

# 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.



1SVR 550 029 R8100

### Characteristics

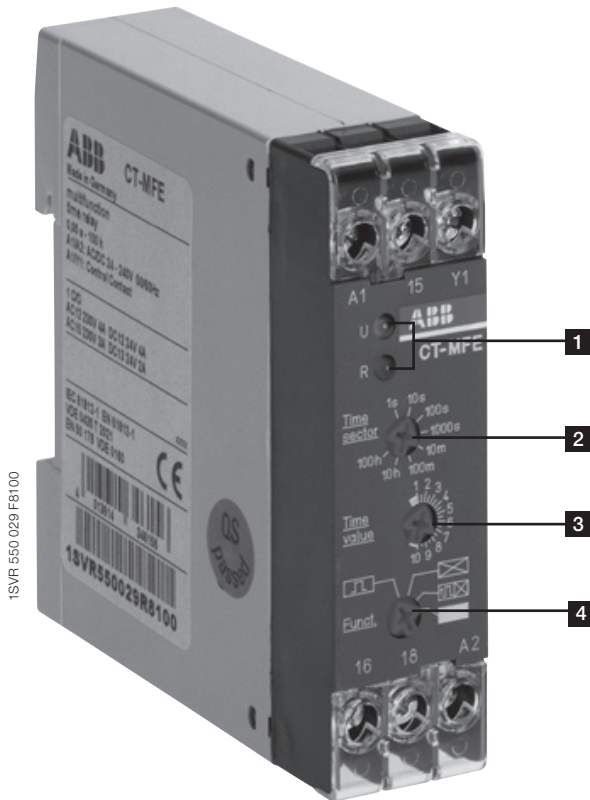
- One device includes 8 times ranges, from 0.05 s to 100 h
- Rated control supply voltage range from 24 to 240 V AC/DC
- Multifunction timer with 6 timing functions:  
ON-delay, OFF-delay, impulse-ON, flasher starting with ON, flasher starting with OFF, pulse former
- Timing can be started via an external, 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



#### 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: , triggering via control input A1-Y1

Impulse-ON:  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

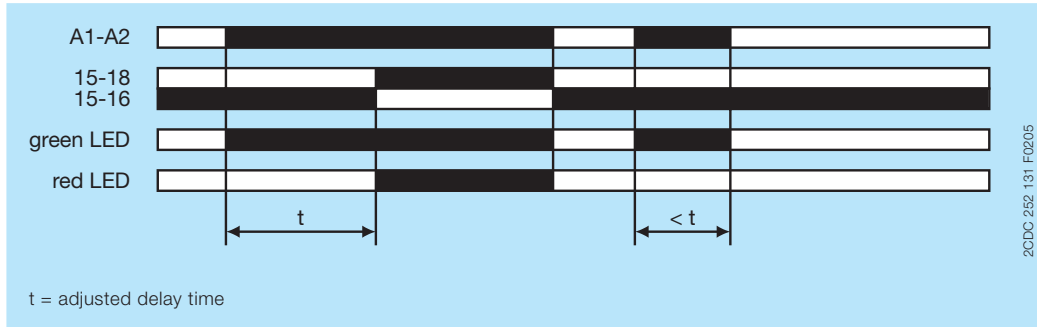
The CT-MFE with 1 c/o (SPDT) contact provides 6 timing functions. The function is rotary switch selectable on the front of the unit. Each function is indicated by an international function symbol. One of 8 time delay ranges, from 0.05 s to 100 h, can be selected with another rotary switch. The fine adjustment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



