



Electronic relays for railway solutions

Time, measuring and
monitoring relays

—
Electronic devices installed in trains are constantly exposed to a harsh operating environment: continuous vibrations, high electrical and mechanical load and changing environmental temperatures. These conditions therefore require superior quality.

ABB's electronic relays meet the requirements for rolling stock standards and are reliable even under constant strain.

Reliable equipment for rail and infrastructure

Keep moving with ABB's electronic relays for rail and infrastructure applications

Millions of people across the world travel by rail each year. ABB's electronic relays adhere to all relevant international standards, insuring the reliable operation of trains and the safe arrival of passengers.

In order to function reliably and safely, trains require special equipment. For example, trains that are primarily used in tunnels, high-speed trains as well as night trains with sleeping cars require devices that are vibration resistant. In addition, passenger safety must be ensured, so that, in an emergency, no additional risk is posed by defective electrical

devices. This is a key concern, particularly when escape routes are limited or restricted, for example in tunnel systems. Due to these different requirements, rolling stock application require different standards than equipment used in building infrastructure such as stations.



Solutions for rolling stock applications, e.g. trains, light rail and freight transport



Building infrastructure, e.g. passenger stations and terminals





Rolling stock

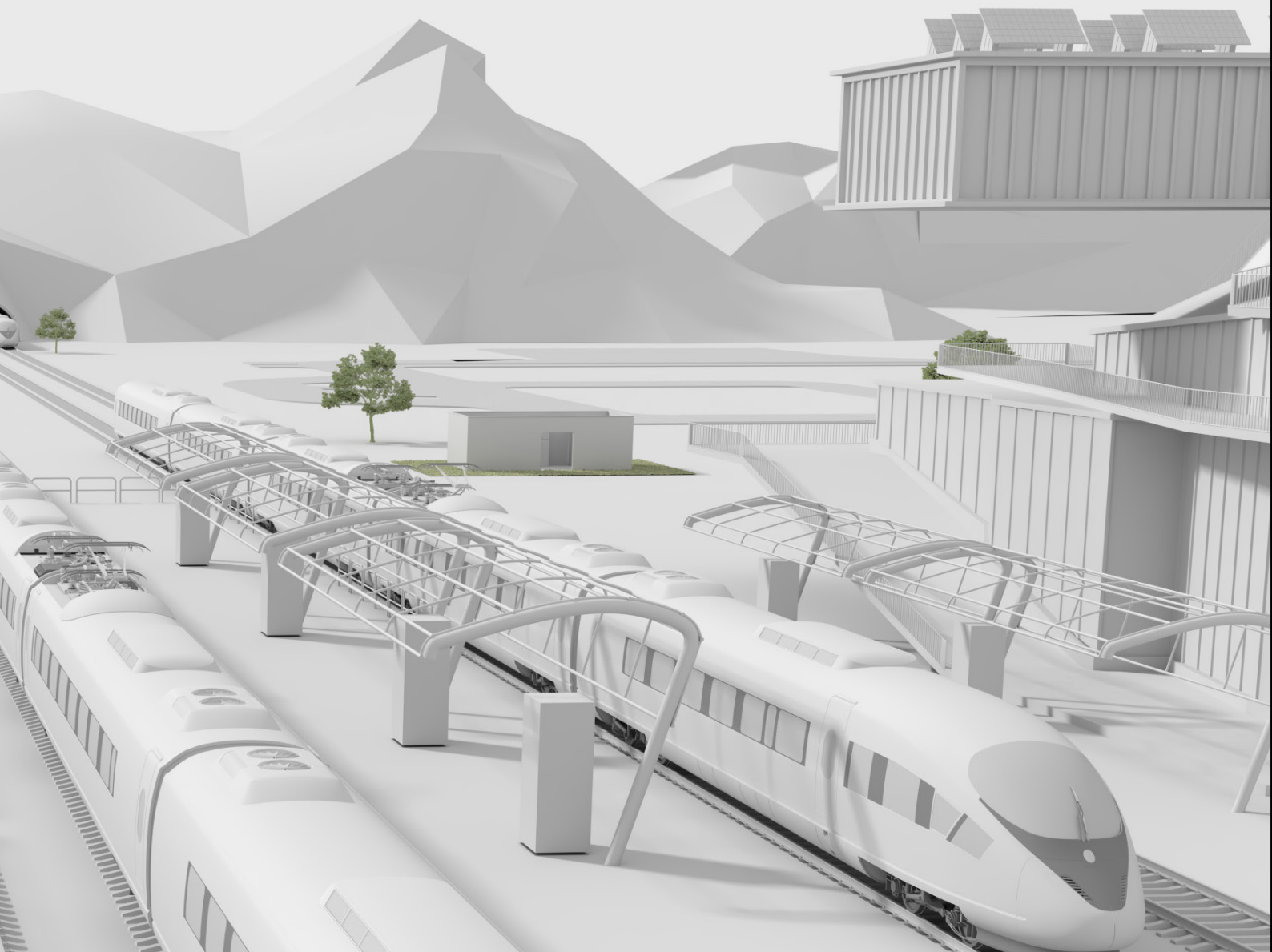


By developing solutions and products which are innovative, reliable, safe and easy to install, we are consistently meeting the high standard of safety expectations for transportation. We can contribute to the increased efficiency of your equipment and support transport operators throughout the whole life-cycle of the traction chain, i.e. in the areas of service, maintenance, upgrades, and retrofit projects.



