



## AES 1165

- 1 safety contact, STOP 0
- Monitoring of BNS range magnetic safety sensors

### Data

#### Ordering data

|                               |                    |
|-------------------------------|--------------------|
| Note (Delivery capacity)      | Phased-out product |
|                               | AES 1165           |
|                               | 101170045          |
| EAN (European Article Number) | 4030661297026      |
| eCl@ss number, Version 9.0    | 27-37-18-19        |
| Available until               | 31.12.2021         |

#### Approval - Standards

cULus  
EAC

#### General data

|                                      |                                                  |
|--------------------------------------|--------------------------------------------------|
|                                      | AES 116x                                         |
|                                      | IEC/EN 60204-1                                   |
|                                      | IEC 60947-5-3                                    |
|                                      | ISO 13849-1                                      |
|                                      | BG-GS-ET-14                                      |
|                                      | BG-GS-ET-20                                      |
|                                      | BG-GS-ET-14                                      |
|                                      | IEC 60947-5-3                                    |
| Enclosure material                   | Glass-fibre reinforced thermoplastic, ventilated |
| Material of the contacts, electrical | Ag-Ni 10 and 0.2 µm gold-plated                  |
| Gross weight                         | 155 g                                            |

## General data - Features

|                                             |     |
|---------------------------------------------|-----|
| Stop-Category                               | 0   |
| Wire breakage detection                     | Yes |
| Short-circuit recognition                   | Yes |
| Automatic reset function                    | Yes |
| Reset after disconnection of supply voltage | Yes |
| Earth connection detection                  | Yes |
| Integral System Diagnostics, status         | Yes |
| Number of inputs for NC                     | 2   |
| Number of inputs for NO                     | 2   |
| Number of LEDs                              | 1   |
| Number of safety contacts                   | 1   |

## Safety appraisal

ISO 13849-1  
IEC 61508

## Safety appraisal - Relay outputs

|                                              |                                                                 |
|----------------------------------------------|-----------------------------------------------------------------|
| Performance Level, up to                     | d                                                               |
| Control category to EN13849                  | 3                                                               |
| PFH-value                                    | $1.00 \times 10^{-7}$ /h                                        |
| Notice                                       | for max. 50,000 switching cycles/year and max. 80% contact load |
| Safety Integrity Level (SIL), applicable for | 2                                                               |
| Mission time                                 | 20 Year(s)                                                      |

## Mechanical data

|                          |                                         |
|--------------------------|-----------------------------------------|
| Mounting                 | Snap onto standard DIN rail to EN 60715 |
| Mechanical life, minimum | 20,000,000 Operations                   |

### Mechanical data - Connection technique

|                               |                                                               |
|-------------------------------|---------------------------------------------------------------|
| Terminal Connector            | Screw connection<br>rigid or flexible                         |
| Terminal designations         | IEC/EN 60947-1<br>0.25 mm <sup>2</sup><br>2.5 mm <sup>2</sup> |
| Tightening torque of<br>Clips | 0.6 Nm                                                        |

### Mechanical data - Dimensions

|        |         |
|--------|---------|
| Width  | 22.5 mm |
| Height | 100 mm  |
| Depth  | 121 mm  |

### Ambient conditions

|                                                  |                                                           |
|--------------------------------------------------|-----------------------------------------------------------|
|                                                  | IP40                                                      |
|                                                  | IP54                                                      |
|                                                  | IP20                                                      |
| Ambient temperature,<br>minimum                  | +0 °C                                                     |
| Ambient temperature,<br>maximum                  | +55 °C                                                    |
| Storage and transport<br>temperature,<br>minimum | -25 °C                                                    |
| Storage and transport<br>temperature,<br>maximum | +70 °C                                                    |
| Resistance to<br>vibrations to EN<br>60068-2-6   | 10...55 Hz, Amplitude 0.35 mm, ± 15 %<br><br>30 g / 11 ms |

### Ambient conditions - Insulation value

|                                    |      |
|------------------------------------|------|
| Rated impulse<br>withstand voltage | 4 kV |
|                                    | III  |
|                                    | 2    |

### Electrical data

|                      |                    |
|----------------------|--------------------|
| Frequency range      | 60 Hz              |
| Thermal test current | 6 A                |
|                      | 24 VAC -15% / +10% |

|                                                      |              |
|------------------------------------------------------|--------------|
| Rated AC voltage for controls, 50 Hz, minimum        | 20.4 VAC     |
| Rated control voltage at AC 50 Hz, maximum           | 26.4 VAC     |
| Rated AC voltage for controls, 60 Hz, minimum        | 20.4 VAC     |
| Rated control voltage at AC 60 Hz, maximum           | 26.4 VAC     |
| Rated AC voltage for controls at DC minimum          | 20.4 VDC     |
| Rated control voltage at DC, maximum                 | 28.8 VDC     |
| Electrical power consumption                         | 5 W          |
| Contact resistance, maximum                          | 0.1 $\Omega$ |
| Note (Contact resistance)                            | in new state |
| Drop-out delay in case of power failure, typically   | 80 ms        |
| Drop-out delay in case of emergency, typically       | 20 ms        |
| Pull-in delay at automatic start, maximum, typically | 100 ms       |
| Pull-in delay at RESET, typically                    | 20 ms        |

#### **Electrical data - Safe relay outputs**

|                                     |         |
|-------------------------------------|---------|
| Voltage, Utilisation category AC15  | 230 VAC |
| Current, Utilisation category AC-15 | 6 A     |
| Voltage, Utilisation category DC13  | 24 VDC  |
| Current, Utilisation category DC13  | 6 A     |
| Switching capacity, minimum         | 10 VDC  |
| Switching capacity, minimum         | 10 mA   |
| Switching capacity, maximum         | 250 VAC |

|                                |     |
|--------------------------------|-----|
| Switching capacity,<br>maximum | 8 A |
|--------------------------------|-----|

