CATALOG

Time relays

CT-C, CT-S, 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).

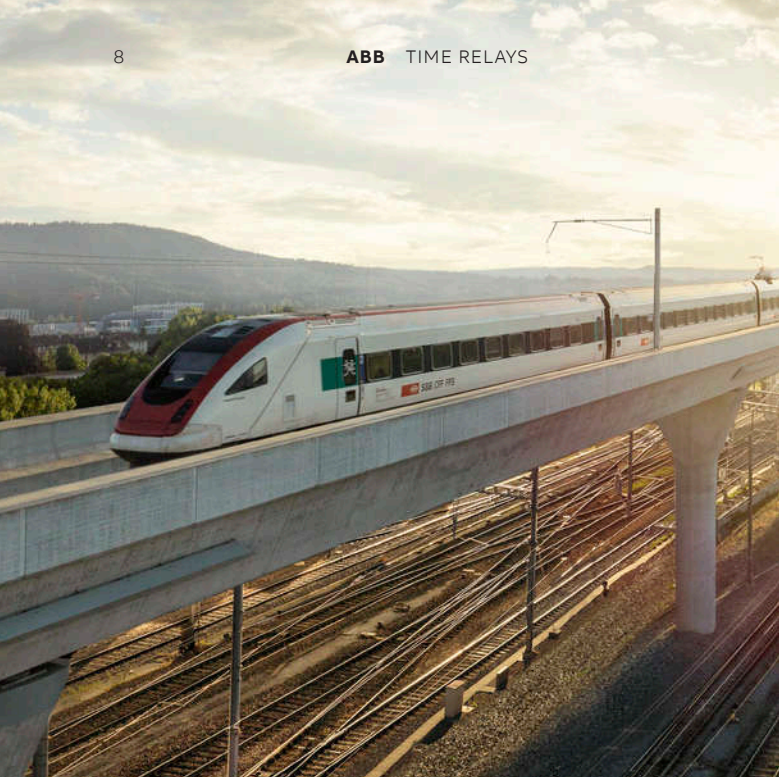
Time relays for industrial applications
Type selection

	multi-functional	single-functional	multi-functional	single-functional
Timing function	**CT-C**		**CT-S**	
ON-delay	CT-MFC	CT-ERC	CT-MVS, CT-MFS, CT-MBS, CT-WBS	CT-ERS
OFF-delay	CT-MFC	CT-AHC	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-MVS, CT-MFS, CT-MBS, CT-WBS	
Impulse-OFF	CT-MFC		CT-MVS, CT-MFS, CT-MBS	
Impulse-ON and OFF			CT-MXS	
Flasher starting with ON	CT-MFC		CT-MFS, CT-MBS, CT-WBS	
Flasher staring with OFF	CT-MFC		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-MVS, CT-MFS, CT-MBS	
Star-delta change-over		CT-SDC, CT-SAC		CT-SDS
Star-delta change-over with impulse			CT-MVS.2x, CT-MFS, CT-MBS	
+ 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



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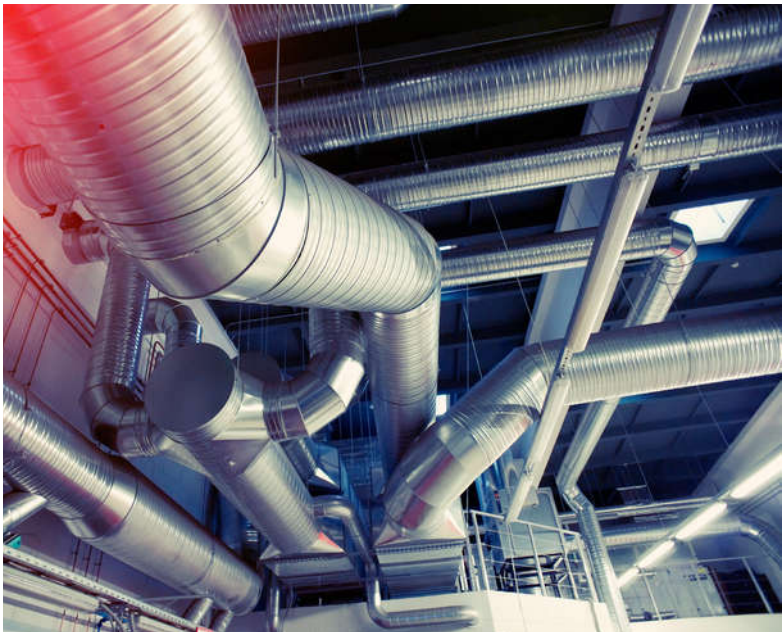
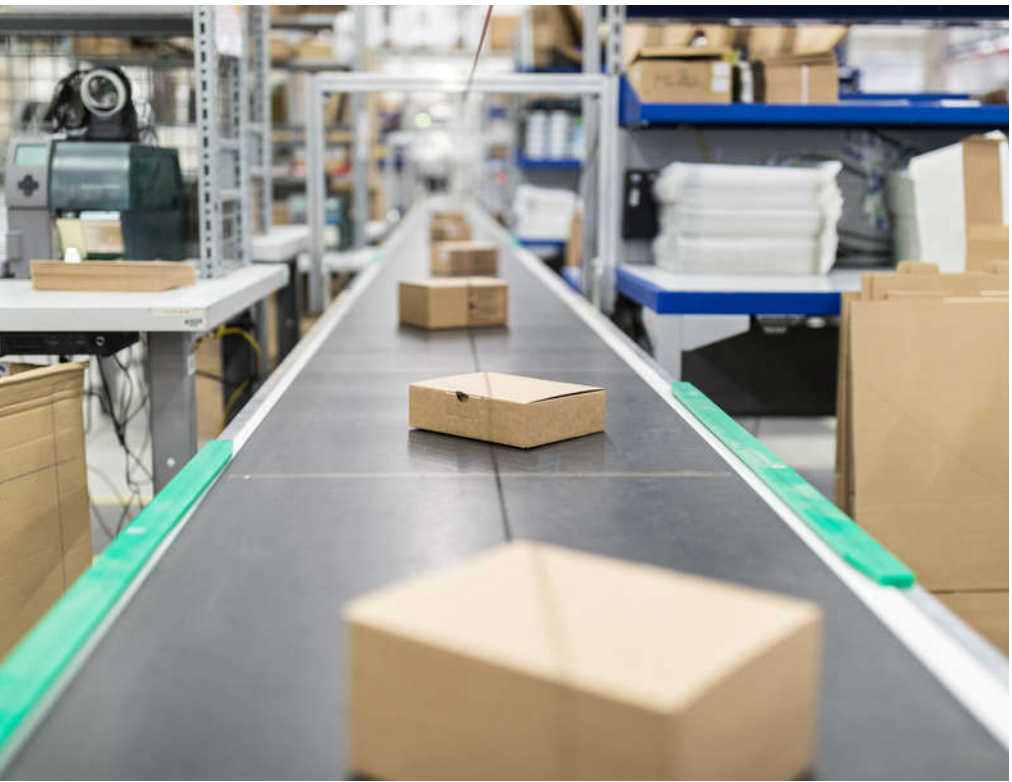
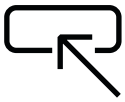






Time relays for industrial applications
Applications

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.



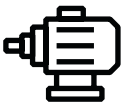
Lighting control, for example the delayed switching of multiple rows of lamps in production facilities or greenhouses.



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
- Packaging machines
- Backing ovens
- Water and wastewater
- Wind
- Industrial cleaning processes


A1 15
CT-ERC
Range
Time
18 16 A2
A1 17
CT-SDC
Range
Time
28 18 A2
A1 15 25
CT-MFC
Range
Time
Function
28 26 A2
18 16 Y1/B1
A1 15 25
CT-TGC
Pulse on Time
Range
Pulse off Time
Range
28 26 A2
18 16 Y1/B1

CT-C range
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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.

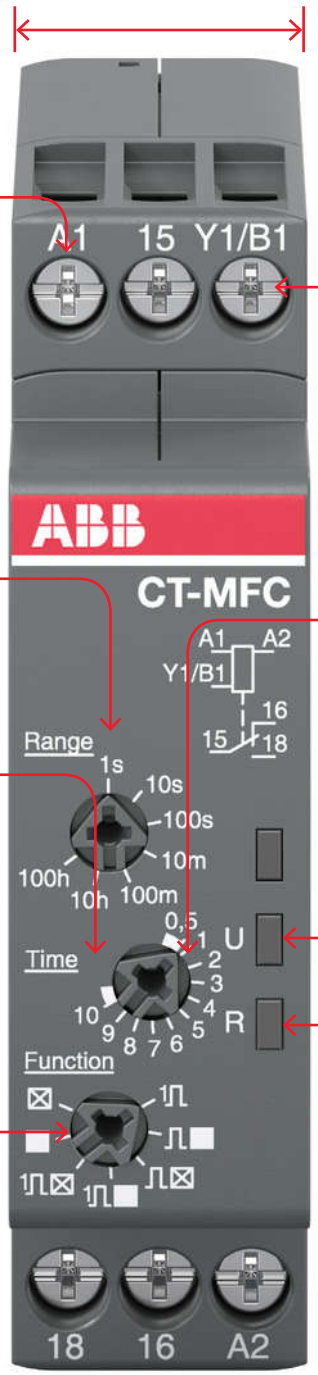
Cost effective solution

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



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

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.

