CATALOG

Smart temperature monitoring relays

Set up these innovative temperature monitoring relays exactly as you need, either via a back-lit LCD or smartphone app. Parametrization and configuration are just one touch away with the ABB EPiC app – even in a non-powered state – reducing installation time by 80%.

And with just one relay covering a wide range of application, stocks can be reduced significantly, making ABB's Smart monitoring relays a true game changer.

Smart monitoring relays
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Smart temperature monitoring relays setup via display and smartphone app

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Easy to install

One look - back-lit LCD for easy reading and parametrization
Everything you need at a glance: the LCD at the front of the relay shows the currently measured values and maintenance data. And with just one push, the symbol-based menu structure can be accessed via the push-rotate button. Simply set the thresholds and parameters with the help of an intuitive and future-ready interface.

Optimum interface

One touch - NFC parametrization via smartphone app
One touch is all that is needed for fast, easy and intuitive configuration with the ABB EPiC smartphone app. Simply touch the relay with your mobile phone: Parameter settings can be edited and stored in the app and then copied to different devices, even if they are not in the powered state. Available in a range of different languages, installation and configuration have never been so easy.

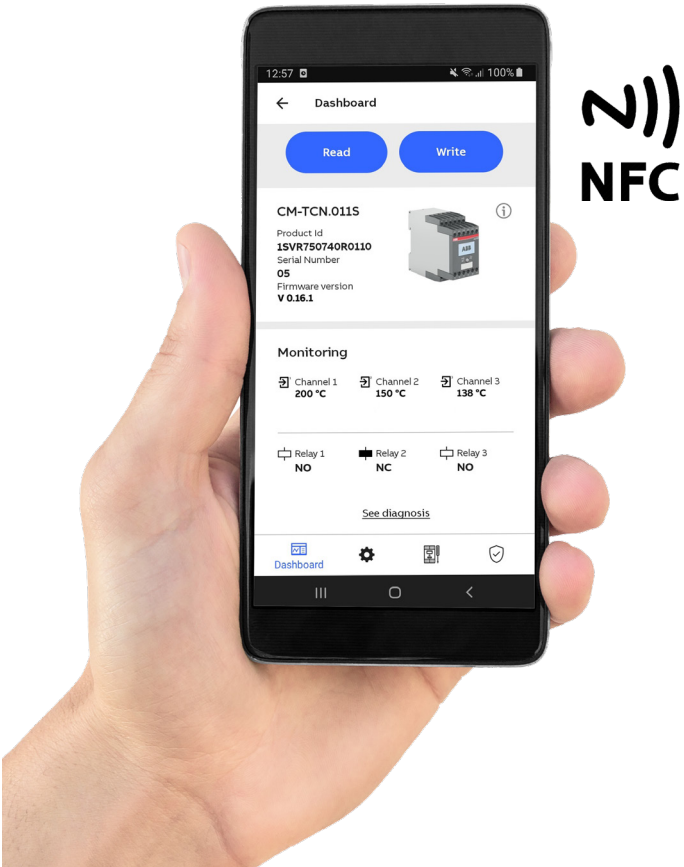
Optimized logistics

One device - for a wide range of applications
Eliminate the need for different devices: the relays are configurable over a wide setting range and can be adjusted flexibly no matter the thresholds, time values or other settings. Predefined settings for key applications, space for user-defined settings, parameter storage and transfer to different devices allow fast and simple commissioning. Upload parameter sets into the cloud or distribute them globally within seconds, for example by email, reduces logistics and inventory costs.

Smart temperature monitoring relays
Features and benefits

CM-TCN temperature monitoring relays can measure temperatures of solids, liquids and gaseous media in up to three sensor circuits using various types of sensors.

One...



look **to have the information needed**
the display shows the measured values and relay status at a glance. The symbol-based menu structure and presettings make parametrization simple.

