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“Line Protection Devices”  
Built-in safety and reliability

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# ABB – a global leader

ABB is a global leader in Power and Automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group operates in around 100 countries and has a strong presence in the South Asian region, spanning several decades. ABB offers customers a comprehensive array of standard products for various applications, helping to optimise resources, reduce energy costs, boost productivity and increase competitiveness.

## System proM

System ProM is a modular system developed by ABB which, is capable of meeting the requirements of the most modern and up-to-date installations for low voltage applications.

The system is based on two main criteria:

- Complete functionality: Wide range of devices which leads to increased safety for the user and greater diversification in command and load management
- Optimum sizing: The modular structure allows the internal structure of the switchboard to be used in the best possible way, reduces wiring operations and enhances functionality and aesthetics of the switchboards

System proM offers a wide range of devices for basic functions like protection, command, measure and load management which characterise the low voltage electrical applications.

Protection forms the basis of system proM which comprises of MCBs, RCCBs, RCBOs and a host of other modular devices. These miniature modular devices are technologically advanced, enable speedy installation and simplify maintenance.

Each device in the System proM has been designed in accordance with strict criteria for safety and functionality to guarantee the maximum operating safety even in the difficult environment conditions.



# Miniature Circuit Breakers ( MCBs) - S270 & S260 series curve 'C' acc. to IEC60898, IS8828-10kA and curve 'D' acc. to IEC60898-10kA

## Introduction

MCBs are used to protect circuits against overload and short-circuit current. They are important devices for reliable and safe operating of installations. The S2 range of MCBs are available in 1-pole, 1-pole + Neutral, 2-pole, 3-pole, 3-pole + Neutral, and 4-pole configurations with breaking capacity of 10kA in accordance with IEC 60898 and Is8828

The S2 range of MCBs complies to international standards and regulations. These MCBs are current limiting types and utilise the state-of-the-art "hammer trip" principle. Each pole is fitted with two different tripping devices operating on a trip free switching mechanism:

- The delayed thermal trip for protection against overload and
- The quick acting electromagnetic trip for protection against short-circuits

## Safety

ABB MCBs have finger-touch proof terminals conforming to IP20 degree of protection thus preventing any electrical shock by accidental touch to any live part. The housing is self-extinguishing conforming to V0 degree with 1.6mm thickness.

## Tropicalisation

The S2 range of MCBs have been designed in accordance with strict criteria for safety and functionality to ensure trouble free operation for many years in highly humid environment (as per IEC 68.2, DIN 50016)

## DC application

S270 range of MCBs can be used in DC circuits with voltages up to 60V ... (single pole), and up to 110V ... (double pole). The S280 UC range can be used up to 220 V ... for single pole or up to 440 V ... for 2 pole.

## Other applications

ABB has MCBs to cater to a wide range of requirements, including various tripping curves like B, C, D, K, Z and different fault levels like 4.5KA, 6KA, 10KA, 15KA, 25KA with voltage levels up to 1000V. A specialized range of MCBs can also be offered for protection of the semiconductor devices. For the distribution network circuits, our MCBs with variable current setting can be offered which provides the perfect coordination with the upstream and downstream installations.

## Low watt loss

Efforts towards power loss limitations in electrical equipment are gaining importance the world over. The power loss per pole of the S2 range of MCBs is much lower than the values stipulated by IEC 60898 standards.

## Features

- Breaking capacity - 10kA
- Tripping characteristics - B,C,D,K & Z curve
- 17 different ratings with some unique ratings like 3A, 8A & 13A
- Higher rating of MCB - 80A & 100A in S280 series
- All round protection against contact with live parts in accordance with DIN VDE 106 part 100
- Delivered with open box terminals , captive screws and lower dual function terminal ready for busbar connection
- Dual function terminals enable simultaneous connection of busbar and cables without additional connection pieces
- Cross wiring possible with solid round conductor up to 10mm<sup>2</sup>
- Positioning of the MCB on the DIN-rail now possible before snapping on, as the mounting plate is on the lower side
- High short-circuit switching capacity
- Long endurance life
- Low watt loss



# Miniature circuit breakers ( MCBs) - S270 & S260 series curve 'C' acc. to IEC60898, IS8828-10kA and curve 'D' acc. to IEC60898 10kA



## Technical data

Standards	IS8828 / IEC60898 and IEC60947/2
Breaking capacity	10kA
Tripping characteristics	C-270, D-260 series
Dimensions of single pole	90x17.5x68 (HxWxD)
Terminals	IP20, housing material with the maximum self-extinguishing degree (V0 level with 1.6 mm thickness)
No. of poles	1, 2, 3, 4, 1+NA, 3+NA ; 1, 2, 3, 4 pole for S260
Rated current I <sub>n</sub> [A]	0.5...63
Rated voltage U <sub>n</sub> [V]	Single pole: 230 / 400 V~, Multi-pole 400 V~
Max. operating voltage U <sub>Bmax</sub> [V]	AC: U <sub>n</sub> + 10 % acc. to UL 1077 and CSA 22.2: 480V~ DC: 1-pole 60 V..., 2- pole 110 V...
Min. operating voltage U <sub>Bmin</sub> [V]	12 ~, 12...
Frequency	50...60 Hz
Degree of protection	IP20, when built in into distribution board: IP40
Dimension of single pole	90x17.5x68 (HxWxD)
Terminal size	25 sq. mm
Housing	Moulded plastic group I
Switching lever	Moulded plastic group II black, sealable
Mechanical life	20,000 operations
Service life at rated load	I <sub>n</sub> < 32 A: 20 000 operations I <sub>n</sub> > 32 A: 10 000 operations
Tripping mechanism	Trip free mechanism
Mounting	snap-on fixing on standard profile rails or screw fixing by means of mounting plate
Connections	Box terminals on top and combi-box terminals on bottom, safe against unintentional touch acc. to DIN VDE 0106 part 100. Suitable for solid or flexible conductors from 0.75 mm <sup>2</sup> to 25 mm <sup>2</sup> (max.16 mm <sup>2</sup> when a max. 3mm busbar is connected; from 0,75mm <sup>2</sup> with casing and from 1.5 mm <sup>2</sup> without)
Tightening torque	2 Nm
Storage temperature [°C]	T <sub>max</sub> + 700, T <sub>min</sub> – 400
Ambient temperature [°C]	T <sub>max</sub> + 550, T <sub>min</sub> – 250
Energy limitation	Class 3 limitation in S280 series 6KA
Watt loss	Low watt loss

## Accessories for MCB

Mechanism of the M.C.B. the auxiliary contact offers a trip-free feature.

The auxiliary contact can be delivered either with screw or plug-in connections, the auxiliary contact with 3 potential free contacts only in screw-in connection.

### Signal contact S 2-S

It signals the tripping caused by overload earth fault or short circuit current however, there is no signal when the M.C.B. is switched OFF manually. With a red handle which allows resetting of the trip signal without the M.C.B. being switched on. It has also a test button for checking the control circuit without interrupting the main circuit.

### Undervoltage releases S 2-UA..

These are used for remote tripping of the M.C.B. Only in case of substained voltage the relay allows to switch on the M.C.B. The undervoltage release trips the M.C.B. if the supply voltage is interrupted or switched off (suitable for emergency off circuits).

### Shunt trip S2-A

These are used for remote tripping of the M.C.B. by applying a control voltage. The shunt trip contains a relay with an integrated contact, that opens after the M.C.B. has tripped and interrupts the control voltage of the relays. This prevents the flow of current in case of substained control voltage.

### Mechanical interlocks

It automatically releases the relative circuit-breaker when the panel of the electric switchboard is opened or removed. The release is only mechanical and acts on the release elements of the circuit-breakers.

The S2 range of circuit-breakers are supported by a whole group of auxiliary elements with many functions and configurations. These include auxiliary contacts, shunt trips, undervoltage releases, signal contacts, and mechanical interlocks.

These accessories improve the performance of the circuit-breaker and enables innovative and integrated solutions to be used in every installation.

Auxiliary contact S 2-H..

