

## PNOZ e1p, PNOZ e4vp

### Guarding with the safety gate open, Category 3, EN 954-1

#### Features

- One Mayser SM/BK safety mat and one safety gate
- Dual-channel with detection of shorts across contacts
- 1 instantaneous load shutdown
- 1 load shutdown with a 0.15 s delay
- 1 logic connection

#### Description

##### Monitoring function

A safety gate monitors access to a machine with a potentially hazardous movement. A safety mat shuts down the machine as soon as the danger zone is accessed when the safety gate is open.

Opening the safety gate interrupts the input circuits on the PNOZ e1p; there is a low signal at safety outputs 14 and 24. Defined machine functions are shut down via contactors K37 and K38. If the safety mat is also activated, the input circuits on the PNOZ e4vp are short-circuited and there is a low signal at safety outputs 14 and 24. The potentially hazardous machine movement is shut down via contactors K39 and K40.

A delay time of 0.15 s is set for safety output 24 on the PNOZ e4vp by connecting feedback loop Y6 to A1 and Y7 to S11. Contactors K39 and K40 de-energise after a 0.15 s delay.

##### Feedback loop PNOZ e1p

N/C contacts K37 and K38 on the contactors are wired in series to the reset circuit. The feedback loop is tested during the start-up process. If one of the contacts K39 or K40 is open, the safety outputs will retain a low signal.

##### PNOZ e4vp

The unit has two feedback loops, one (Y6) for safety output 14 and one (Y7) for safety output 24. N/C contacts K39 and K40 on the contactors are connected to the feedback loop input Y7. Before safety output 24 is switched on, a test is carried out to check whether both N/C contacts K39 and K40 are closed, i.e. whether the contactors have de-energised. If one of the contacts is open, the safety outputs will retain a low signal. It will not be possible to restart the unit until the feedback loop is closed and the safety functions have been triggered.

If the signal at the safety outputs switches from high to low, the N/C contacts must close within a max. of 150 ms. If one contactor fails to de-energise, the

corresponding N/C contact will remain open; an error is detected and is displayed as a flashing pulse (1, 8 or 1,11). It will not be possible to switch the unit back on until the error has been rectified and the supply voltage has been switched off and then on again.

##### Reset

##### PNOZ e1p

If the safety gate and the feedback loop are closed, the unit can be started by pressing the reset button S1 (monitored reset).

##### PNOZ e4vp

If the safety mat has not been activated and the feedback loop is closed, the unit will be active (automatic reset).

## PNOZ e1p, PNOZ e4vp

### Guarding with the safety gate open, Category 3, EN 954-1

#### Safety assessment

- The PNOZelog relays and their respective contactors must be installed in a single location.
- A short circuit between 24 VDC and the input circuits (S11-S12, S21-S22) will be detected as an error. Safety outputs 14 and 24 will carry a low signal.
- PNOZ e1p: If a switch contact in the input circuit is overridden, this will be detected as an error the next time the affected PNOZelog is operated. Safety outputs 14 and 24 will carry a low signal.
- PNOZ e1p: Provided the PNOZelog is still ready for operation, rectifying a short circuit between 24 VDC and the reset circuit input S34 will lead to a high signal at safety outputs 14 and 24.
- PNOZ e1p: A short circuit between 24 VDC and a safety output will be detected and the safety outputs will carry a low signal. The load will therefore be switched off via the second safety output.
- PNOZ e4vp: An interruption to the input circuit (S11-S12, S21-S22) will be detected as an error. Safety outputs 14 and 24 will carry a low signal.
- PNOZ e4vp: A short circuit between 24 VDC and the logic inputs S35 or S36 will not affect the connection logic.
- PNOZ e4vp: A short between 24 VDC and a safety output will be detected as an error. However, it is not possible to shut down via the second safety output because both contactors are driven via safety output 24.

