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CO0418006-V3

Automatic transfer switches(class PC)
OTM_C_D
Installation and instructions

1.Please read the instruction carefully before you use,please retain it for reference.
2.The picture is only for reference, please prevail in kind.

9.Maintenance and troubleshooting

9.1 Maintenance

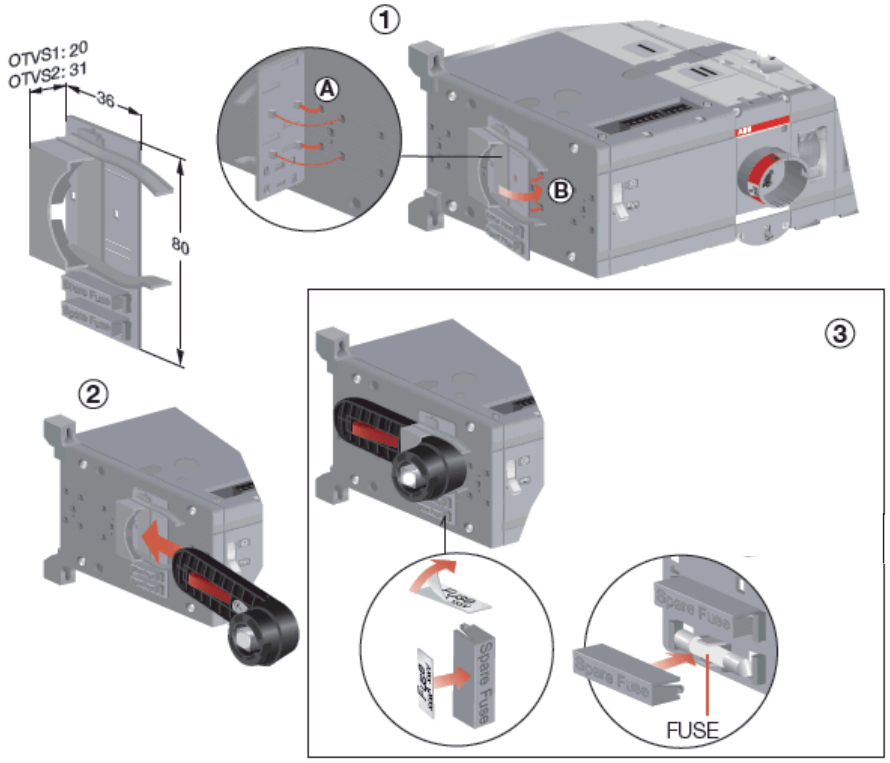
To ensure the reliability of the changeover switch, and should be periodically (recommended every three months) carried out a transfer test to confirm the changeover switch is working properly.

9.2 Troubleshooting

S/N	State	Analysis	Action
1	Power supply normally, the controller without any display.	1.Cables are not connected terminals. 2.The cable has loosen which it was connected between controller and changeover switch.	1.Check it and connect it again. 2.Check it and plug in again.
2	controller is connected, but it can not automatic transfer.	1.Controller or changeover switch is on manual state. 2.Terminal loose. 3.Fuse is broken. 4.Fire fighting single input to controller. 5.Voltage is out of the normal range.	1.Change to automatic Mode or relieve electrical locking or remove the handle. 2.Check it and plug in again. 3.Change fuse. 4.Cancel the fire fighting single. 5.Check voltage, make sure the voltage range in 70% ~130%.
3	OTM_C_D transfer continually.	1.loose or poor between cable and terminal. 2.Voltage fluctuating, and the fluctuation range beyond the overvoltage or under voltage setting value.	1.Check the connections. 2.Reset the value of overvoltage or undervoltage(eg.change115% to 125%) or enlarge changeover delay time setting.
4	Fire fighting fault.	1.fire fighting is not 24V d.c.. 2.fire fighting Polarity reverse connection. 3.fire fighting single lasts less than 1 second.	Please input the correct fire fighting single,it must be 24V.d.c. and lasts more than 1 second.
5	Power supply normally , but control unit display phase lost.	1.loose or poor connect between cable and terminal.	Check and troubleshooting.
6	OTM_C10D remain at fault alarm.	1.line terminal phase loss. 2.N pole is connected mistakenly to A,B or C phase.	Check and troubleshooting.
7	OTM_C11D remain at voervoltage alarm.	1.Line terminal overvoltage. 2.N pole is connected mistakenly to A,B or C phase.	Check and troubleshooting.

8.6 Handle and spare fuse storage

OTVS1	OTM160-250_C_D_
OTVS2	OTM315-800_C_D_



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1.Introduction

This manual describes the installation and the basic operation of the OTM_C_D automatic transfer switch(class PC).The instructive part is followed by a section on available accessories.

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.

8.5 Phase barriers

Phase barriers are used in ABB SACE Tmax T4-T5 MCCB are also fit to Automatic transfer switch OTM_C_D,the relationship refer to form 8-1.

remark:the remained length after cutting of phase barriers is different from Tmax T4-T5 MCCB

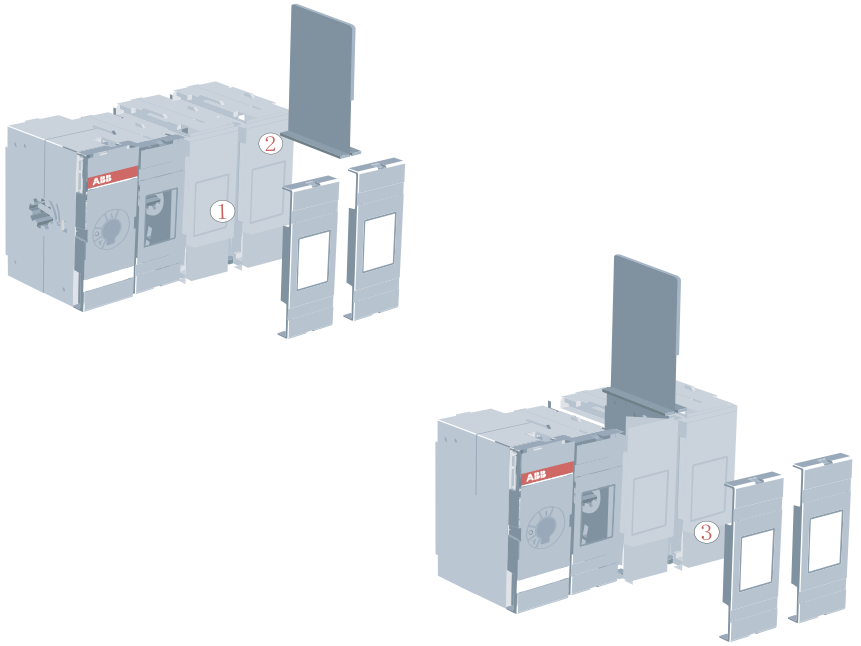


Figure 8-10 OTM_C_D 160...800-PC

Form 8-1 Phase barriers selection table

Phase barriers of ABB SACE Tmax T4-T5 are used for Automatic transfer switch OTM_C_D				
Type	Pole	Qty of Phase barriers	Type of Phase barriers	The retained length after cutting(mm)
OTM_C_D160…250	3 4	4 6	PB100 or PB200	55 55
OTM_C_D315…400	3 4	4 6	PB100 or PB200	67 67
OTM_C_D630…800	3 4	4 6	PB100 or PB200	90 90

8.4 Auxiliary contacts

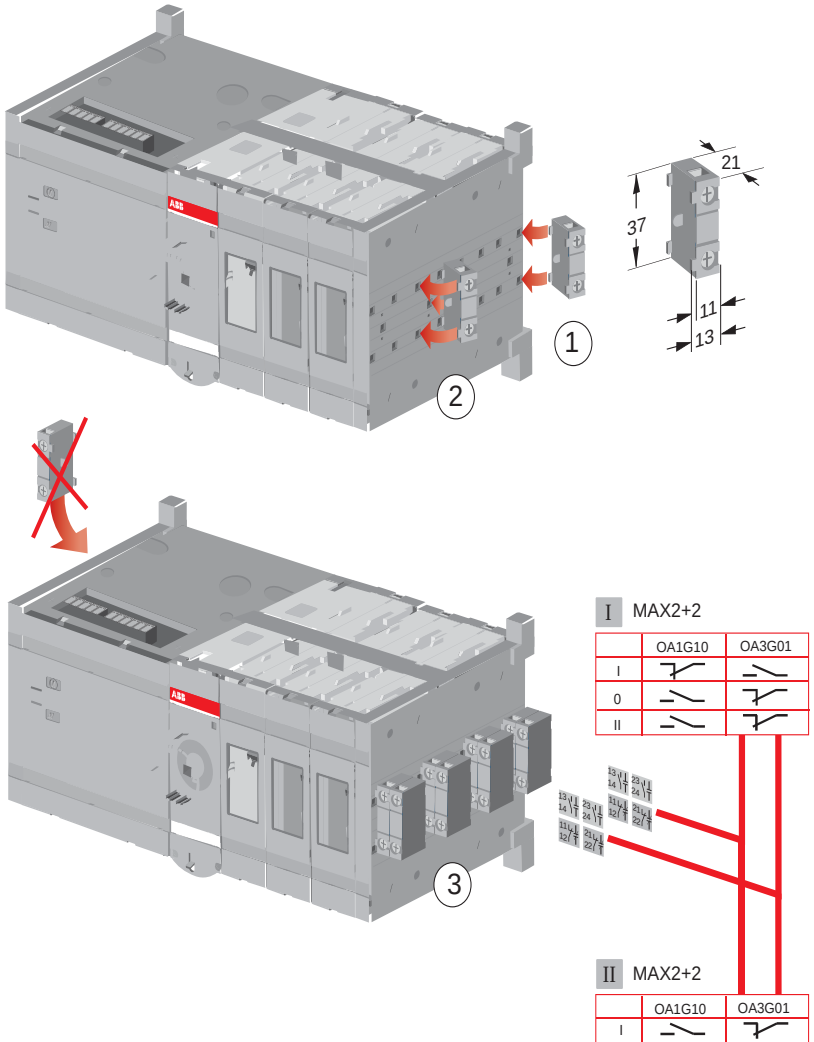
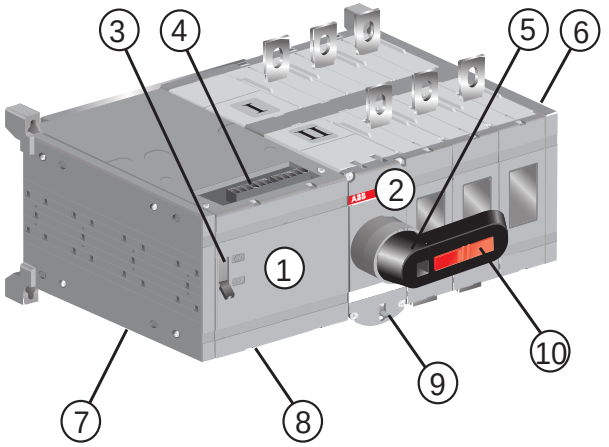