Time relays

ABB's time relays are used in railway applications worldwide and have proven their excellent functionality in daily use, even under the toughest conditions. The CT-S range is designed for harsh environments and offers push-in terminals with excellent vibration resistance - perfect for use in rolling stock.



Monitoring relays

The ABB single- and three-phase monitoring relays ensure fault-free, economical operation of machines and systems. Thus, current and voltage monitoring relays for single-phase mains can protect devices, machines and systems against over-/undervoltages or over-/undercurrents and monitor correct functioning. The three-phase monitoring relays of the CM series can monitor the phase voltages, phase sequence and symmetry as well as phase correction, as necessary.



Insulation monitoring relays

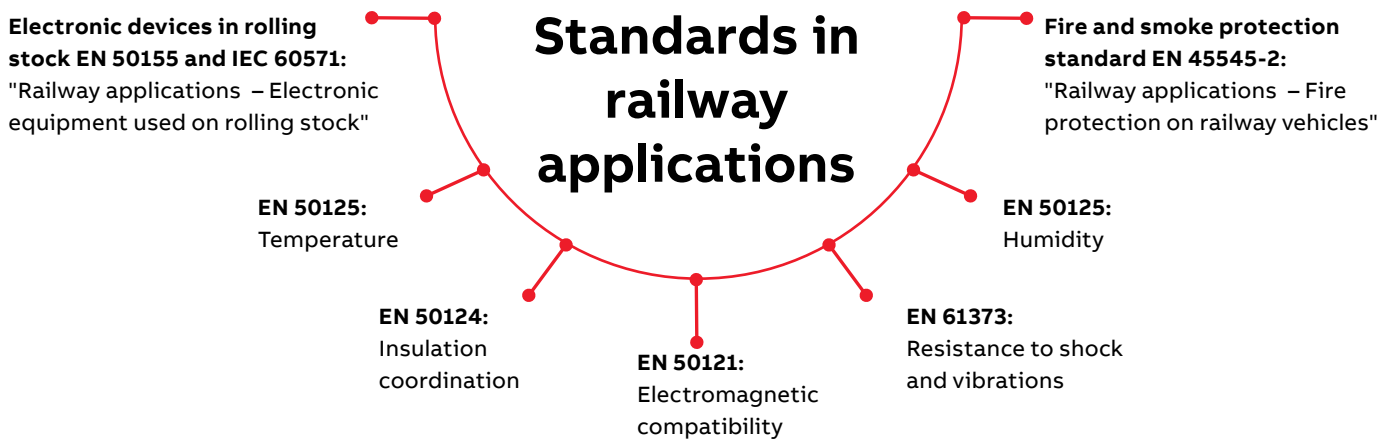
The ABB installation monitoring devices maintain the high reliability of an IT system through constant monitoring of the insulation resistance. The insulation monitoring relay detects insulation faults at their inception and signals the non-fulfillment of a minimum value in good time, before an unexpected operational interruption can occur.

Rail standards keep you on track

Standard overview

The use of electrical products in rolling stock is subject to the highest possible safety standards. Regulations on shock, vibration and fire safety need to be adhered to. The main standards are the ones listed below.

The most important standard for electronic devices in and on vehicles is EN 50155. This umbrella standard combines all the relevant electrical and mechanical aspects. Among other things, this standard contains special fire protection requirements for the electrical equipment of rolling stock. EN 50155 includes:



Freedom of movement

Even under the most extreme conditions

Always on the go in heat, cold, humidity – the environmental conditions for rolling stock are usually much more extreme than those for industrial facilities. All rolling stock products are tested and documented on the basis of safety standards.



Climatic conditions

A key factor is the changing climatic conditions. All electronic devices used in rolling stock must prove that they can continue to perform when there are major temperature variations or a rapid temperature increase. Humidity limit values set high standards, so that no failures occur, particularly in tunnels.



Electrical conditions

Voltage variations are common in rail travel. They range from roughly -30 % to +25 % of the rated voltage and can be the cause of major damage. All the electrical components used in the train must provide prior proof that they can work safely within this range.

However, interference emissions from cables or radiation can also impair the function of the electronic devices. Before the devices can be used in rail applications, they must, among other things, prove their electromagnetic compatibility according to the testing and measuring principles, to show that they do not cause any high frequency fault above a specified value.



Mechanical conditions

Resistance to shock and vibrations is essential. All the cable connections must be completely tight, and no screw connection may slacken due to vibrations. The vibration resistant push-in terminals, as offered by ABB are highly efficacious here.



Easy Connect technology push-in terminals

Thanks to the Push-in Terminals, the devices with Easy Connect Technology can be wired much more quickly and easily – without the need of tools. For example, rigid or flexible wires with wire-end ferrules can be connected without any need of a tool. Even flexible wires without ferrules can be directly connected, here the cage must be opened with a screwdriver before. To release the wires, the cages have to be opened with a tool.

These Push-in terminals are completely secure, making this equipment the perfect solution for environments with high levels of vibrations.