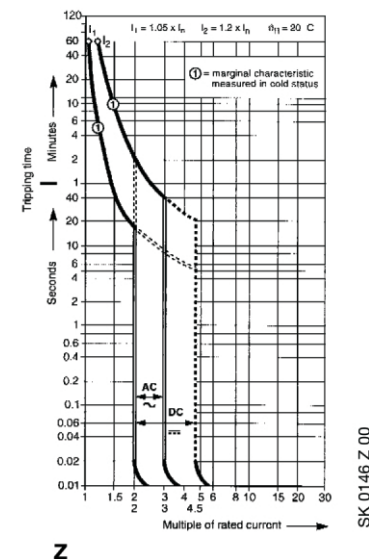
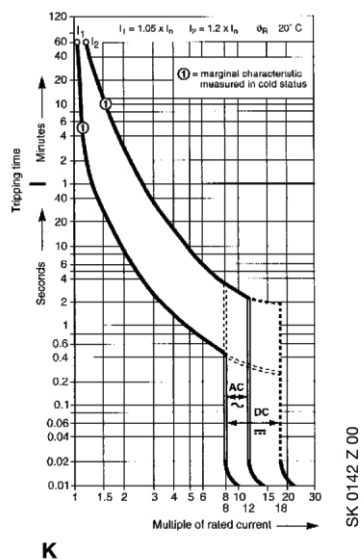
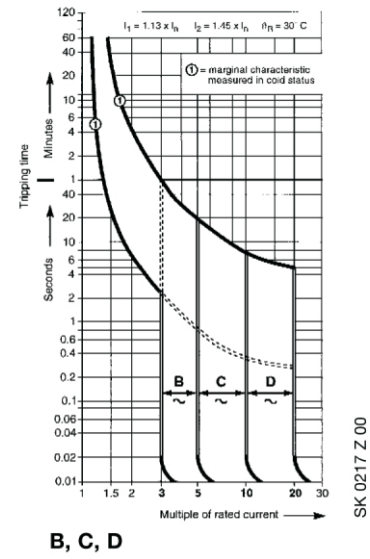
The auxiliary contact can be built on subsequently to the M.C.B. The switching position of the auxiliary contact depends on the position of the M.C.B. (ON-OFF). Because of coupling to the switching

### Description

		Type Reference
Aux. contact block	1NO+1NC	S2H11
Aux. contact block	2NC	S2H02
Aux. contact block	2NO	S2H20
Shunt trip mechanism	12-64AC 12-110DC	S2-A1
Shunt trip mechanism	125-415AC 200DC	S2-A2
Under voltage tripping mechanism	(24 V AC/DC)	S2-UA 24
Under voltage tripping mechanism	(48 V AC/DC)	S2-UA 48
Under voltage tripping mechanism	(110 V AC/DC)	S2-UA 110
Under voltage tripping mechanism	(220 V AC/DC)	S2-UA 220
Under voltage tripping mechanism	(380 V AC/DC)	S2-UA 380
Signalling contact + Auxiliary contact		S2-S/H
Padlock adaptor		SA1
Padlock adaptor with lock and key		SA3



# MCB tripping characteristics



## Tripping characteristics and rated currents

### B-, C- and D-Characteristic

The new characteristics acc. EN 60 898 are for line protection. They all have the same thermal settings and differ only in their magnetic tripping values. The higher magnetic settings of the C- or D-characteristics are for applications with start or high inrush-currents.

### K-Characteristic

For cable and appliance protection.

Rated currents 0.5 to 63 A in 17 steps (S 270) or 0.2 to 63 A in 20 steps (S 280). Motor protection can be achieved by the selection of the M.C.B. with the correct rated current corresponding to the motor data. The electro-magnetic trip is set in such a way that the motor starting current does not lead to tripping.

Due to the higher magnetic non tripping current, in circuits with incandescent lamp groups, mains parallel operated fluorescent lamps or other discharge lamps, the conductor cross-section to be protected can be more economically utilized as compared to a M.C.B. of the same rated current in tripping characteristic B.

### Z-Characteristic

For protection of semiconductor devices and voltage transformer circuits.

## Special features

- Fast removal without dismantling of the busbar
- Captive screws with recessed/slotted head, Pozidriv size 2
- Add-on of up to 3 auxiliary contact S2C-H6R possible
- Integrated lay-on edge for labeling system ILS
- Locking device as accessories for unauthorized ON/OFF
- Approval: VDE, CCC, KEMA

## Isolators- E200 Series

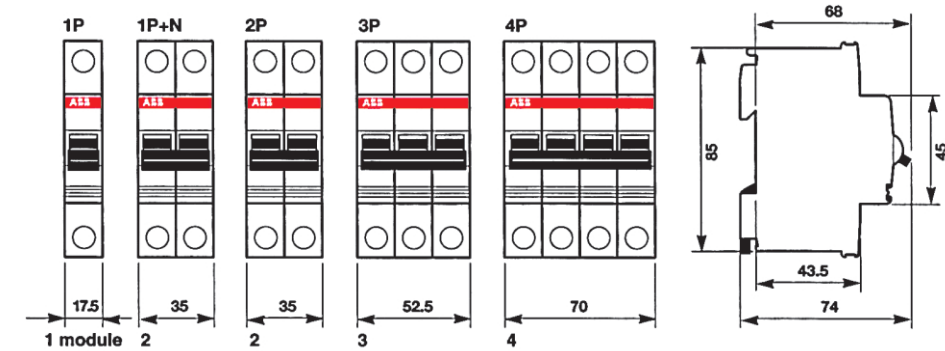


### Technical data

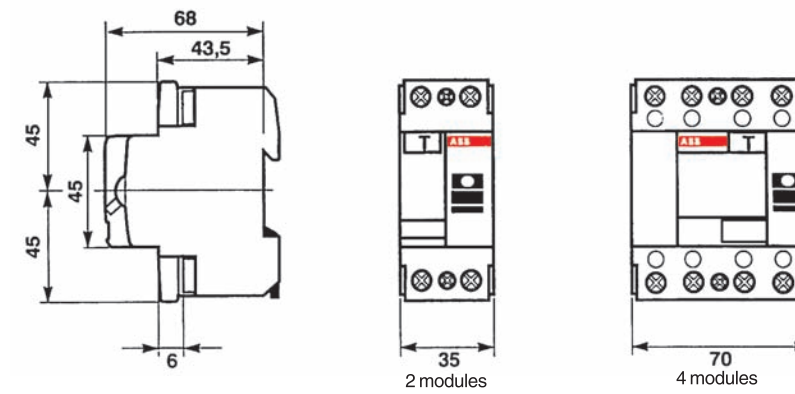
Switching capacity	1.25 x I; 1.1 x U; cos φ = 0.3 acc. to DIN VDE 0632 AC22-A/AC23-A acc. to VDE 0660 part 107, DIN EN 60947-3 resp. IEC 947-3, DC21-B for applications up to 60 V DC
Short-circuit withstand capacity	25 kA in series with NH 00 < 100 A gL-gG; 6 kA in series with NH 00 125 A gL-gG and S 2.. < 63 A
Rated voltage	230/400 V AC; 50/60 Hz
Surge withstand capability U <sub>imp</sub>	4 kVacc. to EN 60947-1
Ambient temperature	-25 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Degree of protection	IP10, IP40 in panelboard
Mechanical endurance	20000 switching cycles
Electrical endurance	1000 switching cycles
Min. voltage	12 VAC/DC at 0.1 VA
Min. contact loading	24 V/4 mA
Torque	2,5 Nm

# Dimension details

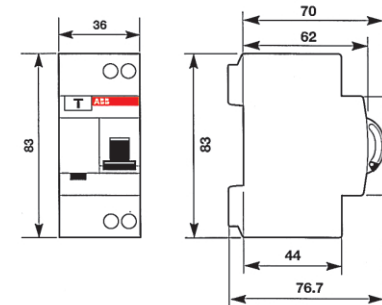
## S 270



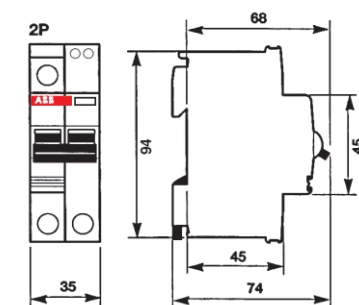
## F 362 / F 364



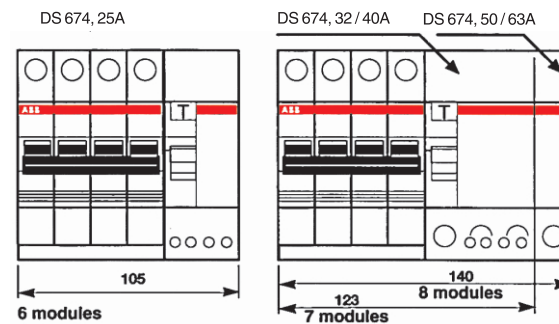
## DS 971 C16



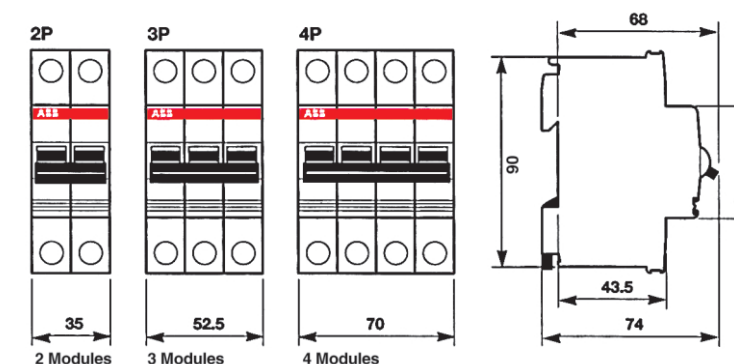
## DS 671 C25 / 32



## DS 674



## E 240-E 270



## Residual current-operated devices (RCDs) RCCBs – F360 range conforms to IEC61008



### Technical data

Range	F 362	F 364
Standard	IEC 61008	
Type (wave form of leakage current detected)	AC/AP	AC/AP
Rated current I <sub>n</sub>	[A] 25,40,63	25,40,63
Poles	2P	4P
Rated voltage U <sub>e</sub>	[V] 230/400	230/400
Max. operating voltage of test button	[V] 254	
Min. operating voltage of test button	[V] 110	
Rated frequency	[Hz] 50..60	
Breaking capacity	[kA] 6	
Rated sensitivity I <sub>Δn</sub>	[A] 0.01-0.03-0.1-0.3-0.5	0.03
Tripping threshold	AC type A type	0.5..1 I <sub>Δn</sub> 0.5..1 I <sub>Δn</sub>
Electrical life	10000	
Mechanical life	20000	
Equipment protection degree	housing terminals	IP4X IP2X
Ambient temperature	[°C] -25..+55	
Storage temperature	[°C] -40..+70	
Terminal size upper/lower per cable	[mm <sup>2</sup> ] 25/25	
Dimensions		
H90xD68xW	2P I <sub>n</sub> <80 A 4P I <sub>n</sub> <100 A	[mm] 35 70
Pole weight	2P 4P	[g] 345/355 460

The ABB range of RCCBs give protection against earth leakage in case of direct and indirect contact to live parts. RCCBs are used for protection of earth leakage. To have short circuit and overload protection these RCCBs are connected in series with a MCB or fuse.