Figure 8-9 OTM_C_D 32...800

2. Product overview

Automatic transfer switch OTM_C_D is uesd to ensure power supply for different occasions. You can operator the changevoer switch by using either way,manual, remote or automatic.



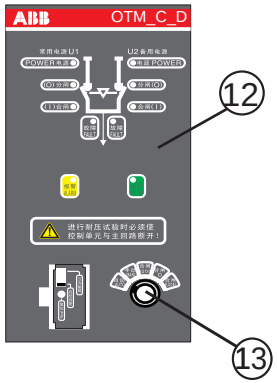


Figure 2-1 OTM_C_D Automatic transfer switch

1. Motor operator
2. Changeover switch
3. Motor/Manual selection
4. Input terminal for operation power supply
5. Handle for manual operation
6. Place for auxiliary contact blocks
7. Fuse (F1)
8. Output terminal for switch state
9. Locking latch for releasing the handele and locking electrical operation
10. Locking clip for locking manual operation
11. Cable for connect to controller
12. OTM_C10D or OTM_C11D controller
13. Function interface

You can choose OTM_10D or OTM_C11D controller for each type changeover switch.

3. Quick start

This is a quick guide olny meant for those who need a reminder of how to operate the unit.For more detailed instructions,see Section 5.

3.1 Operating the switch manually

To operate the switch manually:

1.Turn the knob to the MANU position.

2.Turn the Motor/Manual selector to the Manual(Man)position.

3.Attach the handle to the switch panel by pressing it to the changeover switch until is clicks into place.

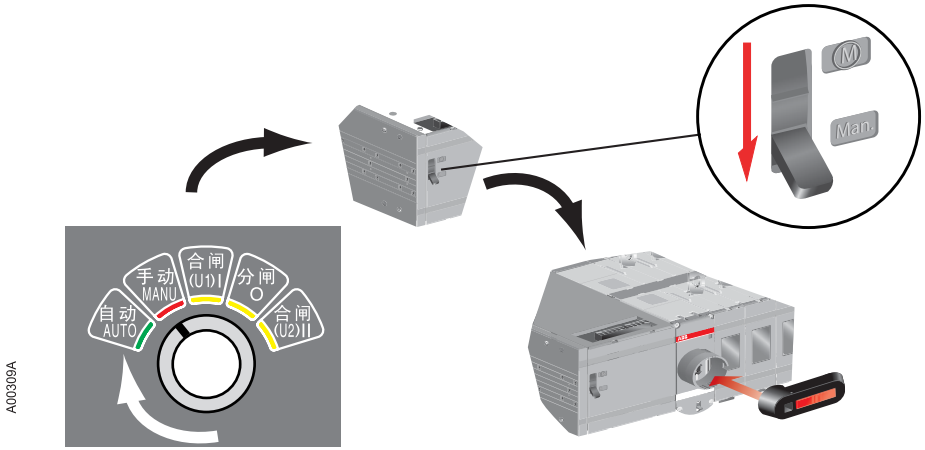


Figure 3-1 Operating the switch manually

To disable the manual (and at the same time also electrical) operation ,turn the handle to the position O and attach the padlock to the handle.

Figure 3-2 Locking the manual operation

8.3 Terminal shrounds

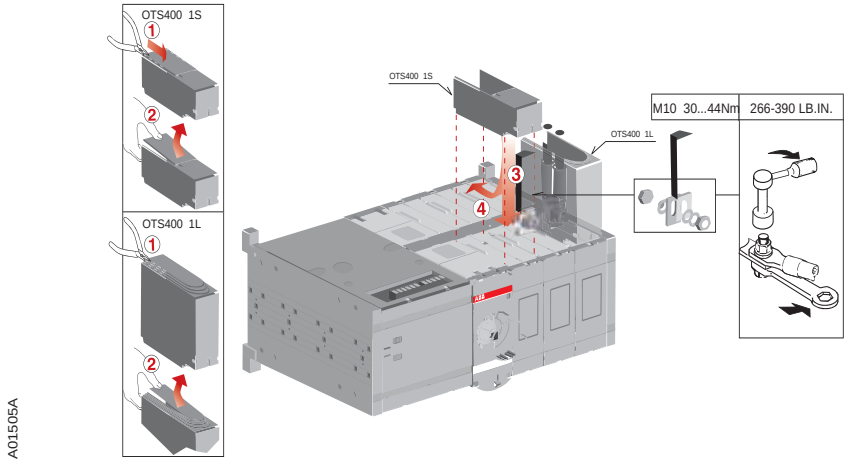


Figure 8-7 OTM_C_D 315...400

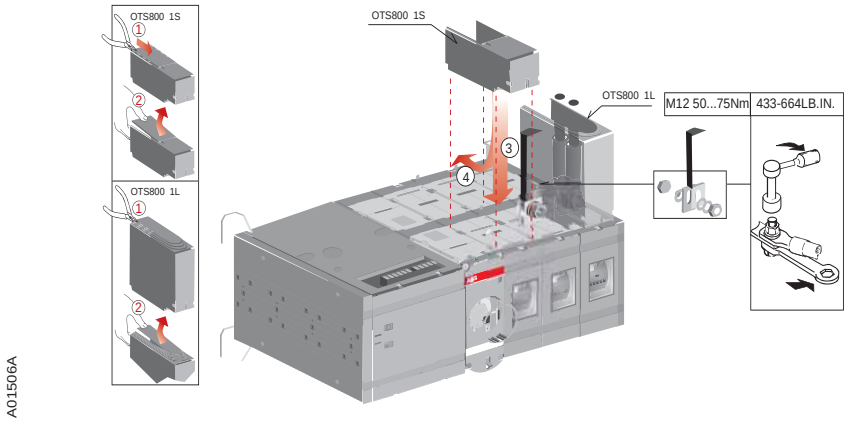


Figure 8-8 OTM_C_D600...800

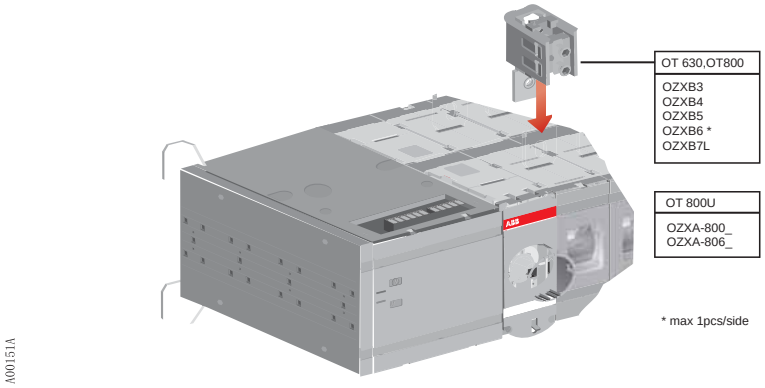


Figure 8-3 OTM_C_D 600...800

8.2 Bridging bars

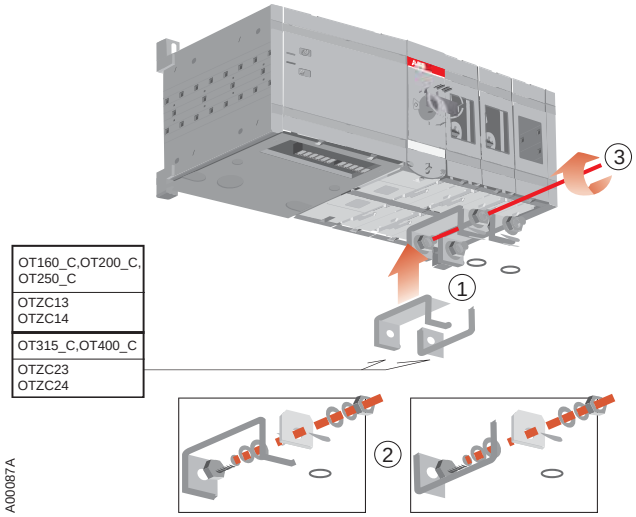


Figure 8-4 OTM_C_D 32...400

3.2 Operating the switch electrically-Manual Mode

To operate the switch electrically

1.Remove the handle from the switch panel.You can remove the handle in all positions.

