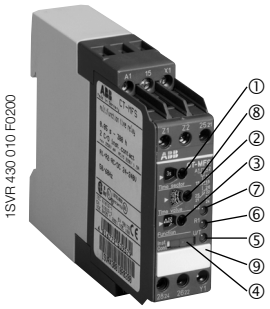
Electronic timer CT-MFS

Multifunctional with 2 c/o contacts

Data sheet



CT-MFS

① 10 selectable time ranges, from 0.05 s to 300 h

② Potentiometer with direct reading scale for the fine adjustment of the time delay

③ Rotary switch for the preselection of the desired timing function

④ Sliding switch to set the 2nd c/o contact as an instantaneous contact

⑤ U/T: green LED - Supply voltage (LED flashes during timing)

⑥ R1: red LED - Output relay 1 energized

⑦ R2: red LED - Output relay 2 energized

⑧ Circuit diagram

⑨ Marker label

Characteristics

- Multifunction timer with 8 timing functions:
  ON-delay, OFF-delay, impulse-ON, impulse-OFF, flasher starting with ON, flasher starting with OFF, star-delta change-over twice ON-delayed, star-delta change-over with impulse
- One device includes 10 time ranges, from 0.05 s to 300 h
- Remote potentiometer connection
- 2 c/o contacts
- 2nd c/o contact can be selected as instantaneous contact (front-face sliding switch)
- Volt-free (dry) control contact
- Starting the time delay is possible
  - via an external control contact or
  - via the supply voltage
- Pause timing / time storage is possible via an external control contact
- 3 LEDs for status indication
- Width 22.5 mm

Approvals

cULus
GL
GOST
CCC

Marks

CE
C-Tick

Order data

Type	Supply voltage	Order code
CT-MFS	24-240 V AC/DC	1SVR 430 010 R0200

Order data (Accessories)

Description	Order code
Remote potentiometer 30.5 mm	1SVR 700 800 R1000
Remote potentiometer 22.5 mm	1SVR 701 800 R1000
Remote potentiometer 10.5 mm	1SVR 214 017 R0900
Adapter for screw mounting on panel	1SVR 430 029 R0100
Sealable cover	1SVR 430 005 R0100
Marker label	1SVR 366 017 R0100

Application

The CT-S range timers are designed for use in industrial applications. They operate over a universal range of supply voltages and a large time delay range, within compact dimensions. The easy-to-set front-face potentiometers, with direct reading scales, provide accurate time delay adjustment.

Multifunction timers are ideally suited for service and maintenance applications, because one device can replace a number of time relays with different functions, voltage and time ranges. This reduces inventory and saves money.

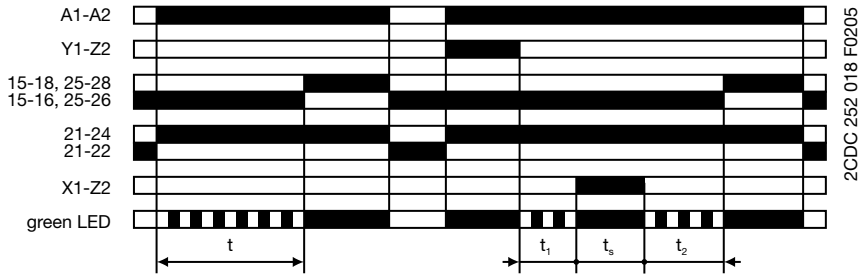
Operating mode

The CT-MFS with 2 c/o contacts provides 8 timing functions. The function is rotary witch selectable on the front of the unit. Each function is indicated by an international function symbol.
One of 10 time delay ranges, from 0.05 s to 300 h, can be selected with another rotary switch. The fine adjustment of the time delay is made via an internal potentiometer, with a direct reading scale, on the front of the unit. When an external potentiometer is connected to terminals Z1- Z2, the internal adjustment is disabled and external adjustment is enabled.
Timing is displayed by a flashing green LED labelled U/T.

