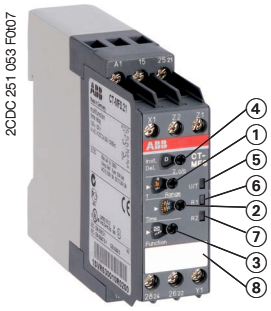
Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet



① Rotary switch for the preselection of the time range

② Potentiometer with direct reading scale for the fine adjustment of the time delay

③ Rotary switch for the preselection of the timing function

④ Rotary switch to set the 2nd c/o contact as an instantaneous contact

⑤ U/T: green LED -
┌──┐
control supply voltage applied
┌┐┌┐
timing

⑥ R1: yellow LED -
┌──┐
output relay 1 energized

⑦ R2: yellow LED -
┌──┐
output relay 2 energized

⑧ Marker label

Features

- Rated control supply voltage 24-240 V AC/DC
- Multifunction timer with 10 timing functions:
  ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Symmetrical ON- and OFF-delay, Flasher starting with ON, Flasher starting with OFF, Star-delta change-over with impulse, Pulse former, ON/OFF-function
- One device includes 10 time ranges (0.05 s - 300 h)
- 2 c/o contacts
- 2nd c/o contact can be selected as instantaneous contact (front-face rotary switch)
- Control input with volt-free triggering to start timing and/or to stop/pause timing
- Remote potentiometer connection
- 3 LEDs for status indication
- Width of 22.5 mm
- Sealable transparent cover (optional accessory) for protection against unauthorized changes of time values
- Integrated marker label

Approvals

	UL 508, CAN/CSA C22.2 No.14	
	GL	
	GOST	
	CB scheme	
	CCC	pending

Marks

CE	CE	
	C-Tick	pending

Order data

Type	Rated control supply voltage	Time range	Output	Control input	Order code
CT-MFS.21	24-240 V AC/DC	0.05 s - 300 h	2 c/o contacts	volt-free triggering	1SVR 630 010 R0200

Order data - Accessories

Adapter for screw mounting on panel

Type	Width in mm	Order code
ADP.01	22.5	1SVR 430 029 R0100

Sealable transparent cover

Type	Width in mm	Order code
COV.01	22.5	1SVR 430 005 R0100

Marker label

Type	Width in mm	Order code
MAR.01	22.5	1SVR 366 017 R0100

Remote potentiometer

50 kΩ±20 % - 0.2 Ω with direct reading scale (graduated scale supplied)

Type	Diameter	Degree of protection	Order code
CT-POT.01	30.5 mm	IP65	1SVR 700 800 R1000
CT-POT.02	22.5 mm	IP65	1SVR 701 800 R1000
CT-POT.03	10.5 mm	IP40	1SVR 214 017 R0900

Application

The CT-S range timers are designed for use in industrial applications. They operate over a universal range of supply voltages and a large time delay range, within compact dimensions. The easy-to-set front-face potentiometers, with direct reading scales, provide accurate time delay adjustment.

Multifunction timers are ideally suited for service and maintenance applications, because one device can replace a number of time relays with different functions, voltage and time ranges. This reduces inventory and saves money.

Operating mode

The CT-MFS.21 with 2 c/o contacts offers 10 timing functions. The function is rotary switch selectable on the front of the unit. Each function is indicated by an international function symbol.

One of 10 time ranges, from 0.05 s - 300 h, can be selected with an other rotary switch. The fine adjustment of the time delay is made via an internal potentiometer, with a direct reading scale, on the front of the unit. When an external potentiometer is connected to terminals Z1-Z2, the internal adjustment is disabled and external adjustment is enabled.

By means of a front-face rotary switch, the function of the 2nd c/o contact can be set to instantaneous contact.

Timing is displayed by a flashing green LED labelled U/T.

Function diagrams

Remarks

Legend:

▭ Control supply voltage not applied / Output contact open

▬ Control supply voltage applied / Output contact closed

Y1-Z2 Control input with volt-free triggering

X1-Z2 Control input with volt-free triggering

Remote potentiometer connection:

When an external potentiometer is connected to the remote potentiometer connection (terminals Z1-Z2), the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.