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

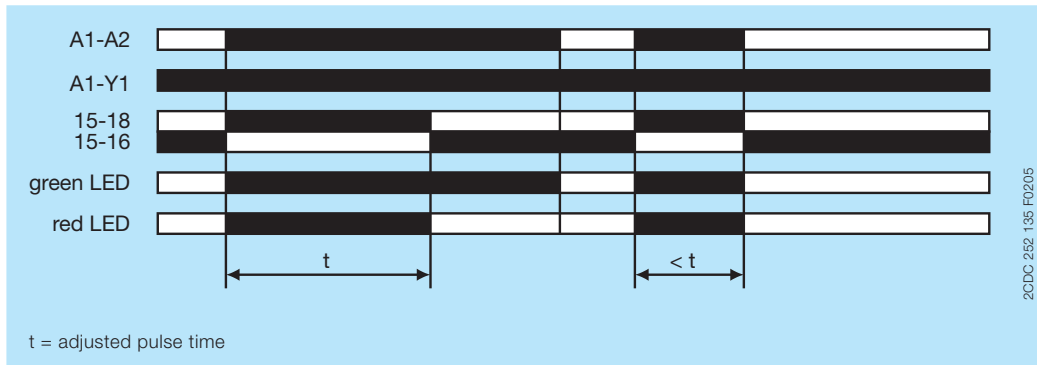
This function requires continuous control supply voltage for timing. Timing is controlled by control input A1-Y1. If the control input is closed, the output relay energizes. If control input A1-Y1 is opened, the selected time delay starts. When the time delay is complete, the output relay de-energizes.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



### 1▭☒ Impulse-ON (Interval)

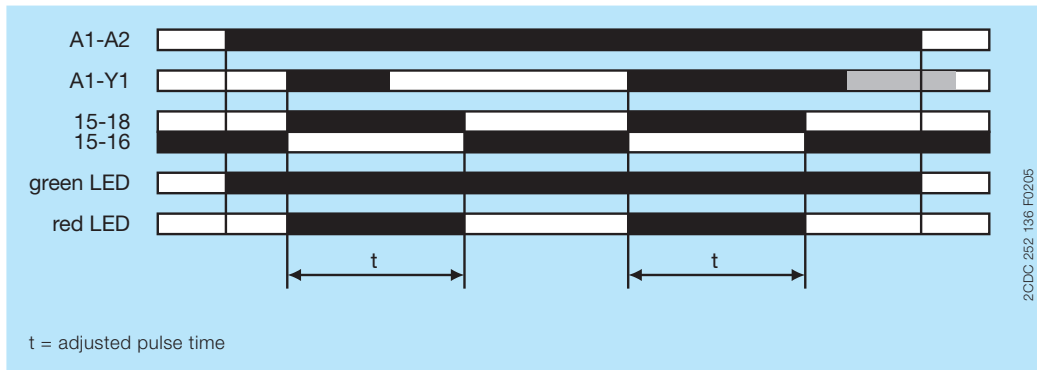
The output relay energizes immediately when control supply voltage is applied and de-energizes after the selected time delay time is complete. If control supply voltage is interrupted before the time delay is complete, the output relay de-energizes and the time delay is reset.

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



1  Pulse former (Single shot)

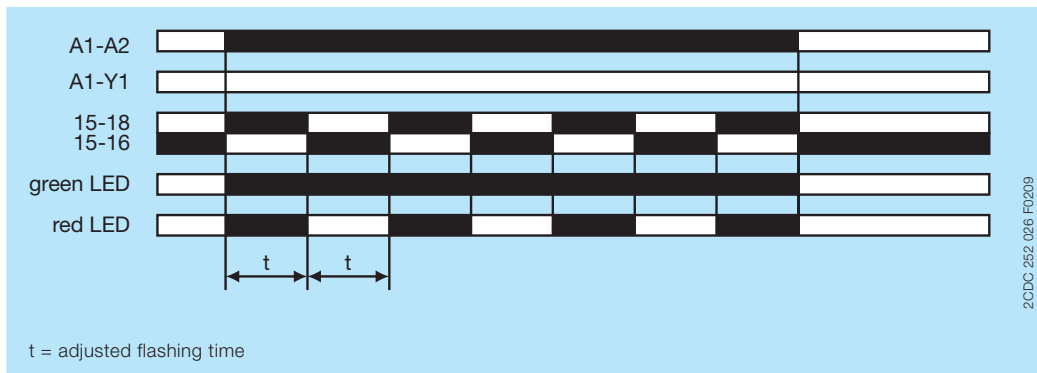
Closing the control input A1-Y1, with control supply voltage applied, energizes the output relay for the selected ON time. Operating the control input during timing has no effect. When the ON time is complete, the output relay de-energizes. Timing can be restarted by re-closing control input A1-Y1. If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



 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.

