






User manual

AOS 4024 safety processing unit

**for 1 optoelectronic safety edge or
for 1 “TwinPro” pull-in protection
and/or pass door switch/secondary safety edge 8k2
operating voltage 24VAC**



Signs and symbols

-  This indication informs you of special features of the system.
 -  Background knowledge
 -  A recommendation for optimum procedure.
 -  Warning instructions please read them carefully and comply with them in all respects.
 -  Risk of fatal injuries if disregarded.
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Safety information

- The AOS safety processing unit complies with EN 954-1/category 3 requirements. Correct protective functioning requires fail-safe connection in the sequential process in accordance with relevant standards and regulations.
- The AOS safety processing unit may only be used on door installations.
- Safety information in the user manual must be complied with in all respects.
- Installation and electrical connection must only be carried out by expert personnel.
- Any switching device must be de-energized and checked for safe isolation from supply before working on it.
- The relevant standards and regulations, in particular EN 12453 (Doors Operational safety for power-operated doors - Requirements), must be observed during assembly, installation, commissioning, maintenance and repair.
- When connecting the optoelectronic safety edge, compliance with EN 12978 “Safety devices for power operated doors and gates” must be observed.
- The manufacturer accepts no liability for damages arising from incorrect operation or connection, failure to observe the user manual or a lack of maintenance and care.

AOS 4024 safety processing unit



- Safety category 3
- Processing for 1 optoelectronic safety edge or 1 "TwinPro" pull-in protection and/or processing for 8k2 pass door switches/secondary safety edge
- Signalling contact
- LED indicators

Functional description

The AOS 4024 safety processing units were developed to EN 12978 "Safety devices for power operated doors and gates".

The AOS 4024 does not only have a safety circuit for processing the optoelectronic safety edge or pull-in protection TwinPro, but also provides a 8k2-safety-circuit for pass door switches and secondary safety edges according to EN954-1 category 3.

These units thus offer a comprehensive high level of safety to category 3.

The output state at any time is indicated by LEDs.

Furthermore all safety processing units include a signalling contact, which closes when the optical safety edge or "TwinPro" pull-in protection is triggered, and opens again after approx. 1,5s.

Declaration of conformity $\text{C} \text{€}$



This device complies with the standards listed below:

EMC directive 2004/108/EEC
EN 61000-6-2 and EN 61000-6-4

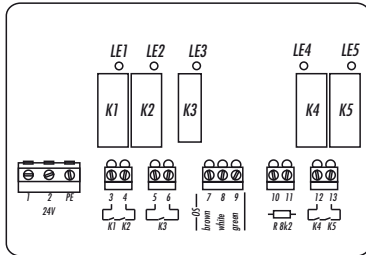
Low voltage directive 73/23/EEC
EN 60335-1


Safety devices for power operated doors and gates
EN 12978

Technical data

Power supply (1/2)		24VAC \pm 10%
Nominal frequency		50Hz \pm 10%
Power consumption		max. 6VA
Safety circuit relay (3/4) (12/13)		2 enabling circuits (NO contact), safety-related, positive-action, Protect externally with 4A time-lag fuse
		
Switching voltage		250VAC / 50VDC
Switching current		min. 10mA, max. 4A
Switching performance		The safety relay drops out max. 20ms after tripping and triggers again 1,5s after the optoelectronic safety edge is enabled.
Service life mech. switching cycles		50x10 ⁶
Service life electr. switching cycles		80x10 ³ at AC 15 (230VAC/4A) 50x10 ³ at DC 13 (24VDC/4A) Utilization category AC15/DC13 nach EN 60947-5-1
Signalling contact (5/6)		not a safety contact; must not be brought into safety circuit (protect externally with 4A time-lag fuse)
		
Switching voltage		250VAC / 50VDC
Switching current		min. 10mA, max. 4A
Switching performance		The signalling relay triggers 220ms after the optoelectronic safety edge trips and drops out again 1,5s later (wipe function).
Connection of opt. safety edge (7/8/9)		Terminal 7 = +12VDC / max. 50mA Terminal 8 = 0V / GND Terminal 9 = Changeover signal/input
Connection 8k2 processing (10/11)		Terminal 10 = Power supply Terminal 11 = Input 8k2 processing
Switching performance		The 8k2 safety relay drops out max. 25ms after detection of a short circuit or an interruption to terminals 10 and 11 (pass door switch/secondary safety edge) and triggers again 1,5s after the 8k2 circuit is restored.
Indicators		5 yellow LEDs, LE1 yellow lights up when K1 is triggered LE2 yellow lights up when K2 is triggered LE3 yellow lights up when K3 is triggered LE4 yellow lights up when K4 is triggered LE5 yellow lights up when K5 is triggered
Wire ranges		finely stranded 0.2-2.5mm ² solid 0.2-4.0mm ²
Degree of protection		IP 66 according to EN60529
Protection class		Basic insulation for 230VAC
Operating temperature		-25 to +55°C
Storage temperature		-25 to +65°C
Weight		0.65kg
Casing size		180x130x60mm