2nd c/o contact selectable as instantaneous contact:

When switch position Inst. “I” is selected, the functionality of the 2nd c/o contact changes to an instantaneous contact. It acts like the c/o contacts of a switching relay, i.e. applying or interrupting the control supply voltage energizes or de-energizes the c/o contact. The designation of the 2nd c/o contact changes from 25-26/28 to 21-22/24, when selected as instantaneous contact.

Terminal designations on the device and in the diagrams:

The 1st c/o contact is always designated 15-16/18. The 2nd c/o contact is designated 25-26/28, if it responds to the time delay. If the 2nd c/o contact is selected as an instantaneous contact, the designation 25-26/28 is replaced by 21-22/24. Control supply voltage is always applied to terminals A1-A2.

Function of the yellow LEDs:

The two yellow LEDs are designated R1 and R2. LED R1 shows the status of the 1st c/o contact (15-16/18) and LED R2 shows the status of the 2nd c/o contact (25-26/28, 21-22/24 resp.). LED R1 or R2 glows as soon as the corresponding output relay energizes and turns off when the corresponding output relay de-energizes.

⊠ ON-delay

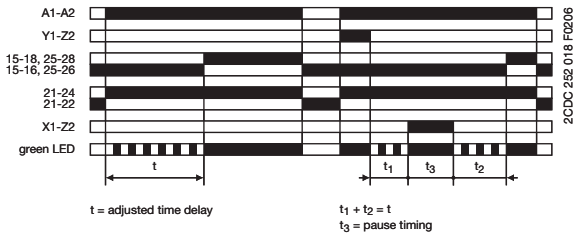
This function requires continuous control supply voltage for timing.

If control input **Y1-Z2** is open, timing begins when control supply voltage is applied. Or, if control supply voltage is already applied, opening control input **Y1-Z2** also starts timing. The green LED flashes during timing. When the selected time delay is complete, the output relay energizes and the flashing green LED turns steady.

If control input **Y1-Z2** closes before the time delay is complete, the time delay is reset and the output relay remains de-energized.

Pause timing / Accumulative ON-delay: Timing can be paused by closing control input **X1-Z2**. The elapsed time t_1 is stored and continues from this time value when **X1-Z2** is reopened. This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



Function diagrams

OFF-delay with auxiliary voltage

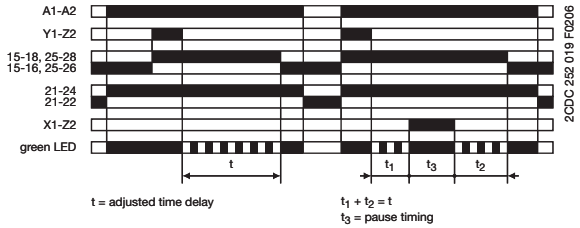
This function requires continuous control supply voltage for timing.

If control input **Y1-Z2** is closed, the output relay energizes immediately. If control input **Y1-Z2** is opened, the time delay starts. The green LED flashes during timing. When the selected time delay is complete, the output relay de-energizes and the flashing green LED turns steady.

If control input **Y1-Z2** closes before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when control input **Y1-Z2** re-opens.

Pause timing / Accumulative OFF-delay: Timing can be paused by closing control input **X1-Z2**. The elapsed time t_1 is stored and continues from this time value when **X1-Z2** is re-opened. This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



Symmetrical ON- and OFF-delay

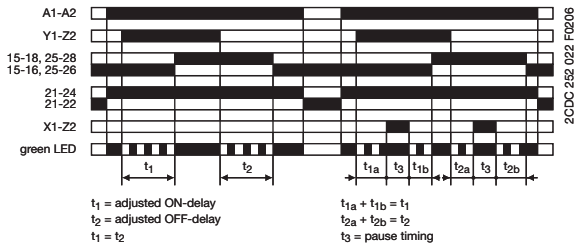
This function requires continuous control supply voltage for timing.