General standards in railway applications

Fire safety and general electronic requirements

ABB's electronic relays fulfill the HL3 class requirements of the fire protection standard EN 45545 for railway applications. As such, ABB's products are not only extremely reliable, but may be used in the most risk sensitive applications.

Fire and smoke protection standard EN 45545

This standard indicates a risk level according to the operating categories of a train and how the train itself is conceptualized. The operating concepts are divided into four different types starting with standard vehicles to trains with sleeping cars. These trains usually operate in different operating environments. According to EN 45545 there are four types of environments. The combination of those two criteria is decisive for the "Classification of the Hazard Level".

A standard vehicle which is only operating in tunnels shorter than one kilometer is classified as HL1. Below you find a matrix which is indicating the hazard level of the different combinations of operating concepts in combination with the train type. The selected devices of the ERC assortment are all applicable for train concepts and types of the risk level HL3.

Train types and operating concepts

		Operating concept			
		N	A	D	S
		Standard vehicles	Automatic vehicles without staff on board	2 level vehicles	Sleeping cars 2 levels or 1 level
Operation class	1	HL1	HL1	HL1	HL2
	2	HL2	HL2	HL2	HL2
	3	HL2	HL2	HL2	HL3
	4	HL3	HL3	HL3	HL3



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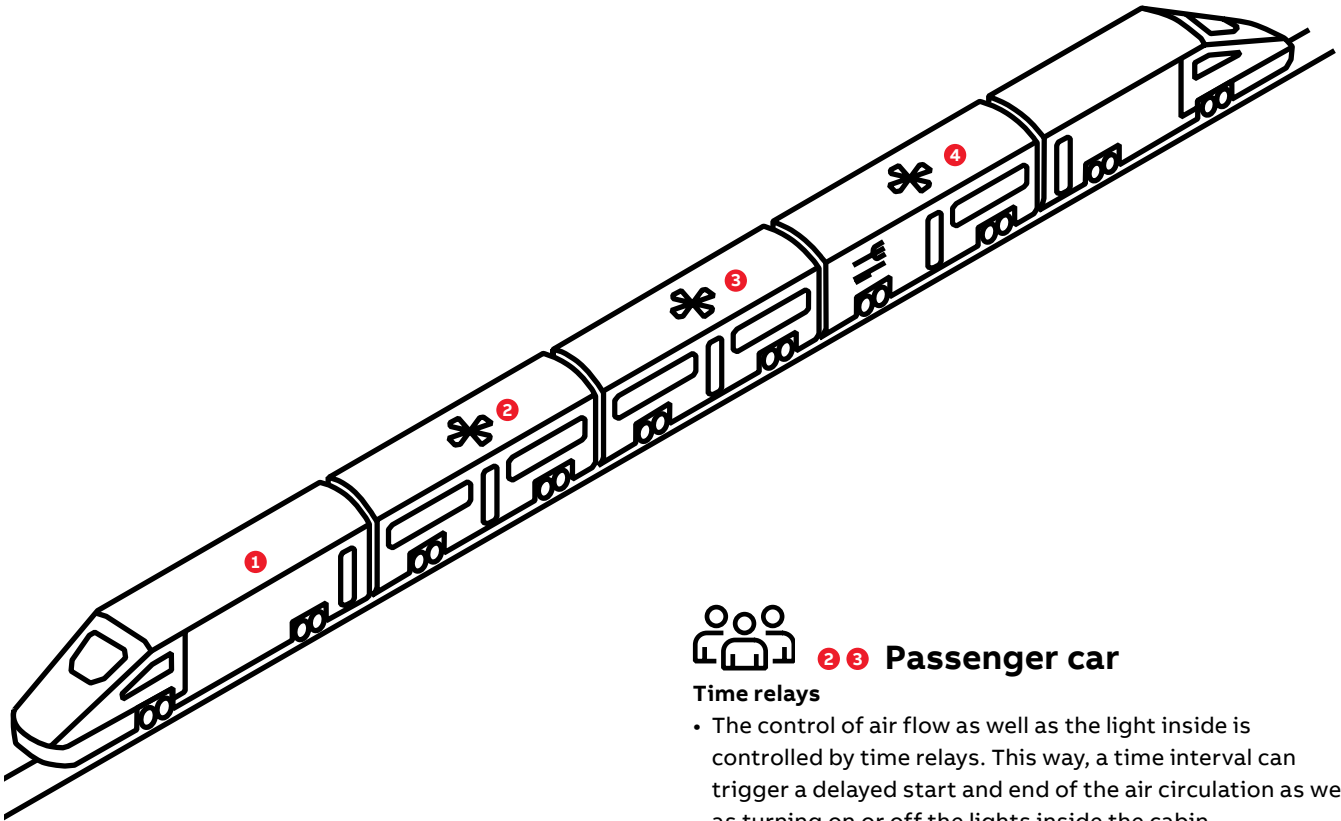
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Application examples

Electronic relays for railway solutions



1

Conductor car

Insulation monitoring relays

- Insulation faults can occur in every unearthed supply system. The insulation monitoring relays of ABB monitor different AC or DC IT supply systems (single- or three-phase) for insulation faults.

Time relays

- In case the press switch does not switch off the auxiliary release pumps of the breaking system a delayed switch off is triggered by the time relays
- While switching between hold-on and start-up coil on the main switch the pulse can be prolonged by using a time relay.
- The reliable and safe functionality of the compressor is essential for trains. Using a time relay, the proper working of the compressor can be steered and in case of malfunction the time relay triggers an alarm signal.