Function diagrams

⌧ ON-delay (delay on make)

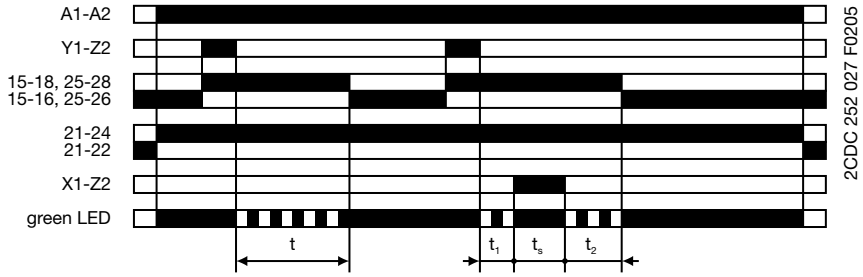
If control contact Y1-Z2 is open, timing begins when supply voltage is applied to A1-A2. Or, if supply voltage is already applied, opening control contact Y1-Z2 also starts timing.
The green LED flashes during timing. When the selected time delay is complete, the output relays energize and the flashing green LED turns steady. If supply voltage is interrupted, the output relays de-energize and the time delay is reset.
If control contact Y1-Z2 closes before the time delay is complete, the time delay is reset and the output relays remain de-energized.
Timing can be paused by closing control contact X1-Z2. The elapsed time is stored and continues from this time value when X1-Z2 is re-pened.
This can be repeated as often as required.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted delay time
t_s = storage time
$t = t_1 + t_2$

■ OFF-delay (Delay on break)

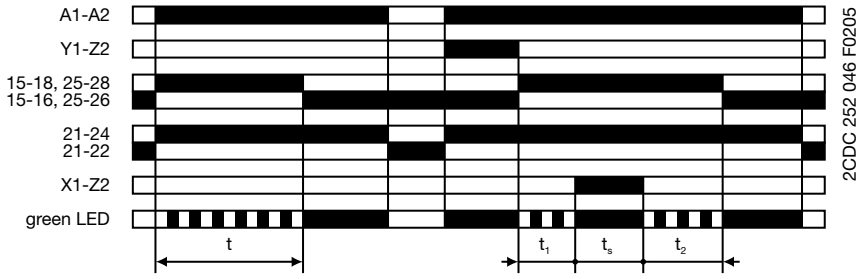
This function requires continuous supply voltage at terminals A1-A2 for timing.
Timing is controlled by a volt-free control contact, connected to terminals Y1-Z2. If the control contact is closed, the output relays energize. If the control contact is opened, the selected time delay starts (minimum control pulse length is 20 ms). The green LED flashes during timing. When the time delay is complete, the output relays de-energize and the flashing green LED turns steady.
If control contact Y1-Z2 closes before the time delay is complete, the time delay is reset and the output relays remain energized.
Timing can be paused by closing control contact X1-Z2. The elapsed time is stored and continues from this time value when X1-Z2 is re-opened. This can be repeated as often as required.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted delay time
t_s = storage time
$t = t_1 + t_2$

1⎍⌧ Impulse-ON (Interval)

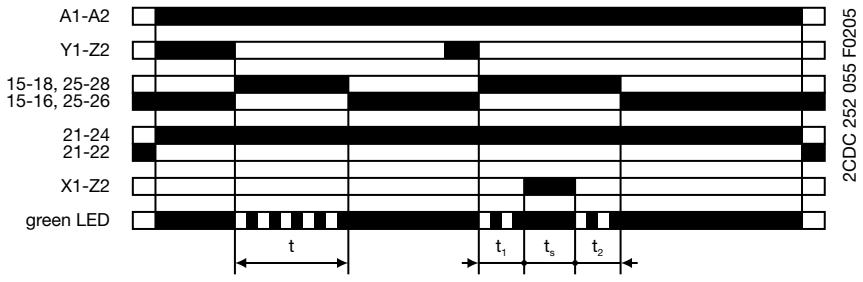
The output relays energize immediately when the supply voltage is applied to terminals A1-A2 and de-energize after the set pulse time is complete. The green LED flashes during timing. When the selected pulse time is complete, the flashing green LED turns steady. Timing can be started by opening control contact Y1-Z2, with supply voltage applied.
Closing control contact Y1-Z2, before the time delay is complete, de-energizes the output relays and the time delay is reset.
Timing can be paused by closing control contact X1-Z2. The elapsed time is stored and continues from this time value when X1-Z2 is re-opened. This can be repeated as often as required.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted pulse time
t_s = storage time
$t = t_1 + t_2$