Control input to start timing

Preselection of the time range

Fine adjustment of the time delay

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

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

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 former

CT-C range
Selection table

	Order number	1SVR508020R0000	1SVR508020R1100	1SVR508100R0000	1SVR508100R0100	1SVR508110R0000	1SVR508110R0100	1SVR508130R0000	1SVR508160R0000	1SVR508160R0100	1SVR508210R0100	1SVR508211R0100
	Type	CT-MFC.12	CT-MFC.21	CT-ERC.12	CT-ERC.22	CT-AHC.12	CT-AHC.22	CT-VWC.12	CT-TGC.12	CT-TGC.22	CT-SAC.22	CT-SDC.22
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									■	■		
Pulse former		■	■									
Star-delta change-over											■	■
Features												
Control input, voltage-related triggering		■	■			■	■		■	■		
Time range												
0.05 s - 100 h		■	■	■	■	■	■	■	2	2		
0.05 s - 10 min											■	■
Supply voltage												
12-240 V AC/DC			■									
24-48 V DC		■		■	■	■	■	■	■	■	■	■
24-240 V AC		■		■	■	■	■	■	■	■	■	■
Output												
c/o contact		1	2	1	2	1	2	1	1	2		
n/o contact											2	2

CT-C range
Ordering details



CT-MFC.12



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 °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		

CT-C range
Technical data

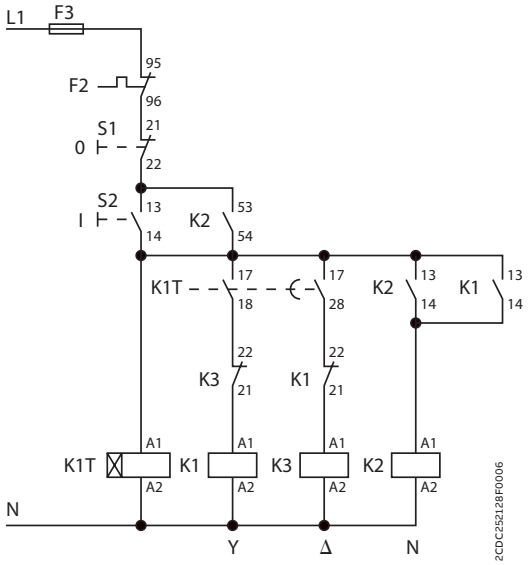
			CT-C with 1 c/o contact	CT-C with 2 c/o contacts	CT-MFC.21
Output circuit					
Kind of output		15-16/18	Relay, 1 c/o contact	-	
		15-16/18; 25-26/28	-	Relay, 2 c/o contacts	
		17-18; 17-28		Relay, 2 n/o contacts (CT-SDC, CT-SAC)	
Contact material			AgNi alloy, Cd free		
Rated operational voltage U_e			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	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

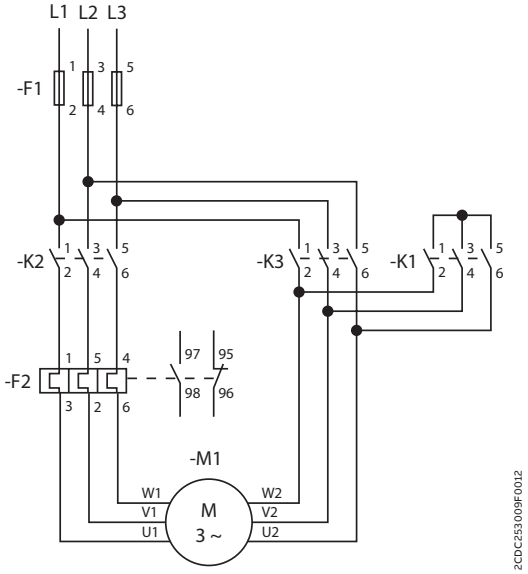
		CT-C with 1 c/o contact	CT-C with 2 c/o contacts	CT-MFC.21
Isolation data				
Rated insulation voltage U_i	input circuit / output circuit	300 V		
	output circuit 1 / output circuit 2	not available	300 V	300 V
Rated impulse withstand voltage U_{imp}	between all isolated circuits	4 kV; 1.2/50 µs		
Power-frequency 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

Example of application - Star-delta changeover



Control circuit diagram

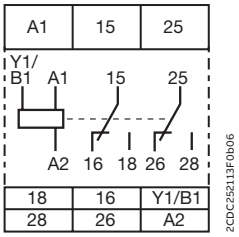


Power circuit diagram

CT-C range
Technical diagrams

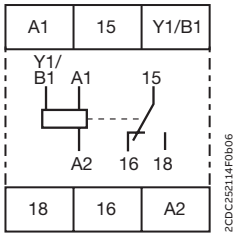
Connection diagrams

CT-MFC.21



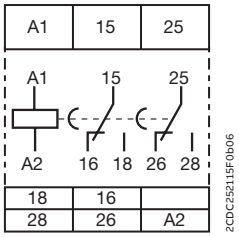
A1-A2	Supply: 12-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MFC.12



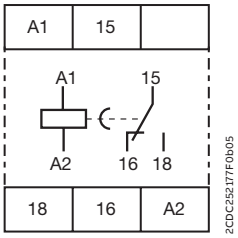
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-ERC.22



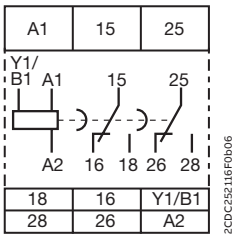
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERC.12



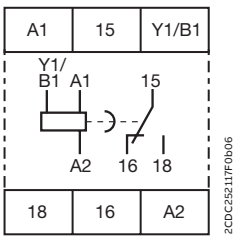
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-AHC.22



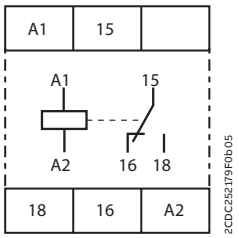
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-AHC.12



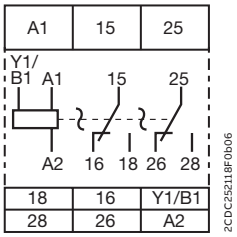
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-VWC.12



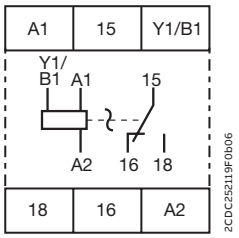
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-TGC.22



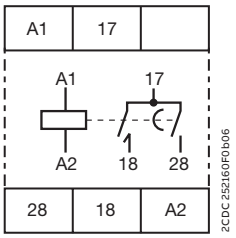
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-TGC.12



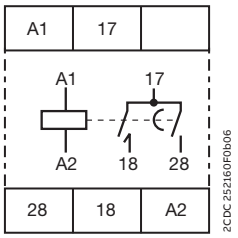
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

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



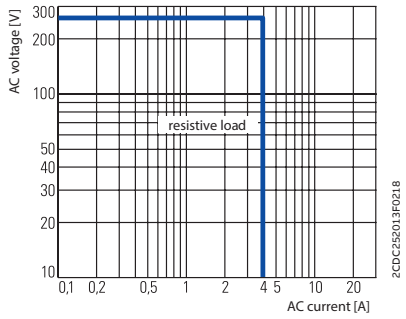
A1-A2	Supply: 24-48 V DC or 24-240 V AC
17-18	1st n/o contact (star contactor)
17-28	2nd n/o contact (delta contactor)

CT-C range
Technical diagrams

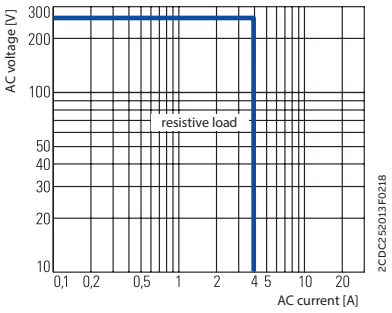
Load limit curves

AC load (resistive)

CT-C.1x

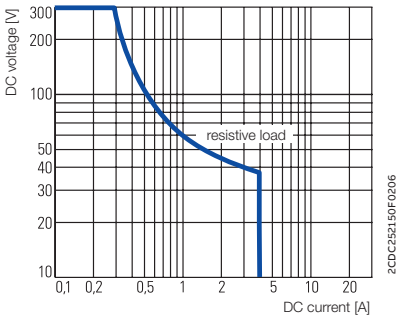


CT-C.2x

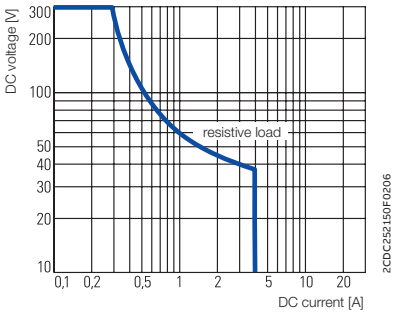


DC load (resistive)

