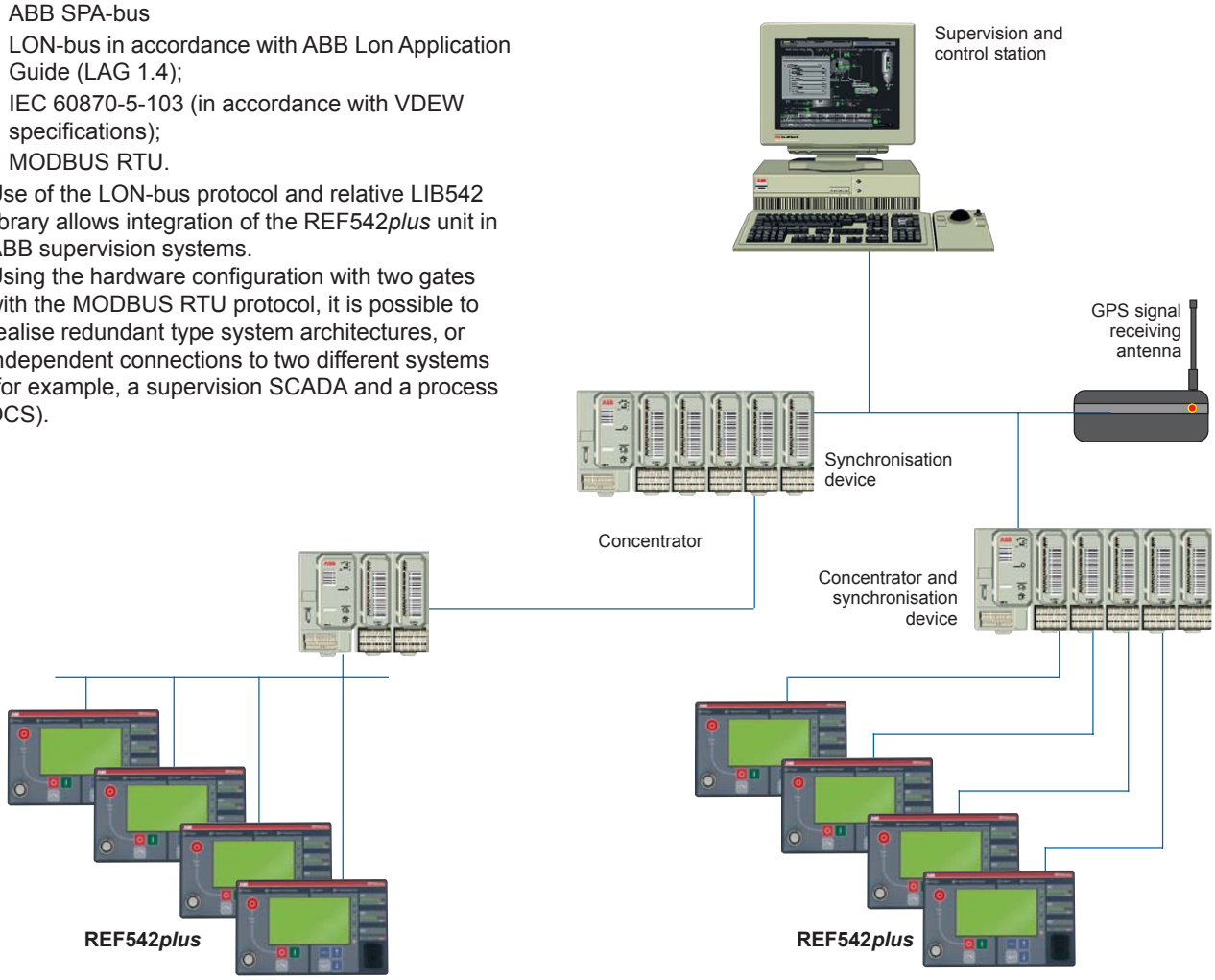
Use of the LON-bus protocol and relative LIB542 library allows integration of the REF542*plus* unit in ABB supervision systems.

Using the hardware configuration with two gates with the MODBUS RTU protocol, it is possible to realise redundant type system architectures, or independent connections to two different systems (for example, a supervision SCADA and a process DCS).

Synchronisation

By means of a dedicated optic input, the REF542*plus* unit can be connected to an external master clock (typically a GPS) for synchronisation. When synchronised using this method, the REF542*plus* units guarantee a precision in chronological recording of the events of one millisecond or better.

