

Motorized Change-Over Switches

34 OTM_C_

Installation and operating instruction

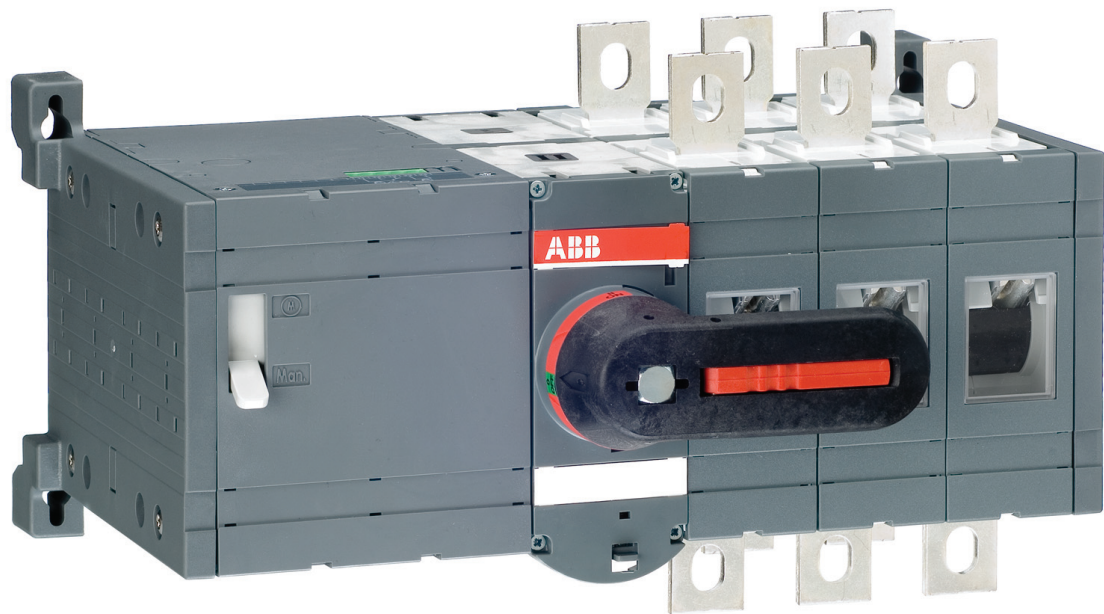


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1 Introduction

This manual describes the installation and the basic operation of the OTM_ motorized change-over switch. The instructive part is followed by a section on available accessories.

1.1 Use of symbols



Hazardous voltage: warns about a situation where a hazardous voltage may cause physical injury to a person or damage to equipment.



General warning: warns about a situation where something other than electrical equipment may cause physical injury to a person or damage to equipment.



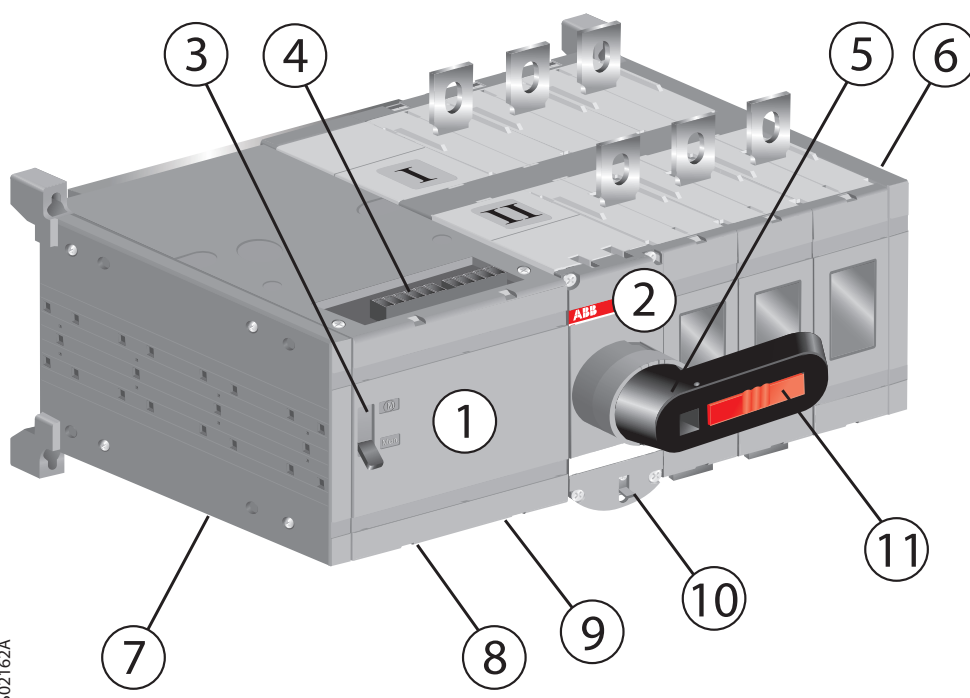
Caution: provides important information or warns about a situation that may have a detrimental effect on equipment.



Information: provides important information about the equipment.

2 Product overview

OTM_ motorized change-over switches are designed for diverse applications to secure power supply. You can operate the OTM_ motorized change-over switches either electrically using the motor operator or manually using the handle.



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Fig. 2-1 OTM_ motorized change-over switch

- 1 Motor operator
- 2 Switch panel
- 3 Motor/Manual selection
- 4 Terminals for locking state information
- 5 Handle for manual operation
- 6 Place for auxiliary terminals
- 7 Fuse (F1) of motor operator
- 8 Terminals for motor operator voltage supply
- 9 Terminals for push-buttons
- 10 Locking latch for releasing the handle and locking electrical control
- 11 Locking clip for locking manual operation

3 Quick start

This is a quick guide meant for you who only need a reminder of how to operate the unit. For more detailed instructions, see chapter 6

3.1 Controlling the switch electrically (remote control)

To control the switch electrically:

1. Remove the handle from the switch panel.
You can remove the handle in any position.
2. Turn the Motor/Manual selector to the Motor (M) position to enable electrical control.

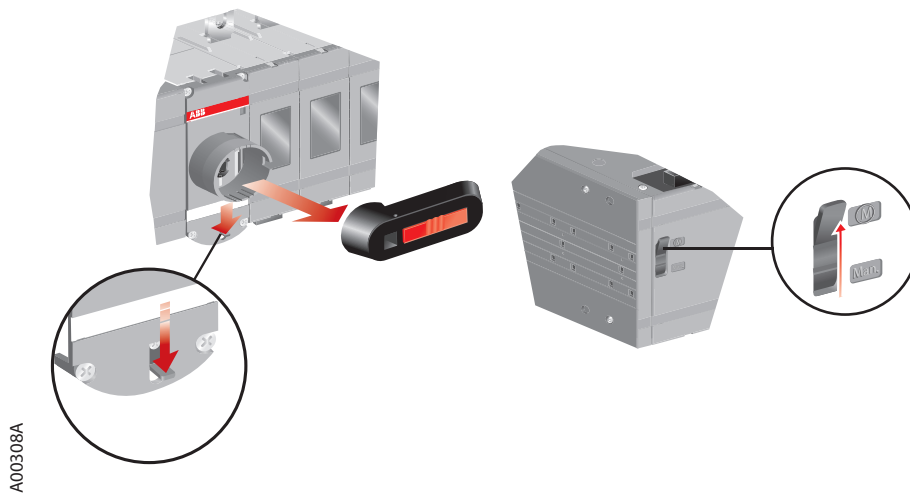


Fig. 3-1 Controlling the switch electrically

To disable electrical control, lock the locking latch with a padlock.

After the locking latch has been locked, the switch cannot be controlled electrically.

You can lock electrical control in any position (I, 0, II).

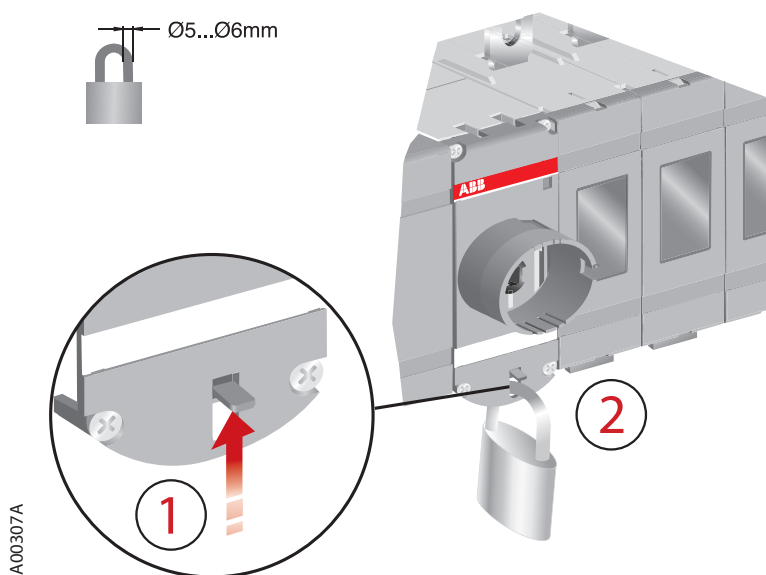


Fig. 3-2 Locking electrical control

3.2 Controlling the switch manually (local operation)

To control the switch manually:

1. Turn the Motor/Manual selector to the Manual (Man.) position to enable manual operation and to prevent electrical operation.
2. Attach the handle to the switch panel.
You can attach the handle in any position.

