

CATALOG

Time relays

CT-C, CT-S, CT-E, CT-D



- From economic to high end
- A reliable solution for every application
- World wide approvals and support

Available in three different ranges to cover every application, CT range time relays are used to provide reliable timing functions worldwide. They have proven their excellent functionality in daily use under the toughest conditions.

Choose ABB as the partner for all your low voltage timing control needs to leverage our wide variety of product options. From economic to high-end solutions – the range offers maximum value.

Time relays

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Time relays for industrial applications

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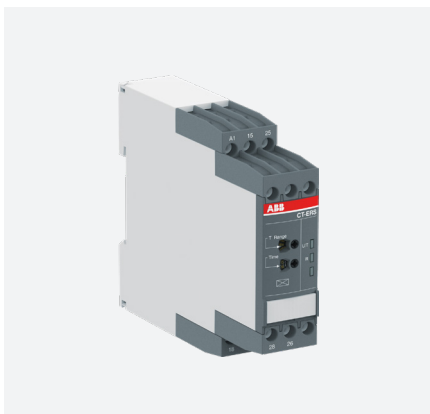
Time relays for industrial applications

Offer overview



CT-C: the compact range

The CT-C range combines lower cost with higher value and performance by offering essential functions in a space-saving 17.5 mm housing. The range offers a choice of 11 devices, including single and multifunctional types, with timing functions that range from 0.05 seconds to 100 hours. Equipped with a wide voltage range, the CT-C range is suitable for a huge variety of applications worldwide.



CT-S: the high-performance range

The advanced CT-S range is ABB's universal range of electronic timers. It includes 22 single-function devices and 16 multifunction time relays, offering flexibility in operation with up to 13 functions. The devices feature seven or ten time ranges, adjustable from 0.05 seconds to 300 hours. Additionally, every device is available in two different connection technologies: familiar double-chamber cage connection terminals (screw terminals) and ABB's vibration-resistant Easy Connect technology (push-in terminals).


















CT-E: the economic range

The CT-E range with its excellent price/performance ratio offers an solution for serial applications. 56 single-function devices with five different time ranges as well as two multifunctional timers with six functions and eight time ranges offer flexibility for almost every application. For high operating cycles, contact-free CT-E timers with solid-state output are available.

Time relays for industrial applications

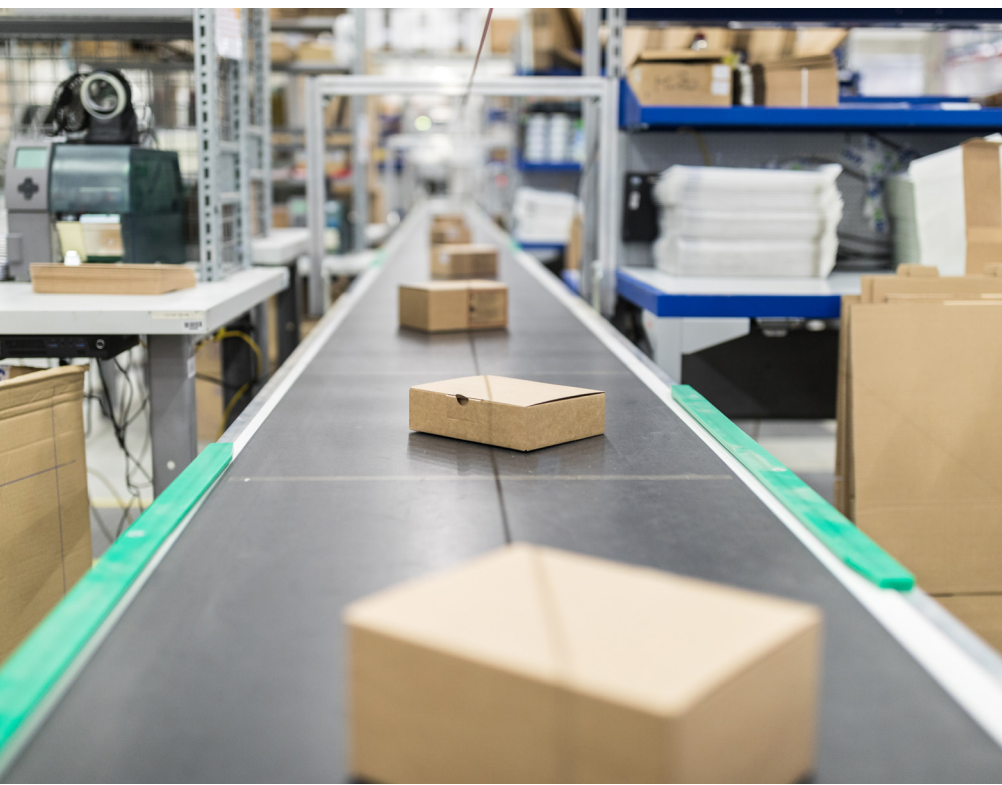
Type selection

	multi-functional	single-functional	multi-functional	single-functional	multi-functional	single-functional
Timing function	CT-C		CT-E		CT-S	
 ON-delay	CT-MFC	CT-ERC	CT-MFE, CT-MKE	CT-ERE, CT-EKE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	CT-ERS
 OFF-delay	CT-MFC	CT-AHC	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-MFC	CT-VWC	CT-MFE, CT-MKE	CT-VWE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	
 Impulse-OFF	CT-MFC			CT-AWE	CT-MVS, CT-MFS, CT-MBS	
 Impulse-ON and OFF					CT-MXS	
 Flasher starting with ON	CT-MFC		CT-MFE, CT-MKE		CT-MFS, CT-MBS, CT-WBS	
 Flasher starting with OFF	CT-MFC		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-TGC			CT-MXS	
 Pulse former	CT-MFC		CT-MFE		CT-MVS, CT-MFS, CT-MBS	
 Star-delta change-over		CT-SDC, CT-SAC				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 in the chapter "Timing functions".

Synonyms

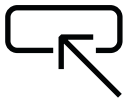
Used expression	Alternative expression(s)
1 c/o contact	SPDT
2 c/o contacts	DPDT
voltage-related	wet / non-floating
volt-free	dry / floating



Time relays for industrial applications

Applications

ABB offers a wide selection of time relays – from economic to high-end – to suit every application for businesses worldwide. ABB time relays provide simple, reliable and economical control solutions in all types of panel. They are typically used in industrial applications and OEM equipment, providing time-delayed switching to start a motor, control a load or manage a process.



Remote control of time delays with a remote potentiometer.



Cyclic switching of machinery, for example the weekly startup of a fan to prevent them sticking or the flushing of pipes to keep them clear.



Lighting control, for example the delayed switching of multiple rows of lamps in production facilities or green-houses.



Time controlled start up or shut down of machinery equipment, for example the delayed switch off of conveyor belts or the successive shut down of a plant.



Alarm triggering in case of fault detection, for example to allow the flashing of a lamp in industrial applications or rolling stock.



Star-delta motor starting to reduce starting current with changeover delay to prevent interphase short-circuits.

Have the perfect timing everywhere with ABB's time relays:

- Control panels
- Pump controls
- Star-delta motor starting
- Movable equipment e.g. cranes
- Machine tools
- Automatic doors
- Car park barriers
- Assembly machines
- HVAC
- Compressor controls
- Transportation
- Industrial refrigeration
- Assembly machines
- Packaging machines
- Baking ovens
- Water and wastewater
- Wind
- Industrial cleaning processes



CT-C range

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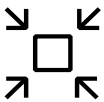
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CT-C range

Benefits and advantages



The CT-C range combines lower cost with higher value and performance by offering essential functions in a 17.5 mm housing, freeing up room in any control cabinet. The range includes 11 devices, offering both single and multifunctional types, with a time range from 0.05 seconds to 100 hours. Equipped with wide voltage ranges, CT-C time relays allow for use across a huge variety of applications worldwide.



Space savings

With a width of just 17.5 mm, the CT-C range is 22% smaller than standard industrial housings for time relays. Its reduced overall footprint saves space in control cabinets. For more flexibility both 1 c/o and 2 c/o output versions are offered in the compact housing.



Cost effective solution

The CT-C range is an economical range that combines lower cost with higher value and performance. It suits basic applications where a time relay is needed, while offering improved functionality in each device.



Optimized logistics

By combining more functions into each device, the CT-C range makes it possible to reduce stock by up to 75% compared to other ranges. All devices in the CT-C range offer a wide supply voltage range as well as a wide time setting range from 0.05 seconds to 100 hours. This significantly reduces order code variance, making the range more compact with just 11 order codes covering every requirement.

CT-C range

Operating controls



Connection terminals

Wide terminal spacing makes wiring connections easier:
2 x 1.5 mm² (2 x 16 AWG) with wire end ferrules or 2 x 2.5 mm² (2 x 14 AWG) without ferrules.



Preselection of the time range



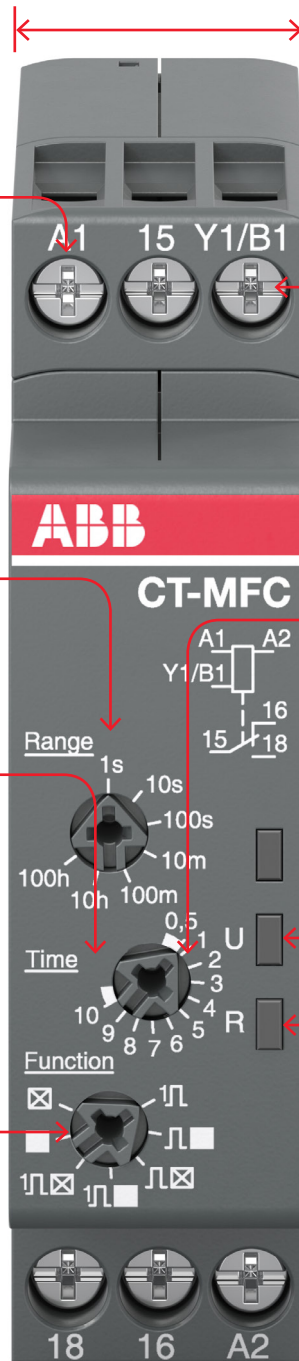
Direct reading scales

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



Selection of the timing function

- ON-delay
- OFF-delay with aux. voltage
- Impulse-ON
- Impulse-OFF with aux. voltage
- Flasher starting with ON
- Flasher starting with OFF
- Pulse generator starting with ON or OFF



Width 17.5 mm

With a width of just 17.5mm, CT-C time relays are ideal for installations with limited space.

Control input to start timing



Fine adjustment of the time delay



LEDs for status indication

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

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

CT-C range

Ordering details



2CDC251030V0018

CT-MFC.12



2CDC251025V0018

CT-ERC.22

- Control input with voltage-related triggering
- No triggering

Description

The CT-C range combines lower cost with higher value and performance in a slim 17.5 mm-wide housing. All relays have a wide time setting range from 0.05 seconds up to 100 hours. Combined with a wide voltage range they are the perfect choice for applications worldwide.

Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Weight (1 pc) kg (lb)
Multi ¹⁾	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	■	1 c/o	CT-MFC.12	1SVR508020R0000	0.060 (0.132)
Multi ¹⁾	12-240 V AC/DC	7 (0.05 s - 100 h)	■	2 c/o	CT-MFC.21	1SVR508020R1100	0.065 (0.143)
ON-delay	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	-	1 c/o	CT-ERC.12	1SVR508100R0000	0.060 (0.132)
			-	2 c/o	CT-ERC.22	1SVR508100R0100	0.065 (0.143)
OFF-delay			■	1 c/o	CT-AHC.12	1SVR508110R0000	0.060 (0.132)
			■	2 c/o	CT-AHC.22	1SVR508110R0100	0.065 (0.143)
Impulse-ON			-	1 c/o	CT-VWC.12	1SVR508130R0000	0.060 (0.132)
Pulse generator		2×7 (0.05 s - 100 h)	■		CT-TGC.12 ²⁾	1SVR508160R0000	0.060 (0.132)
			■	2 c/o	CT-TGC.22 ²⁾	1SVR508160R0100	0.065 (0.143)
Star-delta change-over		4 (0.05 s - 10 min)	-	2 n/o	CT-SDC.22 ³⁾	1SVR508211R0100	0.065 (0.143)
			-		CT-SAC.22 ⁴⁾	1SVR508210R0100	

¹⁾ 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

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




³⁾ Transition time 50 ms fixed

⁴⁾ Transition time adjustable

CT-C range

Technical data

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

		CT-C with 1 c/o contact	CT-C with 2 c/o contacts	CT-MFC.21
Input circuit - Supply circuit				
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 power consumption		max. 3.5 VA		
Power failure buffering time		min. 20 ms		
Release voltage		> 10 % of the minimum rated control supply voltage U _s		
Input circuit - Control circuit				
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		
Timing circuit				
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-SDC, CT-SAC)	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		Δt < 0.005 % / V		
Accuracy within the temperature range		Δt < 0.06 % / °C		
Repeat accuracy (constant parameters)		Δt < ± 0.5 %		
Setting accuracy of time delay		± 10% of full-scale value		
Star-delta transition time		CT-SDC / CT-SAC	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-SDC / CT-SAC	±3 ms	
Indication of operational states				
Control supply voltage / timing		U: green LED	 : control supply voltage applied  : timing	
Relay energized		R, R1, R2: yellow LED	 : output relay energized	
Operating elements and controls				
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-SAC	front-face potentiometer	
Output circuit				

