Data sheet

Electronic timer CT-MVS.22
Multifunctional with 2 c/o (SPDT) contacts

The CT-MVS.22 is a multifunctional electronic timer from the CT-S range. It provides 11 timing functions and 10 time ranges.

All electronic timers from the CT-S range are available with two different terminal versions. You can choose between the proven screw connection technology (double-chamber cage connection terminals) and the completely tool-free Easy Connect Technology (push-in terminals).

2CDC 251 005 V0011

Characteristics

- Rated control supply voltage 24-48 V DC, 24-240 V AC
- 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 or OFF, star-delta change-over with impulse, pulse former, accumulative ON-delay, ON/OFF-function
- 10 time ranges (0.05 s - 300 h)
- Control input with voltage-related triggering to start timing, to pause timing / store time or to select timing function
- Precise adjustment by front-face operating controls
- Screw connection technology or
  Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 2 c/o (SPDT) contacts
- 22.5 mm (0.89 in) width
- 2 LEDs for the indication of operational states

Approvals

UL 508, CAN/CSA C22.2 No.14
GL
EAC
CCC
RMRS

Marks

CE
RCM

Order data

Electronic timers

Type	Rated control supply voltage	Connection technology	Time ranges	Order code
CT-MVS.22P	24-48 V DC, 24-240 V AC	Push-in terminals	0.05 s - 300 h	1SVR 740 020 R3300
CT-MVS.22S	24-48 V DC, 24-240 V AC	Screw type terminals	0.05 s - 300 h	1SVR 730 020 R3300

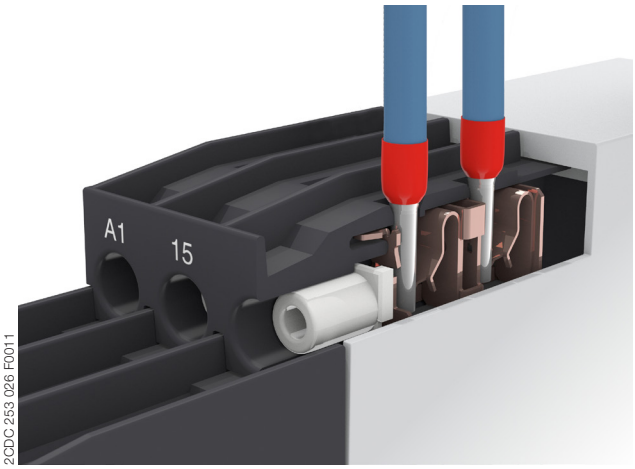
Accessories

Type	Description	Order code
ADP.01	Adapter for screw mounting	1SVR 430 029 R0100
MAR.01	Marker label for devices without DIP switches	1SVR 430 005 R0100
COV.11	Sealable transparent cover	1SVR 730 005 R0100

Connection technology

Maintenance free Easy Connect Technology with push-in terminals

Type designation CT-xxS.yyP



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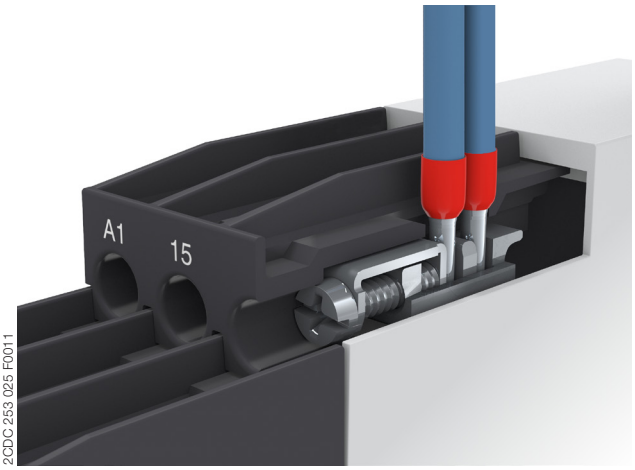
Push-in terminals

- Tool-free connection of rigid and flexible wires with wire end ferrule
- Easy connection of flexible wires without wire end ferrule by opening the terminals
- No retightening necessary
- One operation lever for opening both connection terminals
- For triggering the lever and disconnecting of wires you can use the same tool (Screwdriver according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in))
- Constant spring force on terminal point independent of the applied wire type, wire size or ambient conditions (e. g. vibrations or temperature changes)
- Opening for testing the electrical contacting
- Gas-tight

Approved screw connection technology with double-chamber cage connection terminals