2.Turn the Motor/Manual selector to the Motor(M)position to enable electrical operation.

3.Turn the knob to the right positon what you need.After that,the switch will switching to the right position what you want.

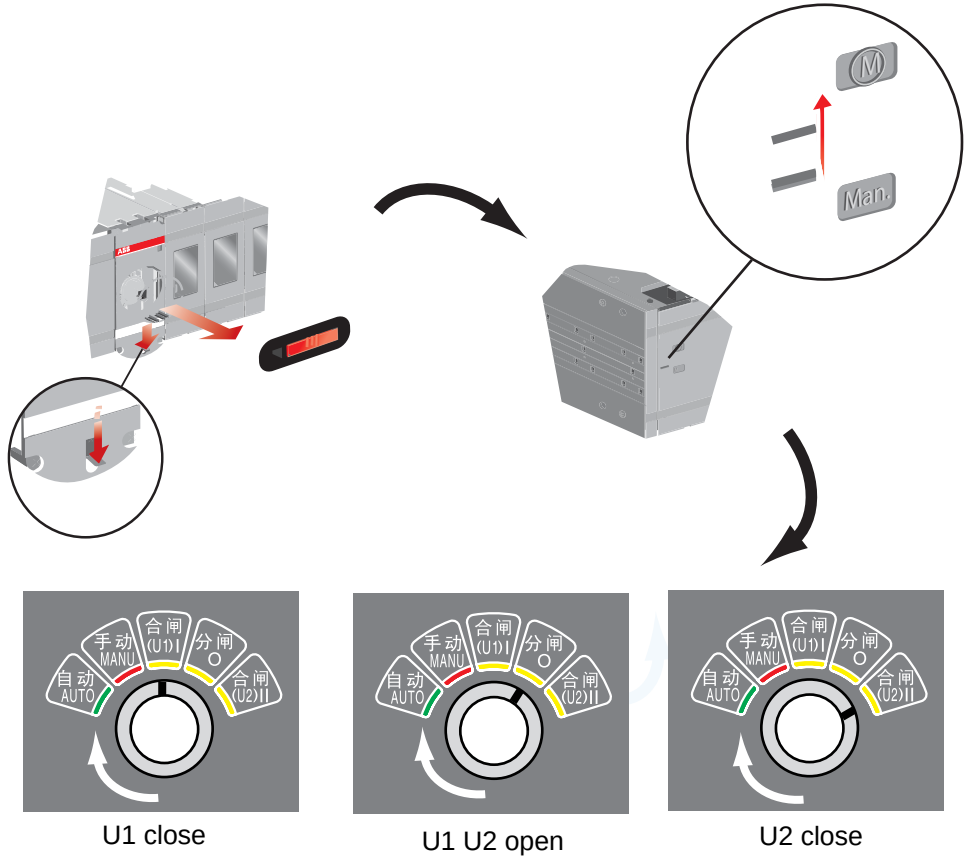


Figure 3-3 Operating the switch electrically/Manual Mode

To disable electrical operation,lock the locking latch with a padlock.After the locking latch has been locked,the motorized changeover switch cannot be operated electrically.You can lock electrical operation in all positions(I,0,II).

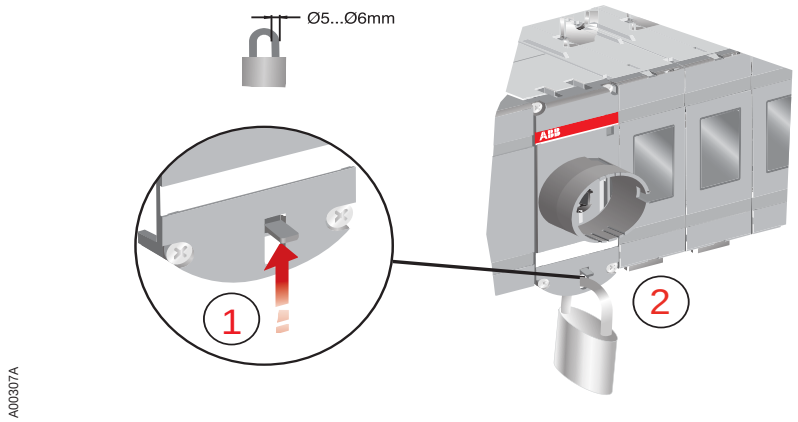


Figure 3-4 Locking electrical operation

3.3 Operating the switch electrically/Automatic Mode

Operating the switch electrically by Automatic Mode

1.Remove the handle from the change-over switch panel.You can remove the handle in all positions(I,0,II).
2.Turn the Motor/Manual selector to the Motor(M)position.
3.Turn the knob to the AUTO position.