2 3

Passenger car

Time relays

- The control of air flow as well as the light inside is controlled by time relays. This way, a time interval can trigger a delayed start and end of the air circulation as well as turning on or off the lights inside the cabin.
- Inside passenger cabins, different applications like light and air conditioning are controlled by time relays. The highly sophisticated CT-S range of time relays from ABB is ideally suited to fulfill all necessary requirements for rail construction.

Single-phase monitoring relays

- The single-phase current and voltages inside a train need to be monitored. The wide range of voltage and current monitors of ABB's assortment are ideally suited for use inside trains.



4

Restaurant car

Three-phase monitoring relays

- Every train has applications running which are connected to the 50 Hz three-phase supply system like the air condition and various applications inside the restaurant car. A three-phase monitoring relay monitors those 50 Hz three-phase supplies.
- Coffee machine: monitoring the presence of the supply in order to protect the coffee machine from damages in case of abnormal supply voltage conditions.

Freedom of movement

Even under the most extreme conditions

Resistance to vibrations, cold, dry and wet heat and condensation – there are many demands on connections.

Double-chamber cage connection terminals

The screw terminals can be connected with two wires with different wire diameters up to 2.5 mm². According to IEC/EN 60947-1 two rigid or fine-strand wires with ferrules up to 2.5 mm² (AWG 14) can be used.

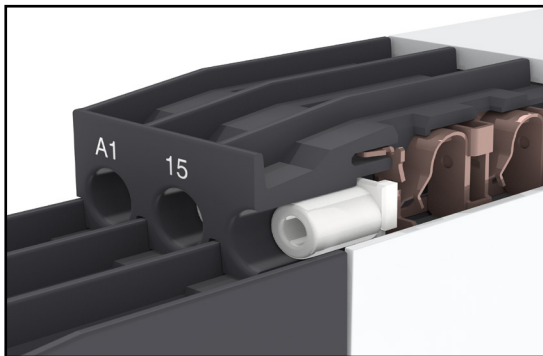
Benefits for train constructors through push-in terminal technology

Regular train maintenance is essential to ensure passenger safety. Usually, maintenance work is performed on trains after every 100,000 km (~ 62,000 miles). For example, within these maintenance cycles, the train's electrical components are dismantled and subjected to testing. The cabling within the train remains intact and is used again after the testing, in order to remount and install the appropriate components.

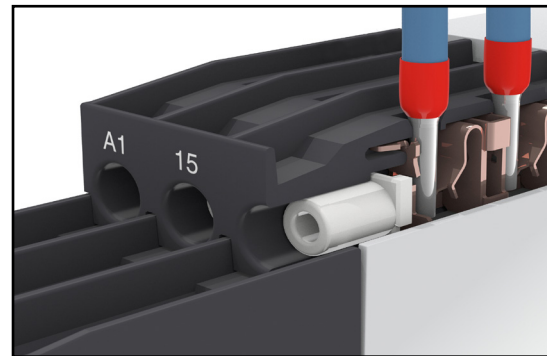
As this is very complex for many of the devices within the train, there are various methods of reducing the work involved:

- Use of multifunctional devices, in order to reduce the overall number of devices
- Use of push-in terminals for simple mounting and dismantling of the devices

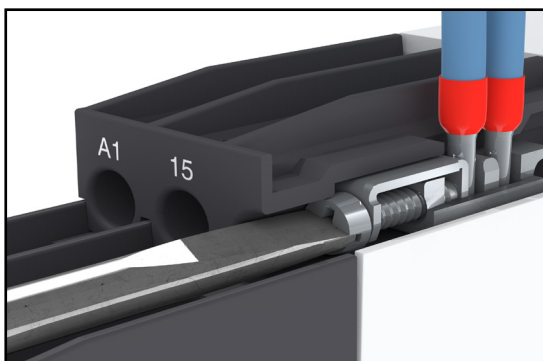
The product range of single-function and multifunctional devices, time relays, single- and three-phase monitoring relays and insulation monitoring relays can combine these options. Thus, instead of individual monitoring relays, it is possible to use a single multifunctional device.



Easy Connect Technology push-in terminals



Tool-free mounting of wires



Wiring of double-cage chamber connection terminals with screw driver



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Electrical, mechanical and environmental requirements

The selected products from the Electronic Relays and Controls range fulfill the train construction requirements mentioned on the previous pages. The following table shows which product of the range meets the requirements to which extent.