'AC' type RCCBs (known as ELECTROSTOP) is used for detection of alternate leakage current.

'A' type RCCBs (known as VARISTOP) is used for detection of alternate/pulsating leakage current with DC components.

Thanks to an electronic circuit able to distinguish between temporary leakage caused by a disturbance and permanent leakage caused by a fault, the new 'AP' type RCCBs resists a current impulse from 8/20μs from and 3000A peak.

### Salient features

- Conditional short circuit current - 6kA
- Type: AC/A/AP
- Higher rating RCCBs - 80A, 100A
- Mounting position: Any direction

## Residual current-operated devices (RCDs) RCBOs – DS971 & DS674 range conforms to IEC61009- 10kA



### Technical data

	DS 971	DS 674
Reference Standards	IEC 61009	
Type (wave form of leakage current detected)	AC, A	AC
Rated current I <sub>n</sub>	[A] 6<I <sub>n</sub> <32	0.5<I <sub>n</sub> <63
Poles	1P+N	4P
Rated voltage one pole AC.	[V] 230	230/400
Rated frequency	[Hz] 50..60	
Rated breaking capacity	I <sub>bn</sub> [A] 10000	10000
acc. to IEC/EN 61009		
Rated sensitivity I <sub>Δn</sub>	[mA] 0.01-0.03-0.1-0.3	0.03-0.3
Tripping threshold	AC type A type	0.5 ... 1 I <sub>Δn</sub> 0.11 ... 1.4 I <sub>Δn</sub>
Electrical life	10000	
Mechanical life	20000	
Protection degree	housing terminals	IP40 IP20
Ambient temperature	[°C] -25 ... +55	
Storage temperature	[°C] -20 ... +70	
Terminal size upper/lower per cable	[mm <sup>2</sup> ] 16/16	25/16, 25/25
Pole weight	[g] 200	770/830

The DS971 range provides protection solution for all types of single-phase circuits in modern installations. It is characterized by an innovative design with a single red/green two colour operating lever and residual current trip signal on the front of the apparatus.

The DS971 range satisfies all protection requirements in two modules, offering the opportunity of choosing between four different sensitivities (10-30-100-300 mA) and for each of these, the possibility of choosing between 'A' type or 'AC' type residual current protection with breaking capacity of 10kA. The 'C' characteristic is available with rated current from 6A to 40A. The closing velocity of the contacts is independent from the rotation velocity of the toggle. This is ensured by a trip mechanism patented by ABB.

'AC' type RCBO is suitable for all installations where there may be loads with alternate fault currents.

'A' type is designed to be used in case of alternate and pulsating DC fault currents. Their use is typical in installations where users are equipped with electronic devices meant to rectify currents or other physical variables.

The DS674 range of RCBO combines in a single device the residual current protection and the thermal+magnetic protection which is typical of MCBs. They trip in both the cases, of earth leakage and overload or short-circuit.

These RCBOs are derived from the corresponding series of MCB, from which they take the characteristics and performance with regard to the thermomagnetic part i.e.. In DS674 the overcurrent protection is provided by the same thermomagnetic release of the S270. The DS674 RCBO mount a residual current release type 'AC'.

### Salient Features

- 16 – 63 A: Suitable for 230/ 400 V
- Type: AC/A/AP
- Rated breaking capacity: 10kA
- Thermomagnetic release characteristic: C





# S800 The High Performance MCB



## Not just B-C-D: The S800 range.

The extensive S800 range provides the right High Performance MCB for high rated breaking capacities and many tripping characteristics. The units of the S800S series, both AC and DC types, operate in a nominal current range of between 10 and 125 A, covering short circuit requirements of up to 50 kA.

For applications involving up to 36 kA – and of course those between 10 and 125 A – the S800N is the ideal solution.

## Compact performance: The selectivity and back-up characteristics.

The high rated breaking capacity of 50 kA allows electric systems to be configured and operated in a simple and safe manner. Convincing selectivity characteristics for upstream power switches, such as the ABB Tmax, and excellent back-up protection for downstream MCBs, such as the ABB system pro M compact and smissline, make planning so simple. The compact dimensions enable a space saving form of energy distribution.

## Does not let go: The interchangeable terminal adapter.

The standard version with interchangeable terminal adapter<sup>1</sup> guarantees a high level of flexibility and convenience. When placing orders, you can choose between cage-type terminal connections or ring-lug cable connections. Incorrect terminal attachment of the connections is reliably prevented by the «terminal shutter» integrated in the terminal body; this guarantees rapid and safe attachment of the connections.

## On the safe side: Operating status display.

The trip position display<sup>1</sup> rapidly indicates the reason for the trip and shows clearly whether the High Performance MCB tripped in response to a thermal-magnetic trigger or as a manual action. This contact indicator provides an additional means of detecting the operating condition of the pair of contacts.

## Simple and flexible: Accessories fitted by the customer.

A wide range of accessories allows the High Performance MCB to be added to an individual way.

- The 9 millimeters wide auxiliary contact is fitted with two potential-free change-over contacts and a test function.
- Also its 9 millimeters in width, the combined auxiliary/signal contact provides two potential-free change-over contacts (one auxiliary contact and one signal contact), test functions for the auxiliary and signal contacts as well as a reset function for the signal contact.
- The two- to four-pole DDA block, which can be mounted on the side, is available with rated sensitivities of between 30 mA and 1 A. You can of course select between AC and A types. As you would expect of ABB: selective RCD units and those with short delay are also available.
- It goes without saying that undervoltage and operating current triggers are available in a wide range of operating voltages.
- Separating neutral of up to 63 A, rotary drives with ergonomic rotary handles, busbars and locking devices round off the extensive product range.

## Setting new standards: ABB quality.

Electrosuisse, a member of the European LOVAG, has product certifications in accordance with IEC60947-2 and EN/IEC60898-1. The S800 High Performance MCB also comply with key international standards (IEC60947-2; EN 60898-1) and approvals (CCC; GOST-R; LR; GL; DNV; RINA).

## Features

- Compact size
- One size up to 125A
- Large variety of accessories to be fitted by customers
- Identical accessories for a broad range of applications
- Interchangeable terminal kits for almost any S800
- Cage terminals or ring lugs
- No need to calculate short circuits using S800S for transformers up to 50kA/1600kVA due to:
  - $I^2t = 100000A^2s$  at  $I_N = 125A$
  - $\hat{I} = 12000A$  at  $I_N = 125A$

## Product Line

- S800S (50kA) upto 125A
- S800N (36kA) upto 125A
- S800C (25kA) upto 125A
- S800B (16kA) 32A – 125A
- S800U (UL-Version up to 50kA)
- S800PV-S (upto 1200V DC & upto 125A)
- S800PV-M (Switch Disconnecter upto 125A )

## Accessories

- Signal and Auxiliary Contacts
- Short Circuit Limitors
- Shunt Open Releases
- RCDs
- Separating Neutral
- Under Voltage Releases
- Rotary Handles
- Busbar Systems

## Versatile: The potential applications.



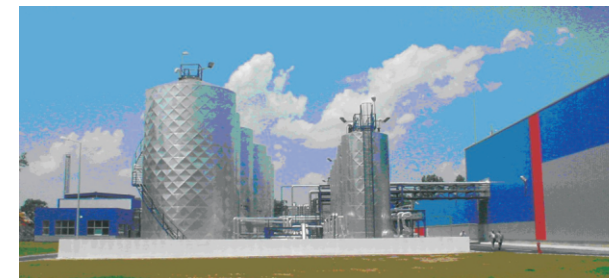
### Commercial buildings.

Airports, hospitals, office blocks: wherever there are large numbers of people coming and going, reliable power supplies are of particular importance. For example in the International Financial Center «101» in Taipei, the world's highest office block where around 10 000 people work or in Hartsfield-Jackson Atlanta International Airport (USA) through which more than 80 million passengers pass every year. High Performance MCB such as the S800 ensure that personal injury and damage to property is avoided in the event of short circuits.



### Power stations.

Virtually nothing runs without electricity. With a total of more than 3 400 000 megawatts of power, power stations around the globe ensure that the world keeps moving. High Performance MCB such as the S800 will protect your infrastructure – and therefore all your staff and machines involved in the production of electricity. The chemical and petrochemical industry.



### The chemical and petrochemical industry contributes significantly to everyday modern life.

Whether you think of health (medicines, diagnostics), food (fertilisers, plant care products, additives), clothes (dyes, fibres) or mobility (fuel) – their products ensure our quality of life and jobs. Over 2 million in the European Union alone. High Performance MCB such as the S800 safeguard production output.



