Data sheet

Electronic timer CT-MFD.21
Multifunctional with 2 c/o (SPDT) contacts

The CT-MFD.21 is a multifunctional electronic time relay. It is from the CT-D range.

With their MDRC profile and a width of only 17.5 mm, the CT-D range timers are ideally suited for installation in distribution panels as well as for industrial applications where compact dimensions are required.

2CDC 251 088 F0006

Characteristics

- Rated control supply voltage 12-240 V AC/DC
- Multifunction timer with 7 timing functions: ON-delay, OFF-delay with auxiliary voltage, impulse-ON, impulse-OFF with auxiliary voltage, flasher starting with ON, flasher starting with OFF, pulse former
- 7 time ranges (0.05 s - 100 h) in one device
- Control input: voltage-related triggering, polarized, capable of switching a parallel load
- Light-grey enclosure in RAL 7035
- 2 c/o (SPDT) contacts (250 V / 5 A)
- Width of only 17.5 mm (0.689 in)
- 2 LEDs for the indication of operational states

Approvals

UL 508, CAN/CSA C22.2 No.14

EAC

CCC

RMRS

Marks

CE

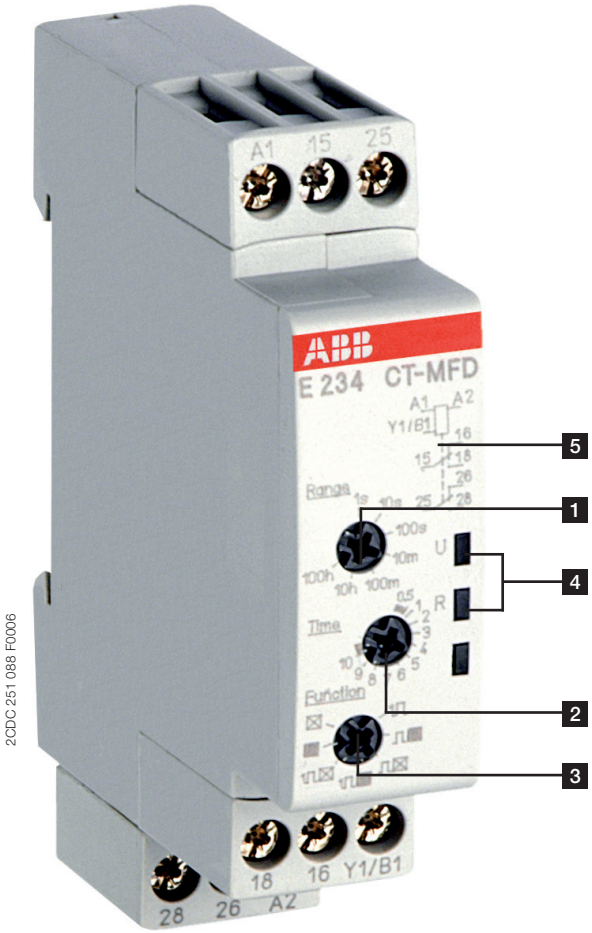
RCM

Order data

Type	Rated control supply voltage	Time range	Output	Order code
CT-MFD.21	12-240 V AC/DC	0.05 s - 100 h	2 c/o (SPDT) contacts	1SVR 500 020 R1100

Functions

Operating controls



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 selection of the timing function**

4 **Indication of operational states**

U: green LED

⎍‾‾‾⎍ control supply voltage applied

⎍⎍⎍⎽ timing

R: yellow LED

⎍‾‾‾⎍ output relays energized

5 **Circuit diagram**

Application

With their structural form and their width of only 17.5 mm, the CT-D range timers are ideally suited for installation in distribution panels.

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-MFD.21 has 2 c/o (SPDT) contacts and provides 7 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 7 time delay ranges, from 0.05 s to 100 h, can be selected with another 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.

