Two-hand control unit

Requirement class IIIC, EN 574
P2HZ X1

Unit features
- Positive-guided relay outputs:
  - 3 safety contacts (N/O), instantaneous
  - 1 auxiliary contact (N/C), instantaneous
- 2 semiconductor outputs
- Connection options for:
  - 2 operator elements (buttons)
- LED indicator for:
  - Switch status channel 1/2
  - Supply voltage
- See order reference for unit types

Safety features
- Safety circuits in accordance with EN 60204-1

Unit Description
The two-hand control relay meets the requirements of EN 574 Type IIIC. It forces the operator to keep his hands outside the danger zone area during the hazardous movement. The unit is suitable for use on controllers for metalworking presses as a component for simultaneous switching.

It can be used in applications with:
- Mechanical presses (EN 692)
- Hydraulic presses (EN 693)

Approvals

<table>
<thead>
<tr>
<th>P2HZ X1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Block diagram
Two-hand control unit

**Requirement class IIIC, EN 574**
P2HZ X1

**Function description**
- The two-hand control relay must be activated by simultaneously pressing two buttons. If one or both of the buttons are released, the unit interrupts the control command for the hazardous movement.
- Reactivation: The output relays will not re-energise until both operator elements have been released and then re-operated simultaneously.

**Timing diagram**

- **Key**
  - POWER: Supply voltage
  - Button 1/Button 2: Input circuits S11-S12-S13, S21-S22-S23
  - Feedback loop: Feedback loop Y1-Y2
  - Output safe: Safety outputs 13-14, 23-24, 33-34
  - Output aux: Auxiliary contacts 41-42
  - Out semi RUN: Semiconductor output for operational readiness Y35
  - Out semi CH: Semiconductor output switch status Y32
  - t₀: Recovery time after power on
  - t₁: Simultaneity, channel 1 and 2
  - t₂: Operating cycle ended through button 1 or 2
  - t₃: Y1-Y2 must be closed before before the button is operated (recovery time)
  - Shaded area: Status irrelevant

- **Wiring**
  - Information given in the “Technical details” must be followed.
  - Outputs 13-14, 23-24, 33-34 are safety contacts, output 41-42 is an auxiliary contact (e.g. for display).
  - To prevent contact welding, a fuse should be connected before the output contacts (see technical details).
  - Calculation of the max. cable runs \( l_{\text{max}} \) in the input circuit:
    \[
    l_{\text{max}} = \frac{R_{\text{max}}}{R_{\text{l}}/\text{km}}
    \]
    \( R_{\text{max}} \) = max. overall cable resistance (see technical details)
    \( R_{\text{l}} / \text{km} \) = cable resistance/km
  - Use copper wire that can withstand 60/75 °C.
  - Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.

---

Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany
Phone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

NSG-D-2-078-01/05
Two-hand control unit

Requirement class IIIC, EN 574
P2HZ X1

Preparing for operation

- Supply voltage

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>AC</th>
<th>DC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1" alt="AC Diagram" /></td>
<td><img src="image2" alt="DC Diagram" /></td>
</tr>
</tbody>
</table>

- Input circuit

<table>
<thead>
<tr>
<th>Input circuit</th>
<th>Single-channel</th>
<th>Dual-channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-hand button with detection of shorts across contacts</td>
<td><img src="image3" alt="Single-channel Diagram" /></td>
<td><img src="image4" alt="Dual-channel Diagram" /></td>
</tr>
</tbody>
</table>

- Feedback loop

<table>
<thead>
<tr>
<th>Feedback loop</th>
<th>Single-channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contacts from external contactors</td>
<td><img src="image5" alt="Feedback Loop Diagram" /></td>
</tr>
</tbody>
</table>

- Semiconductor output

<table>
<thead>
<tr>
<th>Semiconductor output</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6" alt="Semiconductor Output Diagram" /></td>
</tr>
</tbody>
</table>

- Key

<table>
<thead>
<tr>
<th>Key</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S1/S2</td>
<td>Two-hand button</td>
</tr>
</tbody>
</table>
Two-hand control unit

Requirement class IIIC, EN 574
P2HZ X1

Terminal configuration

Installation

- The safety relay should be installed in a control cabinet with a protection type of at least IP54.
- Use the notch on the rear of the unit to attach it to a DIN rail.
- Ensure the unit is mounted securely on a vertical DIN rail (35 mm) by using a fixing element (e.g. retaining bracket or an end angle).

Notice

The distance of the button connected to the two-hand relay from the nearest danger zone must be large enough that if one of the buttons is released, the dangerous moment is interrupted before the operator can reach into the danger zone (see EN 999 “The positioning of protective equipment in respect of approach speeds of parts of the human body”).

Dimensions
**Two-hand control unit**

**Requirement class IIIC, EN 574**

P2HZ X1

---

**Notice**

This data sheet is only intended for use during configuration. For installation and operation, please refer to the operating instructions supplied with the unit.

