Motorized switch-disconnectors OTM_
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1. Introduction

This manual describes the installation and the basic operation of the motorized switch-disconnectors, types 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_**: Motorized switch-disconnector, the type name
- **OME_**: Motor operator, the type name
- **OT_**: Switch-disconnector, the type name
- **OZXB_ and OZXA_**: Terminal clamp sets, the type name, accessories
- **OTS_**: Terminal shrouds, the type name, accessories
- **OA_**: Auxiliary contacts, the type name, accessories
- **OTVS_**: Mounting accessory for handle and spare fuse storing, the type name, accessories
- **OTB_**: Phase barriers, the type name, accessories
2. Product overview

Motorized switch-disconnectors (type OTM) are suitable for remote control. You can operate the motorized switch-disconnectors 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 switch-disconnectors consist of the switch-disconnector and the motor operator.

Figure 2.1  Motorized switch-disconnector (type OTM)

1 Switch-disconnector  
2 Motor operator  
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 Operating the motorized switch-disconnector electrically; remote control

To operate the motorized switch-disconnector electrically:

1. Remove the handle from the switch panel. You can remove the handle in both positions (I or 0).
2. Turn the Motor/Manual selector to the Motor (M) position to enable electrical operate.

![Figure 3.1 Operating the motorized switch-disconnector electrically; remote control](image)

3.1.1 Locking electrical operation

To disable electrical operate, lock the locking latch with a padlock. After the locking latch has been locked, the motorized switch-disconnector cannot be operated electrically. You can lock electrical operation in both positions (I or 0).

![Figure 3.2 Locking electrical operation](image)
3.2 Operating the motorized switch-disconnector manually; local operation

To operate the motorized switch-disconnector 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 both positions (I or 0).

Figure 3.3 Operating the motorized switch-disconnector 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 switch-disconnector

Use protection against direct contact.

Figure 4.1 An example of using protection against direct contact
4. Installation

Installation and operating instructions, OTM_

Figure 4.2  Motorized switch-disconnectors, drilling hole distances / screw-mounting, [mm]
4.2 Dimensional drawings

Figure 4.3 OTM160-250E_M

Figure 4.4 OTM200U_M
4. Installation

Figure 4.5 OTM315-400E_M

Figure 4.6 OTM400U_M
Figure 4.8  OTM600U_M

Figure 4.7  OTM630-800E_M
4. Installation

Figure 4.9  OTM1000-1250E_M

Figure 4.10  OTM800-1200U_M
Figure 4.11  OTM1600E_M

Figure 4.12  OTM1600U_M
Figure 4.13  OTM2000-2500E_M
4.3 Mounting positions

Do not install the motorized switch-disconnectors in any other position than those described above.

4.4 Labelling

Figure 4.15  Labelling of the motorized switch-disconnectors
5. Connecting

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

5.1 Control circuit

Figure 5.1  Motorized switch-disconnector terminals
1. Terminal for motor operator voltage supply
2. Control terminal for push buttons or selector switch
3. Terminal 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, if the voltage is connected. There may be still dangerous external control voltages inside the motorized switch-disconnector even if the voltage is turned off.

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

Exercise sufficient caution when handling the unit.

6.1 Electrical operation

The motorized switch-disconnectors are available for remote control.

To operate the motorized switch-disconnector 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.

![Figure 6.1 Releasing the handle](image)

Electrical operation 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.

![Image of Motor/Manual selection switch in the Motor (M) position](image)

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

3. Operate the motorized switch-disconnector with the push-buttons or selector switch via impulse control or continuous control.

---

**6.1.1 Impulse control**

When using impulse control, the switch-disconnector is controlled by electric impulses. When you press the control button, the switch-disconnector is driven to the corresponding position (I or 0). The control impulse must last more than 100 ms to take effect. A new command cannot be given until the switch-disconnector has reached the position of the previous command. Figure 6.3 shows the operation of the switch-disconnector with impulse control.

![Impulse control diagram](image)

**Figure 6.3  Impulse 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.

---

If a new command is given before the switch has reached the position of the previous command, the fuse (F1) may operate.
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-disconnector is driven to the corresponding position (I or 0). The position will change only when the new command is given. Figure 6.4 shows the operation of the switch-disconnector 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.

![Continuous control diagram]

Figure 6.4 Continuous control

6.2 Manual operation using the handle

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

To operate the motorized switch-disconnector manually:

1. Turn the Motor/Manual selector to the Manual (Man.) position, see Figure 6.5. The motor operator is switched off and electrical operation is prevented.

![Motor/Manual selection diagram]

Figure 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, see Figure 6.6. You can attach the handle in both positions (I or 0).