Type designation CT-xxS.yyS



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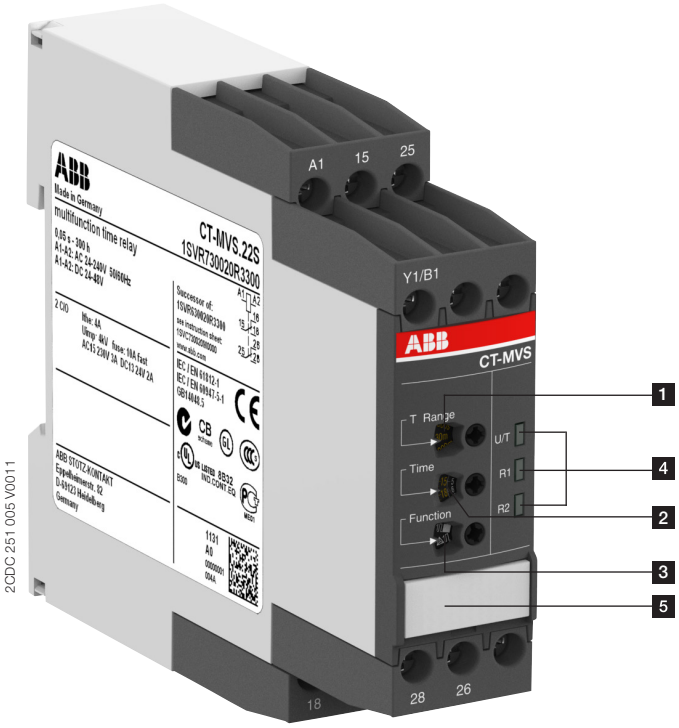
Double-chamber cage connection terminals

- Terminal spaces for different wire sizes
- One screw for opening and closing of both cages
- Pozidrive screws for pan- or crosshead screwdrivers according to DIN ISO 2380-1 Form A 0.8 x 4 mm (0.0315 x 0.157 in), DIN ISO 8764-1 PZ1 ø 4.5 mm (0.177 in)

Both the Easy Connect Technology with push-in terminals and screw connection technology with double-chamber cage connection terminals have the same connection geometry as well as terminal position.

Functions

Operating controls



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1 Rotary switch for the preselection of the time range

2 Fine adjustment of the time delay

3 Rotary switch for the preselection of the timing function

- ON-delay
- + Accumulative ON-delay
- OFF-delay with auxiliary voltage
- Symmetrical ON- and OFF-delay
- 1 Impulse-ON
- 1 Impulse-OFF with auxiliary voltage
- Flasher, starting with ON or OFF
- Pulse former
- ON/OFF-function
- Δ1 Star-delta change-over with impulse

4 Indication of operational states

U/T: green LED - control supply voltage / timing

R1: yellow LED - status of output relay 1

R2: yellow LED - status of output relay 2

5 Marker label

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.

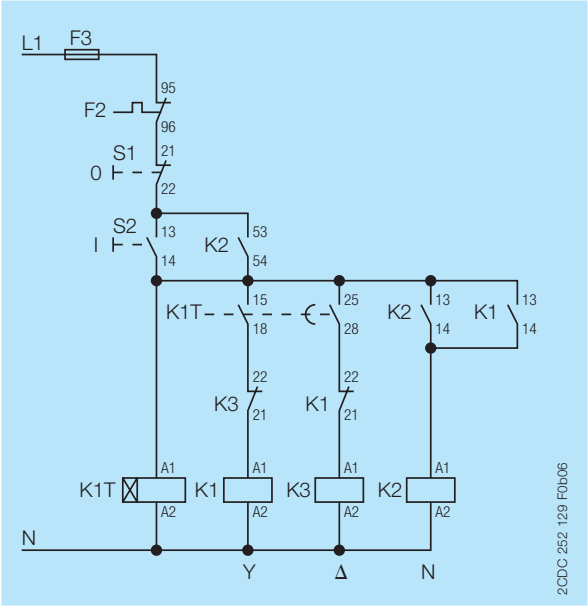
Operating mode

The CT-MVS.22 with 2 c/o (SPDT) contacts offers 11 timing functions. The function is rotary switch selectable on the front of the unit. Each function is indicated by an international function symbol.

