

Motorized change-over switches

Installation and operating instructions
34OTM_C / 1SCC303002M9702



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1. Introduction

This manual describes the installation and the basic operation of the motorized change-over switches (type OTM_). 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.

1.2 Explanations of abbreviations and terms

OTM_C:	Motorized change-over switch, the type name
OME_:	Motor operator, the type name
OT_C:	Change-over switch, the type name
OZXB_ and OZXA_:	Terminal clamp sets, the type name, optional
OTZC_:	Bridging bars, the type name, optional
OTS_:	Terminal shrouds, the type name, optional
OA_:	Auxiliary contact blocks, the type name, optional

2. Product overview

Motorized change-over switches (type OTM_C) are suitable for remote control. You can operate the motorized change-over switches either electrically by using the motor operator or manually by using the handle. The operation, either electrical or manual, can be chosen by the selector switch "Motor/Manual" on the motor operator. Motorized change-over switches consist of the change-over switch and the motor operator.

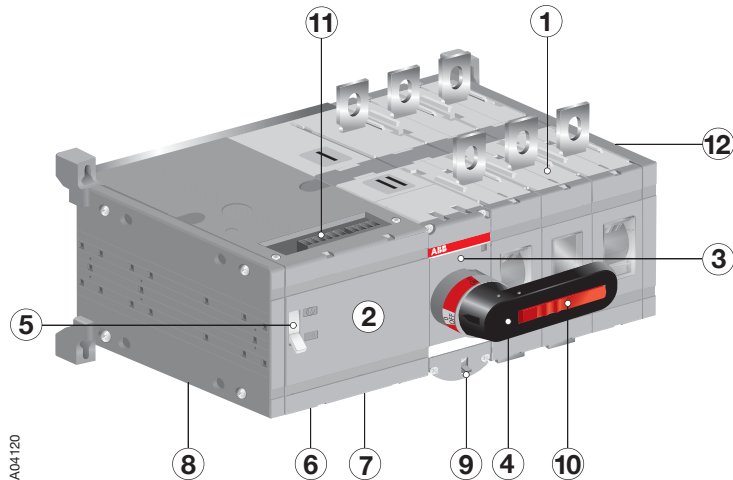


Figure 2.1 Motorized change-over switch (type OTM_C)

- 1 Change-over switch (type OT_C)
- 2 Motor operator (type OME_)
- 3 Switch panel, the operating mechanism
- 4 Handle for manual operation
- 5 Motor/Manual selection
- 6 Terminals for motor operator voltage supply
- 7 Terminals for push-buttons
- 8 Fuse (F1) of motor operator
- 9 Locking latch for releasing the handle and locking electrical control
- 10 Locking clip for locking manual operation
- 11 Terminals for locking state information
- 12 Place for auxiliary contact blocks

3. Quick start

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

3.1 Controlling the motorized change-over switch electrically; remote control

To control the motorized change-over switch electrically:

1. Remove the handle from the change-over switch panel. You can remove the handle in both positions (I, 0, II).
2. Turn the Motor/Manual selector to the Motor (M) position to enable electrical control.

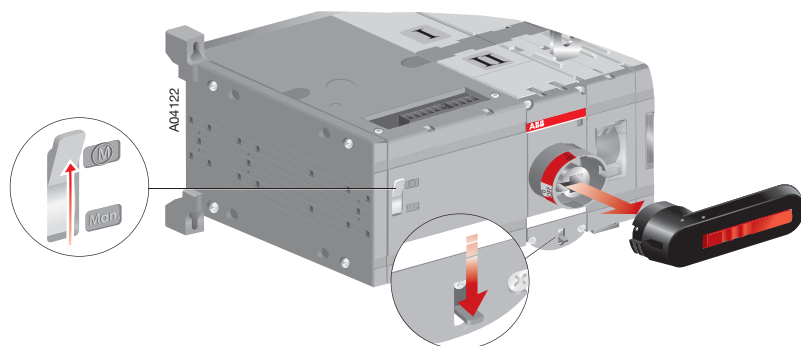


Figure 3.1 Controlling the motorized change-over switch electrically; remote control

3.1.1 Locking electrical control

To disable electrical control, lock the locking latch with a padlock. After the locking latch has been locked, the motorized change-over switch cannot be controlled electrically. You can lock electrical control in both positions (I, 0, II).

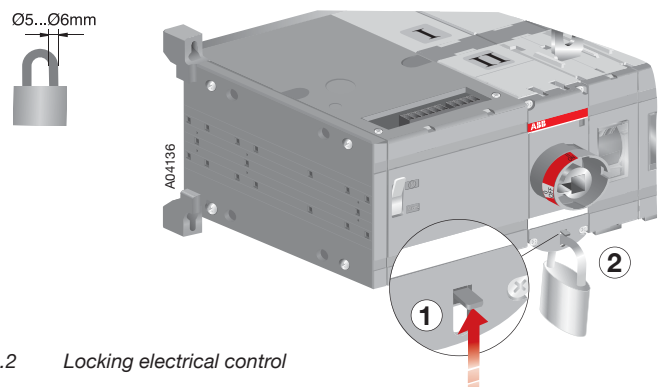


Figure 3.2 Locking electrical control

3.2 Controlling the motorized change-over switch manually; local operation

To control the motorized change-over 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 change-over switch panel. You can attach the handle in both positions (I, 0, II).

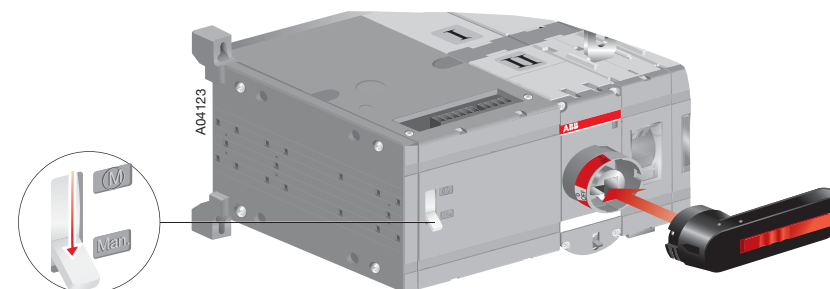


Figure 3.3 Operating the motorized change-over switch manually

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

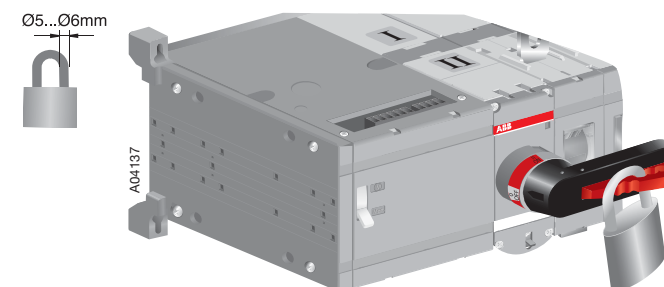


Figure 3.4 Locking the manual operation

4. Installation

4.1 Mounting the motorized change-over switch



Use protection against direct contact.