![Figure 6.6 Attaching the handle](image)

3. Operate the motorized switch-disconnector by turning the handle to the required position (I or 0).

![Figure 6.7 Locking the electrical operation](image)

**6.3 Locking**

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

**6.3.1 Locking the electrical operate**

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

To lock electrical operation:

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

---

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

You cannot attach the handle when electrical operation is locked.
6.3.2 Locking the manual operation

By default, manual operation can only be locked to position 0. Locking to position I 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

![Figure 6.8 Locking the manual operation](image)

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)*.

<table>
<thead>
<tr>
<th>AUTO/PS</th>
<th>14</th>
<th>12</th>
<th>14</th>
<th>12</th>
<th>14</th>
<th>12</th>
<th>14</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11</td>
<td></td>
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<td></td>
<td>11</td>
<td></td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23</td>
<td></td>
<td>23</td>
<td></td>
<td>23</td>
<td></td>
<td>23</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>24</td>
<td></td>
<td>24</td>
<td></td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 6.9  Locking state information*
7. Technical data

7.1 Motor operator

<table>
<thead>
<tr>
<th>Motor operator, control circuit</th>
<th>Value</th>
<th>Cabling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operational voltage U [V]</td>
<td>220-240 Vac, 50-60Hz</td>
<td></td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>0,85... 1,1 x U</td>
<td></td>
</tr>
<tr>
<td>Operating angle</td>
<td>90° 0-I, I-0</td>
<td></td>
</tr>
<tr>
<td>Operating time</td>
<td>See Table 7-2</td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP 20, front panel</td>
<td></td>
</tr>
<tr>
<td>Rated impulse withstand voltage U_{imp}</td>
<td>4 kV</td>
<td></td>
</tr>
<tr>
<td>Voltage supply</td>
<td>PE N L</td>
<td>1,5 -2,5mm²</td>
</tr>
<tr>
<td>F2</td>
<td>Max. MCB 16A</td>
<td></td>
</tr>
<tr>
<td>Cable of the push-buttons (no SELV)</td>
<td>C 10</td>
<td>1,5 -2,5mm²</td>
</tr>
<tr>
<td>Maximum cable length</td>
<td>100 m</td>
<td></td>
</tr>
<tr>
<td>State information of locking (no SELV)</td>
<td>11-12-14 (C/O)</td>
<td>1,5 -2,5mm²</td>
</tr>
<tr>
<td>Locking motor operator</td>
<td>23-24 (NO)</td>
<td>1,5 -2,5mm²</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-25... +55 °C</td>
<td></td>
</tr>
<tr>
<td>Transportation and storage temperature</td>
<td>-40... +70 °C</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>Max. 2000m</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.1 General technical data of motor operators

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage U_e [V]</th>
<th>Nominal current I_n [A]</th>
<th>Current inrush I_{inrush} [A]</th>
<th>Operating time I-0, 0-I, [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM160...250_</td>
<td>220-240Vac</td>
<td>0,3</td>
<td>1,5</td>
<td>0,5 - 1,0</td>
</tr>
<tr>
<td>OTM315...400_</td>
<td>220-240Vac</td>
<td>0,5</td>
<td>2,5</td>
<td>0,5 - 1,0</td>
</tr>
<tr>
<td>OTM600...800_</td>
<td>220-240Vac</td>
<td>0,9</td>
<td>4,0</td>
<td>0,5 - 1,5</td>
</tr>
<tr>
<td>OTM1000...1600_</td>
<td>220-240Vac</td>
<td>1,4</td>
<td>10</td>
<td>1,0 - 2,0</td>
</tr>
<tr>
<td>OTM2000...2500_</td>
<td>220-240Vac</td>
<td>1,4</td>
<td>10</td>
<td>1,0 - 2,0</td>
</tr>
</tbody>
</table>

* Under nominal conditions

Table 7.2 Specified technical data of motor operators

7.2 State information

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handle attached or motor operator locked</td>
<td>11-12-14 (C/O): 5A, AC-1 / 250V</td>
</tr>
<tr>
<td>Locking motor operator</td>
<td>23-24 (NO): 5A, AC-1 / 250V</td>
</tr>
<tr>
<td>SCPD</td>
<td>Max. MCB C2A</td>
</tr>
</tbody>
</table>

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 Terminal shrouds

Figure 8.2 Mounting of the terminal shrouds (type OTS\(_{\_}\)) to the motorized switch-disconnectors OTM160-800E\(_{\_}\).
Figure 8.3 Mounting of the terminal shrouds (type OTS_) to the motorized switch-disconnectors OTM1000-1600E_ and OTM800U-1200U_.
Figure 8.4  Mounting of the terminal shrouds (type OTS_) to the motorized switch-disconnectors OTM2000-2500E_ and OTM1600U_
8.3 Auxiliary contacts

8.3.1 Mounting of auxiliary contacts

Figure 8.5  Mounting of auxiliary contacts, type OA_ on the right side of the switch-disconnector
8.3.2 Mounting of Test auxiliary contacts