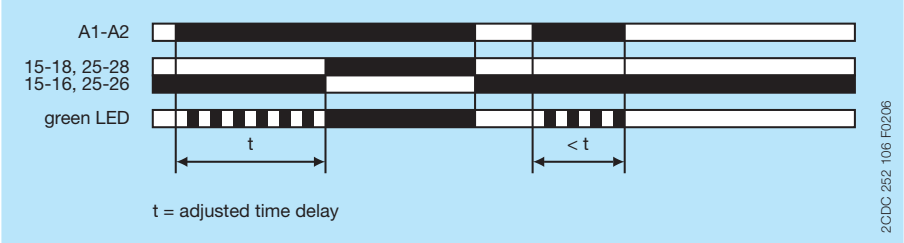
Function descriptions / diagrams

ON-delay

This function requires continuous control supply voltage for timing.
Timing begins when control supply voltage is applied. The green LED flashes during timing. When the selected time delay is complete, the output relays energize and the flashing green LED turns steady.

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

Control input A1-Y1/B1 is disabled when this function is selected.



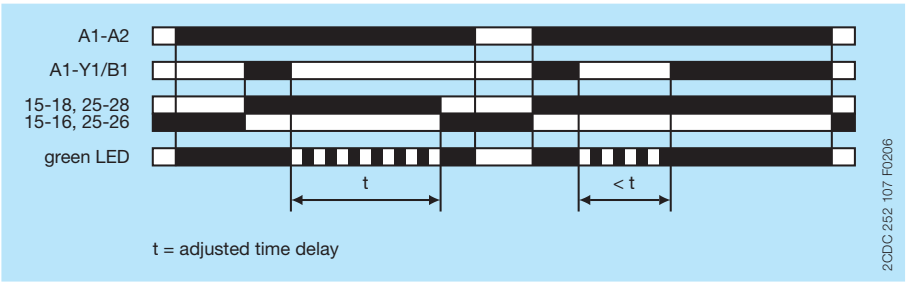
OFF-delay with auxiliary voltage

This function requires continuous control supply voltage for timing.

If control input A1-Y1/B1 is closed, the output relays energize immediately. If control input A1-Y1/B1 is opened, the time delay starts. The green LED flashes during timing. When the selected time delay is complete, the output relays de-energize and the flashing green LED turns steady.

If control input A1-Y1/B1 recloses before the time delay is complete, the time delay is reset and the output relays do not change state. Timing starts again when control input A1-Y1/B1 re-opens.

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



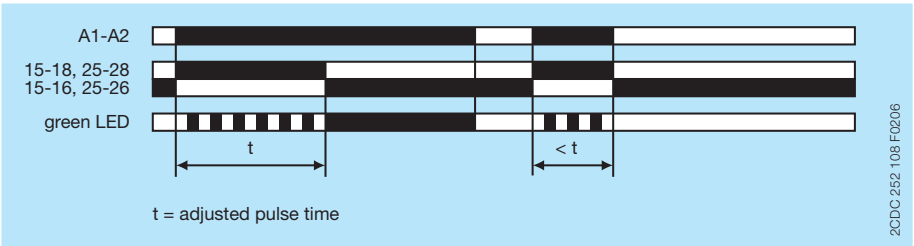
1 Impulse-ON

This function requires continuous control supply voltage for timing.

The output relays energize immediately when control supply voltage is applied and de-energize after the set pulse time is complete. The green LED flashes during timing. When the selected pulse time is complete, the flashing green LED turns steady.

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

Control input A1-Y1/B1 is disabled when this function is selected.



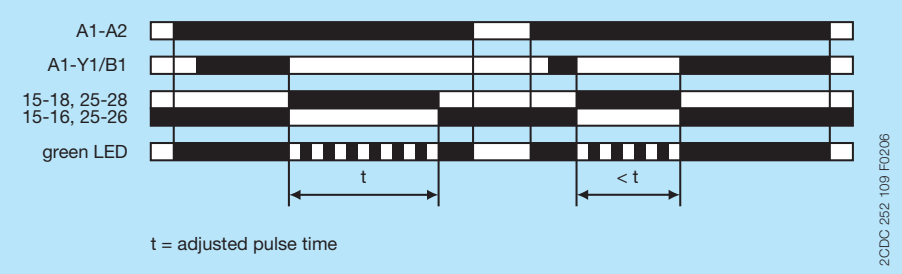
1 Impulse-OFF with auxiliary voltage

This function requires continuous control supply voltage for timing.