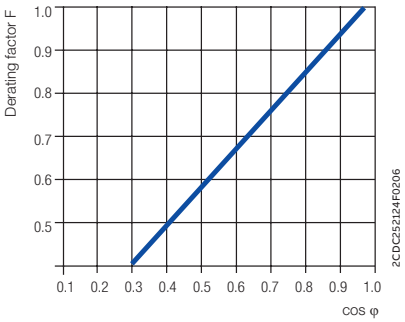
CT-C.1x



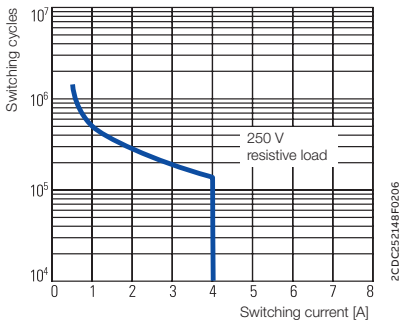
CT-C.2x



Derating factor F for inductive AC load

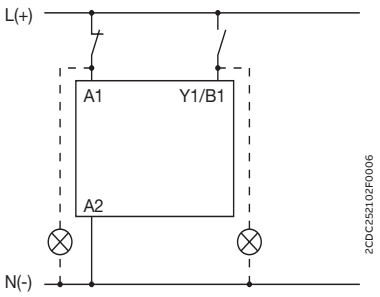


Contact lifetime



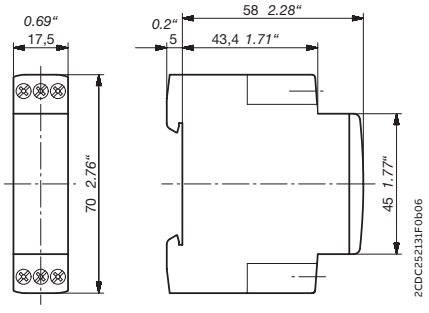
Wiring notes for devices with control input

A parallel load to the control input is possible

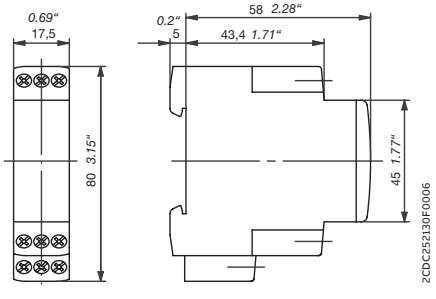


Dimensional drawings

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


A1
15
25
ABB
CT-ERS
T Range
Time
U/T
R
18
28
26
A1
15
25 21
Y1/B1
Z2
Z1
ABB
CT-MVS
Inst. Del. 2.c/o
T Range
Time
Function
U/T
R1
R2
18
28 24
26 22
A1
17
ABB
CT-SDS
T Range
Time
U/T
R1
R2
18
A1
15
25
Z2
ABB
CT-AHS
T Range
Time
U/T
R
18
28
26
Y1

CT-S range
Table of contents

24	**Benefits and advantages**
28	**Selection table**
29	**Ordering details - multifunctional devices**
30	**Ordering details - singlefunctional devices**
31	**Ordering details - Accessories**
32	**Technical data**
35	**Technical diagrams**

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.

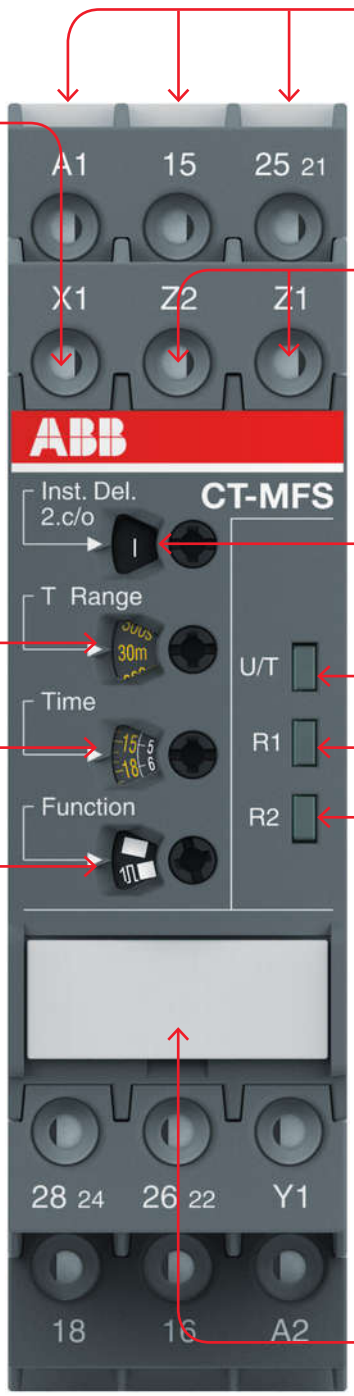
CT-S range
Operating controls

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.

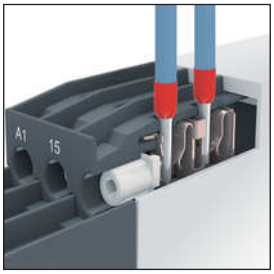
Remote potentiometer connection possible

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 trouble-shooting.
- 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.

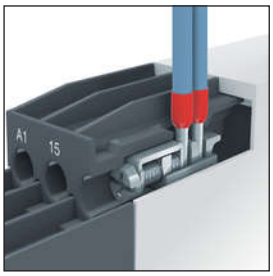
CT-S range
Benefits and advantages



2CDC253026F0011

—
01 Tool-free mounting of wires

Easy Connect Technology
Tool-free wiring and excellent vibration resistance. Easy Connect (Push-in terminals) provide connection of wires up to 2 x 0.5 - 1.5 mm² (2 x 20 -16 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**.



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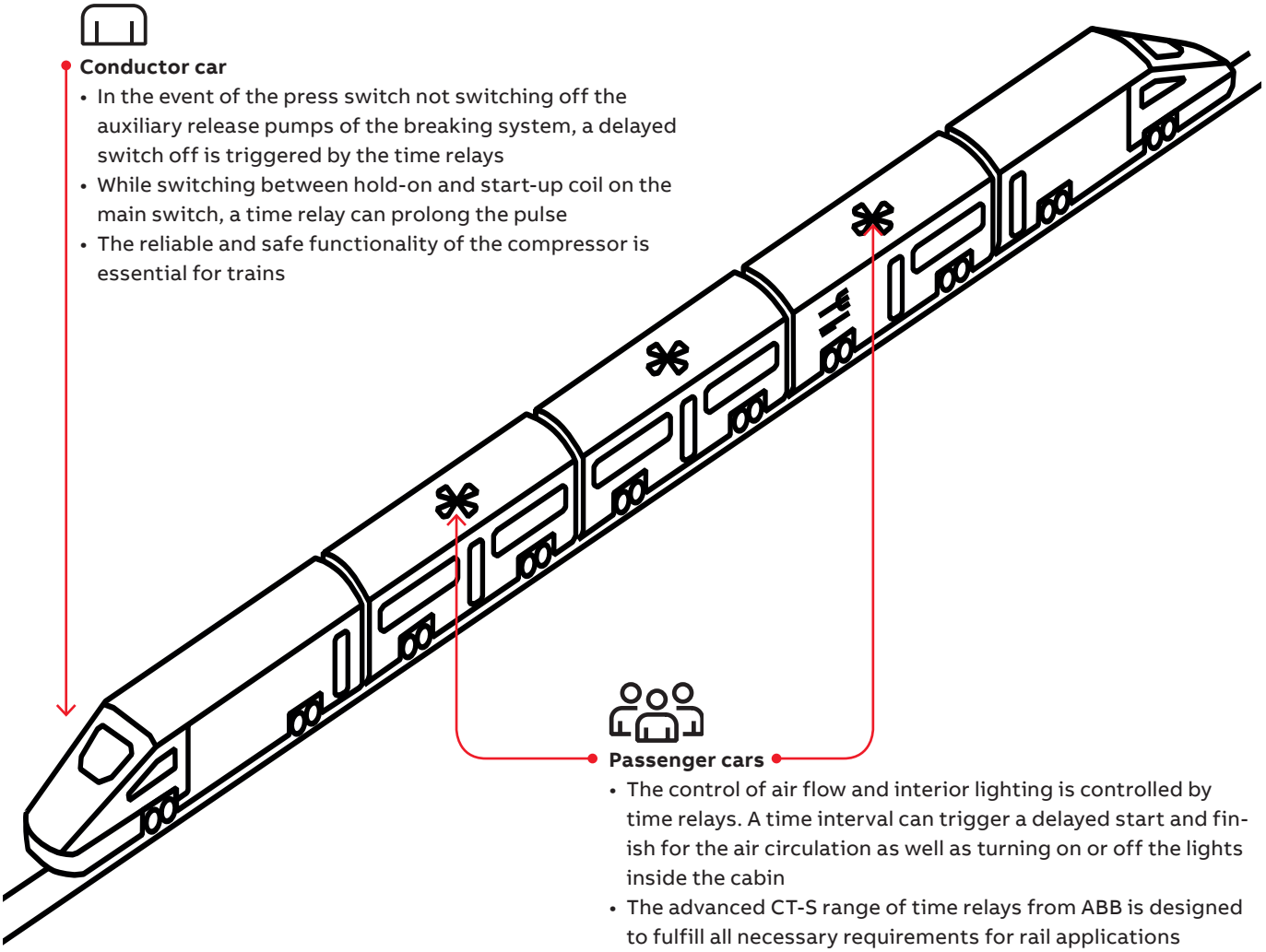
02 Wiring of double-cage chamber connection terminals with screw driver

Double-chamber cage connection terminals
According to IEC/EN 60947-1 double-chamber cage connection terminals provide connection of wires up to 2 x 0.5-2.5 mm² (2 x 20-14 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.xxS.