1⎍■ Impulse-OFF (Trailing edge interval)

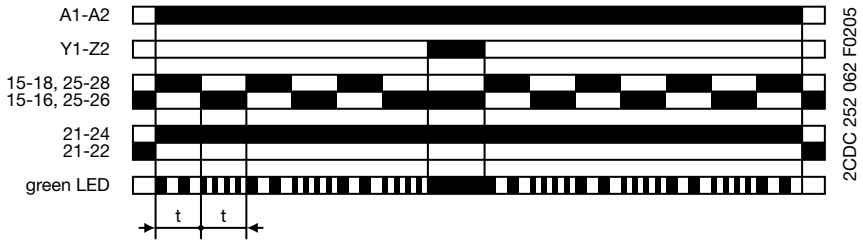
This function requires continuous supply voltage at terminals A1-A2. Opening control contact Y1-Z2, energizes the output relays immediately and timing begins. The green LED flashes during timing. When the selected pulse time is complete, the flashing green LED turns steady and the output relays de-energize.
Closing control contact Y1-Z2, before the time delay is complete, de-energizes the output relays and the time delay is reset.
Timing can be paused by closing control contact X1-Z2. The elapsed time is stored and continues from this time value when X1-Z2 is re-opened. This can be repeated as often as required.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted pulse time
t_s = storage time
$t = t_1 + t_2$

⎍⌧ Flasher with symmetrical ON & OFF times, starting with the ON time (Recycling equal times, ON first)

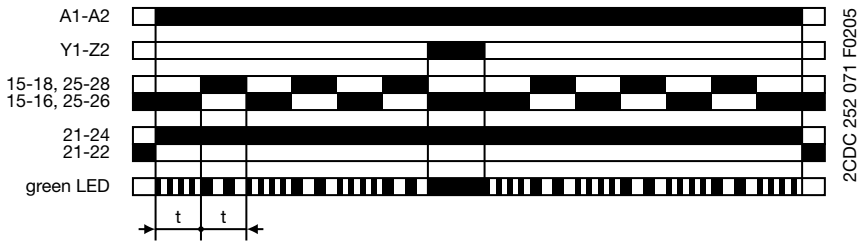
Applying supply voltage to terminals A1-A2, starts timing with symmetrical ON & OFF times. The cycle starts with an ON time first. The ON & OFF times are displayed by the flashing green LED, which flashes twice as fast during the OFF time.
Closing control contact Y1-Z2, with supply voltage applied, de-energizes the output relays. Opening control contact Y1-Z2, starts the timer pulsing again with the set cycle.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted flashing time

⎍■ Flasher with symmetrical ON & OFF times, starting with the OFF time (Recycling equal times, OFF first)

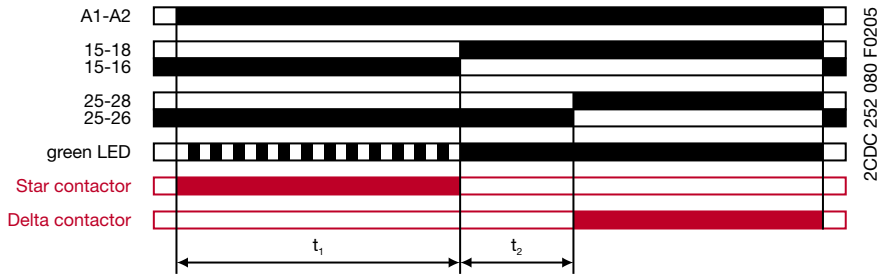
Applying supply voltage to terminals A1-A2, starts timing with symmetrical ON & OFF times. The cycle starts with an OFF time first. The ON & OFF times are displayed by the flashing green LED, which flashes twice as fast during the OFF time.
Closing control contact Y1-Z2, with supply voltage applied, de-energizes the output relays. Opening control contact Y1-Z2 starts the timer pulsing again with the set cycle.
When an external potentiometer is connected to terminals Z1-Z2, the internal, front-face potentiometer is disabled and the time adjustment is made via the external potentiometer.
If the front-face sliding switch is set to the “Inst.” position, the 2nd c/o contact energizes immediately upon application of the supply voltage.