If control supply voltage is applied, opening control input A1-Y1/B1 energizes the output relays immediately and starts timing. The green LED flashes during timing. When the selected pulse time is complete, the output relays de-energize and the flashing green LED turns steady.

Closing control input A1-Y1/B1, before the time delay is complete, de-energizes the output relays and resets the time delay.

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

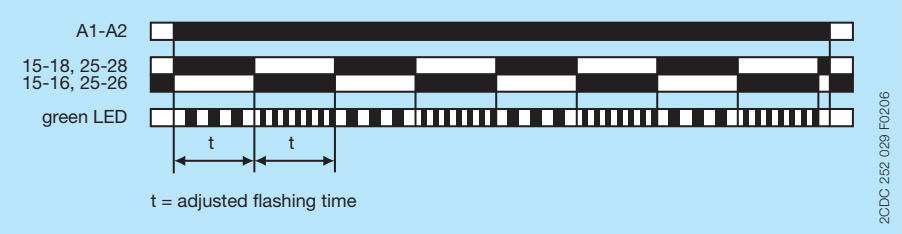


Flasher, starting with ON

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.

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

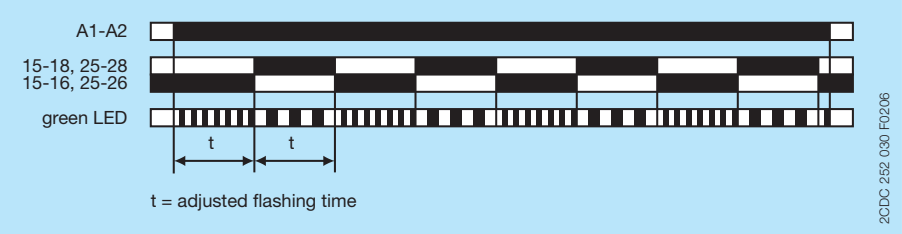
Control input A1-Y1/B1 is disabled when this function is selected.



Flasher, 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.
If control supply voltage is interrupted, the output relays de-energize and the time delay is reset.

Control input A1-Y1/B1 is disabled when this function is selected.

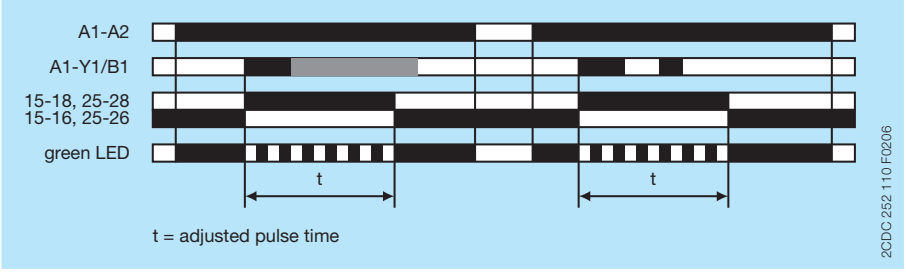


Pulse former

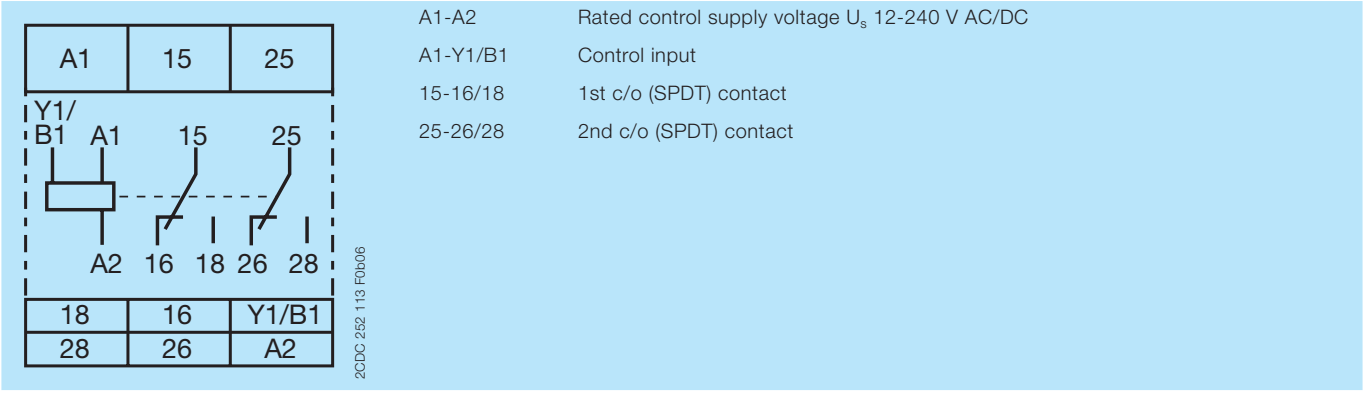
This function requires continuous control supply voltage for timing.