Figure 8.6  Optional extra; Test auxiliary contacts can be mounted on the switch mechanism, first remove the mechanism cover as shown in the figure

Never open any covers on the product, if the voltage is connected. There may be dangerous external control voltages inside the motorized switch fuse even if the voltage is turned off.
### Figure 8.7 Mounting of the Test auxiliary contacts, type OA_ on the switch mechanism

<table>
<thead>
<tr>
<th>OTM180-250E_</th>
<th>OTM200U_</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM315-400E_</td>
<td>OTM400U_</td>
</tr>
<tr>
<td>OTM600U_</td>
<td>OTM800U_</td>
</tr>
<tr>
<td>OTM1000-1600E_</td>
<td>OTM1600U_</td>
</tr>
<tr>
<td>OTM2000-2500E_</td>
<td>OTM1600U_</td>
</tr>
</tbody>
</table>

- Main contact
- Test contact (NC)
- Test indication contact (NC)
- Test contact (NC)
- Test indication contact (NC)

![Diagram of mounting of Test auxiliary contacts](image)
Figure 8.8  Closing the mechanism cover after the mounting of the Test auxiliary contacts on the switch mechanism
8.4 Handle and spare fuse storage

Figure 8.9 Handle and spare fuses can be stored on the motorized switch-disconnector by mounting the accessory OTVS.
### 9. UL standard switches

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

<table>
<thead>
<tr>
<th>Current</th>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM200U</td>
<td>200 A</td>
<td>406 mm/16 in</td>
<td>255 mm/10 in</td>
</tr>
<tr>
<td>OTM400U</td>
<td>400 A</td>
<td>600 mm/24 in</td>
<td>350 mm/14 in</td>
</tr>
<tr>
<td>OTM600U</td>
<td>600 A</td>
<td>600 mm/24 in</td>
<td>700 mm/28 in</td>
</tr>
<tr>
<td>OTM800U</td>
<td>800 A</td>
<td>1220 mm/48 in</td>
<td>610 mm/24 in</td>
</tr>
<tr>
<td>OTM1200U</td>
<td>1200 A</td>
<td>700 mm/28 in</td>
<td>900 mm/36 in</td>
</tr>
<tr>
<td>OTM1600U</td>
<td>1600 A</td>
<td>1200 mm/47 in</td>
<td>750 mm/30 in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable size</th>
<th>A</th>
<th>B</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM600-800U</td>
<td>0</td>
<td>13 mm/0,5 in</td>
<td>13 mm/0,5 in</td>
</tr>
<tr>
<td>OTM800-1200U</td>
<td>0</td>
<td>13 mm/0,5 in</td>
<td>36 mm/1,4 in</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable size</th>
<th>Cable size</th>
<th>Cable size</th>
<th>Cable size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OTM200U</strong></td>
<td><strong>OTM400U</strong></td>
<td><strong>OTM600U-1200U</strong></td>
<td><strong>OTM1600U</strong></td>
</tr>
<tr>
<td>AWG</td>
<td>C</td>
<td>MCM</td>
<td>C</td>
</tr>
<tr>
<td>------</td>
<td>---</td>
<td>-----</td>
<td>---</td>
</tr>
<tr>
<td>4-3</td>
<td>100 mm/4 in</td>
<td>250</td>
<td>200 mm/8 in</td>
</tr>
<tr>
<td>2</td>
<td>100 mm/4 in</td>
<td>300</td>
<td>250 mm/10 in</td>
</tr>
<tr>
<td>1</td>
<td>100 mm/4 in</td>
<td>350</td>
<td>300 mm/12 in</td>
</tr>
<tr>
<td>2/0</td>
<td>150 mm/6 in</td>
<td>400</td>
<td>330 mm/13 in</td>
</tr>
<tr>
<td>3/0-4/0</td>
<td>175 mm/7 in</td>
<td>500</td>
<td>356 mm/14 in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>600</td>
<td>381 mm/15 in</td>
</tr>
</tbody>
</table>
9.1 Phase barriers

Phase barriers or shrouds (see section 8.2) must be used to maintain a clearance of 1 inch on the motorized switch-disconnector types: OTM600U_, if the conductors are wider than 39 mm /1,54 in (phase barrier 68838), on OTM800-1200U_, if the lugs are wider than 54 mm /2,13 in (phase barrier 68912) and on OTM1600U_, if the lugs are wider than 100 mm / 3,94 in (phase barrier 68912).

The types for the package of 6 barriers are: OTB800/6 and OTB1600/6.

Figure 9.2  
OTM600U_, OTM800-1600U_ and OTM1000-2500E_ mounting of phase barriers
The technical data and dimensions are valid at the time of printing. We reserve the right to subsequent alterations.