- Dedicated optic input for synchronisation.
- Recording of events with a precision of one millisecond or better.
- Protocol accepted: IRIG-B.



INSTRUMENT TRANSFORMERS

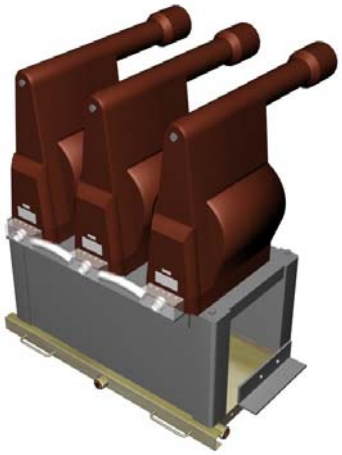
Voltage transformers

The resin-insulated voltage transformers are used for the feeding of measuring instruments and protections. They are suitable either for fixed installation or mounted on withdrawable trucks.
They comply with IEC 60044-2 Standards.
The withdrawable version equipped with fuses is custom-made.
The voltage transformers can be fitted either with one or two poles. Their performances and accuracy classes comply with the functional requirements of the apparatus they are connected to.
The withdrawable version is equipped with medium voltage protection fuses, their replacement can be carried out while the switchboard is in service.

Current transformers

The current transformers are resin-insulated and suitable for the feeding of measuring instruments and protections.

These transformers can have a wound core or a bushing bar with one or more cores. Their performances and accuracy classes comply with the apparatus requirements.
The current transformers comply with IEC 60044-1 Standards.
The switchboard units can be equipped with one or two transformer sets, in accordance with the following combinations:



Withdrawable Voltage transformers for busbar side with primary fuses

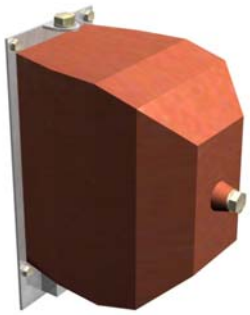
The current transformers can be equipped also with a capacitive socket for being connected to voltage indicator lamps.

Toroidal current transformers

The toroidal current transformers are resin-insulated and suitable for the feeding of measuring instruments and protections.
These transformers can have a ring or a split core.
Their performances and accuracy classes comply with the apparatus requirements.
They are suitable both for measuring phase currents and determining earth fault currents. They meet the requirements of IEC 60044-1 Standards.

Current transformers block type
Dimensions according to DIN standards

Optionally Toroidal CT's available



Fixed type voltage transformer for cable side

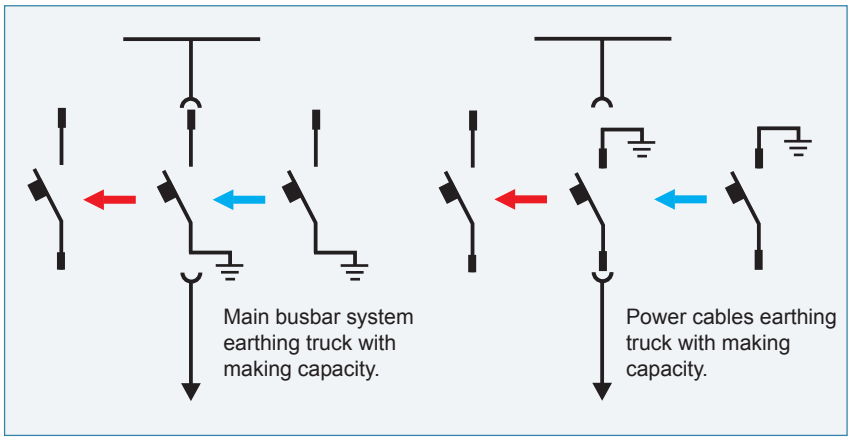
SERVICE TRUCKS

The UniGear can be fitted with the service truck required to complete the switchboard and needed in service operations and during maintenance work.
The truck has earthing with making capacity.

