



Model Number

VAA-4A-G5-V2-Ex

G5 Ex module
4 valve outputs

Features

- Use in hazardous area
- Category, ignition protection category II (1GD) 2G EEx em [ia] IIB/IIC T4
- Outputs EEx ia IIC
- Connection of 4 switch valves
- Function display for bus and outputs

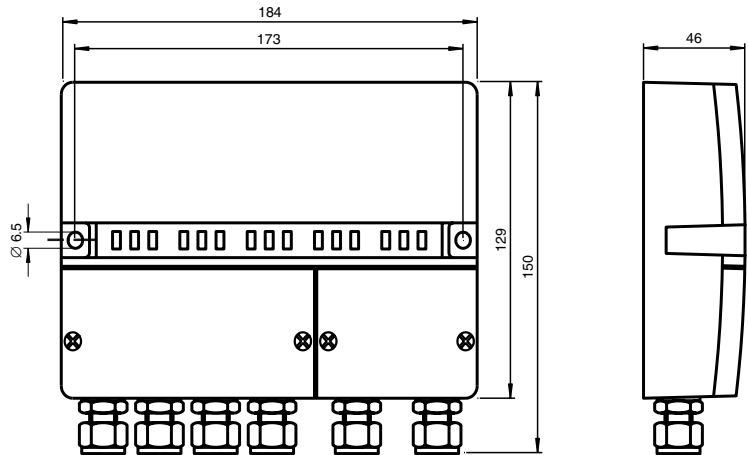
Function

The VAA-4A-G5-V2-Ex module can be installed in zone 1 hazardous areas. The module itself is encapsulated (EEx m), while the connection system of the AS-i cable is designed for use with increased safety. The VAA-4A-G5-V2-Ex can be connected to 4 intrinsically safe switch valves, i. e. the control circuit is intrinsically safe.

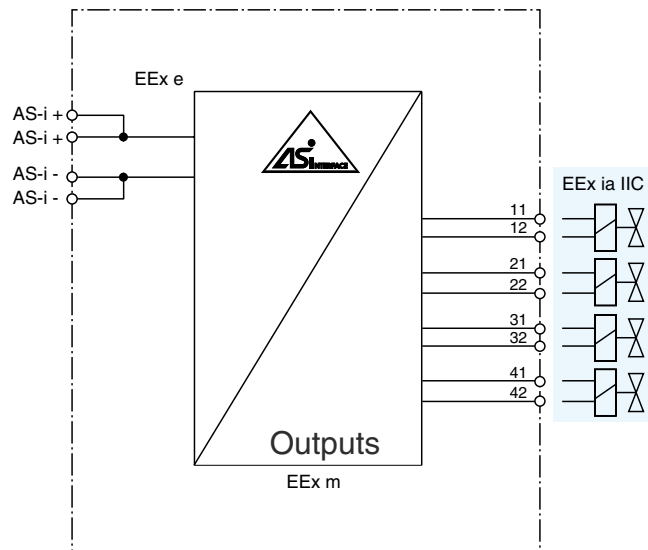
Note:

If two channels are connected incorrectly, the output voltage might be reduced. To reset a module, it has to be disconnected from the supply.

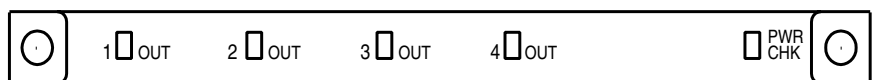
Dimensions



Electrical connection



Indicating / Operating means



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Technical data**General specifications**

Slave type	Standard slave
EC-Type Examination Certificate	DMT 99 ATEX E 072
Group, category, type of protection	⊕ II (1GD)2G EEx em [ia] IIB/IIC T4 Intrinsically safe input and output circuits can be fed into areas in the categories 1G and 1D.

Indicators/operating means

LED PWR/CHK	dual-LED green/red green: AS-Interface voltage, normal operation red: communication error or address 0
LED OUT	switching state (output); 4 LED yellow

Electrical specifications

Safety maximum voltage	U_m	40 V
Rated operational voltage	U_e	26.5 ... 31.6 V PELV from AS-Interface
Rated operational current	I_e	≤ 250 mA

Output

Number/Type	4 outputs EEx ia IIC for controlling intrinsically safe valves
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Values in accordance with EC-Type Examination Certificate

Voltage	U_0	≤ 28 V DC
Current	I_0	≤ 110 mA
Power	P_0	≤ 770 mW
Internal resistor	R_i	≥ 258 Ω
Type of protection		EEx ia IIB EEx ia IIC
External capacitance	C_0	≤ 650 nF ≤ 83 nF
External inductance	L_0	≤ 10 mH ≤ 1 mH

Nominal values (typically)

Open loop voltage	U_{A0}	26 V
Short-circuit current	I_{AK}	50 mA
Internal resistor	R_i	270 Ω
Curve angle points (nominal values)	U_E/I_E	12.5 V DC, 50 mA

Programming instructions

Profile	S-8.F
IO code	8
ID code	F

Data bits (function via AS-Interface)	input	output
D0	-	OUT1
D1	-	OUT2
D2	-	OUT3
D3	-	OUT4