		EN 50155						Temperature class	Shock and vibration EN 61373	Altitude class EN 50125-1	Coated PCB Board
		Voltage supply				Interrupts					
Order code	Type	Supply from accumulator battery	Supply by a static converter or a rotating set	S1 no interruptions	S2 interruptions of up to 10 ms	C1 0.6 x U _n over 100 ms	C2 0.6 x U _n over 30 ms				
Time relays											
1SVR7x0030R3300	CT-MXS.22x	48 V DC	230 V AC / 50 Hz	■	■	■	■	T3 ⁵⁾	Cat. 1, Class B	AX max. 2000 m ¹⁾	no
1SVR7x0010R0200	CT-MFS.21x	24-110 V DC		■	■	■	-				
1SVR7x0020R0200	CT-MVS.21x			■	■	■	-				
1SVR7x0100R0300	CT-ERS.21x			■	■	■	-				
1SVR7x0180R0300	CT-APS.21x			■	■	■	-				
1SVR7x0120R3300	CT-ARS.21x			■	■	-	n/a				
Single-phase monitoring relays											
1SVR7x0830R0300	CM-ESS.1x	24-110 V DC	230 V AC / 50 Hz	■	■	■	-	T3 ⁵⁾	Cat. 1, Class B	AX max. 2000 m ¹⁾	no
1SVR7x0830R0400	CM-ESS.2x			■	■	■	-				
1SVR7x0840R0200	CM-SRS.11x			■	■	■	-				
1SVR7x0840R0400	CM-SRS.21x			■	■	■	-				
1SVR730840R0500	CM-SRS.22S			■	■	■	-				
1SVR7x0840R0700	CM-SRS.M2S			■	■	■	-				
Three-phase monitoring relays											
1SVR7x0885R3300	CM-MPS.21x	n/a ²⁾	3 x 400 V AC / 50 Hz ⁴⁾	■	■	2)	2)	T3 ⁵⁾	Cat. 1, Class B	AX max. 2000 m ¹⁾	no
1SVR7x0884R3300	CM-MPS.41x			■	■	2)	2)				
1SVR7x0884R4300	CM-MPS.43x			■	■	2)	2)				
1SVR7x0824R9300	CM-PFS.x			■	■	2)	2)				
1SVR7x0794R3300	CM-PVS.41x			■	■	2)	2)				
1SVR7x0794R1300	CM-PVS.31x			■	■	2)	2)				
Insulation monitoring relays											
1SVR7x0660R0100	CM-IWS.1x	24-110 V DC	230 V AC / 50 Hz	■	■	■	■	T3 ⁵⁾	Cat. 1, Class B	AX max. 2000 m ¹⁾	no
1SVR7x0670R0200	CM-IWS.2x			■	■	■	■				
1SVR7x0660R0200	CM-IWN.1x			■	■	-	■				
1SVR7x0669R9400	CM-IVN.x	n/a ³⁾	n/a ³⁾	n/a ³⁾	n/a ³⁾	n/a ³⁾	n/a ³⁾	T3 ⁵⁾	Cat. 1, Class B	AX max. 2000 m ¹⁾	no
1SVR7x0660R0200	CM-IWN.1x in comb. with	24-110 V DC	230 V AC / 50 Hz	■	■	-	■				
1SVR7x0669R9400	CM-IVN.x										

¹⁾ The insulation measurement of the devices is based on a figure of 2,000 m. The devices can be used in higher altitudes on request.

²⁾ Only applicable for devices with a DC power supply.

³⁾ passive device, no supply.

⁴⁾ self supplied from the measuring input.

⁵⁾ -25...+70 °C - if continuous ambient temperature of +70 °C is expected, derate the output relay values to AC-15=1.5 A, DC-13=1.0 A and I_{the}=2.5 A

Order code and product type

Order code: 1SVR7x.....

x: 3/5 = screw connection

x: 4/6 = Easy connect / push-in connection

Product type: CM-IWN.1x

x: S = screw connection

x: P = Easy connect / push-in connection

Time relays

Ordering details



CT-MVS.21P

2CDC231024V0001









CT-ERS.21P

2CDC251030V0001

CT-S range - The sophisticated range for harsh environments

For many years, ABB's time relays of the CT range have been used in applications worldwide and have proven their excellent functionality in daily use even under the toughest conditions. The range of time relays provide timing functions for all applications.

All devices are available with two different terminal versions. Choose between screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals) with excellent vibration resistance.

- Single-function and multifunction timers
- Devices with:
 - 2 c/o (SPDT) contacts
 - 2nd c/o contact can be selected as instantaneous contact ¹⁾
 - Remote potentiometer connection ¹⁾
 - Control input with volt-free or voltage-related triggering e.g. to start timing, pause timing
 - Extended operating temperature range down to -40 °C ¹⁾
- Seal-able transparent cover for protection against unauthorized changes of time values
- Integrated marker label
- Approvals / Marks:      
- Classifications: EN50155, IEC 60571, EN 45545-2

¹⁾ depending on device

Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Outputs	Type *	Order code
Multifunctional	24- 240 V AC/DC	10 (0.05 - 300 h)	■	2 c/o	CT-MVS.21S	1SVR730020R0200
					CT-MVS.21P	1SVR740020R0200
Multifunctional	24-48 V DC, 24-240 V AC	2×10 (0.05 s - 300 h)	■	2 c/o	CT-MXS.22S ²⁾	1SVR730030R3300
					CT-MXS.22P ²⁾	1SVR740030R3300
Multifunctional	24-240 V AC/DC	10 (0.05 s - 300 h)	□ / □	2 c/o	CT-MFS.21S	1SVR730010R0200
					CT-MFS.21P	1SVR740010R0200
ON-delay (accumulative)	24-240 V AC/DC	10 (0.05 s - 300 h)	-	2 c/o	CT-ERS.21S	1SVR730100R0300
					CT-ERS.21P	1SVR740100R0300
OFF-delay	24-240 V AC/DC	10 (0.05 s - 300 h)	■	2 c/o	CT-APS.21S	1SVR730180R0300
					CT-APS.21P	1SVR740180R0300
OFF-delay	24-240 V AC/DC	7 (0.05 s - 10 min)	-	2 c/o	CT-ARS.21S	1SVR730120R3300
					CT-ARS.21P	1SVR740120R3300