Location diagram

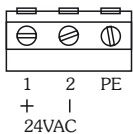


- 1+2 PE Power supply connection
- 3+4 Safety output for optoelectronic safety edge
- 5+6 Signalling contact
 -  The signalling contact is for transmitting information only and must not be brought into the safety circuit.
- 7+8+9 Connection, optoelectronic safety edge 1 or pull-in protection "TwinPro"
- 10+11 8k2 pass door switch and/or secondary safety edge in series
- 12+13 Safety output for pass door switch
- LE4 to LE5 Light up when associated relay trips

Connection scheme for power supply

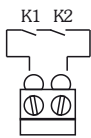


RISK OF FATAL INJURIES! - De-energize and check for safe isolation



If required, the protective conductors can be connected together under the PE terminal.

Safety output for optoelectronic safety edge



F=4A
time-lag fuse



The safety circuit for the optoelectronic safety edge must be provided with a back-up fuse to protect against contact welding.

The safety relay drops out max. 25ms after tripping (when it detects an obstacle) and triggers again 1s after the optoelectronic safety edge is enabled. This must stop the door moving towards the closed position.

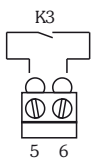


LE 1 lights up, when K1 is triggered

LE 2 lights up, when K2 is triggered

During the entire time for which the safety edge is activated, the safety output contacts are open.

Signalling relay output



K3 is not a safety relay and must therefore not be connected directly to the safety circuit.

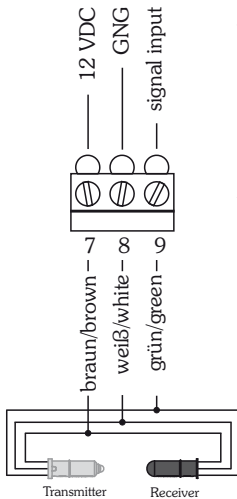


The signalling relay triggers 220ms after the optoelectronic safety edge trips and drops out again 1,5s later (wipe function).



LE 3 lights up, when K3 is triggered

Connection scheme for optoelectronic safety edge

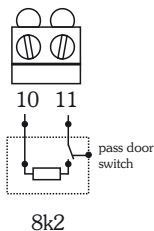


The optoelectronic safety edge is a through-beam photoelectric switch with a special dynamic output function. When the light beam in the safety edge profile is uninterrupted, a changeover signal is generated on the green line within a frequency range of 500 to 2000Hz.



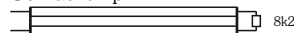
If the light beam in the rubber is interrupted, e.g. because the door has met an obstacle, then the changeover signal becomes a static signal that the controls reliably detect and interpret as an obstacle.

Connection scheme for 8k Ω - processing



It is important that the 8k Ω resistor is connected in the pass door switch or to the end of the secondary safety edge.

Contact strip



The AOS safety processing unit generates defined voltages and currents via the 8k Ω matching resistor. Any deviation from this, e.g. a short circuit in the lines or contacts opening, is reliably detected, prompting the opening of the safety circuit.

Several switches and contact strips may be switched in series if the 8k Ω resistor is inserted at the end.



Please note the required reaction when the device trips.

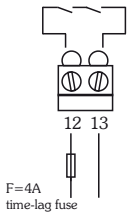


Detecting the pass door switch must also stop the door travelling open.

The secondary safety edge must stop the door closing. However, reversal or opening of the door is permissible.

This depends on the design of the door installation and may require additional equipment.

Safety-output 8k2 contact



Please note the required reaction when the device trips.
See illustration 8k2-processing.

The safety circuit for the 8k2 contact must be provided with a back-up fuse to protect against contact welding.

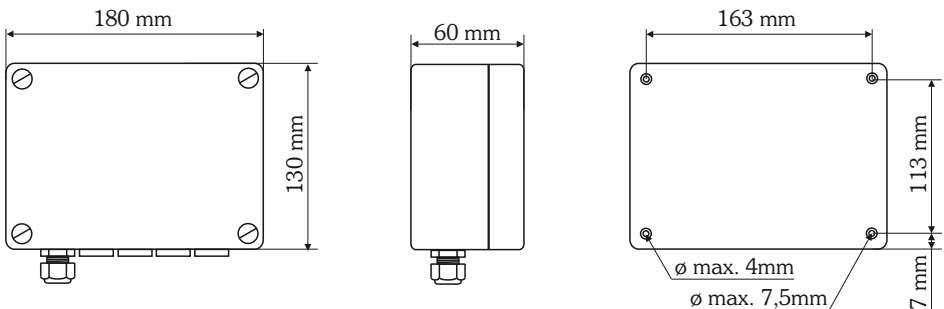
The 8k2 safety relay drops out max. 25ms after tripping (when it detects an obstacle) and triggers again 2s after the optoelectronic safety edge is enabled.

This stop the door moving towards the closed position.

LE4 lights up, when K4 is triggered

LE5 lights up, when K5 is triggered

Size



Ordering details

type

AOS 4024

operating voltage

24VAC

order number

1.113 758



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