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



Electronic relays for railway solutions brochure

For more information about time relays in rolling stock applications visit:

new.abb.com/low-voltage/products/electronicrelays

or scan the QR code

CT-S range
Selection table

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

	Order number*	1SVR7■0020R0200	1SVR7■0020R3300	1SVR7■0021R2300	1SVR7■0020R3100	1SVR7■0030R3300	1SVR7■0010R0200	1SVR7■0010R3200	1SVR7■0040R3300	1SVR7■0100R0300	1SVR7■0100R3300	1SVR7■0100R3100	1SVR7■0180R0300	1SVR7■0180R3300	1SVR7■0180R3100	1SVR7■0110R3300	1SVR7■0120R3100	1SVR7■0120R3300	1SVR7■0210R3300	1SVR7■0211R2300
	Type*	CT-MVS.21●	CT-MVS.22●	CT-MVS.23●	CT-MVS.12●	CT-MXS.22●	CT-MFS.21●	CT-MBS.22●	CT-WBS.22●	CT-ERS.21●	CT-ERS.22●	CT-ERS.12●	CT-APS.21●	CT-APS.22●	CT-APS.12●	CT-AHS.22●	CT-ARS.11●	CT-ARS.21●	CT-SDS.22●	CT-SDS.23●
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, symmetrical, accumulative	⊠▬						■													
ON- and OFF-delay, asymmetrical	⊠▬					■														
ON/OFF function	▭	■	■	■	■	■	■	■	■											
Impulse-ON	1⎍⊠	■	■	■	■		■	■	■											
Impulse-ON, accumulative	1⎍⊠						■													
Impulse-OFF w. aux. voltage	1⎍▬	■	■	■	■		■	■												
Impulse-OFF w. aux. voltage, accumulative	1⎍▬						■													
Impulse-ON and OFF	1⎍▩					■														
Fixed impulse with adjustable time delay	⊠1⎍								■											
Adjustable impulse with fixed time delay	⊠1⎍								■											
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	▩1⎍					■														
Pulse former	1⎍	■	■	■	■		■	■												
Star-delta change-over	Δ																		■	■
Star-delta change-over with impulse	Δ1⎍	■	■	■			■	■												
Features																				
Control input, voltage-related triggering		■	■	■	■	■							■	■	■					
Control input, volt-free triggering							2	1								■				
Remote potentiometer connection		■				2	■	■												
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		■	■	■	■	2	■	■	■	■	■	■	■	■	■	■				
Supply voltage																				
24-48 V DC			■		■	■		■	■		■	■		■	■	■			■	
24-240 V AC			■		■	■		■	■		■	■		■	■	■			■	
24-240 V AC/DC		■					■			■			■				■	■		
380-440 V AC				■																■
Output																				
c/o contact		2	2	2	1	2	2	2	2	2	2	1	2	2	1	2	1	2		
n/o contact																			2	2

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



CT-AHS.22P



CT-SDS.23P

■ 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)
	24-48 V DC, 24-240 V AC				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	10 (0.05 s - 300 h)	□	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 °C
[2] Without auxiliary voltage
[3] 50 ms transition time

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

CT-S range

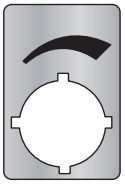
Ordering details - Accessories



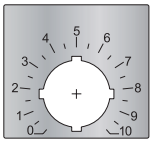
MT-x50B



30 mm adapters



Marker label 29.6 x 44.5 mm



Marker label with scale 0-10
48.5 x 44.5 mm



Sealable transparent cover
for CT-S in new housing

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 kΩ ±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 °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 power consumption			max. 16 VA
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 kΩ (CT-MFS, CT-MBS, CT-MVS.21, CT-MXS)
		Z3-Z2	50 kΩ (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			Δt < 0.004 % / V
Accuracy within the temperature range			Δt < 0.03 % / °C
Repeat accuracy (constant parameters)			< ±0.2 %
Setting accuracy of time delay			± 6 % 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			±2 ms

[1] Prior to first commisioning and after a six-month stop in operation

CT-S range
Technical data

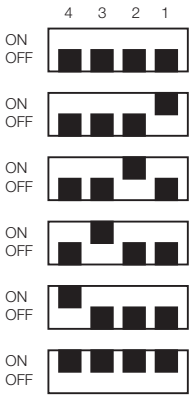
Indication of operational states			
Control supply voltage / timing	U/T: green LED	⎍: control supply voltage applied / ⎍⎍: timing	
Control supply voltage	U: green LED	⎍: control supply voltage applied	
Relay state	R, R1, R2: yellow LED	⎍: output relay energized	
Output circuit			
Kind of output	15-16/18	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/s², 10-58/60-150 Hz	
	resistance	60 m/s², 10-58/60-150 Hz, 20 cycles	
Vibration, seismic (IEC/EN 60068-3-3)	functioning	20 m/s²	
Shock, half-sine (IEC/EN 60068-2-27)	functioning	150 m/s², 11 ms, 3 shocks/direction	
	resistance	300 m/s² , 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

DIP switch configuration CT-MXS.22x



Pulse generator, starting with ON or OFF

Single pulse generator, starting with OFF

Asymmetrical ON- and OFF-delay

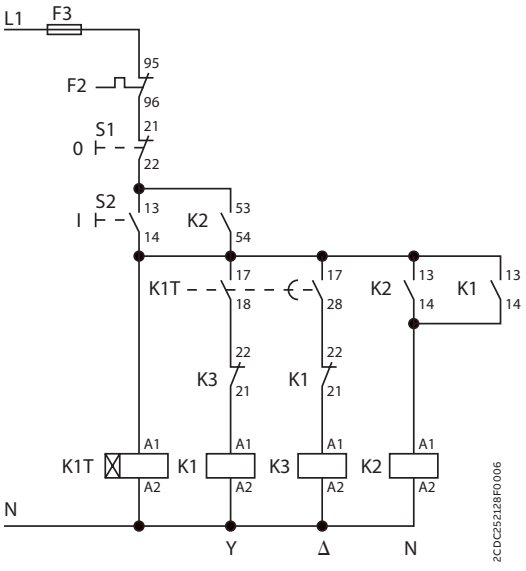
Impulse-ON and Impulse-OFF

No function

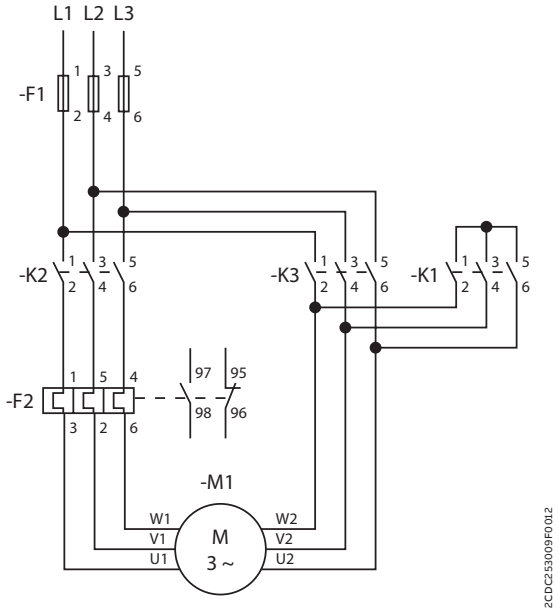
ON/OFF function

Default setting: all DIP switches in position OFF

Example of application - Star-delta changeover



Control circuit diagram

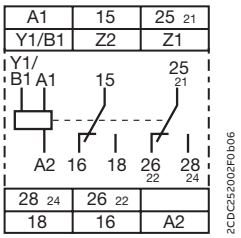


Power circuit diagram

CT-S range
Technical diagrams

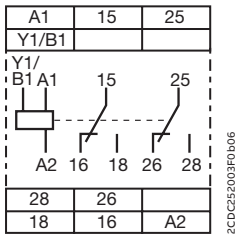
Connection diagrams

CT-MVS.21



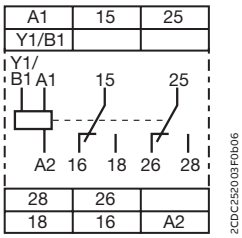
A1-A2	Supply: 24-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact
21-22/24	2nd c/o contact as instantaneous contact
Z1-Z2	Remote potentiometer connection

CT-MVS.22



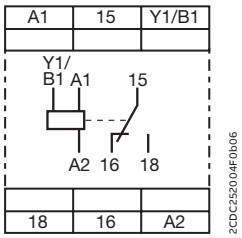
A1-A2	Supply: 224-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MVS.23



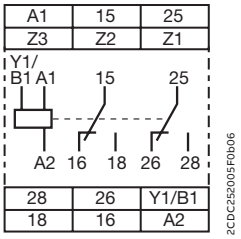
A1-A2	Supply: 380-440V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MVS.12



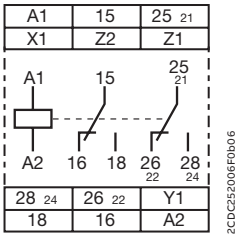
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-MXS.22



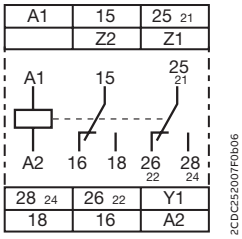
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact
Z1-Z2	Remote potentiometer connection
Z3-Z2	Remote potentiometer connection

CT-MFS.21



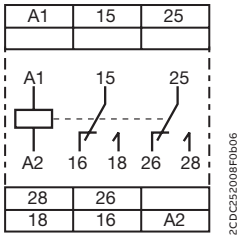
A1-A2	Supply: 24-240 V AC/DC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact
21-22/24	2nd c/o contact as instantaneous contact
Y1-Z2	Control input
X1-Z2	Control input
Z1-Z2	Remote potentiometer connection

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

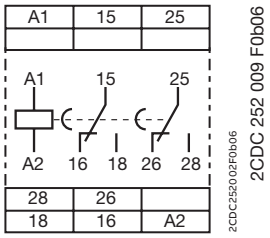


A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-S range
Technical diagrams