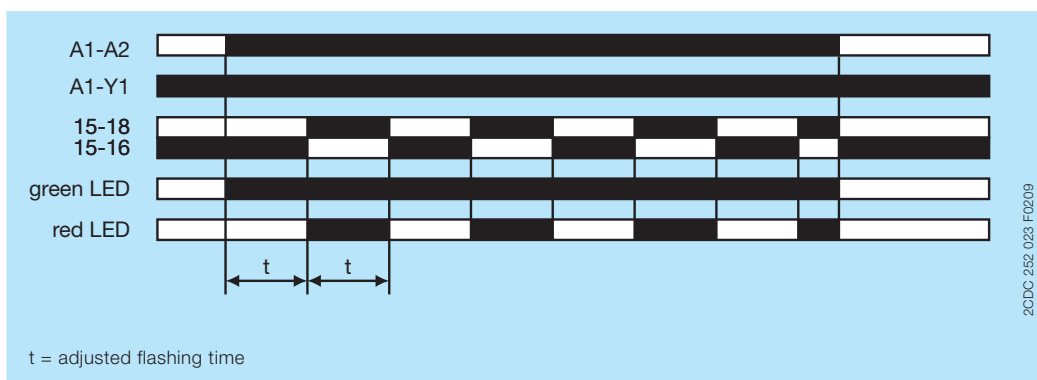
Control input A1-Y1 has to be open, when this timing function is selected.



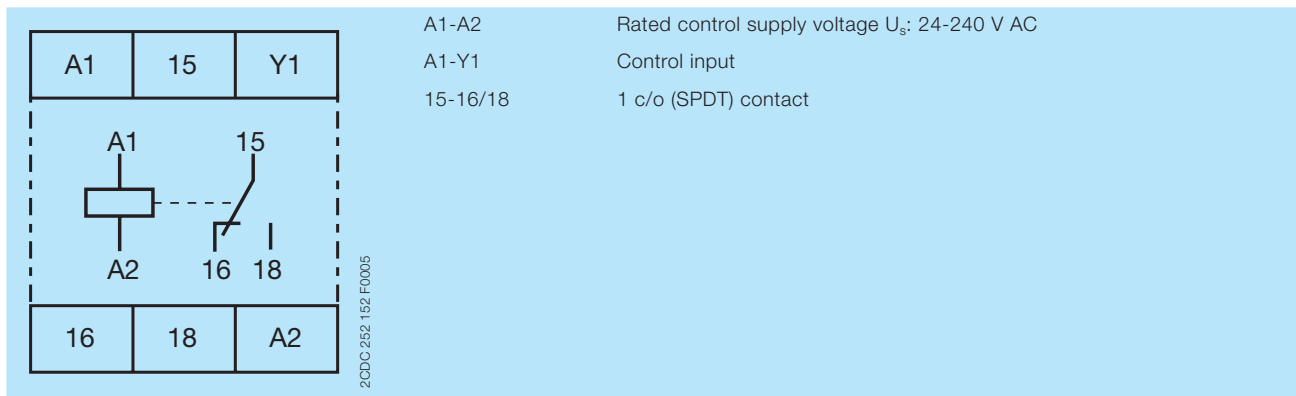
 Flasher, starting with the OFF time

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.



## Electrical connection



Connection diagram

## Technical data

Data at  $T_a = 25\text{ °C}$  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)		$\Delta t < 1\%$
Accuracy within the rated control supply voltage tolerance		$\Delta t < 0.5\% / V$
Accuracy within the temperature range		$\Delta t < 0.06\% / \text{°C}$
Setting accuracy of time delay		$\pm 10\%$ of full-scale value

### User interface

Indication of operational states		
Control supply voltage	U: green LED	<input type="checkbox"/> : control supply voltage applied
Relay status	R: red LED	<input type="checkbox"/> : output relay energized

### Output circuit

Kind of output	15-16/18	relay, 1 c/o (SPDT) contact
Contact material		silver alloy
Rated operational voltage $U_o$		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 <sup>6</sup> switching cycles
Electrical lifetime	AC-12, 230 V, 4 A	0.1 x 10 <sup>6</sup> switching cycles
Frequency of operation	with/without load	360/72000 <sup>-1</sup>
Maximum fuse rating to achieve	n/c contact	10 A fast
short-circuit protection	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 mm <sup>2</sup> (2 x 18-16 AWG)
	fine-strand without wire end ferrule	2 x 1-1.5 mm <sup>2</sup> (2 x 18-16 AWG)
	rigid	2 x 0.75-1.5 mm <sup>2</sup> (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/s <sup>2</sup> , 10-58/60-150 Hz
Shock, half-sine	IEC/EN 60068-2-27	150 m/s <sup>2</sup> , 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 $\mu$ s
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