Closing control input **Y1-Z2** starts the ON-delay t_1. When timing is complete, the output relay energizes. Opening control input **Y1-Z2** starts the OFF-delay t_2. Both timing functions are displayed by the flashing green LED. When the OFF-delay t_2 is complete, the output relay de-energizes.

If control input **Y1-Z2** opens before the ON-delay t_1 is complete, the time delay is reset and the output relay remains de-energized. If control input **Y1-Z2** closes before the OFF-delay t_2 is complete, the time delay is reset and the output relay remains energized.

Pause timing / Accumulative, symmetrical ON-delay and OFF-delay: Timing can be paused by closing control input **X1-Z2**. The elapsed time t_{1a} or t_{2a} is stored and continues from this time value when **X1-Z2** is re-opened. This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



Function diagrams

1 Impulse-ON

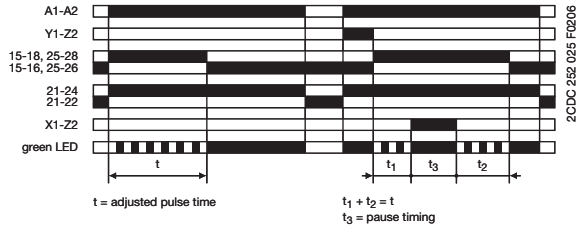
This function requires continuous control supply voltage for timing.

The output relay energizes immediately when control supply voltage is applied and de-energizes after the set pulse time is complete. If control input **Y1-Z2 is** open, timing begins when control supply voltage is applied. Or, if control supply voltage is already applied, opening control input **Y1-Z2** starts timing. The green LED flashes during timing. When the selected pulse time is complete, the output relay de-energizes and the flashing green LED turns steady.

Closing control input **Y1-Z2**, before the pulse time is complete, de-energizes the output relay and resets the pulse time.

Pause timing / Accumulative impulse-ON: Timing can be paused by closing control input **X1-Z2**. The elapsed time t_1 is stored and continues from this time value when **X1-Z2** is re-opened. This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



1 Impulse-OFF with auxiliary voltage

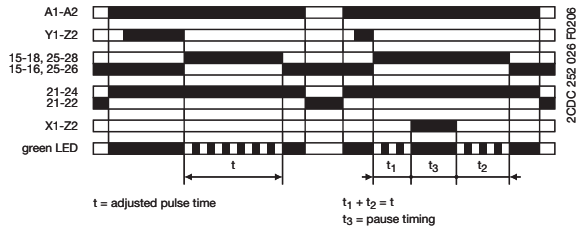
This function requires continuous control supply voltage for timing.

If control supply voltage is applied, opening control input **Y1-Z2** energizes the output relay immediately and starts timing. The green LED flashes during timing. When the selected pulse time is complete, the output relay de-energizes and the flashing green LED turns steady.

Closing control input **Y1-Z2**, before the pulse time is complete, de-energizes the output relay and resets the pulse time.

Pause timing / Accumulative impulse-OFF: Timing can be paused by closing control input **X1-Z2**. The elapsed time t_1 is stored and continues from this time value when **X1-Z2** is re-opened. This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



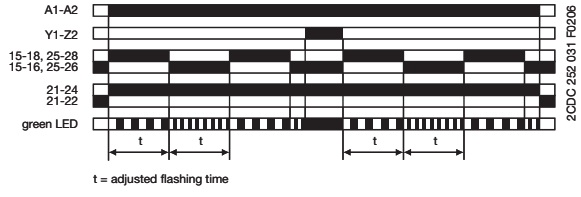
Flasher with reset, starting with ON

Applying control supply voltage starts timing with symmetrical ON / OFF times.

The cycle starts with an ON time first. The ON / OFF times are displayed by the flashing green LED, which flashes twice as fast during the OFF time.