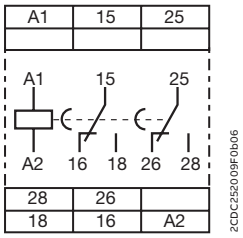
Connection diagrams

CT-ERS.21



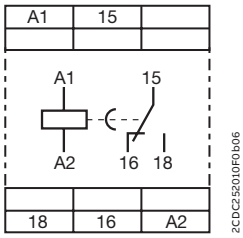
A1-A2	Supply: 24-240 V AC/DC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERS.22



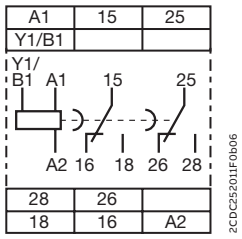
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERS.12



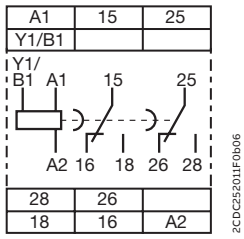
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-APS.21



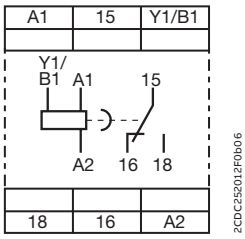
A1-A2	Supply: 24-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-APS.22



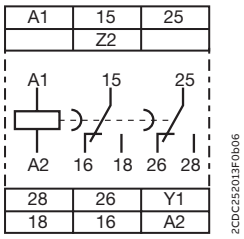
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-APS.12



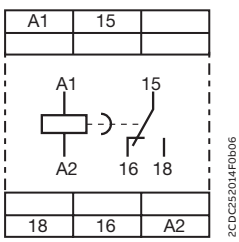
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-AHS.22



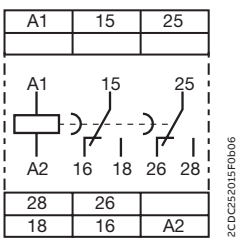
A1-A2	Supply: 24-48 V DC or 24-240 V AC
Y1-Z2	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ARS.11



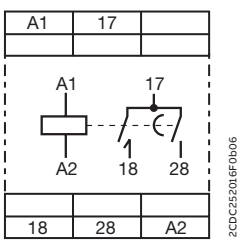
A1-A2	Supply: 24-240 V AC/DC
15-16/18	1st c/o contact

CT-ARS.21



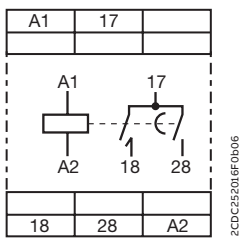
A1-A2	Supply: 24-240 V AC/DC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

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

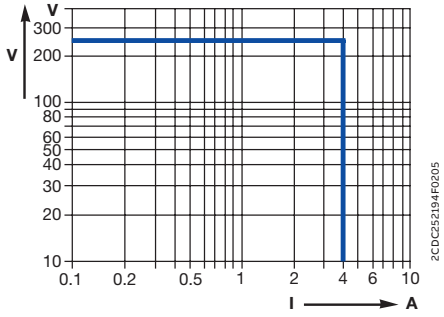


A1-A2	Supply: 380-440 V AC
17-18	1st n/o contact
17-28	2nd n/o contact

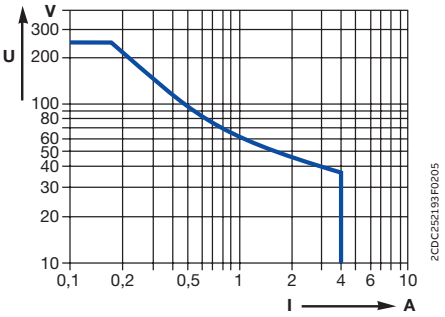
CT-S range
Technical diagrams

Load limit curves

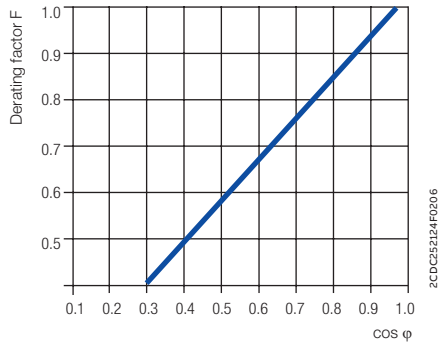
AC load (resistive)



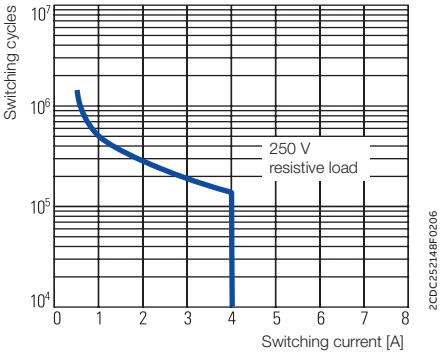
DC load (resistive)



Derating factor F for inductive AC load

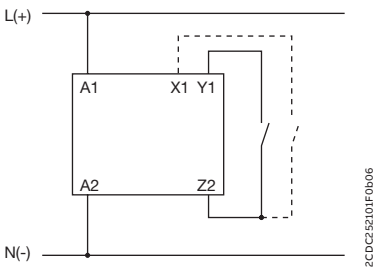


Contact lifetime

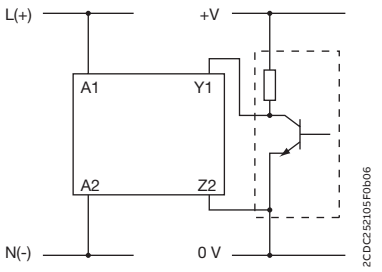


Wiring notes

Control inputs (volt-free triggering)



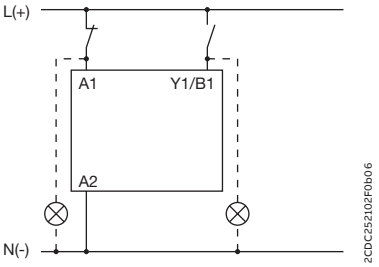
Triggering of the control inputs (volt-free) with a proximity switch (3 wire)

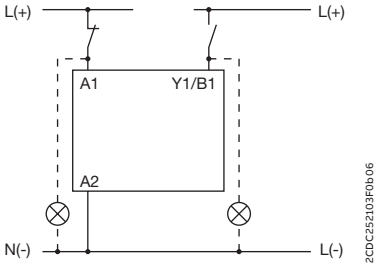


CT-S range
Technical diagrams

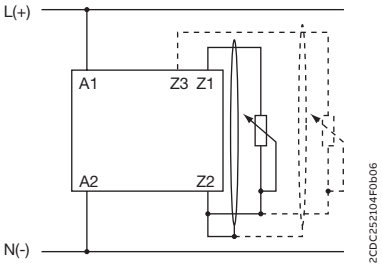
Wiring notes

Control inputs (voltage-related triggering)





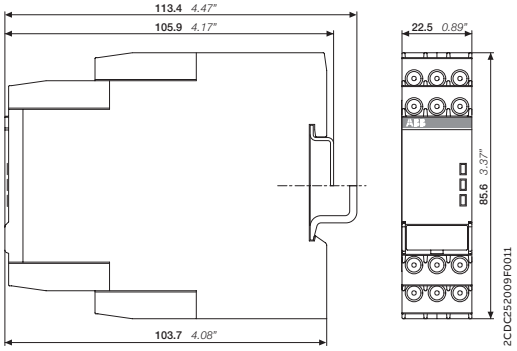
Remote potentiometer



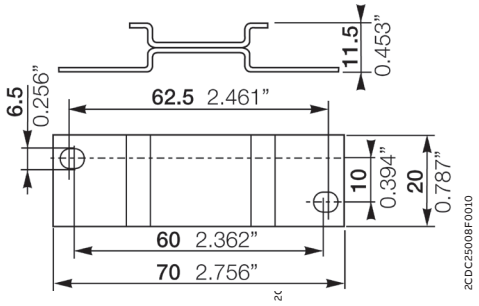
The control input Y1/B1 is triggered with electric potential against A2. It is possible to use the control supply voltage from terminal A1 or any other voltage within the rated control supply voltage range.