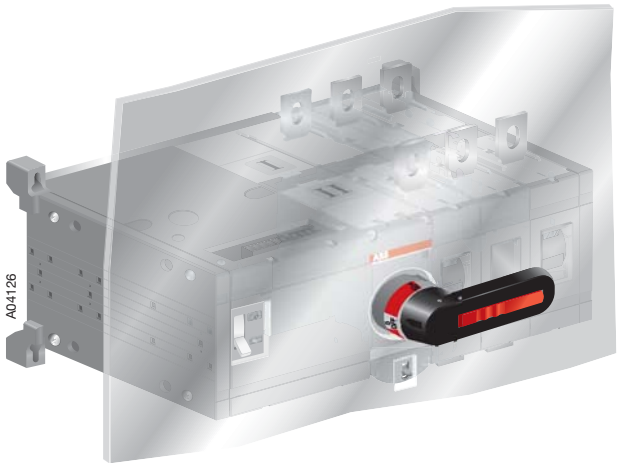
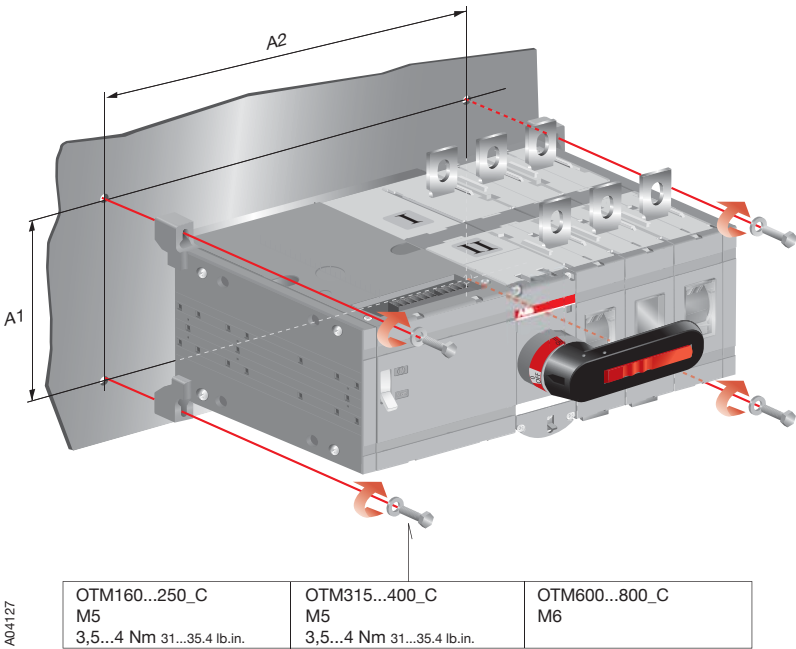


Figure 4.1 An example of using protection against direct contact



	OTM160-250_		OTM160-250		OTM200	
	E3C_	E4C_	E3WC_	E4WC_	U3C_	U4C_
A1	116	116	116	116	116/4,57	116/4,57
A2	258	293	282	325	282/11,10	325/12,80

	OTM315-400_		OTM400	
	E3C_	E4C_	U3C_	U4C_
A1	142	142	142/5,59	142/5,59
A2	305	349	335/13,19	389/15,31

	OTM630-800_		OTM600_	
	E3C_	E4C_	U3C_	U4C_
A1	180	180	180/7,09	180/7,09
A2	390	455	390/15,35	455/17,91

Figure 4.2 Motorized change-over switches, drilling hole distances / screw-mounting, [mm/in]