Closing control input A1-Y1/B1 energizes the output relay immediately and starts timing. Operating the control contact switch A1-Y1/B1 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 A1-Y1/B1.

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



Electrical connection

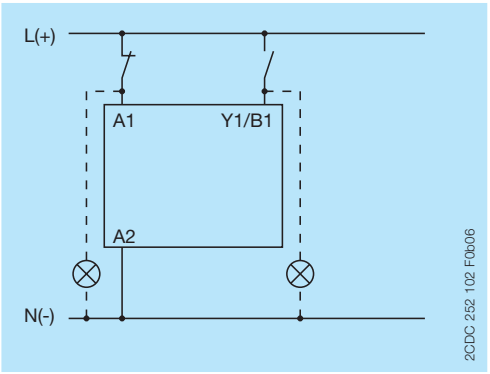


A1-A2	Rated control supply voltage U_s 12-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o (SPDT) contact
25-26/28	2nd c/o (SPDT) contact

Connection diagram

Wiring instructions

Parallel load to control input possible / allowed



Technical data

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

Input circuits

Supply circuit		A1-A2
Rated control supply voltage U_s		12-240 V AC/DC
Rated control supply voltage U_s tolerance		-15...+10 %
Typical current / power consumption	12 V DC	53 mA / 0.7 W
	115 V AC	38 mA / 1.6 VA
	230 V AC	6 mA / 1.1 VA
Rated frequency		DC; 50/60 Hz
Frequency range AC		47-63 Hz
Power failure buffering time		min. 20 ms
Release voltage		> 10 % of the min. rated control supply voltage U_s

Control circuit		
Control input, control function	A1-Y1/B1	start timing external
Kind of triggering		voltage-related triggering
Resistance to reverse polarity		yes
Polarized		yes
Capable of switching a parallel load		yes
Maximum cable length to the control inputs		50 m - 100 pF/m
Minimum control pulse length		20 ms
Control voltage potential		see rated control supply voltage U_s
Current /power consumption of the control input	12 V DC	0.4 mA / 0.01 W
	115 V AC	0.3 mA / 0.03 VA
	230 V AC	0.7 mA / 0.16 VA

Timing circuit		
Kind of timer	Multifunction timer	ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Flasher starting with ON, Flasher starting with OFF, Pulse former
Time ranges 0.05 s - 100 h		0.05-1 s, 0.5-10 s, 5-100 s, 0.5-10 min, 5-100 min, 0.5-10 h, 5-100 h
Recovery time		< 50 ms
Repeat accuracy (constant parameters)		$\Delta t < \pm$ 0.5 %
Accuracy within the rated control supply voltage tolerance		Δt < 0.005 % / V
Accuracy within the temperature range		Δt < 0.06 % / °C
Setting accuracy of time delay		± 10 % of full-scale value

User interface

Indication of operational states		
Control supply voltage / timing	U: green LED	⎍⎺⎺⎺⎍: control supply voltage applied ⎍⎍⎍⎽: timing
Relay status	R: yellow LED	⎍⎺⎺⎺⎍: output relays energized

Output circuit

Kind of output	15-16/18	relay, 1st c/o (SPDT) contact
	25-26/28	relay, 2nd c/o (SPDT) contact
Contact material		Cd-free
Rated operational voltage U_e		250 V
Minimum switching voltage / Minimum switching current		12 V / 100 mA
Maximum switching voltage / Minimum switching current		see load limit curve / see load limit curve
Rated operational current I_e	AC-12 (resistive) at 230 V	5 A
	AC-15 (inductive) at 230 V	n/c: 0.75 A
	DC-12 (resistive) at 24 V	5 A
	DC-13 (inductive) at 24 V	1 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	C 300
	max. rated operational voltage	300 V AC
	maximum continuous thermal current at B 300	2.5 A
	max. making/breaking apparent power at B 300	1800 VA / 180 VA
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime	AC-12, 230 V, 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