### Transport systems.

The increasing levels of performance provided by rail, boat and machine means ever higher short circuit currents. Reliable and powerful protection for people and property is therefore needed. High Performance MCB such as the S800 provide this protection. For example on the «Queen Mary II», the world's largest passenger ship, where 2500 kilometres of electrical cables have been laid – for 80 000 lights, 3000 telephones, 8800 loudspeakers, 5000 fire detectors and 8350 automatic sprinkler systems.



### IT and telecommunications industry.

Communication links people, creates jobs and makes everyday life more interesting. Our lives revolve around communication. IT and telecom specialists around the world are tirelessly looking for ways to make the exchange of data a simpler process. For example, calls are made on millions of mobile phones: by around 1.5 billion people around the world in 2004. High Performance MCB such as the S800 protect the infrastructure of the IT and telecoms industry so that information can flow unhindered. Anytime. Anywhere.





### E 90 fuse switch disconnectors

E 90 series fuse switch disconnectors are designed for switching circuits under load, providing protection against short circuits and overloads. The case is made of self-extinguishing thermoplastic material resistant to high temperatures (all materials are UL listed) while the contact clips are in silver plated copper. E 90 fuse switch disconnectors can be sealed or padlocked to ensure operator safety during maintenance. Versions with blown fuse indicator allow to check whether the fuse is still working correctly or not. For easy and quick installation E 90 range is fully compatible with connecting bars, terminals and caps of S 200 MCBs



### E 90h fuseholders

E 90h fuseholders are suitable for protection against overloads and short circuits. Available in a single module 1P+N version and in a three-module 3P+N version, they are designed for use with gG and aM cylindrical fuse links. The body is made from self-extinguishing material resistant to high temperatures, while the contact clips are in silver-plated copper. E 90h fuseholders can be sealed or padlocked to assure operator safety during maintenance. Versions with blown fuse indicator allow to check whether the fuse is still working correctly or not.



### E 90 PV fuse disconnectors

E 90 PV series fuse disconnectors, designed for operating voltages of 1000 V d.c. with utilization category DC-20B, are particularly suited for protection against overcurrents of photovoltaic systems. The single-pole or two-pole E 90 PV disconnectors for 10.3 x 38 mm cylindrical fuse links offer a reliable, compact and affordable solution for photovoltaic installations. Versions with blown fuse indicator allow to check whether the fuse is still working correctly or not.



### E 9F gG and E 9F aM Cylindrical Fuses

The cylindrical fuses E 9F gG series is suitable for overload and short-circuit protection. E 9F gG covers a wide range of sizes: 8.5x31.5, 10.3x38, 14x51 and 22x58. Thanks to the wide current range from 1 A to 125 A, to the high nominal voltage between 400 V and 690 V AC, and to the high breaking capacity from 20 kA to 120 kA, the series E 9F is ideal for building and industrial applications.

### E 9F PV cylindrical fuses for photovoltaic applications

The cylindrical fuses E 9F PV series are specifically used in overcurrent protection of photovoltaic applications up to 1000 V in direct current. Thanks to the wide current range from 1 A to 30 A, and to the high nominal voltage of 1000 V DC, the series E 9F PV is ideal to protect strings, inverters and OVR surge protections.



### Rd2 residual current monitors

Residual current monitors (RCMs) with external toroidal transformer can detect leakage currents. Through minidip you can set sensitivity and intervention time.

### RD3 residual current monitors

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.

### RD front panel residual current relays

RD front panel residual current relays achieve their protective function in combination with an external toroidal transformer. You can set the sensitivity between 0.025 A and 25 A, the tripping time can vary from 0.02 to 5 seconds.

Residual current relays are available in 48 mm x 48 mm, 72 mm x 72 mm and 96 mm x 96 mm versions. The RD296 version is provided of dip switch to select the fail safe function (the output contacts will switch both for differential current over the threshold that for the lack of input current). The RD296-S is provided of fail safe function and memory led. The RD296-DIG version is provided of fail safe function (as the precedent). The digital display allows the visualization of differential current  $I_{\Delta n}$ .

Operating voltage V	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
<b>RD2 residual current monitors</b>				
230...400 a.c.	Rd2	2CSM142120R1201	0.125	1
48...150 a.c./d.c.	RD2-48	2CSM242120R1201	0.125	1

<b>RD3 residual current monitors</b>				
12-48 a.c./d.c.	RD3-48	2CSJ201001R0001	0.13	1
230-400 a.c.	Rd3	2CSJ201001R0002	0.25	1
12-48 a.c./d.c.	RD3M-48	2CSJ202001R0001	0.13	1
230-400 a.c.	RD3M	2CSJ202001R0002	0.25	1
12-48 a.c./d.c.	RD3P-48	2CSJ203001R0001	0.13	1
230-400 a.c.	RD3P	2CSJ203001R0002	0.25	1

<b>RD front panel residual current relays</b>				
24, 48 V a.c./V d.c.	RD148-24	2CSG452211R1201	0.112	1
115 V a.c./ d.c., 230 V a.c.	RD148-230	2CSG252211R1201	0.112	1
24, 48 V a.c./V d.c.	RD172-24	2CSG452120R1201	0.322	1
115 V a.c./ d.c., 230 V a.c.	RD172-230	2CSG252120R1201	0.322	1
24, 48 V a.c./V d.c.	RD272-24	2CSG452424R1201	0.322	1
115 V a.c./V d.c.	RD272-115	2CSG352424R1201	0.322	1
115, 230, 400 V a.c.	RD272-230	2CSG152424R1201	0.322	1
24, 48 V a.c./V d.c.	RD196-24	2CSG452130R1201	0.383	1
115 V a.c./ d.c., 230, 400 V a.c.	RD196-230	2CSG252130R1201	0.383	1
24, 48, 115 V a.c./ V d.c.	RD296-24	2CSG452434R1201	0.383	1
115 V a.c./ V d.c.	RD296-115	2CSG352434R1201	0.383	1
115 V a.c./ V d.c., 230, 400 V a.c.	RD296-230	2CSG152434R1201	0.383	1
24, 48, 115 V a.c./ V d.c.	RD296-S-24	2CSG452435R1201	0.383	1
115 V a.c./ V d.c.	RD296-S-115	2CSG352435R1201	0.383	1
115 V a.c./ V d.c., 230, 400 V a.c.	RD296-S-230	2CSG152435R1201	0.383	1
24, 48 V a.c./ V d.c.	RD296-DIG-24	2CSG452436R1201	0.383	1
115 V a.c./V d.c.	RD296-DIG-115	2CSG352436R1201	0.383	1
115, 230, 400 V a.c.	RD296-DIG-230	2CSG152436R1201	0.383	1



### Toroidal transformers

Dimension mm	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
29 (modular version)	TRM	2CSM029000R1211	0.170	1
35	TR1	2CSG035100R1211	0.212	1
60	TR2	2CSG060100R1211	0.274	1
80	TR3	2CSG080100R1211	0.454	1
110	TR4	2CSG110100R1211	0.530	1
110 (openable version)	TR4/A	2CSG110200R1211	0.600	1
160	TR160	2CSG160100R1211	1.350	1
160 (openable version)	TR160A	2CSG160200R1211	1.600	1
210	TR5	2CSG210100R1211	1.534	1
210 (openable version)	TR5/A	2CSG210200R1211	1.856	1



### Insulating transformers for medical locations

Permanently connected to an IT power supply system, single-phase medical insulating transformers provide galvanic separation between the distribution network and the user load in accordance with the IEC standards EN 61558-1 and IEC EN 61558-2-15 concerning power supply group 2 medical locations.



### CT and CTA current transformers

Used to transform primary currents (max. 6000 A) into .../5 A low secondary currents indirectly supplying power to analogue and digital measurement devices. They are available both with wound and through primary. In the first case they are provided along with the bar or the primary terminal; in the second case they have a hole to insert in the bar or the cable which forms the primary.



### Voltage transformers

They are used for transforming primary voltages up to 600 V into secondary voltages of .../100 V max. for indirect supply of analogue as well as digital measurement instruments. R3 voltage transformers are used in three-phase distribution systems with neutral.



### DT digital time switches

The digital versions, included in the range, are equipped with a permanent EEPROM memory which allows them to respect the scheduled program and the preservation of the data and hour settings also in the case of long power supply failures. The range, used for both daily and weekly programming, includes single/double channels versions with a change-over contact with a switching capacity of 16(10)A. The programming key, available on versions DT...-K, guarantees an easy and quick programming of n switches avoiding the numbers of mistakes due to future modifications. The DT1-IK/ DCF time switch can be combined with the antenna DT-DCF for the automatic synchronization of one or more switches, even if mounted in unsupervised places, with Frankfurt DCF77 official time. The novelties regard the holiday mode that allows to force the ON-OFF output for a certain period, the random mode used to simulate the presence and the waiver one to carry out waivers remotely or locally.

