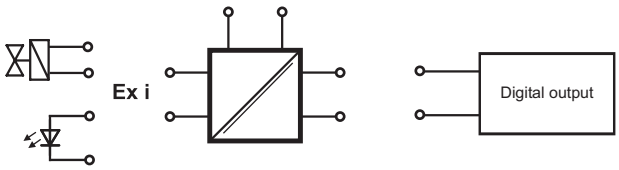
I.S. Isolators

10496E00

Binary Output Loop Powered
Type 9176

- For intrinsically safe operation of I.S. solenoid valves, indicators and horns
- Power supply by control circuit, loop powered
- Intrinsically safe output [Ex ia] IIC / [Ex ib] IIC
- 1 and 2 channels
- Galvanic isolation between inputs and outputs
- Installation possible in Zone 2 and Div. 2
- Can be used up to SIL 3 (IEC 61508)

Basic function: binary output loop powered, 1 and 2 channels.
The digital output is used for intrinsically safe operation of I.S. solenoid valves or indicators.
The supply for the modules comes from the control circuit.
No separate power supply is required.



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Selection table

Version	Channels	No-load voltage U_A	Max. output current $I_{A\,max}$	Internal resistance R_L	Ordering code
Binary output loop powered Type 9176	1	10 V	60 mA	150 Ω	**9176/10-12-00.**
		17.5 V	45 mA	130 Ω	**9176/10-14-00.**
		25 V	35 mA	250 Ω	**9176/10-16-00.**
	2	10 V	60 mA / 120 mA	150 Ω / 75 Ω *)	**9176/20-12-00.**
		17.5 V	45 mA / 90 mA	130 Ω / 65 Ω *)	**9176/20-14-00.**
		25 V	35 mA / 70 mA	250 Ω / 125 Ω *)	**9176/20-16-00.**

Add. to ordering code

Screw terminal	**9176/..-..-..s**
Spring clamp terminal	**9176/..-..-..k**
Insulation displacement connectors	**9176/..-..-..q**

*) Parallel interconnection of the outputs possible. Double output current by that.

Technical Data

Certificates	BVS 04 ATEX E 075 X			
Explosion protection	⟨Ex⟩ II (1) GD [EEx ia] IIC/IIB and ⟨Ex⟩ II 3 G EEx nAC II T4			
Other certificates	USA (FM, UL), Canada (CSA), Russia (VNIIEF), Brazil (UL do Brasil)			
Installation	In Zone 2, Div. 2 and in the safe area			
Safety data (CENELEC)				
Maximum values each output		**9176/.0-12-00.**	**9176/.0-14-00.**	**9176/.0-16-00.**
	Max. voltage U_o	11.3 V	19.6 V	27.6 V
	Max. current I_o [EEx ia] / [EEx ib] *)	75 mA / - -	150 mA / 60 mA	110 mA / 50 mA
	Max. power P_o	210 mW	732 mW	760 mW
	Max. connectable capacitance IIC / IIB	1.79 µF / 12.1 µF	235 nF / 1470 nF	85 nF / 667 nF
	Max. connectable inductance IIC/ IIB	6.3 mH / 25 mH	1.5 mH / 6 mH	1.2 mH / 9 mH
	Internal capacitance C_i	1.1 nF	1.1 nF	1.1 nF
	Internal inductance L_i	negligible	negligible	negligible
	Insulation voltage U_m	253 V AC	253 V AC	253 V AC
	) The digital outputs 9176 can be used for operation with devices marked EEx ib IIC/IIB T. Here the I_o values for [EEx ib] are valid.			
Maximum values for two outputs connected in parallel		**9176/20-12-00.**	**9176/20-14-00.**	**9176/20-16-00.**
	Max. voltage U_o	11.3 V	19.6 V	27.6 V
	Max. current I_o [EEx ia] / [EEx ib] *)	150 mA / - -	300 mA / 120 mA	220 mA / 100 mA
	Max. power P_o	420 mW	1464 mW	1520 mW
	Max. connectable capacitance IIC / IIB	1.79 µF / 12.1 µF	235 nF / 1471 nF	- - / 665 nF
	Max. connectable inductance IIC/ IIB	1.5 mH / 6 mH	0.3 mH / 1.5 mH	- - / 1.8 mH
	Internal capacitance C_i	2.2 nF	2.2 nF	2.2 nF
	Internal inductance L_i	negligible	negligible	negligible
	Insulation voltage U_m	253 V AC	253 V AC	253 V AC
	) The digital outputs 9176 can be used for operation with devices marked EEx ib IIC/IIB T. Here the I_o values for [EEx ib] are valid.			
Power supply	none			
Galvanic isolation	Test voltage under regulations EN 50020 I.S. output to input I.S. outputs to each other		1.5 kV AC 500 V AC	
	Test voltage under regulations EN 50178 Inputs to each other		350 V AC	
Input	Voltage for ON / OFF	18 V ... 31.2 V / 0 V ... 5 V		
	Control Power P_E (with I_A = max. required output current)	**9176/.0-12-00.**	**9176/.-0-14-00.**	**9176/.0-16-00.**
		0.3 W + (I_A x 15 mW / mA)	0.38 W + (I_A x 26 mW / mA)	0.5 W + (I_A x 37 mW / mA)

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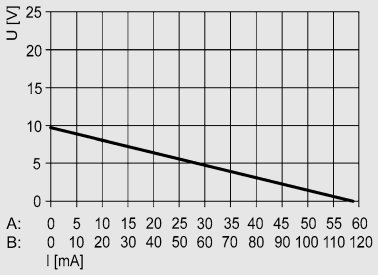
Type 9176

Technical Data

I.S. output

Output characteristic curves (at U_N; - 20 °C ... + 60 °C)
(more information see instructions)

9176/.0-12-00.



