Data sheet

# Electronic timer CT-MFE
## Multifunctional with 1 c/o (SPDT) contact

The CT-MFE is a multifunctional electronic time relay. It is from the CT-E range.

The CT-E range is the economic range of ABB‘s time relays and offers a cost effective price-performance ratio for OEM users. This is achieved by simplified functionality and results in the simplest of setup procedures. The CT-E range is ideally suited for repeat applications.


### Characteristics

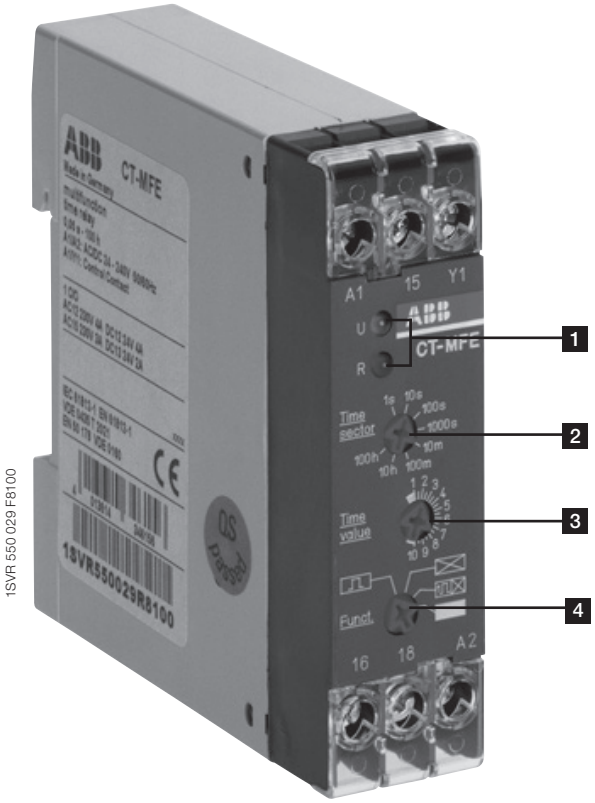
- One device includes 8 times ranges, from 0.05 s to 100 h
- Rated control supply voltage range from 24 to 240 V AC/DC
- Multifunction timer with 6 timing functions:
  ON-delay, OFF-delay, impulse-ON, flasher starting with ON, flasher starting with OFF, pulse former
- Timing can be started via an external, voltage-related control input
- 1 c/o (SPDT) contact
- 22.5 mm (0.89 in) width
- 2 LEDs for the indication of operational states

### Order data

| Type | Rated control supply voltage | Time range | Order code |
|---|---|---|---|
| CT-MFE | 24-240 V AC/DC | 0.05 s - 100 h | 1SVR 550 029 R8100 |

## Functions

### Operating controls




1SVR 550 029 F8100

**1 Indication of operational states**

U: green LED – Control supply voltage applied

R: red LED - Output relay energized

**2 Rotary switch for the preselection of the time range**

**3 Rotary switch for the fine adjustment of the time delay**

**4 Rotary switch for the selection of the timing function**

ON-Delay: ⊠, triggering via control supply voltage
OFF-Delay: ■, triggering via control input A1-Y1
Pulse former: 1⎍⊠, triggering via control input A1-Y1
Impulse-ON: 1⎍⊠ and control input A1-Y1 jumpered
Flasher starting with ON: ⎍ and control input A1-Y1 open
Flasher starting with OFF: ⎍ and control input A1-Y1 jumpered

### Application

Their conception makes the CT-E range timers ideal for repeat applications. 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

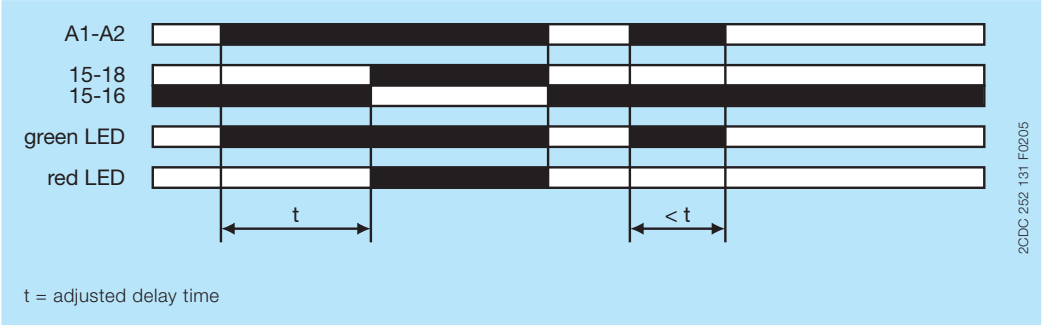
The CT-MFE with 1 c/o (SPDT) contact provides 6 timing functions. The function is rotary switch selectable on the front of the unit. Each function is indicated by an international function symbol. One of 8 time delay ranges, from 0.05 s to 100 h, can be selected with another rotary switch. The fine adjustment of the time delay is also made via a rotary switch.