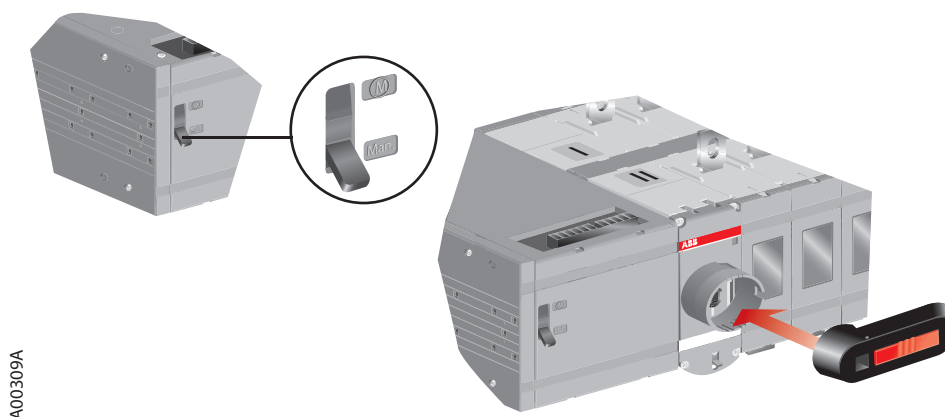
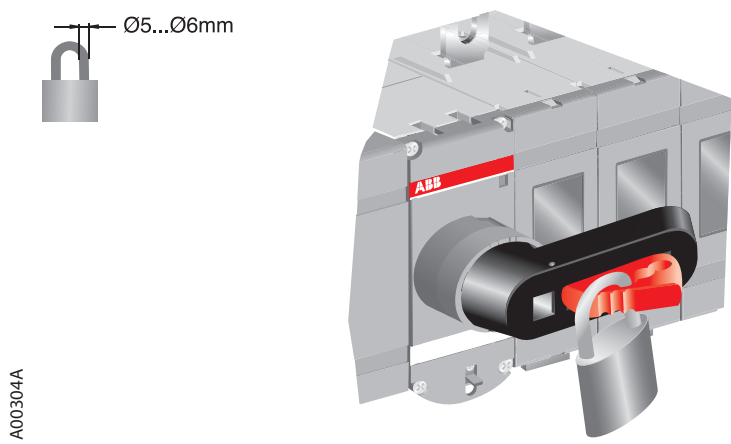


Fig. 3-3 Operating the switch manually

To disable the manual (and electrical) operation, lift up the locking clip in position 0 and attach the padlock to the handle.



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Fig. 3-4 Locking the manual operation

The following chart shows the locking state information.











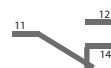

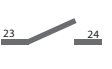



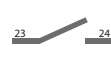
	 M	 Man.			
					
					

Fig. 3-5 Locking state information

4 Installation

4.1 Mounting the OTM_ motorized change-over switch



Use protection against direct contact.

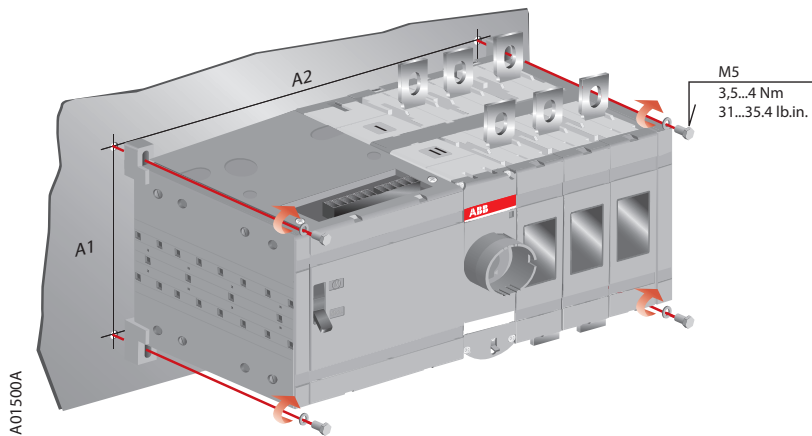


Fig. 4-1 OTM160... 250_C

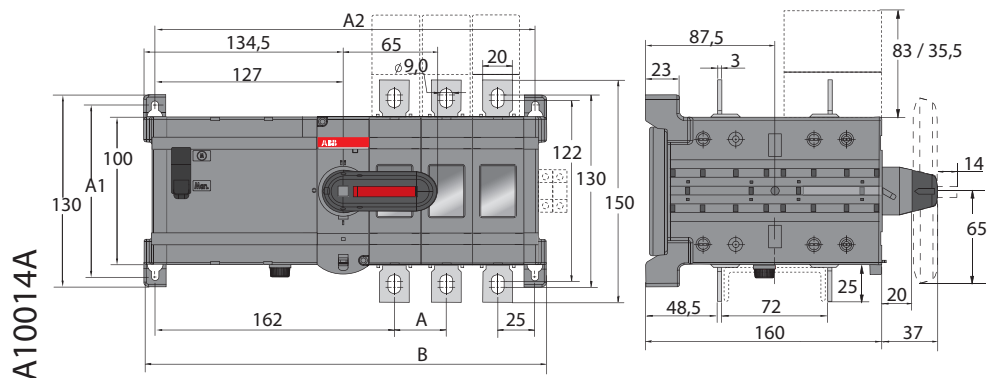
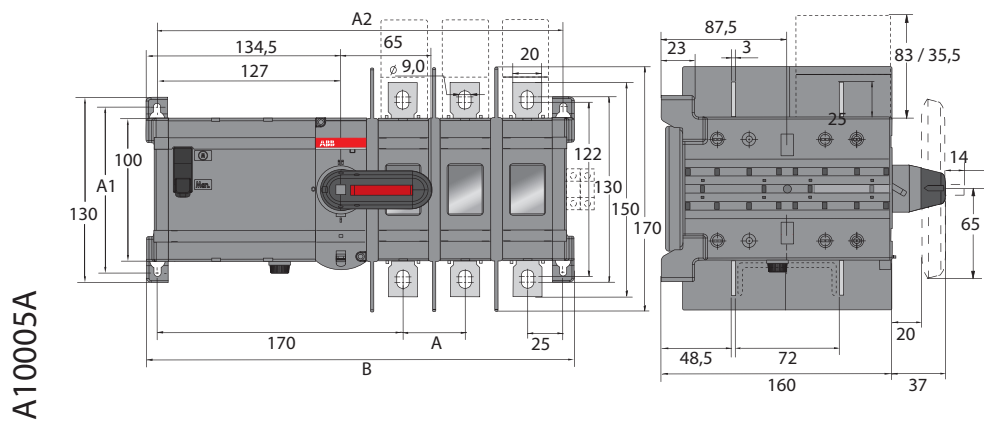
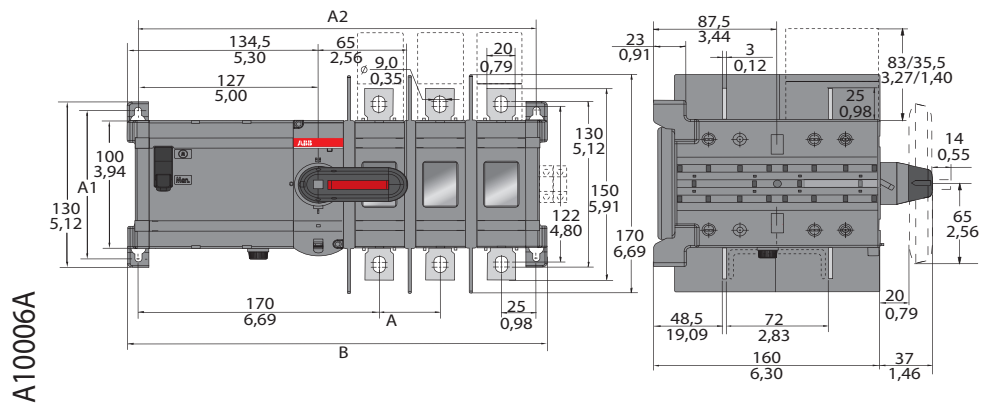