t = adjusted flashing time

⧋⊠ Star-delta change-over, twice ON-delayed (Star-delta starting, delay on make / delay on make)

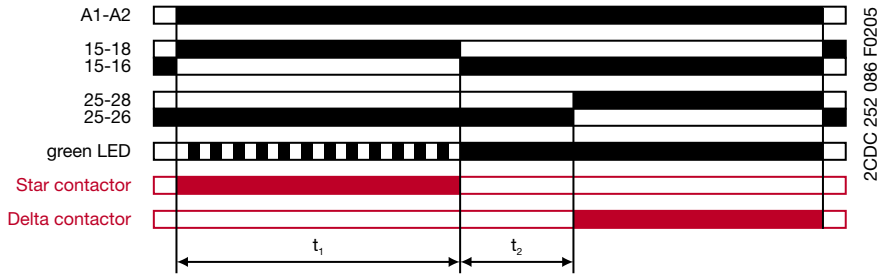
Applying supply voltage to terminals A1-A2, energizes the star contactor connected to terminals 15-16 and begins the set starting time. The green LED flashes during timing.
When the starting time is complete, the first c/o contact de-energizes the star contactor. Now, the fix transition time of 50 ms starts.
When the transition time is complete, the second output relay energizes the delta contactor connected to terminals 25-28. The delta contactor remains energized as long as the supply voltage is applied to the unit.
The “Inst” sliding switch (to set the 2nd c/o contact as an instantaneous contact) is disabled when this function is selected.



t_1 = adjustable starting time
t_2 = transition time (approx. 50 ms)

⧋1⎍ Star-delta change-over with impulse function (Star-delta starting, interval / delay on make)

Applying supply voltage to terminals A1-A2, energizes the star contactor connected to terminals 15-18 and begins the set starting time. The green LED flashes during timing.
When the starting time is complete, the first c/o contact de-energizes the star contactor. Now, the fix transition time of 50 ms starts.
When the transition time is complete, the second output relay energizes the delta contactor connected to terminals 25-28. The delta contactor remains energized as long as the supply voltage is applied to the unit.
The “Inst” sliding switch (to set the 2nd c/o contact as an instantaneous contact) is disabled when this function is selected.



t_1 = adjustable starting time
t_2 = transition time (approx. 50 ms)

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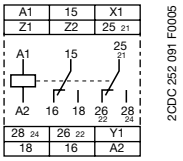
Connection diagram

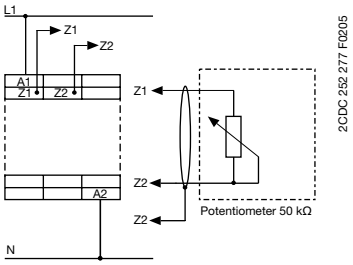
CT-MFS



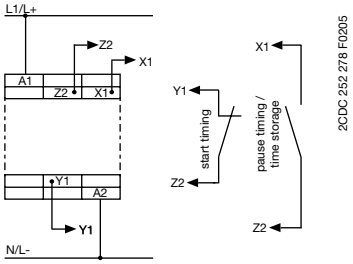
Version:	1SVR 430 010 R0200
A1-A2	Supply: 24-240 V AC/DC
Z1-Z2	Remote potentiometer
Y1-Z2	Control contact to start timing
X1-Z2	Control contact to pause timing
15-16/18	1. c/o contact
25-26/28	2. c/o contact
21-22/24	2. c/o contact as instantaneous contact