General data

MTBF		on request
Duty time		100 %
Dimensions (W x H x D)	product dimensions	17.5 x 80 x 58 mm (0.69 x 3.15 x 2.28 in)
	packaging dimensions	89 x 65 x 20 mm (3.50 x 2.56 x 0.79 in)
Weight		0.065 kg (0.143 lb)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position		any
Minimum distance to other units, normal operation mode	horizontal	not necessary
	vertical	not necessary
Degree of protection	housing	IP50
	terminals	IP20

Electrical connection

Connecting capacity	fine-strand with wire end ferrule	2 x 0.5-1.5 mm^2 / 1 x 0.5-2.5 mm^2 (2 x 20-16 AWG / 1 x 20-14 AWG)
	fine-strand without wire end ferrule	2 x 0.5-1.5 mm^2 / 1 x 0.5-2.5 mm^2 (2 x 20-16 AWG / 1 x 20-14 AWG)
	rigid	2 x 0.5-1.5 mm^2 / 1 x 0.5-4 mm^2 (2 x 20-16 AWG / 1 x 20-12 AWG)
Stripping length		7 mm (0.28 in)
Tightening torque		0.5-0.8 Nm (4.43-7.08 lb.in)

Environmental data

Ambient temperature ranges	operation	-20...+60 °C (-4...+140 °F)
	storage	-40...+85 °C (-40...+185 °F)
Climatic class (IEC/EN 60068-2-30)		3k3
Relative humidity range		25 % to 85 %
Vibration, sinusoidal (IEC/EN 60068-2-6)		20 m/s^2, 10 cycles, 10...150...10 Hz
Shock, half-sine (IEC/EN 60068-2-27)		150 m/s^2, 11 ms

Isolation data

Rated insulation voltage U_i	input circuit / output circuit	300 V
	output circuit 1 / output circuit 2	300 V
Rated impulse withstand voltage U_{imp}	between all isolated circuits	4 kV; 1.2/50 µs
Power-frequency withstand voltage (test voltage)	between all isolated circuits	2.5 kV, 50 Hz, 60 s
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V
Protective separation (IEC/EN 61140, EN 50178)	input circuit / output circuit	250 V
Pollution degree		3
Overvoltage category		III

Standards / Directives

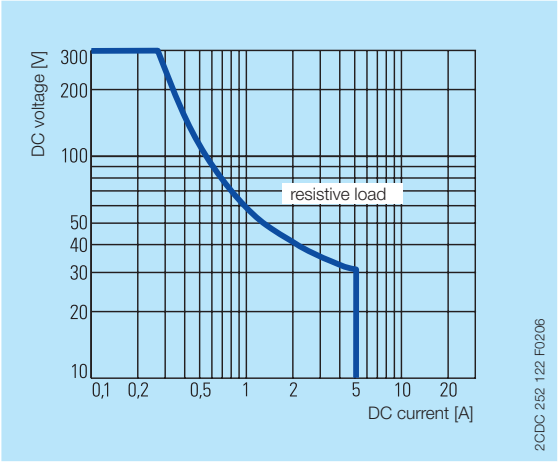
Standards	IEC/EN 61812-1
Low Voltage Directive	2014/35/EU
EMC directive	2014/30/EU
RoHS Directive	2011/65/EC