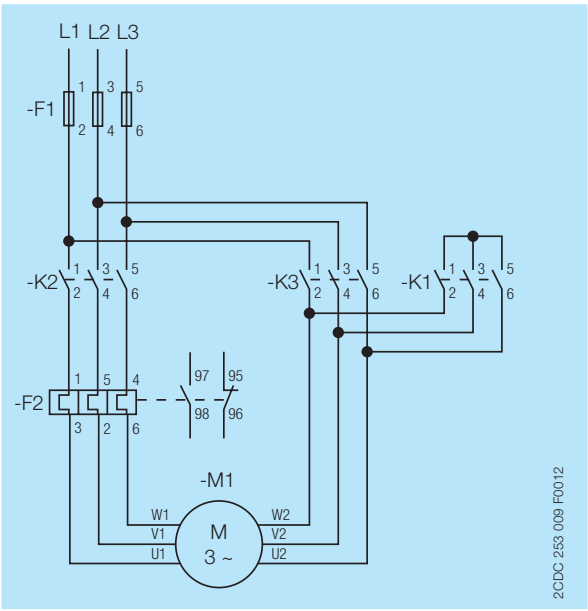
One of 10 time ranges, from 0.05 s to 300 h, can be selected with another rotary switch. The fine adjustment of the time delay is made via an internal potentiometer, with a direct reading scale, on the front of the unit.

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

Examples of application



Star-delta change-over, control circuit diagram



Star-delta change-over, power circuit diagram

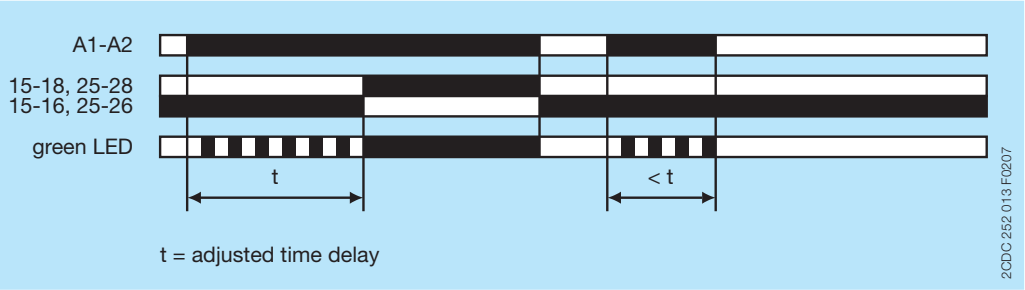
Function diagrams

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.



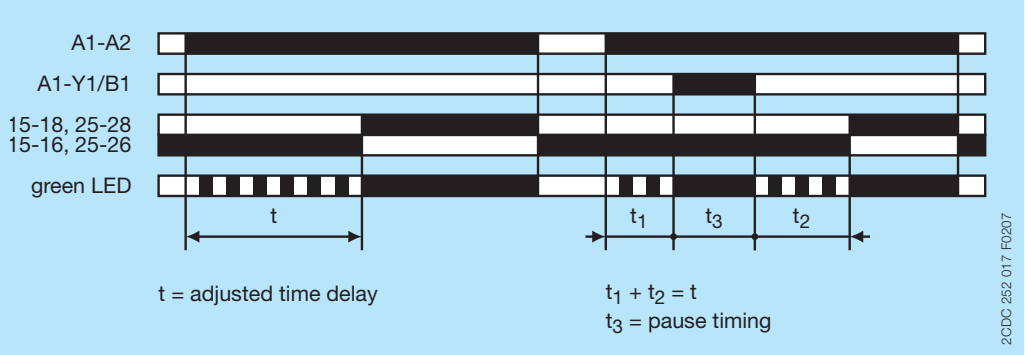
+ Accumulative ON-delay

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.

Timing can be paused by closing control input A1-Y1/B1. The elapsed time t_1 is stored and continues from this time value when A1-Y1/B1 is re-opened. This can be repeated as often as required.

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



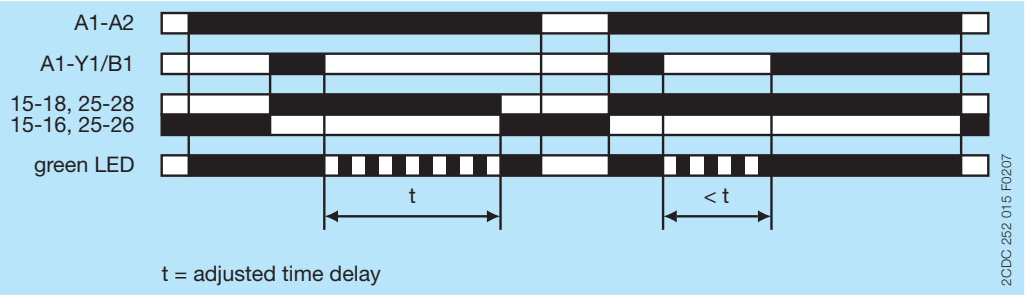
OFF-delay with auxiliary voltage

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.