CT-C range

Technical data

		CT-C with 1 c/o contact	CT-C with 2 c/o contacts	CT-MFC.21
Kind of output	15-16/18	Relay, 1 c/o contact	-	
	15-16/18; 25-26/28	-	Relay, 2 c/o contacts	
	17-18; 17-28		Relay, 2 n/o contacts (CT-SDC, CT-SAC)	
Contact material		AgNi alloy, Cd free		
Rated operational voltage U _e		250 V		
Minimum switching voltage / minimum switching current		12 V / 100 mA		
Maximum switching voltage / maximum switching current		250 V AC / 6 A	250 V AC / 5 A	
Rated operational current I _e	AC-12 (resistive) at 230 V	4 A	4 A	
	AC-15 (inductive) at 230 V	3 A	3 A	n/o: 3 A n/c: 0.75 A
	DC-12 (resistive) at 24 V	4 A	4 A	
	DC-13 (inductive) at 24 V	2 A	2 A	1 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300		n/o: B 300 n/c: C 300
	max. rated operational voltage	300 V AC		
	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 ⁶ switching cycles		
Electrical lifetime		0.1 x 10 ⁶ switching cycles		
Max. fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting		
	n/o contact	10 A fast-acting		6 A fast-acting
General data				
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		
Electrical connection				
Connecting capacity	fine-stranded with(out) wire and ferrule	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)		
		1 x 0.5-2.5 mm ² (1 x 20-14 AWG)		
	rigid	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)		
		1 x 0.5-4 mm ² (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)		
Environmental data				
Ambient temperature range	operation / storage	-20 ... +60 °C / -40 ... +85 °C		
Climatic class	EC/EN 60068-2-30	3K3		
Relative humidity range		25-85%		
Vibration, sinusoidal	IEC/EN 60068-2-6	20 m/s ² ; 10 cycles, 10...150...10 Hz		
Shock (half-sine)	IEC/EN 60068-2-27	150 m/s ² , 11 ms		

CT-C range

Technical data

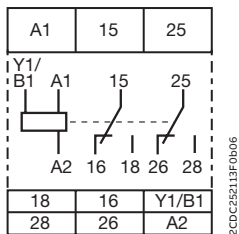
		CT-C with 1 c/o contact	CT-C with 2 c/o contacts	CT-MFC.21
Isolation data				
Rated insulation voltage U _i	input circuit / output circuit	300 V		
	output circuit 1 / output circuit 2	not available	300 V	300 V
Rated impulse withstand voltage U _{imp}	between all isolated circuits	4 kV; 1.2/50 μs		
Power-frequency 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		
Standards / Directives				
Standards		IEC/EN 61812-1		
Low Voltage Directive		2014/35/EU		
EMC Directive		2014/30/EU		
RoHS Directive		2011/65/EU		
Electromagnetic compatibility				
Interference immunity to		IEC/EN 61000-6-2		
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	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-C range

Technical diagrams

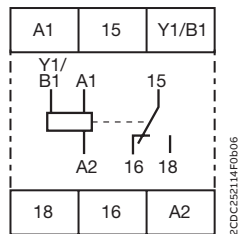
Connection diagrams

CT-MFC.21



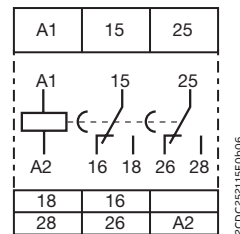
A1-A2	Supply: 12-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MFC.12



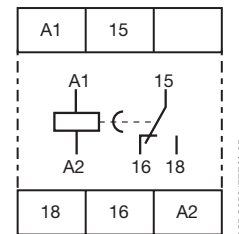
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-ERC.22



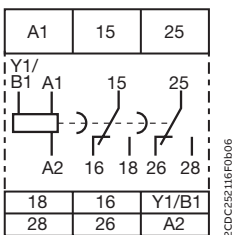
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERC.12



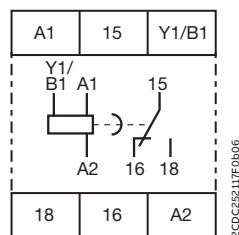
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-AHC.22



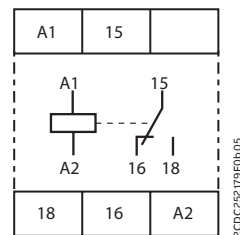
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-AHC.12



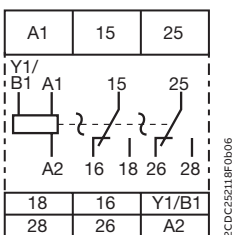
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-VWC.12



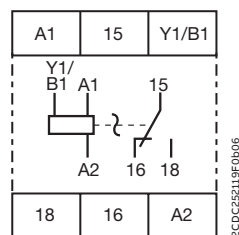
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
15-16/18	1st c/o contact

CT-TGC.22



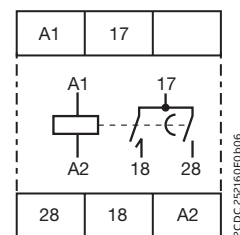
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-TGC.12



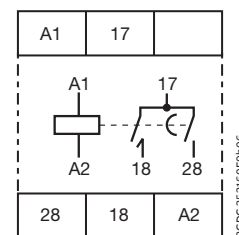
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-SDC.22



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

CT-SAC.22



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

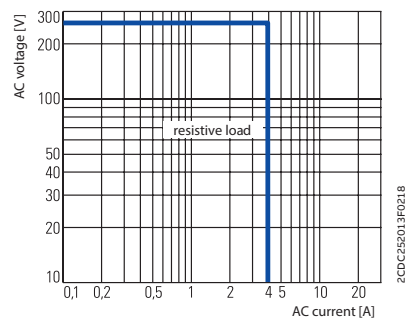
CT-C range

Technical diagrams

Load limit curves

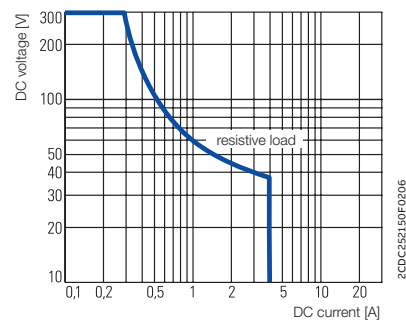
AC load (resistive)

CT-C.1x



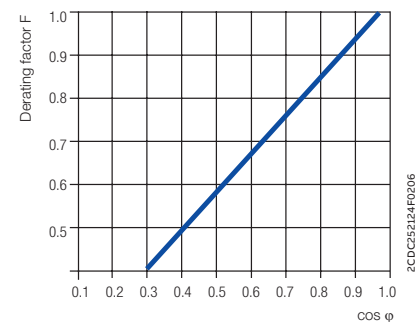
DC load (resistive)

CT-C.1x

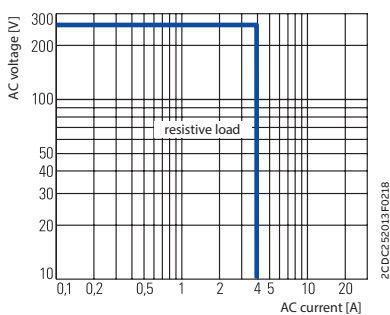


Derating factor F

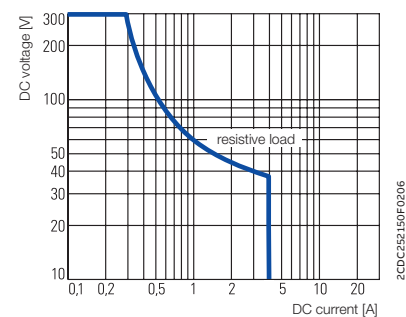
for inductive AC load



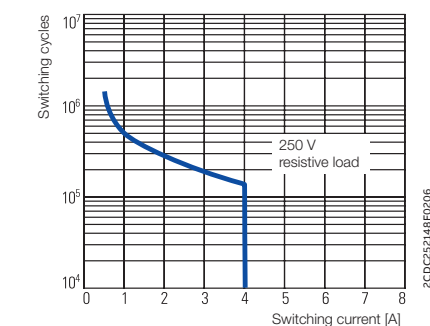
CT-C.2x



CT-C.2x

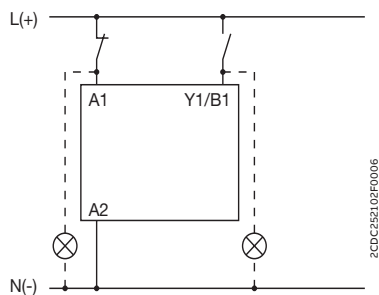


Contact lifetime



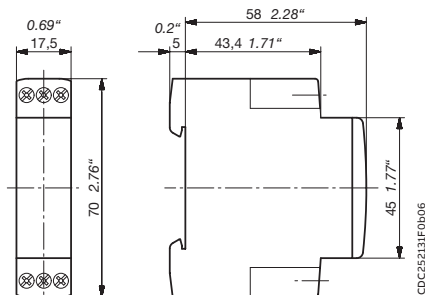
Wiring notes for devices with control input

A parallel load to the control input is possible

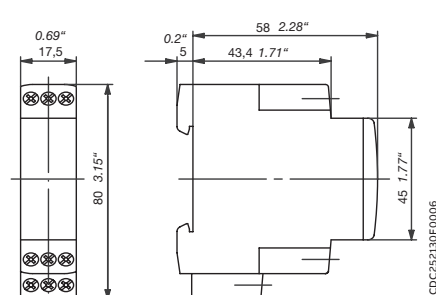


Dimensional drawings

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



CT-C devices with 2 c/o contacts



Dimensions in mm, inches



CT-S range

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CT-S range

Benefits and advantages



The advanced CT-S range includes 22 single-function devices and 16 multifunction timers with up to 13 functions. The devices feature seven or ten time ranges, which are adjustable from 0.05 seconds to 300 hours. Every device is available in two different connection technologies: double-chamber cage connection terminals or ABB's vibration-resistant Push-in Technology.



Improve installation efficiency

The CT-S range allows simple tool free mounting and demounting on the DIN rail. Thanks to the easy connect and the double-chamber cage connection technology simplified wiring with or without wire end ferrules is no problem. Both allow simple and easy installation, even in case of different cable diameters.



Reliable in harsh conditions

The CT-S range's extended features make it especially suited for harsh environments. The housing material has the highest UL fire protection classification. All functions are available with Push-in terminals, making operations in environments with high vibrations possible without retightening. Additionally, the CT-S range offers devices with an extended temperature range, running operations in temperatures as low as -40 °C effortlessly. Specific types are tested according to the latest rail industry standards, making them a perfect solution for rolling stock and other rail applications.



Global availability

Every device in the CT-S range is designed to provide a wide supply voltage range, making global differences irrelevant. Additionally, the CT-S range meets a broad range of standards and requirements. Together with ABB's global support and sales network, using CT-S gives customers the confidence of worldwide sourcing – no matter where they build, install or operate their equipment.

CT-S range

Operating controls

Control input
Starts and pauses timing.



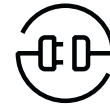
Preselection of time range
Direct assignment of the pre-selected time range to the fine adjustment potentiometer scale by multicolor scales



Fine adjustment of the time delay



Selection of the timing function



Connection terminals
Screw or push-in connection available.

Remote potentiometer connection possible

2nd contact selectable as an instantaneous contact

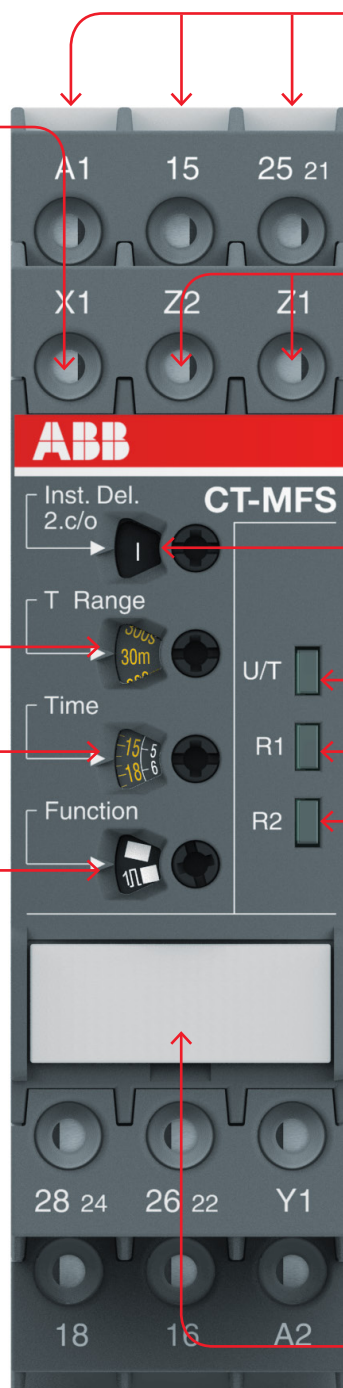


LEDs for status indication
All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

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

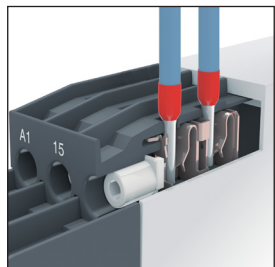


Integrated marker label
Integrated marker labels allow the product to be marked quickly and simply. No additional marker labels are required.