Fig. 4-2 OTM160...250E-C-M

OTM160...250E-C-M		
	E3	E4
A	35	35
A1	116	116
A2	258	293
B	273	308



OTM160...250_WCM		
	E3	E4
A	43	43
A1	116	116
A2	282	325
B	297	340



	OTM200U_C_M	
	U3	U4
A	43/1,69	43/1,69
A1	116/4,57	116/4,57
A2	282/11,10	325/12,80
B	297/11,69	340/13,39

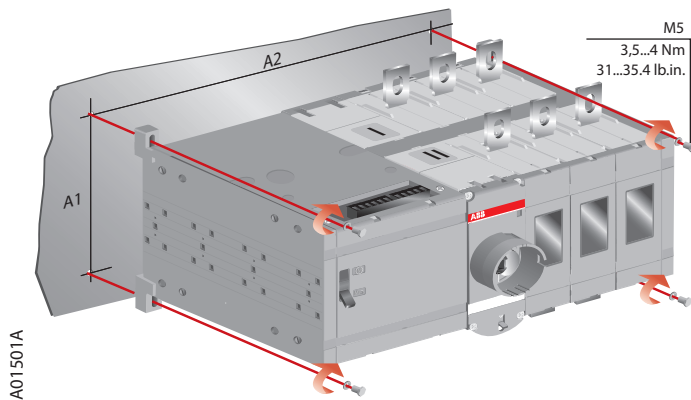


Fig. 4-5 OTM315... 400_C

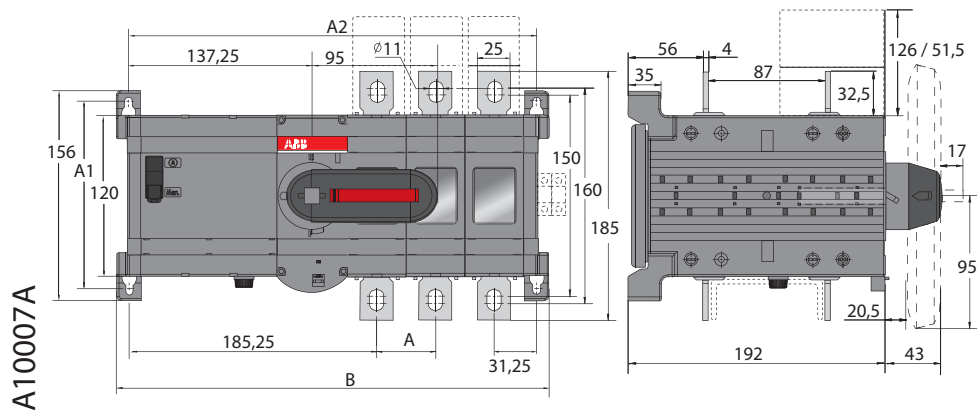


Fig. 4-6 OTM315...400E_C_M

	OTM315...400E_C_M	
	E3	E4
A	44	44
A1	142	142
A2	305	349
B	323	367

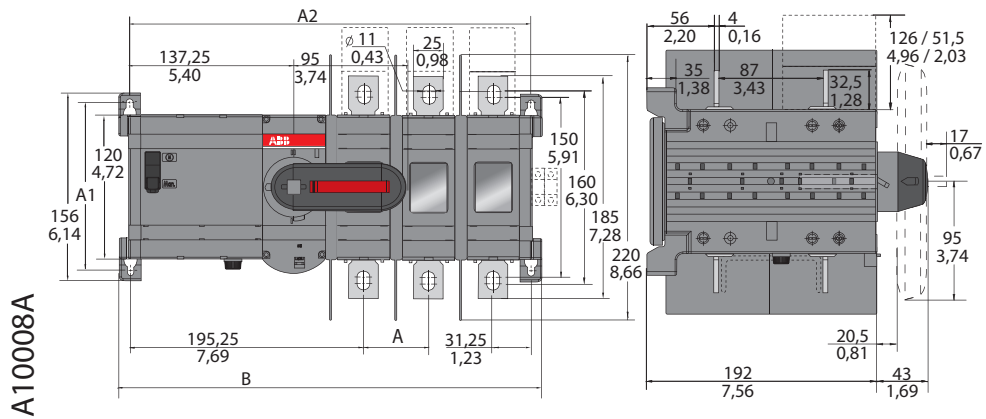


Fig. 4-7 OTM400U_C_M

	OTM400U_C_M	
	U3	U4
A	54/2,13	54/2,13
A1	142/5,59	142/5,59
A2	335/13,19	389/15,31
B	353/13,90	407/16,02

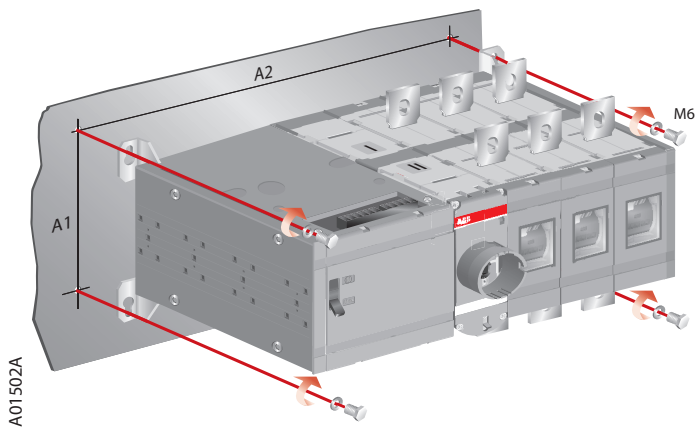


Fig. 4-8 OTM600... 800_C

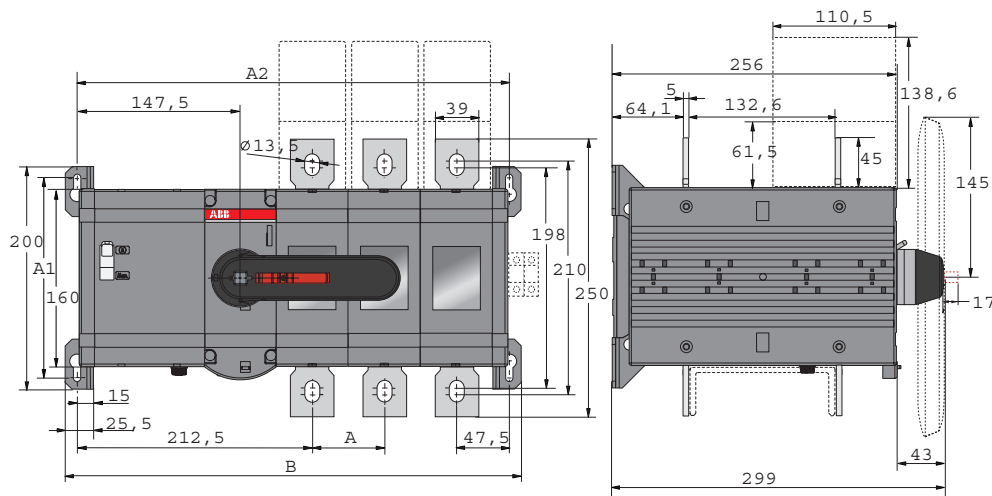


Fig. 4-9 OTM630... 800E_C_M

OTM630-800E-C-M			
	U02	U03	U04
A	65	65	65
A1	180	180	180
A2	325	390	455
B	346	411	476

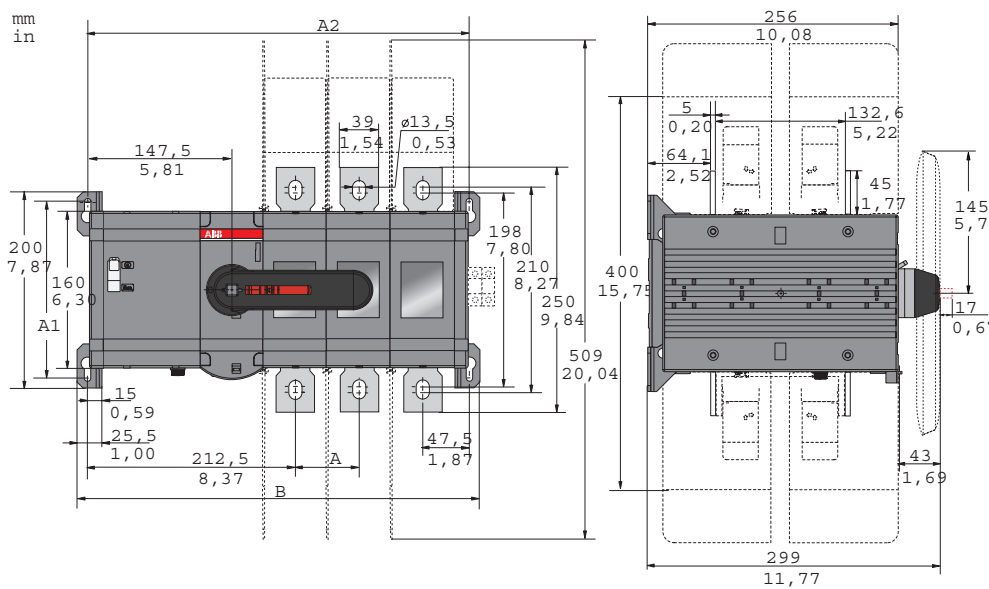


Fig. 4-10 OTM600U_C_M

	OTM600U-C-M		
	U02	U03	U04
A	65/2,56	65/2,56	65/2,56
A1	180/7,09	180/7,09	180/7,09
A2	325/12,8	390/15,35	455/17,91
B	436/13,62	411/16,18	476/18,74

4.2 Mounting positions

The recommended mounting positions for OTM_ motorized change-over switches are horizontal, wall mounted or table mounted.

