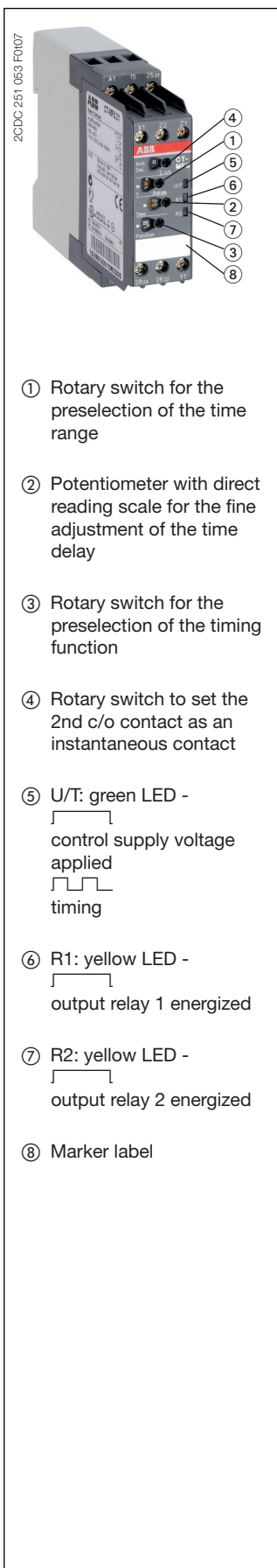


Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts






Data sheet





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)
- Extended operating temperature range down to -40 °C
- 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

Marks

-  CE
-  C-Tick

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 |

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Marker label

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

Remote potentiometer

50 k Ω ±20 % - 0.2 Ω , degree of protection IP66

| Type | Material | Diameter in mm | Order code |
|---------|-----------------|----------------|--------------------|
| MT-150B | black plastic | 22.5 | 1SFA 611 410 R1506 |
| MT-250B | chromed plastic | 22.5 | 1SFA 611 410 R2506 |
| MT-350B | chromed metal | 22.5 | 1SFA 611 410 R3506 |

Adaptor for reduction of 30 mm hole to 22.5 mm

| Type | Material | Order code |
|----------|---------------|--------------------|
| KA1-8029 | black plastic | 1SFA 616 920 R8029 |
| KA1-8030 | chromed metal | 1SFA 616 920 R8030 |

Legend plates for remote potentiometer

| Type | Marking | Order code |
|---------------|---|--------------------|
| SK 615 562-87 | Symbol (see drwg. in data sheet remote potentiometer) | GJD6 155 620 R0087 |
| SK 615 562-88 | Skale 0 - 10 | GJD6 155 620 R0088 |
| MA16-1060 | Skale 0 - 30 | 1SFA 611 940 R1060 |

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.

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

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

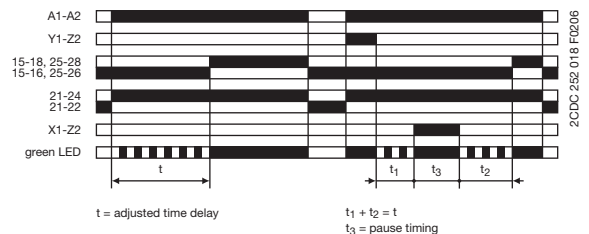
This function requires continuous control supply voltage for timing.

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.



Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Function diagrams

■ OFF-delay with auxiliary voltage

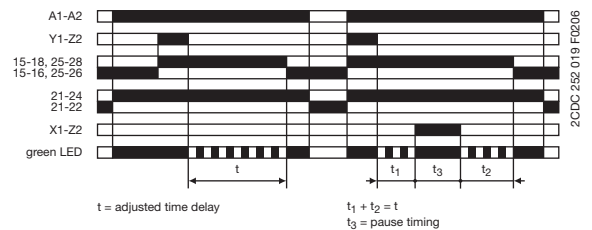
This function requires continuous control supply voltage for timing.

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

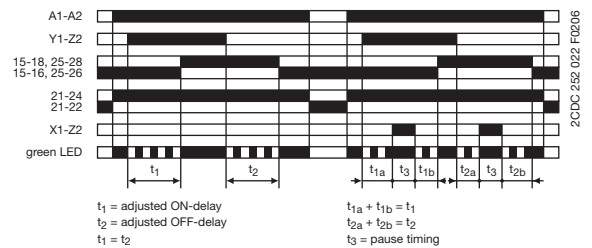
This function requires continuous control supply voltage for timing.

