Automatic Transfer Switch OTM_C_20D

Installation and Operation Instructions
1 Symbols & Terms

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTM_C_20D</td>
<td>Automatic transfer switch, the type name</td>
</tr>
<tr>
<td>LN1-Switch I</td>
<td>Power supply line, e.g. the primary line</td>
</tr>
<tr>
<td>LN2-Switch II</td>
<td>Power supply line, e.g. the secondary line used in emergency cases</td>
</tr>
<tr>
<td>EMERG OFF (fire control system)</td>
<td>Used to drive the automatic transfer switch transfers to the “O” position when receiving EMRG OFF signal.</td>
</tr>
<tr>
<td>AUTO</td>
<td>Automatic mode</td>
</tr>
<tr>
<td>TEST</td>
<td>The switch performs &quot;switching cycle test&quot; as the pre-set program</td>
</tr>
</tbody>
</table>

Table 1 Explanations of abbreviations and terms
2  Product overview

2.1  Product overview and packing

The OTM_C20D automatic transfer switches can be used as a source transfer switch in a three-phase or single-phase networks. Monitored conditions are, no-voltage and phase-loss. You can operate the switch, either manually with the handle or automatically by the "AUTO" mode. The automatic operation modes include Line 1 priority, no line priority and manual back switching mode.

![Figure 1 OTM_C_20D automatic transfer switch](image)

1. Handle for manual operation 7. Locking latch for releasing the handle and locking electrical control
2. Place for auxiliary contact blocks 8. Locking clip for locking manual operation
4. Mimic panel 10. Connecting terminal
5. Voltage sensing connections
6. Locking clip for padlock

The standard package includes: 1. automatic transfer switch, 2.handle, 3.handle storage clip 4.terminal plug, 5.mounting kit
2.2 OTM_C_20D switching sequence

2.2.1 Line 1 Priority (default mode)

The switching sequence can be summarized in following steps:
- An fault occurs on Line 1 (LN1), while Line 2 (LN2) functions normally
- Change-over switch (Switch I) to the position 0
- Change-over switch (Switch II) to the position II

And the back switching sequence can be summarized in the following steps:
- The Line 1 will start the normal functioning
- Change-over switch (Switch II) to the position 0
- Change-over switch (Switch I) to the position I

![Figure 2 Automatic Switching Sequences in OTM_C_20D, Line 1 priority](image)

2.2.2 No line priority

The switching sequence can be summarized in following steps:
- An fault occurs on Line 1 (LN1), while Line 2 (LN2) functions normally
- Change-over switch (Switch I) to the position 0
- Change-over switch (Switch II) to the position II

And the back switching sequence can be summarized in the following steps:
- The Line 1 will start the normal functioning
- Change-over switch stays in position II
- An anomaly occurs on the Line 2 (LN2)
- Change-over switch (Switch II) to the position 0
- Change-over switch (Switch I) to the position I

![Figure 3 Automatic Switching Sequences in OTM_C_20D, No line priority](image)
### 3 Quick start

#### 3.1 Operating the switch manually (local operation)

To operate the switch manually:

1. Attach the handle to the switch panel. You can attach the handle in any position.
2. When the handle is attached, the automatic transfer switch will automatically be in Manual mode and won’t operate automatically in case of line failure. The AUTO LED on the mimic panel is OFF.

![Operating the switch manually](Figure_4_Operating_the_switch_manually.jpg)

<table>
<thead>
<tr>
<th><strong>Tip</strong></th>
<th>When the handle is inserted into the switch, the switch will enter &quot;manual mode&quot; with the automatic operation disabled.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Warning</strong></td>
<td>Do not adjust wires when the transfer switch is being energized.</td>
</tr>
<tr>
<td><strong>Tip</strong></td>
<td>Before the power-on operation of the transfer switch, please operate the switch manually to confirm it is in normal function.</td>
</tr>
<tr>
<td><strong>Tip</strong></td>
<td>With the power supply function in “normal” and without the handle inserted and EMRG OFF signals, the initially energized switch will enter automatic mode and transfer to the main line. Keep the handle inserted if you do not want the switch to be in automatic mode upon initial energization.</td>
</tr>
</tbody>
</table>
3.2 Automatic operation

OTM_C_20D must be in automatic mode and the "AUTO" LED is on in order that the switch can perform automatic transfer cycles according to the pre-set operating mode.

To operate the switch electrically:

1. If the handle inserted,
   1. Press handle locking clip and remove the handle from the switch.
   2. Press "AUTO" button and the "AUTO" LED will be ON, indicating automatic mode.