Earthing truck with making capacity

These trucks carry out the same function as the earthing switches with making capacity.
They consist of circuit-breakers only fitted with top (main busbar earthing) or bottom (power cables earthing) terminals. The contacts without terminals are short-circuited by means of a copper bar and connected to earth by means of the apparatus truck.
They keep all the characteristics of the circuit-breakers, such as full making capacity and opening of the live circuits under fault conditions.
They are used to ensure extremely effective earthing on circuits stressed by a fault. They allow opening and closing operations to be carried out rapidly with remote electric control.
The use of these trucks foresees removal of the switching device from the switchboard (circuit-breaker or contactor) and its replacement with the truck. The units preset for use of earthing trucks are fitted with a key lock which, if activated, prevents their racking-in.
This truck is available in two versions:
– main busbar system earthing;
– power cables earthing.
During the racking-in phase, the main busbar earthing truck only lifts the top shutter and presets the contacts connected to the top branches (and therefore to the main busbar system) for closing to earth by means of a control.During the racking-in phase, the power cables earthing truck only lifts the bottomshutter and presets the contacts connected to the bottom branches (and therefore to the power cables) for closing to earth by means of a control.
These trucks can also be used in bus-tie units.In this case, they earth the two sides of the main busbar system

Power cables earthing truck with making capacity.



PROTECTION AGAINST INTERNAL ARC

An internal arc is extremely rare in metal-clad switchboards since the apparatus is manufactured so as to prevent such an occurrence. Anyway, UniGear ensures maximum personnel safety even in case of internal arc. The switchboard is built to withstand the overpressures ensuing from the internal arc and is fitted with ducts to convey the exhausted gases and prevent damage to operators and apparatus. The different units are guaranteed arc-proof in compliance with IEC 60298 Standards, enclosure AA, class accessibility A, criteria 1 to 6.

IEC 60298 Standards for internal arc test – Criteria definitions

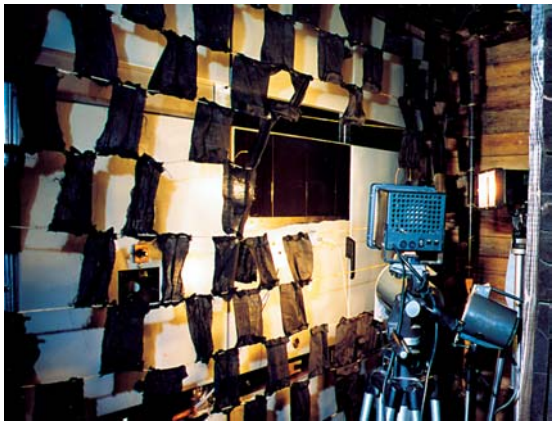
1. The switchboard doors must remain closed and the covering units must never open up
2. Any component that may result hazardous for the personnel must never be ejected
3. The outside enclosure should never get pierced in the parts accessible to the personnel
4. Vertically arranged indicators outside the switchboard must not get burnt
5. Horizontally arranged indicators outside the switchboard must not get burnt
6. All the earthing connectors must remain effective.

Fast Recovery

UniGear switchboards can be equipped with Fast Recovery, a specific protection system. This system is based on pressure sensors suitably located into the switchboard and directly connected to the opening releases. The sensors detect the pressure rise at the moment of the internal arc outburst and promptly open the circuit breaker. Thanks to the Fast Recovery System only the part involved in the fault is selectively excluded in less than 100 ms (including the circuit breaker opening time).
A rapid elimination of the fault along with the metal segregation between compartments and the use of self-extinguishing materials drastically reduces any possible damage.

Fast Recovery pressure sensor.

Internal arc test indicators arrangement.



Test carried out by means of an infrared camera.

ELECTRICAL CHARACTERISTICS

Switchboard		
Rated voltage	kV	36
Rated insulation voltage	kV	36
Rated power frequency withstand voltage	kV (1 min)	70
Rated lightning impulse withstand voltage	kV	170
Rated short-time withstand current	kA (3s)	25
Peak current	kA	63
Internal arc withstand current	kA (1s)	25
Main busbar rated current	A	...2500
Branch connection rated current	A	...2500

TYPICAL UNITS

Depth (mm)		**2400**				**2600**			
Height (mm)		**2161**				**2161**			
Height with gas exhaust duct (mm)		**2662**				**2662**			
Width (mm)		**1000**				**1200**			
Branch Rated current (A)		**1250**	**1600**	**2000**	**2500**	**1250**	**1600**	**2000**	**2500**
IF	Incoming/Outgoing								
	with Fixed Voltage Transformers								
	with Fixed fused Voltage Transformers								
	with withdrawable fused Voltage Transformers	Please consult ABB for details							
BT	Bus-tie								
R	Riser								
M	Measurements								
IFD	Direct cable connection								
	with fixed Voltage Transformers								
	with fused fixed Voltage Transformers								
IFDM	Direct cable connection with measurement (with withdrawable fused Voltage Transformers)								