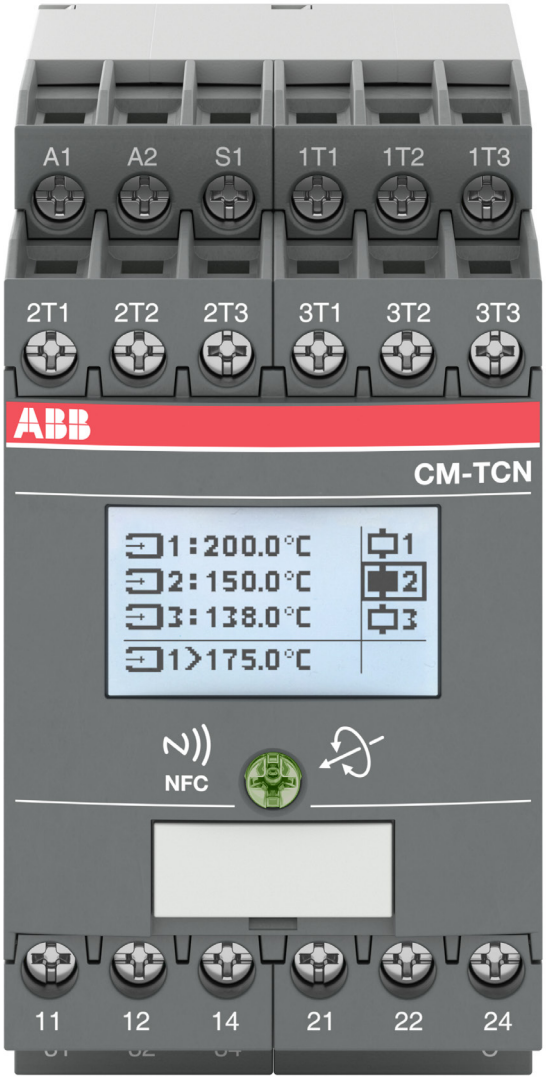
touch **for up to 80% faster setup**
for easy and intuitive parametrization via NFC with the ABB EPiC smartphone app–even if the relay is not powered.

device **for a wide range of applications**
is all you need, because one relay covers all temperature monitoring needs for many different applications.

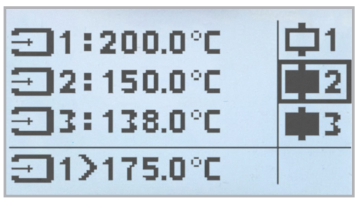
One look - back-lit LCD

Easy reading and setup with one push

Just one look is all it takes to see the status and measured values of the relay, easily navigate through the symbol-based menu and even configure the device with the new, back-lit LCD at the front of the relay.



Start screen
Know the status at one glance.



Symbol-based menu structure
Due to the symbol-based menu structure, there is no need for any translation, which helps avoid misunderstandings and dramatically increases efficiency in after sales support.

Pre- and user-defined settings
For frequently used applications, the device offers predefined settings to save installation time. Parameters can be individually set and saved in one of four user settings.

Push-rotate adjustment
Adjust the relay with a simple screw driver by pushing and rotating the potentiometer to navigate through the menu.

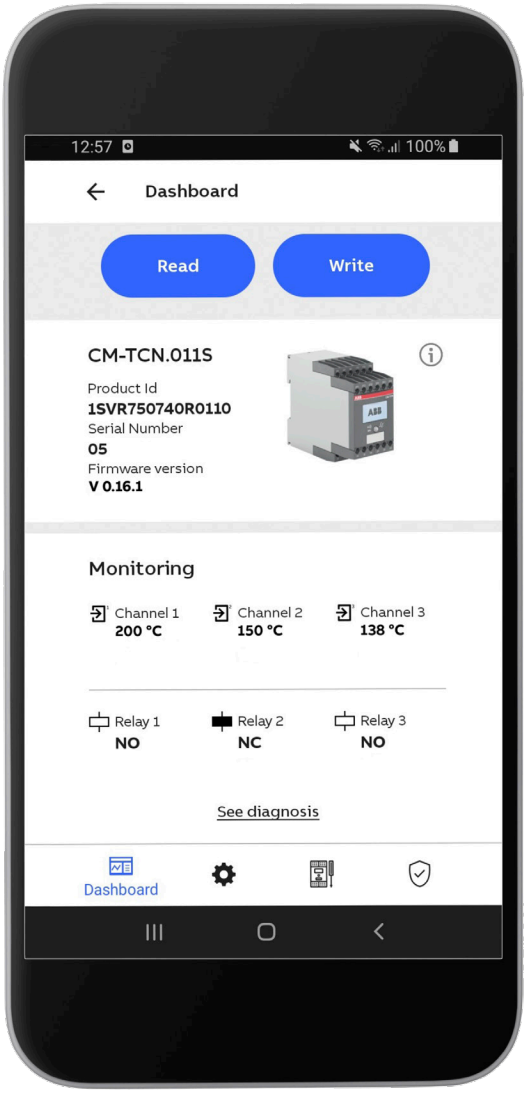
Protection against high voltages
By using a screw driver to setup and parametrize the relay, protection against high voltages in the switching cabinet is ensured.

Back-lit LCD
The back-lit LCD at the front of the relay shows the currently measured values and maintenance data and makes setup easy.

Password & parameter log
Improved security is achieved through the recorded password and parameter log.

One touch - setup via smartphone app
Powerless configuration with NFC

Configuration and parametrization of temperature monitoring relays has never been simpler. One touch is all that is needed for fast, easy and intuitive configuration with the ABB EPiC mobile phone app.



Near Field Communication (NFC)
NFC is an international transmission standard based on radio-frequency identification technology for the contact-less exchange of data.This technology is already integrated into most electronic devices like tablets and smartphones and part of everyday life, e.g. for contactless payment.