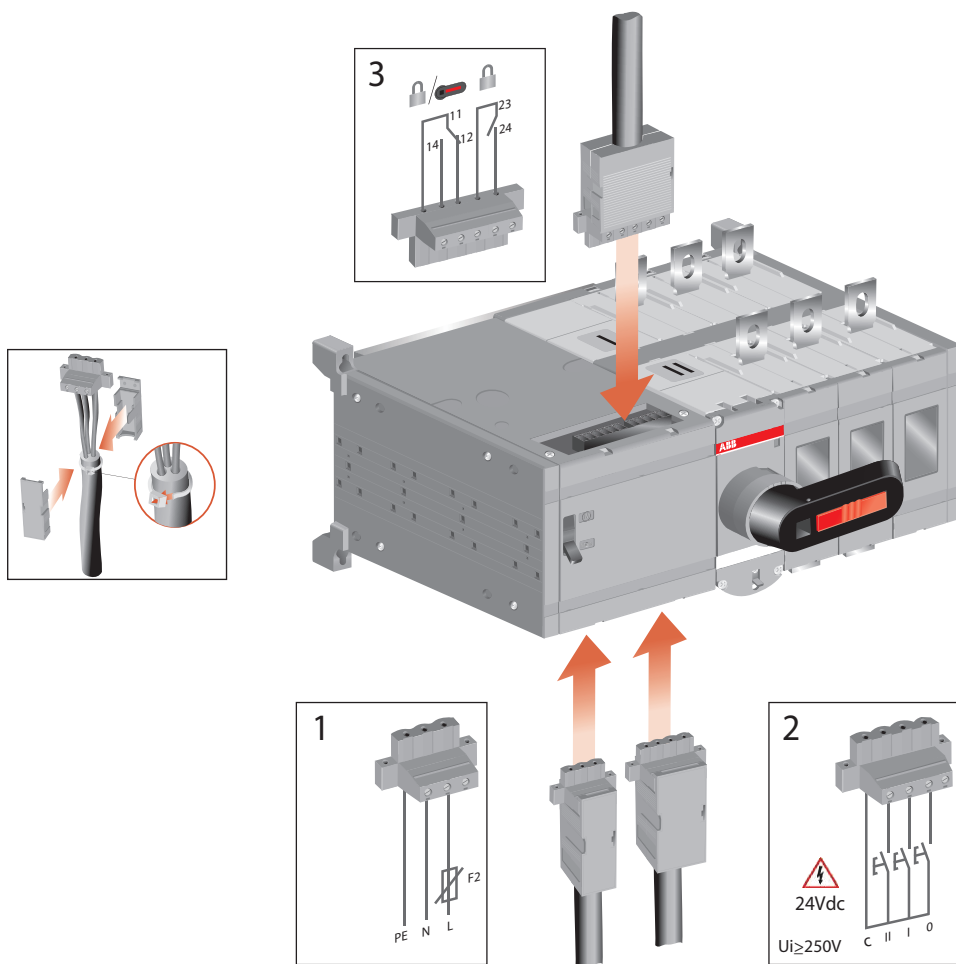


Do not install the OTM_ change-over switches in any other position than those described above.

5 Connecting the control circuit



The electrical installation and maintenance of OTM_motorized change-over switches may be performed only by an authorized electrician. Do not attempt any installation or maintenance actions when an OTM_motorized change-over switch is connected to the electrical mains. Before starting the work, make sure that the switch is de-energized.



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Fig. 5-1 OTM_motorized change-over switch terminals

1. Terminals for motor operator voltage supply
2. Control terminal (push-buttons)
3. Terminals for state information of locking



Do not couple power for the control terminal. See the correct terminal for the power supply in Figure 5-1.



The control voltage (output C = 24Vdc) on the control terminal is non-isolated, see box 2 in Figure 5-1.

The maximum cable length to ensure faultless operation of the push-buttons, see table 7-1



When relay outputs are used with inductive loads (such as relays, contactors and motors), they must be protected from voltage spikes using varistors, RC-protectors (AC current) or DC current diodes (DC current).

6 Operating the OTM motorized change-over switch



Never open any covers on the product. There may be dangerous external control voltages inside the OTM_ motorized change-over switch even if the voltage is turned off.



Never handle control cables when the voltage of the OTM_ motorized change-over switch or external control circuits is connected.



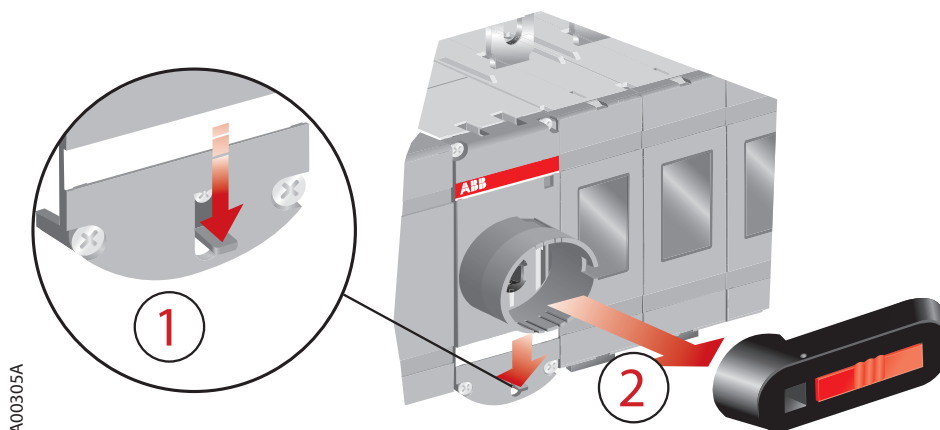
Exercise sufficient caution when handling the unit.

6.1 Electrical control

You can control the switch electrically by using the push-buttons or a similar control concept.

To control the switch electrically:

1. Release the handle from the switch panel by pressing down the locking latch under the switch panel and pulling the handle off, see Figure 6-1.



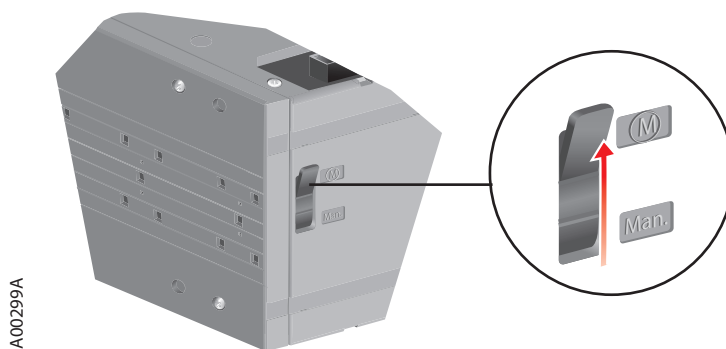
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Fig. 6-1 Releasing the handle



Electrical control is disabled if the handle is attached to the switch panel.

2. Turn the Motor/Manual selection switch to the Motor (M) position, see Figure 6-2.



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Fig. 6-2 Motor/Manual selection in the Motor (M) position

3. Control the OTM₁ motorized change-over switch with the push-buttons via impulse control or continuous control.

The switch can be operated from position I to position II (or from II to I) without stopping it in position 0. For example, if switch I is closed and you press the push-button (II), the control unit first runs switch I in the open position and then the control unit runs switch II from the open to the closed position.



The motor operator is protected from overloading by a fuse (F1) under the motor operator, see Figure 2-1. Only use the same type of fuse that is described on the label close to the fuse.

6.1.1 Impulse control

When using impulse control, the switch is controlled by electric impulses. When you press the control button, the switch is driven to the corresponding position (I, 0 or II). The control impulse must last more than 100ms to take effect. A new command cannot be given until the switch has reached the position of the previous command. Figure 6-3 shows the operation of the switch with impulse control.



If a new command is given before the switch has reached the position of the previous command, the fuse (F1) may operate.

