

# Isolators

## Resistance isolator

### Ex i field circuit ISpac

9180/10-77-11s Art. No. 160491



- 9180/.0 Ex i resistance isolator for Pt100 or 9180/.1 for Pt1000
- Only two-channel device in the world to require just 8.8 mm of space per channel
- For 2-, 3-, 4-wire connection

MY R. STAHL 9180A



The Series 9180 Ex i resistance isolators are used for the intrinsically safe operation of Pt100 (9180/.0) or Pt1000 (9180/.1) resistance temperature detectors. The resistance measured at the input is transmitted to the output and can thereby be measured by an I/O card. The auxiliary power, output and intrinsically safe input are galvanically separated.

## Technical Data

### Explosion Protection

Application range (zones)	2
Ex interface zone	0 1 2 20 21 22
IECEX gas certificate	IECEX BVS 10.0055 X
IECEX gas explosion protection	Ex ec nC [ia Ga] IIC T4 Gc
IECEX dust certificate	IECEX BVS 10.0055 X
IECEX dust explosion protection	[Ex ia Da] IIIC
ATEX gas certificate	BVS 05 ATEX E 176 X
ATEX gas explosion protection	⊕ II 3 (1) G Ex ec nC [ia Ga] IIC T4 Gc
ATEX dust certificate	BVS 05 ATEX E 176 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, AEx/Ex nA nC 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 at Ta = 70°C See Doc. 9180 6 031 001 1
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), China (NEPSI), IECEX (BVS), India (PESO), Korea (KTL), USA (FM)
Ship approval	CCS, EU RO MR (DNV)
Declaration of Conformity	ATEX (EUK), China (CCC)

### Safety Data

Max. voltage U <sub>0</sub>	6.5 V
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#### Safety Data

Max. current $I_o$	16.5 mA				
Max. power $P_o$	27 mW				
Max. permissible external capacity $C_o$ for IIC	25 $\mu$ F				
Max. permissible external capacity $C_o$ for IIB	570 $\mu$ F				
Max. permissible external inductance $L_o$ for IIC	120 mH				
Max. permissible external inductance $L_o$ for IIB	450 mH				
Internal capacitance	Negligible				
Internal inductance	Negligible				
Safety-related max. voltage	253 V				
Intrinsically safe limiting values inductance $L_o$ /capacitance $C_o$	Jointly connectable inductance $L_o$ /capacitance $C_o$				
IIC	$L_o$ [mH]	50 mH	5 mH	1.000 mH	0.200 mH
	$C_o$ [ $\mu$ F]	1.100 $\mu$ F	1.700 $\mu$ F	2.300 $\mu$ F	3.400 $\mu$ F
IIB	$L_o$ [mH]	100 mH	20 mH	2 mH	0.500 mH
	$C_o$ [ $\mu$ F]	5.300 $\mu$ F			
IIA	$L_o$ [mH]				
	$C_o$ [ $\mu$ F]				
IIIC	$L_o$ [mH]	100.000 mH	20.000 mH	2.000 mH	0.500 mH
	$C_o$ [ $\mu$ F]	5.300 $\mu$ F	6.900 $\mu$ F	11.000 $\mu$ F	1.500 $\mu$ F

#### Electrical Data

Number of channels	1
LFD relay	Yes
Measuring range	18 to 391 $\Omega$

#### Auxiliary Power

Auxiliary power	24 V DC
Nominal voltage	24 V DC
Auxiliary power voltage range	18 to 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{ss}$
Nominal current	27 mA
Power consumption	0.65 W
Max. power dissipation	0.6 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage as per standard	IEC EN 60079-11
Ex i input to output	1.5 kV AC
Ex i input to auxiliary power	1.5 kV AC
Ex i input to fault message contact	1.5 kV AC
Test voltage as per standard	EN 50178
Output to auxiliary power	350 V AC
Output to output	350 V AC

#### Galvanic Isolation

Fault message contact to auxiliary power	350 V AC
Fault message contact to output	350 V AC

#### Input

Medium resolution input	0.02 $\Omega$
2-conductor adjustment	Via ADJ DIP switch
Sensor adjustment	DIP switch
Line fault and loss of power signalisation	- Contact (30 V/100 mA), closed against earth in case of error - pac-Bus, potential-free contact (30 V/100 mA)
Input for resistance temperature detector	Pt 100
Input RTD	2-, 3- and 4-wire circuits
Sensor current RTD	$\leq 0.25$ mA

