

Characteristics

- Relay conforms to standards EN 574section III C and EN 60204-1 (1998)
- 2 positively-driven NO contacts
- Up to 230V supply voltage
- Dual channel activation
- Crossfault monitoring
- Optional with removable terminals

Two-hand relays are used to provide operator safety on power presses and punches. Both hands must be used to activate the machine, thus ensuring that the operator is outside the danger zone during the dangerous closing operation. All equipment used for two-hand operation must conform to the applicable standards and regulations (see overleaf).

Characteristics

The ZH 1/456 regulations require that the distance between the control switches and the components executing the dangerous closing movement must properly determined and strictly maintained. It is very important that the distance between the control switches of the two-hand switch and the danger zone is adequate to ensure full safety. If the operator releases even one of the switch elements of the two-hand switch the dangerous closing movement must be either interrupted or completed **before** the operator can reach the danger zone. Standard prEN999 provides the following general formula for calculation of the minimum safety distance:

$$S=K \times T+C$$

S: Minimum safety distance (mm) measured from the danger zone to the reference point, reference line or protection area

K: Constant (mm/s) derived from data on the approach speed of the body or body parts

T: Aggregate response time (s)

C: Additional distance (mm) based on the penetration into the danger zone before activation.



If machine-specific European standards require a safety distance different from that calculated on the basis of this standard the larger of the two values must be used as the minimum safety distance. ZH 1/457 requires that all upstream and downstream contactors and relays must be fitted with positively-driven contacts. The lockout device stipulated in section 3.7 must also be installed. When the device interrupts the control circuit must be disconnected from the power supply. The **F125** conforms to the following Trade Association requirements for two-hand switching devices:

- Verification of the operation of both control switches within max. 0.5s.
- Monitoring of the closing time of both control switches.
- Execution of the close command by means of self-monitoring circuitry.
- Verification of the contactors for press travel by means of an interlock on Y1-Y2.
- Press travel cannot be triggered by interruption of an external line, a short circuit in a control switch line or an internal relay malfunction (e.g. sticking of a relay contact).

Mode of Operation

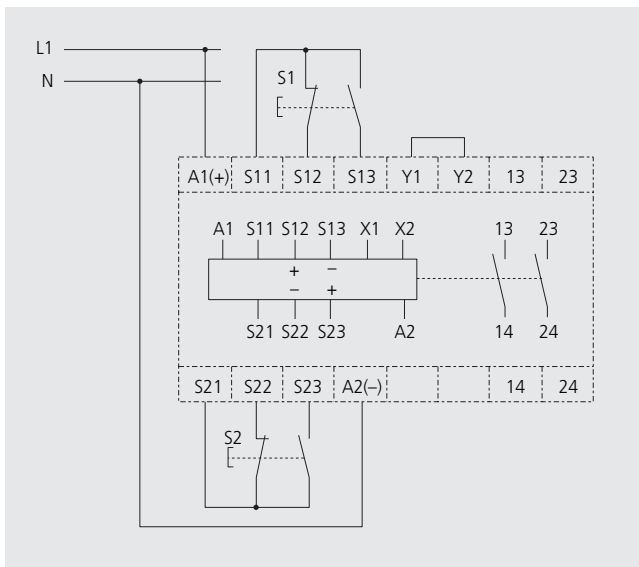
If both the two-hand control switches installed on the machine are activated within 0.5s the two NO contacts close the relay and activate the connected press. If either one or both of the two-hand control switches is released the two NO contacts open immediately, stopping the press movement.

If the period between operation of the two-hand control switches is greater than 0.5s the output contacts of the **F125** are not activated.

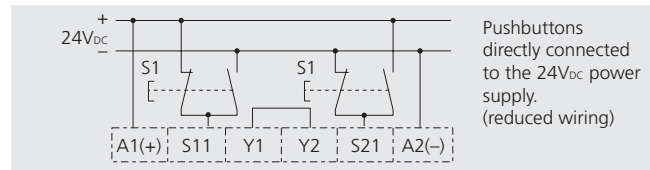
When this happens the **F125** will only execute the switching function after the operator has first released both the two-hand control switches. The operator must then activate both control switches as normal to activate the press.