#### Electrical data - Digital inputs

|                                   |               |
|-----------------------------------|---------------|
| Input signal, HIGH<br>Signal "1"  | 10 ... 30 VDC |
| Input signal, LOW<br>Signal "0"   | 0 ... 2 VDC   |
| Conduction<br>resistance, maximum | 40 $\Omega$   |

#### Electrical data - Digital Output

|                                       |        |
|---------------------------------------|--------|
| Voltage, Utilisation<br>category DC12 | 24 VDC |
| Current, Utilisation<br>category DC12 | 0.1 A  |

#### Electrical data - Relay outputs (auxiliary contacts)

|                                |        |
|--------------------------------|--------|
| Switching capacity,<br>maximum | 24 VDC |
| Switching capacity,<br>maximum | 2 A    |

#### Electrical data - Electromagnetic compatibility (EMC)

|            |               |
|------------|---------------|
| EMC rating | EMC-Directive |
|------------|---------------|

#### Integral system diagnosis (ISD)

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| Note (ISD -Faults) | The following faults are registered by the safety monitoring modules and indicated by ISD. |
|                    | Failure of the safety relay to pull-in or drop-out                                         |
|                    | Failure of door contacts to open or close                                                  |
| Faults             | Cross-wire or short-circuit monitoring of the switch connections                           |
|                    | Interruption of the switch connections                                                     |
|                    | Fault on the input circuits or the relay control circuits of the safety monitoring module  |

#### Other data

|                     |                               |
|---------------------|-------------------------------|
| Note (applications) | Safety sensor<br>Guard system |
|---------------------|-------------------------------|

#### Notes

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

## Circuit example

### Note (Wiring diagram)

The wiring diagram is shown with guard doors closed and in de-energised condition. Monitoring 2 guard door(s), each with a magnetic safety sensor of the BNS range. If one or two external relays or contactors are used to switch the load, the system can then only be classified in Category 3 to EN ISO 13849-1, 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 ISD tables (Integral System Diagnostics) for analysis of the fault indications and their causes are shown in the appendix. 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. To secure 2 guard doors up to PL d and Category 3

## Ordering code

Product type description:

AES 116(1)

(1)

## Pictures

### Photo/Product/Catalogue

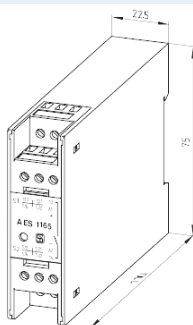


ID: kaes1f22

| 702,8 kB | .jpg | 265.642 x 529.167 mm - 753 x 1500  
Pixel - 72 dpi

| 83,8 kB | .png | 74.083 x 147.461 mm - 210 x 418  
Pixel - 72 dpi

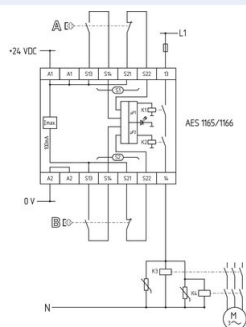
### Dimension/Product/Basic



ID: kaes1g03

| 50,9 kB | .cdr |  
| 7,2 kB | .png | 74.083 x 126.647 mm - 210 x 359  
Pixel - 72 dpi  
| 253,1 kB | .jpg | 352.778 x 603.603 mm - 1000 x  
1711 Pixel - 72 dpi

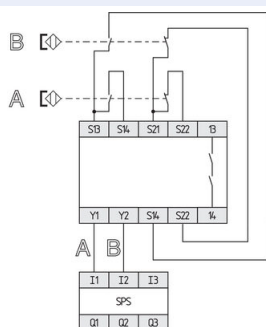
## Graphic/Product/Wiring



ID: kaes1l03

| 151,5 kB | .jpg | 352.778 x 475.897 mm - 1000 x 1349 Pixel - 72 dpi  
| 30,9 kB | .cdr |

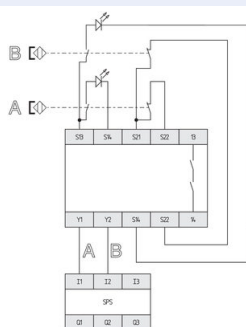
## Graphic/Product/Wiring



ID: kaes1l21

| 69,6 kB | .cdr |  
| 117,4 kB | .jpg | 352.778 x 430.036 mm - 1000 x 1219 Pixel - 72 dpi

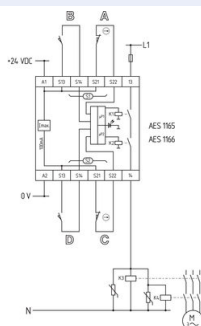
## Graphic/Product/Wiring



ID: kaes1l37

| 114,8 kB | .jpg | 352.778 x 471.664 mm - 1000 x 1337 Pixel - 72 dpi  
| 62,7 kB | .cdr |

## Graphic/Product/Wiring



ID: maes1l06

| 162,7 kB | .jpg | 352.778 x 577.497 mm - 1000 x 1637 Pixel - 72 dpi  
| 329,9 kB | .cdr |

K.A. Schmersal GmbH & Co. KG, Möddinghofe 3, D-42279 Wuppertal

The details and data referred to have been carefully checked. Images may diverge from original. Further technical data can be found in the manual. Technical amendments and errors possible.

Generated on 182021-01-31T12:28:18+01:001201Europe/BerlinSun, 31 Jan 2021 12:28:18

+010018pmSunday.31pm31Europe/BerlinCET2801Europe/BerlinJanuary2021Sun, 31 Jan 2021 12:28:18

+010001pm31