Electronic timer CT-MVS.23 Multifunctional with 2 c/o (SPDT) contacts

The CT-MVS.23 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).



Characteristics

- Rated control supply voltage 380-440 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
- 3 LEDs for the indication of operational states
- Various certifications and approvals (see overview, document no. 2CDC112245D0201)

Order data

Electronic timers

| Туре | Rated control supply voltage | Connection technology | Time ranges | Order code |
|------------|------------------------------|-----------------------|----------------|--------------------|
| CT-MVS.23P | 380-440 V AC | Push-in terminals | 0.05 s - 300 h | 1SVR 740 021 R2300 |
| CT-MVS.23S | 380-440 V AC | Screw type terminals | 0.05 s - 300 h | 1SVR 730 021 R2300 |

Accessories

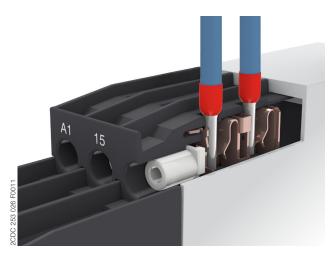
| Туре | Description | Order code |
|--------|---|--------------------|
| ADP.01 | Adapter for screw mounting | 1SVR 430 029 R0100 |
| MAR.01 | Marker label for devices without DIP switches | 1SVR 366 017 R0100 |
| COV.11 | Sealable transparent cover | 1SVR 730 005 R0100 |



Connection technology

Maintenance free Easy Connect Technology with push-in terminals

Type designation CT-xxS.yyP

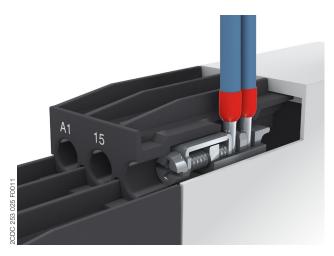


Push-in terminals

- 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



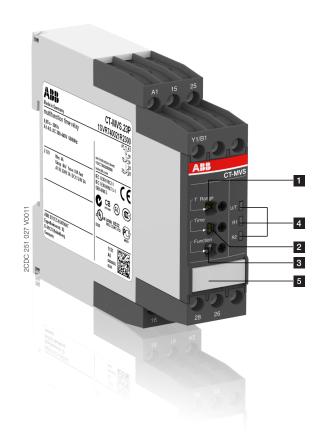
Double-chamber cage connection terminals

- 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



- 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

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

△1Л 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.

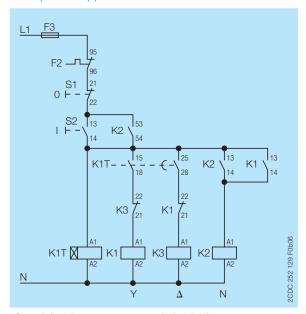
Operating mode

The CT-MVS.23 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.

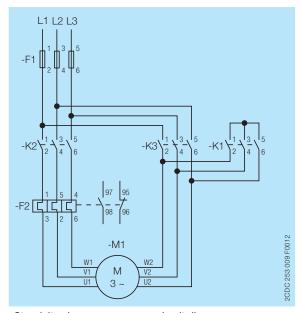
One of 10 time ranges, from 0.05 s to 300 h, can be selected with another rotary switch. The fine adjustment of the time delay is made via an internal potentiometer, with a direct reading scale, on the front of the unit.

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

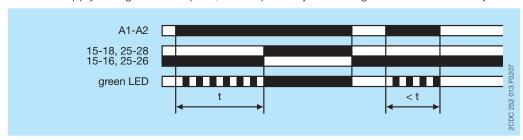
Function diagrams

M 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.

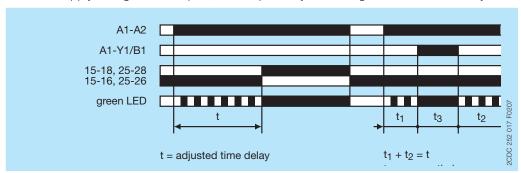


This function requires continuous control supply voltage for timing.

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.



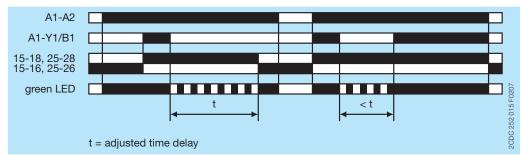
OFF-delay with auxiliary voltage

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.



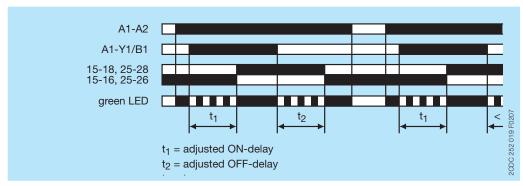
Symmetrical ON- and OFF-delay

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.

