



## Analog Output Module HART Ex n / NI Outputs, 8 Channels Series 9466/15

- 8 channels for controlling HART control valves and positioners
- Outputs for Ex nL, Ex nA and Nonincendive
- Galvanic isolation between outputs and system
- Open-circuit and short-circuit monitoring for each field circuit
- Module can be replaced in operation (hot swap)

Zone	0	1	2	20	21	22
Class	I			II / III		
Zone	0	1	2	20	21	22
Ex interface			X			X
Installation in			X			X <sup>*)</sup>

Class	I		II / III	
Division	1	2	1	2
Ex interface		X		X
Installation in		X		X <sup>*)</sup>

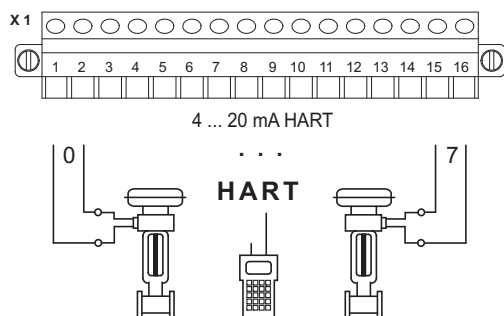
<sup>\*)</sup> suitable enclosure necessary



The Analog Output Module HART is used for the connection of up to 8 HART capable positioners or control valves with 0 ... 20 mA or 4 ... 20 mA signals. All outputs are short-circuit proof and energy limited (Ex nL). Each output is individually monitored for open and short circuits.

The integrated HART multiplexer allows bidirectional HART communication between HART field devices and the automation and engineering system.

The interface of the Analog Output Module HART with the internal data bus of the BusRail is designed with redundancy. Analog (non-HART) control valves and positioners can also be operated.



05688E00

## Selection Table

Version		Order number	Weight kg / lbs
Analog Output Module HART	8 channels for controlling HART control valves and positioners	9466 / 15-08-12	0.321 / 0.708

## Explosion Protection

Certificates		
Europe (ATEX)	KEMA 06 ATEX 0291 X	
USA (NEC)	3007532 (FM)	
Marking		
Europe (ATEX)	Ⓔ II3 (2) GD Ex nA [nL] [ib] IIC T4	
USA (NEC)	NI/I/2/ABCD/T4 Ta = 65 °C, I/2/IIC/T4 Ta = 65°C	
Other certificates		
Marine (DNV)		
Safety data		
Maximum values	max. voltage $U_o / V_{oc}$	23.8 V
	max. voltage $U_i / V_{max}$	32 V
	max. current $I_o / I_{sc}$	36 mA
	max. current $I_i / I_{max}$	any
	max. power $P_o$	553 mW
	max. power $P_i$	any
	Cable parameters (ATEX)	max. capacitance $C_o / C_a$ for IIC
max. capacitance $C_o / C_a$ for IIB		0.88 $\mu$ F
max. inductance $L_o / L_a$ for IIC		2 mH
max. inductance $L_o / L_a$ for IIB		20 mH
effective internal capacitance $C_i$		1.2 nF
effective internal inductance $L_i$		0
Further information		
see respective certificate		

## Technical Data

Ex n / NI outputs	
Number of channels	8
Signal	
Signal range	0 ... 20 mA, 4 ... 20 mA + HART (adjustable parameters for each channel)
Minimum signal	0 mA
Maximum signal	21.8 mA
Maximum load resistance	750 / 700 $\Omega$ (at 20 mA / 21.8 mA)
Resolution in the range	14 Bit at 0 ... 21.8 mA
Maximum delay from internal bus to outputs	5 ms