Wiring notes

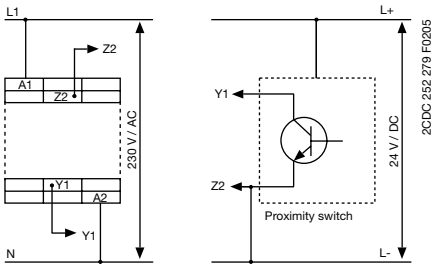
Connection diagram for remote potentiometer



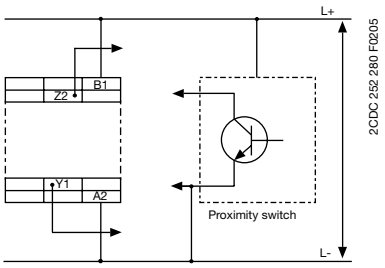
Connection diagram for control contacts



Connection diagram for proximity switch (3 wire) with 230 V AC supply



Connection diagram for proximity switch (3 wire) with 24 V DC supply



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Technical Data

Input circuits		
Supply voltage	A1-A2	24-240 V AC/DC
Power consumption	24-240 V AC/DC	approx. 2-2.5 VA/W
Supply voltage tolerance		-15...+10 %
Supply voltage frequency	AC/DC Version	DC or 50/60 Hz
	AC Version	50/60 Hz
Control contact connections volt-free (dry)	Y1-Z2	start timing external
	X1-Z2	time pause, time storage
Minimum control pulse length		20 ms
Non-load voltage at the control contacts		10-40 V DC (no galvanic separation to supply circuit)
Max. current in the control circuit		1 mA
Max. cable length to the control inputs		50 m
Remote potentiometer connection	Z1/Z3-Z2	50 kΩ
Max. cable length to remote potentiometer		2 x 25 m, shield connected to Z2 potential
Duty time		100 %
Timing circuit		
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
Recovery time		< 50 ms
Repeat accuracy (constant parameters)		< 0.2 %
Timing error within the supply voltage tolerance range		< 0.008 % / % Δ U
Timing error within operating temperature range		< 0.07 % / °C
Indication of operational states		
Supply voltage / timer		green LED steady / flashing while timing
1st / 2nd output relay energized		red LED / red LED
Output circuits	15-16/18, 25(21)-26(22)/28(24)	
Number of contacts		Relays, 2 c/o contacts, 2nd c/o contact selectable as instantaneous contact
Contact material		AgCdO
Related voltage	acc. to VDE 0110, IEC 60947-1	250 V
Maximum switching voltage		250 V AC, 250 V DC
Rated switching current acc. to IEC 60947-5-1	AC-12 (resistive) 230 V	4 A
	AC-15 (inductive) 230 V	3 A
	DC-12 (resistive) 24 V	4 A
	DC-13 (inductive) 24 V	2 A
Maximum lifetime	mechanical	30 x 10^6 switching cycles
	electrical (AC-12, 230 V, 4 A)	0,1 x 10^6 switching cycles
Short circuit proof, max. fuse rating	n/c	10 A fast, operating class gL
	n/o	10 A fast, operating class gL
General data		
Enclosure	width	22.5 mm
	length	78.0 mm
	depth	100.0 mm
Wire size	fine-strand with wire end ferrule	2 x 0.75 - 2.5 mm^2 (18-14 AWG)
	fine-strand without wire end ferrule	
	rigid	2 x 0.5 - 4 mm^2 (20-12 AWG)
Weight		approx. 150 g (5.3 oz)
Mounting position		any
Degree of protection	enclosure / terminals	IP50 / IP20