ABB EPiC smartphone app
Electrification Products intuitive Configurator (EPiC) is a mobile application that makes it possible to configure and check the status of ABB low voltage products. The app is available for free - just download it and connect to your smart monitoring relays, circuit breakers and other devices.

Easy visualization
Monitor the status of the relay and read the measured values in the app.

Store and send parameters
Store a set of parameters in the app and distribute them globally and copy them to other devices.

Powerless adjustment
Parametrize and configure the relays even while not connected to a power supply, e.g. on office desks.

One touch setup
Handle the relays with just one touch- just hold the smartphone against the front of the relay.

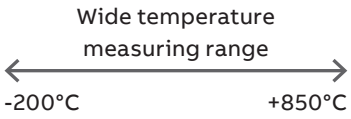
Copy and paste functionality
Simply copy the settings from one device to another–with just one touch to the relay.

Event history
Examine the history of the device and recent events.

One device - reduce stock
Flexible adjustment, wide application range

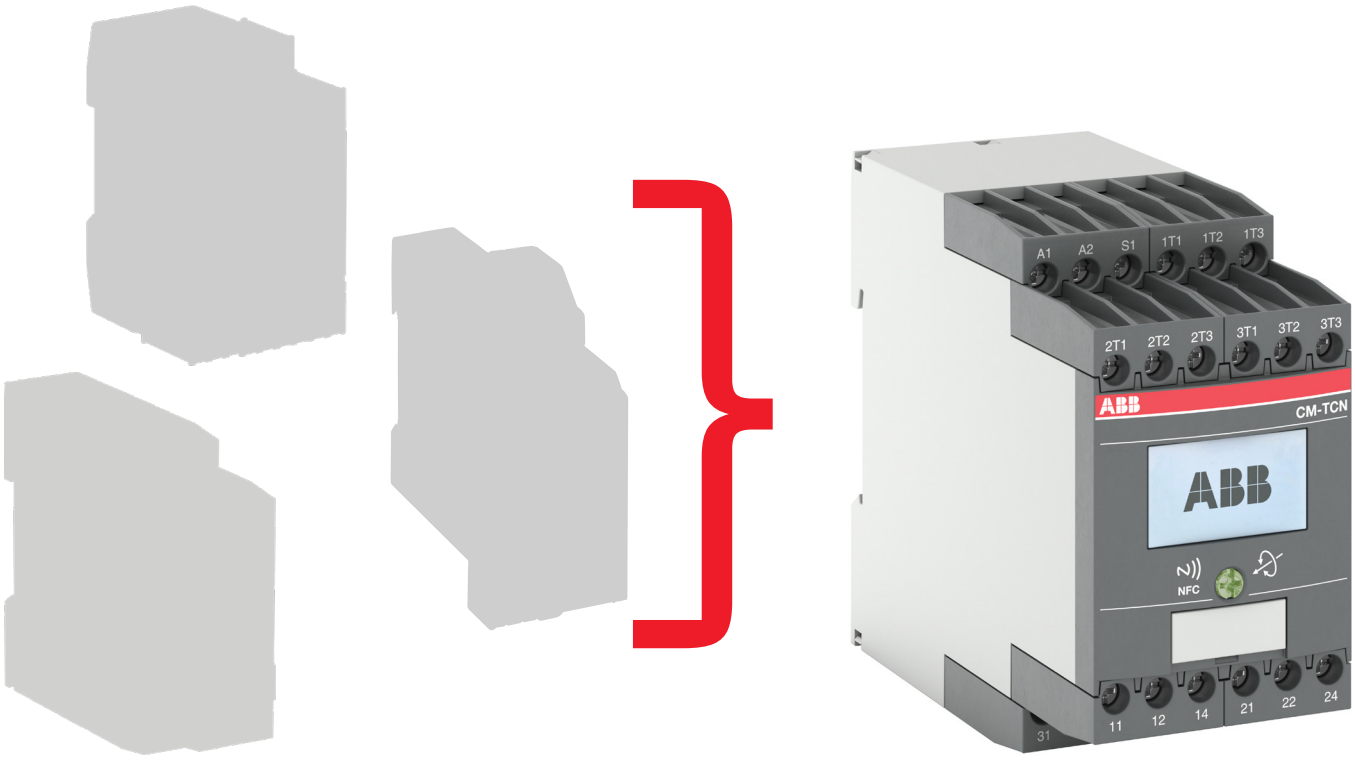
Different devices for different applications? Think again- with the smart monitoring relays, those days are gone. Adjust one relay to meet the needs of every application, effectively reducing stock levels.

Flexible adjustment
The relays are configurable over a wide setting range and can be adjusted flexibly no matter the thresholds, time values or other settings. Because one relay can handle commonly used temperature sensors such as PT 100 and PTC and supports a wide measuring range from -200...850°C, it replaces a whole array of other devices.