4.2 Dimensional drawings

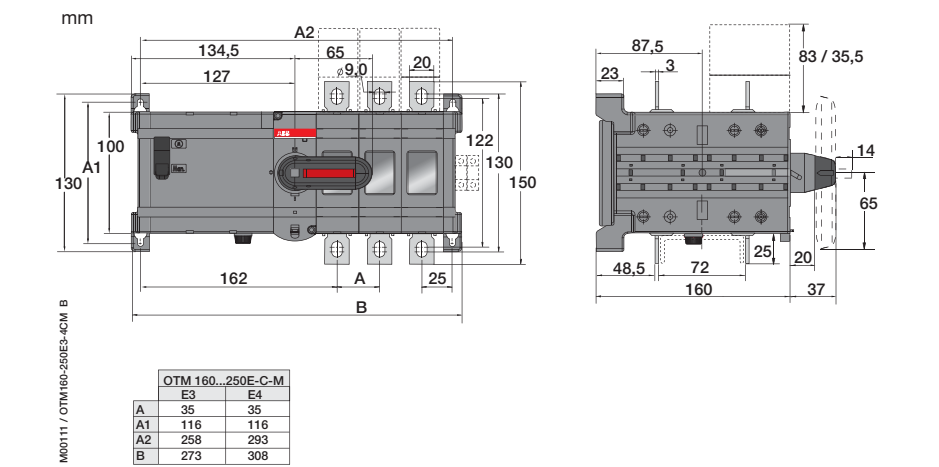


Figure 4.3 OTM160...250E_CM

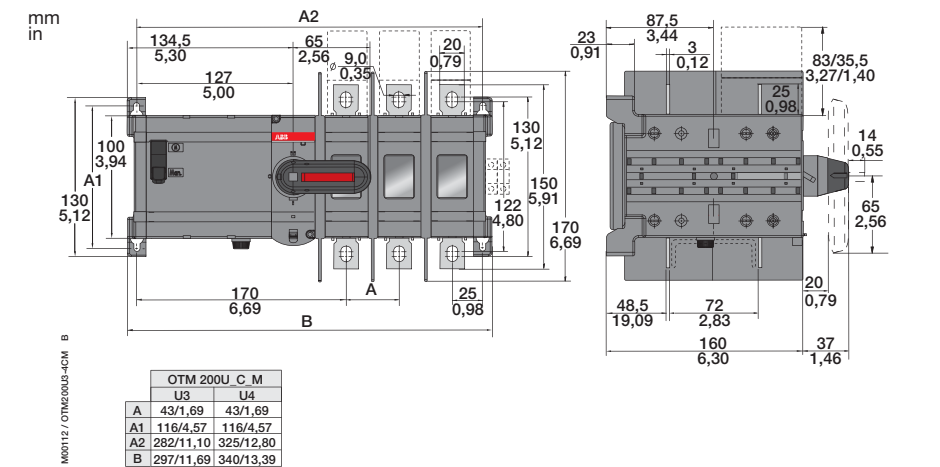


Figure 4.5 OTM200U_CM

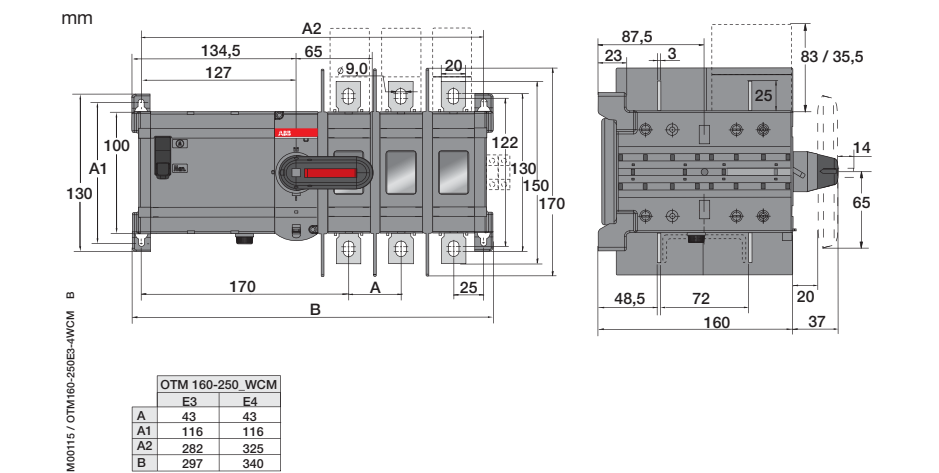


Figure 4.4 OTM160...250E_WCM

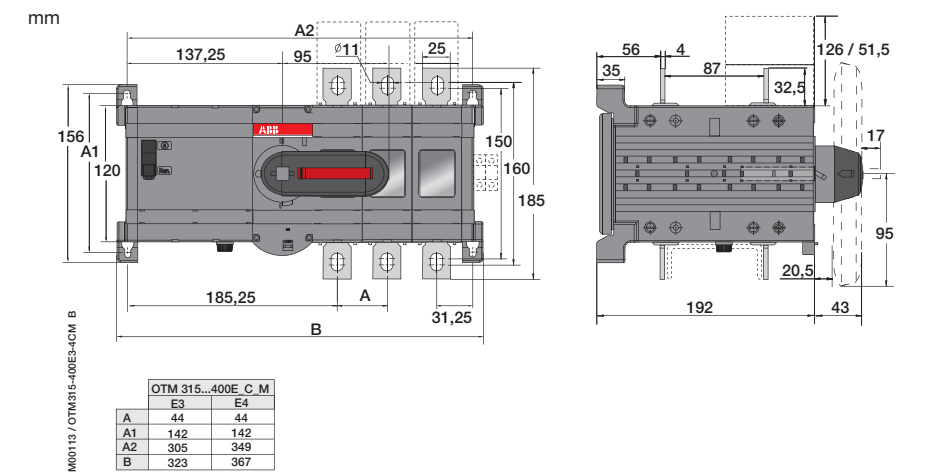


Figure 4.6 OTM315...400E_CM

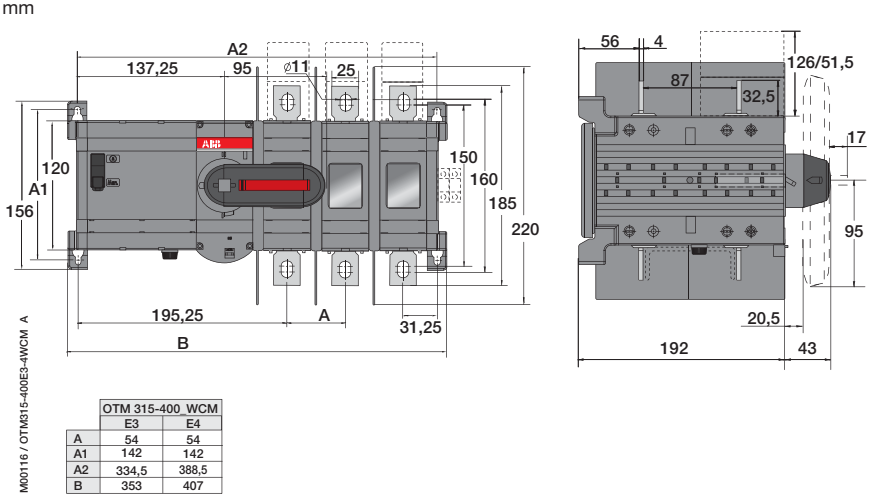


Figure 4.7 OTM315...400E_WCM

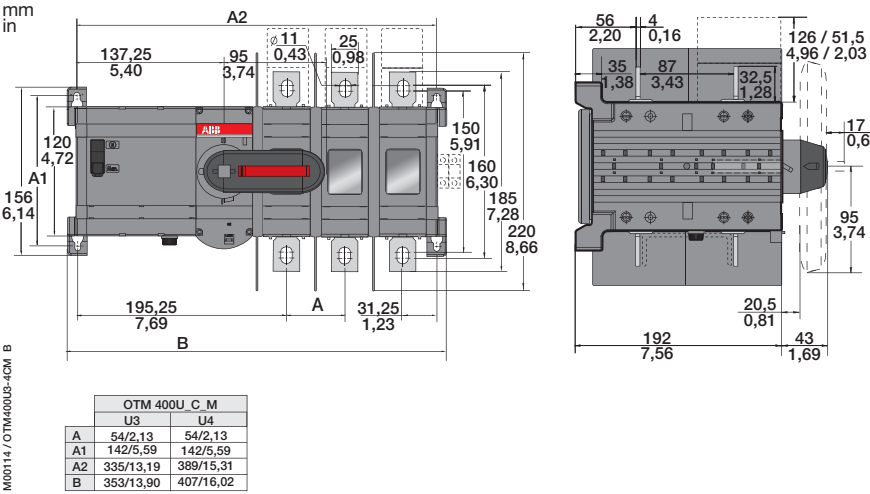


Figure 4.8 OTM400U_CM

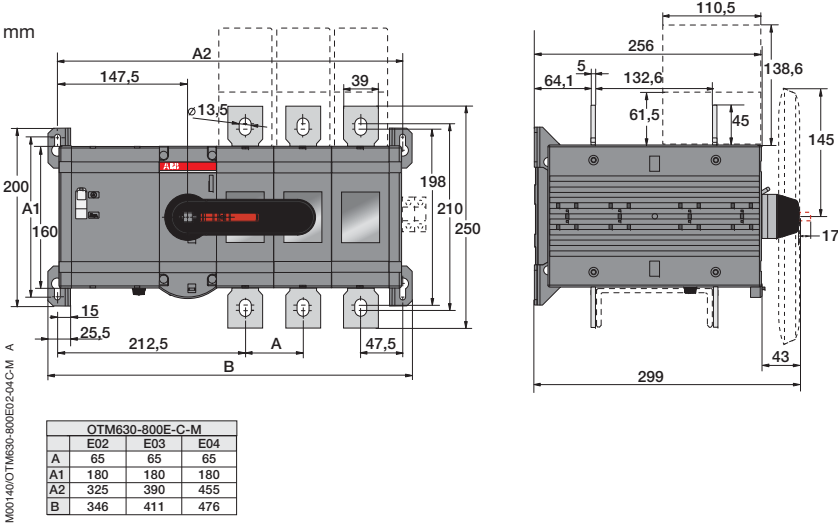


Figure 4.9 OTM630...800E_CM

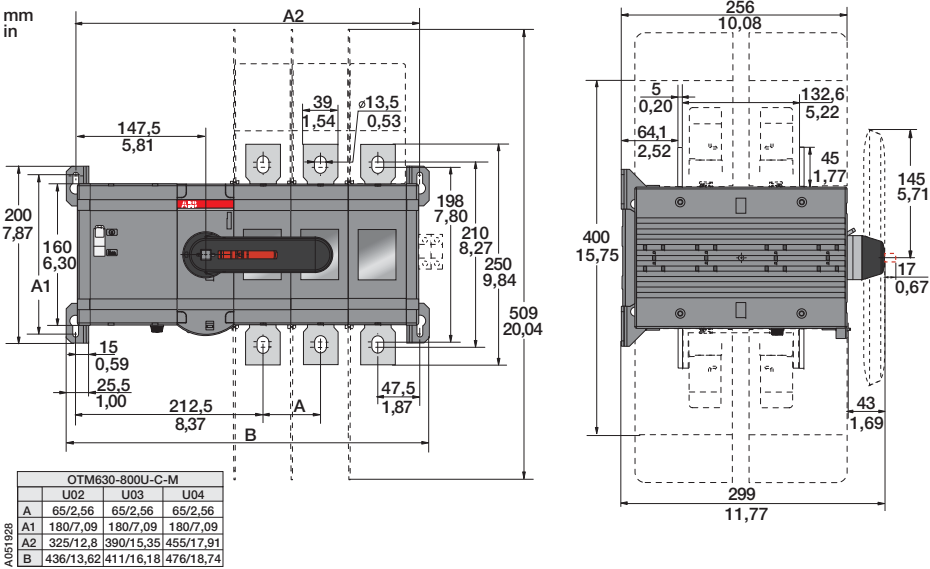


Figure 4.10 OTM600U_CM