## Function diagrams

### ON-delay (Delay on make)

Timing begins when control supply voltage is applied. When the selected time delay is complete, the output relay energizes. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset. Interrupting control supply voltage before the time delay is complete, resets the time delay. The output relay does not energize.

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




t = adjusted delay time

### OFF-delay with auxiliary voltage (Delay on break)

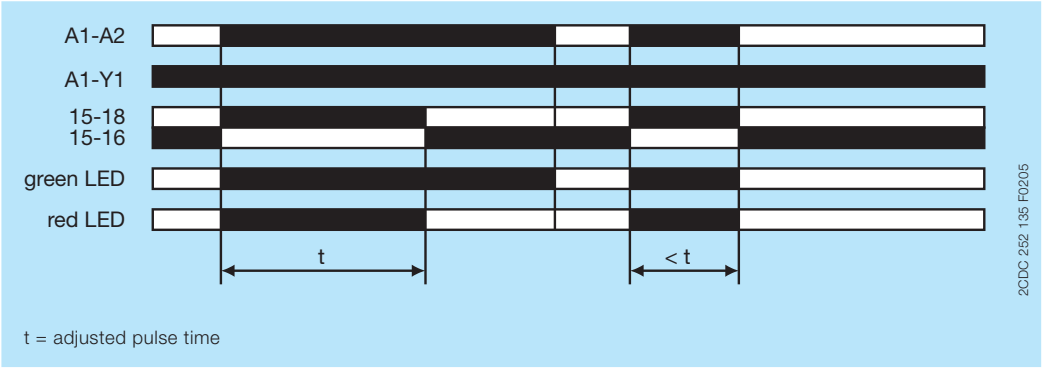
This function requires continuous control supply voltage for timing. Timing is controlled by control input A1-Y1. If the control input is closed, the output relay energizes. If control input A1-Y1 is opened, the selected time delay starts. When the time delay is complete, the output relay de-energizes. If control input A1-Y1 is closed before the time delay is complete, the time delay is reset. Timing starts again when the control input re-opens.


t = adjusted delay time

### Impulse-ON (Interval)

The output relay energizes immediately when control supply voltage is applied and de-energizes after the selected time delay time is complete. If control supply voltage is interrupted before the time delay is complete, the output relay de-energizes and the time delay is reset.

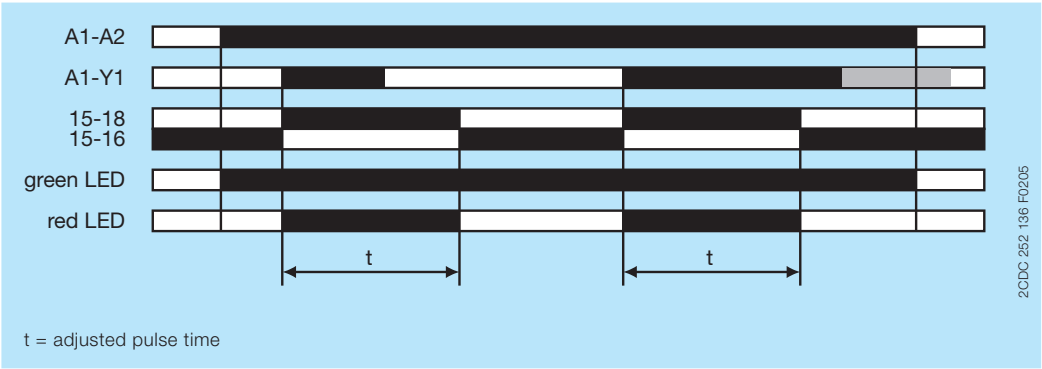
Control input A1-Y1 has to be jumpered, when this timing function is selected.




t = adjusted pulse time

### 1 Pulse former (Single shot)

Closing the control input A1-Y1, with control supply voltage applied, energizes the output relay for the selected ON time. Operating the control input during timing has no effect. When the ON time is complete, the output relay de-energizes. Timing can be restarted by re-closing control input A1-Y1. If control supply voltage is interrupted during timing, the output relay de-energizes and the ON time is reset.

