

# Electronic timers

## Product group picture

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# Electronic timers

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# Electronic timers

## Type selection



### CT-D range in modular DIN rail housing

- Time ranges: 7 (0.05 s - 100 h)
- CT-SDD, CT-SAD: (0.05 s - 10 min)
- Wide and multi ranges of control supply voltage
- 1 or 2 c/o contacts
- CT-SDD, CT-SAD: 2 n/o contacts
- Control inputs: voltage-related triggering, polarized, capable of switching a parallel load

### CT-E the economic range

- Multifunction devices: 8 (0.05 s - 100 h)
- Single-function devices: 0.05-1 s, 0.1-10 s, 0.3-30 s, 3-300 s, 0.3-300 min
- Wide, single and dual ranges of control supply voltage
- 1 c/o contact
- CT-SDE: 1 n/o contact and 1 n/c contact
- CT-MKE, CT-EKE, CT-AKE: 1 thyristor
- voltage-related triggering, polarized
- CT-MFE, CT-AHE, CT-AWE: with auxiliary voltage

### CT-S the high-performance range

- 10 (0.05 s - 300 h)
- CT-ARS, CT-SDS: 7 (0.05 s - 10 min)
- Wide, single and multi ranges of control supply voltage
- 1 or 2 c/o contacts
- CT-MVS.21, CT-MFS, CT-MBS: 2nd c/o contact selectable as inst. contact
- CT-SDS: 2 n/o contacts
- voltage-related triggering, non-polarized, capable of switching a parallel load
- CT-MFS, CT-MBS, CT-AHS: volt-free triggering

		multifunctional	single-functional	multifunctional	single-functional	multifunctional	single-functional
<b>Timing function</b>		<b>CT-D</b>		<b>CT-E</b>		<b>CT-S</b>	
ON-delay		CT-MFD	CT-ERD	CT-MFE, CT-MKE	CT-ERE, CT-EKE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	CT-ERS
OFF-delay		CT-MFD	CT-AHD	CT-MFE	CT-AHE, CT-ARE, CT-AKE	CT-MVS, CT-MFS, CT-MBS	CT-APS, CT-AHS, CT-ARS
ON- and OFF-delay						CT-MVS, CT-MXS, CT-MFS, CT-MBS	
Impulse-ON		CT-MFD	CT-VWD	CT-MFE, CT-MKE	CT-VWE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	
Impulse-OFF		CT-MFD			CT-AWE	CT-MVS, CT-MFS, CT-MBS	
Impulse-ON and OFF						CT-MXS	
Flasher starting with ON		CT-MFD	CT-EBD	CT-MFE, CT-MKE		CT-MFS, CT-MBS, CT-WBS	
Flasher starting with OFF		CT-MFD		CT-MFE, CT-MKE	CT-EBE	CT-MFS, CT-MBS, CT-WBS	
Flasher starting with ON or OFF						CT-MVS	
Pulse generator starting with ON or OFF			CT-TGD			CT-MXS	
Pulse former		CT-MFD		CT-MFE		CT-MVS, CT-MFS, CT-MBS	
Star-delta change-over			CT-SDD, CT-SAD				CT-SDS
Star-delta change-over with impulse					CT-SDE	CT-MVS.2x, CT-MFS, CT-MBS	
Star-delta change-over twice ON-delayed					CT-YDE		
further functions (depending on device)						CT-MVS, CT-MXS, CT-MFS, CT-MBS, CT-WBS	

A detailed explanation of the different timing functions can be found at "Timing functions" on page 1/37.



# CT-D range

## Product group picture

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# CT-D range

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### CT-D Range

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# CT-D range

## Benefits and advantages

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### Characteristics

- Diversity:
  - 2 multifunction timers
  - 10 single-function timers
- Control supply voltages:
  - Wide range: 12-240 V AC/DC
  - Multi range: 24-48 V DC, 24-240 V AC
- 7 time ranges from 0.05 s to 100 h or  
4 time ranges from 0.05 s to 10 min
- Width of only 17.5 mm
- Light-grey housing in RAL 7035
- Devices with:
  - 1 c/o contact (250 V / 6 A) or 2 c/o contacts (250 V / 5 A)
- Control input: voltage-related triggering, polarized, capable of switching parallel loads
- Various approvals and marks

### Benefits

#### Direct reading scales ①

Direct setting of the time delay without any additional calculation provides accurate time delay adjustment.

#### LEDs for status indication ②

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

#### Switching currents

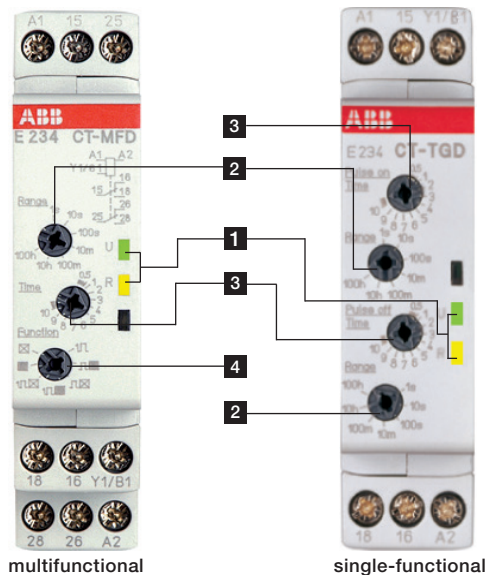
The CT-D range timers allow an output load of up to 6 A on devices with 1 c/o contact and up to 5 A on devices with 2 c/o contacts.

#### Connection terminals ③

Wide terminal spacing allows connection of wires: 2 x 1.5 mm<sup>2</sup> (2 x 16 AWG) with wire end ferrules or 2 x 2.5 mm<sup>2</sup> (2 x 14 AWG) without ferrules.

#### Width 17.5 mm ④

With their width of 17.5 mm only, the CT-D range timers are ideally suited for installation in distribution panels.



### Operating controls

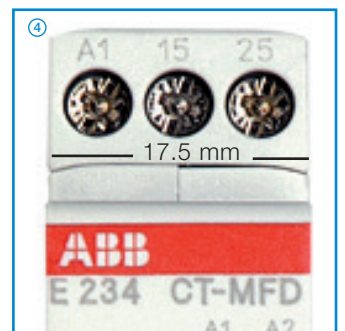
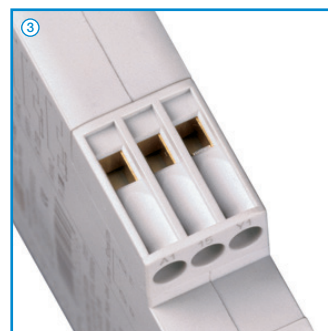
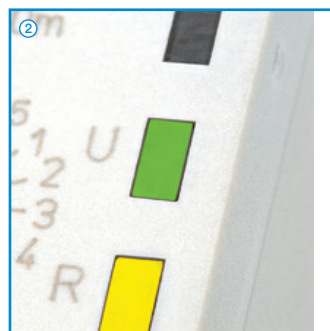
#### ① LEDs for status indication

- U - green LED: control supply voltage applied
- timing
- R, R1, R2 - yellow LED: output relay energized

#### ② Time range adjustment

#### ③ Fine adjustment of the time delay

#### ④ Preselection of the timing function



# CT-D range

## Ordering details

### Description

The CT-D range in MDRC design with a width of only 17.5 mm fits into all domestic installation and distribution panels.

The CT-D range represents a link between industry and the installation types. For maximum flexibility in operation, 10 single-function as well as 2 multifunction devices with 7 timing functions are available. The devices offer 4 or 7 time ranges from 0.05 seconds up to 100 hours. Their wide input range allows the use in applications worldwide.

### Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Price	Weight
							1 pc	kg (lb)
Multi <sup>1)</sup>	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	■	1 c/o	CT-MFD.12	1SVR500020R0000		0.060 (0.132)
Multi <sup>1)</sup>	12-240 V AC/DC	7 (0.05 s - 100 h)	■	2 c/o	CT-MFD.21	1SVR500020R1100		0.065 (0.143)
ON-delay			-	1 c/o	CT-ERD.12	1SVR500100R0000		0.060 (0.132)
			-	2 c/o	CT-ERD.22	1SVR500100R0100		0.065 (0.143)
OFF-delay		7 (0.05 s - 100 h)	■	1 c/o	CT-AHD.12	1SVR500110R0000		0.060 (0.132)
			■	2 c/o	CT-AHD.22	1SVR500110R0100		0.065 (0.143)
Impulse-ON	24-240 V AC 24-48 V DC		-		CT-VWD.12	1SVR500130R0000		0.060 (0.132)
Flasher starting with ON			-	1 c/o	CT-EBD.12	1SVR500150R0000		0.060 (0.132)
Pulse generator		2x7 (0.05 s - 100 h)	■		CT-TGD.12 <sup>2)</sup>	1SVR500160R0000		0.060 (0.132)
			■	2 c/o	CT-TGD.22 <sup>2)</sup>	1SVR500160R0100		0.065 (0.143)
Star-delta change-over		4 (0.05 s - 10 min)	-		CT-SDD.22 <sup>3)</sup>	1SVR500211R0100		0.065 (0.143)
			-	2 n/o	CT-SAD.22 <sup>4)</sup>	1SVR500210R0100		0.065 (0.143)



CT-MFD.12



CT-ERD.22

<sup>1)</sup> Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Flasher starting with ON, Flasher starting with OFF, Pulse former

<sup>2)</sup> ON and OFF times adjustable independently: 2 x 7 time ranges 0.05 s - 100 h

<sup>3)</sup> Transition time 50 ms fixed

<sup>4)</sup> Transition time adjustable

■ Control input with voltage-related triggering  
- No triggering

### Synonyms

used expression	alternative expression(s)	used expression	alternative expression(s)
1 c/o contact	SPDT	voltage-related	wet / non-floating
2 c/o contacts	DPDT	volt-free	dry / floating



Further documentation CT-D electronic timers on [www.abb.com](http://www.abb.com)

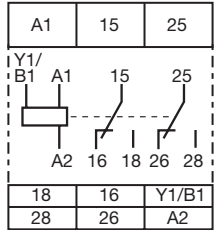


# CT-D range

## Connection diagrams

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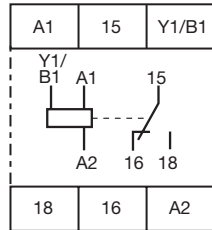
### CT-MFD.21



2CDC 252 113 F0b06

A1-A2 Supply: 12-240 V AC/DC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

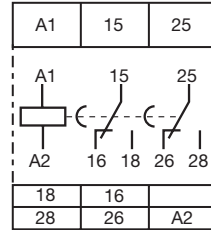
### CT-MFD.12



2CDC 252 114 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact

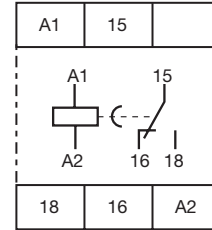
### CT-ERD.22



2CDC 252 115 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

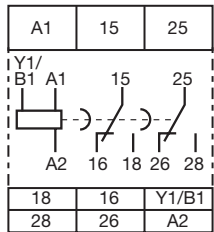
### CT-ERD.12



2CDC 252 177 F0b05

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact

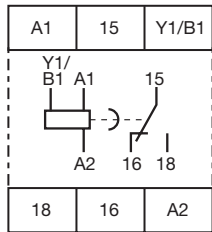
### CT-AHD.22



2CDC 252 116 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

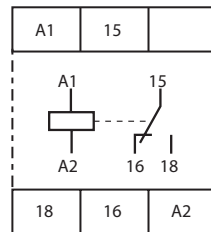
### CT-AHD.12



2CDC 252 117 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact

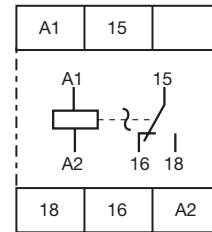
### CT-VWD.12



2CDC 252 179 F0b05

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact

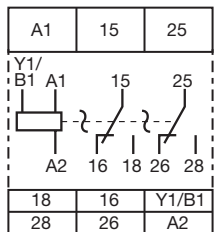
### CT-EBD.12



2CDC 252 180 F0b05

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact

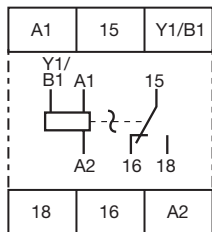
### CT-TGD.22



2CDC 252 118 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

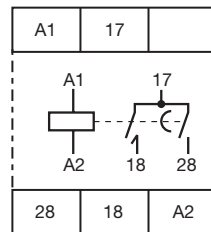
### CT-TGD.12



2CDC 252 119 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact

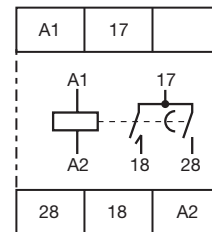
### CT-SDD.22



2CDC 252 160 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 17-18 1. n/o contact (star contactor)  
 17-28 2. n/o contact (delta contactor)