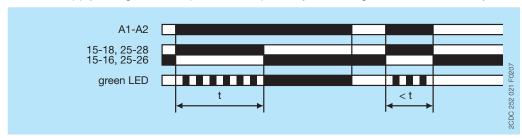


1 Impulse-ON

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.



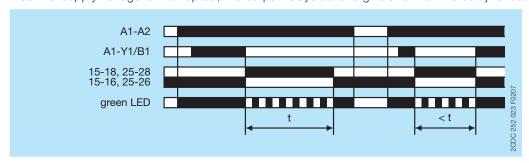
1 Impulse-OFF with auxiliary voltage

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 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.

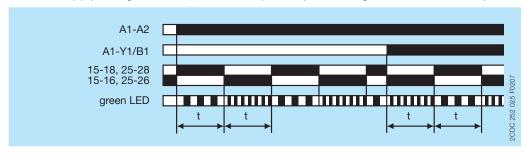


∏ ☐ Flasher, starting with ON or OFF

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.

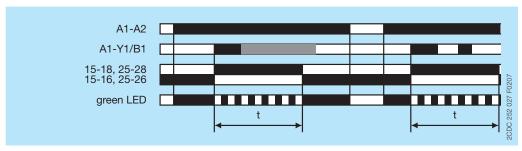


Pulse former

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.



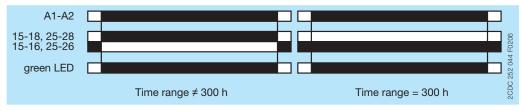
□ ON/OFF-function

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.

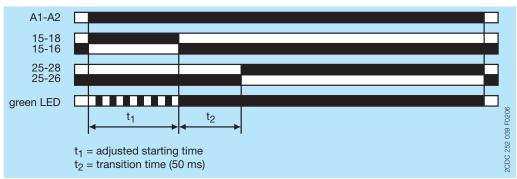


△1Л Star-delta change-over with impulse

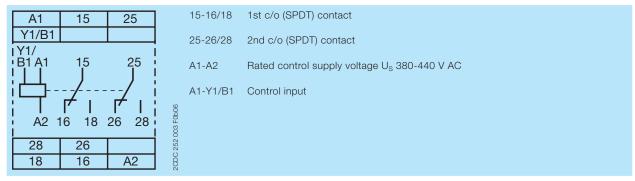
This function requires continuous control supply voltage for timing.

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

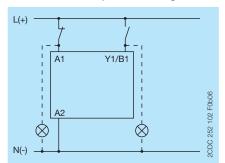


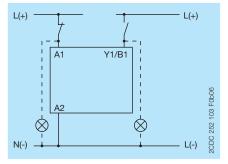
Connection diagram

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 | | 380 - 440 V AC | |
| ed 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 | 400 V AC | 4 mA / 1.6 VA | |
| Power failure buffering time | 400 V AC | min. 20 ms | |
| Release voltage | | $>$ 10 % of the min. rated control supply voltage $\mathrm{U_s}$ | |
| 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 400 V AC | | 6 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 ON/OFF-function | |
| Time ranges 0.05 a. 200 h | | | |
| 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 | | < 60 ms | |
| Repeat accuracy (constant parameters) | | ∆t <± 0.2 % | |
| Accuracy within the rated control supply voltage tolerance | | ∆t < 0.004 %/V | |
| Accuracy within the temperature range | | ∆t < 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 | \tag{\tag{\tag{\tag{\tag{\tag{\tag{ | |
| Relay status | R: yellow LED | : output relay energized | |

Output circuits

| Kind of output 15-16/18 25-26/28 | | relay, 1st c/o (SPDT) contact | |
|---|--------------------------------|--|--|
| | | relay, 2nd c/o (SPDT) contact | |
| Contact material | | Cd-free | |
| Rated operational voltage U _e | | 250 V | |
| Minimum switching voltage / Minimum switching c | urrent | 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 | B 300 | |
| | Circuit Rating Code) | | |
| | max. rated operational voltage | 300 V AC | |
| | max. continuous thermal | 5 A | |
| | current at B 300 | | |
| 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 | n/c contact | 6 A fast-acting | |
| protection | n/o contact | 10 A fast-acting | |