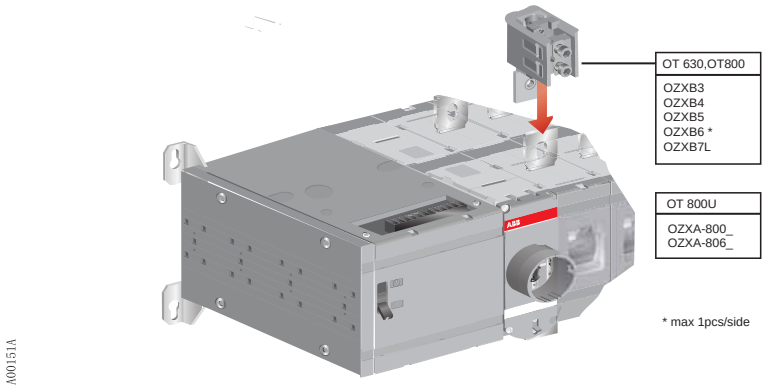


Figure 8-3 OTM_C_D600...800

8.2 Bridging bars

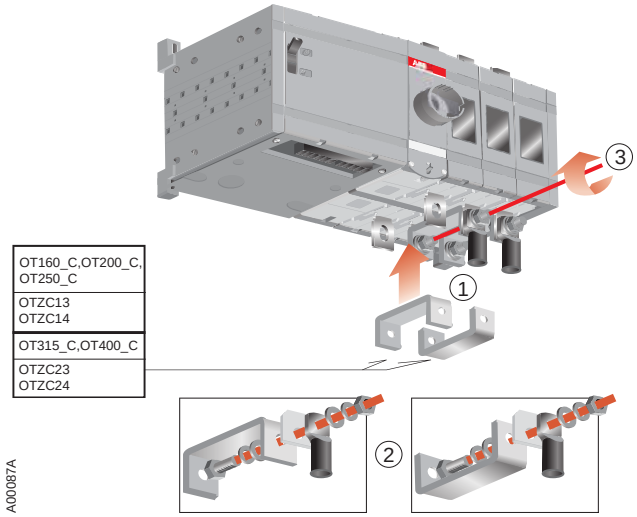


Figure 8-4 OTM_C_D32...400

8.Accessories

8.1 Terminal clamp sets

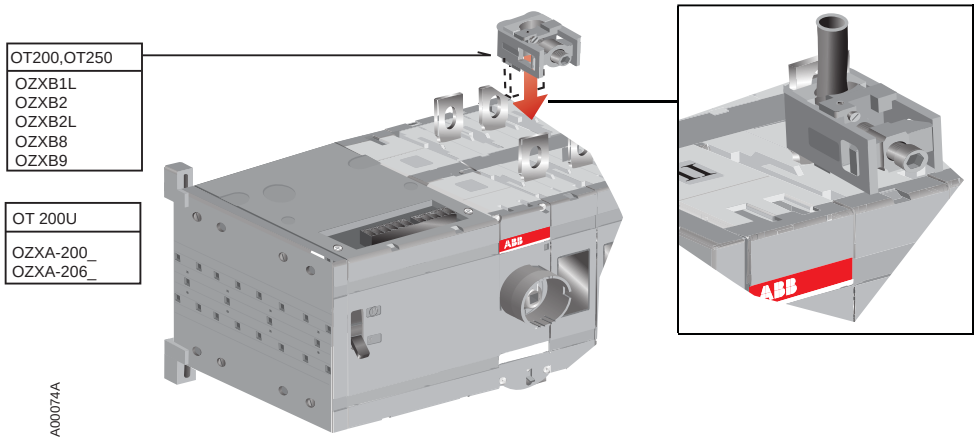


Figure 8-1 OTM_C_D32...250

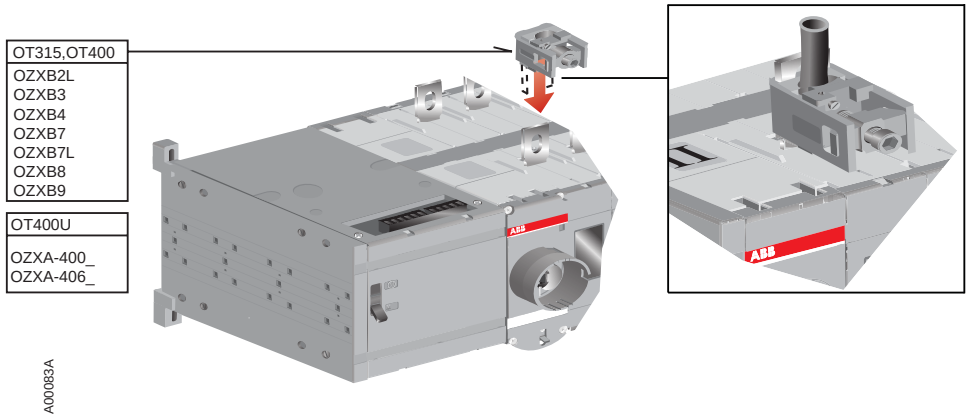


Figure 8-2 OTM_C_D315...400

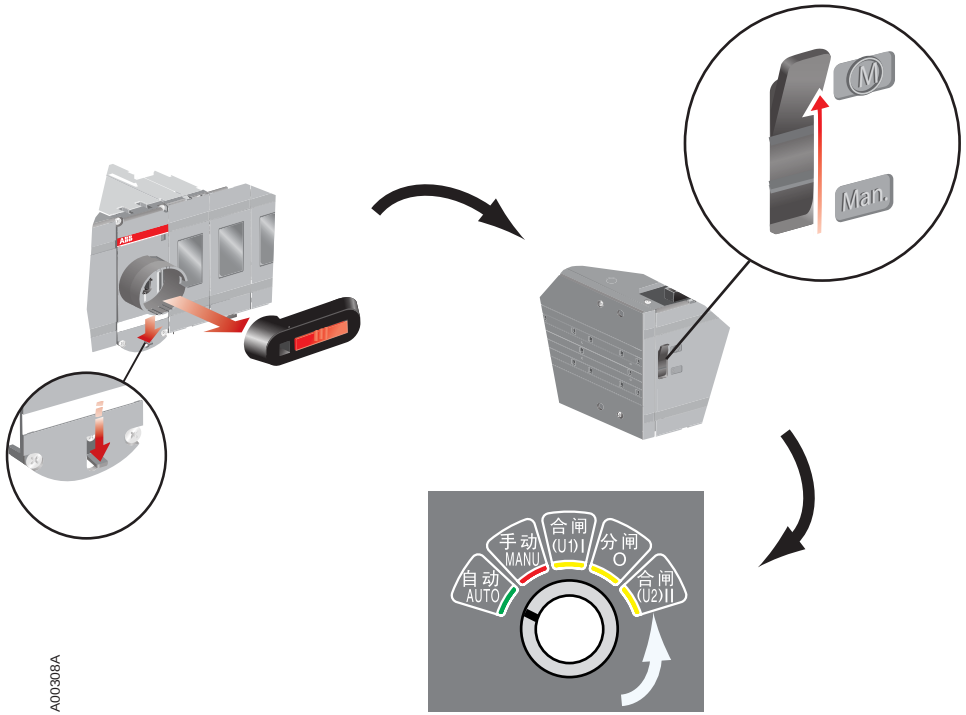


Figure 3-5 Operating the switch electrically/Automatic Mode

To disable electrical control(Automatic Mode),lock the locking latch with a padlock. After the locking latch has been locked,the switch cannot be operated electrically. You can lock electrical operation in all positions(I,0,II).

Locking state information as below table:

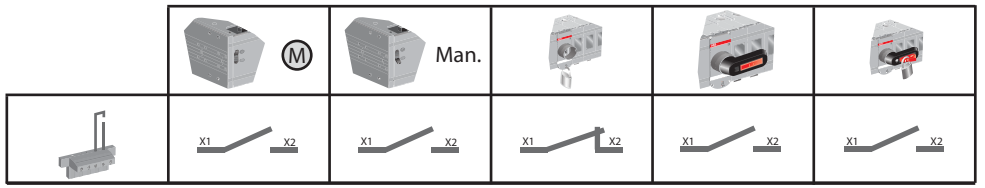


Figure 3-6 Locking state information

Use protection against direct contact.

4.1 Installation Mode

The recommended mounting positions for automatic transfer switches are horizontal, wall mounted or table mounted.

Do not install the Automatic transfer switches in any position than those described above.

4.1.1 Separated installation

1) dimension for changeover switch

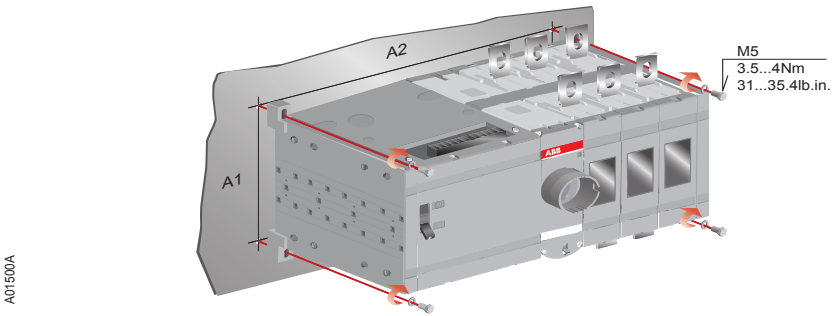


Figure 4-1 OTM_C_D32...250

7.Data

7.1 Motor operator technical Data

Figure 7.1 Motor operator technical data

Item	Parameter
Rated operational voltage Ue	220V a.c./380V a.c.
Operating voltage range	(0.85...1.1)×Ue
Operating angle	90° O-I,I-O,O-II,II-O；180° I-O-II
Operating time	See the Table 7.2
Protection degree	IP20
Locking information	
Locking the electrical operation	X1-X2(NO)：3A/250V/cosφ=1
Rated impulse withstand voltage Uimp	
voltage between terminals	4kV
voltage between contacts	4kV
Operating temperature	-25...+40℃
Transportation and storage temperature	-40...+70℃
Altitude	Max.2000m

Table 7-2 General technical data of motor operators

Type	Voltage Ue[V]	Nominal current In [A]	Current Inrush [A]	Opetating transfer time[S] O-I,I-0,0-II,II-0	Opetating transfer time[S] I-0-II,II-0-I	OFF-time when operating[S] I-II or II-I
OTM_C_D32...250	220V a.c. / 380V a.c.	0.2	1.8	0.4-0.8	1.1-1.5	0.4-0.8
OTM_C_D315...400	220V a.c. / 380V a.c.	0.5	3.5	0.4-0.8	1.1-1.5	0.4-0.8
OTM_C_D600...800	220V a.c. / 380V a.c.	0.8	5	0.7-1	1.5-2	0.7-1

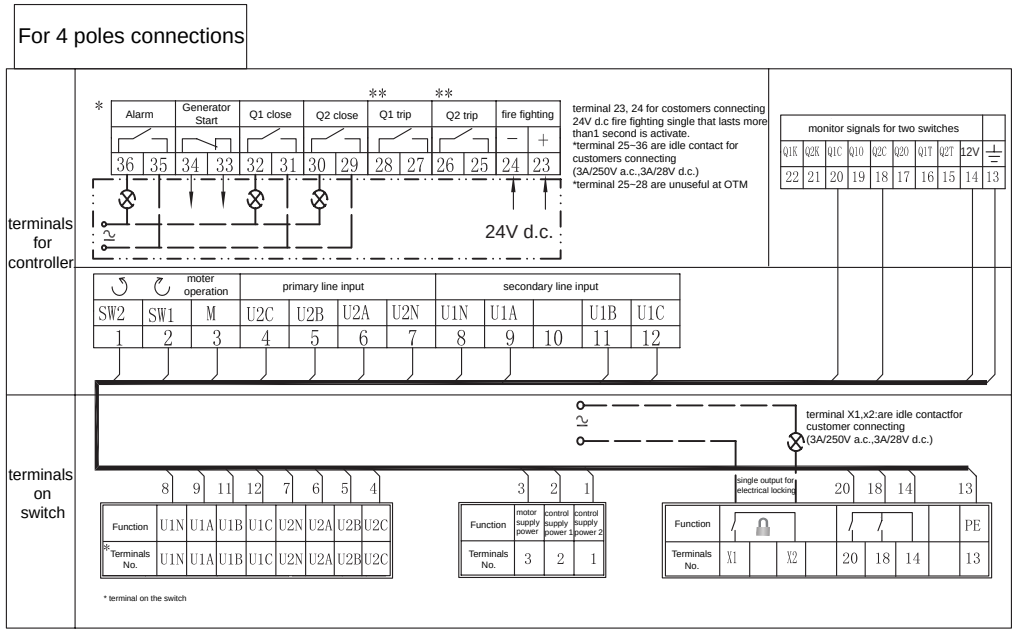
Under nominal conditions

Must use the same type of fuse is described on the label close to the fuse.