### CT-SAD.22






2CDC 252 160 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 17-18 1. n/o contact (star contactor)  
 17-28 2. n/o contact (delta contactor)

# CT-D range

## Technical data

Data at  $T_a = 25\text{ °C}$  and rated values, unless otherwise indicated

	CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFD.21
<b>Input circuit - Supply circuit</b>			
Rated control supply voltage $U_s$	24-240 V AC / 24-48 V DC		12-240 V AC/DC
Rated control supply voltage $U_s$ tolerance	-15...+10 %		
Rated frequency	DC or 50/60 Hz		
Frequency range AC	47-63 Hz		
Typical current / power consumption	see data sheet		
Power failure buffering time	min. 20 ms		
Release voltage	> 10 % of the minimum rated control supply voltage $U_s$		
<b>Input circuit - Control circuit</b>			
Control input, control function	A1-Y1/B1	start timing external	
Kind of triggering		voltage-related triggering	
Resistance to reverse polarity		yes	
Parallel load / polarized		yes / 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	
Current consumption of the control input		see data sheet	
<b>Timing circuit</b>			
Time ranges	7 time ranges 0.05 s - 100 h	1.) 0.05-1 s 2.) 0.5-10 s 3.) 5-100 s 4.) 0.5-10 min 5.) 5-100 min 6.) 0.5-10 h 7.) 5-100 h	
	4 time ranges 0.05 s - 10 min (CT-SDD, CT-SAD)	1.) 0.05-1 s 2.) 0.5-10 s 3.) 5-100 s 4.) 0.5-10 min	
Recovery time		< 50 ms	
Accuracy within the rated control supply voltage tolerance		$\Delta t < 0.005\ % / V$	
Accuracy within the temperature range		$\Delta t < 0.06\ % / \text{°C}$	
Repeat accuracy (constant parameters)		$\Delta t < \pm 0.5\ %$	
Setting accuracy of time delay		$\pm 10\ %$ of full-scale value	
Star-delta transition time	CT-SDD / CT-SAD	fixed 50 ms / adjustable: 20 ms, 30 ms, 40 ms, 50 ms, 60 ms, 80 ms or 100 ms	
Star-delta transition time tolerance	CT-SDD / CT-SAD	$\pm 3\ ms$	
<b>Indication of operational states</b>			
Control supply voltage / timing	U: green LED	 : control supply voltage applied  : timing	
Relay energized (1 c/o contact / 2 c/o contacts or inst. contact)	R: yellow LED	 : output relay energized	
<b>Operating elements and controls</b>			
Adjustment of the time range		front-face rotary switch, direct reading scales	
Fine adjustment of the time value		front-face potentiometer	
Preselection of the timing function at multifunction devices		front-face rotary switch, direct reading scales	
Adjustment of the transition time	CT-SAD	front-face potentiometer	
<b>Output circuit</b>			
Kind of output	15-16/18 15-16/18; 25-26/28 17-18; 17-28	Relay, 1 c/o contact - -	- Relay, 2 c/o contacts Relay, 2 n/o contacts (CT-SDD, CT-SAD)
Contact material		AgNi alloy, Cd free	
Rated operational voltage $U_o$		250 V	
Minimum switching voltage / minimum switching current		12 V / 100 mA	
Maximum switching voltage / maximum switching current		250 V AC / 6 A	
Rated operational current $I_o$	AC-12 (resistive) at 230 V AC-15 (inductive) at 230 V DC-12 (resistive) at 24 V DC-13 (inductive) at 24 V	6 A 3 A 6 A 2 A	5 A 3 A 5 A 2 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code) max. rated operational voltage	B 300 300 V AC	n/o: B 300 n/c: C 300
	maximum continuous thermal current at B300	5 A	n/o: 5 A
	maximum continuous thermal current at C300	-	n/c: 2.5 A
	max. making/breaking apparent power at B300	3600 VA / 360 VA	n/o: 3600/360 VA
	max. making/breaking apparent power at C300	-	n/c: 1800/180 VA
Mechanical lifetime		30 x 10 <sup>6</sup> switching cycles	
Electrical lifetime		0.1 x 10 <sup>6</sup> switching cycles	
Max. fuse rating to achieve short-circuit protection	n/c contact n/o contact	6 A fast-acting 10 A fast-acting	6 A fast-acting

# CT-D range

## Technical data

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		CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFD.21
<b>General data</b>				
Mean time between failures (MTBF)		on request		
Duty time		100%		
Dimensions		see 'Dimensional drawings'		
Mounting		DIN rail (IEC/EN 60715), snap-mounting without any tool		
Mounting position		any		
Minimum distance to other units	horizontal / vertical	no / no		
Degree of protection	housing / terminals	IP50 / IP20		
<b>Electrical connection</b>				
Connecting capacity	fine-strand with(out) wire end ferrule	2 x 0.5-1.5 mm <sup>2</sup> (2 x 20-16 AWG)		
		1 x 0.5-2.5 mm <sup>2</sup> (1 x 20-14 AWG)		
	rigid	2 x 0.5-1.5 mm <sup>2</sup> (2 x 20-16 AWG)		
		1 x 0.5-4 mm <sup>2</sup> (1 x 20-12 AWG)		
Stripping length		7 mm (0.28 in)		
Tightening torque		0.5-0.8 Nm (4.43-7.08 lb.in)		
<b>Environmental data</b>				
Ambient temperature range	operation / storage	-20 ... +60 °C / -40 ... +85 °C		
Climatic class	IEC/EN 60068-2-30	3K3		
Relative humidity range		25-85%		
Vibration, sinusoidal	IEC/EN 60068-2-6	20 m/s <sup>2</sup> ; 10 cycles, 10...150...10 Hz		
Shock (half-sine)	IEC/EN 60068-2-27	150 m/s <sup>2</sup> , 11 ms		
<b>Isolation data</b>				
Rated insulation voltage U <sub>i</sub>	input circuit / output circuit	300 V		
	output circuit 1 / output circuit 2	not available	300 V	300 V
Rated impulse withstand voltage U <sub>imp</sub>	between all isolated circuits	4 kV; 1.2/50 μs		
Power-frequency withstand voltage test(test voltage)	between all isolated circuits	2.5 kV; 50 Hz; 60 s		
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V		
Protective separation (IEC/EN 61140, EN 50178)	input circuit / output circuit	250 V		
Pollution degree		3		
Overvoltage category		III		
<b>Standards / Directives</b>				
Standards		IEC/EN 61812-1		
Low Voltage Directive		2014/35/EU		
EMC Directive		2014/30/EU		
RoHS Directive		2011/65/EU		
<b>Electromagnetic compatibility</b>				
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)		
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		

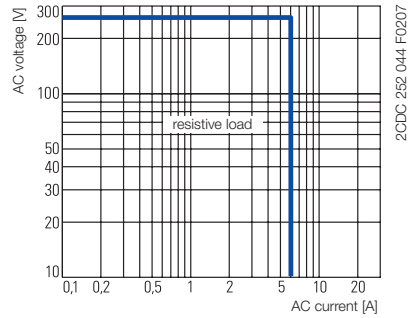
# CT-D range

## Technical diagrams, Wiring notes, Dimensional drawings

### Technical diagrams

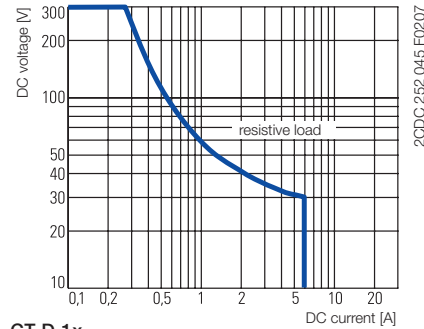
#### Load limit curves

##### AC load (resistive)



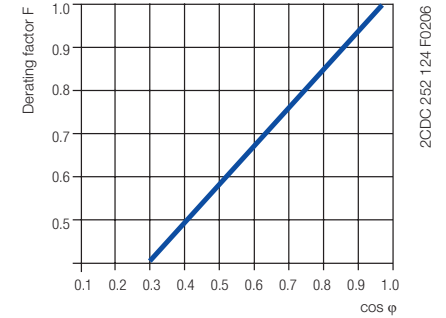
CT-D.1x

##### DC load (resistive)

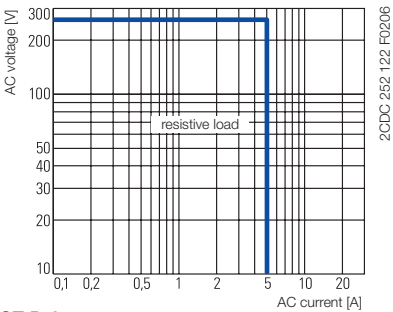
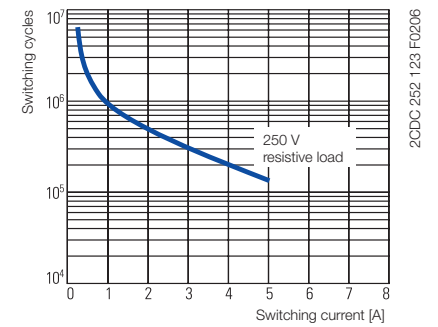


CT-D.1x

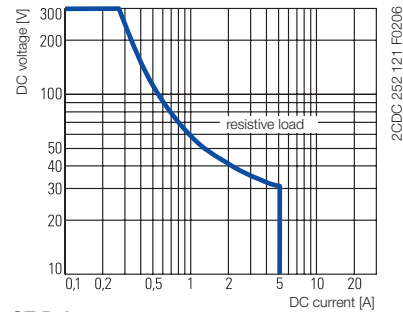
##### Derating factor F for inductive AC load



##### Contact lifetime



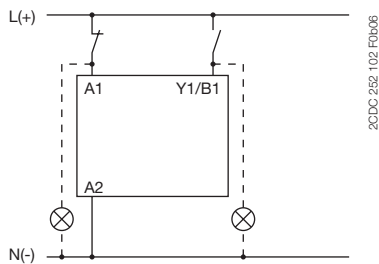
CT-D.2x



CT-D.2x

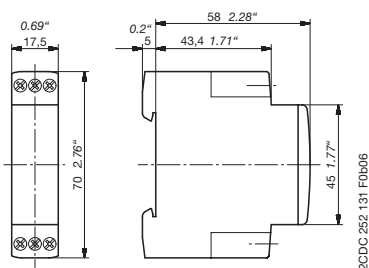
### Wiring notes for devices with control input

A parallel load to the control input is possible

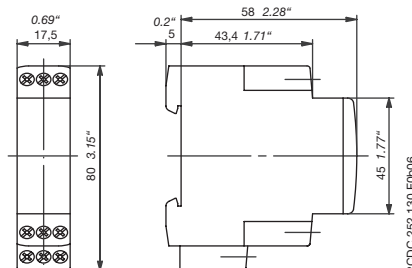


### Dimensional drawings

dimensions in mm



CT-D devices with 1 c/o contact or 2 n/o contacts



CT-D devices with 2 c/o contacts

# CT-E range

## Product group picture

1



# CT-E range

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### CT-E Range

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# CT-E range

## Benefits and advantages

1

### Characteristics

- Diversity:
  - 2 multifunction timers
  - 56 single-function timers
- Control supply voltages:
  - Dual range: 24 V AC/DC
  - Single range: 110-130 V AC, 220-240 V AC
  - Wide range: 24-240 V AC/DC (CT-MFE)
- Time ranges
  - 5 single ranges: 0.05-1 s, 0.1-10 s, 0.3-30 s, 3-300 s, 0.3-30 min
  - 8 time ranges: 0.05 s - 100 h (CT-MFE)
- Devices with 1 c/o (SPDT) contact (250 V / 4 A) or solid-state output for high switching frequencies (thyristor 0.8 A)
- Various approvals and marks

### Benefits

#### Direct reading scales ①

Direct setting of the time delay without any additional calculation provides accurate time delay adjustment.