²⁾ Select function via DIP switches behind the marker label on the front of the unit

* S: screw connection
P: push-in / easy connect

Type*	Order number*
CT-MVS.21●	1SVR7#0020R0200
CT-MX5.22●	1SVR7#0030R3300
CT-MFS.21●	1SVR7#0010R0200
CT-ERS.21●	1SVR7#0100R0300
CT-APS.21●	1SVR7#0180R0300
CT-ARS.21●	1SVR7#0120R3300

Timing function

ON-delay	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ON-delay, accumulative	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF-delay w. aux. voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF-delay w. aux. voltage, accumulative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF-delay w/o aux. voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ON- and OFF-delay, symmetrical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ON- and OFF-delay, asymmetrical	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ON/OFF function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impulse-ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impulse-ON, accumulative	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impulse-OFF w. aux. voltage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impulse-OFF w. aux. voltage, accumulative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impulse-ON and OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flasher starting with ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flasher with reset, starting with ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flasher starting with OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Flasher with reset, starting with OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Flasher starting with ON or OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pulse generator starting with ON or OFF	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Single pulse generator	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pulse former	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Star-delta change-over with impulse	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Features

Control input, voltage-related triggering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control input, volt-free triggering	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Remote potentiometer connection	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2nd c/o contact selectable as instantaneous contact	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Extended temperature range (-40...+60 °C)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Time range

0.05 s - 10 min	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0.05 s - 300 h	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Supply voltage

24-48 V DC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24-240 V AC	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24-240 V AC/DC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

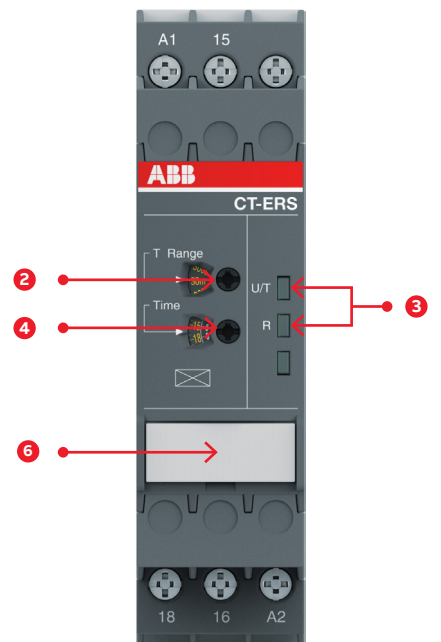
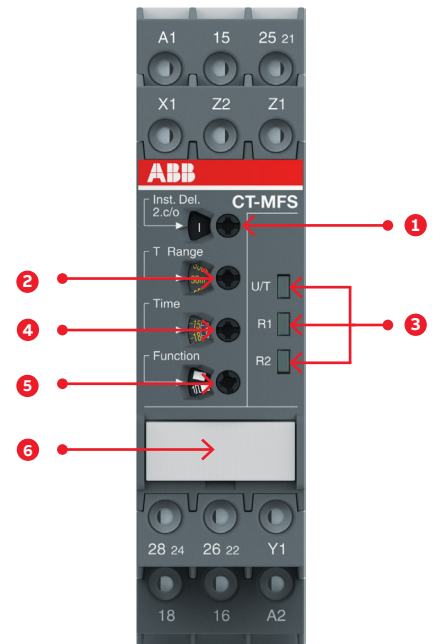
Output

c/o contact	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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Order number and type

All devices are available either with push-in terminals (P-type) or double-chamber cage connection terminals (S-type).

Terminal	Type	Order number
Push-in	● = P	■ = 4
Screw	● = S	■ = 3



- 1 2nd contact as an instantaneous contact
- 2 Preselection of the time range
- 3 Indication of operational states
U/T: control supply voltage applied / timing
- R/R1/R2: Output relay energized
- 4 Fine adjustment of time delay
- 5 Preselection of timing function
- 6 Marker label

Single-phase monitoring relays

Ordering details



2CDC251.054 V0011

CM-SRS.22S



2CDC251.060 V0011

CM-ESS.MP

CM-range - Current and voltage monitoring relays

Single-phase voltage and current monitoring relays protect sensitive equipment and control systems against undervoltage (brownout) or undercurrent events or overvoltage or overcurrent events. Different units with adjustable or fixed threshold values (trip points) are available.

All devices are available with two different terminal versions. Choose between screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals) with excellent vibration resistance.