4.3 Mounting positions

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



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

4.4 Labelling

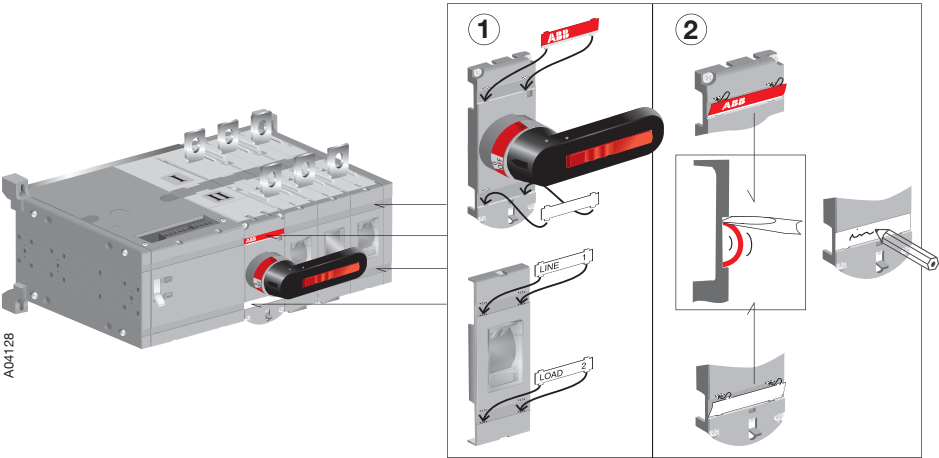


Figure 4.11 Labelling of the motorized change-over switches

5. Connecting



Only an authorised electrician may perform the electrical installation and maintenance of motorized change-over switches. Do not attempt any installation or maintenance actions when a motorized change-over switch is connected to the electrical mains. Before starting work, make sure that the change-over switch is de-energised.