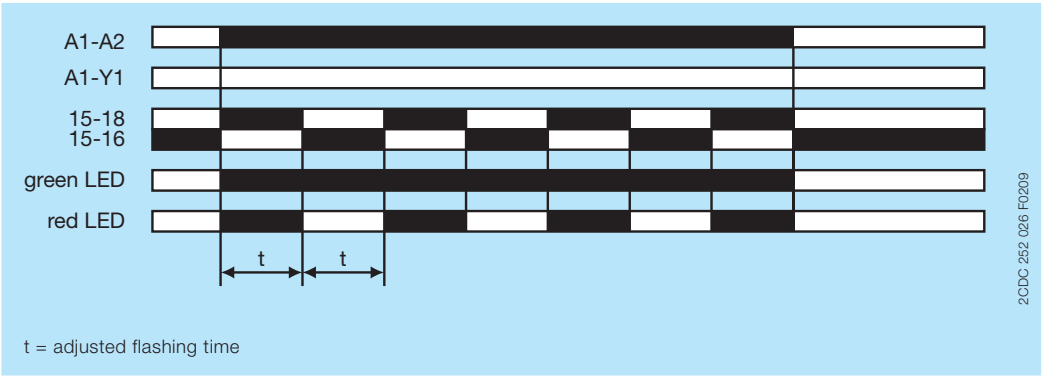



t = adjusted pulse time

### Flasher, starting with the ON time

Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an ON time first. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Control input A1-Y1 has to be open, when this timing function is selected.

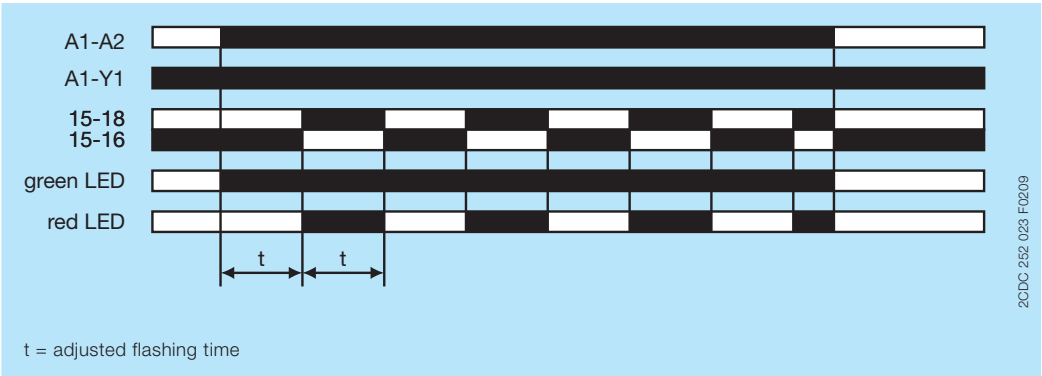



t = adjusted flashing time

### Flasher, starting with the OFF time

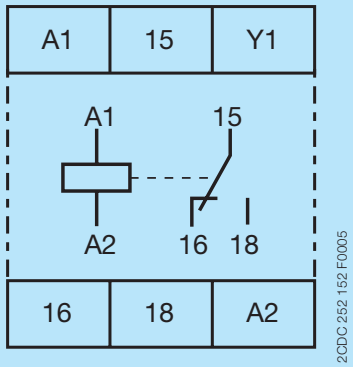
Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an OFF time first. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Control input A1-Y1 has to be jumpered, when this timing function is selected.




t = adjusted flashing time

## Electrical connection




| | |
|---|---|
| A1-A2 | Rated control supply voltage $U_s$: 24-240 V AC |
| A1-Y1 | Control input |
| 15-16/18 | 1 c/o (SPDT) contact |

