

# Isolators

Loop-powered binary output

Ex i field circuit

9176/20-15-00s Art. No. 222180



- Extensive portfolio for all characteristic curves
- Two-channel variants reduce the amount of space required
- For use up to SIL 3 (IEC/EN 61508)

MY R. STAHL 9176A



The Series 9176 binary outputs transmit binary signals for the intrinsically safe operation of Ex i solenoid valves, indicator lamps and horns. The devices do not require a separate auxiliary power supply as they are powered by the control circuit. The intrinsically safe outputs are galvanically separated from the inputs. The two-channel variants are characterised by galvanically separated channels.

## Technical Data

Explosion Protection	
Application range (zones)	2
Ex interface zone	0, 1, 2, 20, 21, 22
IECEX gas certificate	IECEX BVS 13.0012 X
IECEX gas certificate	IECEX BVS 13.0012 X
IECEX gas explosion protection	Ex nA [ia Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 13.0012 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	BVS 04 ATEX E 075 X
ATEX gas certificate	BVS 04 ATEX E 075 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex nA [ia Ga] IIC T4 Gc
ATEX dust certificate	BVS 04 ATEX E 075 X
ATEX dust explosion protection	⊕ II (1) D [Ex ia Da] IIIC
FMus certificate	FM16US0122X
cFM certificate	FM16CA0067X
Marking cFMus	Class I, Div. 2, Groups A,B,C,D; Class I, Zone 2, Group IIC AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; Class I, Zone 0, [AEx ia]/[Ex ia] IIC T4 Mounting vert. at Ta = 70°C , or horizontal Ta = 60°C See Doc. 91 766 01 31 1
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), IECEX (BVS), Korea (KTL), SIL (exida), USA (FM)
Ship approval	CCS, EU RO MR (DNV)
Declaration of Conformity	ATEX (EUK), China (CCC)
Safety Data	
Max. voltage U <sub>o</sub>	27.6 V
Max. current I <sub>o</sub> (Ex ia)	86.5 mA

#### Safety Data

Max. current $I_o$ (Ex ib)	44 mA
Max. power $P_o$	596 mW
Max. permissible external capacity $C_o$ for IIC	0.085 $\mu$ F
Max. permissible external inductance $L_o$ for IIC	1.8 mH
Max. permissible external capacity $C_o$ for IIB	0.667 $\mu$ F
Max. permissible external inductance $L_o$ for IIB	17 mH
Internal capacitance	1.1 nF
Internal inductance	Negligible
Max. voltage $U_o$ parallel	27.6 V
Max. power $P_o$ parallel	1192 mW
Max. current $I_o$ (Ex ia) paral.	173 mA
Max. current $I_o$ (Ex ib) paral.	88 mA
Internal capacitance parallel	2.2 nF
Internal inductance parallel	negligible
Safety-related max. voltage	253 V
Intrinsically safe limiting values inductance $L_o$ /capacitance $C_o$	Max. connectable inductance $L_o$ /capacitance $C_o$ , 2 parallel channels
IIC	$L_o$ [mH] $C_o$ [ $\mu$ F]
IIB	$L_o$ [mH] $C_o$ [ $\mu$ F]
IIIC	$L_o$ [mH] $C_o$ [ $\mu$ F]

#### Functional Safety

SIL	3
HFT	0
SFF	100%
Lambda SD	0 FIT
Lambda SU	364 FIT
Lambda DD	0 FIT
Lambda DU	0 FIT

#### Electrical Data

Number of channels	2
Internal resistance $R_i$	320 $\Omega$

#### Auxiliary Power

Auxiliary power	without
Auxiliary power consumption	0.5 W + ( $I_a$ x 37 mW/mA)
Polarity reversal protection	Yes

#### Galvanic Isolation

Test voltage as per standard	IEC EN 60079-11
Galvanic separation Ex i output to input	1,5 kV AC
Ex i input to Ex i input	500 V AC

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## Galvanic Isolation

Test voltage as per standard	EN 50178
Input to input	350 V AC

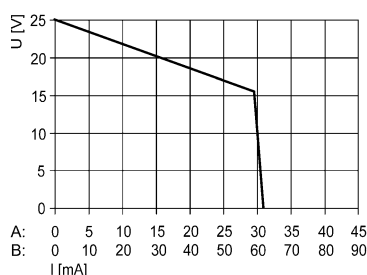
## Input

Input	In accordance with EN 61131-2
Input voltage for ON	18 – 31.2 V
Input voltage for OFF	0 – 5 V
Control Power $P_E$	0.5 W+ ( $I_A \times 37$ mW/mA) (with $I_A$ = max. required output current)