#### Pilz units

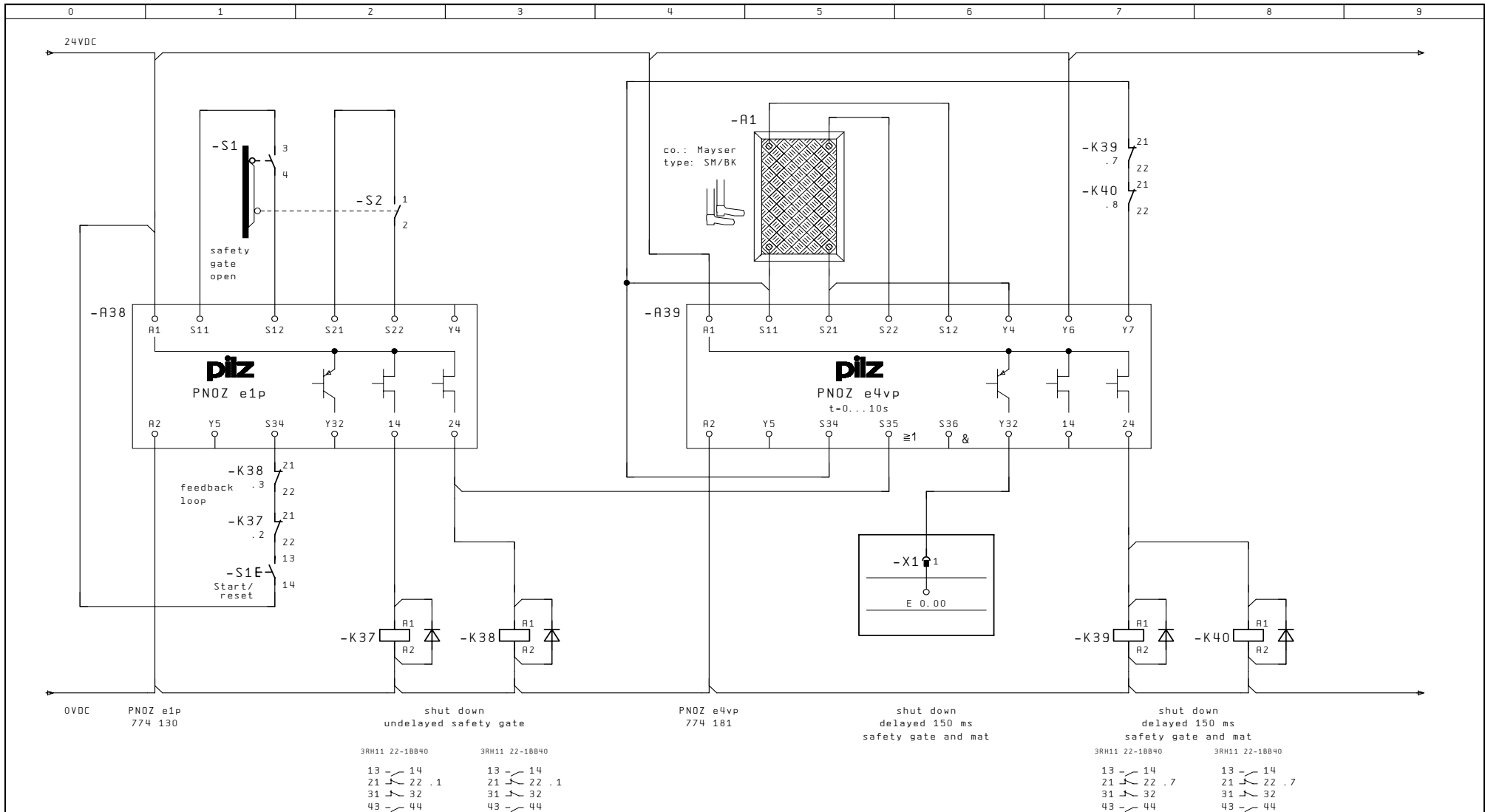
Number	Type	Features	Order number
1	PNOZ e1p	24 VDC	774 130
1	PNOZ e4vp	24 VDC	774 181

#### Products made by other manufacturers

Number	Designation	Manufacturer	Type
1	Safety mat	Mayser	SM/BK

#### Drawing file:

Page 24 in the project EPLAN4/Pilz/PNOZ0702



Revision	03.Sep.2003	Date	21.Jun.1999	safety mat application	Pilz GmbH & Co. Felix-Wankel-Str.2 73760 Ostfildern	safety gate and safety mat monitoring with PNOZ e4vp	Directory:
Name	CLE	Name	CLE				Eplan4/Pilz/Pnoz0702
		Dep.	CS	Category 3 EN 954-1			Page: 24