**Connection diagram**

## Technical data

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

### Input circuits

| **Supply circuit** | | |
|---|---|---|
| Rated control supply voltage $U_s$ | A1-A2 | 24-240 V AC/DC |
| Rated control supply voltage $U_s$ tolerance | | -15...+10 % |
| Rated frequency | | DC or 50/60 Hz |
| Typical current / power consumption | 24-240 V AC/DC | approx. 1.0-2.0 VA/W |
| Release voltage | | > 10 % of the minimum control supply voltage |

| **Control circuit** | | |
|---|---|---|
| Control input, control function | A1-Y1 | start timing external |
| Kind of triggering | | voltage-related |
| Parallel load | | yes |
| Polarized | | no |
| Control voltage potential | | rated control supply voltage |
| Minimum control pulse length | | 20 ms |

| **Timing circuit** | |
|---|---|
| Time ranges | 0.05-1 s, 0.5-10 s, 5-100 s, 50-1000 s, 0.5-10 min, 5-100 min, 0.5-10 h, 5-100 h |
| Recovery time | < 50 ms |
| Repeat accuracy (constant parameters) | Δt < 1 % |
| Accuracy within the rated control supply voltage tolerance | Δt < 0.5 % / 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 | U: green LED | ⎍⎍: control supply voltage applied |
| Relay status | R: red LED | ⎍⎍: output relay energized |

### Output circuit

| | | |
|---|---|---|
| Kind of output | 15-16/18 | relay, 1 c/o (SPDT) contact |
| Contact material | | silver alloy |
| Rated operational voltage $U_e$ | | 250 V |
| Minimum switching voltage / current | | 12 V / 100 mA |
| Maximum switching voltage / current | | see ‚Load limit curves' |

| | | |
|---|---|---|
| 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 |
| | Maximum continuous thermal current at B300 | 5 A |
| | max. making/breaking apparent power at B300 | 3600 VA / 360 VA |
| Mechanical lifetime | | 10 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$^{-1}$ |
| Maximum fuse rating to achieve short-circuit protection | n/c contact | 10 A fast |
| | n/o contact | 10 A fast |

## General data

| | | |
|---|---|---|
| MTBF | | on request |
| Duty time | | 100 % |
| Dimensions | | see 'Dimensional drawings' |
| Weight | net weight | 0.070 kg (0.154 lb) |
| | gross weight | 0.086 kg (0.190 lb) |
| Mounting | | DIN rail (IEC/EN 60715), snap-on mounting without any tool |
| Mounting position | | any |
| Minimum distance to other units | | not necessary |
| Material of housing | lower section | UL 94 V-0 |
| | upper section | UL 94 V-2 |
| Degree of protection | housing | IP50 |
| | terminals | IP20 |

## Electrical connection

| | | |
|---|---|---|
| Connecting capacity | fine-strand with wire end ferrule | 2 x 0.75-1.5 mm² (2 x 18-16 AWG) |
| | fine-strand without wire end ferrule | 2 x 1-1.5 mm² (2 x 18-16 AWG) |
| | rigid | 2 x 0.75-1.5 mm² (2 x 18-16 AWG) |
| Stripping length | | 10 mm (0.39 in) |
| Tightening torque | | 0.6-0.8 Nm (5.31-7.08 lb.in) |

## Environmental data

| | | |
|---|---|---|
| Ambient temperature ranges | operation | -20...+60 °C |
| | storage | -40...+85 °C |
| Relative humidity range | | 4 x 24 h cycle, 40 °C, 93 % RH |
| Vibration, sinusoidal | IEC/EN 60068-2-6 | 20 m/s², 10-58/60-150 Hz |
| Shock, half-sine | IEC/EN 60068-2-27 | 150 m/s², 11 ms, 3 shocks/direction |

## Isolation data

| | | |
|---|---|---|
| Rated insulation voltage $U_i$ | between all isolated circuits | Control supply voltage up to 240 V: 300 V |
| | | Control supply voltage up to 440 V: 500 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, 1 min. |
| Basic insulation (IEC/EN 61140) | input/output | 300 V |
| Protective separation (IEC/EN 61140, EN 50178) | input/output | - |
| Pollution degree | | 3 |
| Overvoltage category | | III |

## Standards / Directives

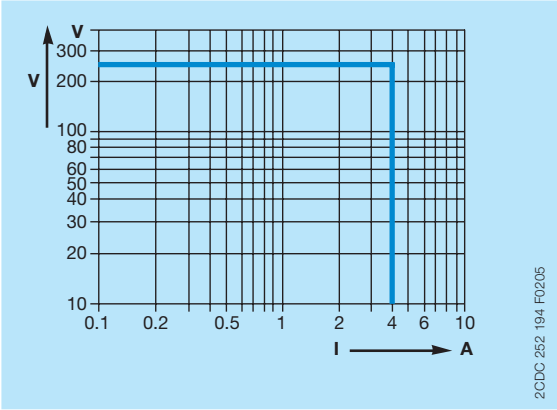
| | |
|---|---|
| Standards | IEC/EN 61812-1 |
| Low Voltage Directive | 2014/35/EU |
| EMC Directive | 2014/30/EU |
| RoHS Directive | 2011/65/EU |