General data

| MTBF | | on request | |
|--|--|-----------------------------------|--------------------------------------|
| Duty time | | 100 % | |
| Dimensions | | see 'Dimensional drawing' | |
| | | Screw connection technology | Easy Connect Technology (push-in) |
| | |) () | 0.133 kg (0.293 lb) |
| Mounting | | DIN rail (IEC/EN 60715), | |
| | | snap-on mounting without any tool | |
| Mounting position | | any | |
| Minimum distance to other units vertica | | not necessary | |
| | | 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) | 1 x 0.5-2.5 mm ² | 2 x 0.5-1.5 mm ² |
| | wire end ferrule | (1 x 18-14 AWG) | (2 x 18-16 AWG) |
| | | 2 x 0.5-1.5 mm ² | |
| | | (2 x 18-16 AWG) | |
| | rigid | 1 x 0.5-4 mm ² | 2 x 0.5-1.5 mm ² |
| | | (1 x 20-12 AWG) | (2 x 20-16 AWG) |
| | | 2 x 0.5-2.5 mm ² | |
| | | (2 x 20-14 AWG) | |
| Stripping length | | 8 mm (0.32 in) | |
| Tightening torque | | 0.6 - 0.8 Nm | - |
| | | (7.08 lb.in) | |
| Recommended screw driver | | DIN ISO 2380-1: Form A | |

Environmental data

| Ambient temperature ranges | operation | -25+60 °C |
|--|-------------|-------------------------------------|
| | | -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 |
| | | 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) | | 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 | |
| Rated impulse withstand voltage U _{imp} | input circuit / output circuit | 6 kV; 1.2/50 μs |
| | output circuit 1 / output circuit 2 | · · |
| 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 | |
| Protective separation (IEC/EN 61140; EN 50178) | input circuit / output circuit | |
| Pollution degree | | 3 |
| Overvoltage category | | III |

Standards / Directives

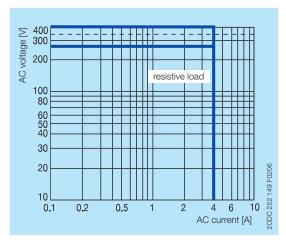
| Standards | IEC/EN 61812-1 |
|-----------------------|----------------|
| Low Voltage Directive | 2014/35/EU |
| EMC Directive | 2014/30/EU |
| RoHS Directive | 2011/65/EU |

Electromagnetic compatibility

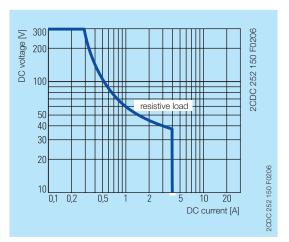
| | | IEC/EN 61000-6-2 |
|---|------------------------|-----------------------|
| electrostatic discharge | IEC/EN 61000-4-2 | |
| radiated, radio-frequency, electromagnetic field | IEC/EN 61000-4-3 | |
| electrical fast transient / burst | IEC/EN 61000-4-4 | Level 3, 2 kV / 5 kHz |
| surge | IEC/EN 61000-4-5 | |
| conducted disturbances, induced by radio-frequency fields | | |
| harmonics and interharmonics | IEC/EN 61000-4-13 | |
| Interference emission | | IEC/EN 61000-6-3 |
| | IEC/CISPR 22, EN 55022 | |
| high-frequency conducted | IEC/CISPR 22, EN 55022 | |

Technical diagrams

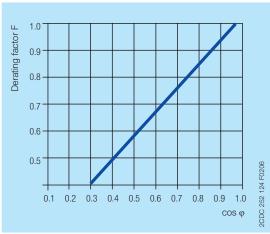
Load limit curves



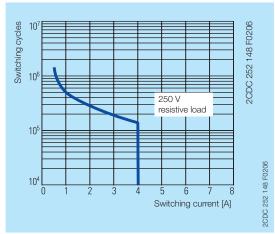
AC load (resistive)



DC load (resistive)



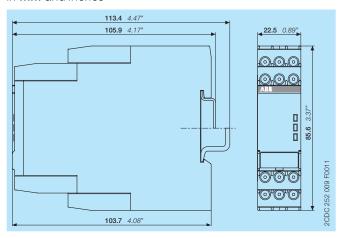
Derating factor F for inductive AC load



Contact lifetime

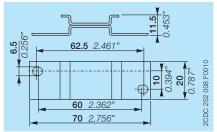
Dimensions

in mm and inches



Accessories

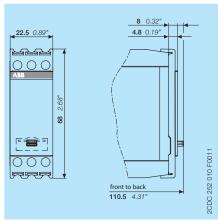
in **mm** and *inches*



ADP.01 - Adapter for screw mounting



MAR.01 - Marker label



COV.11 - Sealable transparent cover

Further documentation

| Document title | Document type | Document number |
|--------------------------------|--------------------|--------------------|
| Electronic relays and controls | : | 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

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You can find the address of your local sales organization on the ABB home page http://www.abb.com/contacts -> Low Voltage Products and Systems

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