2. If handle is not inserted
   1. If "AUTO" LED blinks or OFF, press "AUTO" button and the "AUTO" LED will be ON, indicating automatic mode.
   2. Automatic operation includes two operating modes: Line 1 priority (factory default setting) and No line priority.

Figure 5 Selecting the automatic transfer OTM_C_20D switch to Auto mode
3.3 Local test operation

In automatic mode, "AUTO" LED is ON and you can press the “TEST” button on the panel to lead it to "TEST" mode:

Operation sequences:
1. Ensure switch in "AUTO" mode
2. Press the “TEST” button and the Auto LED will blink, indicating the activation of "TEST" mode.
   Under "TEST" mode, the automatic transfer switch will transfer by one cycle and finally return to its original position.
   e.g., when the switch is in Position I:
   Press the "TEST" button; the switch transfers to Position "O"→ to Position "II"→ to Position "O"→ to Position "I". During process, pressing the "TEST" button again will be invalid until it returns to its original position.
   During "TEST" process, press the "AUTO" button will cancel "TEST" mode and return to "AUTO" mode.

3. After test, press "AUTO" button to return the automatic operation.

![Figure 6 Local test of OTM_C_20D]

- In the test sequence, the main power supply circuit will be closed.
- If the test sequence is interrupted due to power failure, the automatic transfer switch will enter "automatic mode" after power recovery.
3.4 Locking

3.4.1 Locking the electrical operation

The switch can be padlocked in any position, causing that all operating modes and test operations are disabled and handle cannot be inserted. See below for operation:

![Figure 7 Locking the electrical operation](image)

3.4.2 Locking the manual operation

By default, the manual operation can only be locked in position 0. The handle can be padlocked by pulling out the clip from the handle and place the padlock on the handle.

![Figure 8 Locking the manual operation](image)
4 Interface and Settings

4.1 Buttons

AUTO button
It can lead you to "AUTO" mode. When the switch is in “Test” or fault status, you can press the "AUTO" button until the "Auto" LED on.

TEST button
It can lead you to "TEST" mode. First you must on "AUTO" mode, then you can press the "TEST" button while the "Auto" LED blinking. You must press the “AUTO” button after the test is complete.

4.2 LEDs

<table>
<thead>
<tr>
<th>LED</th>
<th>Display</th>
<th>Status description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN1/LN2</td>
<td>ON</td>
<td>Source available</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Overvoltage, undervoltage or phase loss</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Source not available</td>
</tr>
<tr>
<td>I/II</td>
<td>ON</td>
<td>Switch I or II closed</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Switch I or II open</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Switching failure.</td>
</tr>
<tr>
<td>Auto</td>
<td>ON</td>
<td>Transfer switch in automatic mode</td>
</tr>
<tr>
<td></td>
<td>Blinking</td>
<td>Transfer switch in test mode or invalid setting</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Transfer switch in manual mode</td>
</tr>
<tr>
<td>EMRG OFF</td>
<td>ON</td>
<td>Receiving emergency signals</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>No emergency signals input</td>
</tr>
</tbody>
</table>

Table 2 LEDs
4.3 Dip switch setting

The DIP switch is used to set the working modes and poles of transfer switch.

![Figure 11 DIP switch](image)

<table>
<thead>
<tr>
<th>No.</th>
<th>Function</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2</td>
<td>Pole setting</td>
<td>01 10 11 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 poles 3 poles 4 poles Invalid setting</td>
</tr>
<tr>
<td>3</td>
<td>Mode setting</td>
<td>0 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No line priority Line priority LN1</td>
</tr>
</tbody>
</table>

*Table 3 DIP switch*

The 9-bit dip is used to control the switch for circuit testing, and the mismatch with the load power supply will result in testing and transfer failure. Therefore, carefully read this guide and set correct parameters based on the actual situation before using this product.

4.4 Terminal

EMRG OFF: Input the 24VDC EMRG OFF signals for at least 1s until the switch transfers to the EMRG OFF position and the EMRG OFF LED is on. At this time, the switch cannot enter the automatic or test mode and only handle operation is allowed. After the signal is canceled, press "AUTO" to quit EMRG OFF.