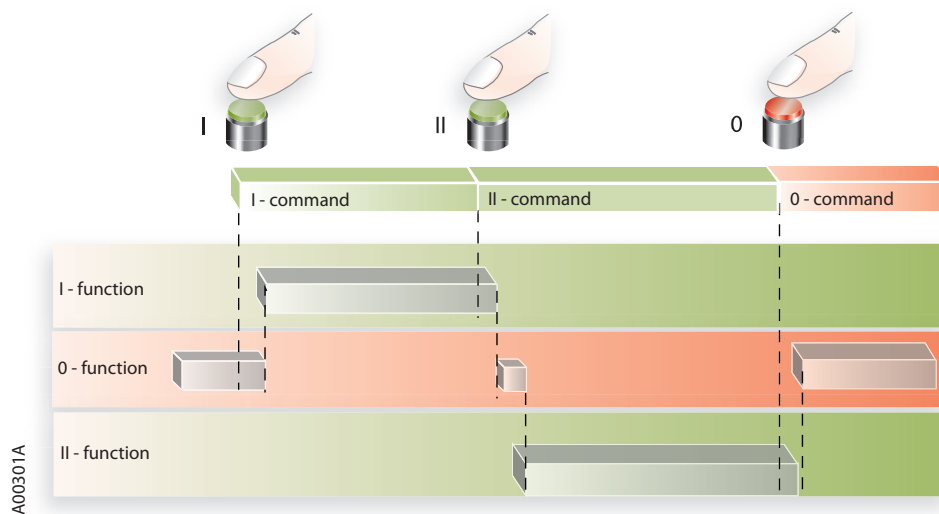


Fig. 6-3 Impulse control

6.1.2 Continuous control

When using continuous control, the control command is supplied to the switch continuously. When you press the control button, the switch is driven to the corresponding position (I, 0 or II). Control of position 0 will over-run control of the other positions; that is, if you simultaneously give the 0 command and another command, the switch is driven to position 0. Figure 6-4 shows the operation of the switch with continuous control.



The continuous control command can be given with push buttons, cam switches or with relays incorporated in PLC equipment or with other suitable contacts.

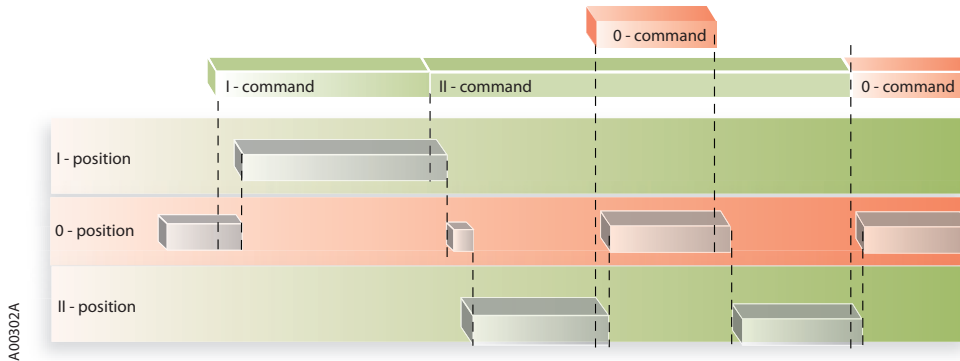


Fig. 6-4 Continuous control

6.2 Manual operation

You can control the switch manually using the handle that is included in the delivery.

To control the switch manually:

1. Turn the Motor/Manual selector to the Manual (Man.) position, see Figure 6-5. The motor operator is switched off and electrical control is prevented.

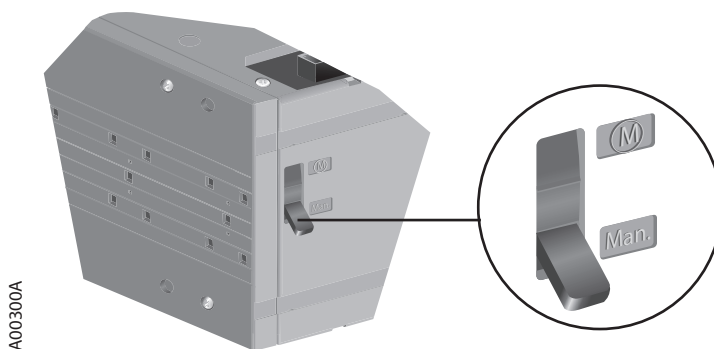


Fig. 6-5 Motor/Manual selection in the Man. position

2. Attach the handle by pressing it to the switch panel until it clicks into place. You can attach the handle in all positions, see Figure 6-6.

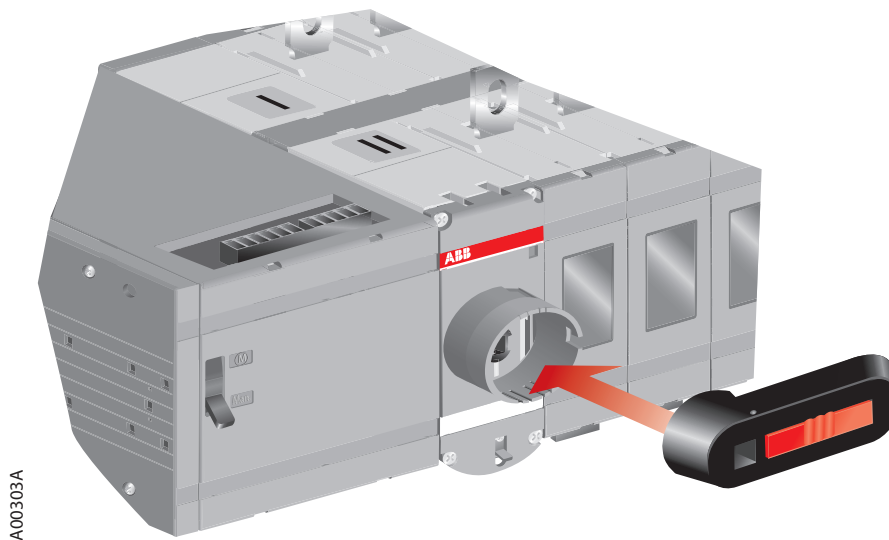


Fig. 6-6 Attaching the handle



Electrical control is prevented when the handle is attached to the switch panel.

3. Control the OTM_ motorized change-over switch by turning the handle to the required position (I, 0, II).

6.3 Lockings

You can lock the OTM_ motorized change-over switch to a specific position.

6.3.1 Locking electrical control

You can lock the electrical control to any position (I, 0, II).

To lock electrical control:

1. Pull up the locking latch under the switch panel.
2. Place the padlock under the latch, see Figure 6-7.

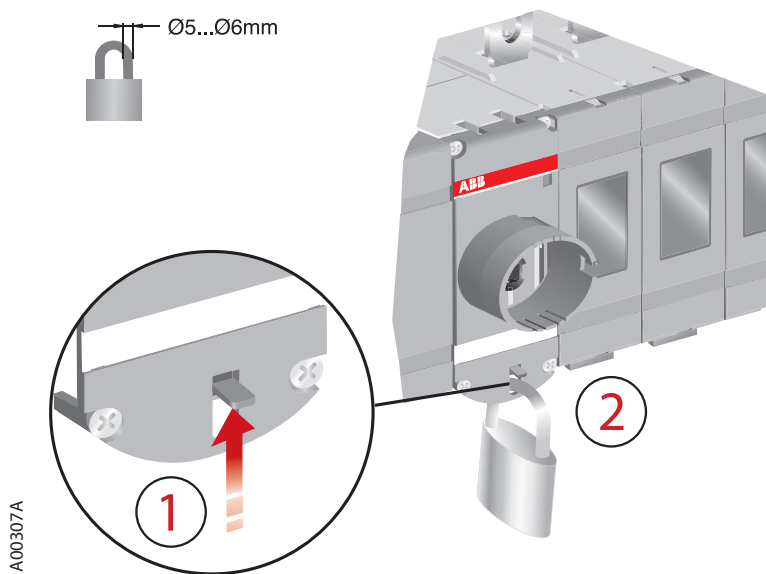


Fig. 6-7 Locking electrical control



You cannot attach the handle when electrical control is locked.

6.3.2 Locking manual operation

By default, manual operation can only be locked to position 0. Locking to positions I and II is optional and possible only with modifications to the switch panel.

To lock manual operation:

1. Turn the handle to the required position.
2. Pull out the clip from the handle and place the padlock on the handle, see Figure 6-8.



Fig. 6-8 Locking manual operation



The handle cannot be removed when padlocked to position 0.