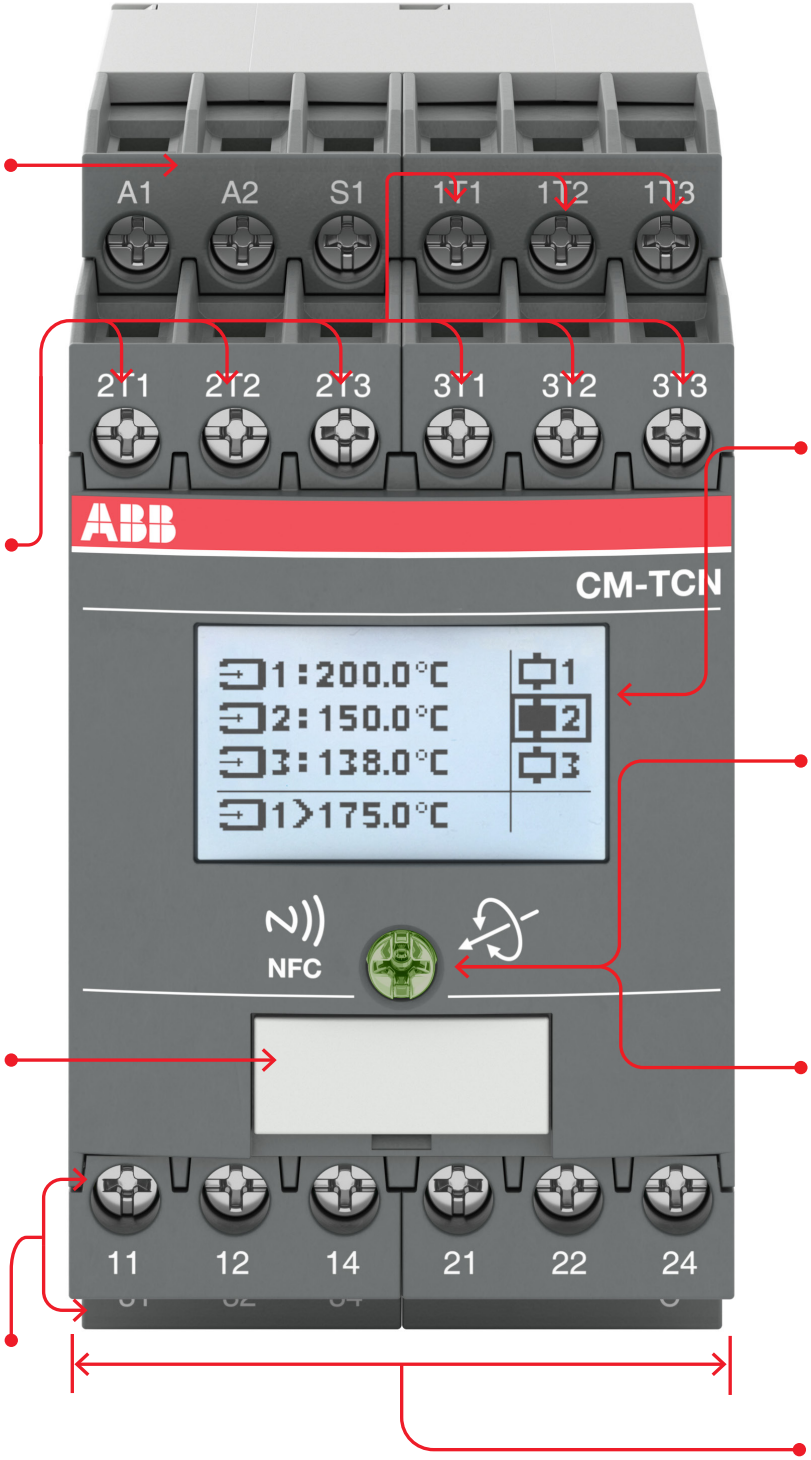


Predefined and user-defined settings
Predefined settings for key applications such as motor protection with three PTC sensors or transformer protection make installation and configuration easy and quick. The predefined settings are adjustable to fit your application to a maximum. Additionally, custom settings can be configured and stored as user-defined settings in the device. And the best thing: with just one touch, they can be copied to more relays with the ABB EPiC smartphone app.

Cloud upload
Upload parameter sets into the cloud or distribute them globally within seconds, by email or other means, reduces logistics and inventory costs to a minimum.



Operating controls



Push-in and screw terminals

3 measuring inputs
PT100, PT1000, PTC, NTC

Marker label

Connection terminals
Wide terminal spacing allows connection of wires:
2 x 1.5 mm² (2 x 16 AWG) with wire end ferrules or
2 x 2.5 mm² (2 x 14 AWG) without ferrules.