![Figure 12 EMRG OFF terminal](image)
## 5 Technical data

<table>
<thead>
<tr>
<th>Automatic transfer switch</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operational voltage $U_e$[V]</td>
<td>220<del>240 V AC 50</del>60 Hz</td>
</tr>
<tr>
<td>Operating voltage range</td>
<td>0.8~1.2 $U_e$</td>
</tr>
<tr>
<td>Error range of monitoring</td>
<td>±5%</td>
</tr>
<tr>
<td>Operating angle</td>
<td>90° ( O-I, I-O, O-II, II-O) 180° ( I-O-II, II-O-I)</td>
</tr>
<tr>
<td>Transfer time for contact</td>
<td>610 ms ± 10%</td>
</tr>
<tr>
<td>Transfer time for switch</td>
<td>2.5 s ± 10%</td>
</tr>
<tr>
<td>Output relay utilization category</td>
<td>3A,AC1,250V</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>Class B</td>
</tr>
<tr>
<td>Ingress Protection Rating</td>
<td>IP20, front panel</td>
</tr>
<tr>
<td>Rated impulse withstand voltage $U_{imp}$</td>
<td>8 kV (6 kV for control circuit, disconnect the power line of the control circuit before the dielectric voltage withstand test)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-25~55°C</td>
</tr>
<tr>
<td>Transportation and storage temperature</td>
<td>-40~70°C</td>
</tr>
<tr>
<td>Altitude</td>
<td>Max. 2000 m</td>
</tr>
</tbody>
</table>

*Table 4 Technical data*
6 Installation

6.1 Installation method

The switch can be installed using screws or a DIN rail. The fixed installation mode on the base board is as follows:

![Figure 13 Installation of OTM_C_20D, screw](image)

Figure 13 Installation of OTM_C_20D, screw

The DIN rail installation mode is as follows:
First pry out the latch with an appropriate tool, as shown in Fig. 13

![Figure 14 Installation of OTM_C_20D, DIN rail](image)

Figure 14 Installation of OTM_C_20D, DIN rail
After attaching the switch to the DIN-rail, push the latch back to lock it.

Figure 15 Installation of OTM_C_20D, DIN rail

⚠️ After attaching the switch to the DIN-rail, make sure you push the latch back to the lock position, otherwise the switch may fall off.
6.2. Installation dimensions

Figure 16 Dimensions
7. Optional accessories

7.1 Bridging bars

Number of conductors permitted to be clamped on the terminal ≤2.
Wire specification: 10-70mm², 8-00AWG

Figure 17 Bridging bars
7.2 Terminal shrouds

7.3 Auxiliary contact blocks

OA2G11 has two layers to provide a maximum of 4 NO + 4 NC auxiliary contacts.

OA2G11
Only suitable for 3-pole products
8. Maintenance and common troubleshooting

8.1 Maintenance

To ensure the operation reliability of switches, regular switching tests should be performed (once every 3 months) to confirm normal function.

8.2 Common troubleshooting

<table>
<thead>
<tr>
<th>No.</th>
<th>Fault Description</th>
<th>Fault Analysis</th>
<th>Troubleshooting Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power supply functioning normally, but LED not ON</td>
<td>Control unit power supply terminal not connected with switch wiring terminal</td>
<td>Check and connect the switch wiring terminal</td>
</tr>
<tr>
<td>2</td>
<td>Power supply LED functioning normally but &quot;AUTO&quot; LED OFF, or no response with &quot;AUTO&quot; button pressed</td>
<td>Handle not pulled out or electrical padlock not removed</td>
<td>Pull out the handle or remove the padlock, and then press the &quot;AUTO&quot; button</td>
</tr>
<tr>
<td>3</td>
<td>Transition failure in case of faulty power supply</td>
<td>1. Switch not operating in &quot;AUTO&quot; mode; 2. Both power supplies malfunctioning</td>
<td>Make sure the switch is working in &quot;AUTO&quot; mode; check and make sure both power supplies are not malfunctioning simultaneously;</td>
</tr>
<tr>
<td>4</td>
<td>EMRG OFF function failure</td>
<td>1. Check if the EMRG OFF signal is 24V DC; 2. Too short duration of EMRG OFF signal</td>
<td>Correctly switch on the EMRG OFF signal, which should only be 24V DC with the duration ≥ 1 s</td>
</tr>
<tr>
<td>5</td>
<td>AUTO LED blinking with all other LEDs OFF; No response from buttons</td>
<td>DIP switch for poles number of power supply set to &quot;00&quot;</td>
<td>Check if the DIP switch setup matches the phase number of switch power supply.</td>
</tr>
<tr>
<td>6</td>
<td>&quot;I&quot; or &quot;II&quot; LED blinking</td>
<td>Execution rejected during switching operation, thus expected result not achieved</td>
<td>Manually set the switch to Position &quot;O&quot;, and press the &quot;AUTO&quot; button to reset</td>
</tr>
</tbody>
</table>

Table 5 Troubleshooting
9. Appendix

9.1 Wiring diagram

Figure 20: Wiring Diagram
Read through this instruction book carefully before working on the switch, and keep this instruction book to hand for later reference.

The images provided in this instruction book are for illustration purposes only and may not match the actual product exactly.

This instruction book is subject to change for product updates without prior notice.