The time delay can be reset by closing control input **Y1-Z2**. Opening control input **Y1-Z2** starts the timer pulsing again with symmetrical ON / OFF times.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



Function diagrams

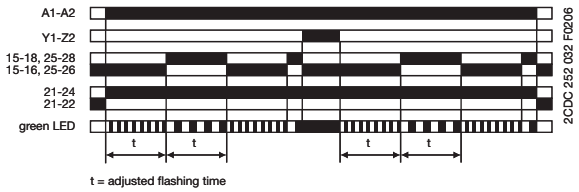
Flasher with reset, starting with OFF

Applying control supply voltage starts timing with symmetrical ON / OFF times.

The cycle starts with an OFF time first. The ON / OFF times are displayed by the flashing green LED, which flashes twice as fast during the OFF time.

The time delay can be reset by closing control input **Y1-Z2**. Opening control input **Y1-Z2** starts the timer pulsing again with symmetrical ON / OFF times.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

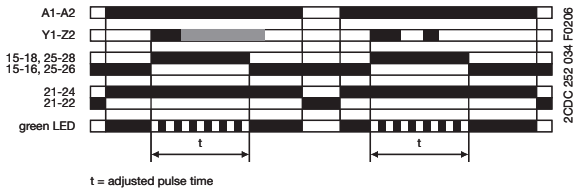


Pulse former

This function requires continuous control supply voltage for timing.

Closing control input **Y1-Z2** energizes the output relay immediately and starts timing. Operating the control contact switch **Y1-Z2** during the time delay has no effect. The green LED flashes during timing. When the selected ON time is complete, the output relay de-energizes and the flashing green LED turns steady. After the ON time is complete, it can be restarted by closing control input **Y1-Z2**.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



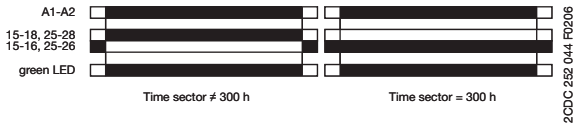
ON/OFF-function

This function is used for test purposes during commissioning and troubleshooting.

If the selected max. value of the time range is smaller than 300 h (front-face potentiometer “Time sector” not 300 h), applying control supply voltage energizes the output relay immediately and the green LED glows. Interrupting control supply voltage, de-energizes the output relay.

If the selected max. value of the time range is 300 h (front-face potentiometer “Time sector” = 300 h) and control supply voltage is applied, the green LED glows, but the output relay does not energize.

Time settings and operating of the control inputs have no effect on the operation.



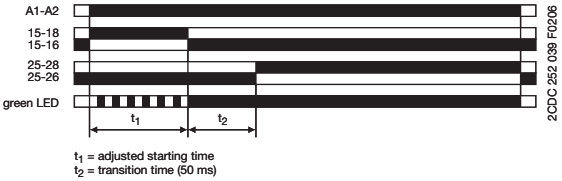
Function diagrams

⏃1⎍ Star-delta change-over with impulse

This function requires continuous control supply voltage for timing.

Applying control supply voltage to terminals **A1-A2**, energizes the star contactor connected to terminals **15-18** and begins the set starting time t_1. The green LED flashes during timing. When the starting time is complete, the first c/o contact de-energizes the star contactor.

Now, the fixed transition time t_2 of 50 ms starts. When the transition time is complete, the second c/o contact energizes the delta contactor connected to terminals **25-28**. The delta contactor remains energized as long as control supply voltage is applied to the unit.

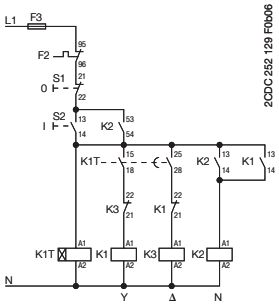


t_1 = adjusted starting time
t_2 = transition time (50 ms)