7 Technical data

7.1 Motor operator

Table 7-1 General technical data of motor operators

Motor operator	Value
Rated operational voltage U_e	220 - 240 VAC
Operating voltage range	0,85... 1,1 x U_e
Operating angle	90° 0-I, I-0, 0-II, II-0; 180° I-0-II
Operating time	See Table 7-2
Protection degree	IP 20
Voltage supply	PE N L
Cable of the push-buttons (no SELV)	C II I 0
Cross section; solid/stranded	1.,5... 2,5 mm ²
Maximum cable length	100 m
State information of locking (no SELV)	
Handle attached or motor operator locked	11-12-14 (C/O)
Locking motor operator	23-24 (NO)
Rated impulse withstand voltage U_{imp}	
Between terminals	4 kV
Between state information contacts	4 kV
Operating temperature	-5... +40 °C
Transportation and storage temperature	-40... +70 °C
Altitude	Max. 2000m

Table 7-2 Specified technical data of motor operators

Type	Voltage U_e [V]	Nominal current ^a I_n [A]	Current Inrush [A]	Operating time I-0, 0-I, 0-II, II- 0 [s]	Operating time I-0-II, II-0-I [s]	OFF-time when operating I-II or II-I [s]
OTM160...250_C	230VAC	0,2	1,8	0,4-0,8	1,1-1,5	0,4-0,8
	110V					
OTM315...400_C	230VAC	0,5	3,5	0,4-0,8	1,1-1,5	0,4-0,8
	110V					
OTM600...800_C	230VAC					
	110V					

^a Under nominal conditions

7.2 State information

Measurement	Value
Handle attached or motor operator locked	11-12-14 (C/O): 4A / 250V / $\cos\phi=1$
Locking motor operator	23-24 (NO): 4A / 250V / $\cos\phi=1$

8 Accessories

8.1 Terminal clamp sets

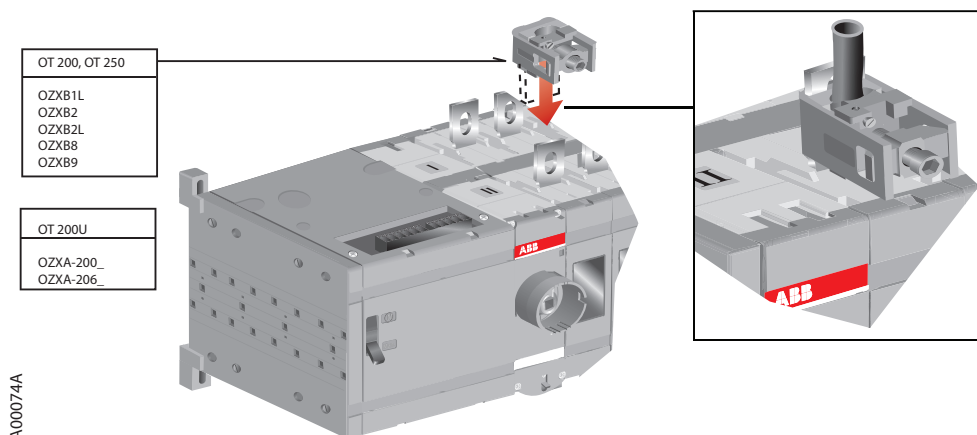


Fig. 8-1 OTM 160...250_C

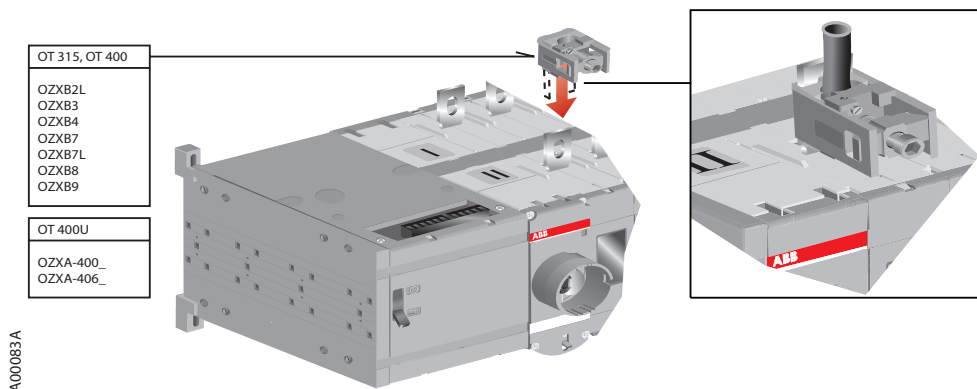


Fig. 8-2 OTM 315...400_C

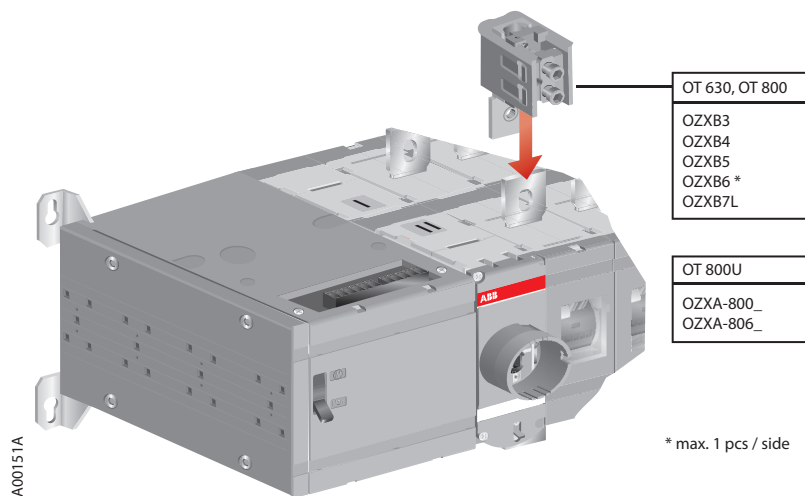


Fig. 8-3 OTM 600...800_C

8.2 Bridging bars

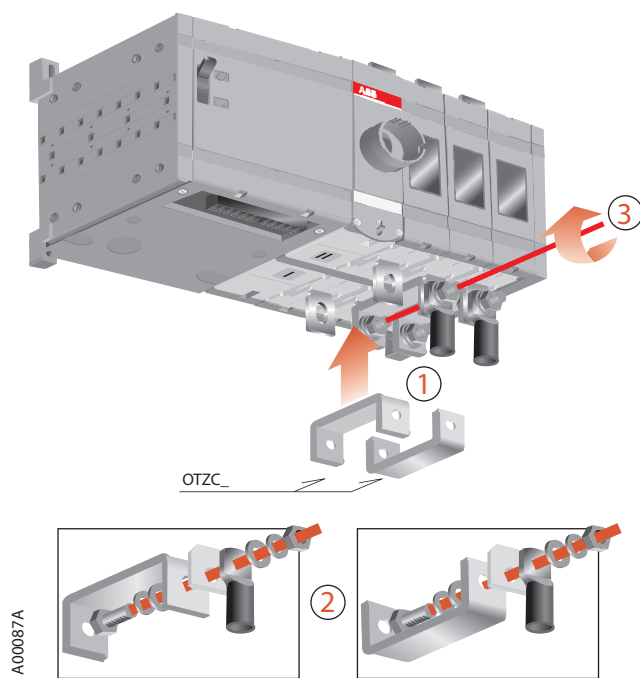
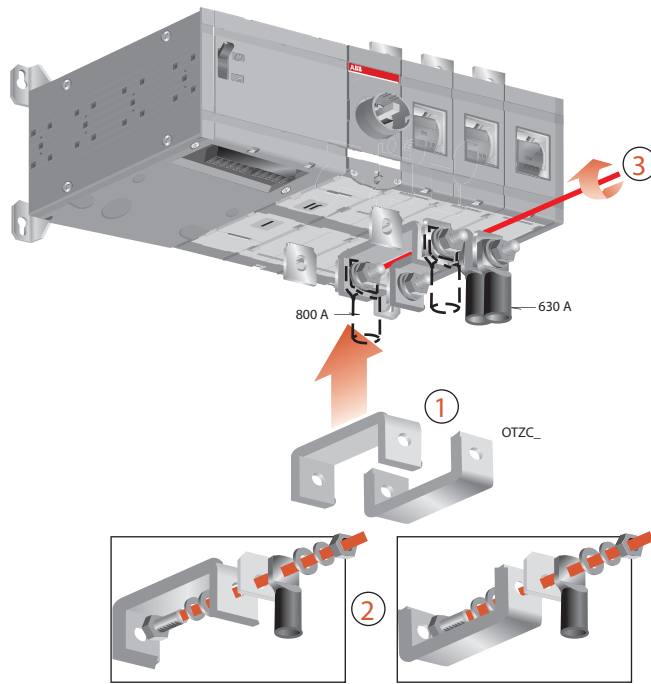