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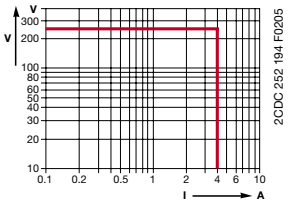
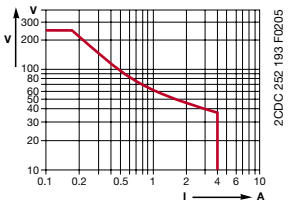
Temperature	operating	-20...+60 °C
	storage	-40...+85 °C
Mounting		DIN rail (EN 50022)
Standards		
Product standard		IEC 61812-1, EN 61812-1
EMC Directive		89/336/EEC
Electromagnetic compatibility		IEC 61000-6-2, EN 61000-6-4
ESD	acc. to IEC 61000-4-2, EN 61000-4-2	level 3 6 kV / 8 kV
HF radiation resistance	acc. to IEC 61000-4-3, EN 61000-4-3	level 3 10 V/m
Burst	acc. to IEC 61000-4-4, EN 61000-4-4	level 3 2 kV / 5 kHz
Surge	acc. to IEC 1000-4-5, EN 61000-4-5	level 4 2 kV L-L
HF line emission	acc. to IEC 1000-4-6, EN 61000-4-6	level 3 10 V
Low Voltage Directive		73/23/EEC
Operational reliability	acc. to IEC 68-2-6	4 g
Mechanical resistance	acc. to IEC 68-2-6	6 g
Approvals / marks		
Approvals		cULus, GL, GOST and CCC
Marks		CE and C-Tick
Isolation data		
Rated insulation voltage between supply circuit, control circuit and output circuit	acc. to VDE 0110, IEC 60947-1	supply up to 240 V: 300 V supply up to 440 V: 500 V
Rated impulse withstand voltage between all isolated circuits	acc. to VDE 0110, IEC 664	4 kV / 1.2-50 µs
Test voltage between all isolated circuits		2.5 kV, 50 Hz, 1 min.
Pollution category	acc. to VDE 0110, IEC 664, IEC 255-5	III/C
Overvoltage category	acc. to VDE 0110, IEC 664, IEC 255-5	III/C
Environmental testing	acc. to IEC 68-2-30	24 h cycle time, 55 °C, 93 % rel., 96 h

Load limit curves

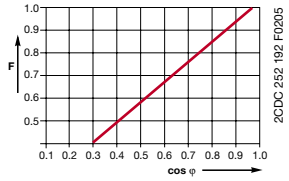
AC load (resistive)



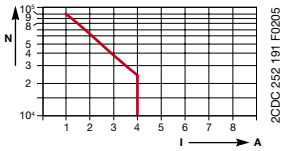
DC load (resistive)



Derating factor F for inductive AC load



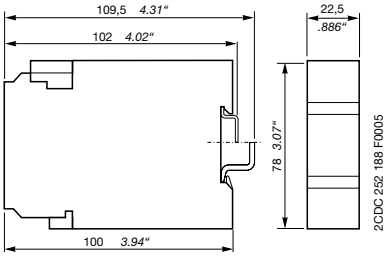
Contact lifetime /switching cycles N



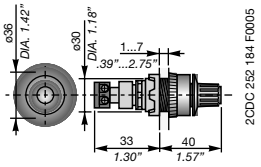
220 V 50 Hz 1 AC 360 cycles/h

Dimensional drawings

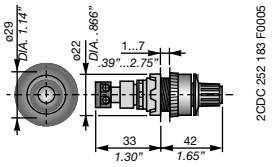
Dimensions in mm



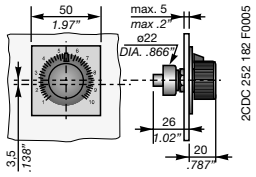
Dimensional drawings (Accessories)



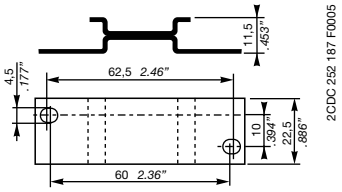
Remote potentiometer 30.5 mm



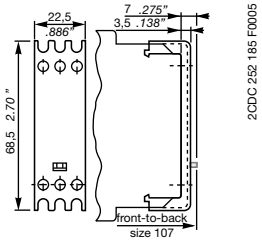
Remote potentiometer 22.5 mm



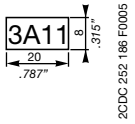
Remote potentiometer 10.5 mm



Adapter for screw mounting on panel



Sealable cover



Marker label

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