7.2 Terminal for state information after pad-lock

Table 7-3 Terminal for state information of locking

State	Data
locking the electrical operation X1-X2(NO)	3A/250V/cosφ=1



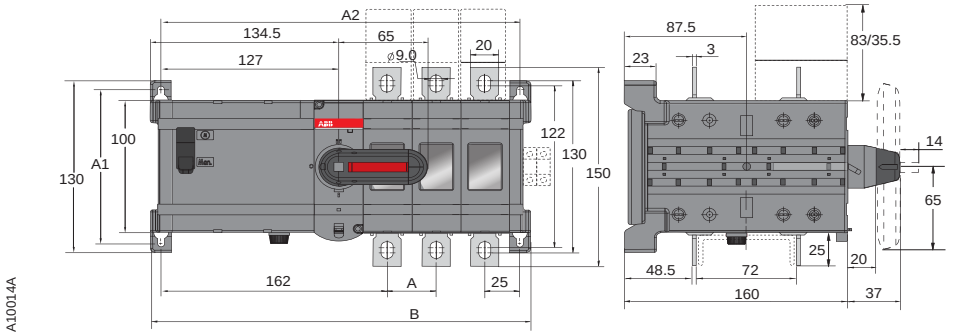


Figure 4-2 OTM_C_D32...250

	OTM_C_D32...250	
	E3	E4
A	35	35
A1	116	116
A2	258	293
B	273	308

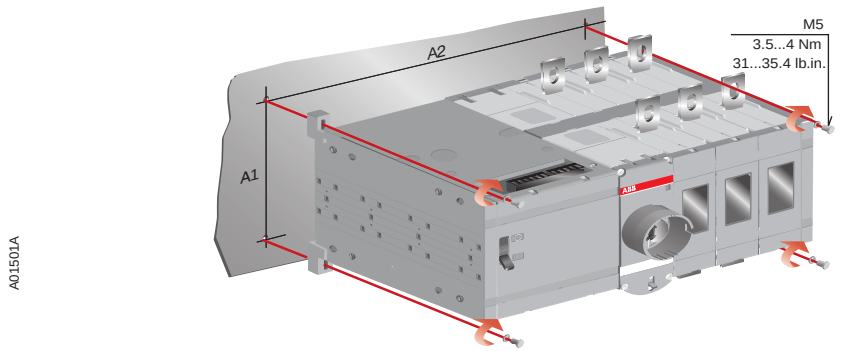


Figure 4-3 OTM_C_D315...400

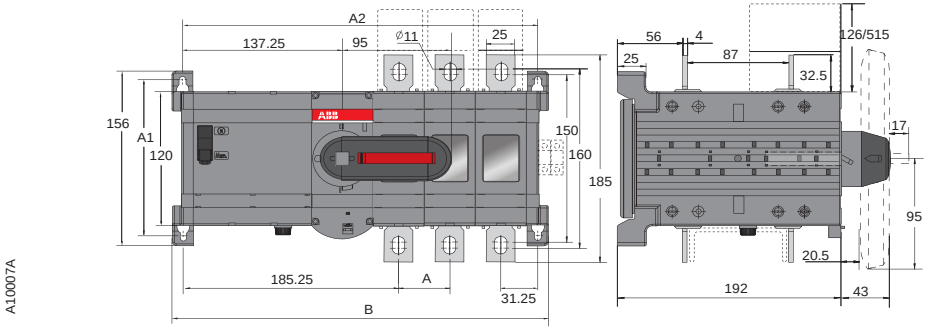


Figure 4-4 OTM_C_D 315...400

	OTM_C_D315...400	
	E3	E4
A	44	44
A1	142	142
A2	305	349
B	323	367

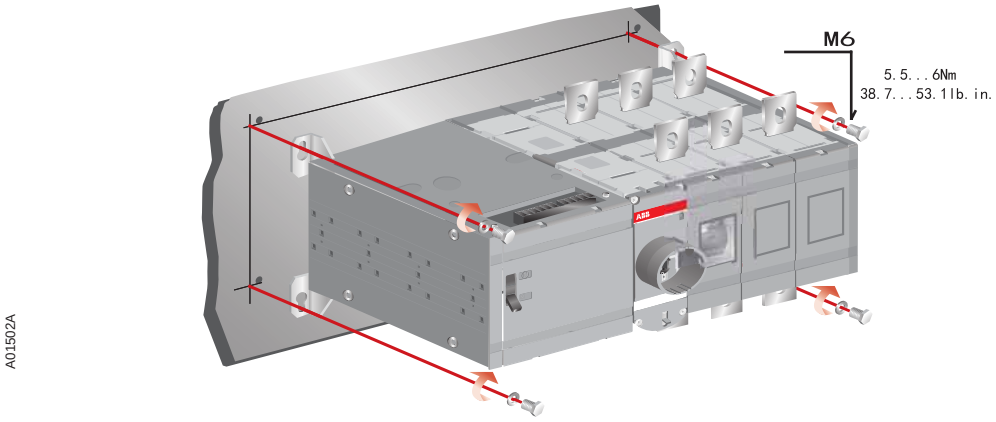
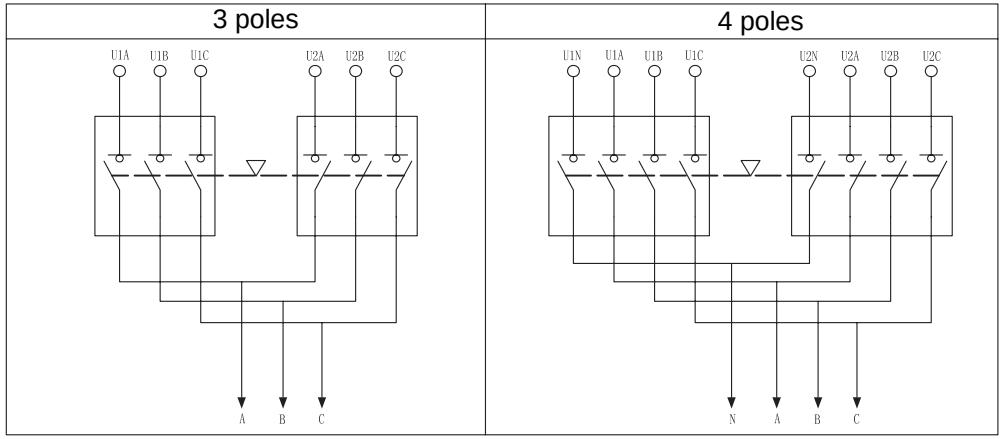


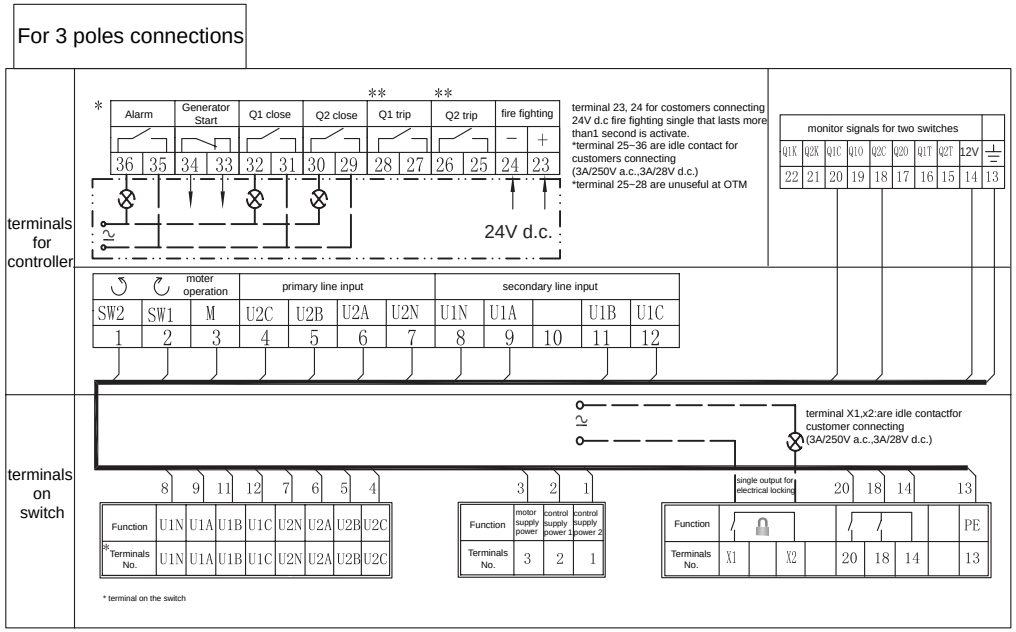
Figure 4-5 OTM_C_D 600...800

6.4 OTM_C_D connections

Main circuit connections



Control circuit connections



Press the reset button to reset the control unit to automatic Mode after the fire fighting command relieved.

7. Gen-Set start

If the primary power comes from transformer and the secondary power come for generator,the controller will send a command to start the generator after the failure happers in the primary power.The switch will transfer to the secondary power after the generator's voltage was stable.Pleasw see the connections in figure 6.4.

8. Reset button function

1)If the controller go into death-loop, you can press the reset botton to resume normal operation.

2)If the fire fighting signals has been cancled,you can press the reset botton reset to automatic mode.

3)Refusing to perform alarm,after the failure is solved,the you need to press the reset botton to reset to automatic mode.

4)The function of the controller is valid after pressed the reset botton.

Reset botton is shown in Figure 6-5

9.Delay time setting

T1:Power state confirmation.It means that the time from the controller monitor a failure to confirm it or from monitor the failure is recovered to confirm it.

T2:Power supply close delay time.It means that the shortest delay time from O position to I or II position.