Examples of application

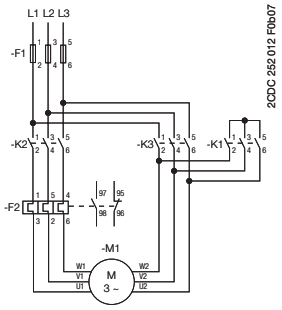
Star-delta change-over

Control circuit diagram

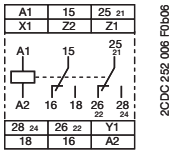


Star-delta change-over

Power circuit diagram



Connection diagram

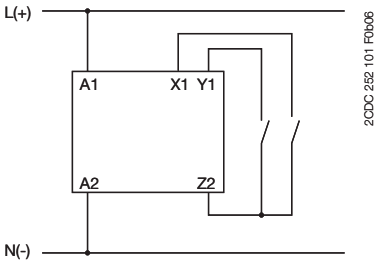


15-16/18	1. c/o contact
21-22/24	2. c/o contact as instantaneous contact
25-26/28	2. c/o contact
A1-A2	Rated control supply voltage U_S 24-240 V AC/DC
X1-Z2	Control input
Y1-Z2	Control input
Z1-Z2	Remote potentiometer connection

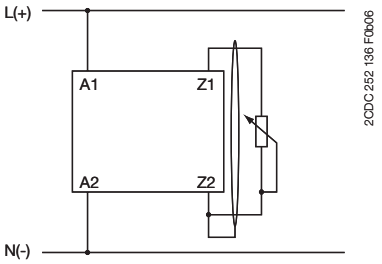
Wiring instructions

Control inputs

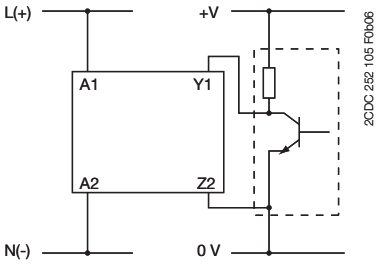
(volt-free triggering)



Remote potentiometer



Triggering of the control inputs with a proximity switch (3 wire)



Technical data

Data at T_a = 25 °C and rated values, if noting else indicated

Input circuits - Supply circuit		1SVR 630 010 R0200		
Rated control supply voltage U_S	A1-A2	24-240 V AC/DC		
Rated control supply voltage tolerance	24-240 V AC/DC	-15...+10 %		
Typical current / power consumption		24 V DC	230 V AC	115 V AC
	24-240 V AC/DC	24 mA / on request	12 mA / on request	22 mA / on request
Rated frequency		DC; 50/60 Hz		
Frequency range AC		47-63 Hz		
Power failure buffering time		20 ms		

Input circuits - Control circuit		1SVR 630 010 R0200
Control input, control function	X1-Z2	pause timing external
	Y1-Z2	start timing external
Kind of triggering		volt-free triggering
Maximum switching current in the control circuit		1 mA
Maximum cable length to the control inputs		50 m - 100 pF/m
Minimum control pulse length		20 ms
No-load voltage at the control input		10-40 V DC
Remote potentiometer connection	Z1-Z2	50 kΩ
Maximum cable length to the control inputs		2 x 25 m, shielded with 100 pF/m
Shield connection		Z2

Timing circuit		1SVR 630 010 R0200
Kind of timer	Multifunction timer	ON-delay OFF-delay with auxiliary voltage Impulse-ON Impulse-OFF with auxiliary voltage Symmetrical ON- and OFF-delay Flasher with reset, starting with ON Flasher with reset, starting with OFF Star-delta change-over with impulse Pulse former ON/OFF-function
Time ranges 0.05 s - 300 h		0.05-1 s, 0.15-3 s, 0.5-10 s, 1.5-30 s, 5-100 s, 15-300 s, 1.5-30 min, 15-300 min, 1.5-30 h, 15-300 h
Recovery time		< 50 ms
Accuracy within the rated control supply voltage tolerance		Δt < 0.004 %/V
Accuracy within the temperature range		Δt < 0.03 %/°C
Star-delta transition time		fixed, 50 ms
Star-delta transition time tolerance		± 2 ms

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Data sheet

Indication of operational states		1SVR 630 010 R0200
Control supply voltage / timing	U/T: green LED	⎍‾‾‾‾⎍: control supply voltage applied
Control supply voltage / timing	U/T: green LED	⎍⎍⎍⎍⎍: timing
Relay status	R1: yellow LED	⎍‾‾‾‾⎍: output relay 1 energized
Relay status	R2: yellow LED	⎍‾‾‾‾⎍: output relay 2 energized

