## Characteristics

- Relay conforms to standards EN 574section III C and EN 60204-1 (1998)2 positively-driven NO contacts
- Up to 230 V 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 twohand 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 x T+C

S: Minimum safety distance ( mm ) measured from the danger zone to the reference point, reference line or protection area
K: Constant ( $\mathrm{mm} / \mathrm{s}$ ) 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:
$\square$ Verification of the operation of both control switches within max. 0.5s.
$\square$ 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 Y1Y2.
- 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 0.5 s 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 0.5 s the output contacts of the F125 are not activated.
When this happens the $\mathbf{F} 125$ will only execute the switching function after the operator has first released both the twohand 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



Pushbuttons directly connected to the 24 V dc power supply. (reduced wiring)

## Dimensional Diagram



| Technical Data |  |
| :---: | :---: |
| Rated voltage | 230 / 115 / 24VAC; 30 / 24VDC |
| Voltage range | 0.8 to $1.1 \times$ rated voltage, ( 0.8 to $1 \times$ at $30 \mathrm{~V} \rightsquigarrow$ type)* |
| Power consumption | Approx. 2W |
| Rated insulation voltage | 250V |
| Creep distance and gaps | Overvoltage category III, Pollution level 2 to DIN VDE 0110-1 (04/97) |
| Test voltage | 2.5 kV |
| Ambient temperature | $-5^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$ |
| 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 lth | Max. $1 \times 6 \mathrm{~A}$ or $2 \times 4 \mathrm{~A}$ |
| 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 $25 \mathrm{~V} / 17 \mathrm{~mA}$ $\mathrm{N} / \mathrm{C}$ contacts $30 \mathrm{~V} / 11 \mathrm{~mA}$ |
| Output contacts | 2 N/O safety contacts |
| Mechanical lifetime | $10^{7}$ switching cycles |
| Switch material | $\mathrm{AgSnO}_{2}, 0.5 \mu \mathrm{Au}$ |
| Terminals | Terminal box with wire protection |
| Line cross section | 2.5 mm² |
| Control circuit | Approx. 24VDC |
| Contact protection | Screwed-type fuse max. 6A slow blow Auto circuit breaker max. C10A quick break |
| Weight | 260g; 24V type: 210 g |

Standards and Regulation

| EN 292-1 | Safety of Machines |
| :--- | :--- |
| (11/91) |  |
| EN 292-2 |  |
| (06/95) | Terms, General |
| Design Guidelines |  |

## Models and Ordering Data

| Supply voltage | 230VAC | 115 VAC | 24VAC | 24VDC | $30 \mathrm{Vdc} \mathrm{m}^{\text {* }}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Type F125 | Order-No. |  |  |  |  |
| Fixed terminals | 07500015 | 07500016 | 07500017 | 07500018 | 07500019 |
| Removable terminals | 07500032 | 07500033 | 07500034 | 07500035 | 07500036 |