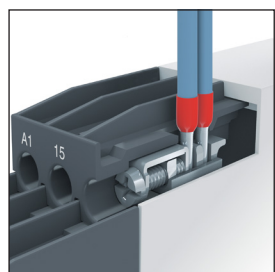


CT-S range

Benefits and advantages



01 Tool-free mounting of wires



02 Wiring of double-chamber cage connection terminals with screw driver

Easy Connect Technology

Tool-free wiring and excellent vibration resistance. Easy Connect (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

According to IEC/EN 60947-1 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. Thanks to the technology, using different cable diameters in one terminal is easy and simple to install. Potential distribution does not require additional terminals. The extended type designators for products with double-chamber cage connection terminals (screw terminals) are indicated by an **S** following the extended type designator, e.g. CT-xxS.xx**S**.



CT-S range

Made for the most extreme conditions

Selected products of the CT-S range comply to the latest rail standards like EN50155. Designed for harsh environments, not only are standard screw type terminals offered – push-in terminals with excellent vibration resistance are also available. Perfect for use in rolling stock.



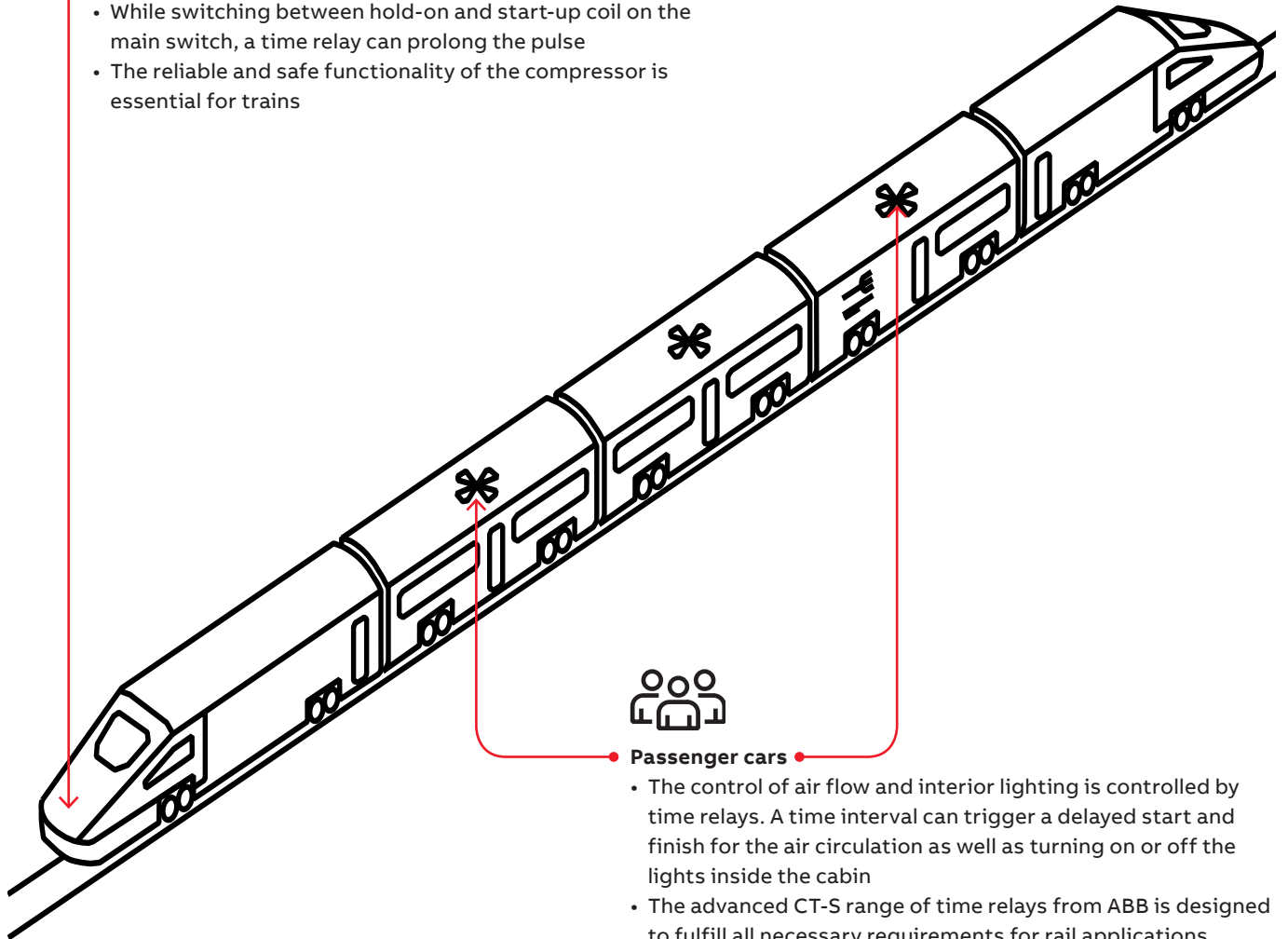
Conductor car

- In the event of the press switch not switching off the auxiliary release pumps of the breaking system, a delayed switch off is triggered by the time relays
- While switching between hold-on and start-up coil on the main switch, a time relay can prolong the pulse
- The reliable and safe functionality of the compressor is essential for trains



Passenger cars

- The control of air flow and interior lighting is controlled by time relays. A time interval can trigger a delayed start and finish for the air circulation as well as turning on or off the lights inside the cabin
- The advanced CT-S range of time relays from ABB is designed to fulfill all necessary requirements for rail applications



CT-S range

Selection table

Order number and type

Order number and type
All devices are available either with push-in terminals (P-type) or double-chamber cage connection terminals (S-type).

Terminal	Type	Order number
Push-in	● = P	■ = 4
Screw	● = S	■ = 3

		Type*	Order number*
		CT-MVS.21●	1SVR7■0020R0200
		CT-MVS.22●	1SVR7■0020R3300
		CT-MVS.23●	1SVR7■0021R2300
		CT-MVS.12●	1SVR7■0020R3100
		CT-MXS.22●	1SVR7■0030R3300
		CT-MFS.21●	1SVR7■0010R0200
		CT-MBS.22●	1SVR7■0010R3200
		CT-WBS.22●	1SVR7■0040R3300
		CT-ERS.21●	1SVR7■0100R0300
		CT-ERS.22●	1SVR7■0100R3300
		CT-ERS.12●	1SVR7■0100R3100
		CT-APS.21●	1SVR7■0180R0300
		CT-APS.22●	1SVR7■0180R3300
		CT-APS.12●	1SVR7■0180R3100
		CT-AHS.22●	1SVR7■0110R3300
		CT-ARS.11●	1SVR7■0120R3100
		CT-ARS.21●	1SVR7■0120R3300
		CT-SDS.22●	1SVR7■0210R3300
		CT-SDS.23●	1SVR7■0211R2300

Timing function	
ON-delay	
ON-delay, accumulative	
OFF-delay w. aux. voltage	
OFF-delay w. aux. voltage, accumulative	
OFF-delay w/o aux. voltage	
ON- and OFF-delay, symmetrical	
ON- and OFF-delay, asymmetrical	
ON/OFF function	
Impulse-ON	
Impulse-ON, accumulative	
Impulse-OFF w. aux. voltage	
Impulse-OFF w. aux. voltage, accumulative	
Impulse-ON and OFF	
Fixed impulse with adjustable time delay	
Adjustable impulse with fixed time delay	
Flasher starting with ON	
Flasher with reset, starting with ON	
Flasher starting with OFF	
Flasher with reset, starting with OFF	
Flasher starting with ON or OFF	
Pulse generator starting with ON or OFF	
Single pulse generator	
Pulse former	
Star-delta change-over	
Star-delta change-over with impulse	

Features	
Control input, voltage-related triggering	
Control input, volt-free triggering	
Remote potentiometer connection	
2nd c/o contact selectable as instantaneous contact	
Extended temperature range (-40...+60 °C)	

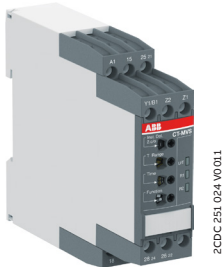
Time range	
0.05 s - 10 min	
0.05 s - 300 h	

Supply voltage	
24-48 V DC	
24-240 V AC	
24-240 V AC/DC	
380-440 V AC	

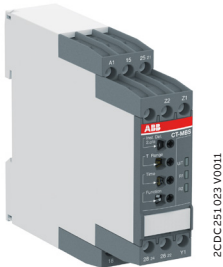
Output	
c/o contact	
n/o contact	

CT-S range

Ordering details - multifunctional devices



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

Description

The high-performance CT-S range is ideally suited for universal use and is available with two different connection technologies:

- Double-chamber cage connection terminals (Screw terminals)
- Easy Connect Technology (Push-in terminals)

Ordering details

Timing function ⁵⁾	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Weight (1 pc) kg (lb)
Multi	24- 240 V AC/DC	10 (0.05 s - 300 h)	■	2 c/o	CT-MVS.21S ^{1) 2) 3)}	1SVR730020R0200	0.148 (0.326)
					CT-MVS.21P ^{1) 2) 3)}	1SVR740020R0200	0.136 (0.30)
	24-48 V DC, 24-240 V AC				CT-MVS.22S	1SVR730020R3300	0.142 (0.313)
					CT-MVS.22P	1SVR740020R3300	0.131 (0.289)
	380-440 V AC				CT-MVS.23S	1SVR730021R2300	0.144 (0.317)
					CT-MVS.23P	1SVR740021R2300	0.133 (0.293)
Multi	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	■	1 c/o	CT-MVS.12S	1SVR730020R3100	0.107 (0.236)
					CT-MVS.12P	1SVR740020R3100	0.102 (0.225)
Multi	24-48 V DC, 24-240 V AC	2×10 (0.05 s - 300 h)	■	2 c/o	CT- MXS.22S ⁴⁾	1SVR730030R3300	0.142 (0.313)
					CT-MXS.22P ⁴⁾	1SVR740030R3300	0.131 (0.289)
Multi	24- 240 V AC/DC	10 (0.05 s - 300 h)	□ / □	2 c/o	CT-MFS.21S ^{1) 2) 3)}	1SVR730010R0200	0.145 (0.32)
					CT-MFS.21P ^{1) 2) 3)}	1SVR740010R0200	0.133 (0.293)
	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	□	2 c/o	CT-MBS.22S ^{2) 3)}	1SVR730010R3200	0.14 (0.309)
					CT-MBS.22P ^{2) 3)}	1SVR740010R3200	0.129 (0.284)
Multi	24-48 V DC, 24-240 V AC	10 (0.05 s - 300 h)	-	2 c/o	CT-WBS.22S	1SVR730040R3300	0.123 (0.271)
					CT-WBS.22P	1SVR740040R3300	0.115 (0.254)

¹⁾ Extended temperature range -40 °C

²⁾ Remote potentiometer connection

³⁾ 2nd c/o contact selectable as instantaneous contact

⁴⁾ 2 remote potentiometer connections

⁵⁾ See selection table on previous page

S: Screw connection

P: Push-in / easy connect

CT-S range

Ordering details - singlefunctional devices



CT-ERS.21P

2CDC 251 030 V0011



CT-AHS.22P

2CDC 251 033 V0011



CT-SDS.23P

2CDC 251 040 V0011

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

Ordering details

Timing function	Rated control supply voltage	Time ranges	Control input	Output	Type	Order code	Weight (1 pc) kg (lb)	
ON-delay	24-240 V AC/ DC	10 (0.05 s - 300 h)	-	2 c/o	CT-ERS.21S ¹⁾	1SVR730100R0300	0.13 (0.287)	
					CT-ERS.21P ¹⁾	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		-	1 c/o	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 ¹⁾	1SVR730180R0300	0.146 (0.322)	
					CT-APS.21P ¹⁾	1SVR740180R0300	0.125 (0.276)	
					CT-APS.22S	1SVR730180R3300	0.138 (0.304)	
					CT-APS.22P	1SVR740180R3300	0.127 (0.28)	
			■	1 c/o	CT-APS.12S	1SVR730180R3100	0.109 (0.24)	
					CT-APS.12P	1SVR740180R3100	0.103 (0.227)	
	24-48 V DC, 24-240 V AC		□	2 c/o	CT-AHS.22S	1SVR730110R3300	0.136 (0.30)	
					CT-AHS.22P	1SVR740110R3300	0.125 (0.276)	
OFF-delay ²⁾	24-240 V AC/DC	7 (0.05 s - 10 min)	-	1 c/o	CT-ARS.11S	1SVR730120R3100	0.106 (0.234)	
					CT-ARS.11P	1SVR740120R3100	0.10 (0.22)	
			-	2 c/o	CT-ARS.21S	1SVR730120R3300	0.124 (0.273)	
					CT-ARS.21P	1SVR740120R3300	0.115 (0.254)	
Star-delta change-over ³⁾	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)	

¹⁾ Extended temperature range -40 °C²⁾ Without auxiliary voltage³⁾ 50 ms transition time

S: Screw connection

P: Push-in / easy connect

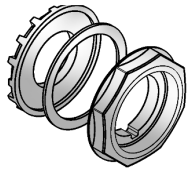
CT-S range

Ordering details - Accessories



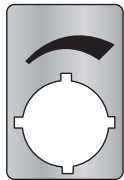
MT-x50B

1SFC151139V0001



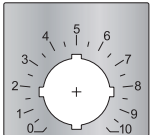
30 mm adapters

2CDC252 042 F0009

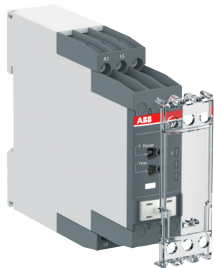


Marker label 29.6 x 44.5 mm

2CDC252 043 F0209

Marker label with scale 0-10
48.5 x 44.5 mm

2CDC252 044 F0209

Sealable transparent cover
for CT-S in new housing

2CDC255 006 S0011

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.