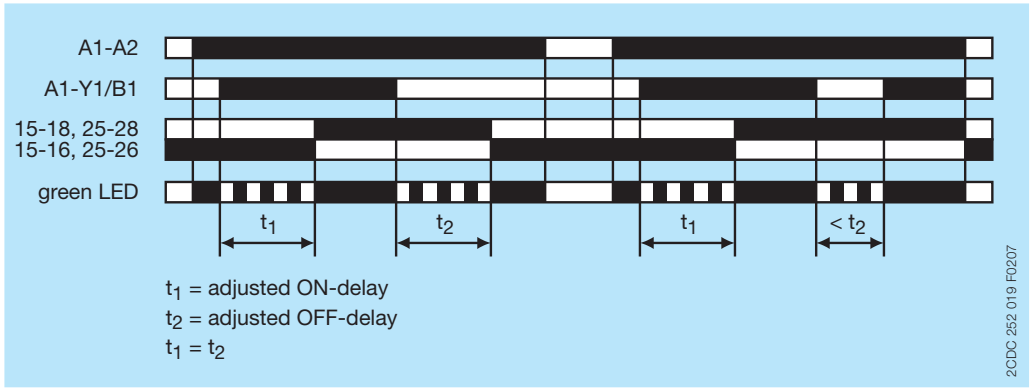
Symmetrical ON- and OFF-delay

This function requires continuous control supply voltage for timing.

Closing control input A1-Y1/B1 starts the ON-delay t_1. When timing is complete, the output relays energize. Opening control input A1-Y1/ B1 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 relays de-energize.

If control input A1-Y1/B1 opens before the ON-delay t_1 is complete, the time delay is reset and the output relays remain de-energized. If control input A1-Y1/B1 closes before the OFF-delay t_2 is complete, the time delay is reset and the output relays remain energized.

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

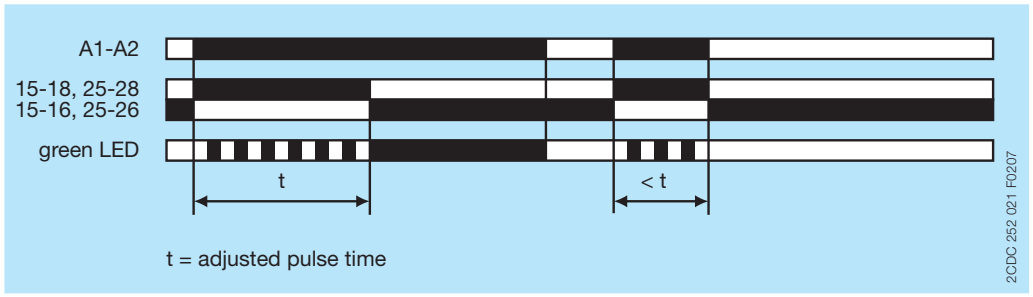


Impulse-ON

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.



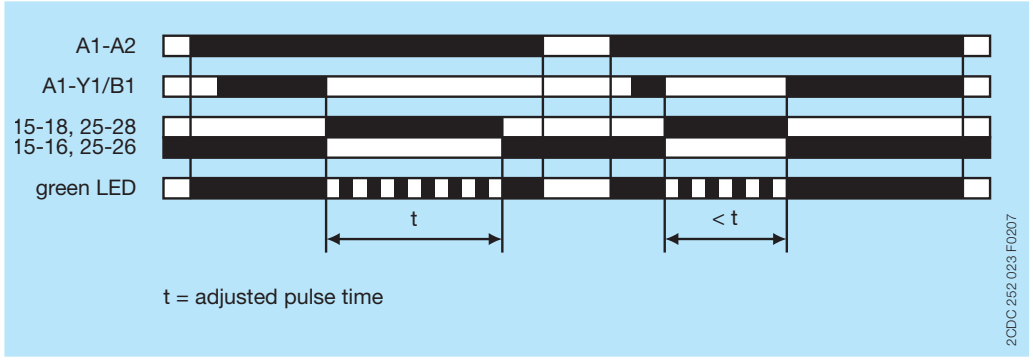
Impulse-OFF with auxiliary voltage

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 pulse time is complete, de-energizes the output relays and resets the pulse time.