Remark:delay time threshold:0,3,5,10,15,20,30 seconds.

delay time knob is shown in Figure 6-5

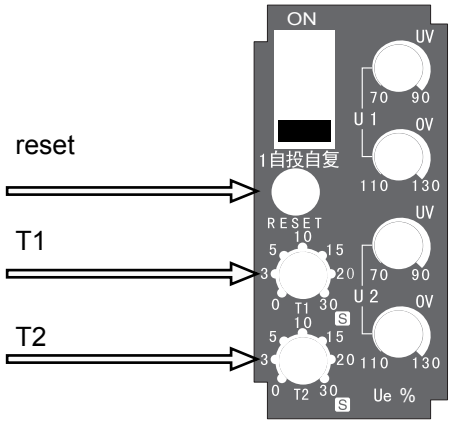


Figure6-5 reset/delay time

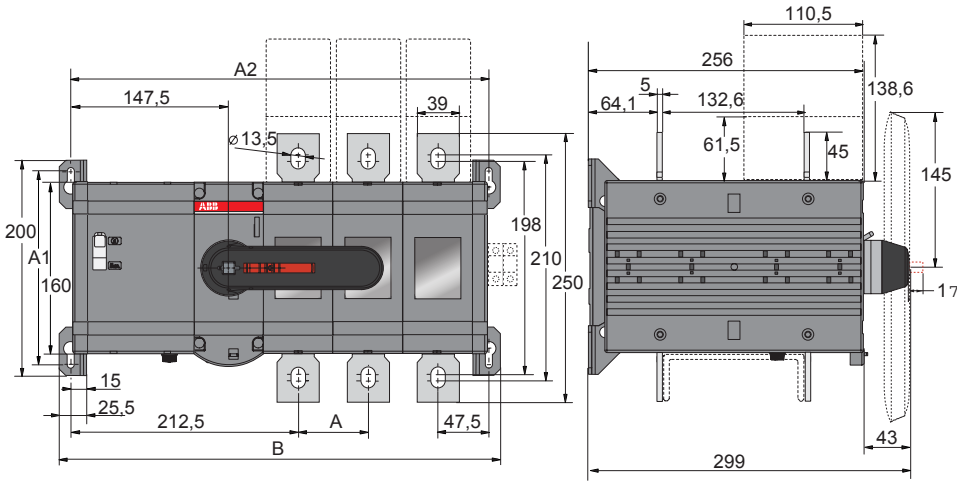
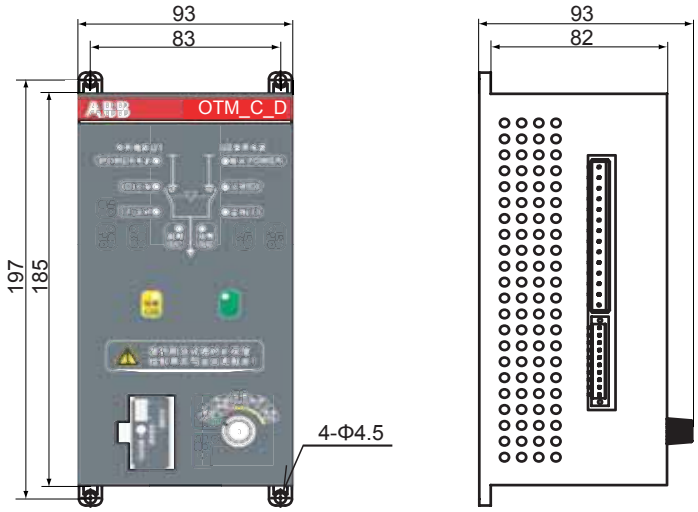


Figure 4-6 OTM_C_D 630...800

	OTM_C_D630...800	
	E3	E4
A	65	65
A1	180	180
A2	390	455
B	411	476

2) Dimension for controller



3) Control unit conections

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

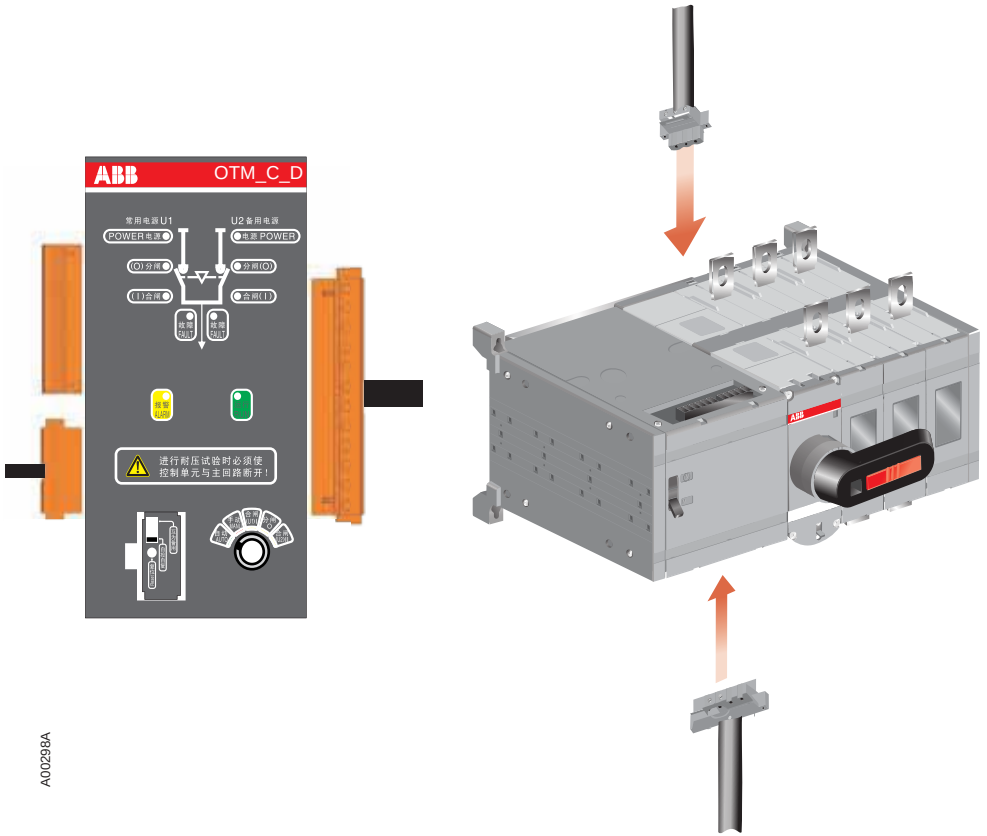


Figure 4-7 OTM_C_D automatic transfer switch terminal connections

4.Alarm
When controller sent a switching signal,the change-over switch executes commond failed,then controller will stop to sent the other switching signal and it will sent a alarm signal.
OTM_C10D Fault light and alarm light on,and has an alarm sound.
OTM_C11D Refusing to perform light and alarm light on,and has an alarm sound.

Refusing to perform light

OTM_C10D does not have refusing to perform light.

Refusing to perform alarm,after the failure is solved,then you need to press the reset botton to reset to automatic mode of control unit.

5. Alarm for N pole wrong connection
For 4 poles,if you connect N pole to A,B or C phase
OTM_C10D failure light and alarm light blinks ,and has an alarm sound.
OTM_C11D overvoltage light and alarm light blinks,and has an alarm sound.

6. Fire fighting
When fire fighting control centre sent a fire fighting signal to controller,controller will sent a switching signal to transfer the switch to O position.
Connection is shown in Figure 6.4

The signal is sent by fire fighting control centre should be 24V d.c., it must last more than 1 second.

6.3 OTM_C_D function and threshold setting

Function below as control unit is on automatic mode:
1. under-voltage transfer
If the power has a under-voltage failure , the controller will control the switch to transfer to the normal power.
The value of under-voltage threshold is adjustable,the range:70%~90% Ue
2.Over-voltage transfer
If the power has a over-voltage failure,the controller will control the switch to transfer to the normal power.
Then value of over-voltage threshold is adjustable ,the range:110%~130% Ue.