Dimensional drawings

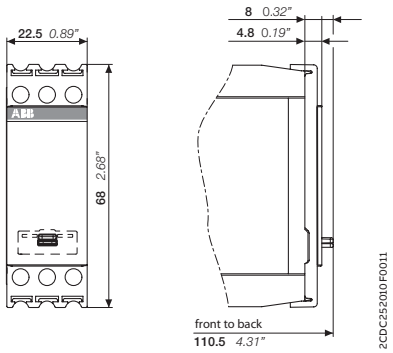
Main device



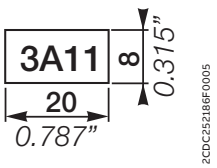
ADP.01 adapter for screw mounting



COV.11 sealable transparent cover



MAR.01 marker label



Dimensions in mm, inches


ABB
E 234 CT-ERD
A1 15
18 16 A2
ABB
E 234 CT-SDD
A1 17
28 18 A2
ABB
E 234 CT-MFD
A1 15 25
18 16 Y1/B1
28 26 A2
ABB
E 234 CT-TGD
A1 15 25
18 16 Y1/B1
28 26 A2

Time relays for building applications
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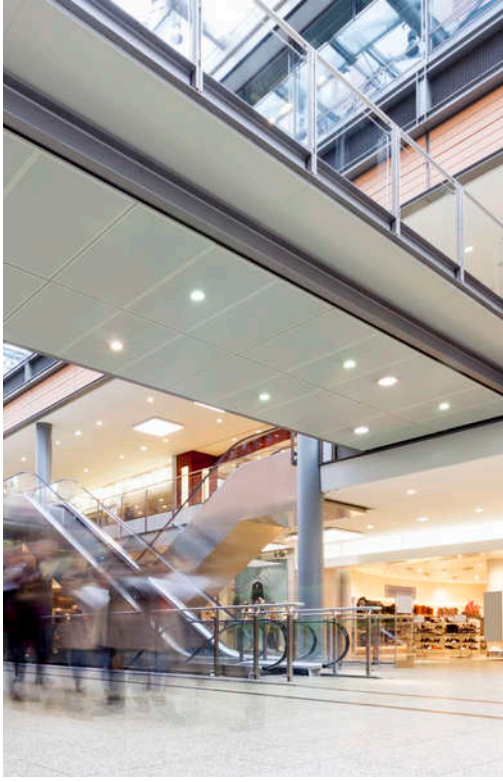
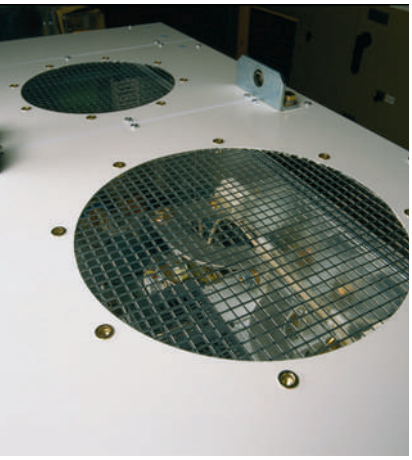
48	Technical data
51	Technical diagrams

















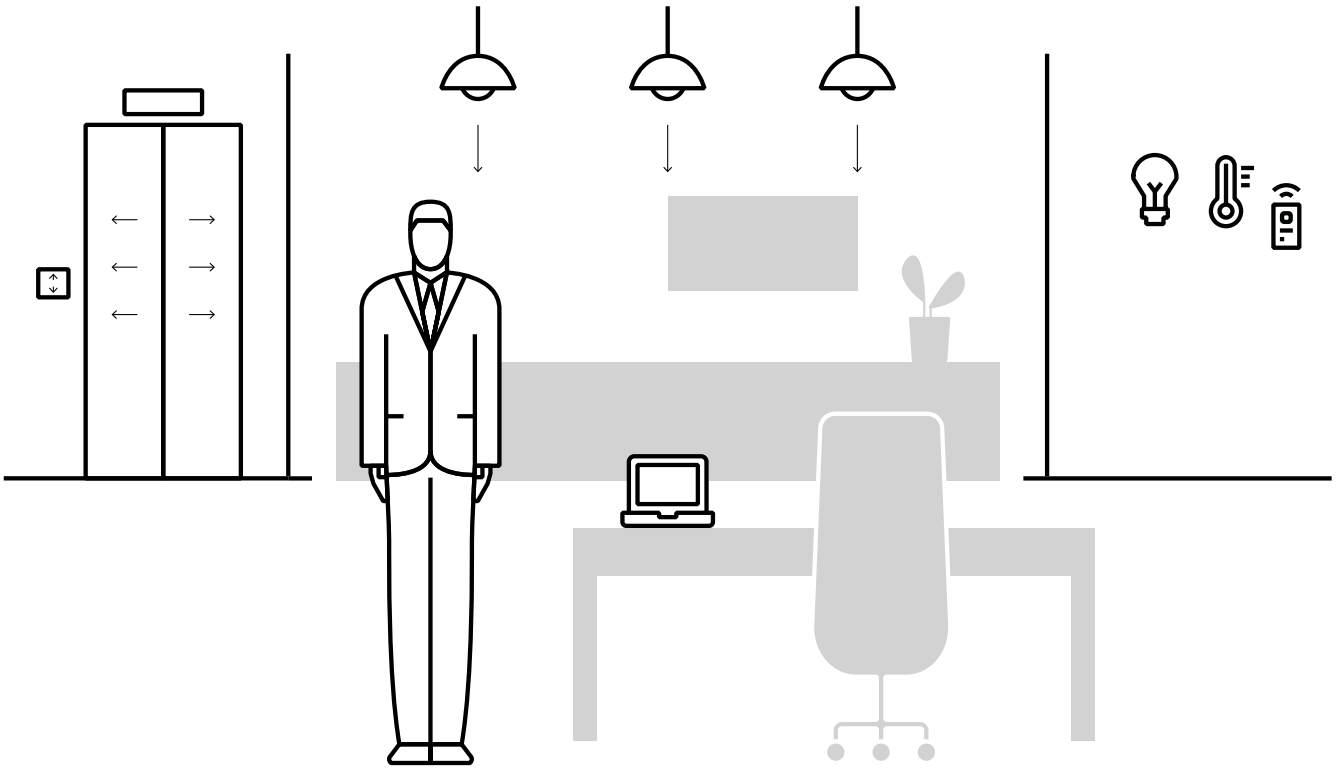
Time relays for building applications
Applications

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.

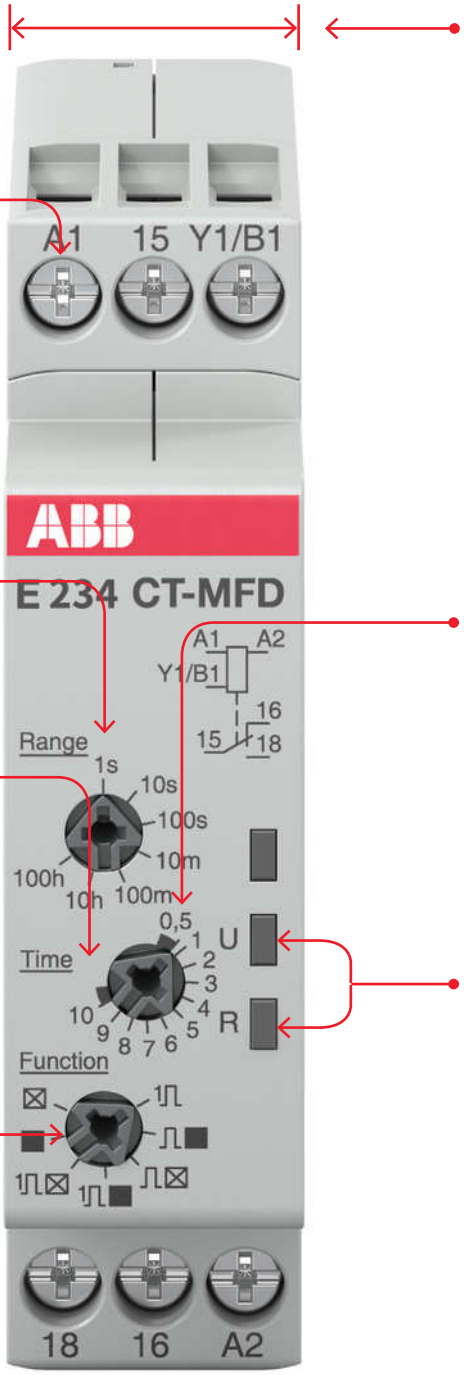
Easy to install

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 availabilty

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



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.

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

Fine adjustment of the time delay

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

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

Selection of the timing function
- ⊠ ON-delay
- ■ OFF-delay with aux. voltage
- 1⎍⊠ Impulse-ON
- 1⎍■ Impulse-OFF with aux. voltage
- ⎍⊠ Flasher starting with ON
- ⎍■ Flasher starting with OFF
- 1⎍ Pulse former

CT-D range
Selection table

	Order number	1SVR500020R0000	1SVR500020R1100	1SVR500100R0000	1SVR500100R0100	1SVR500110R0000	1SVR500110R0100	1SVR500130R0000	1SVR500150R0000	1SVR500160R0000	1SVR500160R0100	1SVR500210R0100	1SVR500211R0100
	Type	CT-MFD.12	CT-MFD.21	CT-ERD.12	CT-ERD.22	CT-AHD.12	CT-AHD.22	CT-VWD.12	CT-EBD.12	CT-TGD.12	CT-TGD.22	CT-SAD.22	CT-SDD.22
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										■	■		
Pulse former		■	■										
Star-delta change-over												■	■
Features													
Control input, voltage-related triggering		■	■			■	■			■	■		
Time range													
0.05 s - 100 h		■	■	■	■	■	■	■	■	2	2		
0.05 s - 10 min												■	■
Supply voltage													
12-240 V AC/DC			■										
24-48 V DC		■		■	■	■	■	■	■	■	■	■	■
24-240 V AC		■		■	■	■	■	■	■	■	■	■	■
Output													
c/o contact		1	2	1	2	1	2	1	1	1	2		
n/o contact												2	2

CT-D range
Ordering details



CT-MFD.12



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)	■		CT-TGD.12[2]	1SVR500160R0000	0.060 (0.132)
			■	2 c/o	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 °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 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		
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