Output circuits		1SVR 630 010 R0200
Kind of output	15-16/18	Relay, 1. c/o contact
	25-26/28	Relay, 2. c/o contact
	25(21)-26(22)/28(24)	Relay, 2. c/o contact selectable as instantaneous contact
Contact material		Cd-free
Rated operational voltage U_e		250 V
Minimum switching voltage / Minimum switching current		12 V / 10 mA
Maximum switching voltage / Minimum switching current		see load limit curves / see load limit curves
Rated operational current I_e (IEC/EN 60947-5-1)	AC12 (resistive) at 230 V	4 A
	AC15 (inductive) at 230 V	3 A
	DC12 (resistive) at 24 V	4 A
	DC13 (inductive) at 24 V	2 A
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime		0.1 x 10^6 switching cycles (AC12, 230 V, 4 A)
Short-circuit resistance, maximum fuse rating (IEC/EN 60947-5-1)	n/c contact	6 A fast-acting
	n/o contact	10 A fast-acting

General data		1SVR 630 010 R0200
Duty time		100 %
Repeat accuracy (constant parameters)		Δt <± 0.2 %
Dimensions (W x H x D)		22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 inches)
Weight		0.134 kg (0.3 lb)
Mounting position		any
Minimum distance to other units		
normal operation mode	horizontal	none
	vertical	none
Mounting		DIN rail (EN 60715), snap-on mounting without any tool
Degree of protection	enclosure / terminals	IP50 / IP20

Electrical connection		1SVR 630 010 R0200
all circuits		Screw connection
Wire size	fine-strand with wire end ferrule	2 x 0.75-2.5 mm^2 (2 x 18-14 AWG)
	fine-strand without wire end ferrule	2 x 0.75-2.5 mm^2 (2 x 18-14 AWG)
	rigid	2 x 0.5-4 mm^2 (2 x 20-12 AWG)
Stripping length		7 mm (0.28 inches)
Tightening torque		0.6-0.8 Nm

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Data sheet

Environmental data		1SVR 630 010 R0200
Ambient temperature range	operation	-25...+60 °C
	storage	-40...+85 °C
Damp heat, cyclic (IEC/EN 60068-2-30)		6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal (IEC/EN 60068-2-6)		40 m/s^2, 20 cycles, 10...58/60...150 Hz
Shock, half-sine (IEC/EN 60068-2-27)		100 m/s^2, 11 ms, 3 shocks, all directions

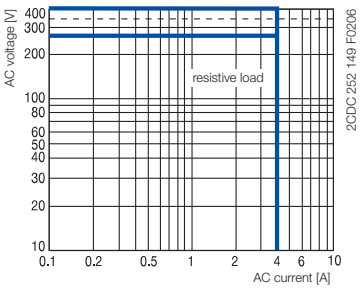
Standards / Directives	1SVR 630 010 R0200
Product standard	IEC 61812-1, EN 61812-1 + A11, DIN VDE 0435 part 2021
EMC Directive	2004/108/EC
Low Voltage Directive	2006/95/EC
RoHS Directive	2002/95/EEC

Electromagnetic compatibility		1SVR 630 010 R0200
Interference immunity		IEC/EN 61000-6-1 IEC/EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	Level 3 (10 V/m)
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
powerful impulses (Surge)	IEC/EN 61000-4-5	Level 4 (2 kV A1-A2)
HF line emission	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission		IEC/EN 61000-6-3 IEC/EN 61000-6-4
electromagnetic field (HF radiation resistance)	IEC/CISPR 22, EN 55022	Class B
HF line emission	IEC/CISPR 22, EN 55022	Class B