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.



Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Function diagrams

1.1.1 Impulse-ON

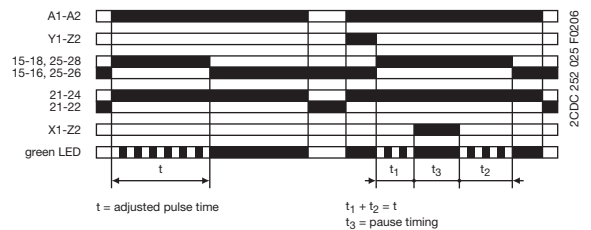
This function requires continuous control supply voltage for timing.

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.



1.1.2 Impulse-OFF with auxiliary voltage

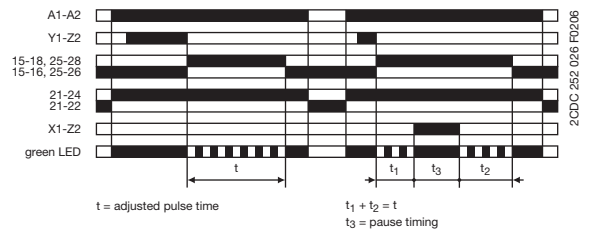
This function requires continuous control supply voltage for timing.

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.



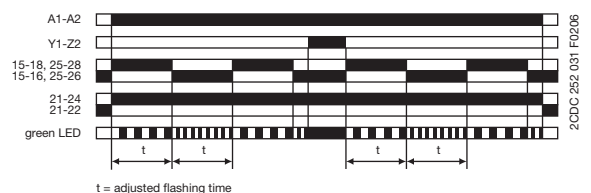
1.1.3 Flasher with reset, starting with ON

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.



Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Function diagrams

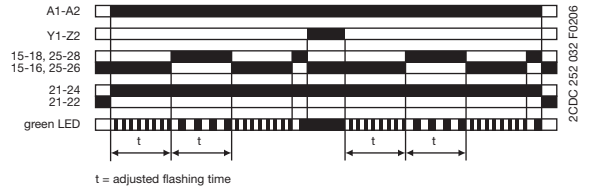
Flasher with reset, starting with OFF

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.

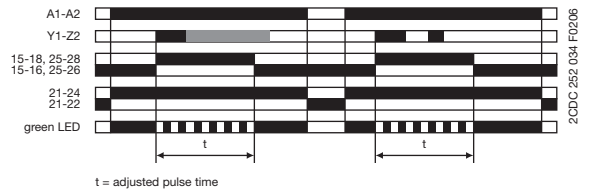


Pulse former

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.



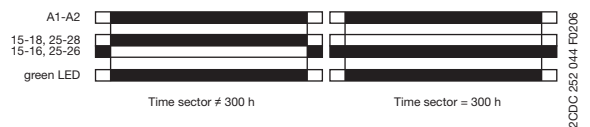
ON/OFF-function

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.



Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

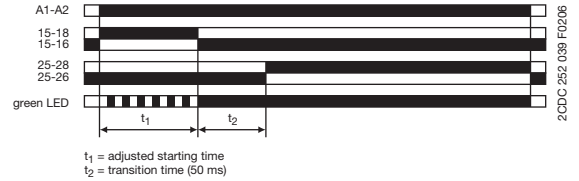
Function diagrams

△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.

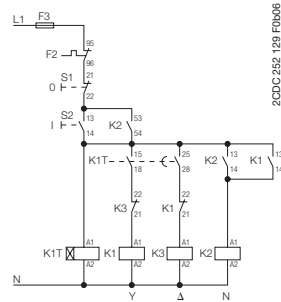
Now, the fixed transition time t_2 of 50 ms starts. When the transition time is complete, the second c/o contact energizes the delta contactor connected to terminals **25-28**. The delta contactor remains energized as long as control supply voltage is applied to the unit.