#### LEDs for status indication ②

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

#### Connection screws in M3 (PoziDrive 1) ③

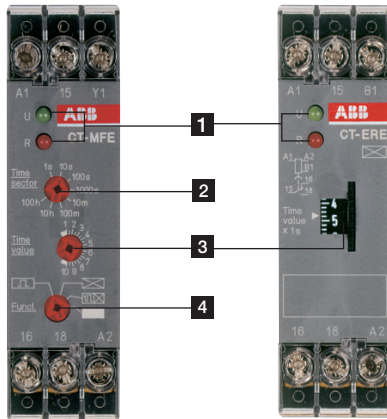
Easy and fast tightening and release of the connection screws with pozidrive, pan- or crosshead screwdriver.

#### Solid-state output ④

Devices with solid-state output are the perfect solution for high operation cycles.

### Synonyms

used expression	alternative expression(s)	used expression	alternative expression(s)
1 c/o contact	SPDT	voltage-related	wet / non-floating
2 c/o contacts	DPDT	volt-free	dry / floating



### Operating controls

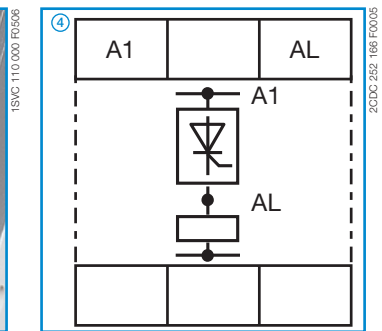
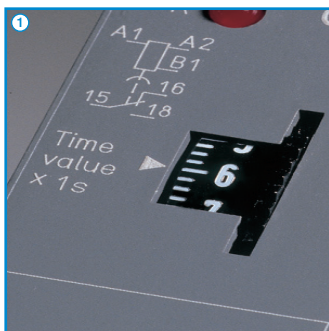
#### 1 LEDs for status indication

U - green LED: control supply voltage applied  
R2: red LED: output relay energized

#### 2 Time range adjustment (only multifunctional devices)

#### 3 Fine adjustment of the time delay

#### 4 Preselection of the timing function (only multifunctional devices)



# CT-E range

## Ordering details

### Description

The CT-E range with its excellent price/performance ratio offers an ideal solution for serial applications. 56 single-function devices with 5 different time ranges as well as 2 multifunction timers with 6 functions and 8 time ranges offer the highest possible flexibility for almost every application. For high operating cycles, contact-free CT-E timers with solid-state output are available.

### Ordering details

Timing function	Rated control supply voltage	Time ranges	Control Input	Output	Type	Order code	Price 1 pc	Weight (1 pc) kg (lb)	
Multi <sup>1)</sup>	24-240 V AC/DC	8 (0.05 s - 100 h)	■	1 c/o	CT-MFE	1SVR550029R8100		0.08 (0.18)	
		0.1-10 s				1SVR550107R1100			
ON-delay	24 V AC/DC, 220-240 V AC	0.3-30 s	-	1 c/o	CT-ERE	1SVR550107R4100		0.08 (0.18)	
		3-300 s				1SVR550107R2100			
		0.3-30 min				1SVR550107R5100			
	110-130 V AC	0.1-10 s	-		1SVR550100R1100				
		0.3-30 s			1SVR550100R4100				
		3-300 s			1SVR550100R2100				
OFF-delay	24 V AC/DC	0.3-30 s	-	1 c/o	CT-AHE	1SVR550118R1100		0.08 (0.18)	
		3-300 s				1SVR550118R4100			
		0.1-10 s				1SVR550118R2100			
	110-130 V AC	0.1-10 s	■		1SVR550110R1100				
		0.3-30 s			1SVR550110R4100				
		3-300 s			1SVR550110R2100				
OFF-delay <sup>2)</sup>	220-240 V AC	0.1-10 s	-	1 c/o	CT-ARE	1SVR550111R1100		0.08 (0.18)	
		0.3-30 s				1SVR550111R4100			
		3-300 s				1SVR550111R2100			
	24 V AC/DC, 220-240 V AC	0.1-10 s	-		1SVR550127R1100				
		0.3-30 s			1SVR550127R4100				
		3-300 s			1SVR550127R2100				
Impulse-ON	110-130 V AC	0.1-10 s	-	1 c/o	CT-VWE	1SVR550137R1100		0.08 (0.18)	
		0.3-30 s				1SVR550137R4100			
		3-300 s				1SVR550137R2100			
	24 V AC/DC, 220-240 V AC	0.1-10 s	-		1SVR550130R1100				
		0.3-30 s			1SVR550130R4100				
		3-300 s			1SVR550130R2100				
Impulse- OFF <sup>2)</sup>	24 V AC/DC	0.05-1 s	-	1 c/o	CT-AWE	1SVR550158R3100		0.08 (0.18)	
		110-130 V AC	0.05-1 s				1SVR550150R3100		
			220-240 V AC			0.05-1 s			1SVR550151R3100



CT-MFE



CT-AHE



Further documentation CT-E electronic timers on [www.abb.com](http://www.abb.com)

1) Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Flasher starting with ON, Flasher starting with OFF, Pulse former

2) Without auxiliary voltage, True Off-delay timer

■ Control input with voltage-related triggering  
- No triggering



# CT-E range

## Ordering details

1



CT-AWE



CT-SDE

### Ordering details

Timing function	Rated control supply-voltage	Time ranges	Control Input	Output	Type	Order code	Price	Weight
							1 pc	(1 pc) kg (lb)
Impulse-OFF	24 V AC/DC	0.1-10 s	■	1 c/o	CT-AWE	1SVR550148R1100	0.08 (0.18)	
		0.3-30 s				1SVR550148R4100		
		3-300 s				1SVR550148R2100		
	110-130 V AC	0.1-10 s				1SVR550140R1100		
		0.3-30 s				1SVR550140R4100		
		3-300 s				1SVR550140R2100		
	220-240 V AC	0.1-10 s				1SVR550141R1100		
		0.3-30 s				1SVR550141R4100		
		3-300 s				1SVR550141R2100		
Flasher starting with OFF	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-EBE <sup>4)</sup>	1SVR550167R1100	0.08 (0.18)	
	110-130 V AC					1SVR550160R1100		
Star-delta change-over twice ON-delayed	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-YDE <sup>1) 2)</sup>	1SVR550207R1100	0.08 (0.18)	
		0.3-30 s				1SVR550207R4100		
		3-300 s				1SVR550207R2100		
	110-130 V AC	0.1-10 s				1SVR550200R1100		
		0.3-30 s				1SVR550200R4100		
		3-300 s				1SVR550200R2100		
Star-delta change-over with impuls	24 V AC/DC, 220-240 V AC	0.3-30 s	-	1 n/o + 1 n/c	CT-SDE <sup>2) 5)</sup>	1SVR550217R4100	0.08 (0.18)	
	110-130 V AC					1SVR550210R4100		
	380-415 V AC					1SVR550212R4100		
Multifunctional <sup>6)</sup>	24-240V AC/DC	0.1-10 s, 3-300 s	-		CT-MKE <sup>3) 6)</sup>	1SVR550019R0000	0.08 (0.18)	
ON-delay	24-240 V AC/DC	0.1-10 s	-	solide-state	CT-EKE	1SVR550509R1000	0.08 (0.18)	
		0.3-30 s				1SVR550509R4000		
OFF-delay	24-240 V AC	0.1-10 s	-		CT-AKE	1SVR550519R1000	0.08 (0.18)	
		0.3-30 s				1SVR550519R4000		
		3-300 s				1SVR550519R2000		

<sup>1)</sup> Without auxiliary voltage

<sup>2)</sup> With fixed transition time

<sup>3)</sup> Solid-state output, functions and time range selection via external jumpers

<sup>4)</sup> Symetric ON & OFF times

<sup>5)</sup> Common contact

<sup>6)</sup> Functions: ON-delay (AC/DC), Impuls-ON (AC only), Flasher starting with OFF (AC only), Flasher starting with ON (AC only)

■ Control input with voltage-related triggering  
- No triggering

### Notice

CT...KE are solid-state timers with thyristor output for 2-wire applications. They are connected directly in series with the control coil of contactors or relays. Voltage should not be applied without a load connected, because there is no current limiting in the unit.

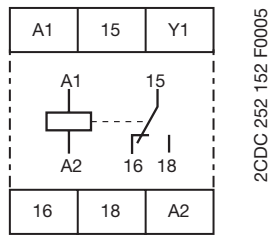


Further documentation CT-E electronic timers on [www.abb.com](http://www.abb.com)

# CT-E range

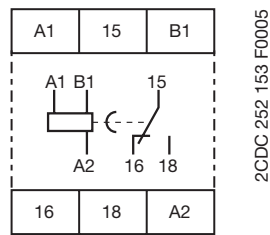
## Connection diagrams

### CT-MFE



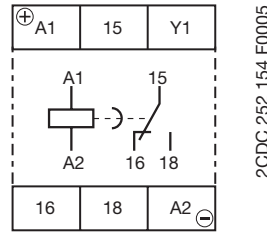
A1-A2 Supply: 24-240 V AC/DC  
 A1-Y1 Control input  
 15-16/18 c/o contact

### CT-ERE



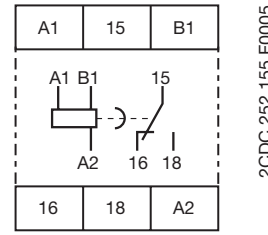
A1-A2 Supply: 220-240 V AC or 110-130 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16/18 c/o contact

### CT-AHE<sup>1)</sup>



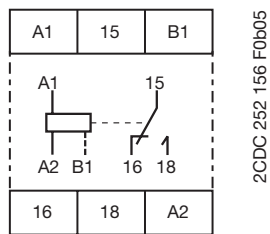
A1-A2 Supply: 24 V AC/DC or 110-240 V AC or 220-240 V AC  
 A1-Y1 Control input  
 15-16/18 c/o contact

### CT-ARE



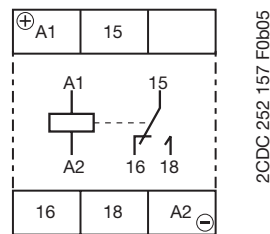
A1-A2 Supply: 220-240 V AC or 110-130 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16/18 c/o contact

### CT-VWE



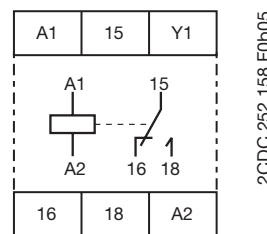
A1-A2 Supply: 220-240 V AC or 110-130 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16/18 c/o contact

### CT-AWE



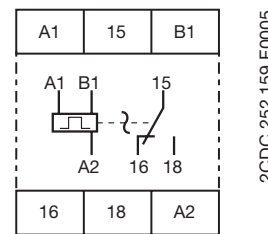
Device without aux. voltage  
 A1(+)-A2(-) Supply: 24 V AC/DC or 110-240 V AC or 220-240 V AC  
 15-16/18 c/o contact

### CT-AWE<sup>1)</sup>



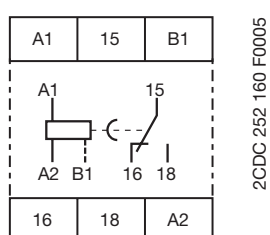
Device with aux. voltage  
 A1-A2 Supply: 24 V AC/DC or 110-240 V AC or 220-240 V AC  
 A1-Y1 Control input  
 15-16/18 c/o contact

### CT-EBE



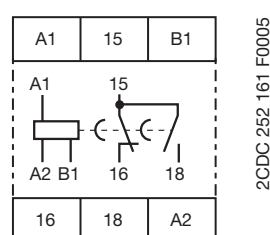
A1-A2 Supply: 220-240 V AC or 110-130 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16/18 c/o contact

