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




**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 | Authorized operation | Enabling path closed |
| | Y2 | No authorized operation | Enabling path open |
| **AES 1135/6-2185** | Y1 | Authorized operation | Enabling path closed |
| | Y2 | Guard door closed | |
| **AES 1145/6** | Y1 | Guard door open | Enabling path open |
| | Y2 | Fault | Enabling path open |

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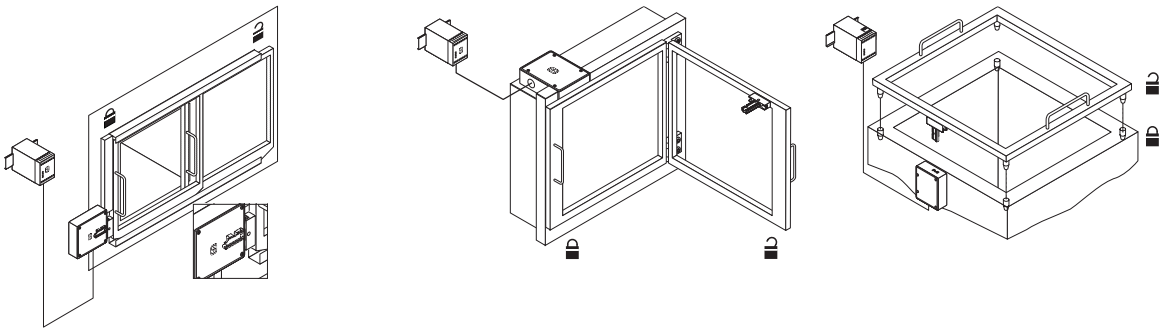
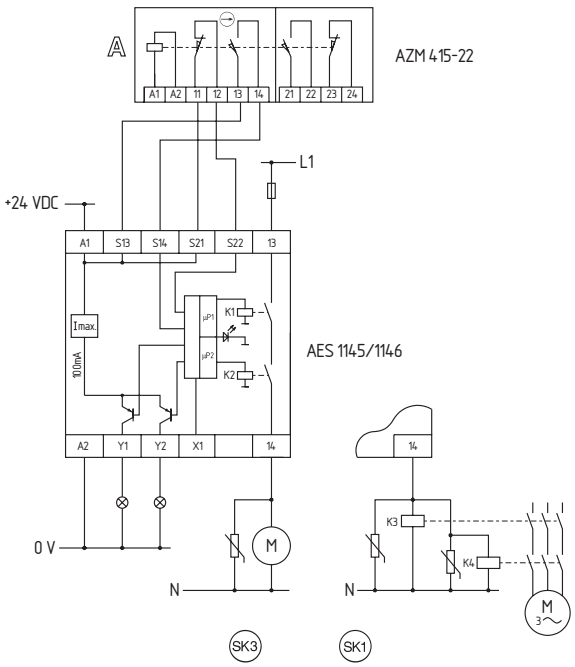
**Applications**



**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.

## 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, | Y1, Y2: AES 1145/1146 min. $U_e$ – 4 V; |
| | short-circuit proof, p-type | 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.

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