Contacts	Version Type code	Order details Order code	Weight 1 piece kg	Pack unit pc.	
1CO		DT1	2CSM204255R0611	0,160	1
1CO	key	DT1-K	2CSM204265R0611	0,160	1
1CO	key + pulse	DT1-IK	2CSM204275R0611	0,160	1
1CO	24VAC/DC + key + pulse	DT1-IK/24	2CSM204285R0611	0,160	1
1CO	key + antenna DCF + pulse	DT1-IK/DCF	2CSM204295R0611	0,160	1
2 CO		DT2	2CSM204305R0611	0,160	1
2 CO	key	DT2-K	2CSM204315R0611	0,160	1
2 CO	key + pulse	DT2-IK	2CSM204325R0611	0,160	1

### AT electro-mechanical time switches

They control circuit opening and closing according to the scheduled program. Available both on daily and weekly version and equipped with a 16A contact, they can be set on the scheduled program or on the permanent ON function (ON-OFF only for three modules versions). The AT1-R, AT3-R and AT3-7R versions are equipped with a built-in battery, generally charged by the network voltage, which allows the devices to maintain the set time also in case of long (up to 200h) power supply failures. The products fit applications such as shop lighting systems, public buildings, schools, heating and irrigation systems and so forth.



Contacts	Running reserve	Version	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
1NO	-	daily	AT1	2CSM204205R0601	0,095	1
1NO	200h	daily	AT1-R	2CSM204215R0601	0,095	1
1CO	-	daily	AT3	2CSM204225R0601	0,180	1
1CO	200h	daily	AT3-R	2CSM204235R0601	0,180	1
1CO	200h	weekly	AT3-7R	2CSM204245R0601	0,180	1



**AT2 electro-mechanical time switches**

The AT2 versions are particularly useful where there is the need to have a complete visibility of the programmable dial in only two modules. They control, as well as the AT1 and AT3 ones, circuit opening and closing according to a scheduled program and are available both on daily and weekly version with a 16A change-over contact. They can be set on the scheduled program or on permanent ON and the versions AT2-R and AT2-7R are equipped with a built-in battery, generally charged by the network voltage, which allows the devices to maintain the set time also in case of long (up to 150h) power supply failures. The products fit applications such as store lighting system, public buildings, schools, heating and irrigation systems and so forth.

Contacts	Running reserve	Version	Order details		Weight 1 piece kg	Pack unit pc
			Type code	Ordercode		
1 CO	-	daily	At2	2CSM204105R0601	0,118	1
1 CO	150h	daily	AT2-R	2CSM204115R0601	0,118	1
1 CO	150h	weekly	AT2-7R	2CSM204125R0601	0,118	1

**D digital time switches**

The "Plus" version can transfer different type of program by using a D KEY to be quickly copied in No digital time switches, avoiding the errors due to future modification. The "SYNCHRO" version can be coupled to the D DCF77 antenna, that allows an automatic synchronization of the digital time switch with the Frankfurt DCF77 time signal, or can be coupled to the D GPS antenna to allows synchronization received from the Global Positioning System.

Channels no.	Order details		Bbn 8012542 EAN	Price 1piece	Price group	Weight 1piece kg	Pack unit pc.
	Type code	Order code					
1	D1	2CSM258763R0621	587637			0.140	1
1	D1 PLUS	2CSM257583R0621	575832			0.140	1
1	D1 PLUS24	2CSM256403R0621	564034			0.140	1
1	D1 PLUS110	2CSM258673R0621	586739			0.140	1
1	D1SYNCHRO	2CSM257493R0621	574934			0.140	1
2	D2	2CSM256313R0621	563136			0.140	1
2	D2 PLUS	2CSM277583R0621	775836			0.140	1
2	D2SYNCHRO	2CSM277363R0621	773634			0.140	1



ABB offers a wide range of analogue voltmeters, ammeters, frequency meters, power factor meters, available in modular or front panel version.

Voltmeters, ammeters and frequency meters are also available in digital range (both modular and front panel version) that also includes voltmeters and ammeters equipped with output relay. ABB multimeters allow the measurement of the main electrical parameters in three phase networks. The range is divided in:

- DMTME – modular version
- DMTME-72 and DMTME-96 – front panel version also available with RS485 Modbus RTU port for communicating the measured parameters over a Modbus network.

ABB offers a front panel range of network analyzers that perform true rms value of the principal electrical quantities in single and three phase networks.

The range of network analysers is divided into:

- MTME measuring in TRMS of all electric quantities (V-I-P-Q-A-cos-Hz-kWh-kVARh etc)
- ANR which are able to measure and record network parameters, information and alarms, routing data towards supervision and monitoring systems.

**Front panel DMTME multimeters & Analyzers**

	Modular and front panel multimeters			Front panel network analysers	
	DMTME	DMTME-72	DMTME-96	MTME-LCD-96	ANR96 ANR144
Overall dimensions	6 DIN modules	72x72x90	96x96x103	96x96x103	96x96x130 144x144x66
Display		LED		LCD backlit	LCD graphic backlit
Power supply	110 V a.c. 230 V a.c	230 V a.c. 400 V a.c.	110 V a.c. 230 V a.c.	110 V a.c. 230 V a.c.	20-60 V a.c./d.c. 85-265 V a.c./d.c.
TRMS voltage, TRMS current, Frequency, Power factor, Cosφ, Active power, Reactive power, Apparent power, Active energy, Reactive energy, Apparent energy, Peak value Min/Max/Avg, Timer and count-down	Electrical parameters measurement			Electrical parameters measurement	Electrical parameters measurement
Power 4Q Energy 4Q Neutral current Current THD Voltage THD Password set up Tariff Maximum demand Harmonic analysis up to 31° Wave form visualisation Memory 1 MB				Power quality	Power quality
Outputs	Digital			Digital	Digital Digital and analog
Inputs					Digital
Serial port	RS485			RS485	RS485
Protocols	Modbus RTU			Modbus RTU	Modbus RTU Ethernet TCP/IP Profibus DP



# DIN-rail digital electricity meters



## ODINsingle electronic single phase energy meters

### General Features

ODINsingle is an active energy, single phase meter for direct metering up to 65A. The LCD display has 6 digits, 6 mm high to ensure easy reading. ODINsingle is made compact, only 2 modules (35 mm) to save space in the installation. A red LED at the front flashes proportionally to the energy consumed. ODINsingle has a temperature range from -25 to +55 (storage +70 °C)

Voltage (V)	Pulse frequency	Output Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
<b>OD1065 direct connected, single phase meter 65A</b>					
230	-	OD1065	2CMA131040R1000	0.145	1
<b>OD1365 direct connected, single phase meter 65A, pulse output and resettable</b>					
230	100 imp/kWh	OD1365	2CMA131041R1000	0.145	1

## DELTAsingle electronic single phase energy meters

### General Features

- DELTAsingle is an active energy, single phase meter for direct metering up to 80 A. The LCD display has 6 digits, 6 mm high to ensure easy reading.
- DELTAsingle is made compact, only 4 modules (72 mm) to save space in the installation. In case of power failure, the meter is equipped with a Super Cap power backup that will run the clock for 48 hours. A red LED at the front flashes proportionally to the energy consumed.
- DELTAsingle has a temperature range from -40 to +55 (storage +70 °C)

Description	Order details Type code	Order code	Weight 1 piece kg	Pack unit pc.
1 tariff without pulse output	FBU 11200	2CMA180891R1000	0.150	1
1 tariff with pulse output	FBB 11200	2CMA180892R1000	0.150	1
2 tariff without pulse output	FBU 11205	2CMA180893R1000	0.150	1
2 tariff with pulse output	FBB 11205	2CMA180894R1000	0.150	1
4 tariff without pulse output	FBU 11206	2CMA180895R1000	0.150	1
4 tariff with pulse output	FBB 11206	2CMA180896R1000	0.150	1

ODIN Meter is a compact three-phase meter for measuring active energy, designed for mounting on DIN rail, on panel and for flush mounting in distribution switchboard or standard boxes.

It is designed and developed to offer extremely easy application and it is equipped with terminals with transparent scores and strong holding screws for connecting cables and terminal boards, phase bus connectors, easy to read 7-digit display, current direction indicator, clear mounting instructions with text and diagrams on the device.

ODIN Meter is a highly reliable and strong meter that maintains the highest measuring accuracy in time.

### Active energy meter 3x230/400 (three-phase+N)

Description	Order details Type code	Order code	Bbn 7392696 EAN	Price 1 piece	Price group	Weight 1 piece kg	Pack unit pc.
direct up to 65A, impulsive output 100 Imp./kWh	OD4165	2CMA131024R1000	310246			0.38	1
indirect with CT/5A, impulsive output 10 Imp./kWh	OD4110	2CMA131025R1000	310253			0.40	1

## DELTAplus electronic three-phase energy meters

DELTAplus meters are designed to offer extremely easy and simple application. Suitable for mounting on DIN rail, lightweight and small, they are ideal for the installation on switchboards, feeder panels and enclosed. The range includes devices for measuring active energy, and the combination of active and reactive energy.