5.1 Control circuit

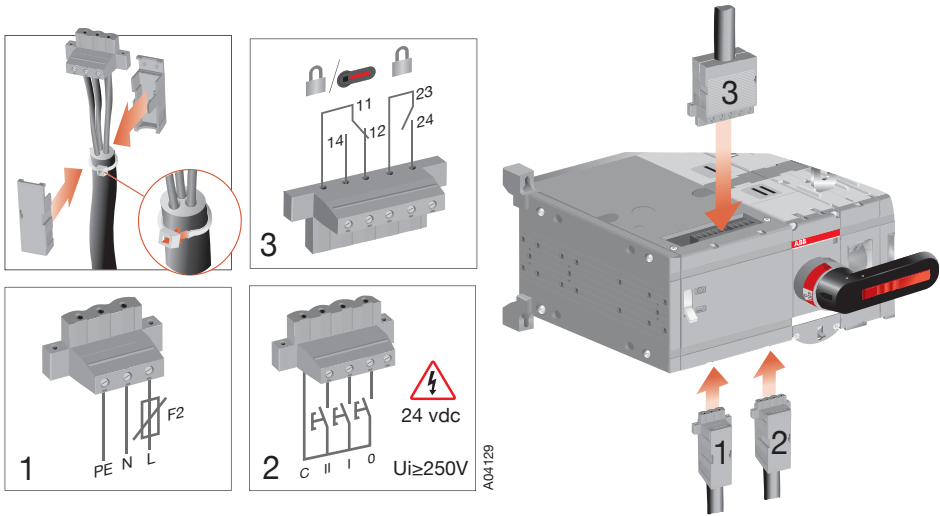


Figure 5.1 Motorized change-over switch terminals

- 1. Terminals for motor operator voltage supply
- 2. Control terminals (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



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

- 

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

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

Exercise sufficient caution when handling the unit.

6.1 Electrical control

The motorized change-over switches are available for remote control.

To control the motorized change-over switch electrically:

1. Release the handle from the change-over switch panel by pressing down the locking latch under the switch panel and pulling the handle off, see Figure 6.1.

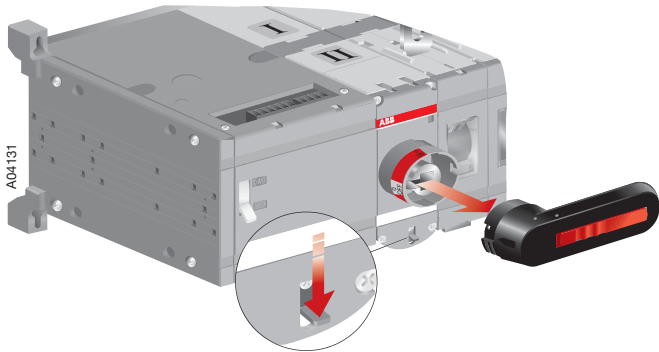


Figure 6.1 Releasing the handle

- 

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

2. Turn the Motor/Manual selection switch to the Motor (M) position, see Figure 6.2.

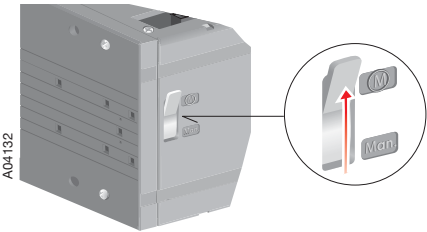


Figure 6.2 Motor/Manual selection switch in the Motor (M) position

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

- 

The motor operator is protected from overloading by a fuse (F1) under the motor operator. 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 change-over switch is controlled by electric impulses. When you press the control button, the change-over switch is driven to the corresponding position (I, 0, II). The control impulse must last more than 100ms to take effect. A new command cannot be given until the change-over switch has reached the position of the previous command. Figure 6.3 shows the operation of the change-over 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.

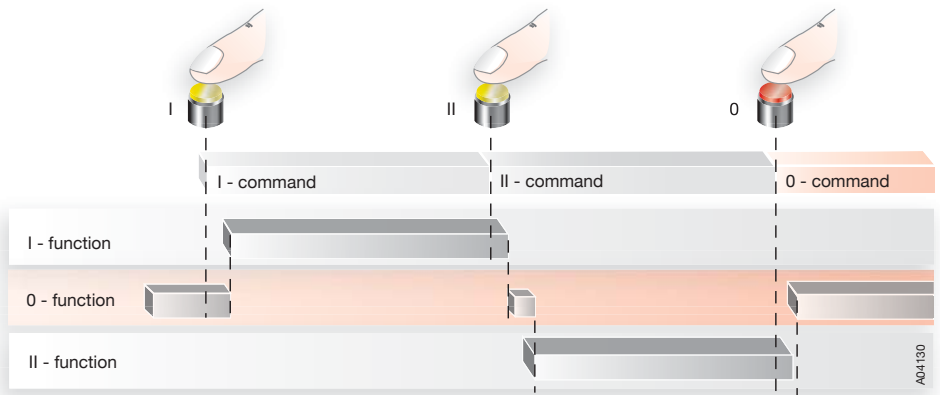


Figure 6.3 Impulse control

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 change-over switch is driven to the corresponding position (I, 0, 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 change-over switch is driven to position 0. Figure 6.4 shows the operation of the change-over 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.

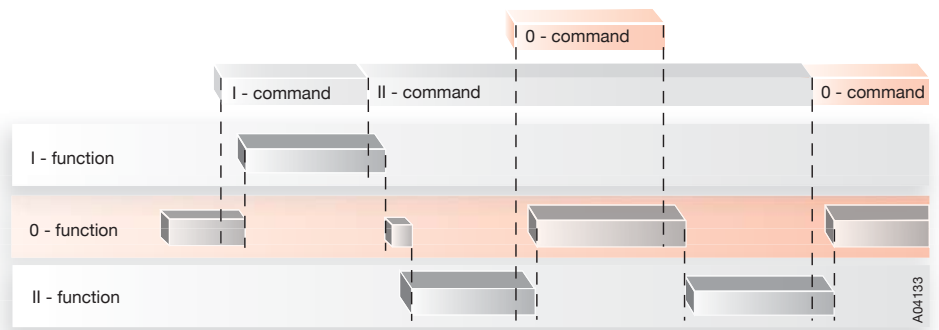


Figure 6.4 Continuous control

6.2 Manual operation using the handle

You can operate the motorized change-over switch manually by using the handle that is included in the delivery.

To control the motorized change-over 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.

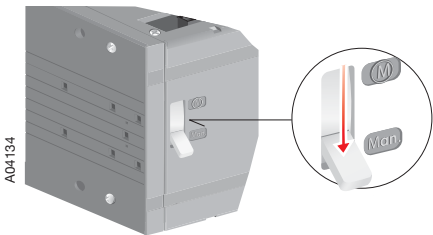


Figure 6.5 Motor/Manual selection in the Man. position

2. Attach the handle by pressing it to the change-over switch panel until it clicks into place. You can attach the handle in both positions (I, 0, II), see Figure 6.6.