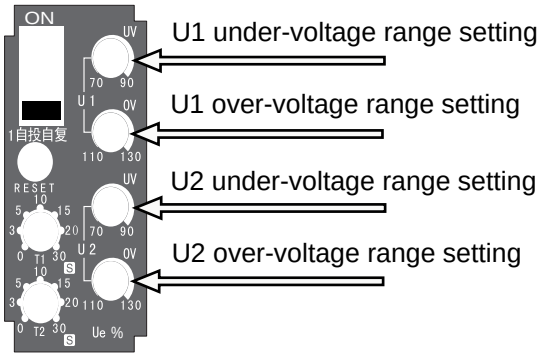


Figure 6-4 under-voltage/over-voltage range setting

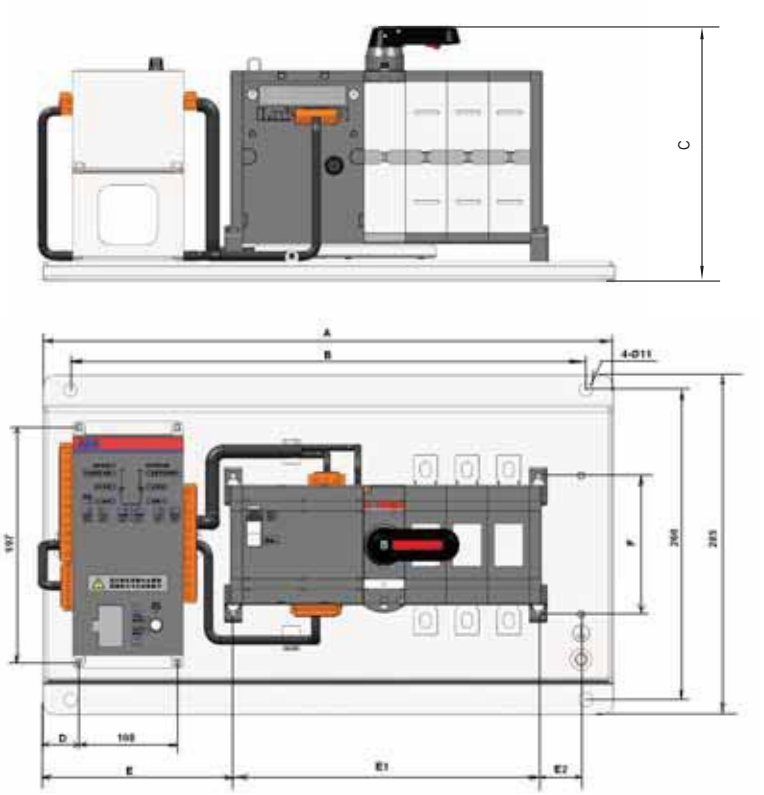
If OTM_10D measures the power having under-voltage failure or over-voltage failure the corresponding light and alarm light blink,and has an alarm sound.
If OTM_11D measures the power having under-voltage failure or over-voltage failure from both power the same time, controller will control the switch switching to the OFF position.
3. Phase loss transfer
If the power has phase loss failure,the controller will control the switch to transfer to the normal power,and when the controller monitors the phase loss failure.
OTM_C10D :alarm light and alarm light blink,and has an alarm sound.
OTM_C11D :phase missing light and alarm light blink,and has an alarm sound.
If OTM_C11D monitors the power having phase loss failure from both power at the same time,the controller will control the switch switching to the OFF position.

If the both power lose A-phase or C-phase at the same time,or the both power voltage less than 70% Ue,then the motor operator isn't working.

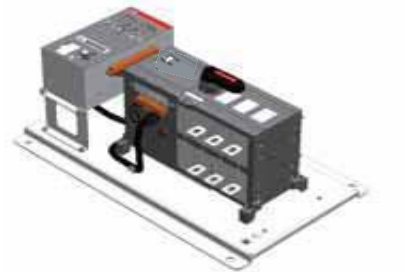
The voltage of terminals is 380V a.c., it is forbidden to insert or remove terminals when the voltage is connected.

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).

4.1.2 Integral installation



	A	B	C	D	E	E1	E2	F
OTM_C_D32…250	480	430	196	30	160	258	35	116
OTM_C_D315…400	545	500	229	30	180	304.5	44	142
OTM_C_D600…800	610	560	293	12	132	390	65	180



6.2.2 The selection of Automatic Operation Mode

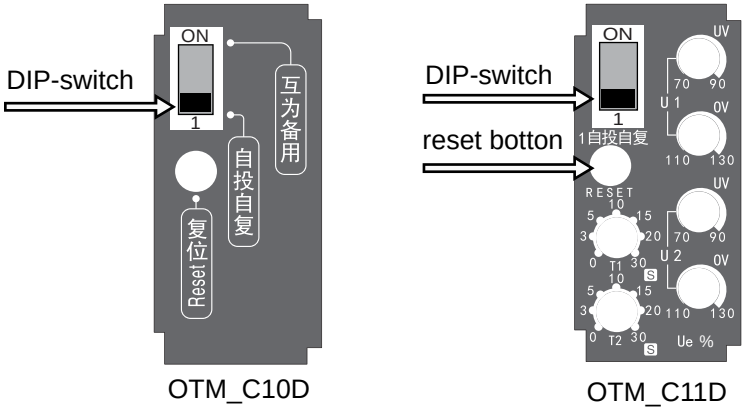


Figure 6-3 selection botton

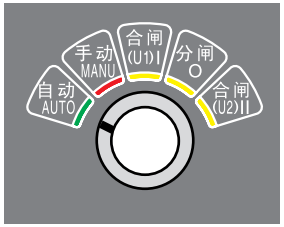
type	configuration	the corresponding Mode of DIP-switch setting	
		1	ON
OTM_C10D	U1 priority/ No line priority	U1 priority	No line priority
OTM_C11D	U1 priority/ No line priority	U1 priority	No line priority

The original setting is U1 priority,you can change the function mode base on your need.The function mode setting must be on automatic mode,and your new setting is effective after pressing reset botton.

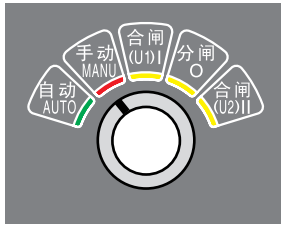
6.2 OTM_C_D Operation Mode setting

Normally U1 is primary line,U2 is secondary line.

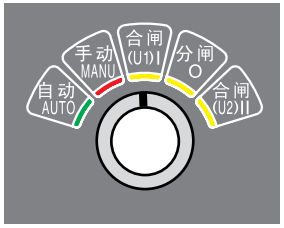
6.2.1 OTM_C_D The selection of Operation Mode



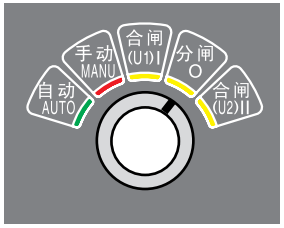
Automatic Mode



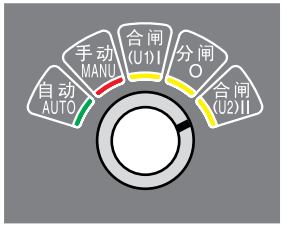
Manual Mode



U1 close



U1,U2 open



U2 close

Figure 6-2 Operation Mode selection

Running light will be off when the controller is selected on manual mode,in this case,you can operate the changeover switch by handle,and the controller still monitor the dual power and has corresponding indication.But is doesn't sent any operating and alarm signal.

When you adjust the knob, the setting will be effective after you keep the knob at the same position last more than 1 second.

5. Operating

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

Never handle control cables when the voltage of the OTM_ automatic transfer switch or external control circuits are connected.

You must operate automatic transfer switch manually before the voltage is connected.

5.1 Manual operating

You can operate the automatic transfer switch manually by using the handle that is including in the delivery.
1.Turn the knob to the MANU position .

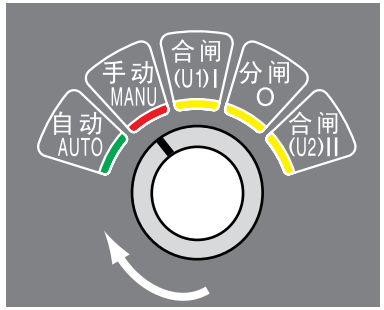


Figure 5-1 function selection position

2.Turn the Motor/Manual selector to the Manual(Man.)position,see Figure 5-2. The motor operator is switched off and electrical operation is prevented.

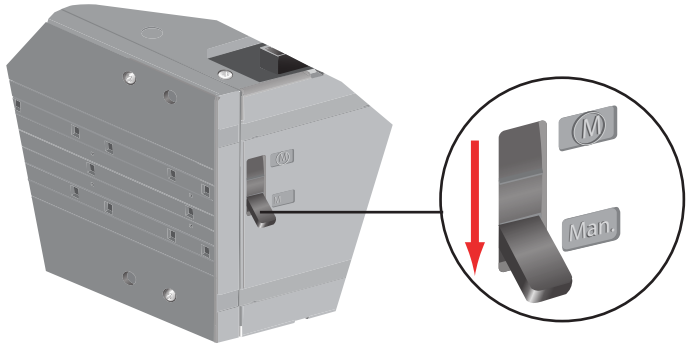


Figure 5-2 Motor/Manual selection in the Man.positon

3. Attach the handle by pressing it to the changeover switch panel until it clicks into place.You can attach the handle in all position(I,O,II),see Figure 5-3.

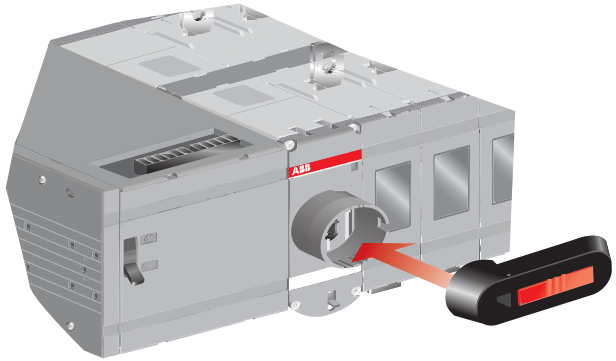


Figure 5-3 Attaching the handle

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

4.Operate the motorized change-over switch by turning the handle to the required position(I,O,II).

6. OTM_C_D controller

OTM_C_D controller must be disconnected from the main circuit during the insulation test.