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

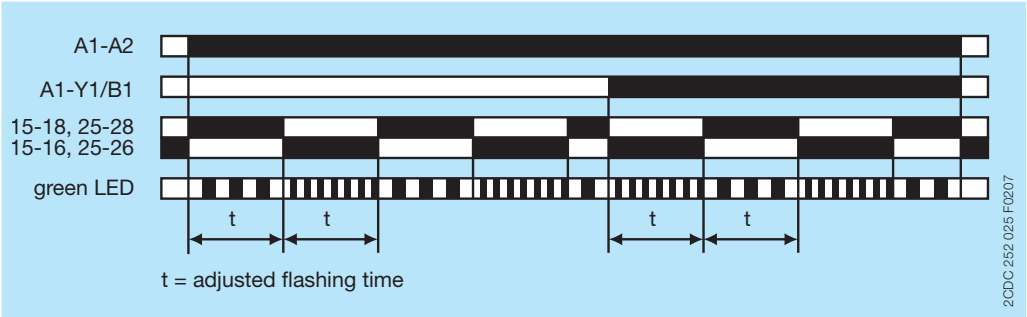


Flasher, starting with ON or OFF

Applying control supply voltage starts timing with symmetrical ON / OFF times. The cycle starts with an ON time first.

Closing control input A1-Y1/B1, with control supply voltage applied, starts the cycle 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.

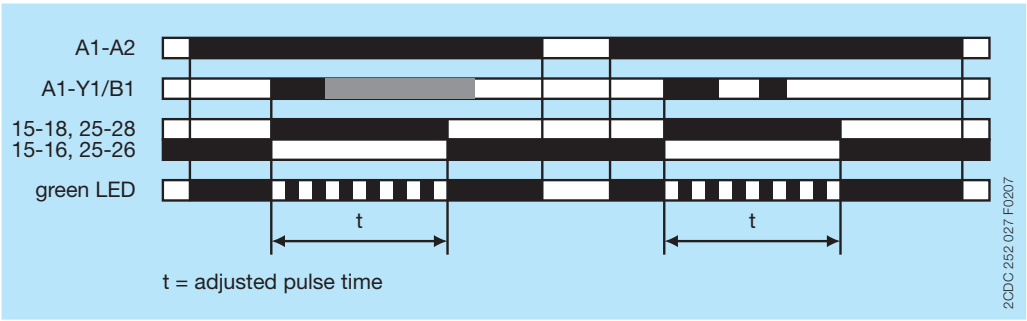


Pulse former

This function requires continuous control supply voltage for timing.

Closing control input A1-Y1/B1 energizes the output relays 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 relays de-energize 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 relays de-energize and the time delay is reset.



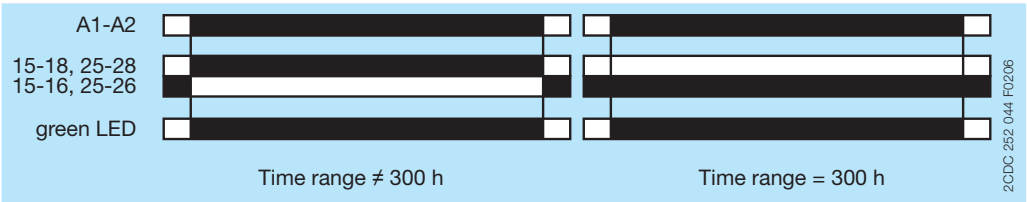
ON/OFF-function

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 “T Range” not 300 h), applying control supply voltage energizes the output relays immediately and the green LED is on. Interrupting control supply voltage, de-energizes the output relays.

If the selected max. value of the time range is 300 h (front-face potentiometer “T Range” = 300 h) and control supply voltage is applied, the green LED is on, but the output relays do not energize.