Back-lit LCD
Symbol-based menu structure

Push-rotate button
Intuitive operation with just one button

LED status indication
Red: Failure
Yellow: NFC ready for pairing
Green: Control supply voltage applied; no failure

Width 45 mm

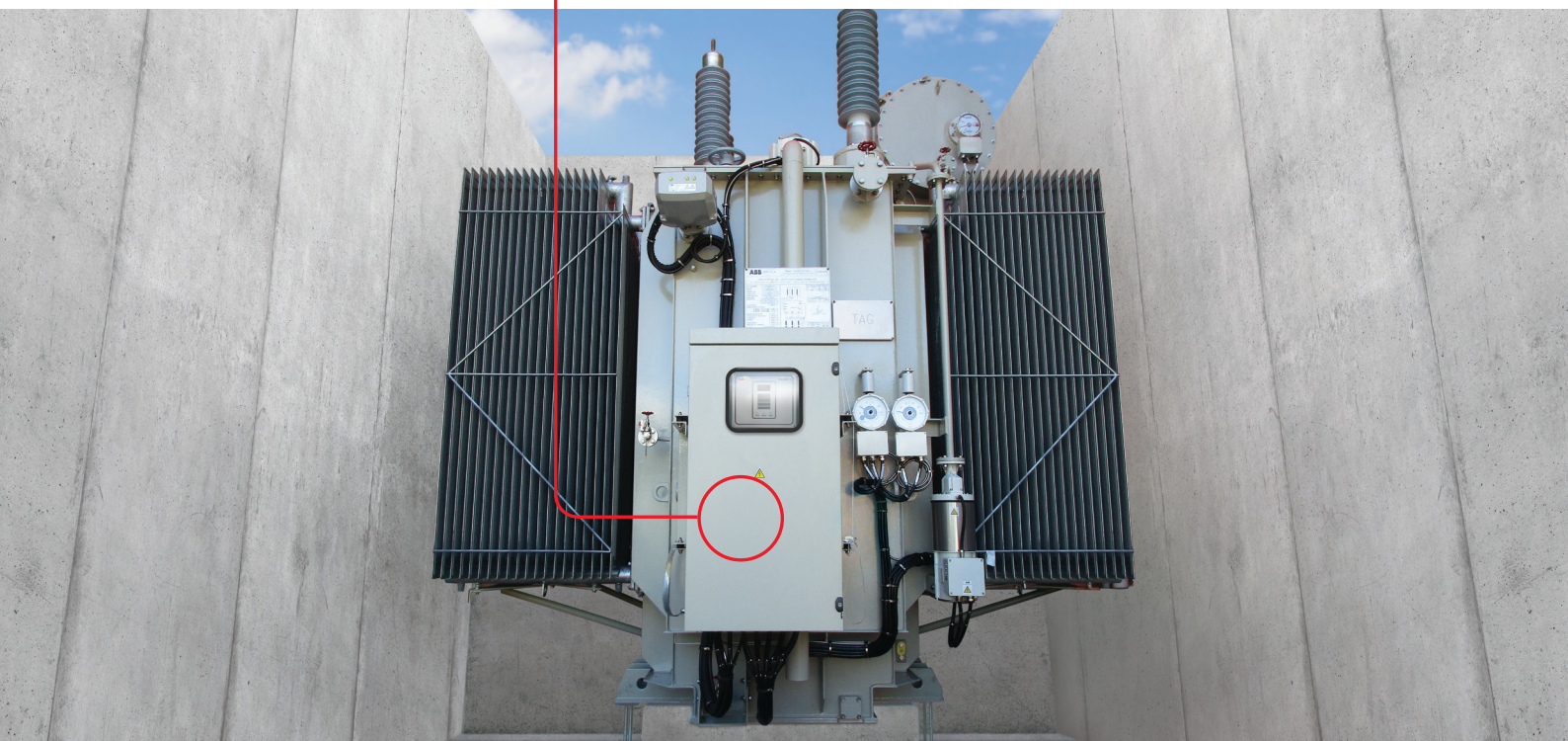
Applications

Temperature monitoring relays are used in a wide array of applications. In conjunction with temperature sensors, such as PT100 or PTC sensors, they monitor motor temperature, control cabinet temperature and protect transformers from overheating.

—
Temperature sensor, e.g. PT100

—
Smart temperature monitoring relay

—
ABB EPiC smart-phone app



Smart monitoring relays- one look, one touch, one device. Reduced stocks, flexible adjustment and easy setup: One relay for all applications.


A1
A2
S1
1T1
1T2
1T3
2T1
2T2
2T3
3T1
3T2
3T3
ABB
CM-TCN
ABB
NFC
11
12
14
21
22
24
31

Smart monitoring relays
Ordering details

CM-TCN

Description
The temperature monitoring relays CM-TCN are able to measure temperatures of solids, liquids and gaseous media within up to three sensor circuits using different types of sensors, such as PT100, PT1000, PTC or NTC within the same time. Different types of sensors, e.g. PT100 and PTC sensors, can be monitored simultaneously.
The temperature is obtained by the sensors in the medium, evaluated by the device and monitored to determine whether it is within an operating range (range monitoring function) or has exceeded or fallen below a threshold. Depending on the parametrization, up to three output relays signalize the changes in the measuring circuits.