Examples of application

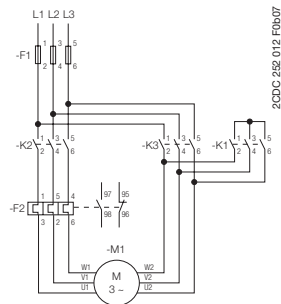
Star-delta change-over

Control circuit diagram



Star-delta change-over

Power circuit diagram

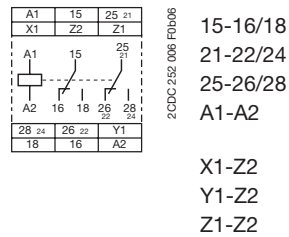


Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Connection diagram

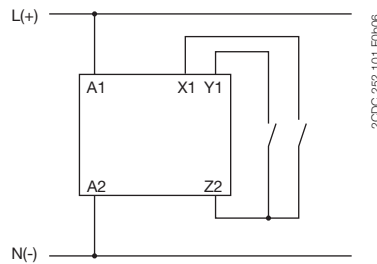


- 1. c/o contact
- 2. c/o contact as instantaneous contact
- 2. c/o contact
- Rated control supply voltage U_s
24-240 V AC/DC
- Control input
- Control input
- Remote potentiometer connection

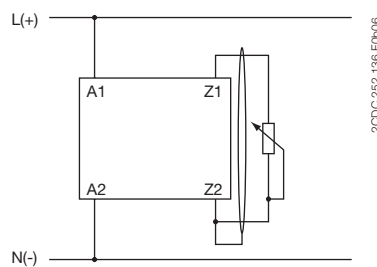
Wiring instructions

Control inputs

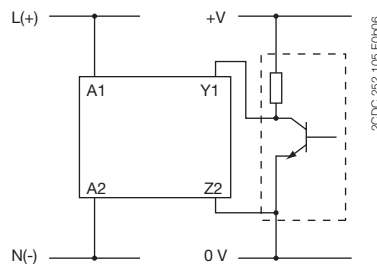
(volt-free triggering)



Remote potentiometer



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



Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Technical data





Data at $T_a = 25\text{ °C}$ and rated values, unless otherwise 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 | 24-240 V AC/DC | 24 V DC | 230 V AC | 115 V AC |
| | | 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 | 24 V DC | min. 15 ms | | |
| | 230 V AC | min. 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 k Ω | | |
| 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 | | |
| Repeat accuracy (constant parameters) | | $\Delta t \leq \pm 0.2\%$ | | |
| Accuracy within the rated control supply voltage tolerance | | $\Delta t < 0.004\%/V$ | | |
| Accuracy within the temperature range | | $\Delta t < 0.03\%/^{\circ}C$ | | |
| Star-delta transition time | | fixed, 50 ms | | |
| Star-delta transition time tolerance | | $\pm 2\text{ ms}$ | | |

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

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 | |
| 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 | | 0.1 x 10 ⁶ switching cycles (AC12, 230 V, 4 A) | |
| Maximum fuse rating to achieve short-circuit protection (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 % | |
| 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 (IEC/EN 60715), snap-on mounting without any tool | |
| Degree of protection | enclosure / terminals | IP50 / IP20 | |

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

| 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 |
| Environmental data | | 1SVR 630 010 R0200 |
| Ambient temperature range | operation | -40...+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) | functioning | 40 m/s ² , 10-58/60-150 Hz |
| | resistance | 60 m/s ² , 10-58/60-150 Hz, 20 cycles |
| Vibration, seismic (IEC/EN 60068-3-3) | functioning | 20 m/s ² |
| Shock, half-sine (IEC/EN 60068-2-27) | functioning | 100 m/s ² , 11 ms, 3 shocks/direction |
| | resistance | 300 m/s ² , 11 ms, 3 shocks/direction |
| 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} (IEC/EN 60664-1, VDE 0110) | between all isolated circuits | 4 kV; 1.2/50 µs |
| Power-frequency withstand voltage test (test voltage) | between all isolated circuits | routine test: 2.0 kV; 50 Hz, 1 s type test: 2.5 kV; 50 Hz, 1 min |
| 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 60664-1, VDE 0110, UL 508) | | 3 |
| Overvoltage category (IEC/EN 60664-1, VDE 0110, UL 508) | | III |
| 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/EC |

