

Isolators

Binary output

Ex i field circuit

9175/20-16-11k Art. No. 160420



- Dual-channel versions reduce the required footprint
- Can be used up to SIL 3 (IEC/EN 61508)
- A wire breakage and short-circuit monitoring system, which can be disconnected and includes messages

WebCode **9175A**



9175 series binary outputs issue binary signals via one or two channels for the intrinsically safe operation of intrinsically safe solenoid valves, indicators or horns. The devices feature three-way galvanic separation. A wire-breakage and short-circuit monitoring system, which can be disabled, directly monitors the state of the field circuit.

Technical Data

Explosion Protection

Application range (zones)	2
Ex interface zone	0 1 2 20 21 22
IECEEx gas certificate	IECEEx BVS 10.0050 X
IECEEx gas explosion protection	Ex nA nC [ia Ga] IIC T4 Gc
IECEEx dust certificate	IECEEx BVS 10.0050 X
IECEEx dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	DMT 03 ATEX E 043 X
ATEX gas explosion protection	II 3 (1) G Ex nA nC [ia Ga] IIC T4 Gc
ATEX dust certificate	DMT 03 ATEX E 043 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. 91 756 01 31 1
cULus certificate	E81680V1S7
Marking cULus	prov. intr. safe circ. f.u.in Class I,II,III, Groups A,B,C,D,E,F,G; See Doc. 91 756 01 31 3
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), IECEEx (BVS), India (PESO), Korea (KTL), SIL (exida), USA (FM), USA (UL)
Ship approval	CCS, EU RO MR (DNVGL)

Explosion Protection

Notes	CCC, UKCA certificate available from 2022 onward
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Safety Data

Max. voltage U_o	27.6 V
Max. current I_o (Ex ia)	110 mA
Max. current I_o (Ex ib)	50 mA
Max. power P_o	760 mW
Max. permissible external capacity C_o for IIC	0.085 μ F
Max. permissible external capacity C_o for IIB	0.667 μ F
Max. permissible external inductance L_o for IIC	1.2 mH
Max. permissible external inductance L_o for IIB	9 mH
Internal capacitance	1.1 nF
Internal inductance	Negligible
Safety-related max. voltage	253 V

Functional Safety

SIL	3
HFT	0
SFF	94%
Lambda SU	166 FIT
Lambda DD	0 FIT
Lambda DU	9 FIT
PFD_{avg} at T_{proof} 1 year	4,25E-05
PFD_{avg} at T_{proof} 2 years	8,12E-05
PFD_{avg} at T_{proof} 5 years	1,97E-04

Electrical Data

Number of channels	2
LFD relay	Yes

Auxiliary Power

Auxiliary power	24 V DC
Auxiliary power voltage range	18 to 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	140 mA
Power consumption	3.4 W
Max. power dissipation	2.4 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

Galvanic Isolation

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

Galvanic Isolation

Ex i input to Ex i input	N/A
Test voltage as per standard	EN 50178
Fault message contact to auxiliary power	350 V AC
Input to auxiliary power	350 V AC
Input to input	350 V AC
Fault message contact to input	350 V AC

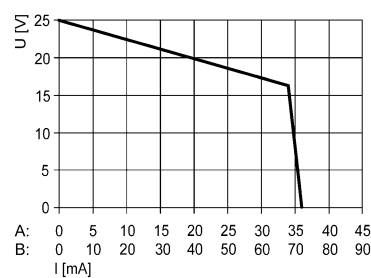
Input

Input	In accordance with EN 61131-2
Input voltage for ON	15 – 31.2 V
Input voltage for OFF	0 – 5 V
Control current	< 5 mA

Output

Output open-circuit voltage U_a	25 V
Max. output current $I_{a \max}$	35 mA
Max. output current I_a note	Parallel channels: 70 mA
Internal resistance R_i note	250 Ω /125 Ω
Output residual ripple	< 50 mV
Output switching frequency	$\leq$ 200 Hz
Switching delay ON/OFF	$\leq$ 1 ms
Switching delay OFF/ON	$\leq$ 1 ms
Switching state indication	Yellow "OUT" LED
Fault message contact switching capacity	30 V / 100 mA
LF switch user adjustment	Activated/deactivated
Indication of line fault	Red "LF" LED
Wire breakage error detection	> 15 k Ω / > 7.5 k Ω
Short circuit error detection	50 to 90 ohm $\pm$ 8 ohm/10 K
KS parallel error detection	25 to 45 ohm $\pm$ 8 ohm/10 K
Line fault and loss of power signalisation	- Contact (30 V / 100 mA) closed to ground in case of fault - pac-Bus, floating contact (30 V / 100 mA)
Test current	2.3 mA (at 100-ohm load)
Parallel channels test current	0.72 mA (at 15-k Ω load)
Note	You can find a list of connectible Ex i solenoid valves on our homepage www.r-stahl.com (WebCode 9175A)

Output characteristic 9175/.0-16-11;
9176/.0-16-00



at U_N : -20 ... +60 °C

X-axis (I [mA])

A: characteristic curve each channel

B: characteristic curve channel 1 parallel channel 2 (only types 9175/20-...-...)