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X-axis (I [mA])

A: characteristic curve each channel
B: characteristic curve channel 1 parallel channel 2 (only types 9176/20-..-...)

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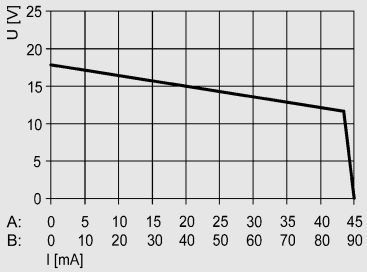

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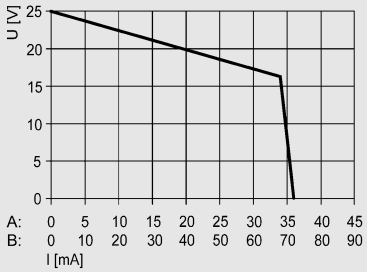

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	9176/.0-12-00.	**9176/.0-14-00.**	**9176/.0-16-00.**
One output:			
No-load voltage U_A	10 V	17.5 V	25 V
Max. output current $I_{A\,max}$	60 mA	45 mA	35 mA
Internal resistance R_i	150 Ω	130 Ω	250 Ω
Two outputs parallel:			
No-load voltage U_A	10 V	17.5 V	25 V
Max. output current $I_{A\,max}$	120 mA	90 mA	70 mA
Internal resistance R_i	75 Ω	65 Ω	125 Ω
Residual ripple output	≤ 100 mV	≤ 100 mV	≤ 100 mV
Switching delay OFF → ON	≤ 12 ms	≤ 20 ms	≤ 18 ms
Switching delay ON → OFF	≤ 25 ms	≤ 40 ms	≤ 50 ms
Operating frequency	≤ 10 Hz	≤ 10 Hz	≤ 10 Hz
Indication	LED yellow „OUT“ each channel		

Note

You may find a list of compatible I.S. solenoid valves on our homepage www.ispac.info.

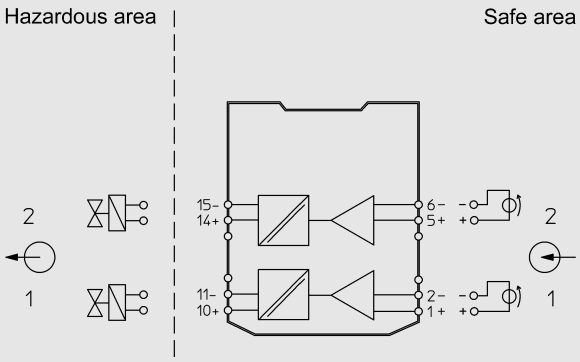
Electromagnetic compatibility

Tested under the following standards and regulations:
EN 61326 (IEC/EN 61000-4-1...6 and 11; EN 55022 Class B);
NAMUR NE 21 (IEC/EN 61000-4-1...6, 8 and 11; EN 55022 Class B)

Ambient conditions

Ambient temperature	- 20 °C ... + 60 °C / + 70 °C (watch instructions)
Storage temperature	- 40 °C ... + 80 °C
Relative humidity (no condensation)	≤ 95 %

Connection diagram



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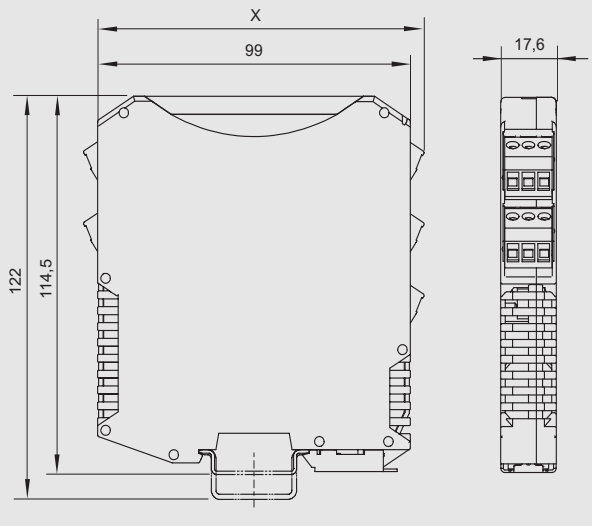
Technical Data

Mechanical data

	Screw terminals	Spring clamp terminals	Insulation displacement connectors
Connection one wire			
- rigid	0.2 ... 2.5 mm²	0.2 ... 2.5 mm²	- -
- flexible	0.2 ... 2.5 mm²	0.2 ... 2.5 mm²	0.5 ... 1 mm²
- flexible, end covering sleeves (without / with plastic sleeving)	0.25 ... 2.5 mm²	0.25 ... 2.5 mm²	- -
Connection two wires			
- rigid	0.2 ... 1 mm²	- -	- -
- flexible	0.2 ... 1.5 mm²	- -	- -
- flexible, end covering sleeves	0.25 ... 1 mm²	0.5 ... 1 mm²	- -

Weight	approx. 160 g
Mounting type	on DIN rail acc. to EN 50022 (NS35/15; NS35/7.5) or in pac-Carrier
Mounting position	horizontal or vertical
Casing protection class	IP 30
Terminal protection class	IP 20
Casing material	PA 6.6
Fire protecting class (UL-94)	V0

Dimension drawings (all dimensions in mm) - subject to alterations



	Dimension X
Screw terminals	108 mm
Spring clamp terminals	128 mm
Insulation displacement connectors	131 mm

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.