

# Isolators

## Resistance isolator

### Ex i field circuit ISpac

9180/21-77-11k Art. No. 160503



- 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 $U_o$	6.5 V
Max. current $I_o$	16.5 mA
Max. power $P_o$	27 mW
Max. permissible external capacity $C_o$ for IIC	25 $\mu$ F

#### Safety Data

Max. permissible external inductance $L_o$ for IIC	120 mH				
Max. permissible external capacity $C_o$ for IIB	570 $\mu$ F				
Max. permissible external inductance $L_o$ for IIB	450 mH				
Max. permissible external capacity $C_o$ for IIIC	570 $\mu$ F				
Max. permissible external inductance $L_o$ for IIIIC	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 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	6.900 $\mu$ F	11 $\mu$ F	1.500 $\mu$ F
IIIIC	$L_o$ [mH]	100 mH	20 mH	2 mH	0.500 mH
	$C_o$ [ $\mu$ F]	5.300 $\mu$ F	6.900 $\mu$ F	11 $\mu$ F	1.500 $\mu$ F

#### Electrical Data

Number of channels	2
LFD relay	Yes
Measuring range	180 to 3910 $\Omega$

#### Auxiliary Power

Auxiliary power	24 V DC
Nominal voltage	24 V DC
Auxiliary power voltage range	18 ... 31.2 V
Voltage range residual ripple	$\leq 3,6 V_{SS}$
Nominal current	37 mA
Power consumption	0.89 W
Max. power dissipation	0.72 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage as per standard	EN IEC 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
Fault message contact to auxiliary power	350 V AC
Fault message contact to output	350 V AC

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### Input

Sensor adjustment	DIP switch
Medium-resolution input	0.2 $\Omega$
Input for resistance temperature detector	Pt 1000
Connection type RTD input	2-, 3- and 4-wire circuits
2-conductor adjustment	Via ADJ DIP switch
Sensor current RTD	200 $\mu$ A ... 0.5 mA
Max. line resistance per wire RTD	50 $\Omega$ (2-wire connection) 100 $\Omega$ (3-, 4-wire connection)

### Output

Output signal	Equal to input signal (resistance value)
Connection type RTD output	2-, 3- and 4-wire circuits
Settling time output	< 10 ms
Response time output	< 1 s
Sensor current range	200 $\mu$ A ... 0.5 mA
LF switch user adjustment	Activated/deactivated
Wire breakage error detection input	> 3940 ohm
Short circuit error detection input	< 160 ohm
Behaviour of the output at line fault	> 10 k $\Omega$
Line fault indication	Red "LF" LED
Fault message contact switching capacity	30 V / 100 mA
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)
Deviations / error note	Information in % of the measuring range (20 mA) at $U_N$ , 23 $^{\circ}$ C
Average measurement fault	< 0,1%
Temperature influence	$\leq$ 0,1 %/10K

### Ambient Conditions

Ambient temperature	-20 $^{\circ}$ C ... +70 $^{\circ}$ C (Single device) -20 $^{\circ}$ C ... +60 $^{\circ}$ C (Group assembly)
Ambient temperature	-4 $^{\circ}$ F ... +158 $^{\circ}$ F (Single device) -4 $^{\circ}$ F ... +140 $^{\circ}$ F (Group assembly)
Note	Installation conditions influence the ambient temperature. Please observe the "Cabinet installation guide".
Storage temperature	-40 $^{\circ}$ C ... +80 $^{\circ}$ C
Storage temperature	-40 $^{\circ}$ F ... +176 $^{\circ}$ F
Maximum relative humidity	95%
Max. additional relative humidity	No condensation
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
Width	17.6 mm