---

**Technical details**

### Electrical data

- **Supply voltage U_B AC**: 24 V, 42 V, 48 V, 110 V, 115 V, 120 V, 230 V, 240 V
- **Supply voltage U_B DC**: 24 V, 26 V
- **Voltage tolerance**: -15% / +10%
- **Power consumption at U_B AC**: 6.0 VA
- **Power consumption at U_B DC**: 2.5 W
- **Frequency range AC**: 50 - 60 Hz
- **Residual ripple DC**: 10%
- **Voltage and current at input circuit: 24 VDC**
  - N/O contact: 30 mA
  - N/C contact: 20 mA
  - feedback loop: 24 VDC
  - output contacts in accordance with **EN 954-1, Category 4**
    - Safety contacts (N/O): 3
    - Auxiliary contacts (N/C): 1

#### Utilisation category of safety contacts in accordance with **EN 60947-4-1**

<table>
<thead>
<tr>
<th>AC1: 240 V</th>
<th>DC1: 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{min}: 0.01 A, I_{max}: 5.0 A</td>
<td>P_{max}: 1250 VA</td>
</tr>
</tbody>
</table>

#### Utilisation category of safety contacts in accordance with **EN 60947-5-1**

<table>
<thead>
<tr>
<th>AC15: 230 V</th>
<th>DC13 (6 cycles/min): 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{max}: 2.5 A</td>
<td>I_{max}: 1.5 A</td>
</tr>
</tbody>
</table>

#### Utilisation category of auxiliary contact in accordance with **EN 60947-4-1**

<table>
<thead>
<tr>
<th>AC1: 240 V</th>
<th>DC1: 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{min}: 0.01 A, I_{max}: 2.0 A</td>
<td>P_{max}: 500 VA</td>
</tr>
</tbody>
</table>

#### Utilisation category of auxiliary contact in accordance with **EN 60947-5-1**

<table>
<thead>
<tr>
<th>AC15: 230 V</th>
<th>DC13 (6 cycles/min): 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_{max}: 2.0 A</td>
<td>I_{max}: 1.5 A</td>
</tr>
</tbody>
</table>

#### Contact material

AgSnO\textsubscript{2} + 0.2 \textmu m Au
Two-hand control unit

Requirement class IIIC, EN 574
P2HZ X1

---

**Electrical data**

- **External contact fuse protection for safety contacts**
  - (EN 60947-5-1)
  - Blow-out fuse, quick: 6 A
  - Blow-out fuse, slow: 4 A
  - Circuit breaker: 4 A, 24 VAC/DC, characteristic B/C

- **External contact fuse protection for auxiliary contact**
  - (EN 60947-5-1)
  - Blow-out fuse, quick: 4 A
  - Blow-out fuse, slow: 2 A
  - Circuit breaker: 2 A, 24 VAC/DC, characteristic B/C

- **Semiconductor outputs (short circuit proof)**
  - Blow-out fuse, quick: 24 V DC, 20 mA
  - Blow-out fuse, slow: 2 A
  - Circuit breaker: 2 A, 24 VDC, characteristic B/C

- **Max. overall cable resistance R_{max} per input circuit**: 14 Ohm

---

**Times**

- **Delay-on de-energisation**
  - (reaction time in accordance with EN 574)
  - N/O contact: 15 ms
  - N/C contact: 30 ms

- **Recovery time**: 250 ms

- **Simultaneity, channel 1 and 2**: Max. 500 ms

---

**Environmental data**

- **EMC**: EN 60947-5-1, EN 61000-6-2
- **Vibration in accordance with**: EN 60068-2-6
  - Frequency: 10 - 55 Hz
  - Amplitude: 0.35 mm
- **Climatic suitability**: EN 60068-2-78
- **Airgap creepage**: VDE 0110-1
- **Ambient temperature**: -10 - 55 °C
- **Storage temperature**: -25 - 85 °C

---

**Protection type**

- **Mounting (e.g. cabinet)**: IP54
- **Housing**: IP40
- **Terminals**: IP20

---

**Mechanical data**

- **Housing material**
  - Front: PPO UL 94 V0
  - Housing: ABS UL 94 V0
- **Max. cross section of external conductors with screw terminals**
  - 1 core, flexible: 0.20 – 4.00 mm²
  - 2 core, same cross section, flexible:
    - with crimp connectors, without insulting sleeve: 0.20 – 2.50 mm²
    - without crimp connectors or with TWIN crimp connectors: 0.20 – 2.50 mm²
- **Torque setting with screw terminals**: 0.60 Nm
- **Dimensions (H x W x D)**
  - with screw terminals: 87.0 mm x 45.0 mm x 121.0 mm
- **Weight**
  - 24 V: 380 g
  - 42 V: 385 g

---

**Order reference**

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
<th>Terminals</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2HZ X1</td>
<td>24 VAC</td>
<td>Screw terminals</td>
<td>774 330</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>42 VAC</td>
<td>Screw terminals</td>
<td>774 331</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>48 VAC</td>
<td>Screw terminals</td>
<td>774 332</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>110 VAC</td>
<td>Screw terminals</td>
<td>774 434</td>
</tr>
</tbody>
</table>

---

The standards current on 08/03 apply.

---

Pilz GmbH & Co. KG, Sichere Automation, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany

Telephone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: pilz.gmbh@pilz.de

NSG-D-2-078-01/05
Two-hand control unit

Requirement class IIIC, EN 574
P2HZ X1

<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
<th>Terminals</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2HZ X1</td>
<td>115 VAC</td>
<td>Screw terminals</td>
<td>774 435</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>120 VAC</td>
<td>Screw terminals</td>
<td>774 436</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>230 VAC</td>
<td>Screw terminals</td>
<td>774 438</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>240 VAC</td>
<td>Screw terminals</td>
<td>774 439</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>24 VDC</td>
<td>Screw terminals</td>
<td>774 340</td>
</tr>
<tr>
<td>P2HZ X1</td>
<td>26 VDC</td>
<td>Screw terminals</td>
<td>774 341</td>
</tr>
</tbody>
</table>