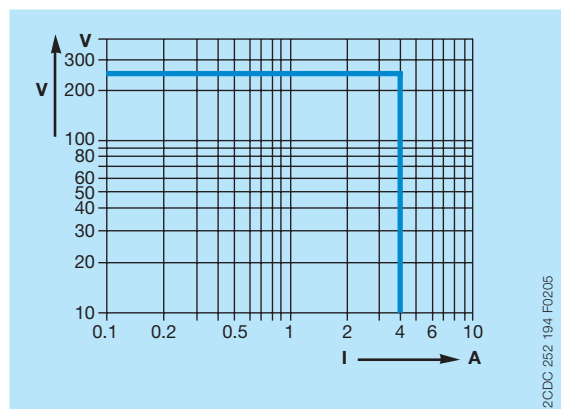
Standards	IEC/EN 61812-1
Low Voltage Directive	2014/35/EU
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

## Electromagnetic compatibility

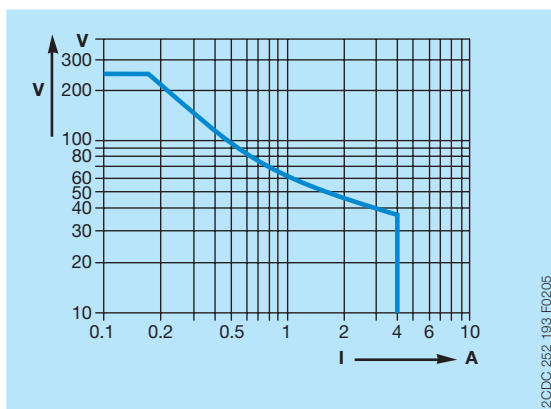
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	10 V/m (1 GHz), 3 V/m (2 GHz), 1 V/m (2.7 GHz)
electrical fast transient / burst surge	IEC/EN 61000-4-4	Level 3 (2 kV / 5 kHz)
surge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

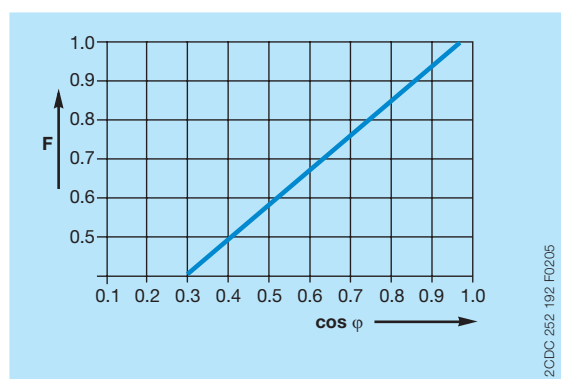
### Load limit curves



AC load (resistive)



DC load (resistive)



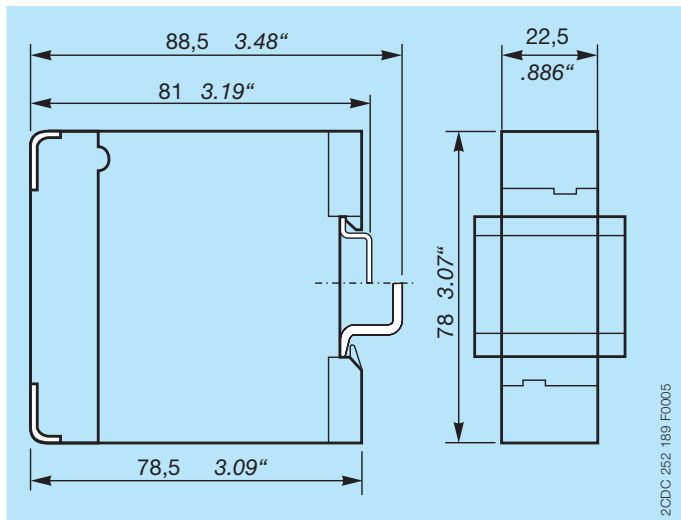
Derating factor F for inductive AC load



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](http://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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