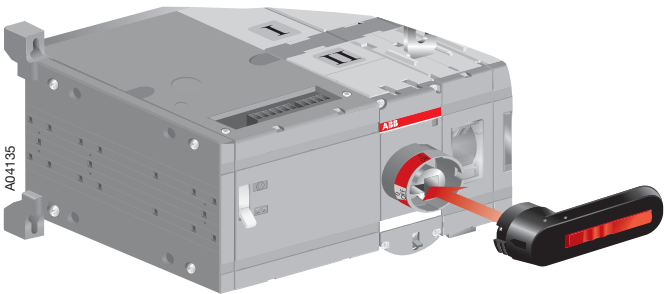


Figure 6.6 Attaching the handle

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



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

6.3 Locking

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

6.3.1 Locking the electrical control

To disable electrical control, lock the locking latch with a padlock. After the locking latch has been locked, the change-over switch cannot be controlled electrically. You can lock the electrical control to both positions (I, 0, II).

To lock electrical control:

1. Pull up the locking latch under the change-over switch panel.
2. Place the padlock under the latch, see Figure 6.7.

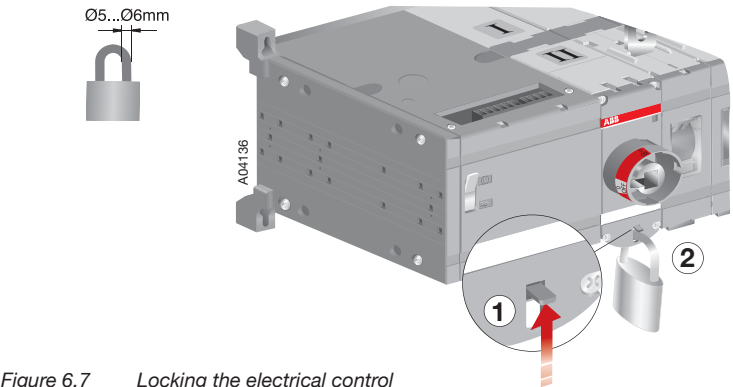


Figure 6.7 Locking the electrical control



The handle cannot be attached when electrical control is locked.

6.3.2 Locking the manual operation

By default, manual operation can only be locked to position 0. Locking to position I and II is optional and possible only with modifications to the change-over 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

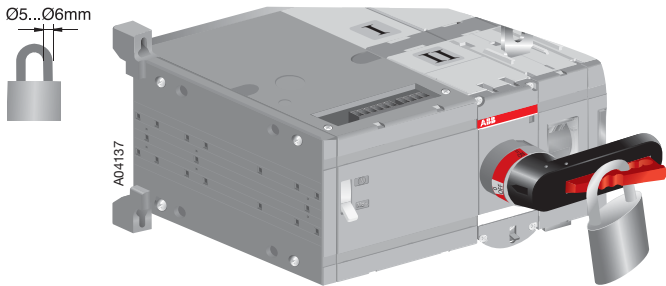


Figure 6.8 Locking the manual operation



The handle cannot be removed when padlocked to position 0.

The following chart shows the locking state information (the voltage on motor operator supply needed).

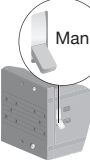
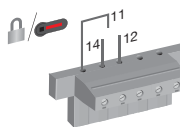
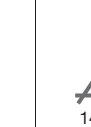
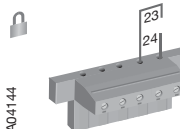
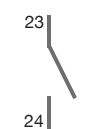
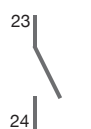
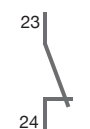
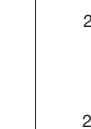
					
					
					

Figure 6.9 Locking state information

7. Technical data

Motor operator, control circuit	Value	Cabling
Rated operational voltage U [V]	220 - 240 Vac, 50-60 Hz	
	110 - 125 Vac/dc, 50-60 Hz	
	48 Vdc	
	24 Vdc	
Operating voltage range	0.85... 1.1 x U	
Operating angle	90° 0-I, I-0, 0-II, II-0; 180° I-0-II	
Operating time	See the Table 7.2	
Protection degree	IP 20, front panel	
Voltage supply	PE N L	1,5 -2,5 mm²
Cable of the push-buttons (no SELV)	C II I O	1,5 -2,5 mm²
Maximum cable length	100 m	
F2	Max. MCB 16 A	
State information of locking (no SELV)		
Handle attached or motor operator locked	11-12-14 (C/O)	1,5 -2,5 mm²
Locking motor operator	23-24 (NO)	1,5 -2,5 mm²
Rated impulse withstand voltage U _{imp}	4 kV	
Operating temperature	-25... +55 °C	
Transportation and storage temperature	-40... +70 °C	
Altitude	Max. 2000m	

Table 7.1 General technical data of motor operators

Type	Voltage U 220-240 VAC [V]	Nominal current ^{a)} I _n [A]	Current Inrush ^{a)} [A]	Operating time ^{a)} I-0, 0-I 0-II, II-0 [s]	Operating transfer time ^{a)} I-II or II-I [s]	OFF-time when operating ^{a)} I-II or II-I [s]
OTM160...250_C	220-240 Vac	0.2	1.3	0.4 - 1.0	1.0 - 2.0	0.4 - 1.0
OTM160...250_C	110-125 Vac/dc	0.45	2.1	0.5 - 1.5	1.1 - 2.5	0.4 - 1.0
OTM160...250_C	48 Vdc	1.1	4.4	0.5 - 1.5	1.4 - 2.5	0.5 - 1.1
OTM160...250_C	24 Vdc	3.3	16.8	0.4 - 1.0	1.0 - 2.0	0.4 - 1.0
OTM315...400_C	220-240 Vac	0.5	2.1	0.4 - 1.0	0.9 - 2.0	0.4 - 1.0
OTM315...400_C	110-125 Vac/dc	0.6	2.5	0.5 - 1.5	1.2 - 2.6	0.5 - 1.5
OTM315...400_C	48 Vdc	2.1	8.3	0.4 - 1.0	1.0 - 2.0	0.4 - 1.0
OTM315...400_C	24 Vdc	4.2	17.5	0.4 - 1.0	1.0 - 2.0	0.4 - 1.0
OTM630...800_C	220-240 Vac	0.7	2.8	0.4 - 1.0	0.9 - 2.0	0.4 - 1.0
OTM630...800_C	110-125 Vac/dc	0.8	4.6	0.6 - 1.2	1.2 - 3.0	0.4 - 1.0
OTM630...800_C	48 Vdc	2.6	8.4	0.6 - 1.6	1.3 -3.0	0.4 - 1.0
OTM630...800_C	24 Vdc	4.0	22.4	0.5 - 1.5	1.1 - 2.5	0.4 - 1.0