## Electromagnetic compatibility

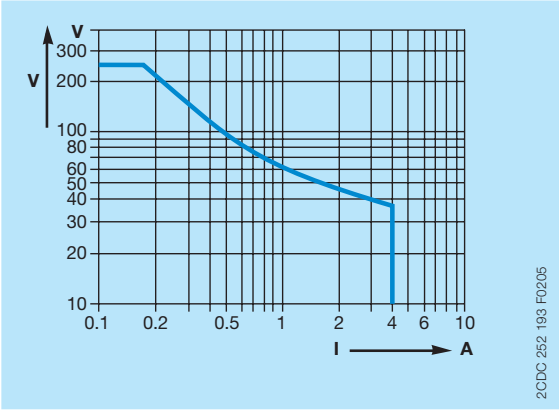
| | | |
|---|---|---|
| Interference immunity to | | IEC/EN 61000-6-2 |
| electrostatic discharge | IEC/EN 61000-4-2 | Level 3 (6 kV / 8 kV) |
| radiated, radio-frequency, electromagnetic field | IEC/EN 61000-4-3 | 10 V/m (1 GHz), 3 V/m (2 GHz), 1 V/m (2.7 GHz) |
| electrical fast transient / burst | IEC/EN 61000-4-4 | Level 3 (2 kV / 5 kHz) |
| surge | IEC/EN 61000-4-5 | Level 4 (2 kV 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

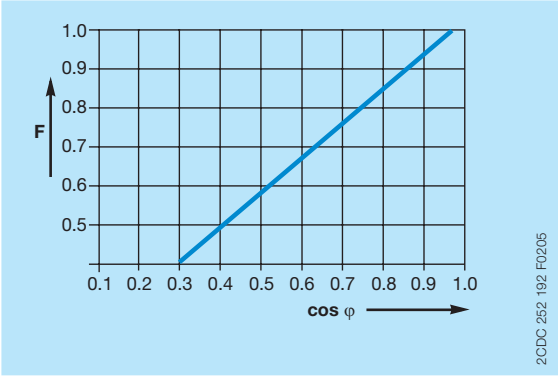
### Load limit curves



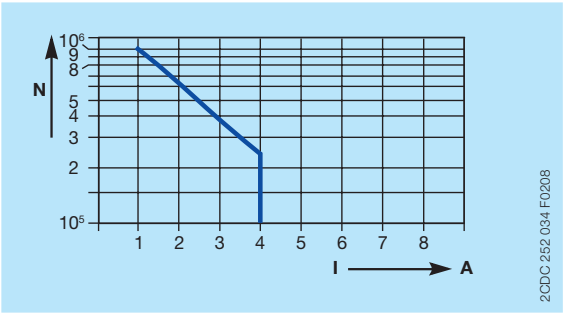

AC load (resistive)




DC load (resistive)



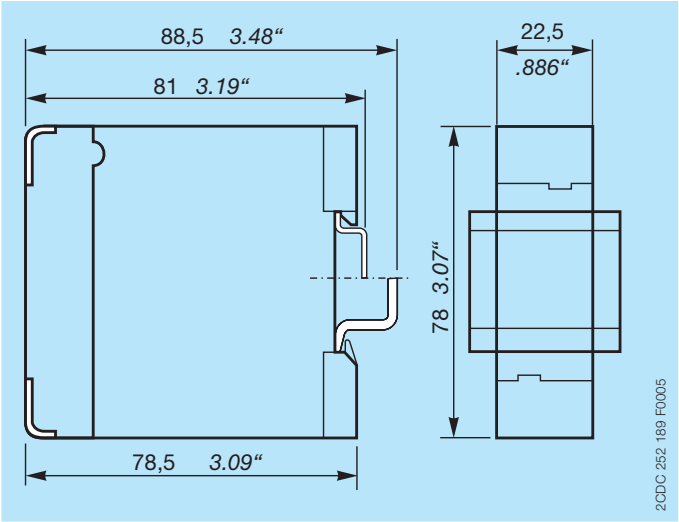

Derating factor F for inductive AC load




Contact lifetime /switching cycles N
220 V 50 Hz AC1, 360 cycles/h

## Dimensions

in **mm** and *inches*




## Further documentation

| Document title | Document type | Document number |
|---|---|---|
| Electronic relays and controls | Catalog | 2CDC 110 004 C02xx |

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

## 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.

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