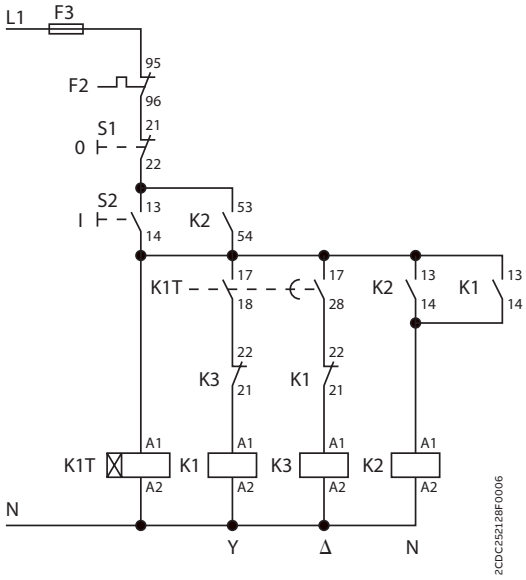
			CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFD.21
Output circuit					
Kind of output		15-16/18	Relay, 1 c/o contact	-	
		15-16/18; 25-26/28	-	Relay, 2 c/o contacts	
		17-18; 17-28		Relay, 2 n/o contacts (CT-SDC, CT-SAC)	
Contact material			AgNi alloy, Cd free		
Rated operational voltage U_e			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 mm² (2 x 20-16 AWG) 1 x 0.5-2.5 mm² (1 x 20-14 AWG)		
		rigid	2 x 0.5-1.5 mm² (2 x 20-16 AWG) 1 x 0.5-4 mm² (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/s²; 10 cycles, 10...150...10 Hz		
Shock (half-sine)		IEC/EN 60068-2-27	150 m/s², 11 ms		

CT-D range
Technical data

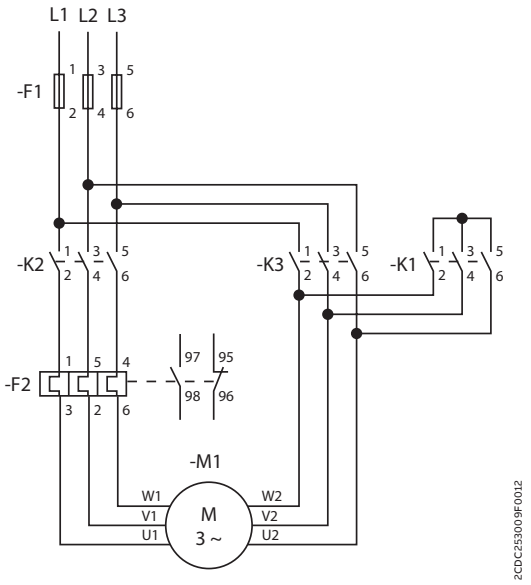
		CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFC.21
Isolation data				
Rated insulation voltage U_i	input circuit / output circuit	300 V		
	output circuit 1 / output circuit 2	not available	300 V	300 V
Rated impulse withstand voltage U_{imp}	between all isolated circuits	4 kV; 1.2/50 µs		
Power-frequency 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

Example of application - Star-delta changeover



Control circuit diagram

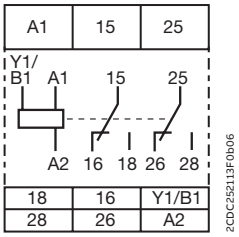


Power circuit diagram

CT-D range
Technical diagrams

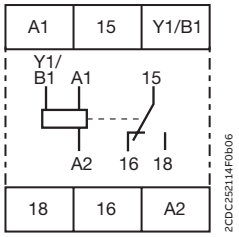
Connection diagrams

CT-MFD.21



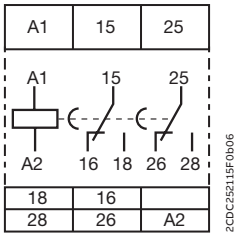
A1-A2	Supply: 12-240 V AC/DC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-MFD.12



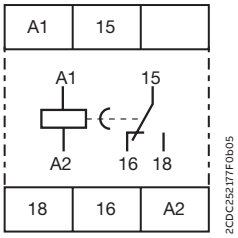
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-ERD.22



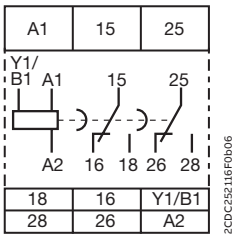
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-ERD.12



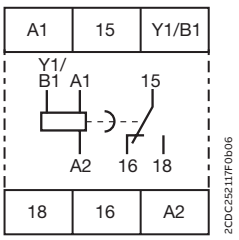
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-AHD.22



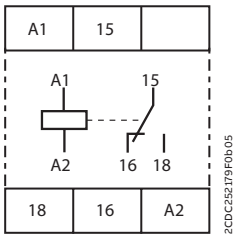
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-AHD.12



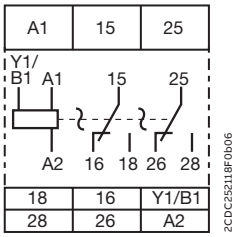
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

CT-VWD.12



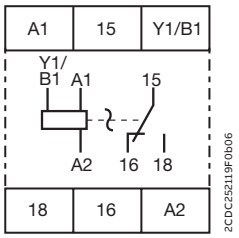
A1-A2	Supply: 24-48 V DC or 24-240 V AC
15-16/18	1st c/o contact

CT-TGD.22



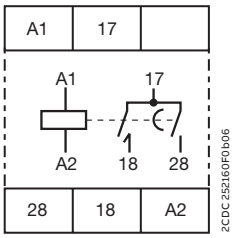
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact
25-26/28	2nd c/o contact

CT-TGD.12



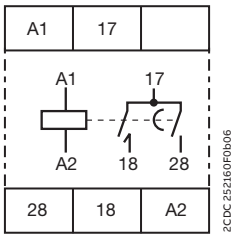
A1-A2	Supply: 24-48 V DC or 24-240 V AC
A1-Y1/B1	Control input
15-16/18	1st c/o contact

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



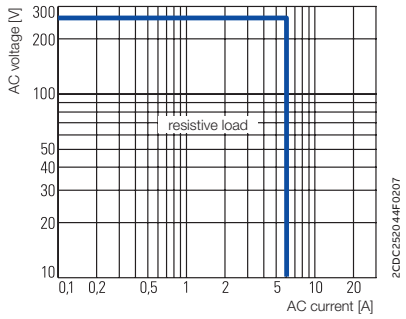
A1-A2	Supply: 24-48 V DC or 24-240 V AC
17-18	1st n/o contact (star contactor)
17-28	2nd n/o contact (delta contactor)

CT-D range
Technical diagrams

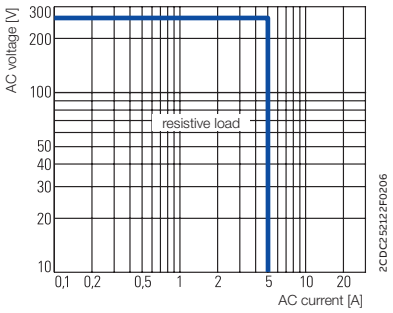
Load limit curves

AC load (resistive)

CT-D.1x

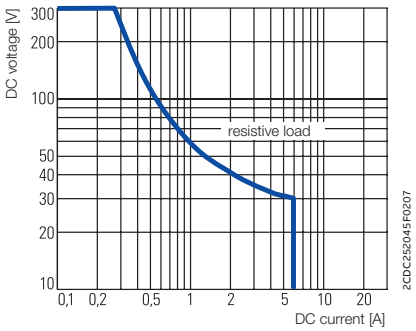


CT-D.2x

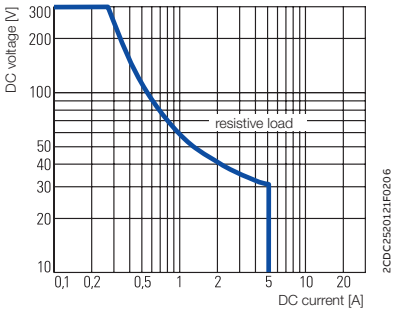


DC load (resistive)

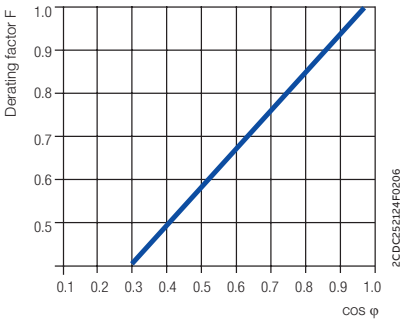
CT-D.1x



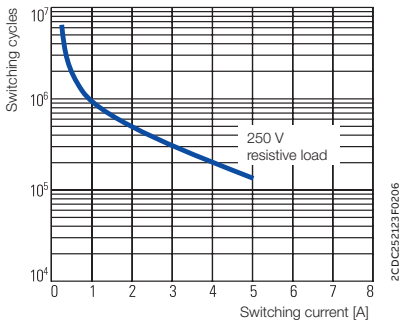
CT-D.2x



Derating factor F for inductive AC load

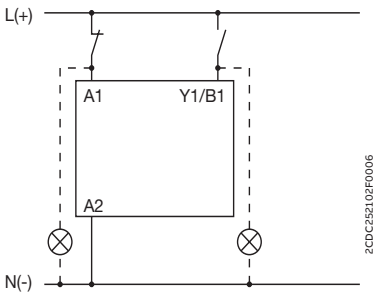


Contact lifetime



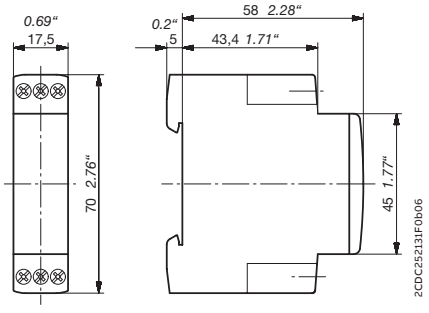
Wiring notes for devices with control input