Smart temperature monitoring relays CM-TCN

Rated control supply voltage	Terminal type	Display & NFC	Temperature sensor	Width	Type	Order code	Weight (1 pc) kg (lb)
24 - 240 V AC/DC	Screw	yes	PT100, PTC, PT1000, NTC	45 mm	CM-TCN.011S	1SVR750740R0110	0.293 (0.646)
	Push-in	yes			CM-TCN.011P	1SVR760740R0110	0.293 (0.646)

Smart monitoring relays
Technical data

Data at Ta = 25 °C and rated values, unless otherwise indicated

Input circuits

		CM-TCN.011
Supply circuit		**A1-A2**
Rated control supply voltage U_s		24-240 V AC/DC
Rated control supply voltage U_s tolerance		-15...+10 %
Rated frequency AC		50-60 Hz
Frequency range AC		47-63 Hz
Typical current consumption	24 V DC	typ. 30 mA / max. 40 mA
	115 V AC/ 50 Hz	typ. 17 mA / max. 20 mA
	230 V AC / 50 Hz	typ. 13 mA / max. 15 mA
Power failure buffering time		min. 20 ms
Measuring circuits		**xT1, xT2, xT3**
Sensor type		PT100, PT1000, PTC, NTC, bi-metal switch
Connection of the sensor	2-wire	yes, jumper xT2 - xT3
	3-wire	yes, use terminal xT1, xT2, xT3
Interrupted wire detection		yes
Short-circuit detection		yes
Measuring ranges	PT100	-200°C...+850°C / -328°F...+1562 °F
	PT1000	-200°C...+850°C / -328°F...+1562°F
	NTC	+80°C...+155°C / +176°F...+311°F
	PTC	max. total resistance of connected resistors in cold state <750 Ohm
Monitoring functions		undertemperature, overtemperature, window monitoring
Measuring input range		-200...+ 850°C / -328...+1562°F
Hysteresis related to the threshold values		1...99 K
Measuring principle		continuous current
Typical current in the sensor circuit	PT100	0.5 mA
	PT1000	0.25 mA
Maximum current in sensor circuit		0.5 mA
Measuring accuracy		± 0.5 K (-50...+200 °C / -58...+392 °F) ± 1 K (< -50°C / -58°F and > 200°C / 392 °F)
Accuracy within the rated control supply voltage tolerance		< 0.05% full scale/1 V
Accuracy within the temperature range		< 0.05% full scale/1 K
Repeat accuracy (constant parameters)		± 0.07%
Maximum measuring cycle		< 2s
Control circuits		
Type of triggering		volt-free triggering
Control function	S1	remote reset
Maximum input current		< 1.5 mA
Maximum no-load voltage at the control inputs		< 15 V
Minimum control pulse length		150 ms
Maximum cable length at the control inputs		50 m - 100 pF/m

Timing functions

Power-on delay		0-999.9 s
ON-delay R1, R2, R3		0-6553.5 s
OFF-delay R1, R2, R3		0-6553.5 s
Cyclic switching function	On time	1 min - 1 day
	cycle time	10 min - 1 year

Smart monitoring relays
Technical data

User interface

Indication of operational states		
Control supply voltage applied		LED green
Cyclic switching function running		LED orange
Internal fault		LED red on
Short circuit		LED red: ⎍⎍⎍⎍⎽
Wire break		LED red: ⎍⎍⎍⎍⎍
Measurement value exceeds high limit		LED red: ⎍⎽⎍⎽
Measurement value exceeds low limit		LED red: ⎍⎍⎍⎍⎽
Parameter error		LED orange: ⎍⎽⎍⎽
For details see the message on the display		
Display		
Technology		LCD
Backlight	on	press button
	off	switch-off delay adjustable, 10 s -1 h (default 10 s)
Resolution		128 x 64 pixel
Display size		36 x 22 mm
Operating controls		
Push-rotate button		Operable with screw driver: PZ1 DIN ISO 8764-1
Near field communication (NFC)		
Standards		ISO/IEC 14443 Part 2+3 NFC Forum Type 2 tag compliant

Output circuits

Relay output		
Kind of outputs	11-12/14	relay R1, c/o (SPDT) contact
	21-22/24	relay R2, c/o (SPDT) contact
	31-32/34	relay R3, c/o (SPDT) contact
Operating principle	open- or closed circuit principle	configurable; default: closed-circuit principle*
Contact material		AgNi alloy, Cd-free
Maximum switching voltage / maximum switching current		see "Load limit curves"
Rated operational voltage U_e and rated operational current I_e	AC-12 (resistive) at 230 V	4 A
	AC-15 (inductive) at 230 V	3 A
	DC-12 (resistive) at 24 V	4 A
	DC-13 (inductive) at 24 V	2 A
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime	at AC-12, 230 V AC, 4 A	0.1 x 10^6 switching cycles
Maximum fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting
	n/o contact	10 A fast-acting
Conventional thermal current I_{th}		4 A