Y1-Y2 are used to verify the functioning of the downstream contactors. One NC contact of each contactor must be connected in series to Y1-Y2. Those NC contacts should be suitable for low currents. No maintenance is required when the unit is used properly.

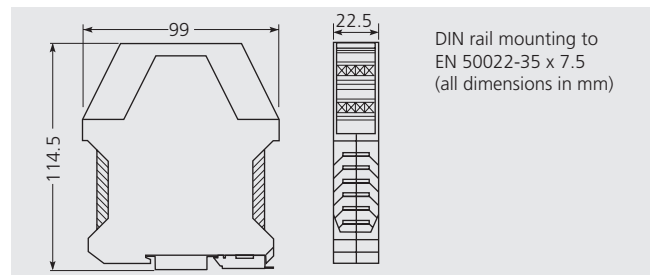
Wiring Diagram



Wiring Variation



Dimensional Diagram



Technical Data

Rated voltage	230 / 115 / 24VAc; 30 / 24Vdc
Voltage range	0.8 to 1.1 x rated voltage, (0.8 to 1 x at 30V type)*
Power consumption	Approx. 2W
Rated insulation voltage	250V
Creep distance and gaps	Overtension category III, Pollution level 2 to DIN VDE 0110-1 (04/97)
Test voltage	2.5kV
Ambient temperature	-5 °C to +55 °C
Mode of protection	Terminals IP 20, IP 40 casing to DIN VDE 0470-1
Switching capacity	250VAc; 1250VA / 24Vdc; 120W, preferably with spark arrest
Thermic current Ith	Max. 1 x 6A or 2 x 4A
Utilisation category	AC-15 250V 5A; DC-13 24V 3A
Response time	Approx. 20ms
Release time	Approx. 20ms
Recovery time	> 500ms
Load via hand- pushbutton contacts	N/O contacts 25V / 17mA N/C contacts 30V / 11mA
Output contacts	2 N/O safety contacts
Mechanical lifetime	10 ⁷ switching cycles
Switch material	AgSnO ₂ , 0.5 μ Au
Terminals	Terminal box with wire protection
Line cross section	2.5 mm ²
Control circuit	Approx. 24Vdc
Contact protection	Screwed-type fuse max. 6A slow blow Auto circuit breaker max. C10A quick break
Weight	260g; 24V type: 210g

Standards and Regulation

EN 292-1 (11/91)	Safety of Machines Terms, General
EN 292-2 (06/95)	Design Guidelines
EN 954-4 (03/97)	Safety of Machines Safety-relevant Control Device Components
EN 894-1 (04/97)	Safety of Machines Ergonomic Requirements for the Design of Displays and Actuators
EN 999 (12/98)	Safety of Machines Hand / Arm Speed
EN 1050 (01/97)	Safety of Machines Risk Evaluation
EN 602044 (11/98)	Safety of Machines Electrical Equipment of Machines
EN 574 (02/97)	Safety of Machines Two-hand Circuits
ZH 1/456 (02/78)	Trade Association Regulations [Berufsgenossenschaft]
ZH 1/457 (02/78)	Trade Association Regulations [Berufsgenossenschaft]
EN 692 (96)	Mechanical Presses Safety
EN 693 (95)	Hydraulic Presses Safety

Models and Ordering Data

Supply voltage	230VAc	115VAc	24VAc	24Vdc	30Vdc *
Type F125	Order-No.				
Fixed terminals	075 00015	075 00016	075 00017	075 00018	075 00019
Removable terminals	075 00032	075 00033	075 00034	075 00035	075 00036

* 30Vdc = Bridge rectifier supply, not filtered

