(4) Turn on the power of the power supply for BL.

(5) The OPC signal is output from the CN3 connector according to the operation of the BL-OPC screwdriver.

*For OPC signal output specifications and timing, refer to 4. OPC Signal Output Specifications.

4. OPC Signal Output Specifications

For the OPC signal output specifications, refer to Table 1. For the timing chart of the OPC signal output, refer to Figure 3.

*Do not use the device with any current exceeding the ratings of +30V and 10mA for each OPC signal output pin.

Table 1. OPC Signal Output Specifications

<table>
<thead>
<tr>
<th>Signal Name</th>
<th>CN3 Connector</th>
<th>Output Conditions</th>
<th>Output Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR signal</td>
<td>PIN4</td>
<td>Screwdriver forward rotation</td>
<td>Open collector output (Low active)</td>
</tr>
<tr>
<td>T-UP signal</td>
<td>PIN2</td>
<td>Screwdriver torque up</td>
<td></td>
</tr>
<tr>
<td>REV signal</td>
<td>PIN6</td>
<td>Screwdriver reverse rotation</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3 Timing Chart of the OPC Signal Output

1. Screwdriver Forward Rotation Operation and Torque up Operation
(1) Start lever ON. → FOR signal output 0V
(Screwdriver forward rotation)

(2) Screwdriver torque up. → T-UP signal output 0V, output for 50ms.
(Screwdriver stop)

* The FOR signal is linked with the T-UP signal and cannot be automatically turned off.

(3) Start lever OFF. → FOR signal output +24V.

2. Screwdriver Reverse Rotation Operation
(1) Start lever ON. → REV signal output 0V
(Screwdriver reverse rotation)

• Because there is no torque up during reverse rotation, the T-UP signal is turned off and the output becomes +24V.

(2) Start lever OFF. → REV signal output +24V.
(Screwdriver stop)

5. Accessories

(1) Instruction Manual (1 copy)
(2) Brackets (2 pcs)
(3) OPC signal plug (1 pc)
(4) 5P screwdriver cord [for power supply connection] <1.5m> (1 pc)

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1. Overview of the Device

The BLOP-AF Relay Box has been developed to easily extract the OPC signals that indicate the forward rotation, reverse rotation, and torque up of a BL-OPC screwdriver to allow other external devices to make use of the signals.

In addition, to facilitate the use of the OPC signal by external devices, the device converts the +30V, which is the rated voltage of BL series screwdrivers, to +24V by using a regulator and outputs it to the CN3 connector, the same output location as the OPC signal.

2. Precautions about Usage

Be aware that using the device without following these instructions may result in a malfunction of or breakdown with the device and its power supply and screwdriver.

(1) Correctly connect the BL-OPC screwdriver and the power supply for BL to the specified connectors of the device. Wrong connection may result in malfunction or breakdown.

(2) Do not directly connect the +24V pin of the CN3 connector or the external +24V power supply to the OPC signal pins of the CN3 connector.

(3) Set the speed selector switch of the power supply for BL to HI. If it is used at LOW, the output voltage of the +24V pin of the CN3 connector decreases accordingly, resulting in a malfunction.

(4) Do not overload to the BL-OPC screwdriver. If the +30V voltage of the power supply for BL decreases to +25V or lower due to overloading, the voltage at the +24V pin of the CN3 connector decreases accordingly, resulting in a malfunction.

(5) If an external device requires a constant voltage of +24V without being affected by overloading, prepare a separate external power supply for the external output circuit.

(6) Do not use the +24V output of the CN3 connector for any purpose other than for the OPC signal. Otherwise, overcurrent will flow through the internal circuit of the BL-OPC screwdriver, resulting in a breakdown. Other unspecified usage will affect the screwdriver's tightening performance or result in a malfunction.

(7) Avoid any usage in which the ratings of +30V and 10mA will be exceeded for each OPC signal pin of the CN3 connector. Overcurrent will result in a malfunction of or breakdown with the device and the BL-OPC screwdriver.

(8) Do not directly connect external devices in which noise may occur, such as relays, motors, buzzers, and lamps, to the OPC signal pins of the CN3 connector. Drive noise or overcurrent from external devices will result in a malfunction of or breakdown with the device and the BL-OPC screwdriver. If external devices in which noise may occur need to be connected, mount noise suppression components such as photo couplers and diodes with reference to Examples 5 and 6 in Figure 2, and carefully confirm the effectiveness before use.

3. How to Use the Device

(1) Connect the device with the BL-OPC screwdriver and the power supply for BL using a screwdriver cord, as shown in Figure 1.

(2) Connect external devices to the CN3 connector of the device.

(3) Set the speed selector switch of the power supply for BL to HI.
Reference: Internal Circuit for the OPC Signal Output of the BL-OPC Screwdriver

Example 1: Voltage output circuit (with an internal power supply)

Example 2: Voltage output circuit (with an external power supply)

Example 3: Current output circuit (with an internal power supply)

Example 4: Current output circuit (with an external power supply)

Example 5: Relay output circuit (with an internal power supply)

Example 6: Relay output circuit (with an external power supply)

Note 1: Do not directly connect the +24V pin of the CN3 connector or the external +24 power supply to the OPC signal pins of the CN3 connector. Otherwise, overcurrent will flow through the internal circuit of the BL-OPC screwdriver, resulting in a breakdown. Please be careful about this.

Note 2: Select the resistance value for each OPC signal pin such that the ratings of +30V and 10mA will not be exceeded.

Note 3: If an external device in which noise may occur needs to be connected, mount noise suppression components such as photo couplers and diodes, and carefully confirm the effectiveness before use.

Power supply for BL

T-30BL (Discontinued model)*
T-45BL
T-70BL

*1 Only for BL-2000-OPC Series
*2 If it is used at LOW, the output voltage of the +24V pin of the CN3 connector decreases accordingly. Please be careful about this.

External device

• Be sure to use an external output circuit. (Refer to Figure 2)