




## Requirement class IIIC, EN 574 P2HZ X1



Two-hand control unit for press controllers and safety circuits

### Approvals

	P2HZ X1
	◆
	◆
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### 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 circuits in accordance with EN 60204-1

### Safety features

The two-hand control relay meets the following safety requirements:

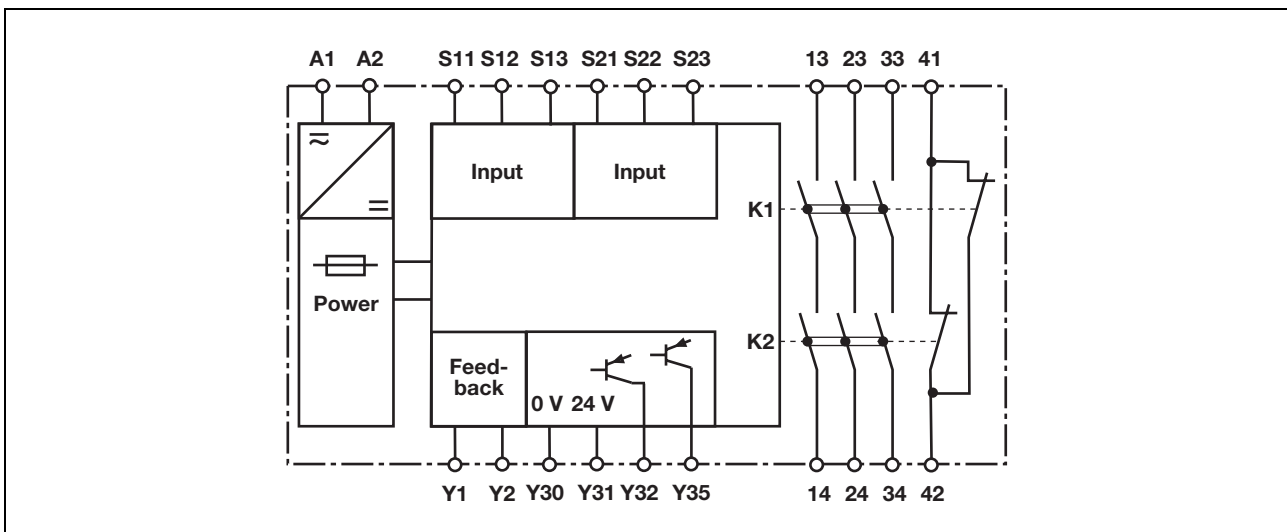
- ▶ The circuit is redundant with built-in self-monitoring
- ▶ The safety function remains effective in the case of a component failure
- ▶ The circuit prevents a further press stroke in the case of:
  - Relay failure
  - Contact welding
  - Coil defect on a relay
  - Open circuit
  - Short circuit

### 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)

### Block diagram



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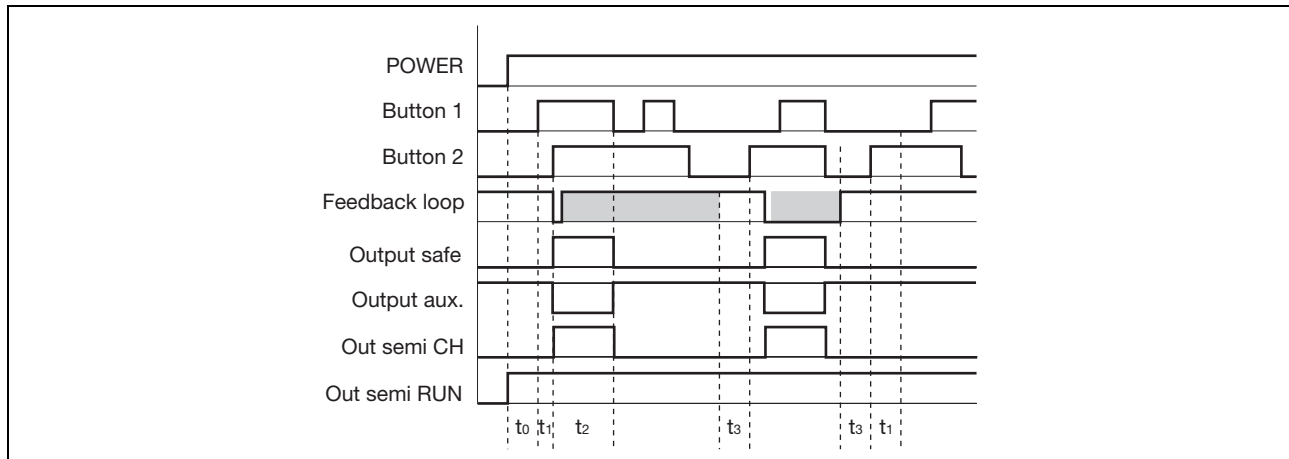
### Function description