Base on difference function configuration ,we have OTM_C10D and OTM_C11D for you to choose.

	under-voltage/ over-voltage transfer	phase loss transfer	delay time setting	refusing to preform alarm	phase loss alarm	under-voltage/ over-voltage alarm	N pole wrong connection alarm	fire fighting alarm	Auto Generator start
OTM_C10D	–	√	1.5s	√	√	–	√	√	–
OTM_C11D	√	√	threshold is adjustable *	√	√	√	√	√	√

* Threshold:0,3,5,10,15,20,30s

6.1 Interface

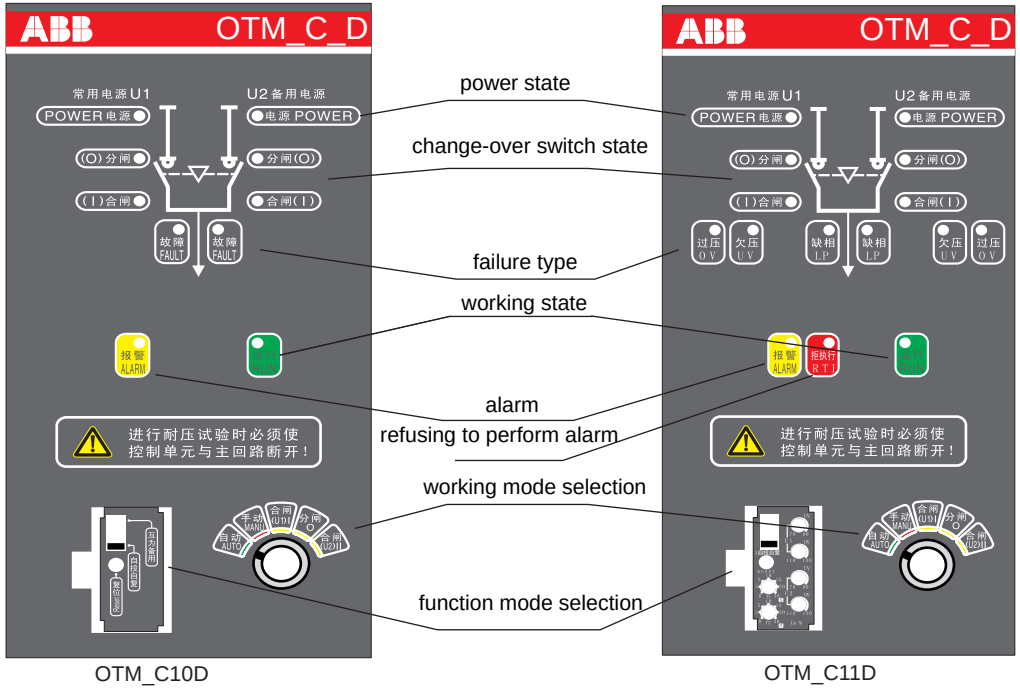


Figure 6-1 Interface

5.4.2 Locking the manual operation

By default,manual operation can only be locked to position O.Locking to position 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 Figure5-9.
(You can place 3 padlocks at most)

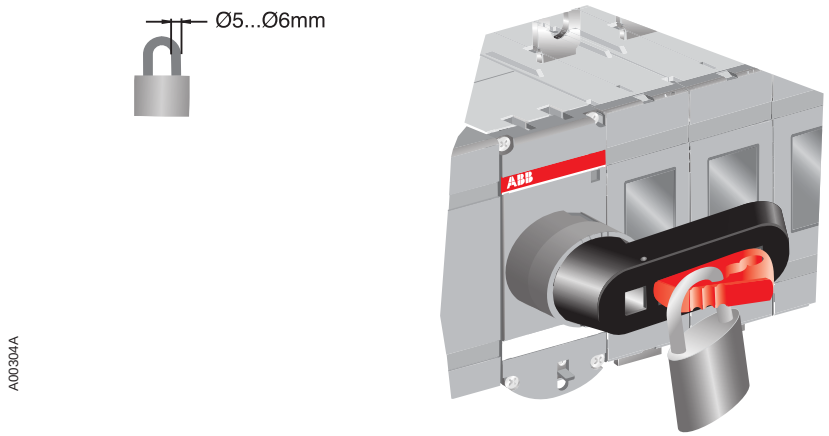


Figure 5-9 Locking the manual operation

The handle cannot be removed when padlocked to position O.

5.2 Electrical operating/Manual Mode

To operate the switch electrically:
1.Release the handle from the switch panel by pushing down the locking latch under the switch panel and pulling the handle off ,see Figure 5-4

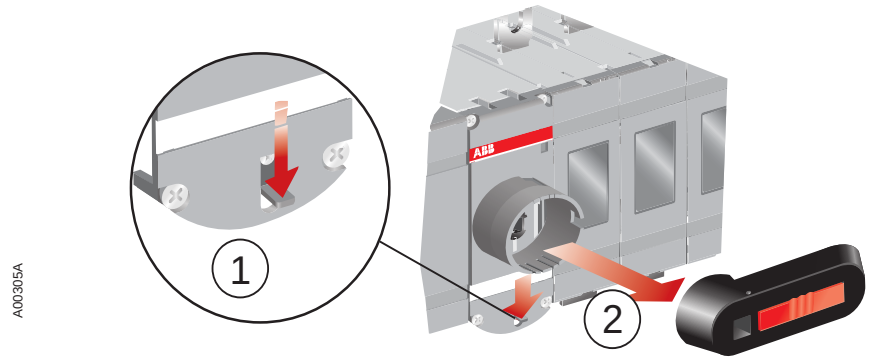


Figure 5-4 Release the handle

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 5-5.

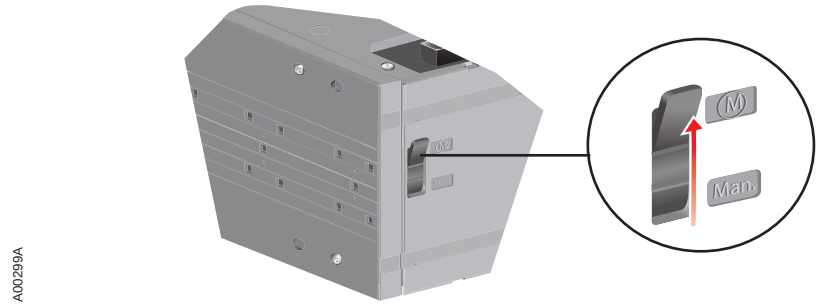
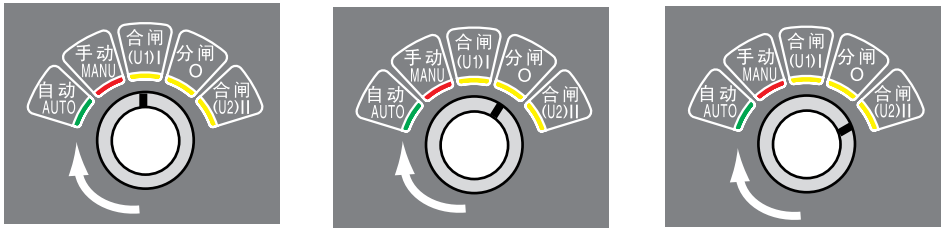


Figure 5-5 Motor/Manual selection switch in the Motor(M)position

3.Turn the right function position on the function selection interface what you need.



U1 close　　U1, U2 open　　U2 close

Figure 5-6 the function selection interface

When you adjust the knob,the setting will be effective after you keep the knob at the same position last more than 1 second.

5.3 Electrical operating/Automatic Mode

To operate the switch electrically:
1.Release the handle from the switch panel by pushing down the locking latch under the switch panel and pulling the handle off ,see Figuer 5-4

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

2.Turn the Motor/Manual selection switch to the Motor(M) position,see Figure 5-5.
3.Turn the knob to the Auto position ,see Figure5-7.

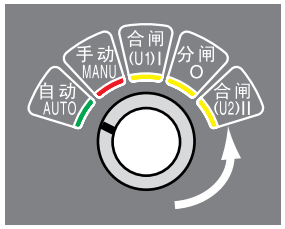


Figure 5-7 the function selection interface

4.OTM_C_D controller can automatically control the switch switching.

For more details about OTM_C_D control unit function and use , please see Section 6.

5.4 Locking

You can lock the OTM_automatic transfer switch to a specific position.

5.4.1 Locking the electrical operating

You can lock the electrical operation to all positions(I,0,II).
To lock electrical operation:
1.Pull up the locking latch under the switch panel.
2.Place the padlock under the latch,see Figure 5-8.

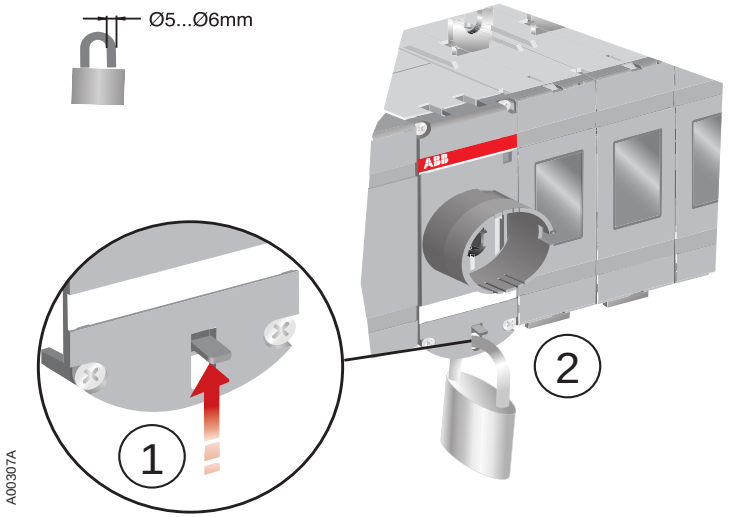


Figure 5-8 Locking the electrical operation

You cannot attach the handle when electrical control is locked.