Remote potentiometer

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

Material	Diameter in mm	Type	Order code	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

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

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

Marker label

Caption	Type	Order code	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

Accessories for CT-S

Description	Type	Order code	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)

CT-S range

Technical data





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

		CT-S
Input circuit - Supply circuit		
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 ¹⁾		5 min (CT-ARS)
Input circuit - Control circuit		
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
Remote potentiometer		
Remote potentiometer connections, resistance value	Z1-Z2	50 k Ω (CT-MFS, CT-MBS, CT-MVS.21, CT-MXS)
	Z3-Z2	50 k Ω (CT-MXS)
Maximum cable length to remote potentiometer		2 x 25 m, shielded with 100 pF/m
Shield connection		Z2
Timing circuit		
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		$\pm 2\text{ ms}$

¹⁾ Prior to first commissioning and after a six-month stop in operation

CT-S range

Technical data

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 _e		IEC/EN 60947-1	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 _e	AC-12 (resistive) at 230 V		4 A
	AC-15 (inductive) at 230 V		3 A
	DC-12 (resistive) at 24 V		4 A
	DC-13 (inductive) at 24 V		2 A (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 x 10 ⁶ switching cycles	
Electrical lifetime		at AC-12, 230 V, 4 A	0.1 x 10 ⁶ switching cycles
Frequency of operation		with/without load	360/72000 h ⁻¹ CT-ARS: 1200/18000 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			
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			
		Screw connection technology	Easy Connect Technology (Push-in)
Connecting capacity	fine-strand with(out) wire end ferrule	1 x 0.5-2.5 mm ² (1 x 18-14 AWG) 2 x 0.5-1.5 mm ² (2 x 18-16 AWG)	2 x 0.5-1.5 mm ² (2 x 18-16 AWG)
		rigid 1 x 0.5-4 mm ² (1 x 20-12 AWG) 2 x 0.5-2.5 mm ² (2 x 20-14 AWG)	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	
Tightening torque		0.6-0.8 Nm (7.08 lb.in)	-

CT-S range

Technical data

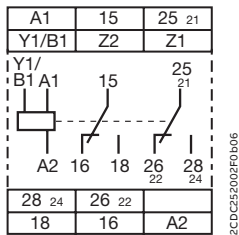
Environmental data		
Ambient temperature ranges	operation / storage	-25...+60 °C / -40...+85 °C, -40...+60 °C / -40...+85 °C for CT-MVS.21, CT-MFS.21, CT-ERS.21, CT-APS.21
Relative humidity range		25 % to 85 %
Vibration, sinusoidal (IEC/EN 60068-2-6)	functioning	40 m/s ² , 10-58/60-150 Hz
	resistance	60 m/s ² , 10-58/60-150 Hz, 20 cycles
Vibration, seismic (IEC/EN 60068-3-3)	functioning	20 m/s ²
Shock, half-sine (IEC/EN 60068-2-27)	functioning	150 m/s ² , 11 ms, 3 shocks/direction
	resistance	300 m/s ² , 11 ms, 3 shocks/direction
Isolation data		CT-S with 1 c/o CT-S with 2 c/o
Rated insulation voltage U _i	input circuit / output circuit	500 V
	output circuit 1 / output circuit 2	not available 300 V
Rated impulse withstand voltage U _{imp}	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
Standards / Directives		
Standards		IEC/EN 61812-1
Low Voltage Directive		2014/35/EU
EMC Directive		2014/30/EU
RoHS Directive		2011/65/EU
Electromagnetic compatibility		
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3, 6 kV / 8 kV
radiated, radio-frequency electromagnetic field	IEC/EN 61000-4-3	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

Connection diagrams

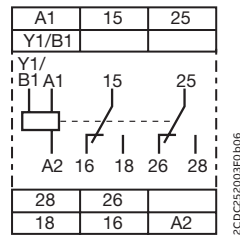
CT-MVS.21



A1-A2 Supply:
24-240 V AC/DC

A1-Y1/B1 Control input
15-16/18 1st c/o contact
25-26/28 2nd c/o contact
21-22/24 2nd c/o contact as
instantaneous contact
Z1-Z2 Remote potentiometer
connection

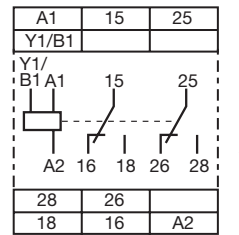
CT-MVS.22



A1-A2 Supply:
224-48 V DC or
24-240 V AC

A1-Y1/B1 Control input
15-16/18 1st c/o contact
25-26/28 2nd c/o contact

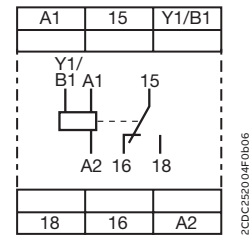
CT-MVS.23



A1-A2 Supply:
380-440V AC

A1-Y1/B1 Control input
15-16/18 1st c/o contact
25-26/28 2nd c/o contact

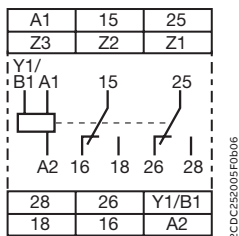
CT-MVS.12



A1-A2 Supply: 24-48 V DC or
24-240 V AC

A1-Y1/B1 Control input
15-16/18 1st c/o contact

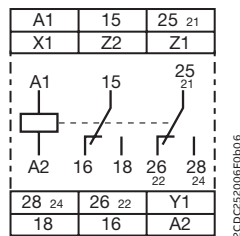
CT-MXS.22



A1-A2 Supply: 24-48 V DC or
24-240 V AC

A1-Y1/B1 Control input
15-16/18 1st c/o contact
25-26/28 2nd c/o contact
Z1-Z2 Remote potentiometer
connection
Z3-Z2 Remote potentiometer
connection

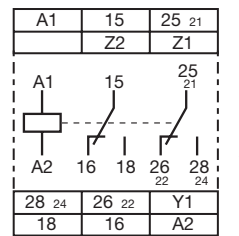
CT-MFS.21



A1-A2 Supply:
24-240 V AC/DC

15-16/18 1st c/o contact
25-26/28 2nd c/o contact
21-22/24 2nd c/o contact as
instantaneous contact
Y1-Z2 Control input
X1-Z2 Control input
Z1-Z2 Remote
potentiometer
connection

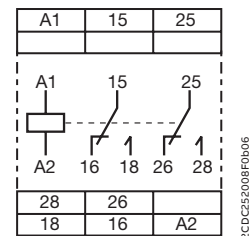
CT-MBS.22



A1-A2 Supply: 24-48 V DC or
24-240 V AC

15-16/18 1st c/o contact
25-26/28 2nd c/o contact
21-22/24 2nd 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

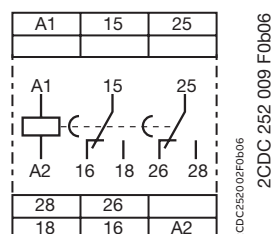
15-16/18 1st c/o contact
25-26/28 2nd c/o contact

CT-S range

Technical diagrams

Connection diagrams

☒ CT-ERS.21

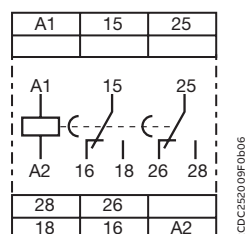


A1-A2 Supply:
24-240 V AC/DC

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

☒ CT-ERS.22

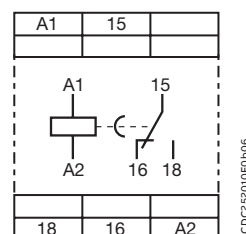


A1-A2 Supply: 24-48 V DC or
24-240 V AC

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

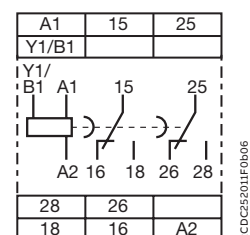
☒ CT-ERS.12



A1-A2 Supply: 24-48 V DC or
24-240 V AC

15-16/18 1st c/o contact

■ CT-APS.21



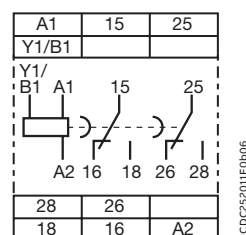
A1-A2 Supply:
24-240 V AC/DC

A1-Y1/B1 Control input

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

■ CT-APS.22



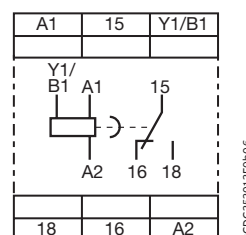
A1-A2 Supply: 24-48 V DC or
24-240 V AC

A1-Y1/B1 Control input

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

■ CT-APS.12

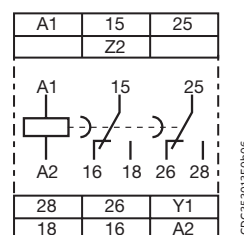


A1-A2 Supply: 24-48 V DC or
24-240 V AC

A1-Y1/B1 Control input

15-16/18 1st c/o contact

■ CT-AHS.22



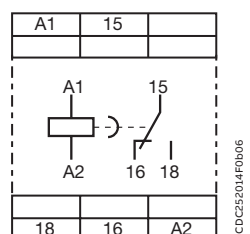
A1-A2 Supply: 24-48 V DC or
24-240 V AC

Y1-Z2 Control input

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

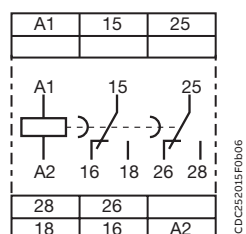
■ CT-ARS.11



A1-A2 Supply:
24-240 V AC/DC

15-16/18 1st c/o contact

■ CT-ARS.21

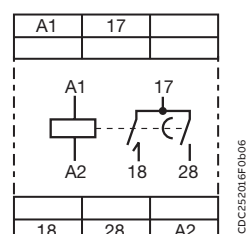


A1-A2 Supply:
24-240 V AC/DC

15-16/18 1st c/o contact

25-26/28 2nd c/o contact

△ CT-SDS.22

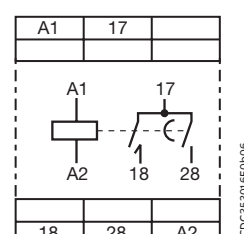


A1-A2 Supply: 24-48 V DC or
24-240 V AC

17-18 1st n/o contact

17-28 2nd n/o contact

△ CT-SDS.23



A1-A2 Supply: 380-440 V AC

17-18 1st n/o contact

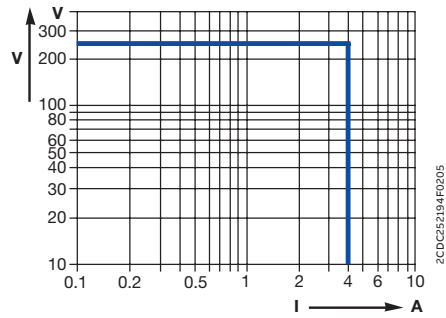
17-28 2nd n/o contact

CT-S range

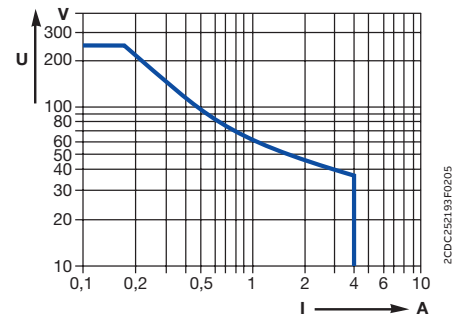
Technical diagrams

Load limit curves

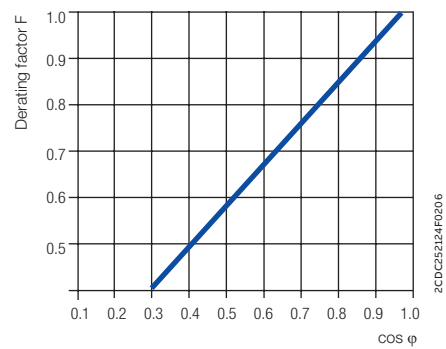
AC load (resistive)