Connections								
Connection suitable for power cables up to 2x630mm2 per phase								
Connection suitable for power cables up to 4x630mm2 per phase								
Top busbar connection	Please consult ABB for details							
Top cable entry	Please consult ABB for details							

Coloured cells indicates availability

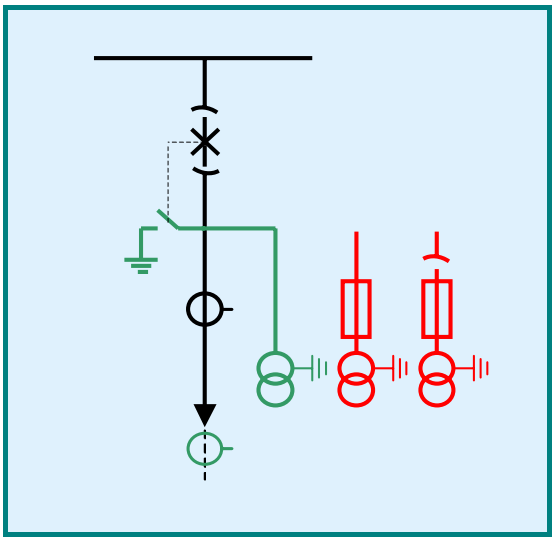
Note: Above dimensioning is valid together with the explanations/remarks given specifically for each unit in page 17,18 and 19.

IF unit

Incoming/outgoing Feeder Cubicle

Rated main busbar current	(A) : 1250/1600/2000/2500
Rated circuit current	(A) : 1250/1600/2000/2500

Block type current transformers (1)	: Yes
Cable core current transformers (2)	: Optional
Fixed voltage transformers without fuses	: Optional
Fixed voltage transformers with fuses (3)	: Optional
Withdrawable voltage transformers with fuses (4)	: Optional
Earthing switch	: Optional
Arc duct	: Optional



(1) Post insulators replace block type current transformers whenever latter is not required

(2) Cable connection is typically one cable per phase when cable core current transformers (CCT) are used. Application of CCTs may effect the overall dimensioning of the switchboard depending on the specific configuration and requirement. In case of such requirement please contact ABB for detailed design and information

(3) Only available in 1200mm wide panel version(

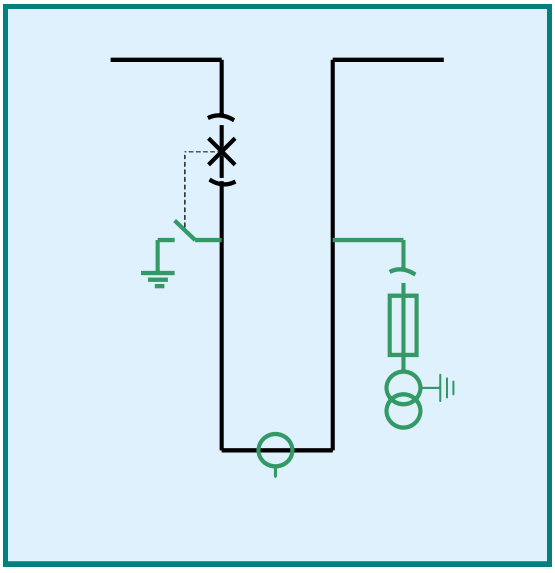
(4) Requires additional panel. Please contact ABB for details

BT & R unit

Bus-tie and Riser Cubicle (1)

Rated main busbar current	(A) : 1250/1600/2000/2500
Rated circuit current	(A) : 1250/1600/2000/2500

Block type current transformers (2)	: Yes
Withdrawable voltage transformers with fuses	: Optional
Earthing switch	: Optional
Arc duct	: Optional



(1) The width of each Bus tie and Riser cubicle is 1000 mm. Each panel can be used seperately for various combinations

(2) Post insulators replace block type current transformers whenever latter is not required