* Closed-circuit principle: Output relay de-energizes if a fault is occurring Open-circuit principle: Output relay energizes if a fault is occurring

Smart monitoring relays
Technical data

General data

MTBF		on request
Duty cycle		100 %
Dimensions		see "Dimensional drawing"
Mounting		DIN rail (IEC/EN 60715) TH 35-7.5 and TH 35-15, snap-on mounting without any tool
Mounting position		any
Minimum distance to other units	horizontal / vertical	non/non
Material of housing		UL 94 V-0
Degree of protection	housing / terminals	IP50/IP20

Electrical connection

			Screw	**Push-in**
Connecting capacity	fine-strand with/ without wire end ferrule	A1, A2, R1, R2, R3, S1	1x 0.5-2.5 mm² (1x18-14 AWG) 2 x 0.5-1.5 mm² (2x18-16 AWG)	2x0.5-1.5 mm² (2x18-16 AWG)
		xT1, xT2, xT3	1x 0.2-2.5 mm² (1x24-14 AWG) 2 x 0.2-1.5 mm² (2x24-16 AWG)	2x0.2-1.5 mm² (2x24-16 AWG)
	rigid	A1, A2, R1, R2, R3, S1	1x 0.5-4 mm² (1x20-12 AWG) 2 x 0.5-2.5 mm² (2x20-14 AWG)	2x0.5-1.5 mm² (2x20-16 AWG)
		xT1, xT2, xT3	1x 0.2-4 mm² (1x24-12 AWG) 2 x 0.2-2.5 mm² (2x24-14 AWG)	2x0.2-1.5 mm² (2x24-16 AWG)
Stripping length			8 mm (0.32 in)	
Tightening torque		< 0.5 mm²	0.5 Nm (4.43 lb.in)	-
		≥ 0.5 mm²	0.6 - 0.8 Nm (7.08 lb.in)	-

Environmental data

Ambient temperature ranges	operation	-25 °C...+60 °C (-13...+140 °F)
	storage	-40 °C...+85 °C (-40...+185 °F)
Damp heat, cyclic	IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Climatic class	IEC/EN 60721-3-3	3K5 (no condensation, no ice formation)
Vibration, sinusoidal		class 2
Shock		class 1

Smart monitoring relays
Technical data

Isolation data

Rated impulse withstand voltage (U_{imp}) EN/IEC60664-1	supply circuit / measuring circuit / modbus / analog out / output circuits (relay)	6 kV
	output circuit 1 / output circuit 2 / output circuit 3	4 kV
Rated insulation voltage U_i Basic insulation	supply circuit / measuring circuit / modbus / analog out / output circuits (relay)	600 V
	output circuit 1 / output circuit 2 / output circuit 3	300 V
Protective separation IEC/EN 61140	supply circuit / measuring circuit / modbus / analog out / output circuits (relay)	300 V
	output circuit 1 / output circuit 2 / output circuit 3	150 V
Pollution degree		2
Overvoltage category		III

Standards/Directives

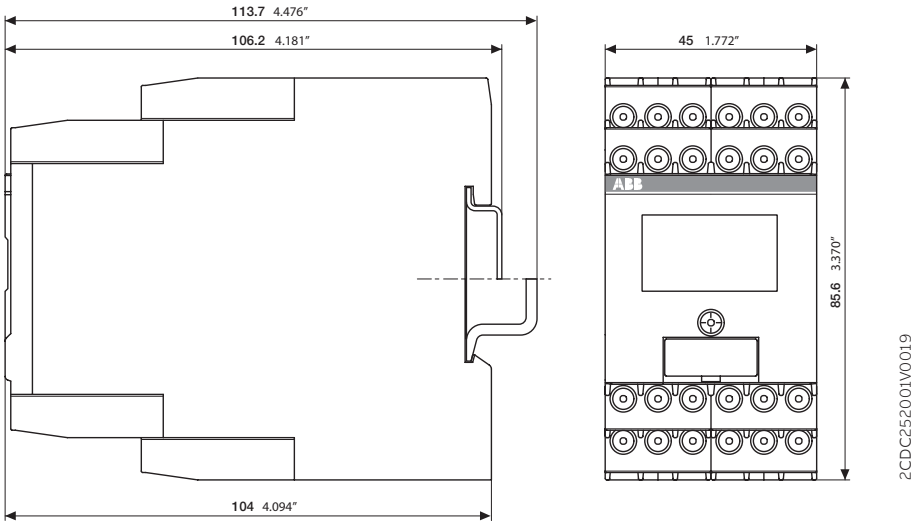
Standards	IEC/EN 60947-5-1
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU incl. 2015/863/EU
WEEE Directive	2012/19/EU
RED Directive	2014/53/EU