### Energy meters for direct connection up to 80 A, class 2

3 x 100-500 V AC (3P)	DBB 22000	2CMA180802R1000	808026			0.338	1
3 x 57-288/100-500 VAC (3P+N)	DBB 23000	2CMA180800R1000	808002			0.338	1
3 x 57-288/100-500 VAC (3P+N) + active/reactiv	DDB 13000	2CMA180810R1000	808101			0.338	1

### Energy meters for connection through C.T. /5 A, class 2

3 x 100-500 V AC (3P)	DAB 12000	2CMA180807R1000	808071			0.304	1
3 x 57-288/100-500 VAC (3P+N)	DAB 13000	2CMA180806R1000	808064			0.304	1
3 x 57-288/100-500 VAC (3P+N) + active/reactiv	DCB 13000	2CMA180808R1000	808088			0.304	1

## DELTAmax advanced electronic three-phase energy meter

DELTAmax is a further enhancement of DELTAplus. Additional features for DELTAmax are:

Four quadrant metering (import and export of energy)

Time dependent functions including

- Load profile (15, 30, 60 min interval)
- Max demand
- Event and quality logs
- Monthly or Daily values (selectable)

Total Harmonic Distortion (THD) up to 9th harmonic (50 Hz network)

### Energy meters for direct connection up to 80 A

3x57-288/100-500 VAC (3P+N)	DFB 13007	2CMA139504R1000	395045				
3x57-288/100-500VAC (3P+N) + M-Bus	DFM 13007	2CMA139507R1000					
3x100-500 VAC (3P) + M-Bus	DFM 12007	2CMA139508R1000					
3x57-288/100-500 VAC (3P+N) + active/reactive	DHB 13007	2CMA139520R1000					

### Energy meters for connection through C.T. /5A

3x57-288/100-500 VAC (3P+N)	DEB 13007	2CMA139497R1000					
3x57-288/100-500VAC (3P+N) + M-Bus	DEM 13007	2CMA139500R1000					
3x100-500 VAC (3P) + M-Bus	DEM 12007	2CMA139549R1000					
3x57-288/100-500 VAC (3P+N) + active/reactive	DGB 13007	2CMA139511R1000					

## Measurement devices



### Analogue instruments

The range provided includes analogue and digital instruments. In addition to standard measurement devices for electric quantities (voltmeters, ammeters, frequency meters, power factor meters), and a set of accessories are available, including ammetric transformers, which increase the functions of these instruments.

### Front panel analogue instruments

Available in both alternating current and direct current versions, they come in three standard sizes, 48 mm x 48 mm, 72 mm x 72 mm and 96 mm x 96 mm (special versions available on request). Ammeters without scale for indirect connection must be completed with the interchangeable scale according to the full scale.



### Digital instruments

The wide range of digital instrument starts with single phase instrument, for measuring voltage, current and frequency. The range is composed by a voltmeter for a.c./d.c. voltage monitoring, two ammeter for a.c. and d.c. current, and frequency meter. Ammeters measure in indirect insertion thanks to measuring accessories, like current transformer for a.c. and shunt for d.c.

### Front panel digital instruments

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### Temperature control units

TMD are used measure and control the temperature levels and efficiency of electric machines, power transformers, motors, etc.

The temperature is measured by four PT100 type sensors. Each measuring channel has two programmable alarm thresholds which trip two output relays to remotely signal that a critical temperature has been reached.

The measured values and any alarm conditions are shown on the dual 3-digit display on the front of the device, which also has five five programming keys for configuring its operation.

The control unit is also able to store in memory maximum values and a log of all trip-events..

Temperature measured	Order details	Bbn	Price	Price	Weight	Pack
	Type code	Order code	EAN	group	1piece	unit
4	MD-4/96	2CSG524000R2021	560203		0.8	1

## Surge protection devices

### Type 1 SPD

- High energy capability to handle direct lightning strike (10/350 wave) at the main incomer panel level
- Encapsulated spark Gap (L-N) and Gas discharging Tube (N-PE)
- Impulse current limit = 25 kA (L-N) and 100kA (N-PE)
- High follow current interrupting rating I<sub>fi</sub> = 7 to 50 kA
- Single pole and multipole versions adapted to all type of networks
- Voltage protection level, U<sub>p</sub> = 2.5kV and 4kV
- Response time = 100 ns



### Type 2 SPD

- To discharge lower energy from distant lightning strikes or switching operations (8/20 wave) at the sub-DB level
- Maximum discharge current I<sub>max</sub> = 15 to 70 kA
- Pluggable (P), Safety reserve (s) and remote indicator (TS) versions in option.
- Single pole and multipole versions adapted to all types of networks.
- Voltage protection level, U<sub>p</sub> = 0.9kV to 1.5kV
- Response time = 25 ns



### Telecom & dataline SPD

- Adapted to analog and digital lines.
- Nominal voltages from 6 to 200V
- Local status indicator on front side.
- Pluggable cartridges
- Response time = 25 ns



### SPD's for Photovoltaic installations

- Specially designed and tested for PV application DC circuits
- Maximum continuous operating Voltage (U<sub>c</sub>) = 700 V & 1120V
- Modular systems with pluggable cartridges for easy maintenance (without breaking the circuit),
- Fitted with remote auxiliary contacts for monitoring the operating status (TS),
- No follow current
- No risk of + and - inversion.
- Response time = 25 ns

### SPD's for Windmill application

- Windmills are very high and located in isolated areas, the risk of direct lightning strike is important, therefore ABB recommends to install a Type 1 SPD in the MSB (Main Switch Board).
- In addition, fine protection is required with Type 2 SPDs installed close to the sensitive equipment of the installation (like the anemometer for instance).
- Windmill applications are specific because many different voltages exist : 24V (for HUB protection) 48V / 230V between Phase and Neutral, and 380V / 480V / 690V or 1000V (for stator protection) between Phases.
- Data line surge arresters (OVR TC) provide protection against transient overvoltages for equipment connected to telephone lines (digital or analog), computer links or current loops, for applications such as RS-485, 4-20 mA.

# Lightning Protection

## OPR ESE Terminals

The new OPR (Optimized Pulse Rod) range with increased initiation advance performances, represents further progress in terms of protection, operating autonomy and ease of maintenance. These advancements reinforce ABB's position as international leader in direct lightning protection.

The unique efficiency of the OPR lightning conductor is based on a specific initiation advance, well before the natural formation of an upward leader, the OPR generates a leader that rapidly propagates to capture the lightning and direct it to earth. Validated in laboratory, this gain in time relative to the simple rod provides additional essential protection.

During a storm the ambient electric field may rise to between 10 to 20 kV/m. As soon as the field exceeds a threshold representing the minimum risk of a lightning strike, the OPR lightning terminal is activated. It draws its energy from the ambient electric field the energy required to generate high voltage pulses, creating and propagating an upward leader. No other power sources are required, and no radioactive components are used.

### OPR Range

Time gain, $\Delta T$ ( $\mu s$ )	Description	Order Code	Length (m)	Weight (kg)
30	OPR 30	2CTB899800R7000	0.215	2.19
60	OPR 60	2CTB899800R7100	0.215	2.19

### Accessories

Description	Order Code	Length (m)	Weight (kg)
Lightning stroke counter	H0CCF2004	0.121	0.56
Mounting mast, 2m	H00003002L	2.0	4.4
Mounting mast, 3m with Guywire & Base plate	H00003003LGB	3.0	6.5



### Radius of Protection (Rp)

Level of protection	OPR Radius of Protection					
	I(D=20m)		II(D=40m)		III(D=60m)	
OPR	OPR	OPR	OPR	OPR	OPR	OPR
	30	60	30	60	30	60
h(m)	Radius of Protection RP(m)					
2	19	32	25	40	28	44
3	28	48	38	59	42	65
4	38	64	50	78	57	87
5	48	79	63	97	71	107
6	48	79	64	97	72	107
8	49	79	65	98	73	106
10	49	79	66	99	75	109
15	50	80	69	101	78	111
20	50	80	71	102	81	113
45	50	80	75	105	89	119
60	50	80	75	105	90	120

# Maintenance-free Earthing material

## GRIC (Ground Resistance Improvement Compound)

GRIC is a mixture of specifically selected compounds, which possess excellent electrical conductivity that improves grounding effectiveness. Provides a permanent solution and maintains the integrity of the earthing system.

GRIC a compound, mixed with water and poured inside the earth pit with soil in alternative layers around the electrode. The powder and water react to a permanent low resistance earthing system. It will not wash away under any seasonal conditions. Corrosion-free on the Earth electrode material and Eco-friendly.

### Why GRIC is needed

- Maintenance-free
- Corrosion-free
- Long life
- Steady performance
- Space saving

### GRIC Contents :

- **Ionic Compounds** : NaCl (Sodium Chloride) & KCl, (Potassium chloride) compounds increase the conductivity.
- **Dispersions Compounds** : Mainly consisting on coke powder helps to distribute the ions through out the earth pit uniformly.
- **Diffusion Compounds** : Removes the air pockets between the earthing rod & the earth pit to improve the conductivity.
- **Expansion Compounds** : Vermiculite & perlite, which can increase in surface area with time.
- **Hygroscopic Compounds** : Retains & absorbs the moisture from the surrounding and maintains in jelly form to increase the conductivity.
- **Other Patented Chemicals helps,**
  - Maintains constant & High electrical conductivity and unaffected when changes in temperature & moisture.
  - The Compound permanently remain embedded and should not dissolve in and swept away by water.
  - Ability to absorb large amount of water and retain the same over long periods of time.



### Physical Properties

- Presentation : Solid in granule form.
- Granulometry : 0.85 micro.m at 4 mm
- Colour : Grey.
- Smell : Inodorous.
- Solubility in water : Partially miscible
- PH value : 6.9-7.2 1000g/l at - 20° C
- Apparent volumic mass : 500 to 650 Kg/m3 (Compressed), 450 to 500 Kg/m3 (Not Compressed)

Description	Order Code	Length (m)	Weight (kg)
GRIC, 5kg	H00003002EC5	-	5
Copper bonded Earth Rod, 1.2m	H00003002ER12	1.2	-
Rod to tape clamp	H00003002ERC1	-	-



# Distribution Boards

## A perfect blend of aesthetics, functionality and safety

ABB's S-series of Distribution Boards meet all the requirements of modern installation for domestic, commercial or industrial applications.