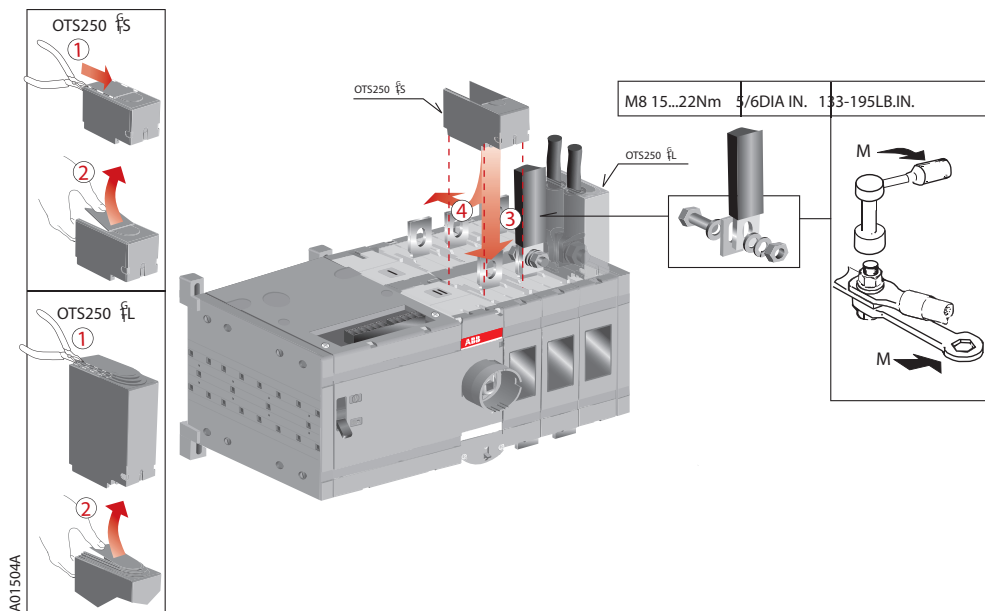
Fig. 8-4 OTM160...400_C



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Fig. 8-5 OTM600...800_C

8.3 Terminal shrouds



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Fig. 8-6 OTM160...250_C

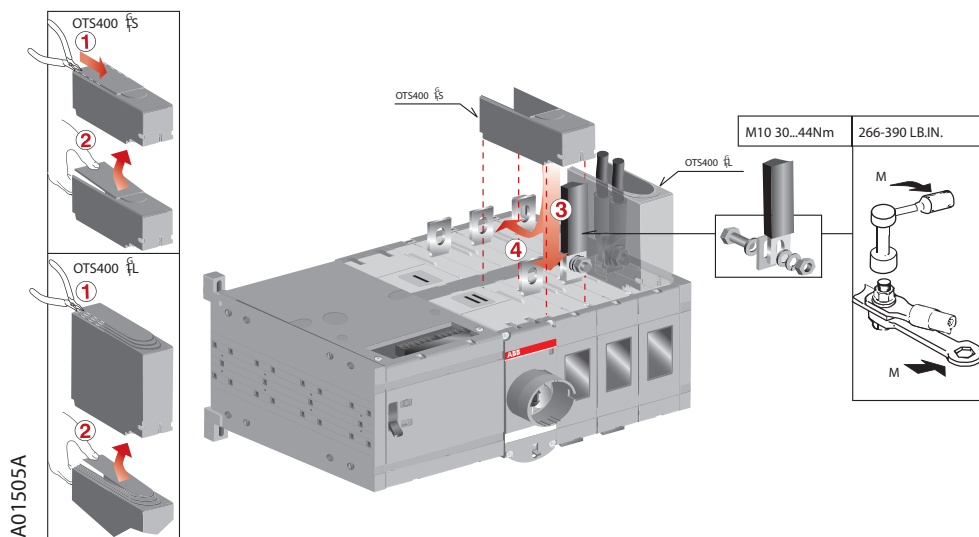


Fig. 8-7 OTM315...400_C

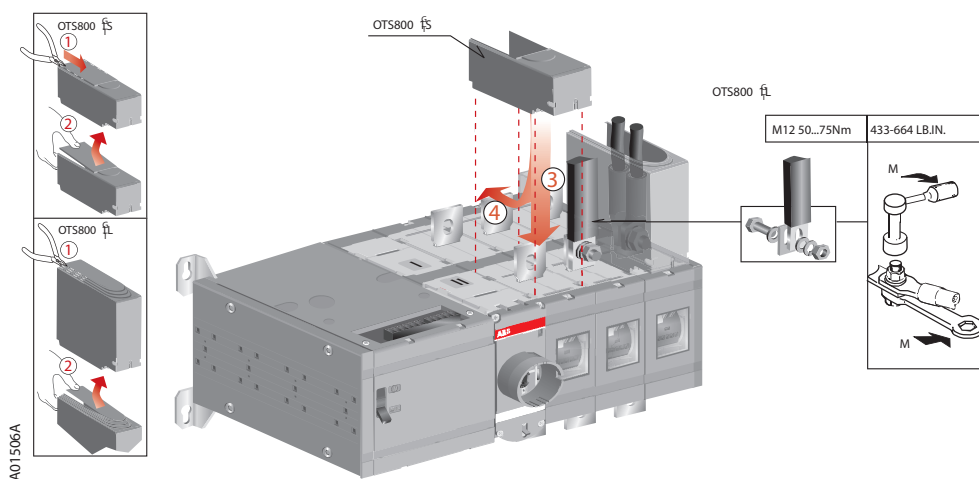
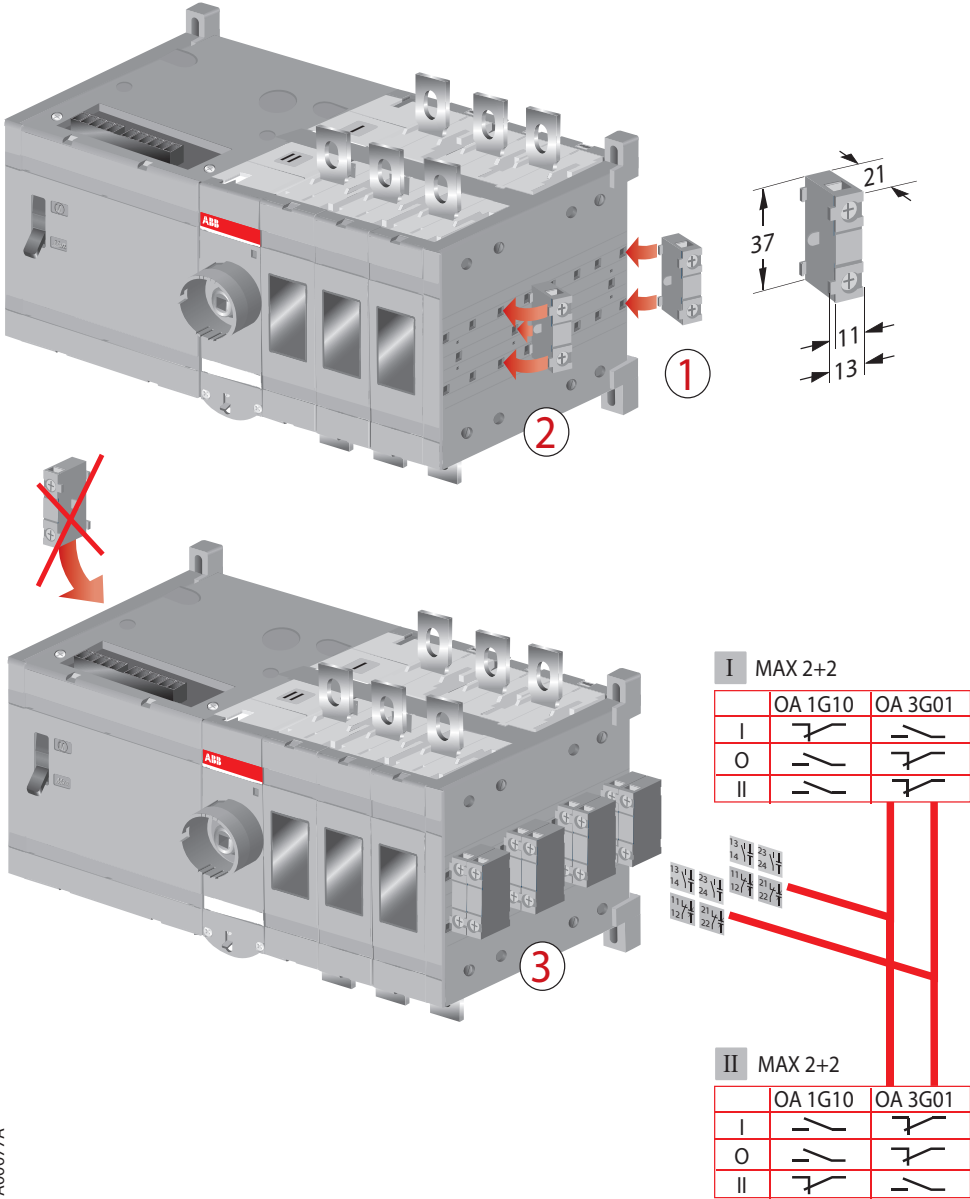