Parameter bits (programmable via AS-i) function

P0/P1	(Output conditions on failure of the AS-Interface communication) 0/0 Outputs old value 0/1 outputs not controlled 1/0 outputs controlled 1/1 outputs not controlled
P2	not used
P3	not used

Ambient conditions

Ambient temperature	-20 ... 65 °C (253 ... 338 K)
Storage temperature	-20 ... 85 °C (253 ... 358 K)

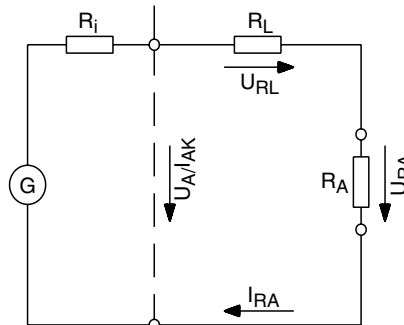
Mechanical specifications

Protection degree	IP54 according to EN 60529
Connection	screw terminals
Mass	1.5 kg
Mounting	screw mounting

Notes

Valve coupler:

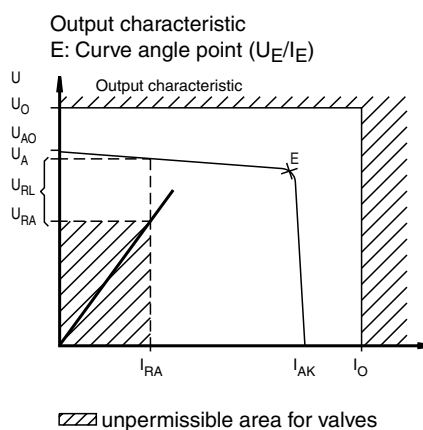
The block diagram at right illustrates the combined effect of the module and a valve switch. The module, with respect to the valve, provides a power source with internal resistance. The input circuit of the valve corresponds to the load resistance R_A of this circuit. Minimum currents and voltages must be available on the valve in order for the valve to switch correctly. The voltage U_{RL} drops across the cable resistance R_L due to the current I_{RA} , which is the same throughout.



- G: Generator
- R_i : Internal resistor
- R_L : Lead resistance
- R_A : Load resistor
- U_{A0} : Quiescent voltage
- U_A : Output voltage
- U_{RL} : Voltage drop on lead resistance
- U_{RA} : Voltage drop on load
- U_0 : max. voltage
- I_0 : max. current
- I_{AK} : Short-circuit current
- I_{RA} : Load current

The **output characteristic** diagram at right shows the generator characteristic and the resistance line of the valve. The difference between the U_{RA} and the actual output voltage U_A meets the maximum voltage drop across the cable. From that, the maximum cable length and resistance can be calculated.

However, the calculation does not take into account the requirements per DIN EN 50020 (Intrinsic Safety). Therefore, the user should test the system to ensure that maximum values for external inductance and capacitance are not exceeded.



Instructions

1. Utilisation

- In process measuring and control technology, the connecting modules are used to transfer binary signals within potentially explosive areas and from potentially explosive areas into non-explosive areas.
- The data sheets of individual devices contain the electrical data for the EC Declaration of Conformity and has to be considered as an essential component of the instruction manual.
- The outputs are built to conform with protection class "Intrinsic Safety i", the BUS conforms to protection class "Increased Safety e", and the I/O modules themselves conform to protection class "Encapsulation m".
- Laws and/or regulations governing the use or intended usage have to be observed.
- Devices that are operated in general electrical systems must not be operated in electrical systems subsequently that are connected with potentially explosive areas.
- The I/O modules are not suitable to separate signals in power engineering. The data sheets of the manufacturer have to be observed.

2. Initial operation, installation

(The initial operation and the installation shall be carried out only by specifically trained expert staff.)

- The I/O modules are built to conform with the protection class IP54.
- The I/O modules are suitable for use in hazardous areas of zone 1.
- The intrinsically safe electric circuits (light blue marking on the device) may be passed into hazardous areas, if a safe separation to all non-intrinsically safe electric circuits is ensured, in particular. The installation has to be carried out in keeping with the applicable installation regulations.
- If the intrinsically-safe electric circuits are used in a potentially dust explosive area "D", field devices may be used only which have been approved for this kind of application.
- When intrinsically-safe field devices are connected up to the intrinsically-safe electric circuits of the I/O modules, the respectively applicable maximum values of the field device and of the I/O module have to be observed in keeping with the explosion protection (proof of inherent safety). The provisions of EN 6007914/IEC 6007914 have to be observed in this regard. The "National Foreword" of DIN EN 6007914/VDE 0165 Part 1 also has to be observed for the Federal Republic of Germany.
- The EC Declarations of Conformity and/or the EC Type Approval Certificates have to be observed. The adherence to the "Special Conditions" mentioned is especially important.
- The device may be installed directly on the wall.

3. Servicing, maintenance

- The transfer characteristics of the devices remain stable, even over long periods of time, thus eliminating the need for regular adjustment. Maintenance is therefore not required.

4. Fault clearance

- Devices, which are operated in hazardous areas, must not be modified. Repairs on the device may only be performed by specialists who have been trained and authorised specifically for the task.