Ambient Conditions

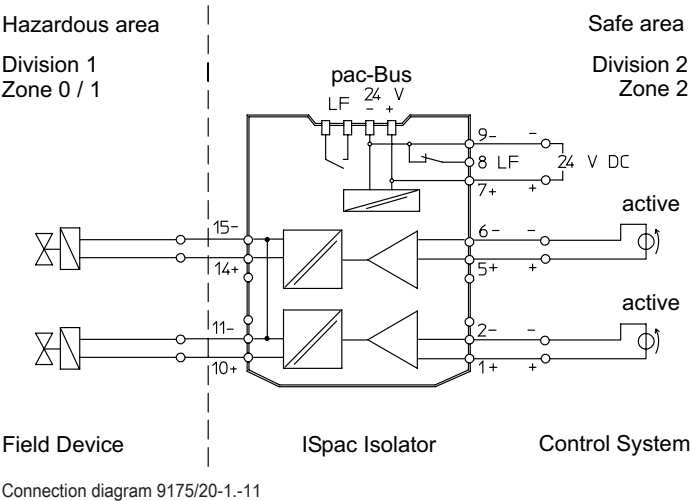
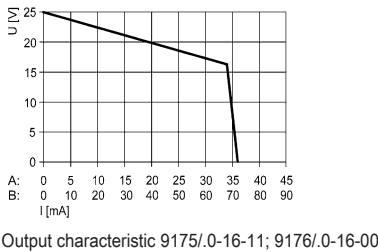
Ambient temperature	-20 °C ... +70 °C (Single device) -20 °C ... +60 °C (Group assembly)
Ambient temperature	-4 °F ... +158 °F (Single device) -4 °F ... +140 °F (Group assembly)

Ambient Conditions	
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 Use in industrial environment; NAMUR NE 21

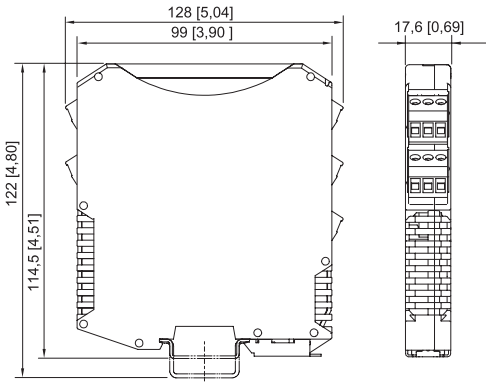
Mechanical Data	
Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Grid dimension	17.6 mm
Width	17.6 mm
Width, inches	0.69 in
Height	114.5 mm
Height, inches	4.51 in
Length	128 mm
Length, inches	5.04 in
Weight	0.111 kg
Weight	0.24 lb

Mounting / Installation	
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Vertical Horizontal
Connection type	Spring clamp terminal
Min. rigid conductor cross section	0.2 mm²
Max. rigid conductor cross section	2.5 mm²
Min. flex conductor cross section	0.2 mm²
Max. flex conductor cross section	2.5 mm²
Connection cross-section AWG	24 – 13

Technical Drawings – Subject to Alterations

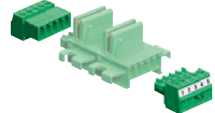


Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



ISpac Series 9146, 9147, 9160, 9162, 9163, 9165,
9167, 9170, 9172, 9175, 9176, 9180, 9182, 9193,
ISbus Series 9412 with spring clamp terminal

Accessories

Front cover		Art. No.
	for ISpac modules 91xx yellow, transparent Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)	200914
pac-Bus		Art. No.
	Wiring auxiliary power and collective error message	160731
Terminal set for pac-Bus		Art. No.
	For the supply of 24 V DC auxiliary power via terminals (alternative to using the supply module 9193/21-11-11), with jumper for error message chain for ISpac module 91xx	160730

Spare Parts

Screw terminal		Art. No.
	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

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STAHL

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.