#### Output

Output signal	Equal to input signal (resistance value)
RTD connection type	2-, 3- and 4-wire circuits
Settling time output	< 10 ms
Response time output	< 1 s
Sensor current range	200 $\mu$ A to 5 mA
Average measurement fault	< 0,1%
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	> 394 ohm
Short circuit error detection	< 16 ohm
Behaviour of output with DB	> 10 k $\Omega$
Behaviour of output with KS	> 10 k $\Omega$

#### 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)
Storage temperature	-40 °C ... +80 °C
Storage temperature	-40°F ... +176°F
Maximum relative humidity	95%
Max. additional relative humidity	No condensation
Temperature influence	$\leq 0,1$ %/10K
Use at the height of	< 2000 m

#### Mechanical Data

Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
AWG clamping range	16 – 12
Connection cross-section	0.2 to 2.5 mm <sup>2</sup> flexible 0.25 to 2.5 mm <sup>2</sup> flexible with core end sleeve 0.2 to 2.5 mm <sup>2</sup> rigid
Grid dimension	17.6 mm

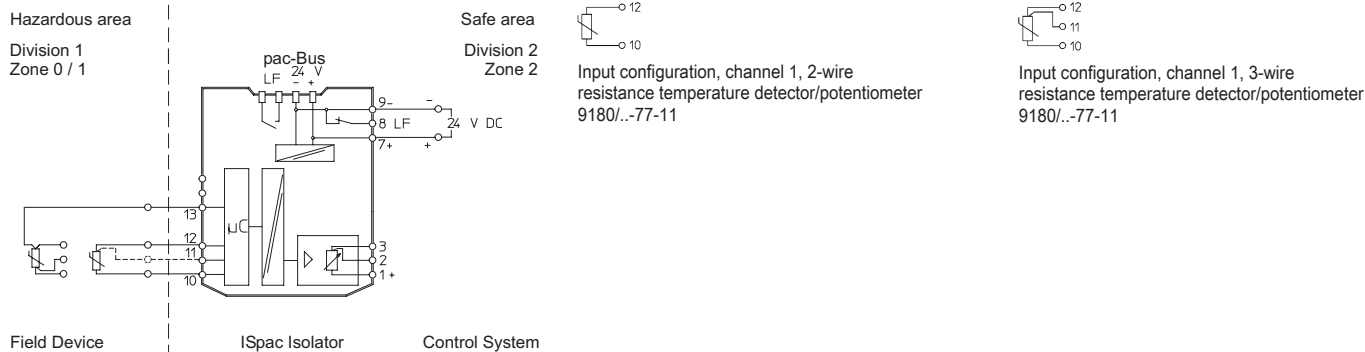
#### Mechanical Data

Width	17.6 mm
Width, inches	0.69 in
Height	114.5 mm
Length	108 mm
Length, inches	4.25 in
Mounting depth, inches	4.51 in
Weight	160 g
Weight	0.35 lb

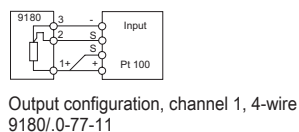
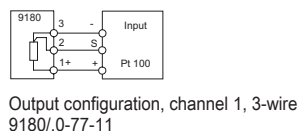
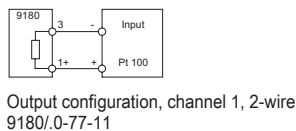
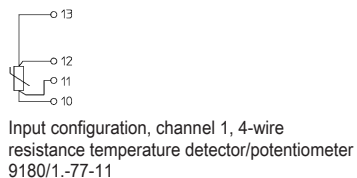
#### Mounting / Installation

Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Horizontal Vertical
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



9180/1.-77-11 connection diagram



# Isolators

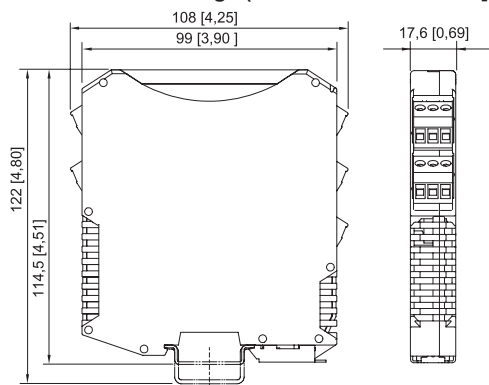
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#### Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



ISpac Series 9143, 9146, 9147, 9160, 9162, 9163, 9165, 9167, 9170, 9172, 9175, 9176, 9180, 9182, 9193, ISbus Series 9412 with screw terminal

## 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



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: black

### Art. No.

112816



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: blue

112818



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: green

112817

### Screw terminal with test tap



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

### Art. No.

113004



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

113005

# Isolators

Resistance isolator

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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.