Key to components

- Standard components
- Accessories
- Alternative solutions

M unit

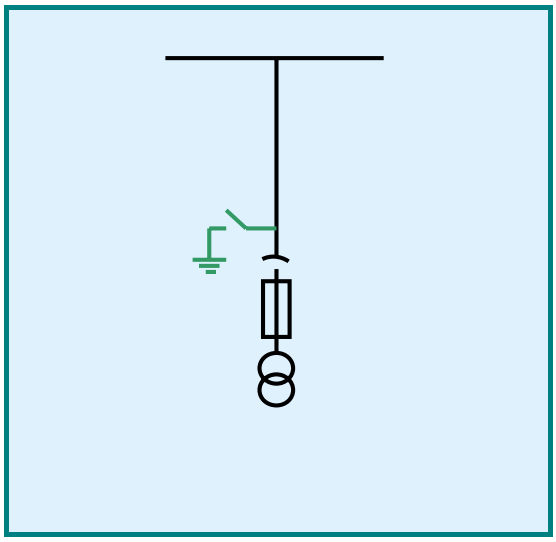
Measuring Cubicle

Rated main busbar current (A) : 1250/1600/2000/2500

Rated circuit current (A) : 1250

Withdrawable voltage transformers with fuses : Yes
Earthing switch : Optional
Arc duct : Optional

Please contact ABB for busbar mounted current transformers solution for busbar measuring.



IFD unit

Direct Cable Connection Cubicle

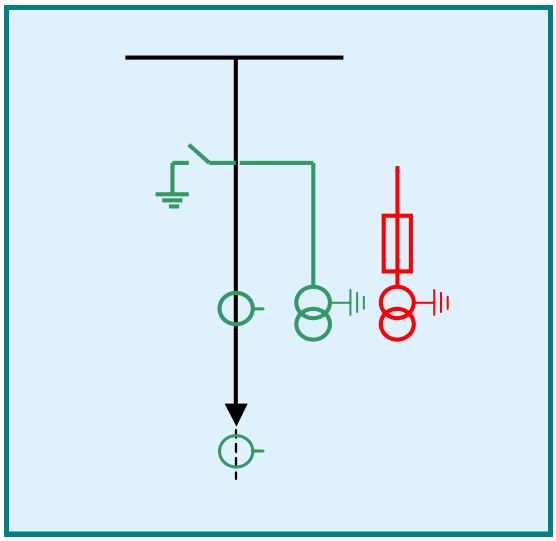
Rated main busbar current (A) : 1250/1600/2000/2500

Rated circuit current (A) : 1250/1600/2000/2500

Block type current transformers [1] : Yes
Cable core current transformers [2] : Optional
Fixed voltage transformers without fuses : Optional
Fixed voltage transformers with fuses [3] : Optional
Earthing switch : Optional
Arc duct : Optional

[1] Post insulators replace block type current transformers whenever latter is not required

[2] Cable connection is typically one cable per phase when cable core current transformers (CCT) are used. Application of CCTs may effect the overall dimensioning of the switchboard depending on the specific configuration and requirement. In case of such requirement please contact ABB for detailed design and information



Key to components

Standard components
Accessories
Alternative solutions

IFDM unit

Direct Cable Connection with Measurement Cubicle

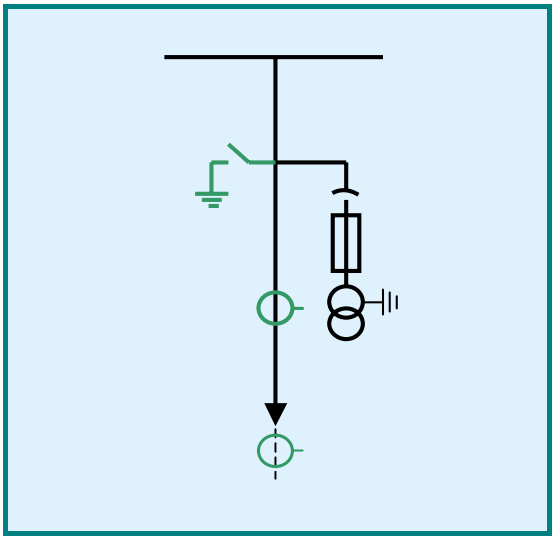
Rated main busbar current (A) : 1250/1600/2000/2500

