Model number

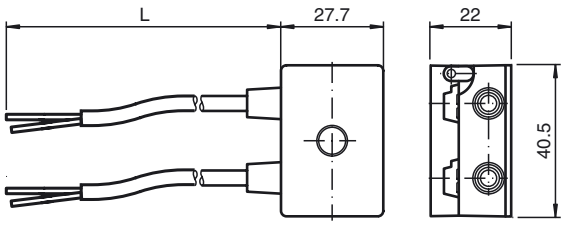
VAA-2E1A-G10-SAJ/EA2J-2X1M

G10 safety module
2 safety inputs and
1 standard electronic output

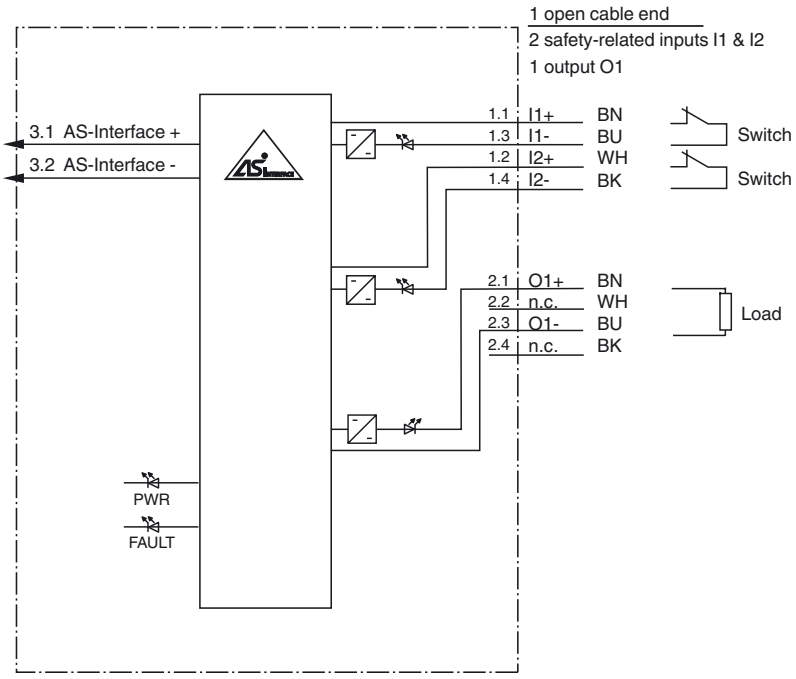
Features

- Connection of contact safety switches, e.g. EMERGENCY STOP button
- Applications up to PL_e
- Modular safety solution
- Ultra-compact enclosure
- Degree of protection IP67

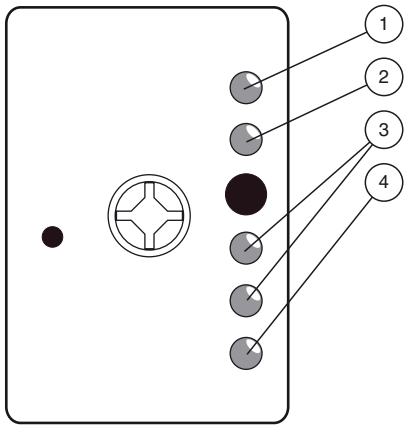
Dimensions



Electrical connection



Indicating / Operating means



1 status display AS-Interface
2 error display
3 switching state inputs
4 switching state output

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Technical data

General specifications		
Slave type		Safety-Slave
AS-Interface specification		V3.0
Required master specification		≥ V2.1
UL File Number		E223772 "For use in NFPA 79 Applications only"
Indicators/operating means		
LED FLT		error display; LED red red: communication error or address is 0
LED AS-i		AS-Interface voltage; green LED green: voltage OK flashing green: address 0
LED IN		switching state (input); 2 LED yellow
LED OUT		Switching state (output); LED yellow
Electrical specifications		
Rated operating voltage	U_e	26.5 ... 31.6 V from AS-Interface (PELV)
Rated operating current	I_e	≤ 90 mA
Protection class		III
Surge protection		overvoltage category III
Rated insulation voltage		32 V
Pulse withstand voltage		0.8 kV
Input		
Number/Type		2 safety-related inputs for mechanical contacts, crossed-circuit monitored: 2 single-channel contacts: up to category 2/PL c to ISO 13849-1 or 1 2-channel contact: up to category 4/PL e to ISO 13849-1
Supply		from AS-Interface
Voltage		20 ... 30 V DC pulsed
Current		input current limited ≤ 15 mA, short-circuit protected
Output		
Number/Type		1 conventional electronic output, PNP
Supply		from AS-Interface
Voltage		$(U_{ASI} - 7.0\ V) \leq U_{OUT} \leq U_{ASI}$
Current		50 mA , short-circuit/overload protected
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 62026-2:2013 EN 61000-6-2:2005 EN 61000-6-4:2007
Machinery Directive		
Directive 2006/42/EC		EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN 62061:2005 + AC:2010 + A1:2013 + A2:2015
Standard conformity		
Degree of protection		EN 60529:2000
Fieldbus standard		EN 62026-2:2013
Electrical safety		IEC 61140:2009
Emitted interference		EN 61000-6-4:2007
AS-Interface		EN 62026-2:2013
Noise immunity		IEC 62026-2:2013 EN 62061:2005 EN 61000-6-2:2005
Functional safety		EN ISO 13849-1:2015 EN ISO 13849-2:2012 EN 62061:2005 + AC:2010 + A1:2013 + A2:2015
Programming instructions		
Profile		S-7.B
IO code		7
ID code		B
ID1 code		F
ID2 code		0
Data bits (function via AS-Interface)		**input** / **output**
D0		dyn. safety code 1 / OUT 1
D1		dyn. safety code 1 / -
D2		dyn. safety code 2 / -
D3		dyn. safety code 2 / -
Parameter bits (programmable via AS-i)		**function**
P0		communication monitoring P0 = 1 (default settings), monitoring = ON, i.e. if communication fails, the outputs are de-energised P0 = 0, monitoring = OFF, if communication fails, the outputs maintain their condition
P1		not used
P2		not used
P3		not used
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Storage temperature		-25 ... 80 °C (-13 ... 176 °F)
Relative humidity		< 95 %
Altitude		≤ 2000 m above MSL