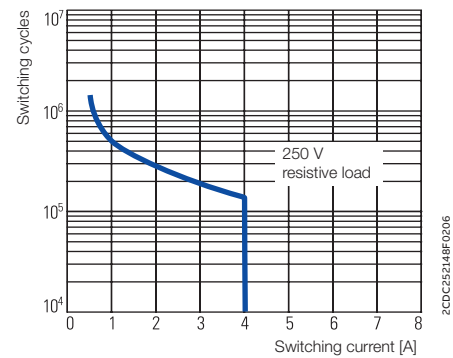
DC load (resistive)



Derating factor F for inductive AC load



Contact lifetime

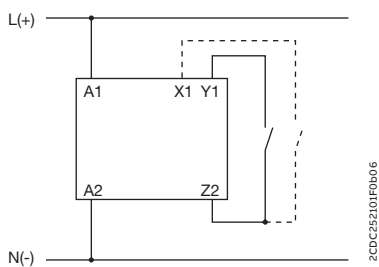


CT-S range

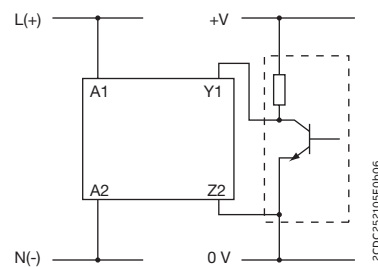
Technical diagrams

Wiring notes

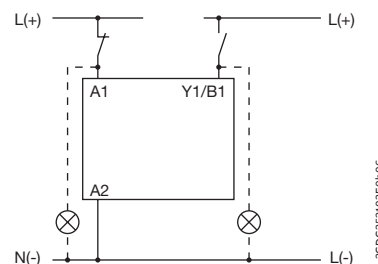
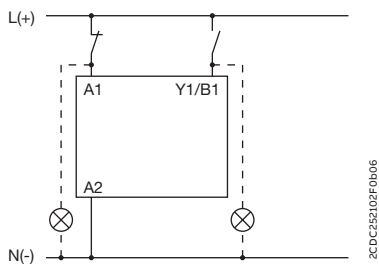
Control inputs (volt-free triggering)



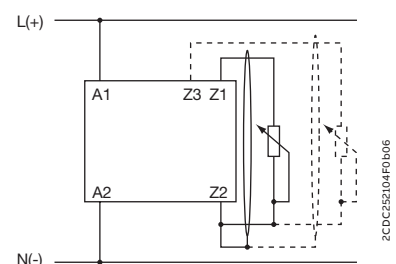
Triggering of the control inputs (volt-free) with a proximity switch (3 wire)



Control inputs (voltage-related triggering)

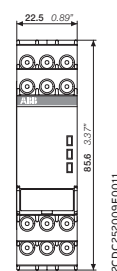
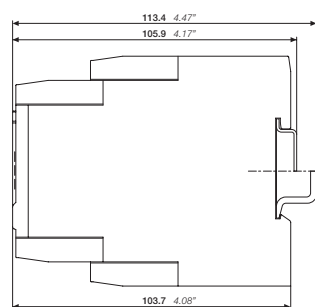
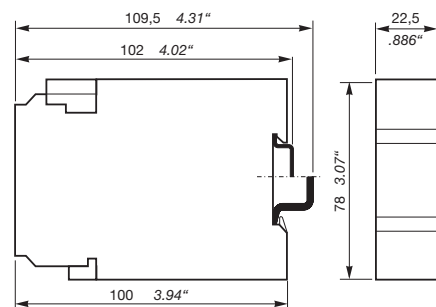


Remote potentiometer



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.

Dimensional drawings



Dimensions in mm, inches



CT-E range

Table of contents

42	Benefits and advantages
44	Selection table
46	Ordering details
48	Technical data
51	Technical diagrams

CT-E range

Benefits and advantages



The CT-E range with its excellent price/performance ratio offers an solution for serial applications. 56 single-function devices with five different time ranges as well as two multifunctional timers with six functions and eight time ranges offer flexibility for almost every application. For high operating cycles, contact-free CT-E timers with solid-state output are available.



Improve installation efficiency

The CT-E range helps make installation fast and easy. Thanks to the front-face adjustment wheel, setting the right time delay has never been easier. The wheel makes adjustments simple and tool-free with no complex time calculations.



Cost effective solution

With a wide variety of products, the CT-E range offers exactly the right device. The combination of different voltage and time ranges in multiple devices makes it simple to select the best device for every application, making the CT-E range a cost-optimized solution.



Global availability

The CT-E range can be used in installations around the world, thanks to its compliance with various global standards and approvals. CT-E time relays are the ideal solution no matter where you build, install or operate your equipment.

CT-E range

Operating controls

Multifunctional



Time range adjustment
Eight time ranges:
0.05 s - 100 h (CT-MFE)



Fine adjustment of the time delay



Selection of the timing function



LEDs for status indication

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

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



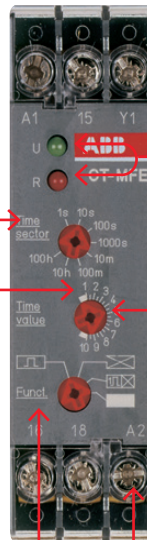
Direct reading scales

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



Connection screws in M3 (Pozidrive 1)

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



Single-functional



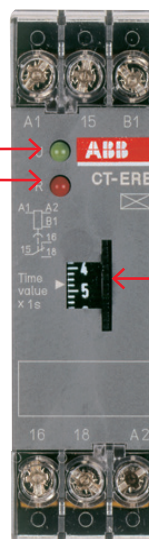
LEDs for status indication

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

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



Adjustment of the time delay



		Type	Order number
		CT-MFE	1SVR550029R8100 1SVR550107R1100 1SVR550107R4100 1SVR550107R2100 1SVR550107R5100 1SVR550100R1100 1SVR550100R4100 1SVR550100R2100 1SVR550100R5100 1SVR550118R1100 1SVR550118R4100 1SVR550118R2100 1SVR550110R1100 1SVR550110R4100 1SVR550110R2100 1SVR550111R1100 1SVR550111R4100 1SVR550111R2100 1SVR550127R1100 1SVR550127R4100 1SVR550120R1100 1SVR550120R4100 1SVR550137R1100 1SVR550137R4100 1SVR550137R2100 1SVR550130R1100 1SVR550130R4100 1SVR550130R2100
Timing function			
ON-delay			
OFF-delay with aux. voltage			
OFF-delay without aux. voltage			
Impulse-ON			
Impulse-OFF with aux. voltage			
Impulse-OFF without aux. voltage			
Flasher starting with ON			
Flasher starting with OFF			
Pulse former			
Star-delta change-over twice ON-delayed			
Features			
Control input, voltage-related triggering			
Time range			
0.05 s - 100 h			
0.05 s - 1 s			
0.1 s - 10 s			
0.3 s - 30 s			
3 s - 300 s			
0.3 min - 30 min			
Supply voltage			
24 V AC/DC			
24-240 V AC			
24-240 V AC/DC			
110-130 V AC			
220-240 V AC			
380-415 V AC			
Output			
c/o contact			
n/o contact			
n/c contact			
Solid-state			

	Type	Order number
	CT-AWE	1SVR550158R3100
		1SVR550150R3100
		1SVR550151R3100
		1SVR550148R1100
		1SVR550148R4100
		1SVR550148R2100
		1SVR550141R1100
		1SVR550141R4100
	CT-EBE	1SVR550141R2100
		1SVR550167R1100
		1SVR550160R1100
		1SVR550207R1100
	CT-YDE	1SVR550207R4100
		1SVR550207R2100
		1SVR550200R1100
		1SVR550200R4100
		1SVR550200R2100
		1SVR550217R4100
	CT-SDE	1SVR550210R4100
		1SVR550212R4100
	CT-MKE	1SVR550019R0000
	CT-EKE	1SVR550509R1000
		1SVR550509R4000
		1SVR550509R2000
	CT-AKE	1SVR550519R1000
		1SVR550519R4000
		1SVR550519R2000
Timing function		
ON-delay		
OFF-delay with aux. voltage		
OFF-delay without aux. voltage		
Impulse-ON		
Impulse-OFF with aux. voltage		
Impulse-OFF without aux. voltage		
Flasher starting with ON		
Flasher staring with OFF		
Pulse former		
Star-delta change-over twice ON-delayed		
Features		
Control input, voltage-related triggering		
Time range		
0.05 s - 100 h		
0.05 s - 1 s		
0.1 s - 10 s		
0.3 s - 30 s		
3 s - 300 s		
0.3 min - 30 min		
Supply voltage		
24 V AC/DC		
24-240 V AC		
24-240 V AC/DC		
110-130 V AC		
220-240 V AC		
380-415 V AC		
Output		
c/o contact		
n/o contact		
n/c contact		
Solid-state		

CT-E range

Ordering details



CT-MFE



CT-AHE

■ Control input with voltage-related triggering

- No triggering

Description

The CT-E range with its excellent price/performance ratio offers an ideal solution for serial applications. 56 single-function devices with five different time ranges as well as two multi-function timers with six functions and eight 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	Weight (1 pc) kg (lb)					
Multi ¹⁾	24-240 V AC/DC	8 (0.05 s - 100 h)	■	1 c/o	CT-MFE	1SVR550029R8100	0.08 (0.18)					
ON-delay	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-ERE	1SVR550107R1100	0.08 (0.18)					
		0.3-30 s				1SVR550107R4100						
		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								
		0.3-30 min		1SVR550100R5100								
	OFF-delay	24 V AC/DC	0.1-10 s	■	1 c/o	CT-AHE	1SVR550118R1100	0.08 (0.18)				
			0.3-30 s				1SVR550118R4100					
3-300 s			1SVR550118R2100									
110-130 V AC		0.1-10 s	1SVR550110R1100									
		0.3-30 s	1SVR550110R4100									
		3-300 s	1SVR550110R2100									
220-240 V AC		0.1-10 s	1SVR550111R1100									
		0.3-30 s	1SVR550111R4100									
		3-300 s	1SVR550111R2100									
OFF-delay ²⁾		24 V AC/DC, 220-240 V AC	0.1-10 s				-		1 c/o	CT-ARE	1SVR550127R1100	0.08 (0.18)
			0.3-30 s								1SVR550127R4100	
		110-130 V AC	0.1-10 s								1SVR550120R1100	
	0.3-30 s		1SVR550120R4100									
Impulse-ON	24 V AC/DC, 220-240 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						
	110-130 V AC	0.1-10 s				1SVR550130R1100						
		0.3-30 s				1SVR550130R4100						
		3-300 s				1SVR550130R2100						
	Impulse-OFF ²⁾	24 V AC/DC				0.05-1 s		-	1 c/o	CT-AWE	1SVR550158R3100	0.08 (0.18)
110-130 V AC		1SVR550150R3100										
220-240 V AC		1SVR550151R3100										

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

CT-E range

Ordering details



CT-AWE

2CDC 251.125 F0004



CT-SDE

2CDC 251.059 F0003

■ Control input with voltage-related triggering

- No triggering

Ordering details

Timing function	Rated control supply voltage	Time ranges	Control Input	Output	Type	Order code	Weight (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	
	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 ⁴⁾	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 ^{1) 2)}	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 ^{2) 5)}	1SVR550217R4100	0.08 (0.18)
	110-130 V AC					1SVR550210R4100	
	380-415 V AC					1SVR550212R4100	
Multi-functional ⁸⁾	24-240 V AC/DC	0.1-10 s, 3-300 s	-	solide-state	CT-MKE ^{3) 6)}	1SVR550019R0000	0.08 (0.18)
ON-delay	24-240 V AC/DC	0.1-10 s	-		CT-EKE	1SVR550509R1000	0.08 (0.18)
		0.3-30 s				1SVR550509R4000	
		3-300 s				1SVR550509R2000	
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			

¹⁾ Without auxiliary voltage

²⁾ With fixed transition time

³⁾ Solid-state output, functions and time range selection via external jumpers

⁴⁾ Symmetric ON & OFF times

⁵⁾ Common contact

⁶⁾ Functions: ON-delay (AC/DC), Impulse-ON (AC only), Flasher starting with OFF (AC only), Flasher starting with ON (AC only)

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.