Blending aesthetics, functionality and safety, the S-series of ABB Distribution Boards are manufactured with precision and are of high quality CRCA steel sheets. These Distribution Boards undergo a seven-tank phosphating process and powder coating to ensure an anti-rust conditioning, superior finish and lasting strength. It is available in Ivory (RAL 9010) colour.

### Installation

The S-series of ABB Distribution Boards are universal mounting types, hence can be flush or wall mounted. These Distribution Boards are provided with top and bottom removable gland plates with adequate

number of knockouts, which enable easy installation and connection of conduits of all sizes (upto 36mm dia knockout). Double door construction of Distribution Boards facilitates easy removal of door intermediate plate.

### Protection

S-series Distribution Boards offer two types of protection-IP42 degree with a metal door and IP20 degree without a door. The highest degree of attention has been paid to the safety aspect of the Distribution Boards, considering that they are installed in close proximity to people. An intermediate plate ensures total safety, as no live parts are exposed when the door is opened.



### SHC – SPN Consumer Units

Horizontal single phase consumer unit with provision for 2 pole (MCB / Isolator / RCD) incoming and single phase outgoing. These Distribution Boards come with neutral link, earth link and 100A tinned electrolytic copper busbar. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface.

Number of ways : 4, 6, 8, 10, 12, 14, 16, 20



### SHDB – TPN Distribution Boards

Horizontal three phase distribution board provision for incomer 8 pole (MCB / Isolator / RCD) and single phase outgoing. These Distribution Boards come with neutral link, earth link, 100A tinned electrolytic copper busbar and wire sets for cable management. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface.

Number of ways : 4, 6, 8, 12



### SEN – Metal Enclosures

Metal enclosures, universal mounting suitable for 2 pole, 4 pole and 6 pole arrangement.



### SHPPI – Horizontal per-phase Isolation Distribution Board

Horizontal per-phase Isolation Distribution Board with provision for 8 pole (MCB / Isolator / RCD) as incomer and 2 pole (MCB / Isolator / RCD) sub-incomers with single phase as part of the outgoing. Separate neutral links are provided for per phase isolation.

These Distribution Boards come with earthing link, 100A tinned electrolytic copper busbar and top and bottom removable gland plates with knockouts. Mounting of these boards can be flush or surface.

Number of ways : 6, 8, 12, 16



### SVTDB – Vertical TPN Distribution Board

Vertical three phase Distribution Board with provision for 8 pole (MCB / Isolator / RCD) incoming with three phase and single phase (TP/SP) outgoing, complete with insulated busbar arrangement.

Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface.

Number of ways : 4, 6, 8, 12



# Acrylic Distribution Boards

## SVTDB T1 – Vertical TPN Distribution Board with MCCB incomer

Vertical TPN Distribution Board with provision for 4 pole MCCB as incomer and three phase / single phase (TP/SP) outgoing. For incoming of 160A, ABB T-max MCCB type T1 is used with 200A tinned electrolytic copper busbar, neutral bar and earth bars. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface. Number of ways : 4, 6, 8, 12.



## S7SEG – Seven Segment Distribution Board

Seven Segment Distribution Board with phase segregation and separation between incoming and outgoing with provision for 8P incomer (MCB / Isolator / RCD) and 4 pole sub-incomer (MCB / Isolator / RCD) with single phase outgoing. These Distribution Boards come with earthing link, neutral bar and wire sets for cable management for each compartment. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface. Number of ways : 4, 6, 8, 12



## SVFL – Tier Distribution Board

Total flexibility as per site needs – configuration as per your choice of incomer and outgoing. Supply busbars need to be selected. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface. Number of ways : 13 way 3 tier, 13 way 4 tier



## SVDB – Vertical per-phase Isolation Distribution Boards

Vertical per-phase Isolation Distribution Board in 4-tier structure with provision for 8 pole (MCB / Isolator / RCD) incomer and provision for 2 pole (MCB / Isolator / RCD) as sub-incomer with single phase outgoing. Separate neutral links are provided for per phase isolation. These Distribution Boards come with earthing link, 100A tinned electrolytic copper busbar and wire sets. Top and bottom, removable gland plates with knockouts. Mounting of these boards can be flush or surface. Number of ways : 6, 8, 12



## Plug and Socket Distribution Board – SGK

This range offers a wide variety of plug sockets up to 63A. These plug sockets can be used for single phase or three phase along with MCBs or RCBOs. They can be universally mounted.



## Unibox IP 40 flush-mounting Acrylic Distribution Board

### Technical characteristics

- Protection degree: IP40; Flush mounting
- Door opening with push-pull mechanism
- Extractable DIN rail frame to facilitate bench cabling
- 150mm inter-axis between DIN rails
- One extra module per row that can be used by removing the 1/2 module trimmings at the end of each row
- No. of ways 24, 36, 54



## Europa IP 40 flush-mounting Acrylic Distribution Board

### Technical characteristics

- Protection degree: IP40; Flush mounting
- Colour: White RAL 9001
- Door opening with push-pull mechanism; opens up to 180 degrees
- Door designed to be fitted with a pin lock code 12 867
- Dimensional Stability: -20o C to +85o C
- Extractable DIN rail frame to facilitate bench cabling
- Optional accessories: Pin type Lock with key (Code No. 12867) & spare doors of each type
- No. of ways 24, 36, 54



## Estetica IP 40 flush-mounting Acrylic Distribution Board

### Technical characteristics

- Protection degree: IP40; Flush mounting
- Colors: White RAL 9001
- Dimensional Stability: -20o C to +85o C
- Extractable DIN rail frame to facilitate bench cabling
- No. of ways 24, 36



## ACP Acrylic Consumer Panel

### Technical characteristics

- 70% transparent cover made of PC
- Continuous heat resistance and good performance in flammability
- Can be locked in the open as well as closed position
- Slim metal box suitable for single brick wall installation (70mm)
- Unmatchable range in SPN type units – 6, 8, 11, 14, 18, 21 outgoing + 2 pole incomer
- Iso available in 3-phase construction with 24, 36, 54 module size in 3 rows
- No. of ways 24, 36
- 15o correction is possible if the metal box is wrongly mounted.
- No. of ways 6, 8, 11, 14, 18, 21





# Industrial Plugs & Sockets



**A wide range of tough products for demanding use**  
**The ABB Industrial Plugs and Sockets are a part of the comprehensive ABB program of high quality low voltages products for industries, buildings and OEM's. Much of ABB product program are sold through external partners such as distributors, system integrators and panel builders.**  
 The production of Industrial Plugs and Sockets are going back a long time. ABB \_\_\_-control has produced Plugs and Sockets since 1959 in the factory located in \_\_\_\_, Sweden.

Long experience of producing and developing plugs and sockets within ABB have resulted in a wide product range with high quality and an ergonomic practical design. Covering up to 125A and \_\_ V, tested and approved for EC standards.

The design and material have continuously been improved to follow the trend and development of customers requirements and environments for the applications.

ABB Industrial Plugs and Sockets are the solution for products in Industrial environments with demands on durability, reliability and cost saving for the end user.

- Durability** - selection of plastic material that gives a high durability for tough conditions and environments.
- Reliability** - high quality contacts ensures high reliability.
- Cost savings** - designed for quick, easy and safe installation.

You will find what you need in the ABB industrial Plugs and Sockets product range.  
 One supplier for all your needs and worldwide availability.

**Perfect for the job**  
 Depending on type of installation, demand on productivity, safety and functionality you could choose from a wide range of products. To make it easier for you to find a combination that is perfect for your job, we have vlassified our product range under three categories

- Critical & Safe
- Tough & Safe
- Easy & Safe

The structure of this catalogue is based on these three categories in order to make your choice easier. Look out for the three different marks in the table and after that function and current.

### Modular Combi a part of the Critical & Safe range

Modular Combi is our concept for combination boxes which are available in plastic or metal housing. Modular Combis the choice for the customer that needs a combination with a customer adapted solutions, out from the needs and demands of functionality.

Only one feeding cable is needed which facilitates the installation and saves cost.If needed the Modular Combi could be provided for looping.

**Perfect performance**  
 All Plugs and Sockets in our range comply with high standards of quality.But they are all different, to be able to meet different tasks. Some are made of heavy-duty plastics (PBT), others of metal. Some have advanced features whilst others have a straightforward functionality. Perfect for demanding customers.

**Perfect productivity**  
 The result is that you can rely on all our Plugs and Sockets to help you maintain a high up-time in your operations.No unscheduled or unwanted interruptions. But they still allow you a high degree of flexibility.

**Perfect safety**  
 Even more important than productivity is safety.By choosing our Plugs and Sockets that are optimized for their task, you not only minimize the risk of short circuits. You also ensure medium personal safety for anyone in the vicinity of your equipment.