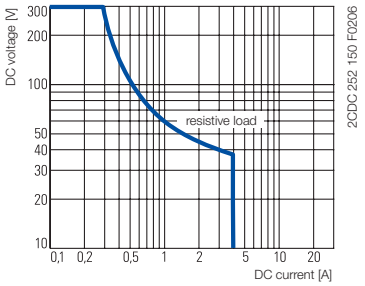
Isolation data		1SVR 630 010 R0200
Rated insulation voltage U_i	Output circuit 1 / Output circuit 2	300 V
	Input circuit / Output circuit	500 V
Rated impulse withstand voltage U_{imp} (type test) (IEC 60664-1, VDE 0110)	between all isolated circuits	4 kV; 1.2/50 µs
Power-frequency withstand voltage test (Test voltage, routine test)	between all isolated circuits	2.0 kV; 50 Hz, 1 s
Basic insulation (IEC/EN 61140)	Input circuit / Output circuit	500 V
Protective separation (IEC/EN 61140; VDE 0106 part 101 and part 101/A1)	Input circuit / Output circuit	250 V
Pollution degree (IEC/EN 60664, VDE 0110, UL 508)		3
Overvoltage category (IEC/EN 60664, VDE 0110, UL 508)		III

Technical diagrams

Load limit curve

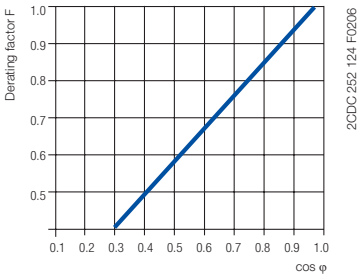


AC load (resistive)

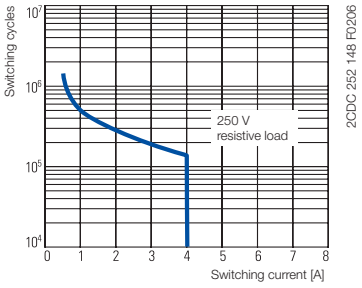


DC load (resistive)

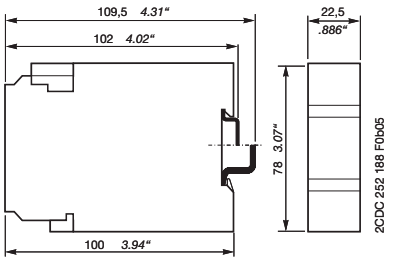
Derating factor F



Contact lifetime

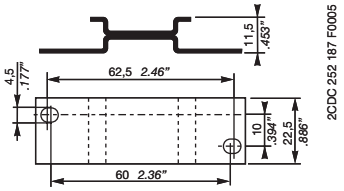


Dimensions
in mm

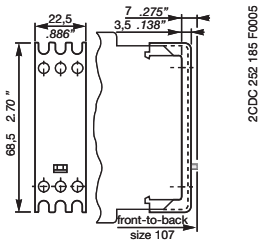


CT-MFS.21

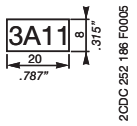
Dimensions accessories
in mm



ADP.01 - Adapter for screw mounting on panel

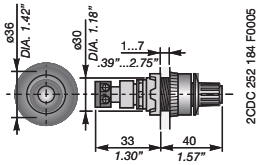


COV.01 - Sealable transparent cover

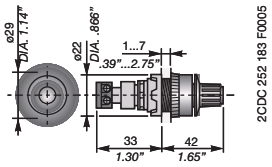


MAR.01 - Marker label

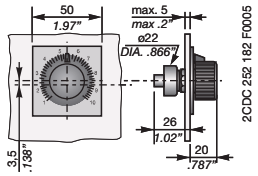
Dimensions accessories
in mm



CT-POT.01 - Potentiometer 30.5 mm



CT-POT.02 - Potentiometer 22.5 mm



CT-POT.03 - Potentiometer 10.5 mm

Synonyms

Used expression	Alternative expression(s)	Used expression	Alternative expression(s)
2 c/o contacts	1 DPDT / 2 SPDT	volt-free	dry / floating

As part of the on-going product improvement, ABB reserves the right to modify the characteristics of the products described in this document. The information given is non-contractual.
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