CT-E range

Technical data

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

		CT-E (relays)		CT-E (solid-state)	
Input circuit - Supply circuit					
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			≤ 2 mA (24-60 V AC/DC) ≤ 8 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			
Input circuit - Control circuit					
Kind of triggering		voltage-related triggering		-	
Control input, Control function		A1-Y1	start timing external		-
Parallel load / polarized		no / yes ¹⁾		-	
Minimum control pulse length		20 ms		-	
Control voltage potential		see rated control supply voltage		-	
Timing circuit					
Time ranges	1 of 5 time ranges per single-function device		0.05-1 s / 0.1-10 s / 0.3-30 s / 3-300 s / 0.3-30 min		
	CT-MFE: 8 time ranges 0.05 s - 100 h		1.) 0.05-1 s 3.) 5-100 s 5.) 0.5-10 min 7.) 0.5-10 h	2.) 0.5-10 s 4.) 50-1000 s 6.) 5-100 min 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			Δt < 0.5 % / V		
Accuracy within the temperature range			Δt < 0.1 % / °C		
			CT-MFE: Δt < 0.06 % / °C	-	
Repeat accuracy (constant parameters)			Δt < 1 %		
Setting accuracy of time delay			± 10 % of full-scale value		

CT-E range

Technical data

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

		CT-E (relays)	CT-E (solid-state)
Output circuit			
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_e		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_e	AC-12 (resistive) at 230 V	4 A	-
	AC-15 (inductive) at 230 V	3 A	-
	DC-12 (resistive) at 24 V	4 A	-
	DC-13 (inductive) at 24 V	2 A	-
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300	-
	max. rated operational voltage	300 V AC	-
	maximum continuous thermal current at B300	5 A	-
	max. making/breaking apparent power at B300	3600 VA / 360 VA	-
Mechanical lifetime		10×10^6 switching cycles	-
Electrical lifetime	at AC-12, 230 V, 4 A	0.1×10^6 switching cycles	-
Frequency of operation	with/without load	360/72000 h ⁻¹	
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 $T_a = 20\text{ °C}$
Load current reduction / derating		-	10 mA/°C
Maximum surge current		-	CT-EKE, CT-AKE: $\leq 15\text{ A}$ CT-MKE: $\leq 20\text{ A}$ for $t \leq 20\text{ ms}$
Voltage drop in connected state		-	$\leq 8\text{ V}$
Discharge current with blocked solid-state output		-	$\leq 4\text{ mA}$
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
General data			
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	

¹⁾ CT-MFE: yes / no

CT-E range

Technical data

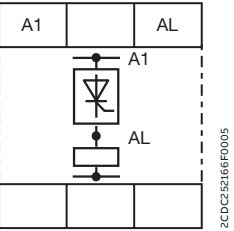
		CT-E (relays)	CT-E (solid-state)
Electrical connection			
Connecting capacity	fine-strand with wire end ferrule	2 x 0.75-1.5 mm² (2 x 18-16 AWG)	
	fine-strand without wire end ferrule	2 x 1-1.5 mm² (2 x 18-16 AWG)	
	rigid	2 x 0.75-1.5 mm² (2 x 18-16 AWG)	
Stripping length		10 mm (0.39 in)	
Tightening torque		0.6-0.8 Nm (5.31-7.08 lb.in)	
Environmental data			
Ambient temperature ranges	operation / 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/s², 10-58/60-150 Hz	
Shock, half-sine	IEC/EN 60068-2-27	150 m/s², 11 ms, 3 shocks/direction	
Isolation data			
Rated insulation voltage U _i	input circuit / output circuit	300 V (supply up to 240 V)	-
		500 V (supply up to 440 V)	-
Rated impulse withstand voltage U _{imp}	between all isolated circuits	4 kV; 1.2/50 μs	-
Power-frequency withstand voltage (test voltage)	between all isolated circuits	2.5 kV; 50 Hz; 60 s	-
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V	-
Pollution degree		3	
Overvoltage category		III	
Standards / Approvals			
Standards		IEC 61812-1	
Low Voltage Directive		2014/35/EU	
EMC Directive		2014/30/EU	
RoHS Directive		2011/65/EU	
Electromagnetic compatibility			
Interference immunity to		IEC/EN 61000-6-2	
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)	
radiated, radio-frequency electromagnetic field	IEC/EN 61000-4-3	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

Technical diagrams

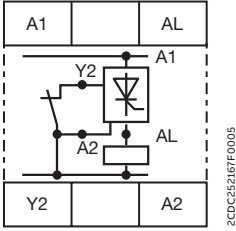
Connection diagrams

CT-EKE



A1-A2	Supply: 24-240 V AC/DC
A1-AL	Thyristor

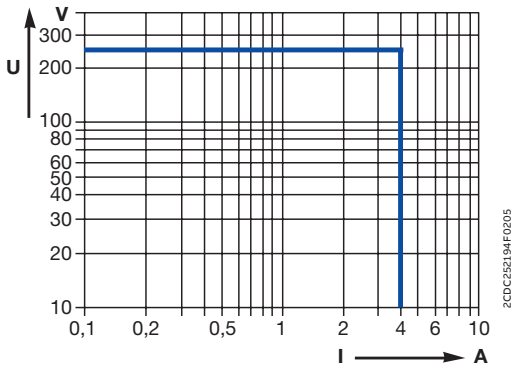
CT-AKE



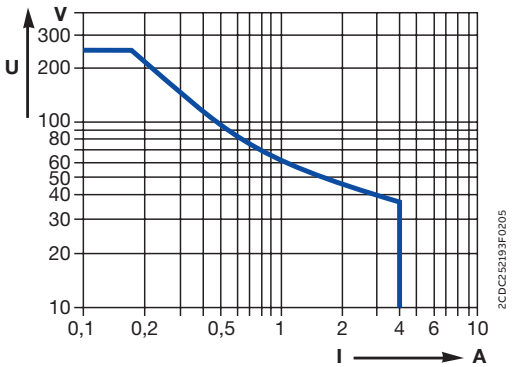
A1-AL	Supply: 24-240 V AC
A1-AL	Thyristor
Y2-A2	Control input

Load limit curves

AC load (resistive)

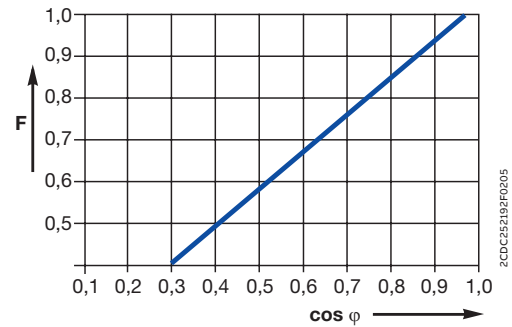


DC load (resistive)

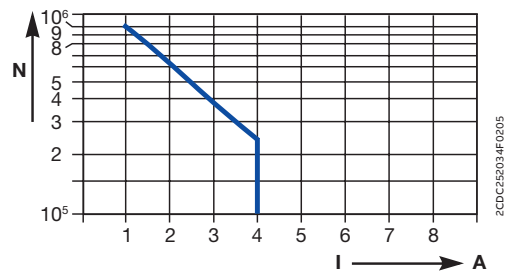


220 V 50 Hz AC1
360 cycles/h

Derating factor F for inductive AC load



Contact lifetime

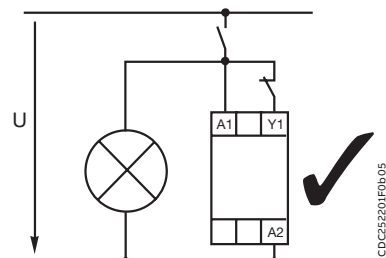
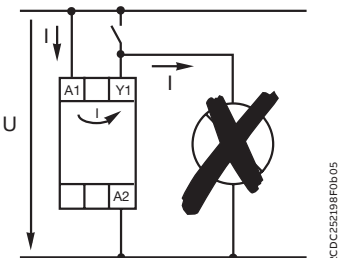
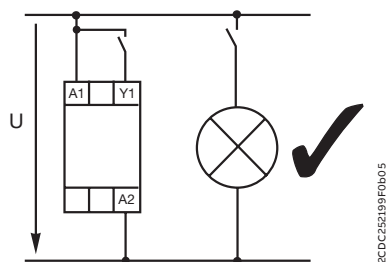
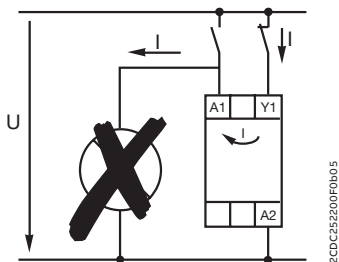


CT-E range

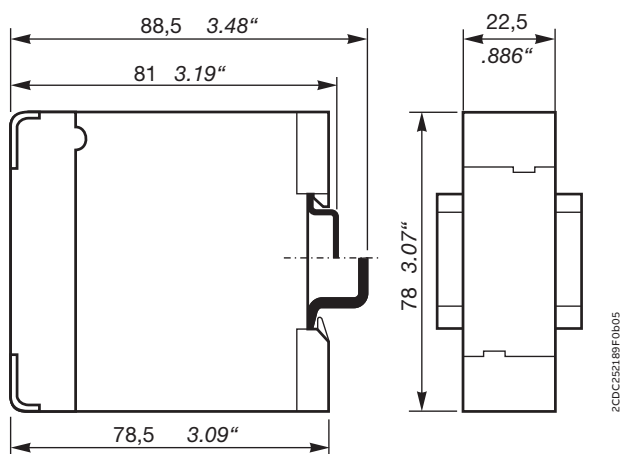
Technical diagrams

Wiring notes

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



Dimensional drawings



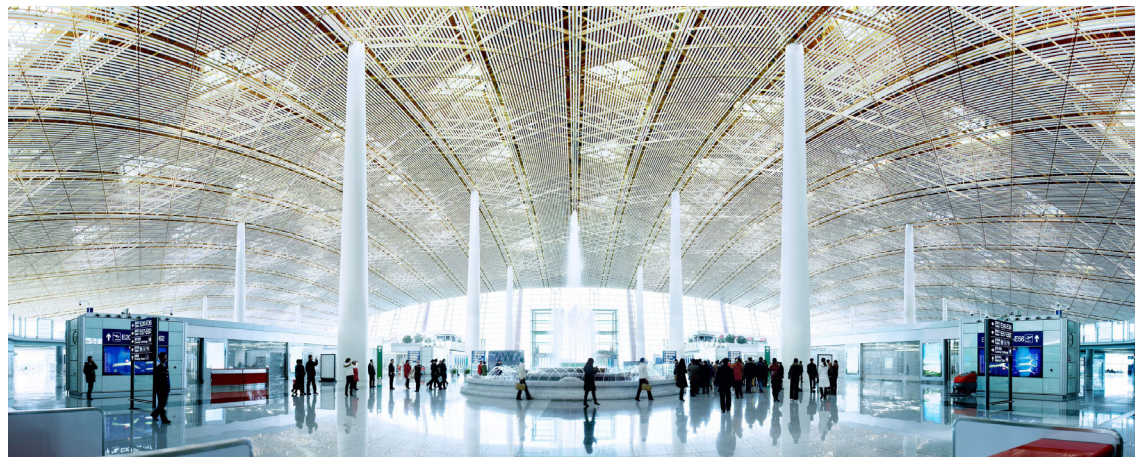
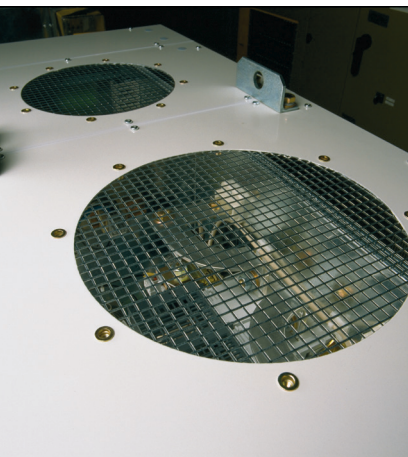
Dimensions in mm



Time relays for building applications

Table of contents

57	Applications
58	Benefits and advantages
60	Selection table
61	Ordering details
62	Technical data
65	Technical diagrams



Time relays for building applications

Applications

The CT-D range is designed in a modular housing, making it well suited for building and residential applications. In just 12 order codes the CT-D range covers all the main timing functions needed for building automation, safely and reliably.