## Output

Output open-circuit voltage $U_a$	25 V
Max. output current $I_{a\max}$	29 mA
Internal Resistance $R_i$	320 $\Omega$ /parallel: 160 $\Omega^*$
Max. output current $I_a$ note	Parallel channels: 58 mA
Internal resistance $R_i$ note	320 $\Omega$ /parallel: 160 $\Omega$
Output residual ripple	< 100 mV
Output switching frequency	$\leq 10$ Hz
Switching delay ON/OFF	$\leq 50$ ms
Switching delay OFF/ON	$\leq 18$ ms
Switching state indication	LED

9176/0-15-00 output characteristic



At  $U_N$ ; -20 to +60 °C

X axis (I [mA])

A: Characteristic curve for each channel

B: Characteristic curve for channel 1, parallel channel 2 (only types 9176/20-...-...)

## Ambient Conditions

Ambient temperature	-20 °C ... +70 °C (Single device) -20 °C ... +60 °C (Group assembly)
Ambient temperature	-4 °F ... +158 °F (Single device) -4 °F ... +140 °F (Group assembly)
Note	Installation conditions influence the ambient temperature. Please observe the "Cabinet installation guide".
Storage temperature	-40 °C ... +80 °C
Storage temperature	-40 °F ... +176 °F
Maximum relative humidity	95%
Use at the height of	< 2000 m
Electromagnetic compatibility	Tested to the following standards and regulations: EN 61326-1 For use in industrial areas; NAMUR NE 21

## Mechanical Data

Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Grid dimension	17.6 mm

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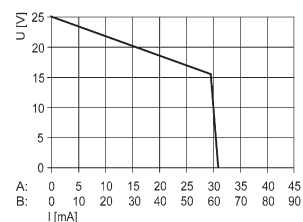
## Mechanical Data

Width	17.6 mm
Width, inches	0.69 in
Height	114.5 mm
Height in inches	4.51 in
Length	108 mm
Length in inches	4.25 in
Weight	185 g
Weight	0.41 lb

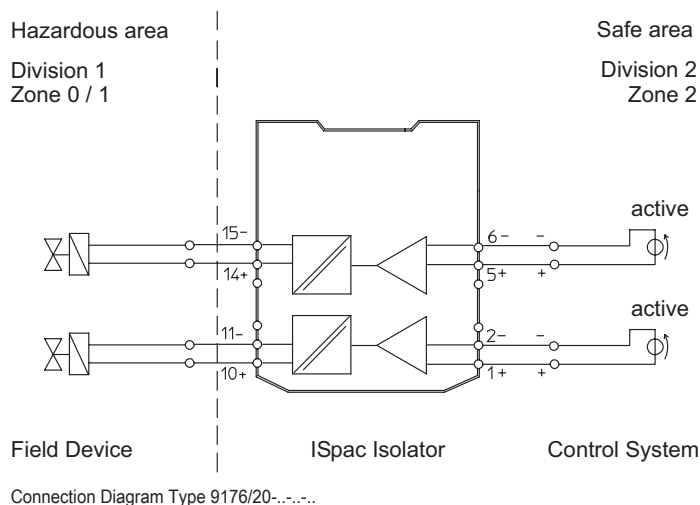
## Mounting / Installation

Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Vertical Horizontal
Connection type	Screw terminal
Min. rigid conductor cross section	0.2 mm <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross section	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 ... 14

## Technical Drawings – Subject to Alterations



9176/0-15-00 output characteristic



## Accessories

### Transparent cover



For 91xx ISpac modules  
Yellow, transparent  
Clear identification of the device for SIL applications.  
(Packaging unit: 10 pieces)

Art. No.

200914

## Spare Parts

### Screw terminal

Art. No.




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	3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: green	112817
	3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: black	112816
	3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: blue	112818




## Screw terminal with test tap

Art. No.

	3-pole plug with test tap, screw connector thread: M3 stripping length: 7 mm colour: black	113005
	3-pole plug with test tap, screw connector thread: M3 stripping length: 7 mm colour: blue	113004

## Spring clamp terminal

Art. No.

	3-pole plug with test tap, spring clamp connection stripping length: 10 mm colour: green	112825
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm colour: black	112824
	3-pole plug with test tap, spring clamp connection stripping length: 10 mm colour: blue	112826

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