AES 1235 / 1236

- Control Category 3 to EN 954-1
- Classification PDF-M to EN 60947-5-3 in combination with BNS safety sensors
- 2 enabling paths
- Enable delay time can be modified
- Monitoring of BNS range magnetic safety sensors
- Cross-wire monitoring with NO-NC contact combination
- ISD Integral System Diagnostics
- Short-circuits proof additional transistor output
- Feedback circuit to monitor external relays
- Start function
- Operating voltage 24 VDC
- Can be changed from NO/NC to NC/NC contact combination
- Connection of input expander possible
- Additional contacts by means of output expander

Technical data

Standards:	IEC/EN 60204-1 EN 60947-5-3 EN 954-1 BG-GS-ET-14 BG-GS-ET-20
Stop category	0
Control category:	3
Start conditions:	automatic or start button
Start-up test:	no / yes
Enclosure:	glass-fibre reinforced thermoplastic, ventilated
Mounting:	snaps onto standard DIN rail to EN 50022
Connection:	screw terminals
Cable section:	max. 2.5 mm^2 (incl. conductor ferrules)
Protection class:	IP 20 to EN 60529
U_e:	24 VDC ± 15%
I_e:	0.2 A
Monitored inputs	1 NC / 1 NO or 2 NC
Feedback circuit:	yes
Input resistance:	approx. 4 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
Enabling contacts:	2 enabling paths
Utilisation category:	AC-15, DC-13
I_e/U_e:	3 A / 230 VAC 2 A / 24 VDC
Contact load capacity:	max. 250 VAC, max. 6 A (cos φ = 1)
Max. fuse rating:	6 A gG D-fuse
Signalling output:	2 transistor outputs, Y1 + Y2 = max. 100 mA, p-type, short-circuit proof
Function display:	LED (ISD)
EMC rating:	conforming to EMC Directive
Max. switching frequency:	1 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 %
Resistance to shock:	30 g / 11 ms
Ambient temperature:	0 °C ... + 55 °C
Storage and transport temperature:	– 25 °C ... + 70 °C
Dimensions:	22.5 x 100 x 121 mm
Note:	Inductive loads (e.g. contactors, relays, etc.) are to be suppressed by means of a suitable circuit.

Approvals

Ordering details

AES 123①

No.	Replace	Description
①	5	Without start-up test
	6	With start-up test

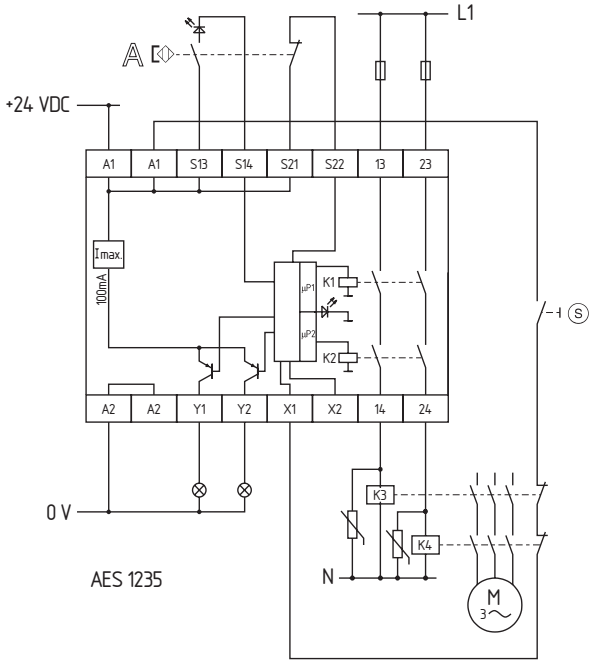
Function table

Additional transistor output:	Function / Switching condition:
Y1	Authorized operation, enabling paths closed
Y2	No authorized operation, enabling paths open

Note

- AES to monitor a guard door to Control Category 3 to EN 954-1
- Monitoring one guard doors using a BNS range magnetic safety sensor.
- The feedback circuit monitors the position of the contactors K3 and K4.
- Start push button Ⓢ:
  A start push button (NO) can optionally be connected in the feedback circuit. With the guard door closed, the enabling paths are then not closed until the start push button has been operated.
- If neither start push button nor feedback circuit is used, X1 and A1 must be bridged.
- If only one external relay or contactor is used to switch the load, the system can be classified in Control Category 3 to EN 954-1, if exclusion of the fault “Failure of the external contactor” can be substantiated and is documented, e.g. by using a reliable down-rated contactor. A second contactor leads to an increase in the level of security by redundant switching to switch the load off.
- Modification for 2 NC contacts:
  The safety monitoring module can be modified to monitor two NC contacts by bridging the terminals A1 and X2. The cross-wire monitoring between connections then becomes inoperative
- 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.

Wiring diagram



ISD

The following faults are registered by the safety monitoring modules and indicated by 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
- Fault on the input circuits or the relay control circuits of the safety monitoring module

Note

The wiring diagram is shown with guard doors closed and in de-energised condition.

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

AES 1135/36, AES 1165/66, AES 1185 and AES 1235/36

Indication LED on green	Explanation of switching conditions • Enabling paths closed
LED flashing green	• Enable delay time running, enabling paths open, only for AES 1185
LED flashing yellow (pulses approx. 0.5 Hz)	• Guard device open
LED flashing yellow (pulses approx. 2 Hz)	• Guard device closed but no authorised operation. Possible cause: Faulty operation (only one contact actuated when opening the guard) • Voltage drop • Feedback circuit not closed • Start-up test not carried out, only for AES ...6

Indication (yellow) LED one pulse	Explanation of switching conditions • Guard device 1 open	Only valid for: AES 1165/1166, AES 1185, AES 1265/1266, and AES 2165/2166
LED two pulses	• Guard device 2 open	
LED three pulses	• Guard device 3 open, only for AES 1185	

AES 1135/36, AES 1165/66, AES 1185 and AES 1235/36

Indication (orange)	Fault	Cause
LED one pulse 	• Inputs S1	• Incoming connection to switch defective • Switch defective or fitted incorrectly • Switch at least 5 s only partially actuated* • Cross-wire monitoring
LED two pulses 	• Inputs S2, only for AES 1165/1166, AES 1265/1266, AES 2165/2166 and AES 1185	• See fault inputs S1 • Defective incoming connection to relay or relay contact • Defective relay
LED three pulses 	• Inputs S1 + S2, only for AES 1165/1166, AES 1265/1266 and AES 2165/2166 • Inputs S3, only for AES 1185	• See fault inputs S2 • Defective incoming connection to relay or relay contact • Defective relay
LED four pulses 	• Fault signals on the inputs, no secure evaluation, not for AES 1185	• Too high capacitive or inductive coupling on the switch leads or incoming power supply leads
LED five pulses 	• One or both relays not pulled in within a monitored time	• Operating voltage U_e too low • Defective relay
LED six pulses 	• Relay not dropped out on actuation of switch	• Welded relay contact
LED seven pulses 	• Dynamic monitoring of both channels (Cross-Monitoring) not operating correctly • Fault signals on the inputs, no safe evaluation, only for AES 1185	• Fault on one channel • Error in internal data transmission • Too high capacitive or inductive coupling on input signal leads, only for AES 1185

*** Partial actuation**
Switch position in which only one contact has been actuated

Deletion of fault indication
The fault indication is deleted, when its cause has been eliminated and the connected switch has been actuated to check all functions.
(Open and re-close guard device)