A parallel load to the control input is possible

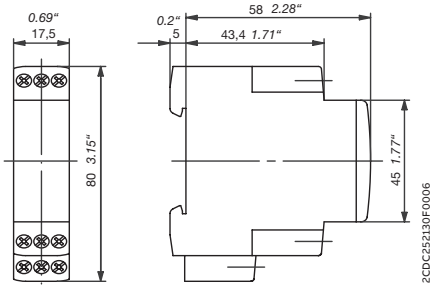


Dimensional drawings

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


ABB
E 234 CT-ERD
E 234 CT-MFD
CT-ERC
CT-MFC
CT-AHS
CT-MVS
A1 15 25
18 16 A2
18 16 Y1/B1
28 26 A2
28 26 Y1
Y1/B1 Z2 Z1
Range
Time
Function
T Range
U/T
R
R1
R2

Timing functions

Timing functions
CT-C, CT-S, CT-D

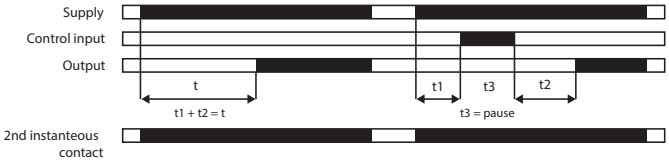
On delay functions (Delay on make) ✉

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.

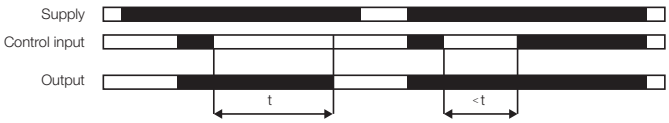
ON-delay accumulative



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.

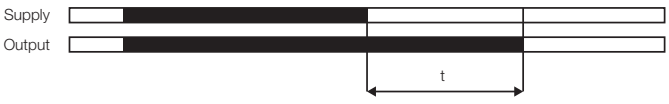
OFF delay functions (Delay on break) ■

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.

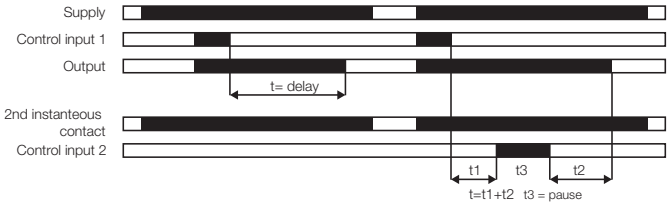
OFF-delay without auxiliary voltage



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-D

OFF-delay with auxiliary voltage (Delay on break), accumulative



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 t1 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, accumulative



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 t1 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-D

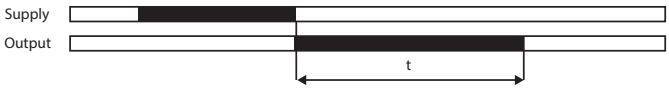
Impulse-OFF functions 1⎍▮

Impulse-OFF with auxiliary voltage



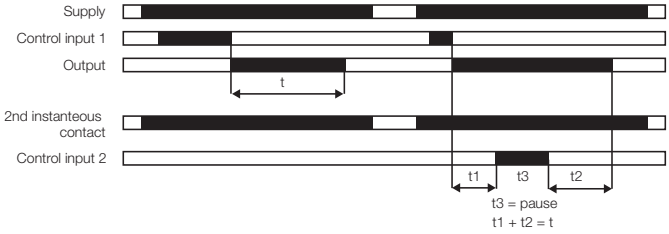
This function requires a continuous control supply voltage for timing. The output relay energizes immediately when the control input is de-energized and the output de-energizes after the set pulse time is complete. If the control supply voltage is interrupted, the output relay de-energizes and the time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

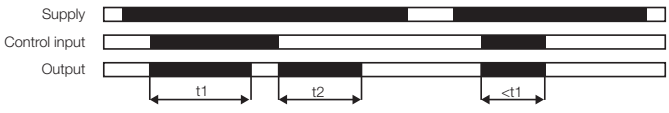
Impulse-OFF with auxiliary voltage
(Trailing edge interval)



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 t1 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 t1. When t1 is complete, the output relay de-energizes. Re-opening the control input energizes the output relay immediately and starts the pulse time t2. When t2 is complete, the output relay de-energizes. t1 and t2 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-D

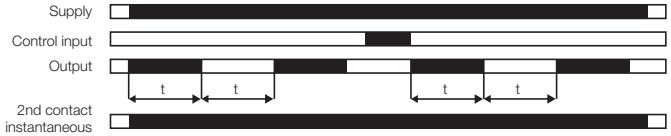
Flasher starting with ON functions ⎍⌧

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.

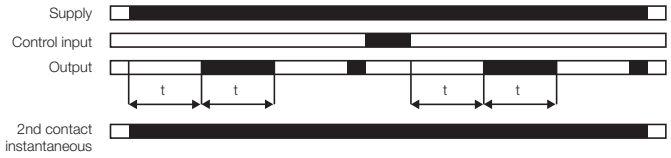
Flasher starting with OFF functions ⎍■

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.

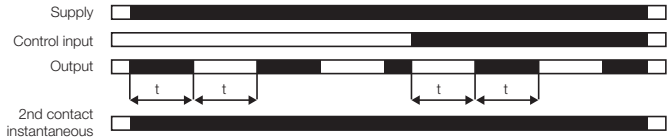
Flasher with reset starting with OFF



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

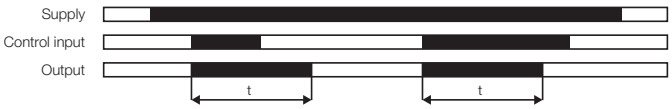


Applying a control supply voltage starts timing with symmetrical ON / OFF times. If the control input is open while supply voltage is connected the cycle starts with an ON time first. If the control input is closed while supply voltage is connected the cycle starts with an OFF time first.

Timing functions
CT-C, CT-S, CT-D

Pulse former

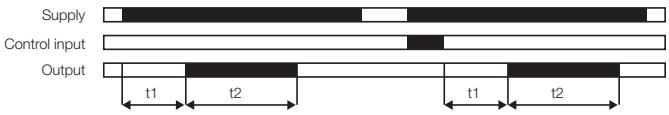
Puls former (single shot)



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

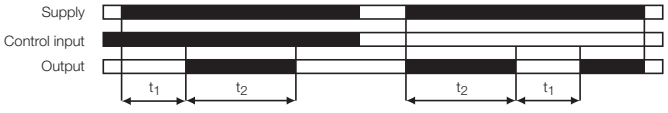
Single-pulse generator, starting with OFF



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 t1 is complete. When the following ON time t2 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

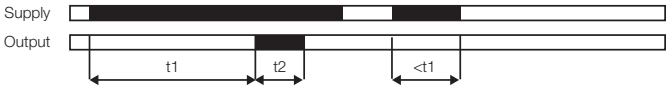
Starting with the ON or OFF time
(Recycling unequal times, ON or OFF first)



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 t1 starts when a control supply voltage is applied. When t1 is complete, the output relay energizes for the fixed impulse time t2 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

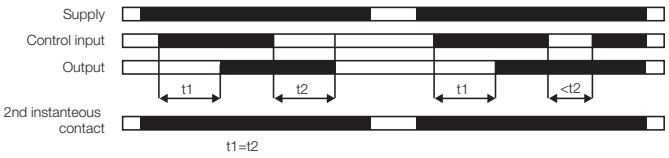


This function requires a continuous control supply voltage for timing. As soon as the control supply voltage is applied the output relay will close after 500 ms. When t2 is complete, the output relay energizes and the selected pulse time t1 starts. When t1 is complete, the output relay de-energizes. 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-D

ON- and OFF-delay

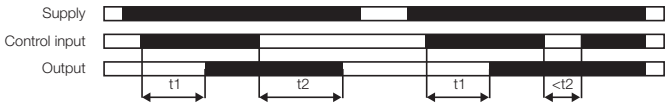
Symmetrical ON- and OFF-delay [1)]



This function requires a continuous control supply voltage for timing. Closing the control input starts the ON-delay time t1. When timing is complete, the output relay energizes. Opening the control input starts the OFF-delay time t2. When the OFF-delay t2 is complete, the output relay de-energizes. If the control input opens before the ON-delay (<t1) is complete, the time delay is reset and the output relay remains de-energized. If control input closes before the OFF-delay time (<t2) is complete, the time delay is reset and the output relay remains energized.

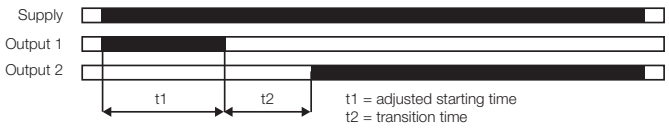
1) Variant with 2nd control input for pause timing is available too.

Asymmetrical ON- and OFF-delay



This function requires a continuous control supply voltage for timing. Closing the control input starts the ON-delay t1. When timing is complete, the output relay energizes. Opening the control input starts the OFF-delay t2. 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 (<t1), the time delay is reset and the output relay remains de-energized. If the control input closes before the OFF-delay is complete (<t2), 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 t1. When the starting time is complete, the first output contact de-energizes the star contactor. When the transition time t2 is complete, the second output contact energizes the delta contactor. The delta contactor remains energized as long as the control supply voltage is applied. t2 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” ≠ 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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