### CT-YDE



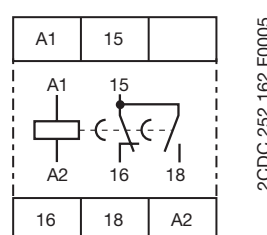
A1-A2 Supply: 220-240 V AC or 110-130 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16/18 c/o contact

### CT-SDE



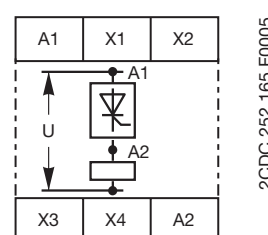
Device: 1SVR 550 217 R4100  
 A1-A2 Supply: 220-240 V AC  
 A1-B1 Supply: 24 V AC/DC  
 15-16 n/c contact  
 15-18 n/o contact with common contact

### CT-SDE



Devices: 1SVR 550 210 R4100, 1SVR 550 212 R4100  
 A1-A2 Supply: 110-130 V AC or 380-415 V AC  
 15-16 n/c contact  
 15-18 n/o contact with common contact

### CT-MKE



A1-A2 Supply: 24-240 V AC/DC  
 A1-A2 Thyristor  
 X1-X4 Timing function adjustment  
 X2-X4 Timing function adjustment  
 X3-X4 Time range adjustment  
 (Details see function diagrams)

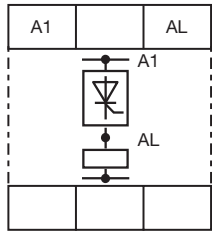
<sup>1)</sup> "Wiring notes, Dimensional drawings" on page 1/22

# CT-E range

## Connection diagrams, Technical diagrams

1

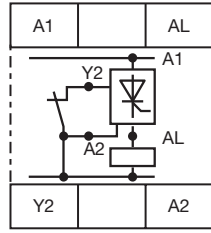
**CT-EKE**



2CDC 252 166 F0005

A1-AL Supply: 24-240 V AC/DC  
A1-AL Thyristor

**CT-AKE**

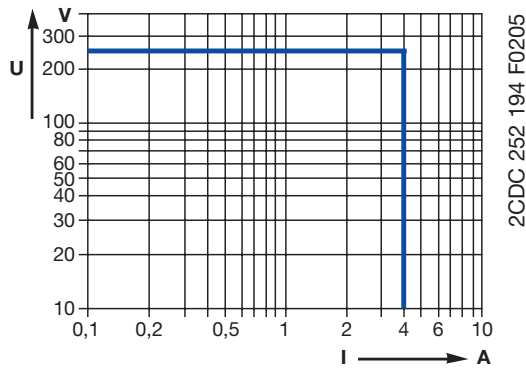


2CDC 252 167 F0005

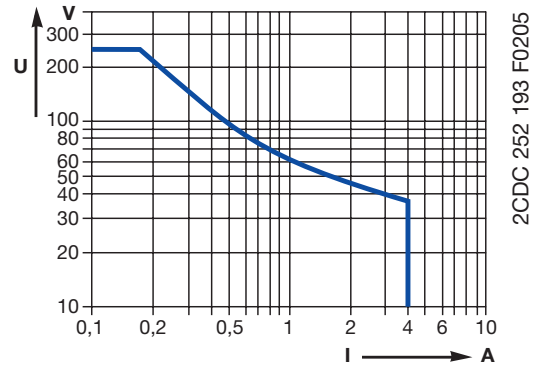
A1-AL Supply: 24-240 V AC  
A1-AL Thyristor  
Y2-A2 Control input

### Technical diagrams

#### Load limit curves AC load (resistive)

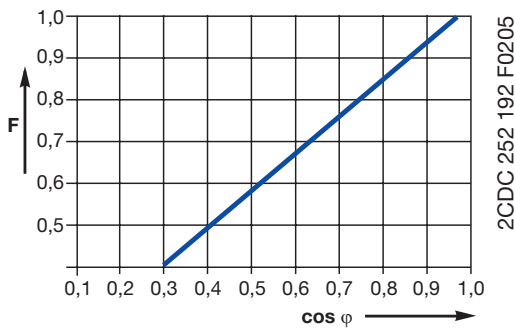


#### DC load (resistive)

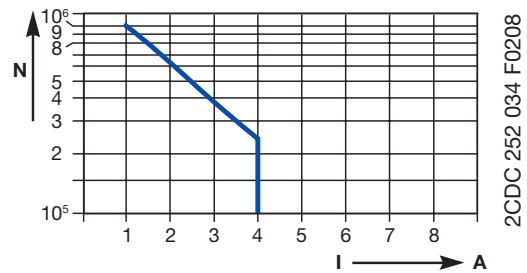


220 V 50 Hz AC1  
360 cycles/h

#### Derating factor F for inductive AC load



#### Contact lifetime



# CT-E range

## Technical data

### Technical data

Data at  $T_a = 25\text{ °C}$  and rated values, unless otherwise indicated

		CT-E (relays)	CT-E (solid-state)
<b>Input circuit - Supply circuit</b>			
Rated control supply voltage $U_s$	A1-A2, A1-AL	24-240 V AC/DC	
	A1-A2, A1-AL	24-240 V AC	
	A1-A2	110-130 V AC	-
	A1-A2	220-240 V AC	-
	A1-A2	380-415 V AC	-
	A1-B1	24 V AC/DC	-
Rated control supply voltage $U_s$ tolerance		-15...+10 %	
Rated frequency	AC/DC versions	DC or 50/60 Hz	
	AC versions	50/60 Hz	
Typical current / power consumption	24-240 V AC/DC, 24-240 V AC	approx. 1.0-2.0 VA/W	
	110-130 V AC, 220-240 V AC	approx. 2.0 VA	-
	380-415 V AC	approx. 3.0 VA	-
	24 V AC/DC	approx. 1.0 VA/W	-
Current consumption while timing			$\leq 2\text{ mA}$ (24-60 V AC/DC) $\leq 8\text{ mA}$ (60-240 V AC/DC) (CT-AKE only AC)
Minimum energizing time	CT-ARE, CT-AWE w/o aux. voltage	200 ms	-
Release voltage		> 10 % of the minimum rated control supply voltage $U_s$	
<b>Input circuit - Control circuit</b>			
Kind of triggering		voltage-related triggering	-
Control input, Control function	A1-Y1	start timing external	-
Parallel load / polarized		no / yes <sup>1)</sup>	-
Minimum control pulse length		20 ms	-
Control voltage potential		see rated control supply voltage	-
<b>Timing circuit</b>			
Time ranges	1 of 5 time ranges per single-function device CT-MFE: 8 time ranges 0.05 s - 100 h	0.05-1 s / 0.1-10 s / 0.3-30 s / 3-300 s / 0.3-30 min 1.) 0.05-1 s    2.) 0.5-10 s 3.) 5-100 s    4.) 50-1000 s 5.) 0.5-10 min    6.) 5-100 min 7.) 0.5-10 h    8.) 5-100 h	-
	CT-AKE, CT-EKE: 3 time ranges 0.1-300 s		1.) 0.1-10 s 2.) 0.3-30 s 2.) 3-300 s
	CT-MKE: 2 time ranges 0.1-300 s		1.) 0.1-10 s 2.) 3-300 s
Star-delta transition time	CT-YDE / CT-SDE	50 ms / 30 ms	-
Starting time	CT-SDE	0.3-30 s	
	CT-YDE, depending on device	0.1-10 s, 0.3-30 s or 3-300 s	
Recovery time		< 50 ms CT-ARE: < 200 ms CT-AWE, CT-SDE: < 400 ms CT-YDE: < 500 ms	CT-AKE: < 300 ms CT-EKE: < 50 ms CT-MKE: < 100 ms
Accuracy within the rated control supply voltage tolerance		$\Delta t < 0.5\text{ \% / V}$	
Accuracy within the temperature range		$\Delta t < 0.1\text{ \% / °C}$	
Repeat accuracy (constant parameters)		CT-MFE: $\Delta t < 0.06\text{ \% / °C}$	-
Setting accuracy of time delay		$\Delta t < 1\text{ \%}$	
		$\pm 10\text{ \%}$ of full-scale value	
<b>Output circuit</b>			
Kind of output	15-16/18	relay, 1 c/o contact	-
	CT-SDE: 15-16, 15-18	1 n/c, 1 n/o contact with common contact	
	A1-A2, A1-AL	-	thyristor
Contact material		silver alloy	-
Rated operational voltage $U_o$		250 V	
Minimum switching voltage / minimum switching current		12 V / 100 mA	
Maximum switching voltage / maximum switching current		see 'Load limit curves'	
Rated operational current $I_o$	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	-

<sup>1)</sup> CT-MFE: yes / no

# CT-E range

## Technical data

1

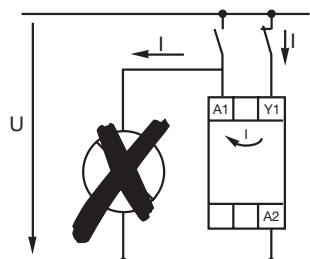
		CT-E (relays)	CT-E (solid-state)
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300	-
	max. rated operational voltage	300 V AC	-
	maximum continuous thermal current at B300	5 A	-
	max. making/breaking apparent power at B300	3600 VA / 360 VA	-
Mechanical lifetime		10 x 10 <sup>6</sup> switching cycles	-
Electrical lifetime	at AC-12, 230 V, 4 A	0.1 x 10 <sup>9</sup> switching cycles	-
Frequency of operation	with/without load	360/72000 h <sup>-1</sup>	-
Max. fuse rating to achieve short-circuit protection	n/c contact	10 A fast-acting, CT-ARE: 5 A	-
	n/o contact	10 A fast-acting, CT-ARE: 5 A	-
Minimum load current		-	CT-EKE, CT-AKE: 10 mA CT-MKE: 20 mA
Maximum load current		-	CT-EKE, CT-AKE: 0.7 A CT-MKE: 0.8 A at T <sub>a</sub> = 20 °C
Load current reduction / Derating		-	10 mA/°C
Maximum surge current		-	CT-EKE, CT-AKE: ≤ 15 A CT-MKE: ≤ 20 A for t ≤ 20 ms
Voltage drop in connected state		-	≤ 8 V
Discharge current with blocked solid-state output		-	≤ 4 mA
Cable length between solid-state timer and connected load at 50 Hz and a cable capacity of 100 pF/m :	at 24 V AC	-	220 m / 22 nF
	at 42 V AC	-	100 m / 10 nF
	at 60 V AC	-	65 m / 6.5 nF
	at 110 V AC	-	50 m / 5 nF
	at 240 V AC	-	22 m / 2.2 nF
<b>General data</b>			
Duty time		100%	
Dimensions		see 'Dimensional drawings'	
Mounting		DIN rail (IEC/EN 60715)	
Mounting position		any	
Minimum distance to other units	horizontal / vertical	not necessary / not necessary	
Material of housing	lower section	UL 94 V-0	
	upper section	UL 94 V-2	
Degree of protection	housing / terminals	IP50 / IP20	
<b>Electrical connection</b>			
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)	
<b>Environmental data</b>			
Ambient temperature ranges	operation / storage	-20...+60 °C / -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	
<b>Isolation data</b>			
Rated insulation voltage U <sub>i</sub>	input circuit / output circuit	300 V (supply up to 240 V) 500 V (supply up to 440 V)	-
Rated impulse withstand voltage U <sub>imp</sub>	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; 60 s	-
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V	-
Pollution degree		3	
Overvoltage category		III	
<b>Standards / Approvals</b>			
Standards		IEC 61812-1	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
RoHS Directive		2011/65/EU	
<b>Electromagnetic compatibility</b>			
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 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	

# CT-E range

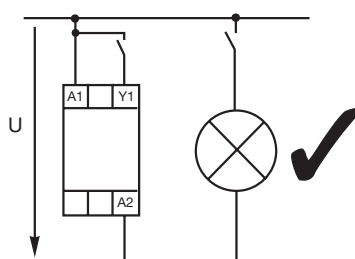
## Wiring notes, Dimensional drawings

### Wiring notes

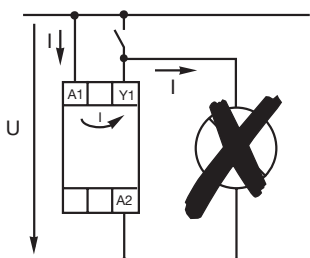
for single-function devices with control contact (CT-AHE, CT-AWE with auxiliary voltage)