^{a)} Under nominal conditions

Table 7.2 Specified technical data of motor operators

Measurement	Value
Handle attached or motor operator locked	11-12-14 (C/O): 5A / 250V / cosφ=1
Locking motor operator	23-24 (NO): 5A / 250V / cosφ=1
SCPD	Max. MCB C2A

Table 7.3 State information

8. Accessories

8.1 Terminal clamp sets

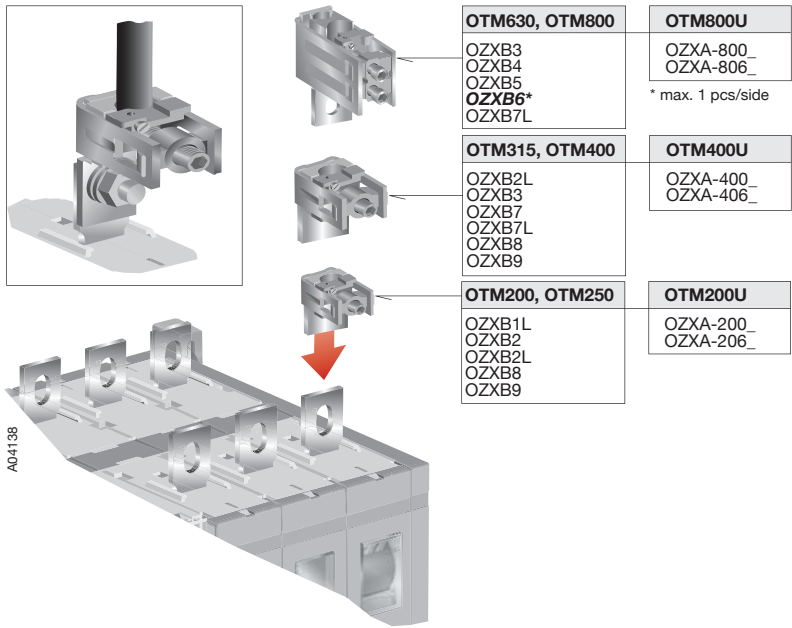


Figure 8.1 Mounting of the terminal clamp sets, types OZXB_ and OZXA_

8.2 Bridging bars

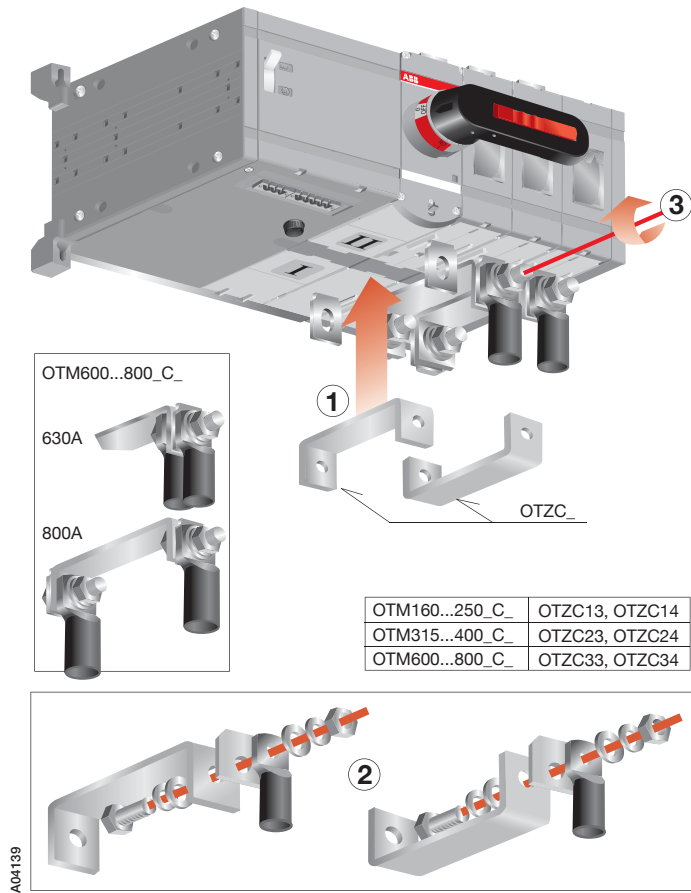
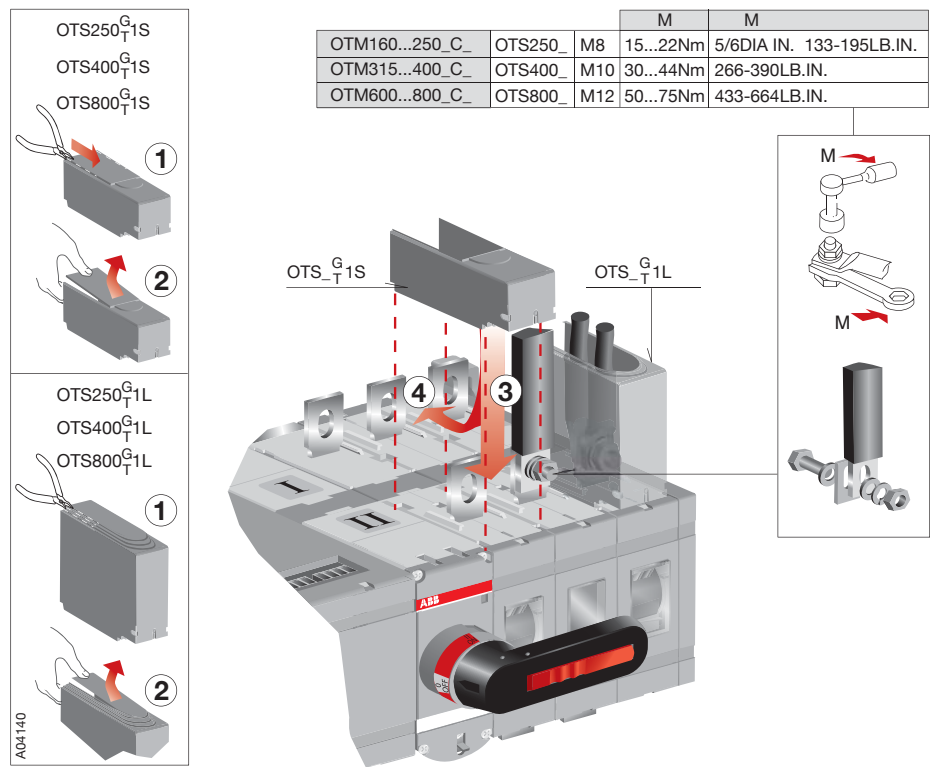
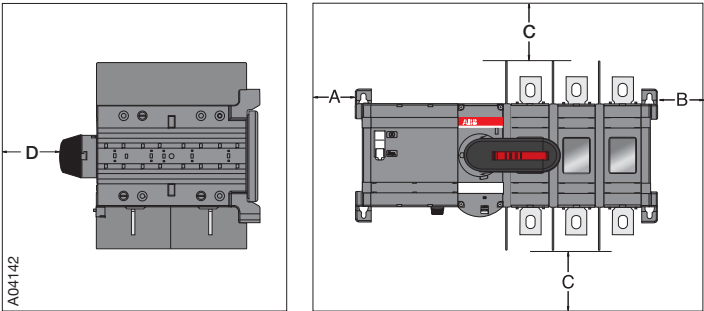