- Monitoring of DC and AC currents (3 mA to 15 A)
- Monitoring of DC and AC voltages (3-600 V)
- TRMS measuring principle
- One device includes 3 measuring ranges
- Over- and/or undercurrent/voltage monitoring configurable¹⁾
- CM-SRS.M: Latching function configurable
- Hysteresis adjustable (3-30 %) or fixed hysteresis (5 %)¹⁾
- Precise adjustment by front-face operating controls
- Latching function configurable¹⁾
- Start-up delay T_v adjustable: 0; 0.1 - 30 s¹⁾
- Tripping delay T_v adjustable: 0; 0.1 - 30 s¹⁾
- 22.5 mm width
- 3 LEDs for status indication
- Approvals / Marks:
- Classifications: EN50155, IEC 60571, EN 45545-2

¹⁾ depending on device

- Overcurrent monitoring
- Undercurrent monitoring
- Without latching
- With latching

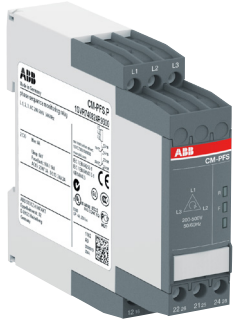
Ordering details

Rated control supply voltage	Function configurable	Tripping delay T_v	Outputs	Measuring range	Type *	Order code
24-240 V AC/DC		without	1 c/o (SPDT) contact	3-30 mA 10-100 mA 0.1-1 A	CM-SRS.11S	1SVR730840R0200
					CM-SRS.11P	1SVR740840R0200
24-240 V AC/DC		adjustable 0 or 0.1-30 s	2 c/o (SPDT) contacts		CM-SRS.21S	1SVR730840R0400
					CM-SRS.21P	1SVR740840R0400
24-240 V AC/DC		adjustable 0 or 0.1-30 s	2 c/o (SPDT) contacts	0.3-1.5 A 1-5 A 3-15 A	CM-SRS.22S	1SVR730840R0500
24-240 V AC/DC	 				CM-SRS.M2S	1SVR730840R0700
24-240 V AC/DC		without	1 c/o (SPDT) contact	3-30 V 6-60 V 30-300 V 60-600 V	CM-ESS.1S	1SVR730830R0300
24-240 V AC/DC					CM-ESS.1P	1SVR740830R0300
24-240 V AC/DC		adjustable 0 or 0.1-30 s	2 c/o (SPDT) contacts	3-30 V 6-60 V 30-300 V 60-600 V	CM-ESS.2S	1SVR730830R0400
24-240 V AC/DC					CM-ESS.2P	1SVR740830R0400

* S: screw connection
P: push-in / easy connect

Single-/multifunctional monitoring relays

Ordering details



2CDC251015V0012

CM-PFS.P



2CDC251006V0013

CM-MPS.43P

CM-range - Three-phase monitoring relays

The reliable and continuous monitoring of three-phase networks guarantees trouble-free and economic operation of machines and installations.

The most multifunctional devices in the ERC assortment are the CM-MPS/N monitoring relays for rated voltage levels up to 820 V AC and 400 Hz. Additionally, a variety of economic and cost-efficient three-phase monitoring relays are offered in this range with specialized functionality.

All devices are available with two different terminal versions. Choose between screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals) with excellent vibration resistance.

- Monitoring of three-phase mains for phase sequence, phase failure, phase unbalance over- and undervoltage ¹⁾
- TRMS measuring principle
- Threshold values are adjustable as absolute values ¹⁾
- Powered by the measuring circuit
- Precise adjustment by front-face operating controls
- S-range: 22.5 mm / N-range : 45 mm
- 3 LEDs for status indication
- Adjustable ON-delay / OFF-delay times
- Approvals / Marks: /
- Classifications: EN50155, IEC 60571, EN 45545-2

¹⁾ depending on device

- ON-delayed
- OFF-delayed
- Phase sequence monitoring activated
- Phase sequence monitoring deactivated
- Phase sequence correction activated
- Phase sequence correction deactivated
- 2x1 c/o (SPDT) contacts
- 1x2 c/o (SPDT) contacts

Ordering details - single function devices

Rated control supply voltage = measuring voltage	Monitoring function	Outputs	Type*	Order code
3x200-500 V AC (L-L)	Phase sequence, phase failure	2 c/o (SPDT) contacts	CM-PFS.S	1SVR730824R9300
			CM-PFS.P	1SVR740824R9300
3x160-300 V AC (L-L)	Phase sequence, phase failure, over- and undervoltage with adjustable threshold values (Three-phase)	2 x 1 c/o (SPDT) contacts	CM-PVS.31S	1SVR730794R1300
			CM-PVS.31P	1SVR740794R1300
3x300-500 V AC (L-L)			CM-PVS.41S	1SVR730794R3300
			CM-PVS.41P	1SVR740794R3300

Ordering details - multi function devices

Rated control supply voltage = measuring voltage	DIP switch	Monitoring function	Outputs	Neutral monitoring	Type*	Order code
180-280 V AC (L-N)		Multifunctional (Phase failure, Phase sequence, overvoltage, undervoltage, Phase unbalance)	2 x 1 c/o (SPDT) contacts		CM-MPS.21S	1SVR730885R3300
3x300-500 V AC (L-L)					CM-MPS.21P	1SVR740885R3300
	3x300-500 V AC (L-L)				CM-MPS.41S	1SVR730884R3300
CM-MPS.41P					1SVR740884R3300	
3x300-500 V AC (L-L)			2 x 1 or 1 x 2 c/o (SPDT) contacts		CM-MPS.43S	1SVR730884R4300
					CM-MPS.43P	1SVR740884R4300

* S: screw connection
P: push-in / easy connect

Insulation monitoring relays

Ordering details



CM-IWS.2

CM-range - Monitoring of unearthed supply systems

The high reliability of a system is guaranteed by a continuous monitoring of the resistance between the system and the earth potential. An insulation monitoring of the CM-IWx range recognizes these so-called insulation faults and trips as soon as the measured value of the resistance between the system and earth potential falls below the set threshold. By using an insulation monitoring relay already the first insulation fault will be detected and can be fixed before a second fault occurs and forces the system to switch off.