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

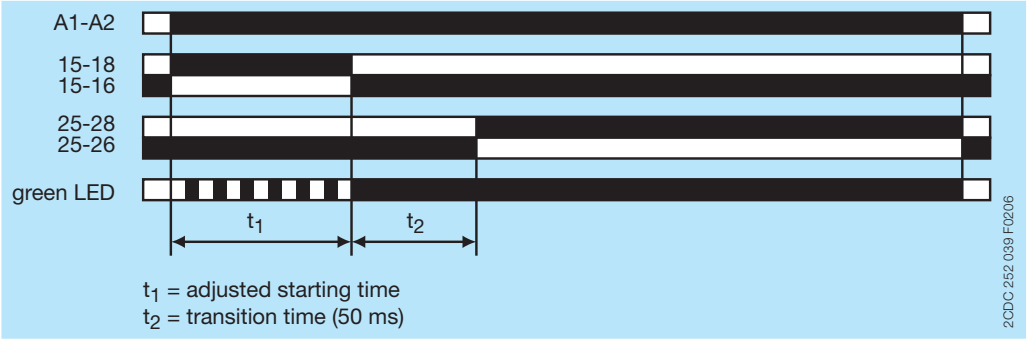


⏃1⎍ Star-delta change-over with impulse

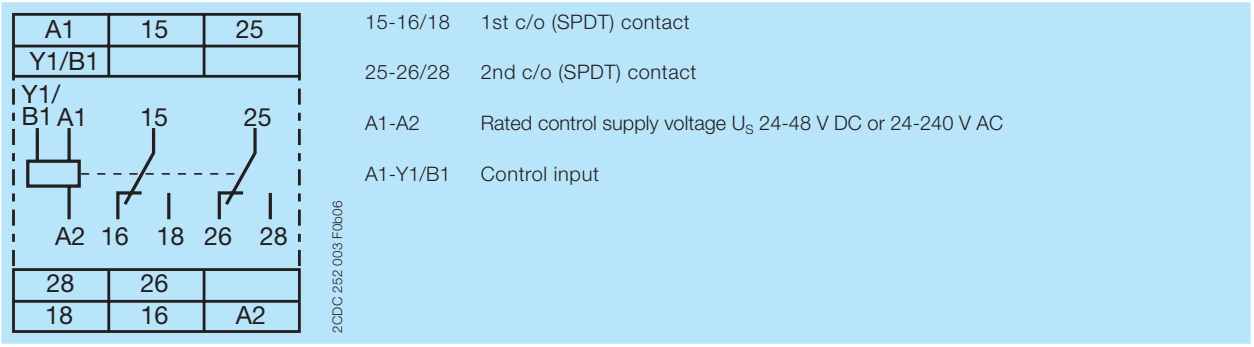
This function requires continuous control supply voltage for timing.

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 (SPDT) 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 (SPDT) 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.



Electrical connection



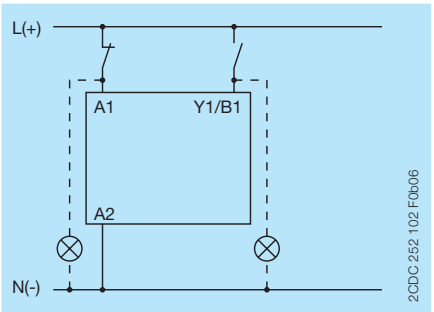
15-16/18	1st c/o (SPDT) contact
25-26/28	2nd c/o (SPDT) contact
A1-A2	Rated control supply voltage U_S 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input

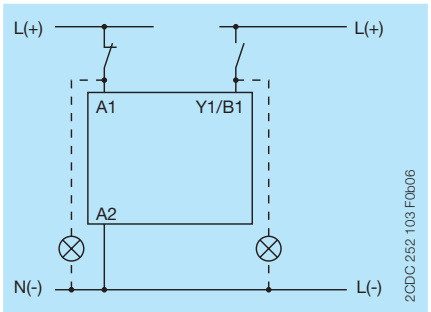
Connection diagram

Wiring instructions

Control input (voltage-related triggering)

The control input Y1/B1 is triggered with electric potential against A2. It is possible to use the control supply voltage from terminal A1 or any other voltage within the rated control supply voltage range.





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		24-48 V DC, 24-240 V AC		
Rated control supply voltage U_S tolerance		-15...+10 %		
Rated frequency	DC	n/a		
	AC	50/60 Hz		
Frequency range	AC	47-63 Hz		
Typical current / power consumption		24 V DC	230 V AC	115 V AC
	24-48 V DC	20 mA / 0.5 W	- / -	- / -
	24-240 V AC	- / -	70 mA / 16 VA	53 mA / 6.1 VA
Power failure buffering time	24 V DC	min. 15 ms		
	230 V AC	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
Restistance to reverse polarity		yes
Polarized		no
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 consumption of the control input	24 V DC	1.2 mA
	230 V AC	8 mA

Timing circuit		
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, starting with ON or OFF Star-delta change-over Pulse former Accumulative ON-delay 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		< 80 ms
Repeat accuracy (constant parameters)		Δt <± 0.2 %
Accuracy within the rated control supply voltage tolerance		Δt < 0.004 %/V
Accuracy within the temperature range		Δt < 0.03 %/°C
Setting accuracy of time delay		± 6 % of full-scale value
Star-delta transition time		fixed, 50 ms
Star-delta transition time tolerance		± 2 ms