Electromagnetic compatibility

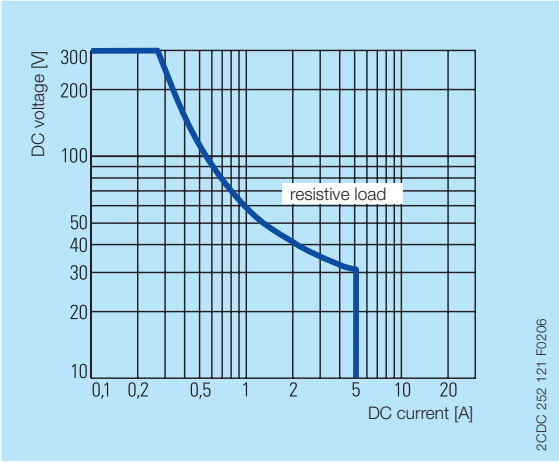
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
surge	IEC/EN 61000-4-5	Level 3 (2 kV L-L)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission		IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

Technical diagrams

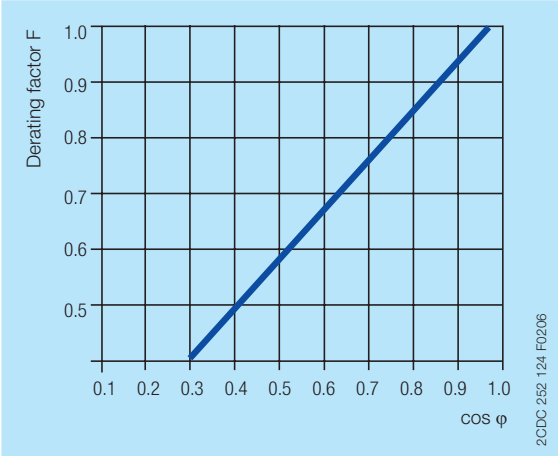
Load limit curves



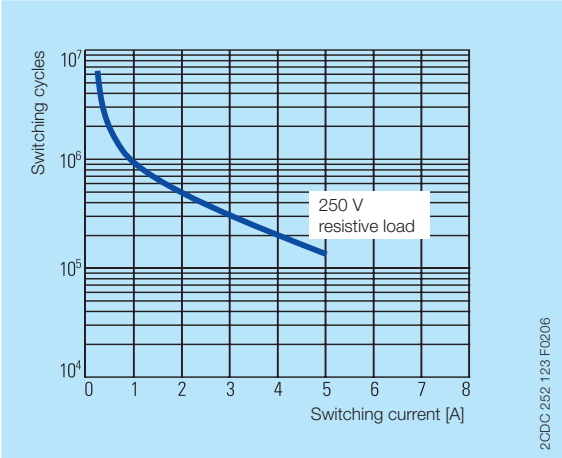
AC load (resistive)



DC load (resistive)



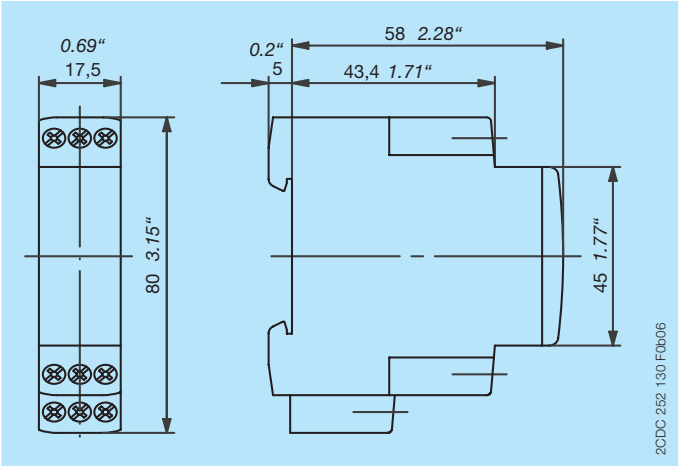
Derating factor F for inductive AC load



Contact lifetime

Dimensions

in **mm** and *inches*



Further documentation

Document title	Document type	Document number
Electronic products and relays	Technical catalogue	2CDC 110 004 C02xx
CT-D range	Instruction manual	1SVC 500 010 M1000

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Electronic relays and controls -> Electronic timers.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com
-> Low Voltage Products & Systems -> Control Products -> Electronic Relays and Controls.

Contact us

ABB STOTZ-KONTAKT GmbH
P. O. Box 10 16 80
69006 Heidelberg, Germany
Phone: +49 (0) 6221 7 01-0
Fax: +49 (0) 6221 7 01-13 25
E-mail: info.desto@de.abb.com

You can find the address of your
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