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

| Electromagnetic compatibility | | 1SVR 630 010 R0200 |
|---|------------------------|--------------------------------------|
| Interference immunity to | | IEC/EN 61000-6-1 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 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 | Level 3 |
| Interference emission | | IEC/EN 61000-6-3 IEC/EN 61000-6-4 |
| high-frequency radiated | IEC/CISPR 22, EN 55022 | Class B |
| high-frequency conducted | IEC/CISPR 22, EN 55022 | Class B |

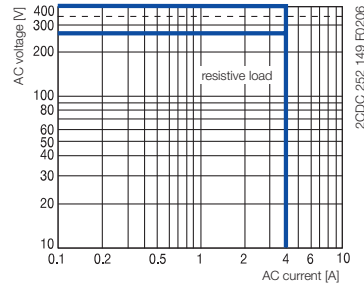
Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

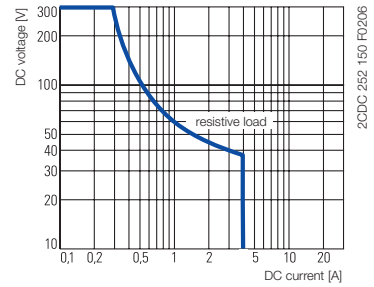
Data sheet

Technical diagrams

Load limit curve

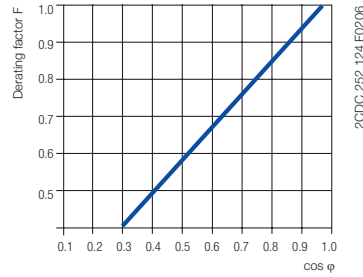


AC load (resistive)

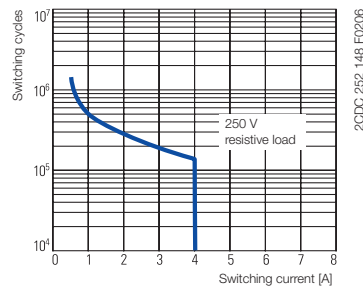


DC load (resistive)

Derating factor F

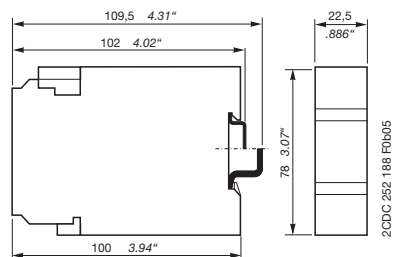


Contact lifetime



Dimensions

in mm



CT-MFS.21

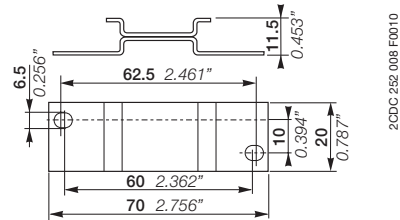
Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

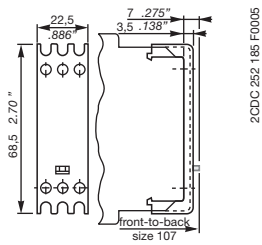
Data sheet

Dimensions accessories

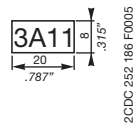
in mm



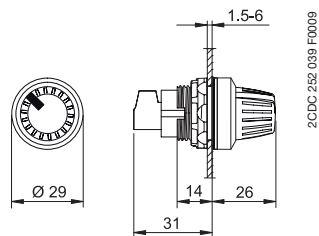
ADP.01 - Adapter for screw mounting on panel



COV.01 - Sealable transparent cover



MAR.01 - Marker label



Remote potentiometer

Electronic timer CT-MFS.21

Multifunctional with 2 c/o contacts

Data sheet

Synonyms

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

Further documentation

| Document title | Document type | Document number |
|---|---------------------|--------------------|
| Electronic Products and Relays | Technical catalogue | 2CDC 110 004 C020x |
| CT-AHS, CT-ARS, CT-MBS, CT-MFS | Instruction manual | 1SVC 630 010 M0000 |
| Remote potentiometer for CT-S range time relays | Data sheet | 2CDC 111 108 D0201 |

You can find the documentation on the internet at www.abb.com/lowvoltage → Control Products → Electronic Relays and Controls

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