User interface

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

Output circuits

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 / 10 mA
Maximum switching voltage / Maximum switching current		see 'Load limit curves' on page 12
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
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making / breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		30 x 10^6 switching cycles
Electrical lifetime	AC-12, 230 V, 4 A	0.1 x 10^6 switching cycles
Frequency of operation, with/without load		360/72000 h^{-1}
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	22.5 x 85.6 x 103.7 mm (0.89 x 3.37 x 4.08 in)	
	packaging dimensions	97 x 109 x 30 mm (3.82 x 4.29 x 1.18 in)	
Weight		**Screw connection technology**	**Easy Connect Technology (push-in)**
	net weight	0.142 kg (0.313 lb)	0.131 kg (0.289 lb)
	gross weight	0.164 kg (0.362lb)	0.153 kg (0.337 lb)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position		any	
Minimum distance to other units	vertical	not necessary	
	horizontal	not necessary	
Material of housing		UL 94 V-0	
Degree of protection	housing	IP50	
	terminals	IP20	

Electrical connection

		Screw connection technology	**Easy Connect Technology (push-in)**
Connecting capacity	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm² (1 x 18-14 AWG) 2 x 0.5-1.5 mm² (2 x 18-16 AWG)	2 x 0.5-1.5 mm² (2 x 18-16 AWG)
	rigid	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6 - 0.8 Nm (7.08 lb.in)	-

Environmental data

Ambient temperature ranges	operation	-25...+60 °C
	storage	-40...+85 °C
Relative humidity range		25 % to 85 %
Vibration, sinusoidal (IEC/EN 60068-2-6)	functioning	40 m/s², 10-58/60-150 Hz
	resistance	60 m/s², 10-58/60-150 Hz, 20 cycles
Vibration, seismic (IEC/EN 60068-3-3)	functioning	20 m/s²
Shock, half-sine (IEC/EN 60068-2-27)	functioning	150 m/s², 11 ms, 3 shocks/direction
	resistance	300 m/s², 11 ms, 3 shocks/direction

Isolation data

Rated insulation voltage U_i	input circuit / output circuit	500 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 between all isolated circuits (test voltage)		2.0 kV; 50 Hz, 1 min
Basic insulation (IEC/EN 61140)	input circuit / output circuit	500 V
Protective separation (IEC/EN 61140; EN 50178)	input circuit / output circuit	250 V
Pollution degree		3
Overvoltage category		III

Standards / Directives

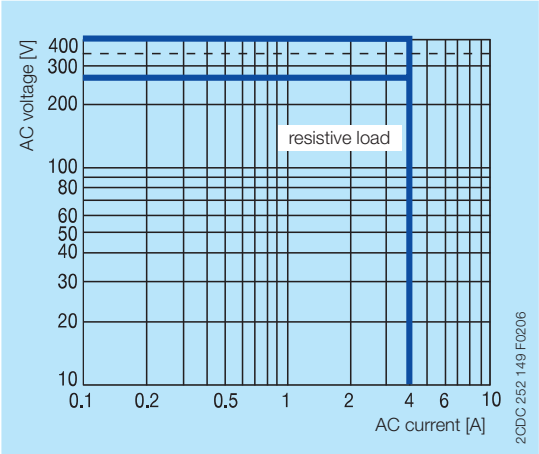
Standards	IEC/EN 61812-1
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

Electromagnetic compatibility

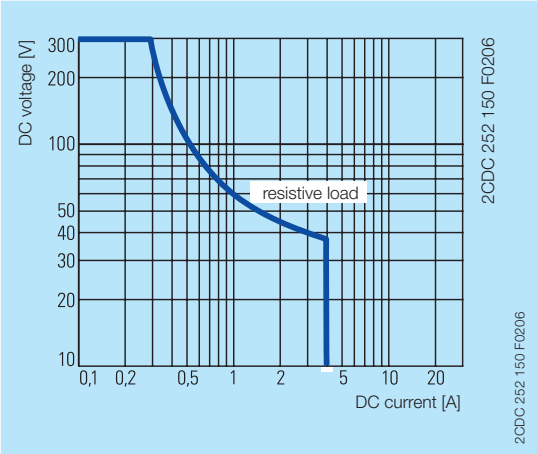
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3, 6 kV / 8 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz) / 1 V/m (2.7 GHz)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz
surge	IEC/EN 61000-4-5	Level 4, 2 kV A1-A2
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3, 10 V
harmonics and interharmonics	IEC/EN 61000-4-13	Class 3
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

