

10. Safety monitoring modules

10.2 Guard door monitors

10.2.10 AES 1135, AES 1136, AES 1145 and AES 1146 range to monitor one guard door

SK3



Features

- Control Category 3 to EN 954-1
- 1 enabling path
- Enable delay time can be modified
- Monitoring mechanical position switches, safety switches, solenoid interlocks or magnetic safety sensors
- Can be changed from NO-NC to NC-NC contact combination
- Can be used as Emergency Stop relay for Stop Category 0 to EN 60204-1, see chapter 10.3
- Cross-wire monitoring with NO-NC contact combination
- ISD Integral System Diagnostics
- Operating voltage 24 VDC
- Short-circuit proof additional transistor outputs
- Connection of input expander possible, see chapter 10.6

Dimensions 22.5 x 75 x 110 mm

ISD **The following faults are recognised by the safety monitoring module and indicated by means of ISD**

- Failure of door contacts to open or close
- Cross-wire or short-circuit monitoring of the switch connections
- Interruption of the switch connections
- Failure of the safety relay to pull-in or drop-out
- Faults on the input circuits or on the relay control of the guard door monitor

Note

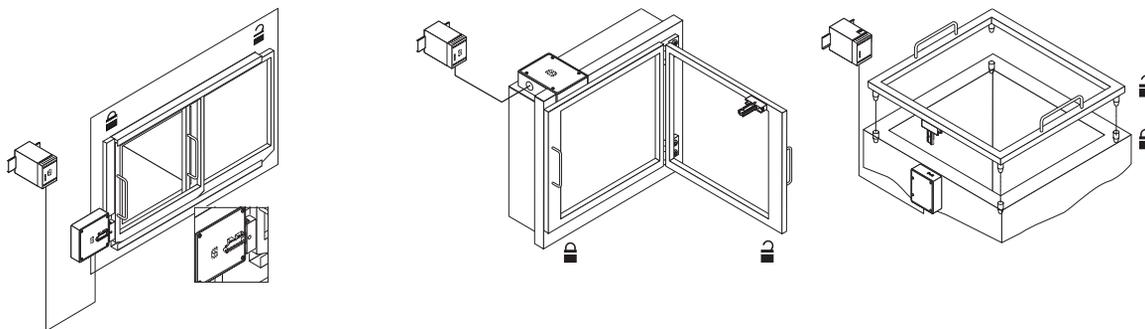
The ISD tables (Integral System Diagnostics) for analysis of the fault indications and their causes are shown in the appendix.

Part number	Operating voltage	24 VDC	24 VDC	24 VDC
	Without start-up test	AES 1135	AES 1135-2185	AES 1145
	With start-up test	AES 1136	AES 1136-2185	AES 1146

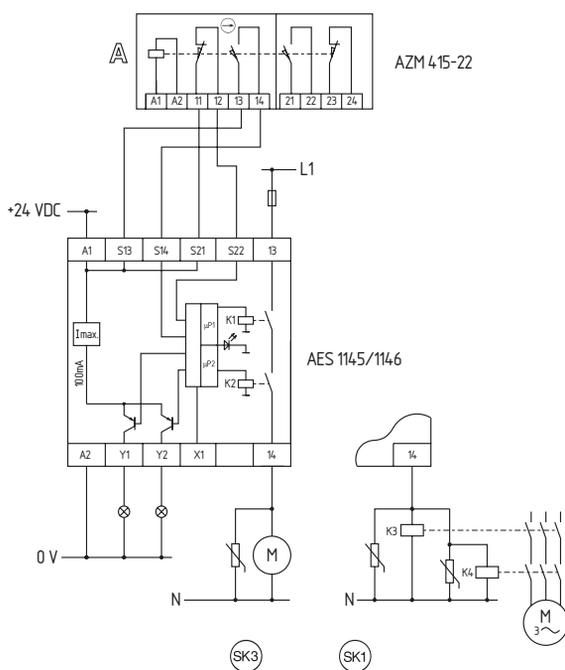
Function table	Additional transistor output Y	Function of output Y	Switching condition
AES 1135/6	Y1 Y2	Authorized operation No authorized operation	Enabling path closed Enabling path open
AES 1135/6-2185	Y1 Y2	Authorized operation Guard door closed	Enabling path closed
AES 1145/6	Y1 Y2	Guard door open Fault	Enabling path open Enabling path open

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Applications



Wiring diagram



Notes

- AES to secure a guard door up to Control Category 3.
- Monitoring a sliding, hinged or removable guard door using a solenoid interlock, see chapter 2.
- The NC contact A must have positive break when the guard door is opened.
- Control Category 3 to EN 954-1 can be achieved by substantiation and documentation of exclusion of "faults due to breakage or loosening of the actuator or in the solenoid interlock".
- If the load is directly switched by the AES, the complete system can be classified in Control Category 3 to EN 954-1. If one or two external relays or contactors are used to switch the load, the system can then only be classified in Control Category 3 to EN 954-1 if exclusion of the fault "Failure of the external contactors" can be substantiated and is documented, e.g. by using reliable down-rated contactors. A second contactor leads to an increase in the level of security by redundant switching to switch the load off.
- The wiring diagram is shown with guard door closed and in de-energised condition.

Circuit option

- Expansion of enable delay time
 The enable delay time can be increased from 0.1 s to 1 s by changing the position of a jumper link connection under the cover of the unit.

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10.2.22 Technical data

	AES 1235/1236	AES 1135/1136 / AES 1145/1146
Standards:	IEC/EN 60204-1; EN 1088; EN 954-1; DIN VDE 0660-209; DIN VDE 0801/-A1;	
	BG-GS-ET-14; BG-GS-ET-20	
Control Category:	3	
Start-up test:	No/Yes	
Enclosure material:	Glass-fibre reinforced thermoplastic	
Mounting:	Snaps onto standard DIN rail to DIN EN 50022	
Screw terminals:	Max. 2.5 mm ² (incl. conductor ferrules)	
Protection class:	Terminals IP 20; Enclosure IP 40 to IEC/EN 60529	
Operating voltage U _e :	24 VDC ± 15 %	
Operating current I _e :	0.2 A	
Inputs:	S14/S22, X1:	S1-S14/S22, X1:
Input resistance:	Approx. 2 kΩ to ground	
Input signal "1":	10 ... 30 VDC	
Input signal "0":	0 ... 2 VDC	
Max. cable length:	1000 m of 0.75 mm ² conductor	
Outputs:	13-14/23-24:	13-14:
	2 enabling paths	1 enabling path
Utilisation category:	AC-15; DC-13	
Rated operating current / voltage I _e /U _e :	2 A/250 VAC; 2 A/24 VDC	
Switching voltage:	Max. 250 VAC	
Load current:	Max. 4 A (cos φ = 1)	
Switching capacity:	Max. 1000 VA	
Max. fuse rating:	4 A (quick blow)	
Additional transistor outputs:	Y1:U _e – 4 V; 100 mA, short-circuit proof, p-type	Y1, Y2: AES 1145/1146 min. U _e – 4 V; Y1 + Y2 = Max. 100 mA, short-circuit proof, p-type
Indications:	ISD	
EMC rating:	Conforming to EMC Directive	
Max. switching frequency:	5 Hz	
Overvoltage category:	II to DIN VDE 0110	
Degree of pollution:	3 to DIN VDE 0110	
Resistance to vibration:	10 ... 55 Hz / amplitude 0.35 mm ± 15 % at the regulation point	
Resistance to shock:	30 g / 11 ms	
Ambient temperature:	0 °C ... + 55 °C	
Storage and transport temp.:	– 25 °C ... + 70 °C	

Note: Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