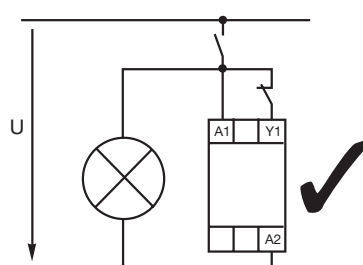
2CDC 252 200 F0b05



2CDC 252 199 F0b05



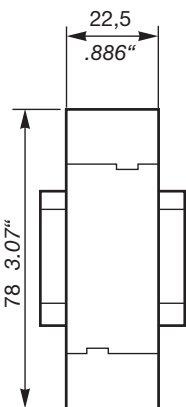
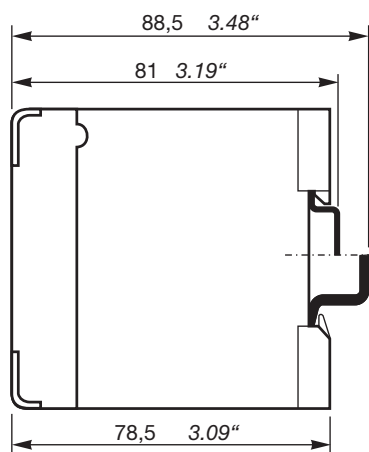
2CDC 252 198 F0b05



2CDC 252 201 F0b05

### Dimensional drawing

### dimensions in mm



2CDC 252 189 F0b05

# CT-S range

## Product group picture

1



# CT-S range

## Table of contents

### CT-S Range

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Connection diagrams	1/30
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# CT-S range

## Benefits and advantages

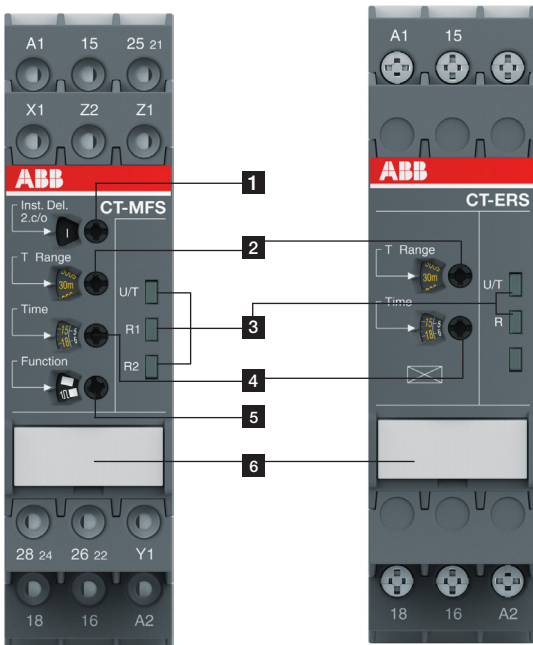
1

### Characteristics

- Diversity:
  - 8 multifunction timers
  - 11 single-function timers
- Control supply voltages:
  - Multi range: 24-48 V DC, 24-240 V AC
  - Wide range: 24-240 V AC/DC
  - Single range: 380-440 V AC
- Innovative connection technology
  - Double-chamber cage connection terminals
  - Easy Connect Technology
- Devices with:
  - 1 or 2 c/o (SPDT) contacts
  - 2nd c/o contact can be selected as instantaneous contact <sup>1)</sup>
  - Remote potentiometer connection <sup>1)</sup>
  - Control input with volt-free or voltage-related triggering e.g. to start timing, pause timing
  - Extended operating temperature range down to -40 °C <sup>1)</sup>
- Sealable transparent cover for protection against unauthorized changes of time values
- Integrated marker label
- Various approvals and marks

1) selected devices

### Operating controls



**1** 2nd contact as an instantaneous contact

**2** Preselection of the time range

**3** Indication of operational states

U/T: control supply voltage applied / timing  
 R: Output relay energized

**4** Fine adjustment of time delay

**5** Preselection of timing function

**6** Marker label

# CT-S range

## Benefits and advantages

### Easy Connect Technology ①

Tool-free wiring and excellent vibration resistance. Push-in terminals provide connection of wires up to  $2 \times 0.5 - 1.5 \text{ mm}^2$  ( $2 \times 20 - 16 \text{ AWG}$ ), rigid or fine-strand with or without wire end ferrules. The extended type designators for products with push-in terminals are indicated by a **P** following the extended type designator e.g. CT-xxS.xx**P**.

### Double-chamber cage connection terminals ②

Double-chamber cage connection terminals provide connection of wires up to  $2 \times 0.5-2.5 \text{ mm}^2$  ( $2 \times 20-14 \text{ AWG}$ ) rigid or fine-strand, with or without wire end ferrules. Potential distribution does not require additional terminals. The extended type designators for products with double-chamber cage connection terminals are indicated by a **S** following the extended type designator e.g. CT-xxS.xx**S**.

### Time range preselection and fine adjustment ③

Direct assignment of the preselected time range to the fine adjustment potentiometer scale by multicolor scales.

### Higher utility class ④

The Easy Connect Technology provides excellent vibration resistance with gas tight push-in terminals – the right solution for harsh environment. Selected products of the electronic timers and measuring and monitoring relays comply to the latest rail standards NF F 16-101/102, EN 45545, EN 50155 and more standards which are relevant for railway applications. Find more information in the rail brochure 2CDC110084B0201.

### LEDs for status indication ⑤

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

### Integrated marker label ⑥

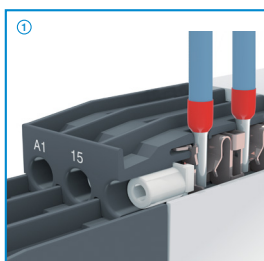
Integrated marker labels allow the product to be marked quickly and simply. No additional marker labels are required.

### Sealable transparent cover ⑦

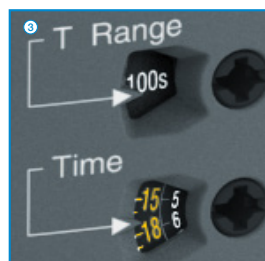
Protection against unauthorized changes of time and threshold values. Available as an accessory.

### Snap-On housing ⑧

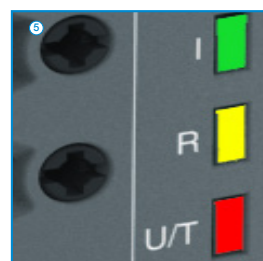
Tool-free DIN rail installation and deinstallation of the electronic timer.



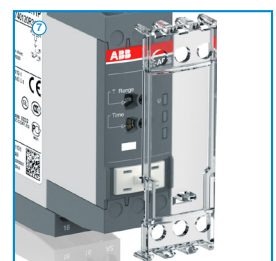
2CDC 253 025 F0011



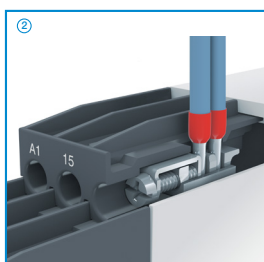
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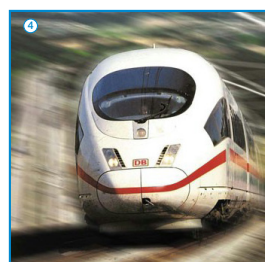
2CDC 252 006 F0012



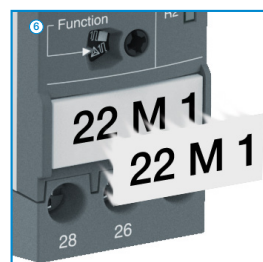
2CDC 255 006 S0011



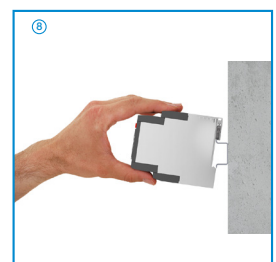
2CDC 253 025 F0011



2CDC 110 004 C0210\_01 (E) | Catalog Electronic relays and controls 2016 | ABB 1/26



2CDC 253 007 F0012



2CDC 253 013 F0013

# CT-S range

## Ordering details - multifunctional

1

### Description

The high-performance CT-S range in ABB's new S-range housing offers two different types of connection terminals and is ideally suited for universal use. Two different connection technologies are available:

- Double-chamber cage connection terminals
- Easy Connect Technology

### Accessories:

The CT-S range offers the possibility of using accessories such as a remote potentiometer to adjust the time delay or a sealable, transparent cover to protect against unauthorized changes of time and threshold values.

### Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Price	Weight
							1 pc	(1 pc)
Multi <sup>5)</sup>	24- 240 V AC/DC	10 (0.05 s - 300 h)	■	2 c/o	CT-MVS.21S <sup>1) 2) 3)</sup>	1SVR730020R0200	0.148	0.148
					CT-MVS.21P <sup>1) 2) 3)</sup>	1SVR740020R0200	0.136	(0.326)
	24-48 V DC, 24-240 V AC				CT-MVS.22S	1SVR730020R3300	0.142	0.142
					CT-MVS.22P	1SVR740020R3300	0.131	(0.313)
	380-440 V AC				CT-MVS.23S	1SVR730021R2300	0.144	0.144
					CT-MVS.23P	1SVR740021R2300	0.133	(0.317)
Multi <sup>6)</sup>	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	■	1 c/o	CT-MVS.12S	1SVR730020R3100	0.107	0.107
					CT-MVS.12P	1SVR740020R3100	0.102	(0.236)
Multi <sup>7)</sup>	24-48 V DC, 24-240 V AC	2x10 (0.05 s - 300 h)	■	2 c/o	CT-MXS.22S <sup>4)</sup>	1SVR730030R3300	0.142	0.142
					CT-MXS.22P <sup>4)</sup>	1SVR740030R3300	0.131	(0.313)
Multi <sup>8)</sup>	24- 240 V AC/DC	10 (0.05 s - 300 h)	□ / □	2 c/o	CT-MFS.21S <sup>1) 2) 3)</sup>	1SVR730010R0200	0.145	0.145
					CT-MFS.21P <sup>1) 2) 3)</sup>	1SVR740010R0200	0.133	(0.32)
	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	□ / □	2 c/o	CT-MBS.22S <sup>2) 3)</sup>	1SVR730010R3200	0.14	0.14
					CT-MBS.22P <sup>2) 3)</sup>	1SVR740010R3200	0.129	(0.309)
Multi <sup>9)</sup>	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	-	2 c/o	CT-WBS.22S	1SVR730040R3300	0.123	0.123
					CT-WBS.22P	1SVR740040R3300	0.115	(0.271)
							0.115	(0.254)



CT-MVS.21P



CT-MBS.22P

- Control input with voltage-related triggering
- Control input with volt-free triggering
- / □ Two control input with volt-free triggering
- No triggering

S: Screw connection  
P: Push-in / easy connect

<sup>1)</sup> Extended temperature range -40 °C

<sup>2)</sup> Remote potentiometer connection

<sup>3)</sup> 2nd c/o contact selectable as instantaneous contact

<sup>4)</sup> 2 remote potentiometer connections

<sup>5)</sup> 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

<sup>6)</sup> 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, Pulse former, Accumulative ON-delay, ON/OFF-function

<sup>7)</sup> Functions: Select function via DIP switches behind the marker label on the front of the unit, asymmetrical ON- and OFF-delay, Impulse-ON/OFF, Pulse generator starting with ON or OFF, Single pulse generator, ON/OFF-function

<sup>8)</sup> 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

<sup>9)</sup> Functions: Flasher starting with ON, Flasher starting with OFF, Impulse-ON, ON-delay, fixed impulse with adjustable time delay, adjustable impulse with fixed time delay, ON/OFF-function



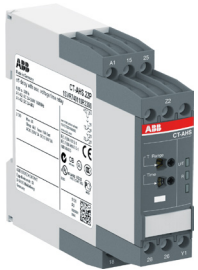
Further documentation CT-S electronic timers on [www.abb.com](http://www.abb.com)