Function

The VAA-2E1A-G10-SAJ/EA2J- * is an AS-Interface safety module with 2 safety-related inputs and one conventional output. A two-channel mechanical switch or a single channel mechanical switch each can be connected to the two safety-related inputs. The output is a conventional electronic non-safety-related output, which can be loaded with 50 mA.
The module is suitable for remote connection of switches in very limited space. The one-piece housing provides a degree of protection of IP67 .
The connection to the AS-Interface cable is achieved by means of insulation piercing method of the inserted flat cables. The inputs and the output are connected via open cable ends.
To display the current switching state, there is a LED for each channel mounted on top of the module. A LED indicating the AS-Interface communication and the adress 0 of the module is also available. If a communication error occurs, the outputs are switched off (only at P0 = 1).
The module can be used up to Category 4/PL e according to ISO 13849-1, SIL 3 according to EN 62061.
If two single-channel switches are connected, the module can be used up to Category 2/PL c according to ISO 13849-1, SIL 1 according to EN 62061.

Accessories

VBP-HH1-V3.0-KIT
AS-Interface Handheld with accessory

VAZ-PK-FK-0,2M-V1-W
Adapter cable G10 module/hand-held programming device

Matching system components

VAZ-2E1A-F85A-S
Emergency stop button

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Shock and impact resistance		30 *g*, 11 ms in 6 spatial directions 3 shocks 10 *g*, 16 ms in 6 spatial directions 1000 shocks
Vibration resistance		0.75 mm 10 ... 57 Hz , 5 g 57 ... 150 Hz, 20 cycles
Pollution degree		3
Mechanical specifications		
Degree of protection		IP67 This protection class is achieved by using the AS-Interface flat cable VAZ-FK-S-YE
Connection		AS-Interface: AS-Interface flat cable Inputs/outputs: open conductor ends
Material		
Contacts		open conductor ends with connector sleeves
Housing		PBT
Cable		PUR
Mounting screw		Stainless steel 1.4305 / AISI 303
Cable		
Sheath diameter		Ø4,3 mm
Bending radius		> 5 x cable diameter, fixed > 10 x cable diameter, moving not appropriate for conveyor chains
Color		black
Cores		4 x 0.34 mm^2
Length	L	1 m
Mass		200 g
Tightening torque, fastening screws		1.65 Nm
Approvals and certificates		
UL approval		cULus Listed, Type 1 enclosure

Notes

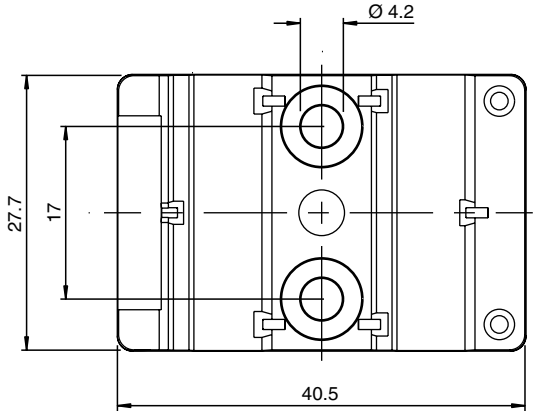
Functional safety related parameters		
Operating mode	1-channel	2-channel
Safety Integrity Level(SIL)	SIL 1	SIL 3
Performance Level (PL)	PL c	PL e
Category	Cat. 2	Kat. 4
$MTTF_d$	100 a	no significant contribution to MTTFd, PFD or PFH of the overall system
PFH_d	2,3 x 10^{-7}	
PFD	1,6 x 10^{-13}	
Safe reaction time	< 300 µs	< 300 µs
Diagnostic coverage	80 %	-
Design Lifetime	20 a	20 a

Safety Instructions

If a single-channel switch is used, the module is suitable for use up to category 2/PL c in accordance with ISO 13849-1, or SIL 1 in accordance with EN/IEC 62061. Only tested and certified power supplies with safe isolation may be used to supply power. These power supplies must have PELV voltage in accordance with EN 50295 / IEC 62026-2, and a minimum MTBF of 50 years. The power supplies are designed to exclude a short circuit between the primary and secondary sides.

Mounting Instructions

You may screw the device onto a level mounting surface using two M4 attachment screws. The attachement screws are not included.



Lay all cables in accordance with EN/IEC 60204.
Do not use the outputs for safety-related functions.
Do not connect inputs and outputs, which are supplied via the module from AS-interface or via auxiliary power, with power supply and signal circuits with external potentials.
See the manual for a guide to the intended use.

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