Rated circuit current (A) : 1250/1600/2000/2500

Block type current transformers [1]	: Yes
Cable core current transformers [2]	: Optional
Withdrawable voltage transformers with fuses	: Yes
Earthing switch	: Optional
Arc duct	: Optional

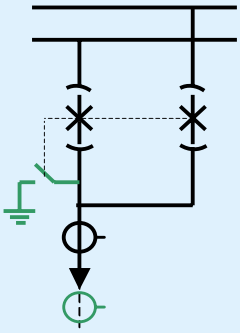
[1] Post insulators replace block type current transformers whenever latter is not required

[2] Cable connection is typically one cable per phase when cable core current transformers are used. Please contact ABB for details

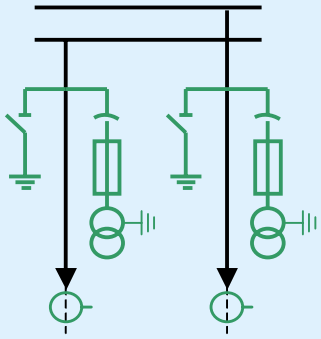


Duplex cubicle solutions

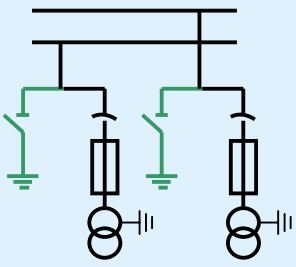
DIF unit
Incoming/outgoing feeder cubicle



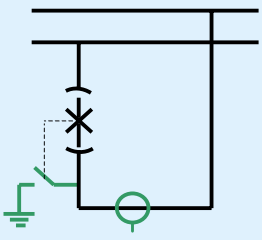
DIFD unit
Direct cable incoming/outgoing feeder cubicle



DM unit
Measuring cubicle



DBT unit
Bust-tie and riser cubicle



Dimensions :

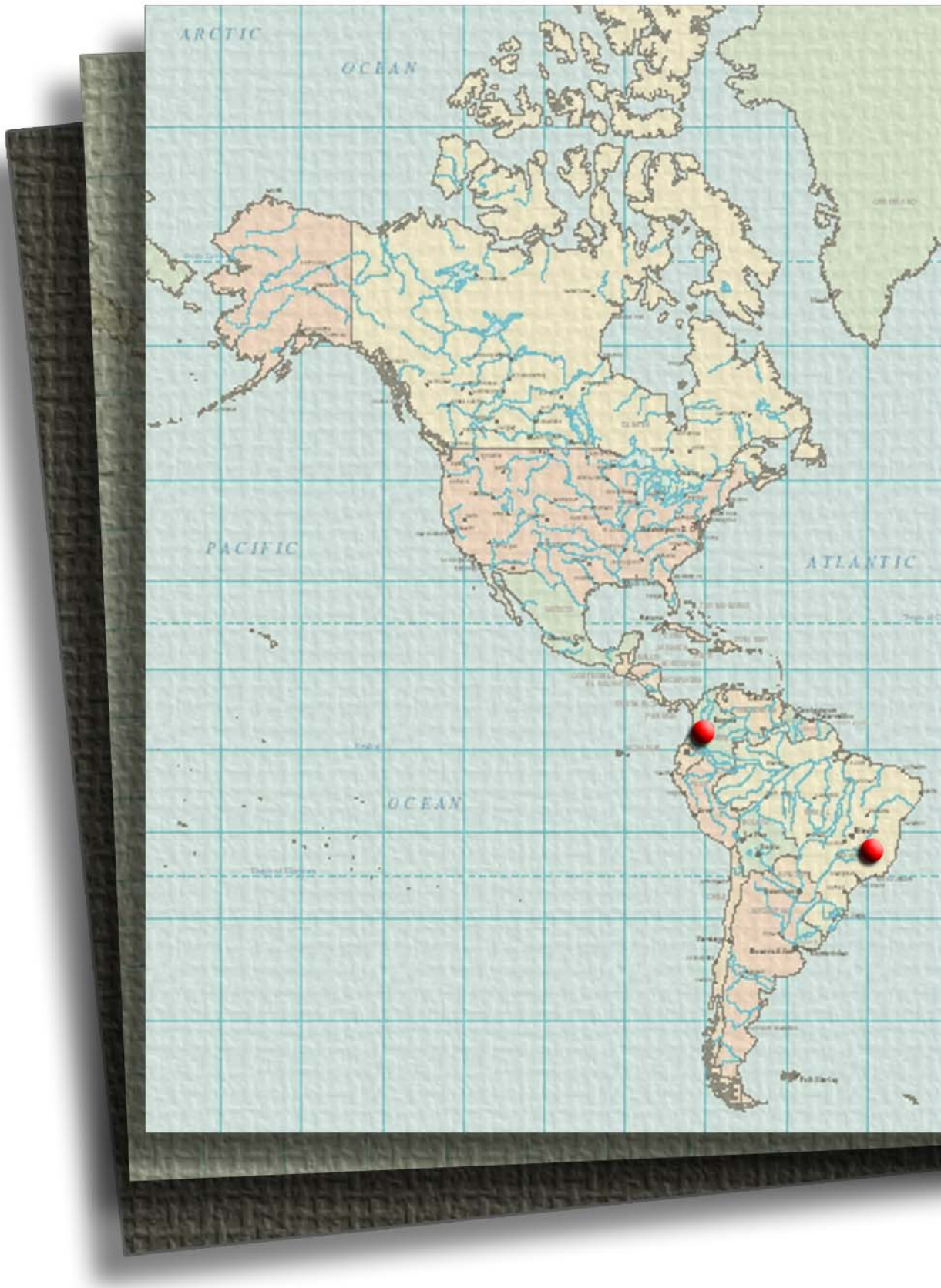
without arc duct
(width x depth x height) (mm)
1000 x 3820 x 2161