# CT-S range

## Ordering details - singlefunctional



CT-ERS.21P



CT-AHS.22P



CT-SDS.23P

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Price	Weight (1 pc)
							1 pc	kg (lb)
ON-delay	24-240 V AC/DC	10 (0.05 s - 300 h)	-	2 c/o	CT-ERS.21S <sup>1)</sup>	1SVR730100R0300		0.13 (0.287)
					CT-ERS.21P <sup>1)</sup>	1SVR740100R0300		0.121 (0.267)
	24-48 V DC, 24-240 V AC				CT-ERS.22S	1SVR730100R3300		0.121 (0.267)
					CT-ERS.22P	1SVR740100R3300		0.113 (0.249)
	24-48 V DC, 24-240 V AC				CT-ERS.12S	1SVR730100R3100		0.106 (0.234)
					CT-ERS.12P	1SVR740100R3100		0.101 (0.222)
OFF-delay	24-240 V AC/DC	10 (0.05 s - 300 h)	■	2 c/o	CT-APS.21S <sup>1)</sup>	1SVR730180R0300		0.146 (0.322)
					CT-APS.21P <sup>1)</sup>	1SVR740180R0300		0.125 (0.276)
	24-48 V DC, 24-240 V AC				CT-APS.22S	1SVR730180R3300		0.138 (0.304)
					CT-APS.22P	1SVR740180R3300		0.127 (0.28)
	24-48 V DC, 24-240 V AC				CT-APS.12S	1SVR730180R3100		0.109 (0.24)
					CT-APS.12P	1SVR740180R3100		0.103 (0.227)
OFF-delay <sup>5)</sup>	24-240 V AC/DC	7 (0.05 s - 10 min)	-	1 c/o	CT-AHS.22S	1SVR730110R3300		0.136 (0.30)
					CT-AHS.22P	1SVR740110R3300		0.125 (0.276)
	24-48 V DC, 24-240 V AC				CT-ARS.11S	1SVR730120R3100		0.106 (0.234)
					CT-ARS.11P	1SVR740120R3100		0.10 (0.22)
	24-48 V DC, 24-240 V AC				CT-ARS.21S	1SVR730120R3300		0.124 (0.273)
					CT-ARS.21P	1SVR740120R3300		0.115 (0.254)
Star-delta change-over <sup>6)</sup>	24-48 V DC, 24-240 V AC	7 (0.05 s - 10 min)	-	2 n/o	CT-SDS.22S	1SVR730210R3300		0.114 (0.251)
					CT-SDS.22P	1SVR740210R3300		0.108 (0.238)
	380-440 V AC				CT-SDS.23S	1SVR730211R2300		0.118 (0.26)
					CT-SDS.23P	1SVR740211R2300		0.112 (0.247)

<sup>1)</sup> Extended temperature range -40 °C

<sup>2)</sup> Remote potentiometer connection

<sup>3)</sup> 2nd c/o contact selectable as instantaneous contact

<sup>4)</sup> 2 remote potentiometer connections

<sup>5)</sup> Without auxiliary voltage

<sup>6)</sup> 50 ms transition time

■ Control input with voltage-related triggering

□ Control input with volt-free triggering

□ / □ Two control input with volt-free triggering

- No triggering

S: Screw connection

P: Push-in / easy connect



Further documentation CT-S electronic timers on [www.abb.com](http://www.abb.com)

# CT-S range

## Ordering details - Accessories

1



MT-x50B

1SFC 151 138 V0001

### Remote potentiometer

50 k $\Omega$   $\pm$ 20 % - 0.2  $\Omega$ , degree of protection IP66

Material	Diameter in mm	Type	Order code	Price 1 piece	Pack.- unit pieces	Weight 1 piece g / oz
Plastic, black	22.5	MT-150B	1SFA611410R1506		1	0.040
Plastic, chrome	22.5	MT-250B	1SFA611410R2506		1	0.040
Metal, chrome	22.5	MT-350B	1SFA611410R3506		1	0.048



Data sheet remote potentiometer

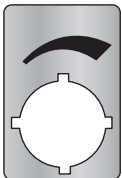


30 mm adapters

2CDC 252 042 F0009

### 30 mm adapter for attaching the potentiometer 22 mm in 30 mm mounting hole

Material	Type	Order code	Price 1 piece	Pack.- unit pieces	Weight 1 piece g / oz
Plastic, black	KA1-8029	1SFA616920R8029		1	
Metal, chrome	KA1-8030	1SFA616920R8030		1	

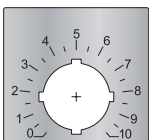


Marker label 29.6 x 44.5 mm

2CDC 252 043 F0209

### Marker label

Caption	Type	Order code	Price 1 piece	Pack.- unit pieces	Weight 1 piece g / oz
Symbol (see illustration)	SK 615 562-87	GJD6155620R0087		1	0.002
Scale 0 - 10	SK 615 562-88	GJD6155620R0088		1	0.002
Scale 0 - 30	MA16-1060	1SFA611940R1060		1	0.002

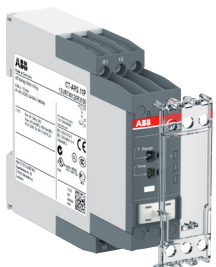


Marker label with scale 0-10  
48.5 x 44.5 mm

2CDC 252 044 F0209

### Accessories for CT-S in new housing (1SVR7...)

Description	Type	Order code	Price 1 piece	Pack.- unit pieces	Weight 1 piece g / oz
Adapter for screw mounting	ADP.01	1SVR430029R0100		1	0.018 (0.040)
Sealable transparent cover	COV.11	1SVR730005R0100		1	0.004 (0.009)
Marker label for devices w/o DIP switches	MAR.01	1SVR366017R0100		10	0.001 (0.002)
Marker label for devices with DIP switches	MAR.12	1SVR730006R0000		10	0.001 (0.002)



Sealable transparent cover for  
CT-S in new housing

2CDC 255 006 S0011

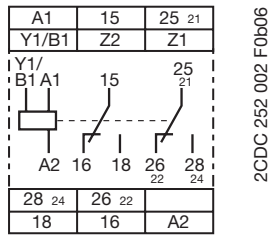
### Accessories for CT-S in old housing (1SVR4...)

Description	Type	Order code	Price 1 piece	Pack.- unit pieces	Weight 1 piece g / oz
Adapter for screw mounting	ADP.01	1SVR430029R0100		1	0.018 (0.040)
Sealable transparent cover	COV.01	1SVR430005R0100		1	0.004 (0.009)
Marker label for devices w/o DIP switches	MAR.01	1SVR366017R0100		10	0.001 (0.002)
Marker label for devices with DIP switches	MAR.02	1SVR430043R0000		10	0.001 (0.002)

# CT-S range

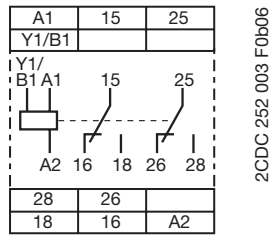
## Connection diagrams

### CT-MVS.21



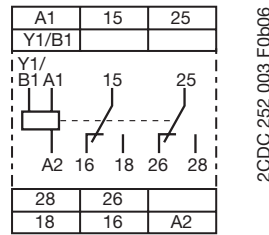
A1-A2 Supply: 24-240 V AC/DC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact  
 21-22/24 2. c/o contact as instantaneous contact  
 Z1-Z2 Remote potentiometer connection

### CT-MVS.22



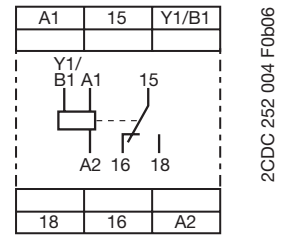
A1-A2 Supply: 224-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

### CT-MVS.23



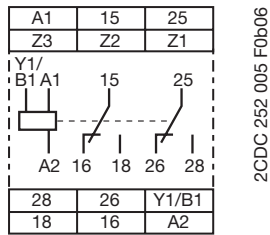
A1-A2 Supply: 380-440V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

### CT-MVS.12



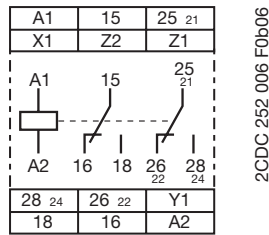
A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact

### CT-MXS.22



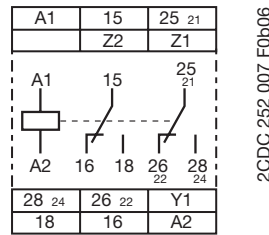
A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact  
 Z1-Z2 Remote potentiometer connection  
 Z3-Z2 Remote potentiometer connection

### CT-MFS.21



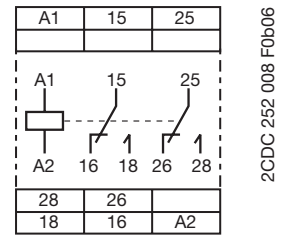
A1-A2 Supply: 24-240 V AC/DC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact  
 21-22/24 2. c/o contact as instantaneous contact  
 Y1-Z2 Control input  
 X1-Z2 Control input  
 Z1-Z2 Remote potentiometer connection

### CT-MBS.22



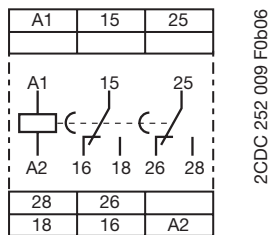
A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact  
 21-22/24 2. c/o contact as instantaneous contact  
 Y1-Z2 Control input  
 Z1-Z2 Remote potentiometer connection

### CT-WBS.22



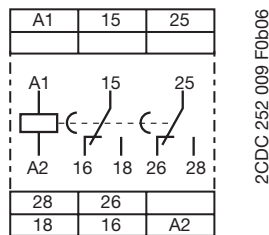
A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

### CT-ERS.21



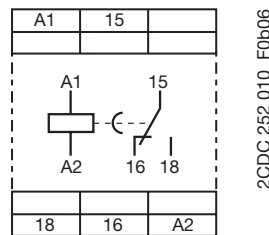
A1-A2 Supply: 24-240 V AC/DC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

### CT-ERS.22



A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

### CT-ERS.12



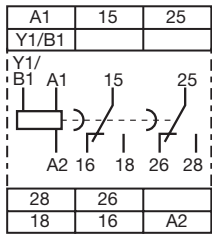
A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 15-16/18 1. c/o contact

# CT-S range

## Connection diagrams

1

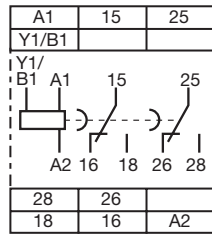
### CT-APS.21



2CDC 252 011 F0b06

A1-A2 Supply: 24-240 V AC/DC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

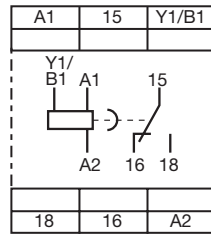
### CT-APS.22



2CDC 252 011 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

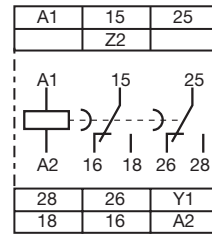
### CT-APS.12



2CDC 252 012 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 A1-Y1/B1 Control input  
 15-16/18 1. c/o contact

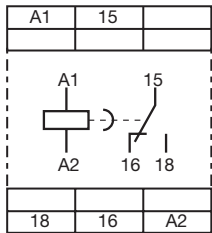
### CT-AHS.22



2CDC 252 013 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 Y1-Z2 Control input  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

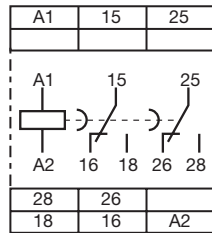
### CT-ARS.11



2CDC 252 014 F0b06

A1-A2 Supply: 24-240 V AC/DC  
 15-16/18 1. c/o contact

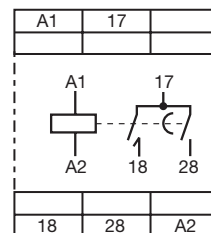
### CT-ARS.21



2CDC 252 015 F0b06

A1-A2 Supply: 24-240 V AC/DC  
 15-16/18 1. c/o contact  
 25-26/28 2. c/o contact