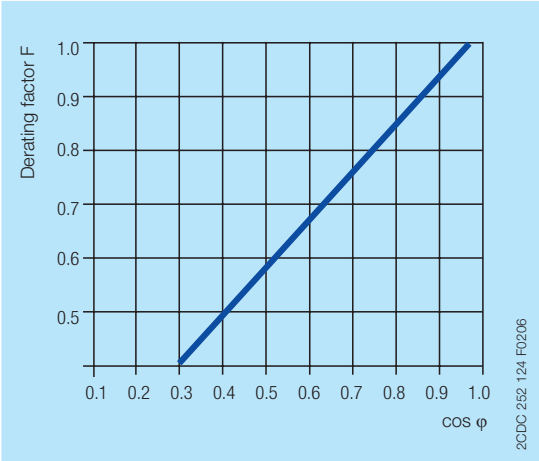
Load limit curves



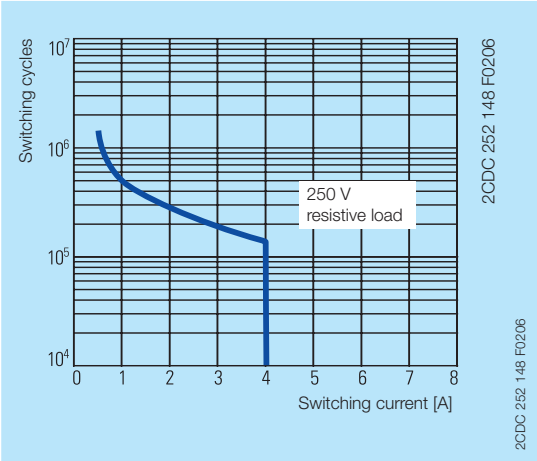
AC load (resistive)



DC load (resistive)



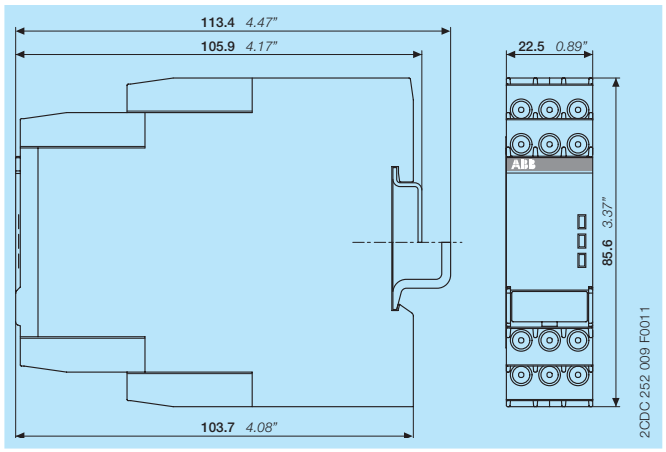
Derating factor F for inductive AC load



Contact lifetime

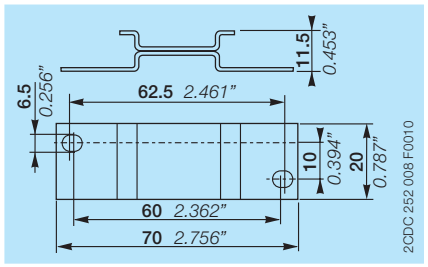
Dimensions

in **mm** and *inches*

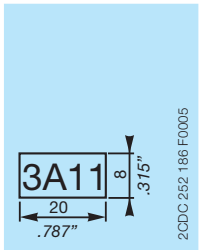


Accessories

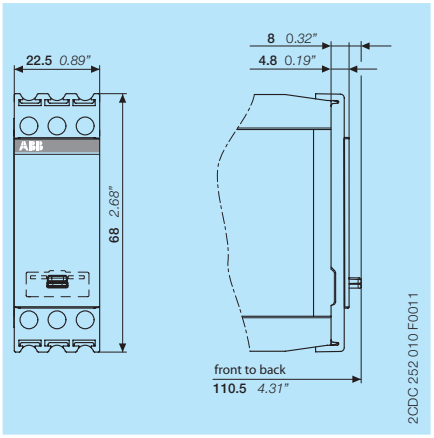
in **mm** and *inches*



ADP.01 - Adapter for screw mounting



MAR.01 - Marker label



COV.11 - Sealable transparent cover

Further documentation

Document title	Document type	Document number
Electronic Products and Relays	Technical catalogue	2CDC 110 004 C02xx
CT-APS, CT-ERS, CT-MVS, CT-SDS	Instruction manual	1SVC 730 020 M0000

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
local sales organization on the
ABB home page
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-> Low Voltage Products and Systems

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