- ▶ 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
  - ▶  $t_0$ : Recovery time after power on
  - ▶  $t_1$ : Simultaneity, channel 1 and 2
  - ▶  $t_2$ : Operating cycle ended through button 1 or 2
  - ▶  $t_3$ : Y1-Y2 must be closed before the button is operated (recovery time)
- Shaded area: Status irrelevant

### Wiring

Please note:

- ▶ 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  $I_{max}$  in the input circuit:

$$I_{max} = \frac{R_{I_{max}}}{R_l / km}$$

$R_{I_{max}}$  = max. overall cable resistance (see technical details)

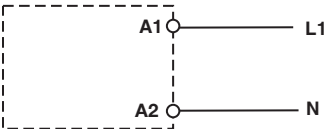
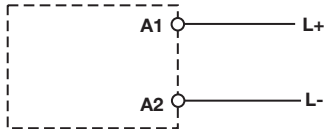
$R_l / km$  = cable resistance/km

- ▶ Use copper wire that can withstand 60/75 °C.
- ▶ Sufficient fuse protection must be provided on all output contacts with capacitive and inductive loads.


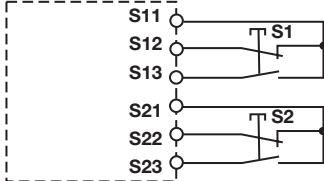
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### Preparing for operation

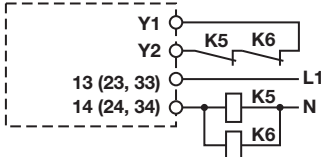
#### ▶ Supply voltage

Supply voltage	AC	DC
		

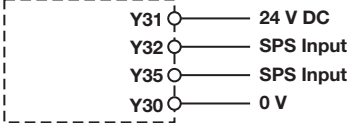
#### ▶ Input circuit

Input circuit	Single-channel	Dual-channel
Two-hand button <b>with</b> detection of shorts across con- tacts		

#### ▶ Feedback loop

Feedback loop	
Contacts from external contactors	

#### ▶ Semiconductor output

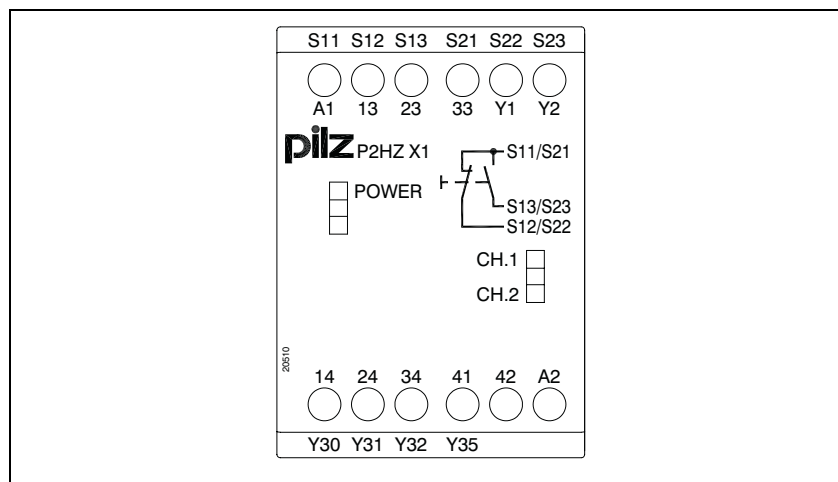

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#### ▶ Key

S1/S2	Two-hand button
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### Terminal configuration