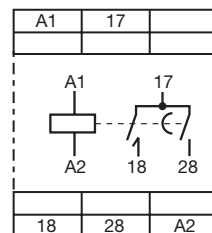
### CT-SDS.22



2CDC 252 016 F0b06

A1-A2 Supply: 24-48 V DC or 24-240 V AC  
 17-18 1. n/o contact  
 17-28 2. n/o contact

### CT-SDS.23



2CDC 252 016 F0b06

A1-A2 Supply: 380-440 V AC  
 17-18 1. n/o contact  
 17-28 2. n/o contact

# CT-S range

## Technical data

Data at  $T_a = 25\text{ °C}$  and rated values, unless otherwise indicated

		CT-S
<b>Input circuit - Supply circuit</b>		
Rated control supply voltage $U_s$	CT-xxx.x1	24-240 V AC/DC
	CT-xxx.x2	24-48 V DC, 24-240 V AC
	CT-xxx.x3	380-440 V AC
Rated control supply voltage $U_s$ tolerance		-15...+10 %
Rated frequency		DC or 50/60 Hz
Frequency range AC		47-63 Hz
Typical current / power consumption		depending on device, see data sheet
Power failure buffering time	24 V DC	min. 15 ms
	230/400 V AC	min. 20 ms
Release voltage		> 10 % of the minimum rated control supply voltage $U_s$
Minimum energizing time		100 ms (CT-ARS)
Formatting time <sup>1)</sup>		5 min (CT-ARS)
<b>Input circuit - Control circuit</b>		
Kind of triggering	CT-MVS, CT-MXS, CT-APS	voltage-related triggering
Control input, Control function	A1-Y1/B1	start timing external
Parallel load / polarized		yes / no
Maximum cable length to the control input		50 m - 100 pF/m
Minimum control pulse length		20 ms
Control voltage potential		see rated control supply voltage
Current consumption of the control input	24 V DC	1.2 mA
	230 V AC	8 mA
	400 V AC	6 mA
Kind of triggering	CT-MFS, CT-MBS, CT-AHS	volt-free triggering
Control input, Control function	Y1-Z2	start timing external
	X1-Z2	pause timing / accumulative functions (CT-MFS)
Maximum switching current in the control circuit		1 mA
Maximum cable length to the control input		50 m - 100 pF/m
Minimum control pulse length		20 ms
No-load voltage at the control inputs		10-40 V DC
<b>Remote potentiometer</b>		
Remote potentiometer connections, resistance value	Z1-Z2	50 k $\Omega$ (CT-MFS, CT-MBS, CT-MVS.21, CT-MXS)
	Z3-Z2	50 k $\Omega$ (CT-MXS)
Maximum cable length to remote potentiometer		2 x 25 m, shielded with 100 pF/m
Shield connection		Z2
<b>Timing circuit</b>		
Time ranges	10 time ranges 0.05 s - 300 h	1.) 0.05-1 s 2.) 0.15-3 s 3.) 0.5-10 s 4.) 1.5-30 s 5.) 5-100 s 6.) 15-300 s 7.) 1.5-30 min 8.) 15-300 min 9.) 1.5-30 h 10.) 15-300 h
	7 time ranges 0.05 s - 10 min (CT-SDS, CT-ARS)	1.) 0.05-1 s 2.) 0.15-3 s 3.) 0.5-10 s 4.) 1.5-30 s 5.) 5-100 s 6.) 15-300 s 7.) 0.5-10 min
Recovery time	24-240 V AC/DC	< 50 ms
	24-48 V DC, 24-240 V AC	< 80 ms
	380-440 V AC	< 60 ms
Accuracy within the rated control supply voltage tolerance		$\Delta t < 0.004\text{ % / V}$
Accuracy within the temperature range		$\Delta t < 0.03\text{ % / °C}$
Repeat accuracy (constant parameters)		< $\pm 0.2\text{ %}$
Setting accuracy of time delay		$\pm 6\text{ %}$ of full-scale value
Star-delta transition time		fixed 50 ms (CT-SDS, CT-MBS, CT-MFS, CT-MVS.2x)
Star-delta transition time tolerance		$\pm 2\text{ ms}$


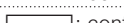
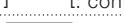

<sup>1)</sup> prior to first commissioning and after a six-month stop in operation



# CT-S range

## Technical data

1

Indication of operational states			
Control supply voltage / timing	U/T: green LED	 : control supply voltage applied /  : timing	
Control supply voltage	U: green LED	 : control supply voltage applied	
Relay state	R, R1, R2: yellow LED	 : output relay energized	
Output circuit			
Kind of output	15-16/18	relay, 1 c/o contact	
	15-16/18; 25-26/28	relay, 2 c/o contacts	
	15-16/18; 25(21)-26(22)/28(24)	relay, 2 c/o contacts, 2nd c/o contact selectable as inst. contact	
	17-18; 17-28	relay, 2 n/o contacts (CT-SDS)	
Contact material		Cd-free, on request	
Rated operational voltage $U_o$	IEC/EN 60947-1	250 V	
Minimum switching voltage / minimum switching current		12 V / 10 mA	
Maximum switching voltage / maximum switching current		see load limit curves	
Rated operational current $I_o$	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 (CT-ARS; 1.5 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		$30 \times 10^6$ switching cycles	
Electrical lifetime	at AC-12, 230 V, 4 A	$0.1 \times 10^6$ switching cycles	
Frequency of operation	with/without load	$360/72000 \text{ h}^{-1}$ <b>CT-ARS:</b> $1200/18000 \text{ h}^{-1}$	
Max. fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting	
	n/o contact	10 A fast-acting	
General data <sup>2)</sup>			
MTBF		on request	
Duty time		100%	
Dimensions		see 'Dimensional drawings'	
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool	
Mounting position		any	
Minimum distance to other units	vertical / horizontal	not necessary / not necessary	
Material of housing		UL 94 V-0	
Degree of protection	housing / terminals	IP50 / IP20	
Electrical connection <sup>2)</sup>			
Connecting capacity	fine-strand with(out) wire end ferrule	<b>Screw connection technology</b>	<b>Easy Connect Technology (Push-in)</b>
		1 x 0.5-2.5 mm <sup>2</sup> (1 x 18-14 AWG) 2 x 0.5-1.5 mm <sup>2</sup> (2 x 18-16 AWG)	2 x 0.5-1.5 mm <sup>2</sup> (2 x 18-16 AWG)
	rigid	1 x 0.5-4 mm <sup>2</sup> (1 x 20-12 AWG) 2 x 0.5-2.5 mm <sup>2</sup> (2 x 20-14 AWG)	2 x 0.5-1.5 mm <sup>2</sup> (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6-0.8 Nm (7.08 lb.in)	-

<sup>2)</sup> Data for all references 1SVR 730 xxx xxx and 1SVR 740 xxx xxx. For devices with 1SVR 430 xxx xxx please refer to the data sheet.

# CT-S range

## Technical data

<b>Environmental data</b>			
Ambient temperature ranges	operation / storage	-25...+60 °C / -40...+85 °C, -40...+60 °C / -40...+85 °C (CT-MVS.21, CT-MFS.21, CT-ERS.21, CT-APS.21)	
Relative humidity range		25 % to 85 %	
Vibration, sinusoidal (IEC/EN 60068-2-6)	functioning	40 m/s <sup>2</sup> , 10-58/60-150 Hz	
	resistance	60 m/s <sup>2</sup> , 10-58/60-150 Hz, 20 cycles	
Vibration, seismic (IEC/EN 60068-3-3)	functioning	20 m/s <sup>2</sup>	
Shock, half-sine (IEC/EN 60068-2-27)	functioning	150 m/s <sup>2</sup> , 11 ms, 3 shocks/direction	
	resistance	300 m/s <sup>2</sup> , 11 ms, 3 shocks/direction	
<b>Isolation data</b>		CT-S with 1 c/o	CT-S with 2 c/o
Rated insulation voltage U <sub>i</sub>	input circuit / output circuit	500 V	
	output circuit 1 / output circuit 2	not available	300 V
Rated impulse withstand voltage U <sub>imp</sub>	between all isolated circuits	4 kV; 1.2/50 μs except devices CT-xxx.23: input / output: 6 kV; 1.2/50 μs output 1 / output 2: 4 kV; 1.2/50 μs	
Power-frequency withstand voltage (test voltage)	between all isolated circuits	2.0 kV; 50 Hz; 60 s	
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	
<b>Standards / Directives</b>			
Standards		IEC/EN 61812-1	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
RoHS Directive		2011/65/EU	
<b>Electromagnetic compatibility</b>			
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	

# CT-S range

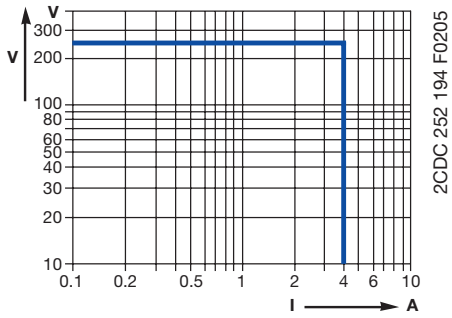
## Technical diagrams

1

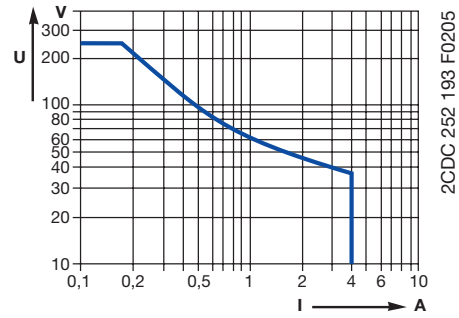
### Technical diagrams

#### Load limit curves

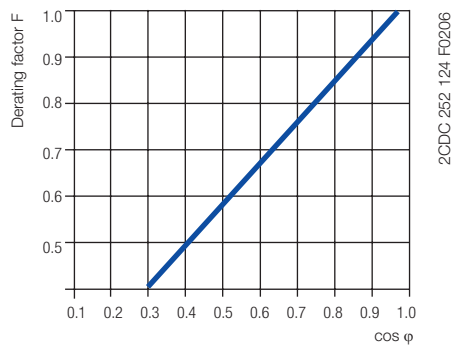
AC load (resistive)



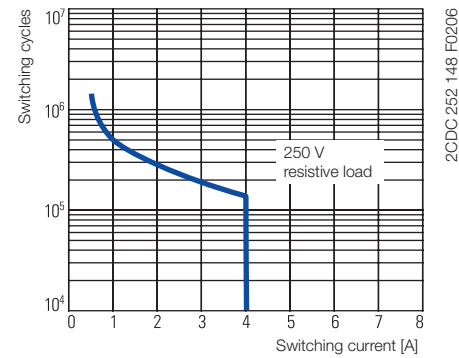
DC load (resistive)



Derating factor F for inductive AC load



Contact lifetime

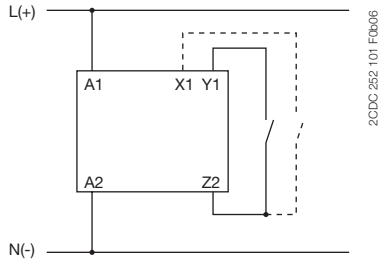


# CT-S range

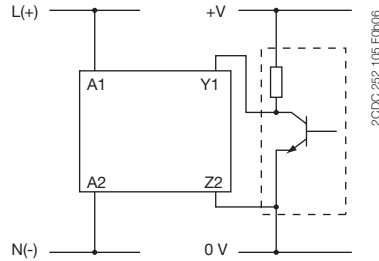
## Wiring notes, Dimensional drawings

### Wiring notes

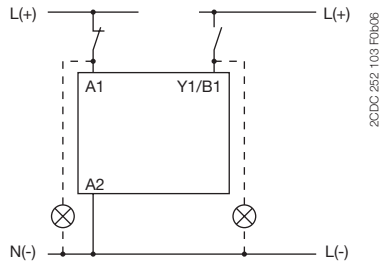
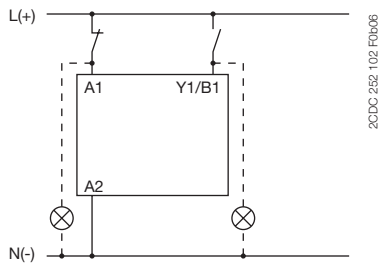
#### Control inputs (volt-free triggering)



#### Triggering of the control inputs (volt-free) with a proximity switch (3 wire)

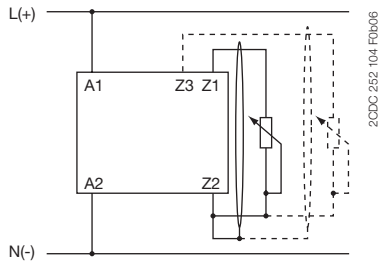


#### Control inputs (voltage-related triggering)

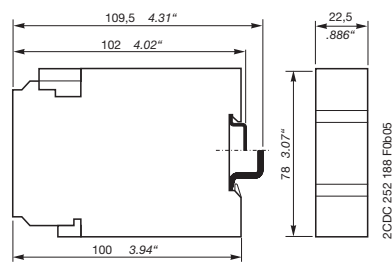


The control input Y1/B1 is triggered with electric potential against A2. It is possible to use the control supply voltage from terminal A1 or any other voltage within the rated control supply voltage range.