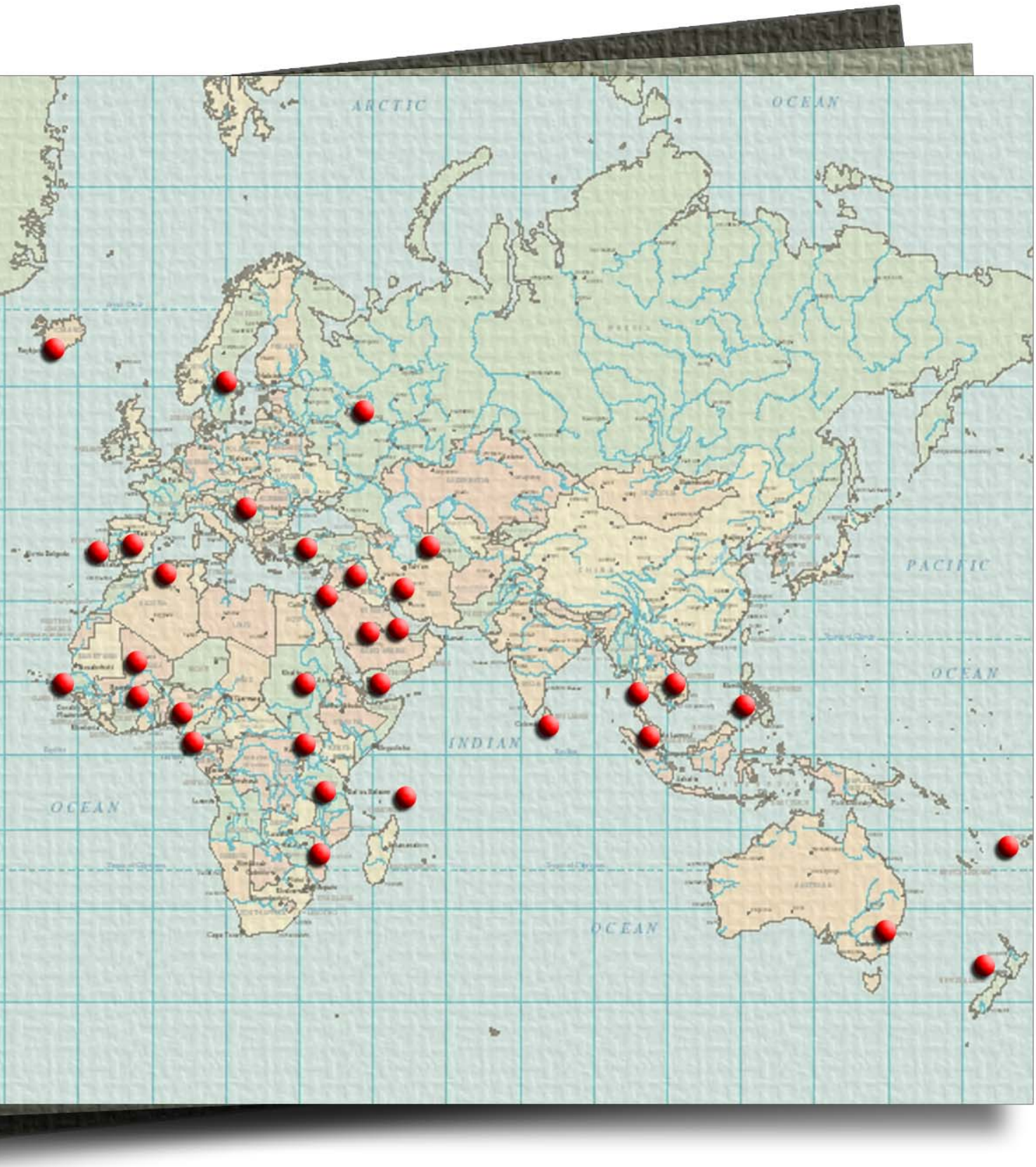
with arc duct
(width x depth x height) (mm)
1000 x 3820 x 2671