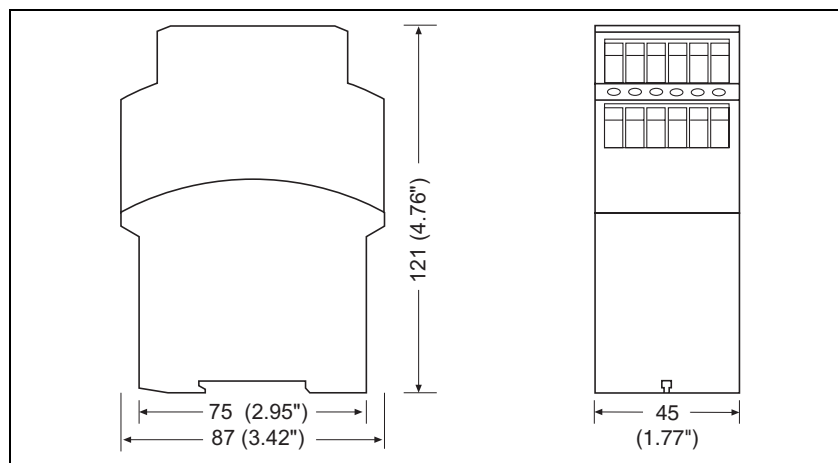
### Installation

- ▶ 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

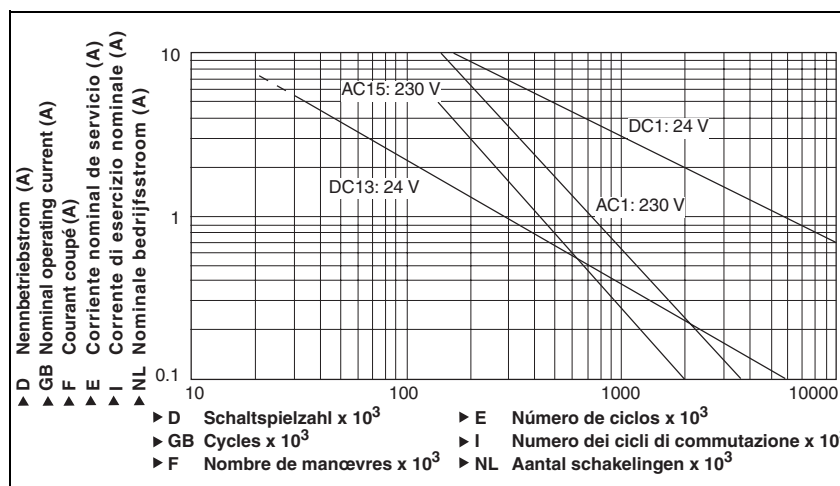


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### Notice

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

### Service life graph



### Technical details

#### Electrical data

Supply voltage $U_B$ AC	<b>24 V, 42 V, 48 V, 110 V, 115 V, 120 V, 230 V, 240 V</b>
Supply voltage $U_B$ DC	<b>24 V, 26 V</b>
Voltage tolerance	<b>-15 % / +10 %</b>
Power consumption at $U_B$ AC	<b>6.0 VA</b>
Power consumption at $U_B$ DC	<b>2.5 W</b>
Frequency range AC	<b>50 - 60 Hz</b>
Residual ripple DC	<b>10 %</b>
Voltage and current at input circuit: <b>24 VDC</b>	
N/O contact	<b>30 mA</b>
N/C contact	<b>20 mA</b>
feedback loop: <b>24 VDC</b>	<b>45 mA</b>
Output contacts in accordance with <b>EN 954-1, Category 4</b>	Safety contacts (N/O): <b>3</b> Auxiliary contacts (N/C): <b>1</b>
Utilisation category of safety contacts in accordance with <b>EN 60947-4-1</b>	
AC1: <b>240 V</b>	$I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>5.0 A</b> $P_{max}$ : <b>1250 VA</b>
DC1: <b>24 V</b>	$I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>5.0 A</b> $P_{max}$ : <b>125 W</b>
Utilisation category of safety contacts in accordance with <b>EN 60947-5-1</b>	
AC15: <b>230 V</b>	$I_{max}$ : <b>2.5 A</b>
DC13 (6 cycles/min): <b>24 V</b>	$I_{max}$ : <b>1.5 A</b>
Utilisation category of auxiliary contact in accordance with <b>EN 60947-4-1</b>	
AC1: <b>240 V</b>	$I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>2.0 A</b> $P_{max}$ : <b>500 VA</b>
DC1: <b>24 V</b>	$I_{min}$ : <b>0.01 A</b> , $I_{max}$ : <b>2.0 A</b> $P_{max}$ : <b>50 W</b>
Utilisation category of auxiliary contact in accordance with <b>EN 60947-5-1</b>	
AC15: <b>230 V</b>	$I_{max}$ : <b>2.0 A</b>
DC13 (6 cycles/min): <b>24 V</b>	$I_{max}$ : <b>1.5 A</b>
Contact material	<b>AgSnO<sub>2</sub> + 0.2 μm Au</b>

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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)	24 V DC, 20 mA
External supply voltage	24 V DC
Voltage tolerance	-15 % / +10 %
Max. overall cable resistance $R_{lmax}$ 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	
Housing	PPO UL 94 V0
Front	ABS UL 94 V0
Max. cross section of external conductors with screw terminals	
1 core flexible	0.20 - 4.00 mm <sup>2</sup>
2 core, same cross section, flexible:	
with crimp connectors, without insulating sleeve	0.20 - 2.50 mm <sup>2</sup>
without crimp connectors or with TWIN crimp connectors	0.20 - 2.50 mm <sup>2</sup>
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	380 g Order no.: 774330, 774331, 774332, 774434, 774435, 774436, 774438, 774439 285 g Order no.: 774340, 774341

The standards current on **08/03** apply.

Order reference			
Type	Features	Terminals	Order no.
P2HZ X1	24 VAC	Screw terminals	774 330
P2HZ X1	42 VAC	Screw terminals	774 331
P2HZ X1	48 VAC	Screw terminals	774 332
P2HZ X1	110 VAC	Screw terminals	774 434

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Type	Features	Terminals	Order no.	
P2HZ X1	115 VAC	Screw terminals	774 435	
P2HZ X1	120 VAC	Screw terminals	774 436	
P2HZ X1	230 VAC	Screw terminals	774 438	
P2HZ X1	240 VAC	Screw terminals	774 439	
P2HZ X1		24 VDC	Screw terminals	774 340
P2HZ X1		26 VDC	Screw terminals	774 341