### Remote potentiometer

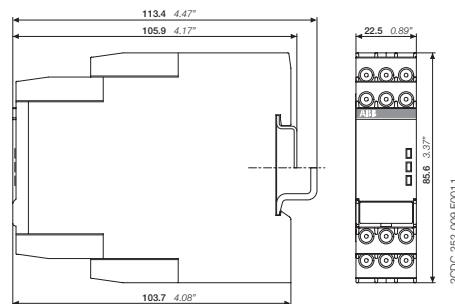


### Dimensional drawing



1SVR 430 xxx xxx

### dimensions in mm



1SVR 730 xxx xxx, 1SVR 740 xxx xxx

# Electronic timers

## Timing functions

For a detailed overview of product specific timing functions please refer to the corresponding data sheet.

1

### On delay functions (Delay on make) ☒

#### ON-delay



This function requires continuous control supply voltage for timing. 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.

#### ON-delay accumulative



This function requires continuous control supply voltage for timing. Timing begins when control supply voltage is applied. When the selected time delay is complete, the output relay energizes. Timing can be paused by closing control input. The elapsed time  $t_1$  is stored and continues from this time value when the control input is re-opened. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

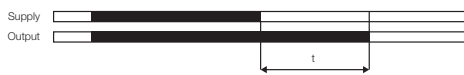
### OFF delay functions (Delay on break) ■

#### OFF-delay with auxiliary voltage



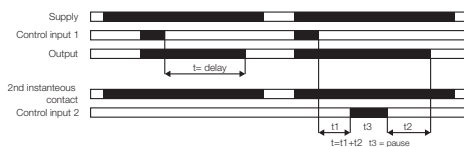
This function requires continuous control supply voltage for timing. If control input is closed, the output relay energizes immediately. If control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes. If control input recloses before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when control input re-opens. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

#### OFF-delay without auxiliary voltage



The OFF-delay function without auxiliary voltage does not require continuous control supply voltage for timing. Applying control supply voltage, energizes the output relay. If control supply voltage is interrupted, the OFF-delay starts. When timing is complete, the output relay de-energizes. If control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay remains energized. Control supply voltage must be applied for the minimum energizing time (200 ms), for proper operation.

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



This function requires continuous control supply voltage for timing. If control input is closed, the output relay energizes immediately. If control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes. If control input 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 reopens. Pause timing / Accumulative OFF-delay: Timing can be paused by closing control input 1. The elapsed time  $t_1$  is stored and continues from this time value when control input 1 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.

### Impulse-ON functions 1⏏☒

#### Impulse-ON (interval)



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 supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

#### Impulse-ON (with pause)



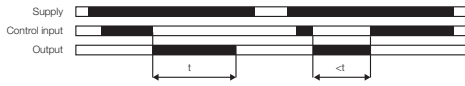
This function requires continuous control supply voltage for timing. The output relay energizes immediately when control supply voltage is applied and de-energizes after the set pulse time is complete. If control input 1 is open, timing begins when control supply voltage is applied. Or, if control supply voltage is already applied, opening control input 1 starts timing. When the selected pulse time is complete, the output relay de-energizes. Closing control input 1, 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 2. The elapsed time  $t_1$  is stored and continues from this time value when control input 2 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 timers

## Timing functions

### Impulse-OFF functions

Impulse-OFF



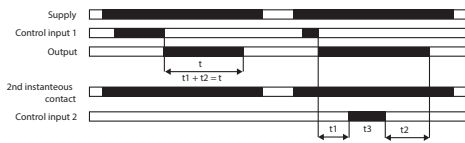
This function requires continuous control supply voltage for timing. The output relay energizes immediately when the control input is de-energized and the output de-energizes after the set pulse time is complete. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-OFF without auxiliary voltage



This function does not require continuous control supply voltage for timing. If control supply voltage is interrupted, the output relay energizes and the OFF time starts. When timing is complete, the output relay de-energizes. If control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay de-energizes. Control supply voltage must be applied for the minimum energizing time (200 ms), for proper operation.

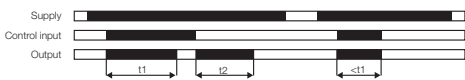
Impulse-OFF with auxiliary voltage (Trailing edge interval)



This function requires continuous control supply voltage for timing. If control supply voltage is applied, opening control input 1 energizes the output relay immediately and starts timing. When the selected pulse time is complete, the output relay de-energizes. Closing control input 1, 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 2. The elapsed time  $t_1$  is stored and continues from this time value when control input 2 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.

### Impuls-ON and Impulse-OFF functions

Impulse-ON and impulse-OFF



This function requires continuous control supply voltage for timing. If control supply voltage is applied, closing control input energizes the output relay immediately and starts the pulse time  $t_1$ . When  $t_1$  is complete, the output relay de-energizes. Re-opening control input energizes the output relay immediately and starts the pulse time  $t_2$ . When  $t_2$  is complete, the output relay de-energizes.  $t_1$  and  $t_2$  are independently adjustable. If control input changes state before the pulse time is complete, the output relay de-energizes and the pulse time is reset. If control input changes state again, the interrupted pulse time restarts. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

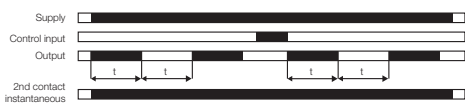
### Flasher starting with ON functions

Flasher starting with ON



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.

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 time delay can be reset by closing control input. Opening control input 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.

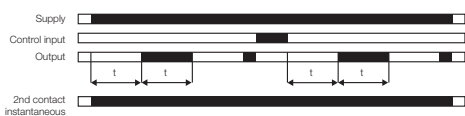
### Flasher starting with OFF functions

Flasher starting with OFF



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.

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 time delay can be reset by closing control input. Opening control input 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.

### Flasher starting with ON or OFF functions

Flasher starting with ON or OFF



Applying control supply voltage starts timing with symmetrical ON / OFF times. If the control input is open while supply voltage is connected the cycle starts with an ON time first. If the control input is closed while supply voltage is connected the cycle starts with an OFF time first.

# Electronic timers

## Timing functions

1

### Pulse former

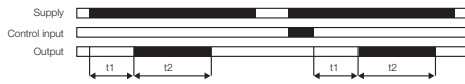
Pulse former (single shot)



This function requires continuous control supply voltage for timing. Closing control input energizes the output relay immediately and starts timing. Operating the control input during the time delay has no effect. When the selected ON time is complete, the output relay de-energizes. After the ON time is complete, it can be restarted by closing control input. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

### Single-pulse former

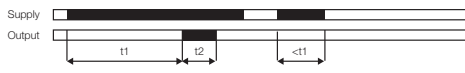
Single-pulse generator, starting with OFF



This function requires continuous control supply voltage for timing. Applying control supply voltage while the control input is open energizes the output relay after the OFF time  $t_1$  is complete. When the following ON time  $t_2$  is complete, the output relay de-energizes. Alternatively, when control supply voltage is already applied, the timing process can be started by opening control input. Closing control input with control supply voltage applied, de-energizes the output relay and resets the time delay. The ON & OFF times are independently adjustable.

### Impulse with delay

Fixed impulse with adjustable time delay



This function requires continuous control supply voltage for timing. The time delay  $t_1$  starts when control supply voltage is applied. When  $t_1$  is complete, the output relay energizes for the fixed impulse time  $t_2$  of 500 ms. If control supply voltage is interrupted, the time delay is reset. The output relay does not change state.

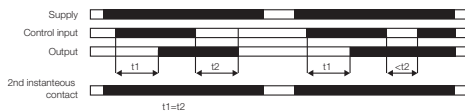
Adjustable impulse with fixed time delay



This function requires continuous control supply voltage for timing. As soon as the control supply voltage is applied the output relay will close after 500 ms. When  $t_2$  is complete, the output relay energizes and the selected pulse time  $t_1$  starts. When  $t_1$  is complete, the output relay de-energizes. If control supply voltage is interrupted, the pulse time is reset and the output relay de-energizes.

### ON- and OFF-delay

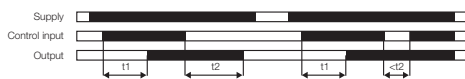
Symmetrical ON- and OFF-delay <sup>1)</sup>



This function requires continuous control supply voltage for timing. Closing control input starts the ON-delay time  $t_1$ . When timing is complete, the output relay energizes. Opening control input starts the OFF-delay time  $t_2$ . When the OFF-delay  $t_2$  is complete, the output relay de-energizes. If control input opens before the ON-delay ( $<t_1$ ) is complete, the time delay is reset and the output relay remains de-energized. If control input closes before the OFF-delay time ( $<t_2$ ) is complete, the time delay is reset and the output relay remains energized.

1) Variant with 2nd control input for pause timing is available too.

Asymmetrical ON- and OFF-delay



This function requires continuous control supply voltage for timing. Closing control input starts the ON-delay  $t_1$ . When timing is complete, the output relay energizes. Opening control input starts the OFF-delay  $t_2$ . When the OFF-delay is complete, the output relay de-energizes. The ON-delay and OFF-delay are independently adjustable. If control input opens before the ON-delay is complete ( $<t_1$ ), the time delay is reset and the output relay remains de-energized. If control input closes before the OFF-delay is complete ( $<t_2$ ), the time delay is reset and the output relay remains energized. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

# Electronic timers

## Timing functions

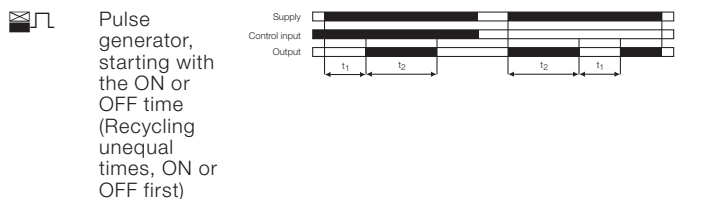
### Further functions



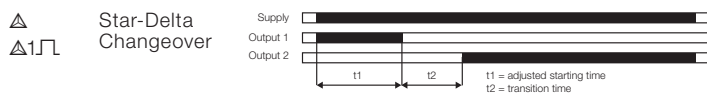
This function is used for test purposes during commissioning and troubleshooting.

If the selected max. value of the time range is smaller than 300 h (front-face potentiometer "Time sector"  $\neq$  300 h), applying control supply voltage energizes the output relay immediately. 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 output relay does not energize.



This function requires continuous control supply voltage for timing. Applying control supply voltage, with closed control input, starts timing with an OFF time first. Applying control supply voltage, with open control input, starts timing with an ON time first. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.



This function requires continuous control supply voltage for timing. Applying control supply voltage, energizes the star contactor and begins the set starting time  $t_1$ . When the starting time is complete, the first output contact de-energizes the star contactor. When the transition time  $t_2$  is complete, the second output contact energizes the delta contactor. The delta contactor remains energized as long as control supply voltage is applied.  $t_2$  is fixed to 50ms or in some variants adjustable.



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