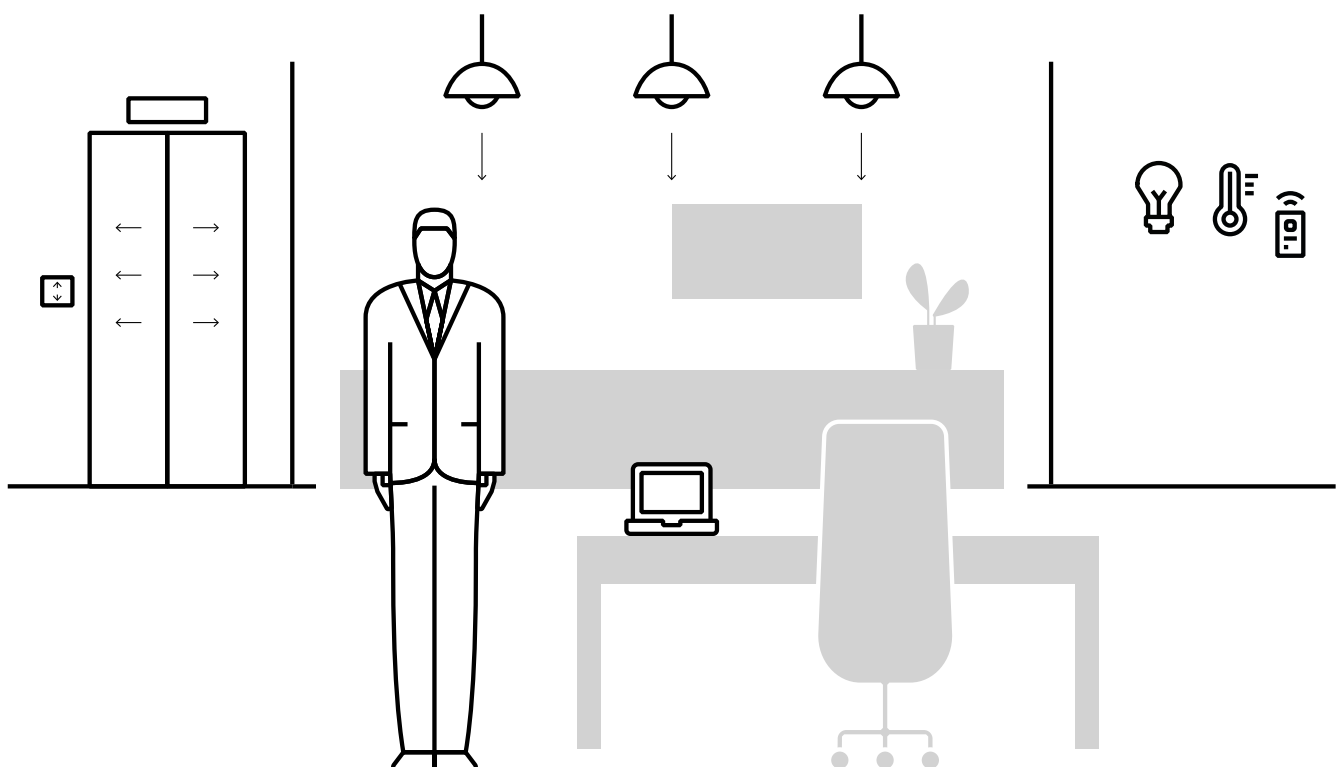
A typical application for timers is delayed switching. Switching several rows of lamps on and off in corridors, stairwells, staircases, etc, is a widespread application in which the excellent functionality of the CT-D timers is undisputed.



Air conditioning systems, heaters and fans can be found everywhere in buildings - just like the CT-D timers long used to switch them. On-delay, off-delay and a range of other functions cover all requirements.



Elevators, escalators, gates, compressors and doors - here too ABB timers ensure optimum and time-delayed opening as required. ABB's CT-D timers cover most functions with just 12 order codes.

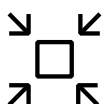


CT-D range

Benefits and advantages



The CT-D range is ideal for building applications and installation panels, due to its compact modular housing. For maximum flexibility in operation, nine single-function as well as two multifunction devices with seven timing functions are available. The devices offer four or seven time ranges from 0.05 seconds up to 100 hours. Their wide supply voltage range allows their use in applications worldwide.



Space savings

The CT-D range is ideal for installation panels thanks to its compact modular housing. The housing's design helps make the status and configuration more clearly visible. The CT-D range also offers a higher output current than standard industrial types. As well as the 1 c/o contacts, ABB offers devices with 2 c/o contacts for maximum flexibility.



Easy to install

Direct reading scales help make time setting quick and easy. A pre-selection for the time range together with an additional scale for fine adjustments help improve installation efficiency. For more flexibility, the delay time can even be changed when processes are running, making optimization to fit the application even simpler. All devices can be mounted and demounted tool-free.



Global availability

The CT-D range fulfills various global standards and approvals, supporting business worldwide. Additionally, all devices from the CT-D range have a wide supply voltage from 24-48 V DC and 24-240 V AC, making it ideal for the use in installation panels around the world.

CT-D range

Operating controls



Connection terminals

Wide terminal spacing makes connection of wires simpler: 2 x 1.5 mm² (2 x 16 AWG) with wire end ferrules or 2 x 2.5 mm² (2 x 14 AWG) without ferrules.



Preselection of the time range



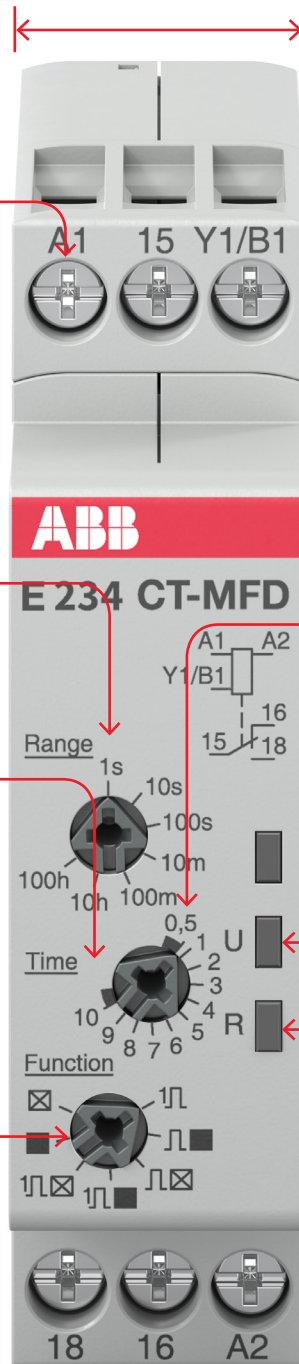
Direct reading scales

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



Selection of the timing function

- ON-delay
- OFF-delay with aux. voltage
- Impulse-ON
- Impulse-OFF with aux. voltage
- Flasher starting with ON
- Flasher starting with OFF
- Pulse generator starting with ON or OFF



Width 17.5 mm

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



Fine adjustment of the time delay



LEDs for status indication

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

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

[illegible]

CT-D range

Ordering details



2CDC251002V0018

CT-MFD.12



2CDC251002V0018

CT-ERD.22

- Control input with voltage-related triggering
- No triggering

Description

The CT-D range with its modular design is a perfect solution for installation panels. For maximum flexibility in operation, 10 single-function as well as two multifunction devices with seven timing functions are available. The devices offer four or seven time ranges from 0.05 seconds up to 100 hours. Their wide input range allows their use in applications worldwide.

Ordering details

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

¹⁾ 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

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




³⁾ Transition time 50 ms fixed

⁴⁾ Transition time adjustable

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
Input circuit - Supply circuit				
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		
Input circuit - Control circuit				
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		
Timing circuit				
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		Δt < 0.005 % / V		
Accuracy within the temperature range		Δt < 0.06 % / °C		
Repeat accuracy (constant parameters)		Δt < ± 0.5 %		
Setting accuracy of time delay		± 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	±3 ms	
Indication of operational states				
Control supply voltage / timing		U: green LED	 : control supply voltage applied  : timing	
Relay energized		R, R1, R2: yellow LED	 : output relay energized	
Operating elements and controls				
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-SAC	front-face potentiometer	

CT-D range

Technical data

		CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFD.21
Output circuit				
Kind of output	15-16/18	Relay, 1 c/o contact	-	
	15-16/18; 25-26/28	-	Relay, 2 c/o contacts	
	17-18; 17-28		Relay, 2 n/o contacts (CT-SDC, CT-SAC)	
Contact material		AgNi alloy, Cd free		
Rated operational voltage U _e		250 V		
Minimum switching voltage / minimum switching current		12 V / 100 mA		
Maximum switching voltage / maximum switching current		250 V AC / 6 A	250 V AC / 5 A	
Rated operational current I _e	AC-12 (resistive) at 230 V	6 A	5 A	
	AC-15 (inductive) at 230 V	3 A	3 A	n/o: 3 A n/c: 0.75 A
	DC-12 (resistive) at 24 V	6 A	5 A	
	DC-13 (inductive) at 24 V	2 A	2 A	1 A
AC rating (UL 508)	utilization category (Control Circuit Rating Code)	B 300		n/o: B 300 n/c: C 300
	max. rated operational voltage	300 V AC		
	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 ⁶ switching cycles		
Electrical lifetime		0.1 x 10 ⁶ switching cycles		
Max. fuse rating to achieve short-circuit protection	n/c contact	6 A fast-acting		
	n/o contact	10 A fast-acting		6 A fast-acting
General data				
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		
Electrical connection				
Connecting capacity	fine-stranded with(out) wire and ferrule	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)		
		1 x 0.5-2.5 mm ² (1 x 20-14 AWG)		
	rigid	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)		
		1 x 0.5-4 mm ² (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)		
Environmental data				
Ambient temperature range	operation / storage	-20 ... +60 °C / -40 ... +85 °C		
Climatic class	EC/EN 60068-2-30	3K3		
Relative humidity range		25-85%		
Vibration, sinusoidal	IEC/EN 60068-2-6	20 m/s ² ; 10 cycles, 10...150...10 Hz		
Shock (half-sine)	IEC/EN 60068-2-27	150 m/s ² , 11 ms		

CT-D range

Technical data

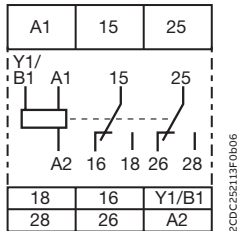
		CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFC.21
Isolation data				
Rated insulation voltage U _i	input circuit / output circuit	300 V		
	output circuit 1 / output circuit 2	not available	300 V	300 V
Rated impulse withstand voltage U _{imp}	between all isolated circuits	4 kV; 1.2/50 μs		
Power-frequency 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		
Standards / Directives				
Standards		IEC/EN 61812-1		
Low Voltage Directive		2014/35/EU		
EMC Directive		2014/30/EU		
RoHS Directive		2011/65/EU		
Electromagnetic compatibility				
Interference immunity to		IEC/EN 61000-6-2		
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	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

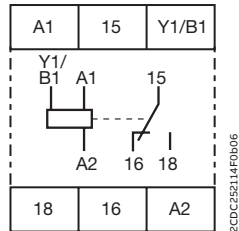
Connection diagrams

CT-MFD.21



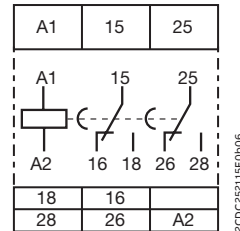
A1-A2	Supply: 12-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MFD.12



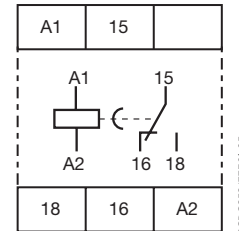
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-ERD.22



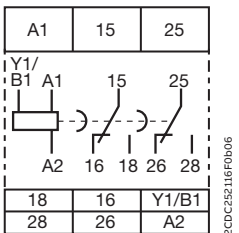
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERD.12



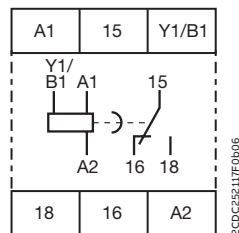
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-AHD.22



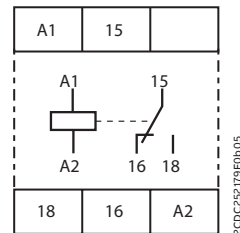
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-AHD.12



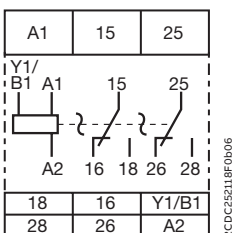
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-VWD.12



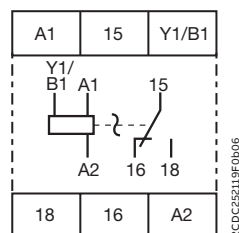
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
15-16/18	1st c/o contact

CT-TGD.22



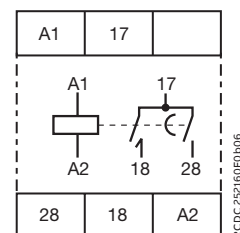
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-TGD.12



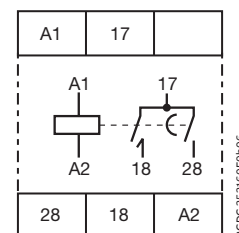
A1-A2	Supply: 24-48 V DC or 24- 240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-SDD.22