**ABB Industrial Plugs and Sockets- a complete offer**

- All plugs and Sockets are approved according to IEC 60309-2.
- ABB Industrial Plugs and Sockets range from 16A up to 125A.
- P44 (slashproof) and IP87 (wattertight).
- All contacts are corrosion free, self cleaning and calibrated.
- Plugs and Sockets for 63 and 125A have pins and sleeves carrier in glass fibre reinforced polyamide.
- For devices in the Critical & Safe and TOugh & Safe range \_\_\_\_\_ are in stainless steel.
- Clear terminal meaning inside and at the front of the device.
- Switched interlocked socket-outlets for vertical or horizontal mounting.

**Worldwide availability**  
 ABB is represented in over 130 countries. Our Plugs and Sockets sheets all major international and national standards.



# Smart home and intelligent building control (KNX)

ABB i-bus® KNX is the intelligent installation system that meets the highest requirements for applications in modern home and building control.

- ABB i-bus® KNX is based on the simple, yet proven KNX technology which is now accepted as the world's first open Standard for the control of all types of intelligent buildings - industrial, commercial or residential.
- With the ABB i-bus® KNX system, the buildings we occupy are easier to manage and control, resulting in increased flexibility, security, economic efficiency and convenience.
- The operational flexibility of an ABB i-bus® KNX electrical installation allows the everyday working or living environment to be easily adapted to the individual's needs – now and in the future.
- The ABB i-bus® KNX product range includes components covering the complete spectrum of applications found in today's buildings, ranging from lighting and shutter control to heating, ventilation, security, energy management, and many more.

## ABB i-bus® Eib-KNX – The standard bus system

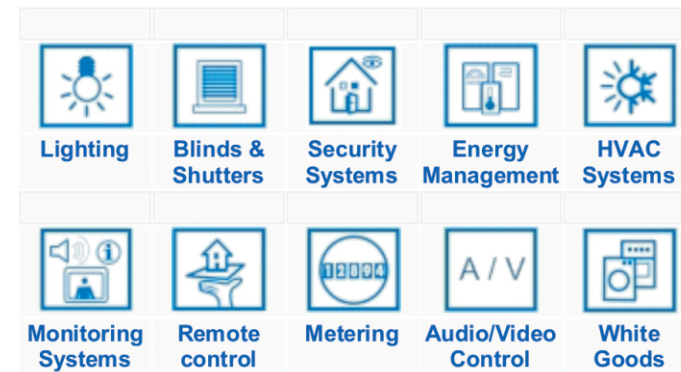
KNX is the creator of the open standard EIB -KNX technology – the worldwide open STANDARD for all applications in home and building control, ranging from lighting and shutter control to various security systems, heating, ventilation, air conditioning, monitoring, alarming, water control, energy management, metering as well as household appliances, audio and lots more. The technology can be used in new as well as in existing home and building



KNX is approved as an International Standard (ISO/IEC 14543-3) as well as an European Standard (CENELEC EN 50090 and CEN EN 13321-1) and Chinese Standard (GB/Z 20965). KNX is therefore future proof. KNX products made by different manufacturers can be combined – the KNX trademark logo

guarantees their interworking and interoperability. KNX is therefore the world's only open Standard for the control in both commercial and residential buildings.

## Applications of ABB i-BUS®EIB-KNX



### Lighting control

- Switching/dimming
- Light Scenes/mood lighting
- Central/group switching
- Constant lighting control

### Control of heating, Ventilation and air conditioning (HVAC)

- Individual room control
- Reduction during night time and absence
- Presence-dependent control

### Remote maintenance/energy management

- Remote maintenance/fault reporting
- Load management
- Facility management

### Shutter control

- Control of the shutters
- Weather-dependent control
- Energy optimization

### Security system

- Intrusion
- Fire
- Technical alarms (gas/water)

### Visualisation

- Control
- Operation
- Synoptic/displays

### Audio video integration

## Product range overview

### Power supplies for KNX system voltage:



SV/S 30.X.5

Power supply with integrated choke for the ABB i-bus® system voltage. Additional 30 V DC output to supply a second line in connection with a separate choke. Connected to the bus line via a bus connecting terminal. Available in 160 mA , 320 mA and 640 mA range. For supply of the KNX bus voltage in case of a mains failure, a 12 V DC sealed lead acid battery can be connected with uninterruptible KNX power supply.

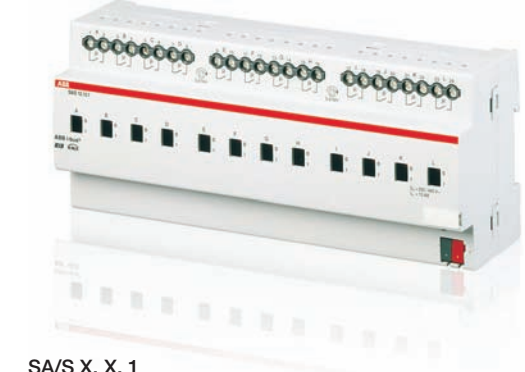
### Room master and room controller:



RM/S X.1

The Room Master opens new possibilities for objects where rooms with a living area and bathroom are to be controlled and utilized efficiently. The Room Master has been developed especially for these areas typically found in hotels, hospitals, assisted living accommodation and student residential homes. It covers all the demands placed on the electrical installations of these applications and offers the following functions in a compact format: Switching of lighting, Control of heating/cooling, Providing shade (via shutters or blinds), Switching of electrical sockets and loads .The communication of the devices via the KNX bus also implements central control functions as well as sending of emergency signals from the rooms to a control centre.

### Outputs for Switching with feedback:



SA/S X. X. 1

Uses potential free contacts starting from 2, 4,8 and 12 channels to switch independent electrical loads via the ABB i-bus®. Manual and visual operation. The device is especially suited for loads with high surge currents e.g. flourescent lighting (AX) acc. EN 60669. Available in current rating starting from 6 A to 20 A .

### Shutters and blind control:



JA/S X.X.1

Controls independent shutter or sunblind drives including the functions Up/Down, Step/Stop, Move to position, Sun protection automatic control and Heating/cooling automatic control. Direct manual operation, with or without EIB/KNX voltage connected.

### Illumination and lght sensors:



SD/S X.X.1

MDRC Device for switching (16A-AC1) and dimming independent groups of luminaries with elect. Ballasts and 1-10V control inputs, via the ABB i-bus®. Manual and visual operation. A power supply is not necessary.



UD/S 2.300.2

For switching and dimming incandescent lamps, 230 V halogen lamps or low-voltage halogen lamps powered by wound or electronic transformers. Automatic load detection. Full output power up to 45 °C ambient temperature.

**Heating and Cooling:**



FC/S 1.1

Controls motor-driven and thermal heating and ventilation valves as well as multi-speed fans via the ABB i-bus® or as a stand-alone device in combination with the temperature sensor. Two binary inputs for 24 V AC signaling contacts

**Visualization, Display and Signaling:**



8136-500

The Busch- Comfort Touch combines the functions of a house control, an infotainment centre and entertainment centre in one attractive masterpiece. With the Busch- Comfort Touch, you can operate or dim the lights, control your blinds, regulate the room temperature or create scenes from a combination of the functions listed – even by remote control. You can increase the security of your house through presence simulation, alarm and information messages. And if you want to know who is at the door or outside the house, then switch the camera to exterior view and you will immediately feel secure. You can also use the brilliant audio player for MP3 files and a video player to play films. You can leave voice and graphic messages for other family members, access e-mails, track up-to-date stock market news, have a look at the weather or the latest traffic reports or simply set a wake-up alarm. And all this with an intuitive Touch Control, supported by a novel color coding system. So you will certainly soon find that you do not want to be without the Busch- Comfort Touch anymore



TG/S 3.1

Sends configurable voice messages via the telephone network. 100 communication objects are available in the ETS program as inputs or outputs. Apart from the voice messages, e-mail or SMS messages can be sent. Commands via DTMF/MFV can be executed.

**Voperation: Switch sensors**



6344-XX

With Busch- priOn you can control and monitor the whole room at the same time. Light, scenes, timer, blind control, heating control – all functions are performed intuitively via a rotary regulator. The 3.5" TFT display shows all information clearly. Busch- priOn is not style frame bound and can be a modular design layout. Freely programmable functions, such as light scenes, blind functions or particular lights can be called up using the switch rockers. Busch- priOn can be ideally adapted to all customer requirements. There is a choice of three high-quality design versions: "glass white", "glass black" and stainless steel with anti-fingerprint coating.

**Energy Management:**



ZS/S 1.1

Receives measuring data and values from ABB energy meters such as DELTAplus, DELTAsingle, ODIN and ODINsingle and transforms them into KNX telegrams. These data can be used e.g. for visualisation, energy optimizing, billing and monitoring purposes.

**Security and surveillance:**



MT/S X.12.1

Compact KNX security solution for the detection of intrusions and technical alarms. The device provides 8 monitored inputs and 3 relay outputs. A 12 V DC SELV auxiliary supply is necessary. For connection with magnetic reed contacts, door window contacts, glass breakage sensors, water detectors, smoke detectors, vibration detectors etc

DG/S 1.X

For controlling DALI devices via the ABB i-bus®. Up to 128 DALI Slaves are addressable. 64 DALI slaves can individually and directly switched and dimmed. Additional 64 DALI devices are controlled in broadcast mode.



6131-101

For switching up to two channels of illumination + one channel for HVAC, dependent on brightness and/or movement Constant light regulation Alarm function Surveillance zone (installation