Electromagnetic compatibility

Interference immunity to		IEC/EN 60947-5-1
electrostatic discharge	IEC/EN 61000-4-2	level 2, 4 kV contact discharge, 8 kV air discharge
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	level 3, 10 V/m; 2.7 GHz
electrical fast transient / burst	IEC/EN 61000-4-4	level 3 / 2 kV, 5 kHz
surge	IEC/EN 61000-4-5	supply circuit: level 3; L-L 1 kV, L-PE 2 kV relay circuit: level 3; L-PE 2 kV measuring circuit, remote S1: level 2; L-PE 1 kV
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	level 3, 10 V
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	class 3
Interference emission		IEC/EN 60947-5-1
high-frequency radiated		fulfilled (environment B)
high-frequency conducted		fulfilled (environment A)

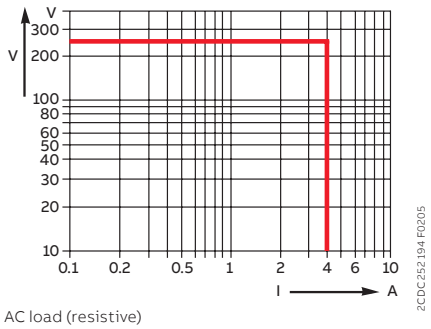
Smart monitoring relays
Technical diagrams

Dimensional drawings
in **mm** and inches

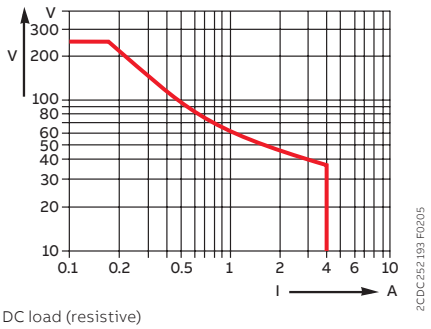


CM-TCN.011

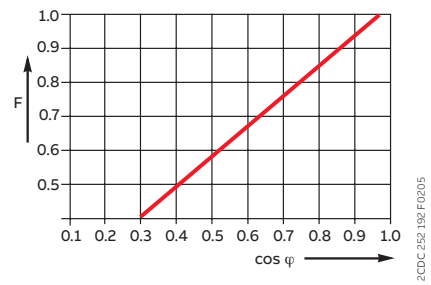
Load limit curves



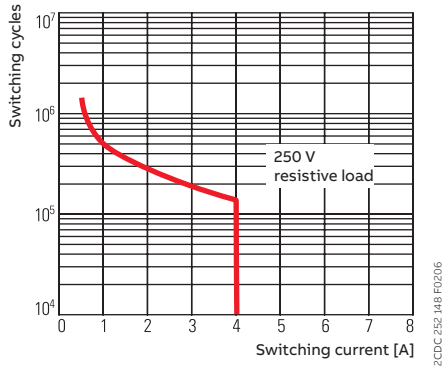
AC load (resistive)



DC load (resistive)



Derating factor F for inductive AC load

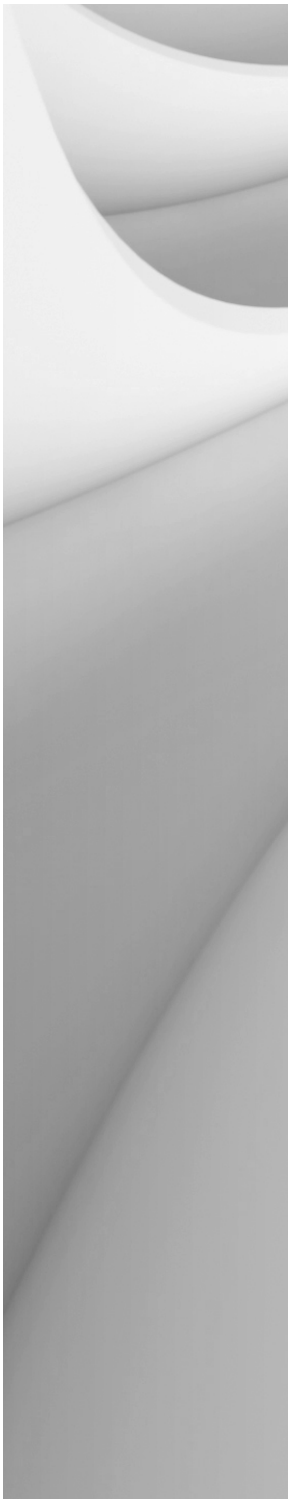


Contact lifetime

ABB STOTZ-KONTAKT GmbH
Eppelheimer Strasse 82
69123 Heidelberg
Germany

You can find the address of your local sales organization on the ABB homepage

abb.com/lowvoltage



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