Rated main busbar current (A)
1250/1600/2000/2500

Applicable maximum circuit current may vary for different configurations. In case of any specific application requirement, please contact ABB for detailed dimensioning and configuration.

References in 5 continents ...

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Certificate of Approval

Awarded to

ABB ELEKTRİK SANAYİ A.Ş.

YUKARI DUDULLU, YENİ ORGANİZE SANAYİ BÖLGESİ, GENÇOĞLU CAD. NO: 22, ÜMRANİYE, İSTANBUL - TURKEY

Bureau Veritas Quality International certify that the Management System of the above operator has been assessed and found to be in accordance with the requirements of the environmental standards and operational scope detailed below

ENVIRONMENTAL STANDARDS

ISO 14001 : 1996

OPERATIONAL SCOPE

DESIGN, MANUFACTURE, SALES AND SERVICING OF LOW VOLTAGE, MEDIUM VOLTAGE, SWITCHGEARS, NETWORK CONTROL AND PROTECTION SYSTEMS, POWER FACTOR CORRECTION SYSTEMS (CAPACITOR AND HARMONIC FILTER); DESIGN, SALES AND SERVICING OF HIGH VOLTAGE SYSTEMS, AUTOMATION PRODUCTS AND SYSTEMS: SALES OF LOW VOLTAGE APPARATUS

Date: **01 SEPTEMBE**

Certificate No: 7

The use of Accreditation

TSE KALİTE SİSTEM BELGESİ TSE
QUALITY SYSTEM CERTIFICATE

TÜRK STANDARDLARI ENSTİTÜSÜ
bu belge ile

ABB ELEKTRİK SAN. A.Ş.
Gençoğlu Cad. Yeni Organize San. Bölgesi No:20
Yukarıdudullu - İSTANBUL / TÜRKİYE

firmasının **TS-EN-ISO 9001** şartlarına uygun bir KALİTE SİSTEMİNE sahip olduğunu onaylar.

Belge kapsamı Ek'te verilmiştir.

K - Q
TSE-ISO-EN
9000

TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

TSE GENEL SEKRETERİ
Secretary General of TSE
Osman GÜNEK

TSE BAŞKANI
President of TSE
Ahmet CAFOĞLU

Bu belge Türk Standardları Enstitüsü'nün kurulusu hakkındaki 132 sayılı kanun uyarınca verilmiştir.
This certificate is issued in accordance with the Law No. 132 establishing Turkish Standards Institution.

TURKISH STANDARDS INSTITUTION
hereby certifies that the company

ABB ELEKTRİK SAN. A.Ş.
located in
Gençoğlu Cad. Yeni Organize San. Bölgesi No:20
Yukarıdudullu - İSTANBUL / TÜRKİYE

has a QUALITY SYSTEM which fulfills the requirements of the **TS-EN-ISO 9001**

Scope of the certificate is given in appendix.

Belge No / Certificate No	**KG 1520/01**
Belge Tarihi / Date of Certificate	**30/01/2001**
Geçerlilik Tarihi / Valid Until	**14/12/2003**

1YTS030001-en,Rev-A, 2004

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