Choose between screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals) with excellent vibration resistance.

- According to IEC/EN 61557-8
- Rated control supply voltage 24 - 240 V AC/DC

CM-IWS

- For monitoring the insulation resistance of unearthed systems: up to $U_n = 400$ V AC
- Superimposed DC signal
- One measuring range 1–100 k Ω
- Precise adjustment of the threshold value in 1 k Ω steps
- Interrupted wire detection
- Fault storage/latching configurable by control input
- 1 c/o (SPDT) contact, closed-circuit principle

Approvals / Marks:



Classifications:

EN50155, IEC 60571, EN 45545-2

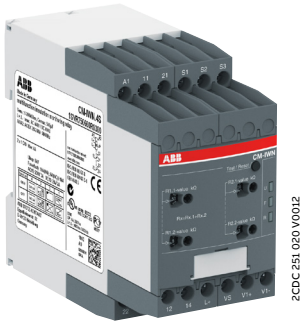
Ordering details - CM-IWS

Rated control supply voltage = measuring voltage	Nominal voltage U_n of the distribution system to be monitored	System leakage capacitance, max.	Outputs	Adjustment range of the specified response value R_{an} (threshold)	Type	Order code
24-240 V AC/DC	0-250 V AC / 0-300 V DC	10 μ F	1 c/o (SPDT) contact	1-100 k Ω	CM-IWS.1S	1SVR730660R0100
					CM-IWS.1P	1SVR740660R0100
24-240 V AC/DC	0-400 V AC	10 μ F		1-100 k Ω	CM-IWS.2S	1SVR730670R0200
					CM-IWS.2P	1SVR740670R0200
24-240 V AC/DC	0-400 V AC / 0-600 V DC Expendable with coupling unit CM-IVN.x	20 μ F	2 x 1 or 1 x 2 c/o (SPDT) contacts configurable	1-100 k Ω 2-200 k Ω (activated / de-activated by DIP-switch)	CM-IWN.1S	1SVR750660R0200
					CM-IWN.1P	1SVR760660R0200

* S: screw connection
P: push-in / easy connect

Insulation monitoring relays

Ordering details



CM-IWN.1

2CDC 251 020 V0012

CM-IWN.1

- For monitoring the insulation resistance of unearthed systems up to $U_n = 250$ V AC and 300 V DC or $U_n = 400$ V AC and 600 V DC
- Prognostic measuring principle with superimposed square wave signal
- One or two measuring ranges
 - 1-100 k Ω
 - 1-100 k Ω + 2-200 k Ω
- One or two configurable c/o contacts
- Precise adjustment of the measuring value in 1 or 2 k Ω steps
- (Non-volatile) fault storage, configurable latching, interrupted wire protection, open- or closed-circuit principle selectable

Ordering details - CM-IWN

Rated control supply voltage = measuring voltage	Nominal voltage U_n of the distribution system to be monitored	System leakage capacitance, max.	Outputs	Adjustment range of the specified response value R_{an} (threshold)	Type	Order code
24-240 V AC/DC	0-400 V AC / 0-600 V DC Expendable with coupling unit CM-IVN.x	20 μ F	2 x 1 or 1 x 2 c/o (SPDT) contacts configurable	1-100 k Ω 2-200 k Ω (activated / de-activated by DIP-switch)	CM-IWN.1S	1SVR750660R0200
					CM-IWN.1P	1SVR760660R0200

Ordering details - Coupling unit expansion for CM-IVN.xS/P

Rated control supply voltage = measuring voltage	Nominal voltage U_n of the distribution system to be monitored	Type *	Order code
Passive device, no control supply voltage needed	0-690 V AC / 0-1000 V DC	CM-IVN.S	1SVR750669R9400
		CM-IVN.P	1SVR760669R9400

- * S: screw connection
P: push-in / easy connect



Building infrastructure



When it comes to passenger stations and buildings, the key focus areas are energy efficiency, safety and security. We are constantly improving our offering, looking for the most user-friendly solutions and bringing people and technology together.



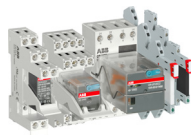
Universal Motor Controller

The intelligent universal motor controller UMC100.3 combines motor protection and control functions, fieldbus and Ethernet communication, as well as fault diagnosis in just one device. It provides flexible configuration options, detailed operational, diagnostic and service data required by modern predictive maintenance systems.



Primary switch mode supplies

The CP range offers the latest technology in a compact construction of power supplies. Modern power supply units are a vital component in most areas of energy management and automation technology. ABB pays the utmost attention to these areas' requirements.



Interface relays and optocouplers

A reliable voltage conversion between process peripherals and higher-level control systems. The wide variety of pluggable interface relays with standard or logic sockets can be used for switching AC or DC loads and offer a range of different coil voltages and plug-in functional modules.



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abb.com/lowvoltage

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