Figure 8.2 Mounting of the bridging bars (type OTZC_) to the motorized change-over switches

8.3 Terminal shrouds



9. UL standard switches



	Current	Height	Width	Depth
OTM200U_C	200 A	406 mm/16 in	305 mm/12 in	203 mm/8 in
OTM400U_C	400 A	610 mm/24 in	356 mm/14 in	254 mm/10 in
OTM600U_C	600 A	610 mm/24 in	700 mm/28 in	400 mm/16 in

	A	B	D
OTM200U_C	0	13 mm/0,5 in	13 mm/0,5 in
OTM400U_C	0	13 mm/0,5 in	13 mm/0,5 in
OTM600U_C	0	13 mm/0,5 in	13 mm/0,5 in

OTM200U_C			
Cable size		Cable size	
AWG	C	MCM	C
4-3	100 mm/4 in	250	200 mm/8 in
2	100 mm/4 in	300	250 mm/10 in
1	100 mm/4 in		
1/0	125 mm/5 in		
2/0	150 mm/6 in		
3/0-4/0	175 mm/7 in		

OTM400U_C			
Cable size		Cable size	
AWG	C	MCM	C
2	100 mm/4 in	250	250 mm/8 in
1	100 mm/4 in	300	250 mm/10 in
1/0	125 mm/5 in	350	350 mm/12 in
2/0	150 mm/6 in		
3/0-4/0	175 mm/7 in		

OTM600U_C			
Cable size		Cable size	
AWG	C	MCM	C
2	100 mm/4 in	250	200 mm/8 in
1	100 mm/4 in	300	250 mm/10 in
1/0	125 mm/5 in	350	300 mm/12 in
2/0	150 mm/6 in	400	330 mm/13 in
3/0-4/0	175 mm/7 in	500	356 mm/14 in
		600	381 mm/15 in

Figure 9.1 Clearances per UL 98, minimum enclosure size or equivalent volume

9.1 Phase barriers



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

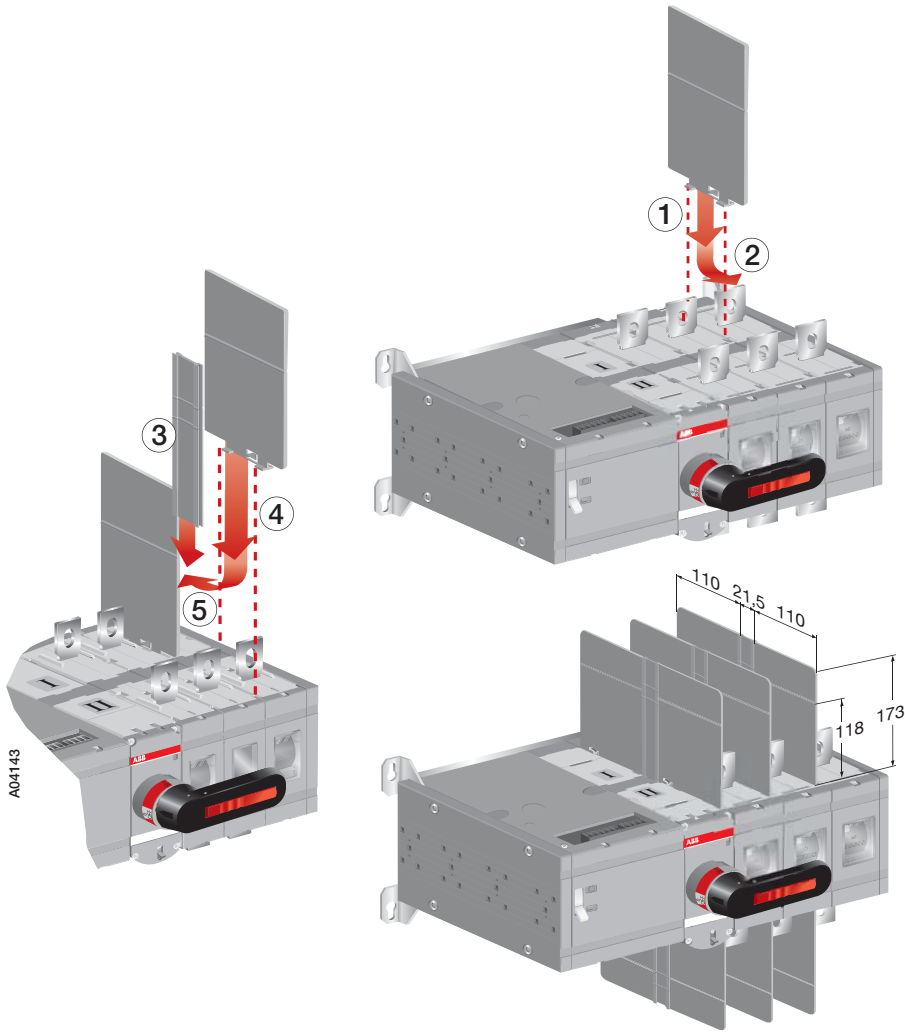


Figure 9.2 OTM600U_C, mounting of phase barriers

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



ABB Oy

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