Fig. 8-8 OTM600...800_C

8.4 Auxiliary contact blocks



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Fig. 8-9 OTM160...800_C

8.5 UL standard switches

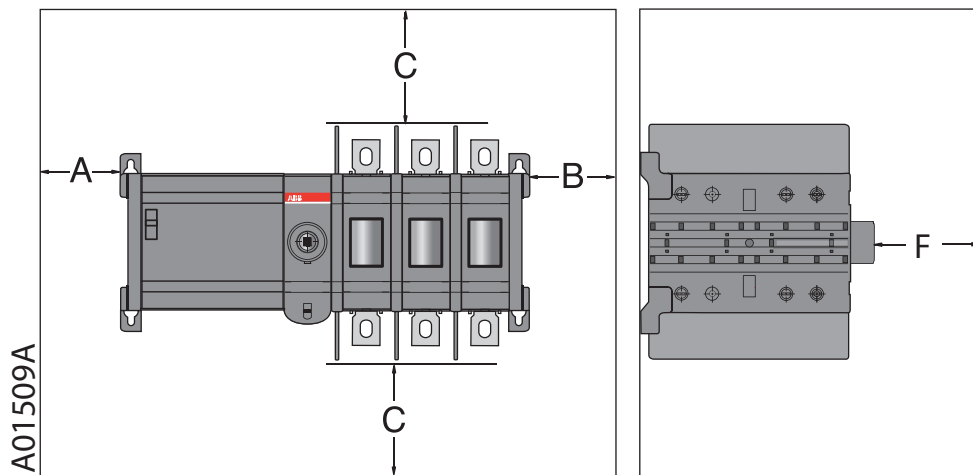


Fig. 8-10 OTM200U_C

Height	Width	Depth
406 mm	305 mm	203 mm
16 inch	12 inch	8 inch

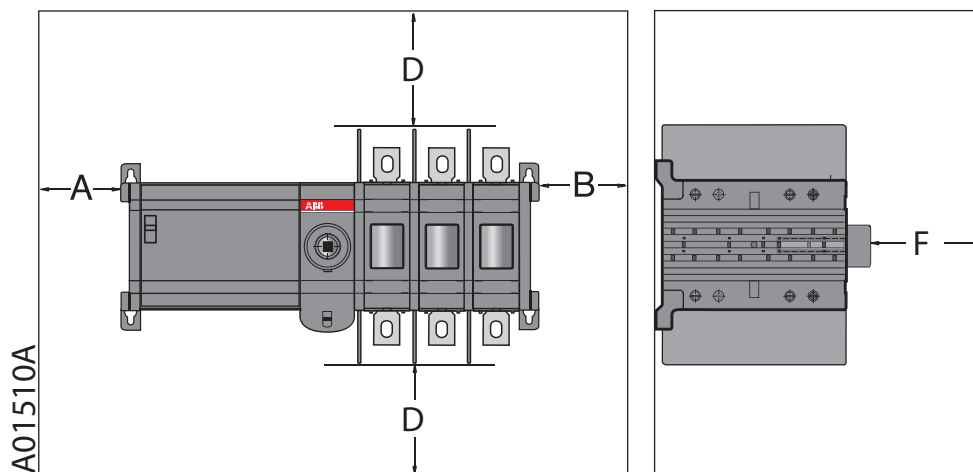


Fig. 8-11 OTM400U_C

Height	Width	Depth
610 mm	356 mm	254 mm
24 inch	14 inch	10 inch

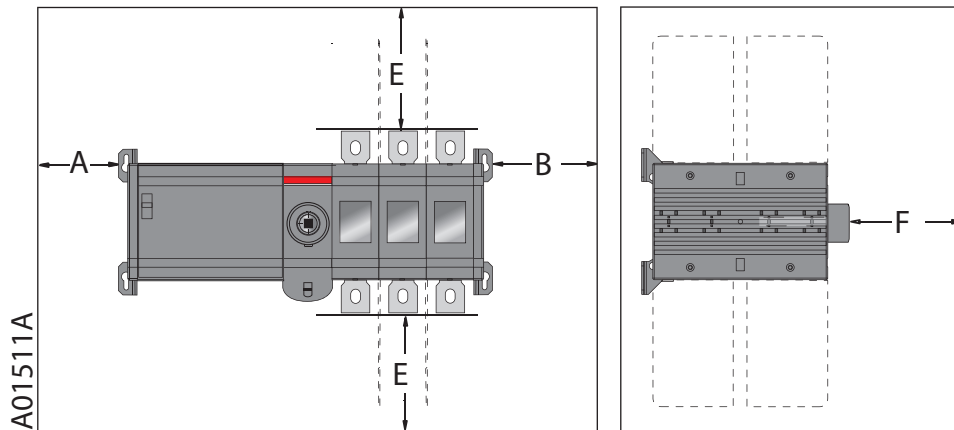


Fig. 8-12 OTM600U_C

Height	Width	Depth
600 mm	700 mm	400 mm
24 inch	28 inch	16 inch

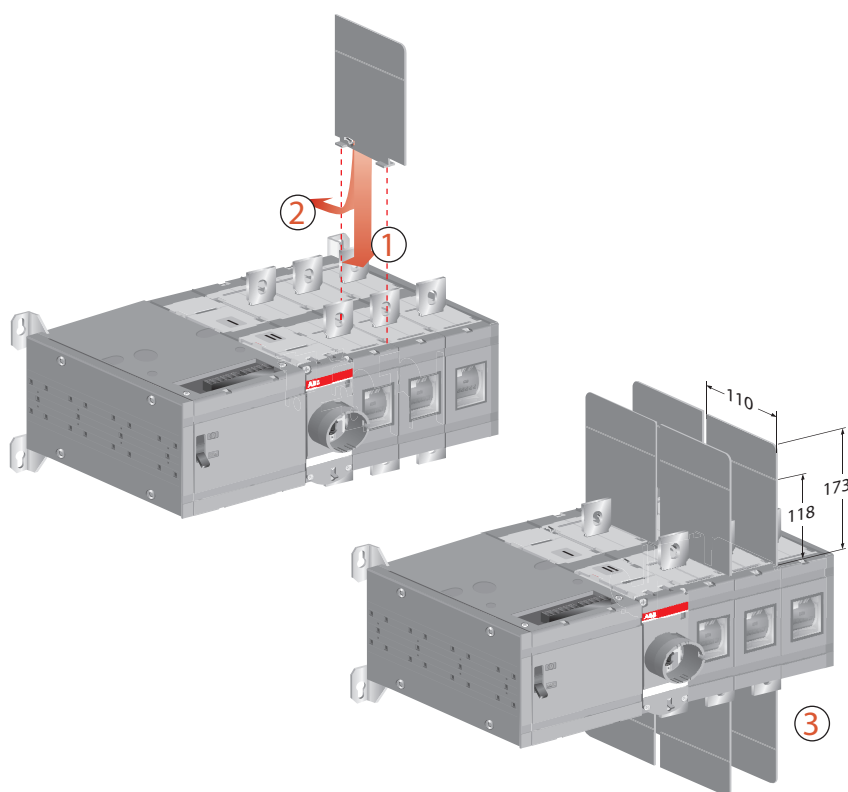
Table 8-4 Measurements of the OTM_ motorized change-over switch

A	0											
B	13mm 0,5 inch											
C	Cable size AWG/MCM	4-3	2	1	1/0	2/0	3/0-4/0	250	300			
		100 mm	100 mm	100 mm	125 mm	150 mm	175 mm	200 mm	250 mm			
		4 inch	4 inch	4 inch	5 inch	6 inch	7 inch	8 inch	10 inch			
D	Cable size AWG/MCM	2	1	1/0	2/0	3/0-4/0	250	300	350			
		100 mm	100 mm	150 mm	150 mm	175 mm	200 mm	250 mm	300 mm			
		4 inch	4 inch	5 inch	6 inch	7 inch	8 inch	10 inch	12 inch			
E	Cable size AWG/MCM	2	1	1/0	2/0	3/0-4/0	250	300	350	400	500	600
		100 mm	100 mm	150 mm	150 mm	175 mm	200 mm	250 mm	300 mm	330 mm	356 mm	381 mm
		4 inch	4 inch	5 inch	6 inch	7 inch	8 inch	10 inch	12 inch	13 inch	14 inch	15 inch
F	13mm 0,5 inch											

8.6 Barriers



If the conductors are wider than 39 mm (1.54 inch), barriers of type 68838 or shrouds must be used on OTM600U_C to maintain a clearance of 1 inch.



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Fig. 8-13 OTM600U_C



ABB Oy

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