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

CT-SAD.22



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

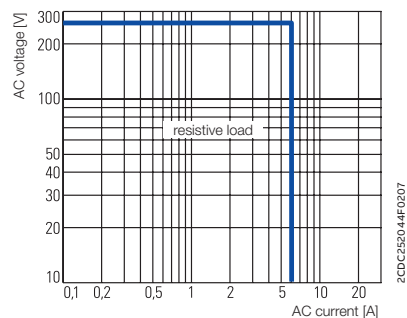
CT-D range

Technical diagrams

Load limit curves

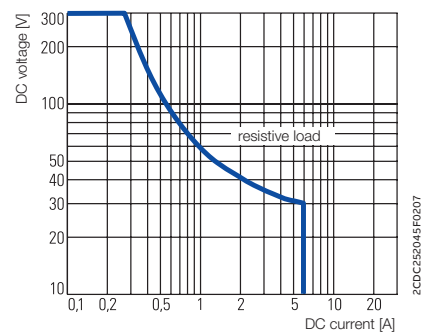
AC load (resistive)

CT-D.1x

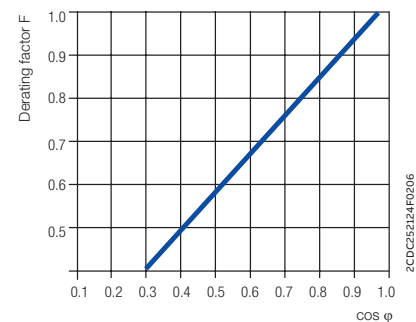


DC load (resistive)

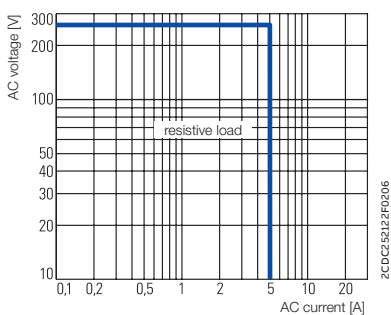
CT-D.1x



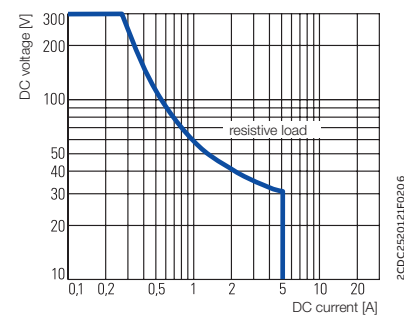
Derating factor F for inductive AC load



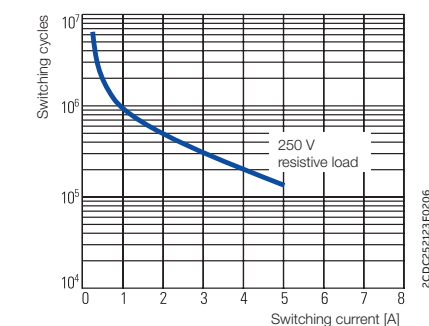
CT-D.2x



CT-D.2x

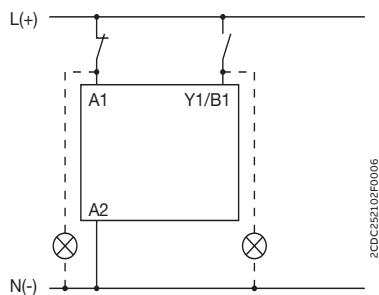


Contact lifetime



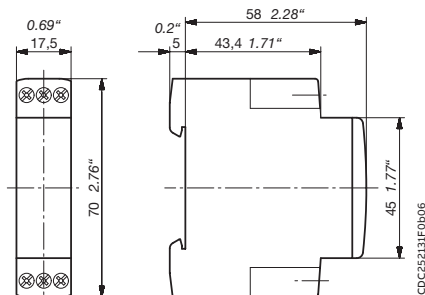
Wiring notes for devices with control input

A parallel load to the control input is possible

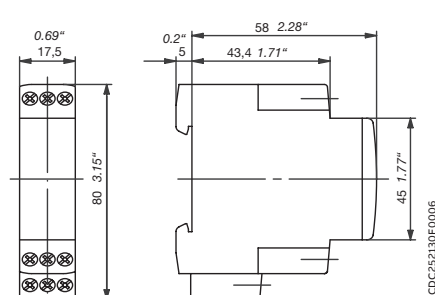


Dimensional drawings

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



CT-D devices with 2 c/o contacts



Dimensions in mm, inches





Timing functions

Timing functions

CT-C, CT-S, CT-E, CT-D

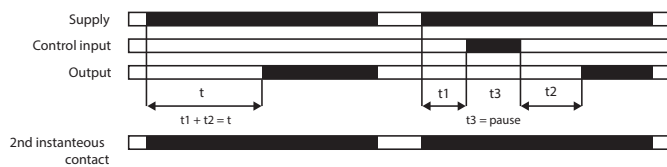
On delay functions (Delay on make) ☒

On-delay



This function requires a continuous control supply voltage for timing. Timing begins when a control supply voltage is applied. When the selected time delay is complete, the output relay energizes. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

ON-delay accumulative

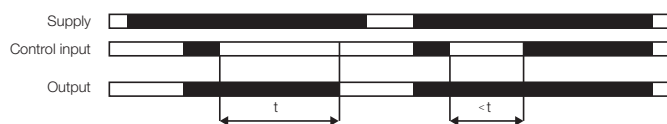


This function requires a continuous control supply voltage for timing. Timing begins when a control supply voltage is applied. When the selected time delay is complete, the output relay energizes. Timing can be paused by closing the control input.

The elapsed time t1 is stored and continues from this time value when the control input is re-opened. If the 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 a continuous control supply voltage for timing. If the control input is closed, the output relay energizes immediately. If the control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes.

If control input re-closes before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when the control input re-opens. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

OFF-delay without auxiliary voltage



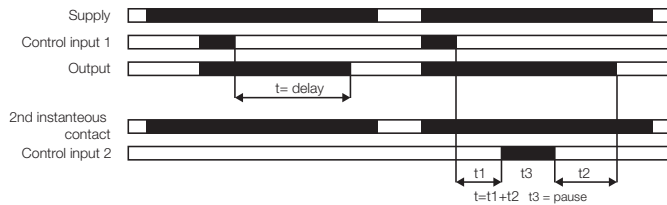
The OFF-delay function without auxiliary voltage does not require a continuous control supply voltage for timing. Applying a control supply voltage energizes the output relay. If the control supply voltage is interrupted, the OFF-delay starts. When timing is complete, the output relay de-energizes.

If a control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay remains energized. A control supply voltage must be applied for the minimum energizing time (200 ms), for correct operation.

Timing functions

CT-C, CT-S, CT-E, CT-D

OFF-delay with auxiliary voltage (Delay on break)



This function requires a continuous control supply voltage for timing. If the control input is closed, the output relay energizes immediately. If the control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes. If the 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 the control input reopens.

Pause timing / Accumulative OFF-delay: Timing can be paused by closing control 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 the 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 a continuous control supply voltage for timing. The output relay energizes immediately when the control supply voltage is applied and de-energizes after the set pulse time is complete. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-ON (with pause)



This function requires a continuous control supply voltage for timing. The output relay energizes immediately when the control supply voltage is applied and de-energizes after the set pulse time is complete. If control input 1 is open, timing begins when a control supply voltage is applied. Or, if control a 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 re-sets 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 the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Timing functions

CT-C, CT-S, CT-E, CT-D

Impulse-OFF functions 1

Impulse-OFF



This function requires a 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 the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

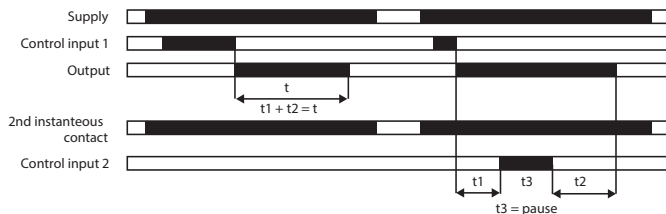
Impulse-OFF without auxiliary voltage



This function does not require a continuous control supply voltage for timing.

If the control supply voltage is interrupted, the output relay energizes and the OFF time starts. When timing is complete, the output relay de-energizes. If a control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay de-energizes. A control supply voltage must be applied for the minimum energizing time (200 ms), for proper operation.

Impulse-OFF with auxiliary voltage (Trailing edge interval)



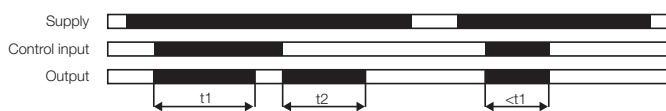
This function requires a continuous control supply voltage for timing. If a control supply voltage is applied, opening control input 1 energizes the output relay immediately and starts timing. When the selected pulse time is complete, the output relay de-energizes. Closing control input 1, before the 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 the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-ON and Impulse-OFF functions 1

Impulse-ON and impulse-OFF



This function requires a continuous control supply voltage for timing. If a control supply voltage is applied, closing the 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 the 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 the control input changes state before the pulse time is complete, the output relay de-energizes and the pulse time is reset. If the control input changes state again, the interrupted pulse time restarts. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Timing functions

CT-C, CT-S, CT-E, CT-D

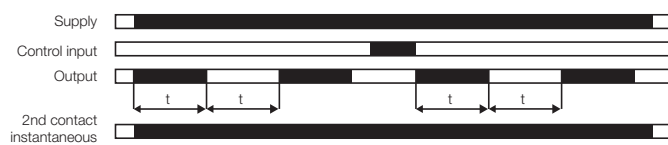
Flasher starting with ON functions

Flasher starting with ON



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

Flasher with reset starting with ON



Applying a 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 the control input. Opening the control input starts the timer pulsing again with symmetrical ON & OFF times. If the control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

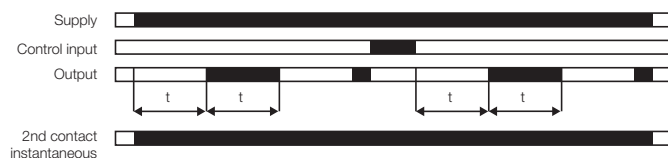
Flasher starting with OFF functions

Flasher starting with OFF



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

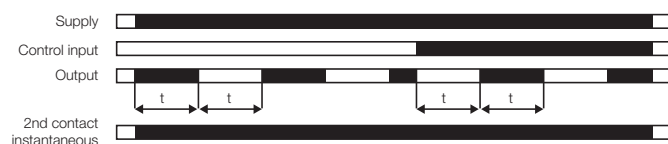
Flasher with reset starting with OFF



Applying a 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 the control input. Opening the control input starts the timer pulsing again with symmetrical ON & OFF times. If the 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 a 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.

Timing functions

CT-C, CT-S, CT-E, CT-D

Pulse former

Puls former (single shot)



This function requires a continuous control supply voltage for timing. Closing the 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 the 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 a continuous control supply voltage for timing. Applying a 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 a control supply voltage is already applied, the timing process can be started by opening control input. Closing the control input with a control supply voltage applied, de-energizes the output relay and re-sets the time delay. The ON & OFF times are independently adjustable.

Pulse generator

Starting with the ON or OFF time (Recycling unequal times, ON or OFF first)



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

Impulse with delay

Fixed impulse with adjustable time delay



This function requires a continuous control supply voltage for timing. The time delay t_1 starts when a 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 the control supply voltage is interrupted, the time delay is re-set. The output relay does not change state.

Adjustable impulse with fixed time delay



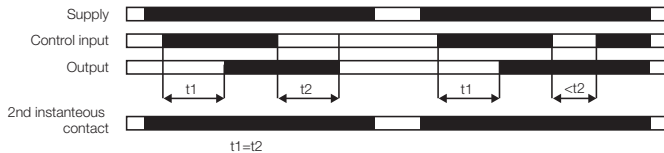
This function requires a continuous control supply voltage for timing. As soon as the control supply voltage is applied the output relay will close after 500 ms. When t_2 is complete, the output relay energizes and the selected pulse time t_1 starts. When t_1 is complete, the output relay de-energizes.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

Timing functions

CT-C, CT-S, CT-E, CT-D

ON- and OFF-delay

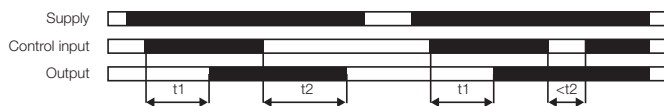
Symmetrical ON- and OFF-delay ¹⁾



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

Star-Delta Changeover



This function requires a continuous control supply voltage for timing. Applying a 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 the control supply voltage is applied. t_2 is fixed to 50 ms or in some variants adjustable.

Further functions

ON/OFF function



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

If the selected maximum value of the time range is smaller than 300 hours (front-face potentiometer "Time sector" \neq 300 h), applying a control supply voltage energizes the output relay immediately. Interrupting the control supply voltage, de-energizes the output relay.

If the selected maximum value of the time range is 300 hours (front-face potentiometer "Time sector" = 300 h) and a control supply voltage is applied the output relay does not energize.

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