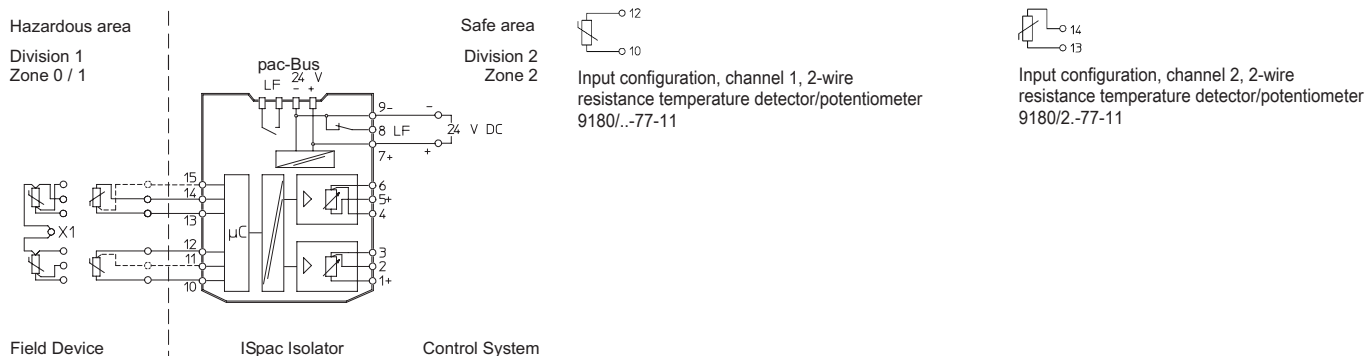
#### Mechanical Data

Width, inches	0.69 in
Height	114.5 mm
Length	128 mm
Length in inches	5.04 in
Mounting depth in inches	4.51 in
Weight	180 g
Weight	0.4 lb

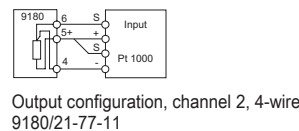
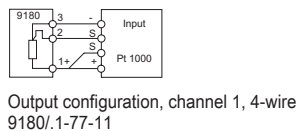
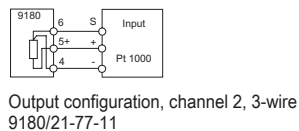
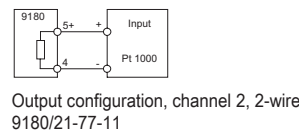
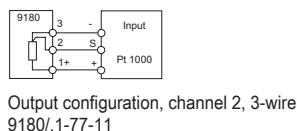
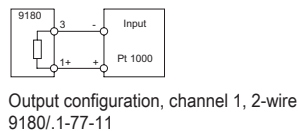
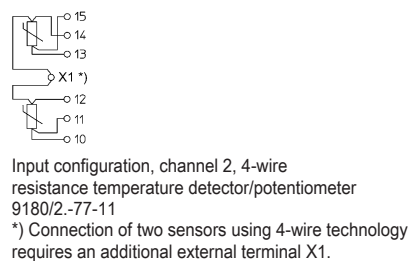
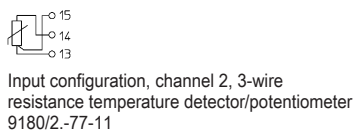
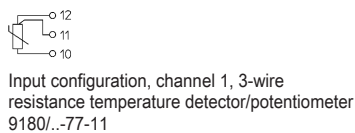
#### Mounting / Installation

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



9180/2.-77-11 connection diagram



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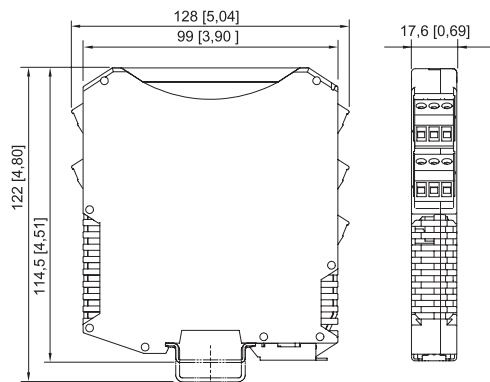
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## Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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

## Accessories

### 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

### Spring clamp terminal



3-pole plug with test tap, spring clamp connection  
stripping length: 10 mm  
colour: blue

### Art. No.

112826



3-pole plug with test tap, spring clamp connection  
stripping length: 10 mm  
colour: green

### Art. No.

112825



3-pole plug with test tap, spring clamp connection  
stripping length: 10 mm  
colour: black

### Art. No.

112824

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.