#### Technical Data

<b>Galvanic isolation</b>	
between power supply and system components	1500 V AC
between two input / output modules	500 V AC
between inputs and system components	500 V AC
The inputs and outputs of an I/O module have a common negative conductor	
<b>Measuring accuracy</b>	
Note	All values in % of the signal span, at 23 °C / 73.4 °F
Measurement deviation	0.06 %
Ambient temperature effect	0.06 % / 10 K
MTBF acc. to MIL	31.1 years (at 40 °C / 104 °F)
<b>Settings</b>	
Open-circuit and short-circuit monitoring	ON, OFF (for each channel)
<b>Safety position</b>	
Output when communication error	-10 %, 0 %, 100 %, 110 % of the signal, hold last value (adjustable parameters)
Stop time to safety position	0, 1, 2, ... 254, 255 (x 100 ms) (adjustable parameters)
<b>Diagnostics</b>	
Retrievable parameters	Manufacturer, type, version, serial number
Module faults	<ul style="list-style-type: none"> <li>• Internal primary bus faults</li> <li>• Internal redundant bus faults</li> <li>• No response</li> <li>• Module does not correspond to configuration</li> <li>• Hardware fault</li> </ul>
<b>Signal faults per channel</b>	
Open circuit	Output voltage > 15.2 V
Short circuit	Output load < 50 Ω
<b>Operator interface</b>	
Operation	LED green "RUN"
Fault	LED red "ERR"
<b>Power supply</b>	
Maximum power consumption	6 W (8 channels at 20 mA)
Maximum power dissipation	4.4 W (8 channels at 20 mA and 500 Ω)
<b>Mechanical data</b>	
Module enclosure	Polyamide 6GF
Fire protection class (UL 94)	V2
Degree of protection (IEC 60529)	
Modules	IP30
Connections	IP20

## Technical Data

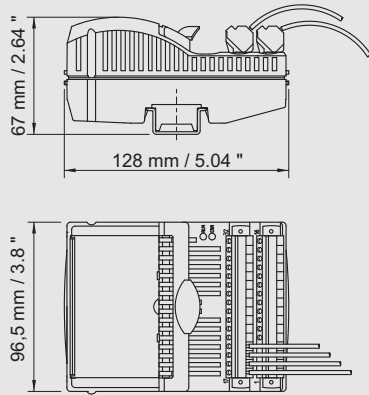
Electrical connection	
Ex n / NI field signals	Plug-in terminals 16-pole with catch, 2.5 mm <sup>2</sup> / up to 14 AWG, screw or spring type
Installation conditions	
Mounting type	on 35 mm DIN rail NS 35/15
Installation position	horizontal and vertical
Ambient conditions	
Ambient temperature	- 20 ... + 65 °C / - 4 ... + 149 °F
Storage temperature	- 40 ... + 70 °C / - 40 ... + 158 °F
Maximum relative humidity	95 % (no condensation)
Vibration, sinusoidal (IEC EN 60068-2-6)	1 g in frequency range between 10 ... 500 Hz 2 g in frequency range 45 ... 100 Hz
Shock, semi-sinusoidal (IEC EN 60068-2-27)	15 g (3 shocks per axis and direction)
Electromagnetic compatibility	Tested according to the following standards and regulations: EN 61 326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21
Engineering notes	<ul style="list-style-type: none"> <li>• Versions 946./5 only for installation in Zone 2 or in safe area.</li> <li>• Mixing of Zone 1 modules (946./2) and Zone 2 modules (946./5) on same BusRail is allowed.</li> <li>• For separation between intrinsically safe and non-intrinsically safe circuits (≥ 50 mm / 2 in), a partition (162740) is required.</li> </ul>

## Accessories and Spare Parts

Designation	Illustration	Description	Order number
Plug-in terminal	 09898E00	Screw connection, 2.5 mm <sup>2</sup> with catch, 16-pole, black, for connecting Ex nL/Ex nA field signals Labelling: 1 ... 16	162708
	 09899E00	Spring connection, 2.5 mm <sup>2</sup> with catch and test jacks, 16-pole, black, for connecting Ex nL/Ex nA field signals Labelling: 1 ... 16	162710
Labelling strips	 05869E00	„FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels	162788
Partition	 02078E00	For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance	162740
Designation strips	 05871E00	For BusRail, for 1 BusRail with 16 I/O modules	162793
Warning sign	 05872E00	„Only clean modules with damp cloths“	162796



**Dimensional Drawings** (All Dimensions in mm / inches) - Subject to Alterations



09879E00

We reserve the right to make alterations to the technical data, weights, dimensions, designs and products available without notice. The illustrations cannot be considered binding.