

# Isolators

## Resistance isolator

### Ex i field circuit ISpac

9180/20-77-11s Art. No. 160494



- Resistance isolator for intrinsically safe Pt100 or Pt1000
- World's only two-channel device requiring just 8.8 mm of space per channel
- For two-, three- and four-wire connection

WebCode 9180A



9180 series resistance isolators can be used for the intrinsically safe operation of Pt100 or Pt1000 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 nA nC [ja 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 nA nC [ja Ga] IIC T4 Gc
ATEX dust certificate	BVS 05 ATEX E 176 X
ATEX dust explosion protection	⊕ II (1) D [Ex ia Da] IIIC
Certificate FMus	FM16US0122X
Certificate cFM	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
EAC certificate	EAEU RU S-DE.HA91.B.00100/20
EAC gas explosion protection	⊕ 2 Ex nA nC [ja Ga] IIC T4 Gc X
EAC dust explosion protection	⊕ [Ex ia Da] IIIC X
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), EAC (ENDCE), IECEX (BVS), India (PESO), Korea (KTL), Russia (Meteorological certificate), USA (FM)

#### Explosion Protection

Ship approval	CCS, EU RO MR
Notes	CCC certificate available from 2021 onward

#### Safety Data

Maximum voltage $U_o$	6.5 V
Maximum current $I_o$	16.4 mA
Maximum power $P_o$	27 mW
Max. permissible external capacitance $C_o$ for IIC	25 $\mu$ F
Max. permissible external capacitance $C_o$ 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 $C_i$	Negligible
Internal inductance $L_i$	Negligible
Safety-related maximum voltage	253 V

#### Electrical Data

Number of channels	2
LFD relay	Yes
Measuring range	18 ... 391 $\Omega$

#### 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
Power dissipation max.	0.72 W
Polarity reversal protection	Yes
Undervoltage monitoring	Yes
Operation indication	Green "PWR" LED

#### Galvanic Isolation

Test voltage according to standard	IEC EN 60079-11
Galvanic isolation Ex i input to output	1.5 kV AC
Galvanic isolation Ex i input to auxiliary power	1.5 kV AC
Galvanic isolation Ex i input to fault message contact	1,5 kV AC
Test voltage according to standard 2	EN 50178
Galvanic isolation output to auxiliary power	350 V AC
Galvanic isolation output to output	350 V AC
Galvanic isolation fault message contact to auxiliary power	350 V AC

#### Galvanic Isolation

Galvanic isolation fault message contact to output	350 V AC
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#### Input

Medium resolution input	0.01 $\Omega$
RTD input	2-,3-,4-wire circuits
Sensor current	$\leq 0,25$ mA
2-wire compensation adjustment	via DIP switch ADJ
Sensor adjustment	DIP switch
Input resistance	$\leq 5$ ohms (2-wire circuit)
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)
Input for resistance temperature detector	Pt 100

#### Output

Output signal	Equal to input signal (resistor)
Settling time output	< 10 ms
Response time output	< 1 s
Switching capacity fault message contact	30 V / 100 mA
Switch user adjustment line fault	Activated / deactivated
Indication of line fault	"LF" LED, red
Error detection wire breakage	> 394 $\Omega$
Short circuit error detection	< 16 $\Omega$
Behaviour of the output at wire breakage	> 10 k $\Omega$
Behaviour of the output at short circuit	> 10 k $\Omega$
Average measurement fault	< 0,1%

#### 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
Relative humidity max.	95%
Temperature influence	$\leq 0,25$ %/10K
Use at the height of	< 2000 m

#### Mechanical Data

Degree of protection (IP)	IP30
Terminal degree of protection (IP)	IP20
Fire resistance (UL 94)	V0
Connection cross-section	0.2-2.5 mm <sup>2</sup> flexible 0.25-2.5 mm <sup>2</sup> flexible core end sleeve 0.2-2.5 mm <sup>2</sup> rigid
Enclosure material	Polyamide
Clamping range AWG	16 – 12
Connection cross-section AWG	16 ... 12
Grid dimension	17.6 mm
Width inches	0.69 in

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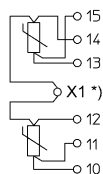
#### Mechanical Data

Length inches	4.25 in
Mounting depth inches	4.51 in
Weight	0.18 kg
Weight	0.4 lb

#### Mounting / Installation

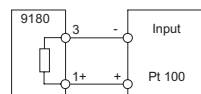
Mounting type	NS35/15, NS35/7.5 DIN rail
Mounting position	Vertical Horizontal
Connection type	Screw terminal
Conductor cross-section rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section solid max.	2.5 mm <sup>2</sup>
Conductor cross-section flexible min.	0.2 mm <sup>2</sup>
Conductor cross-section flexible max.	2.5 mm <sup>2</sup>

#### Technical Drawings – Subject to Alterations

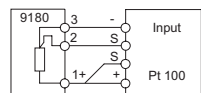


Configuration input, channel 2, 4-wire  
Resistance thermometer / RTD

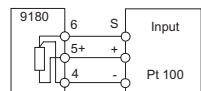
\*) The connection of two sensors in 4-wire scheme requires an additional external terminal X1.



Configuration output, channel 1, 2-wire



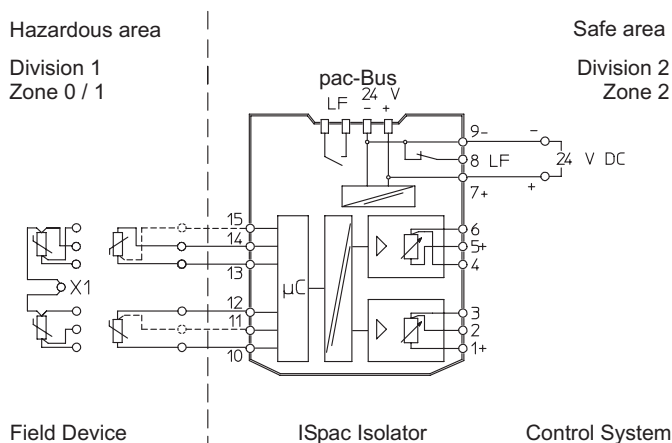
Configuration output, channel 1, 4-wire



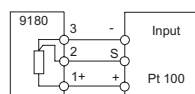
Configuration output, channel 2, 3-wire



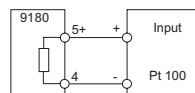
Configuration input, channel 2, 2-wire  
Resistance thermometer / RTD



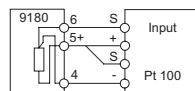
Connection diagram 9180/2.-77-11



Configuration output, channel 1, 3-wire



Configuration output, channel 1, 2-wire



Configuration output, channel 2, 4-wire



Configuration input, channel 2, 3-wire  
Resistance thermometer / RTD

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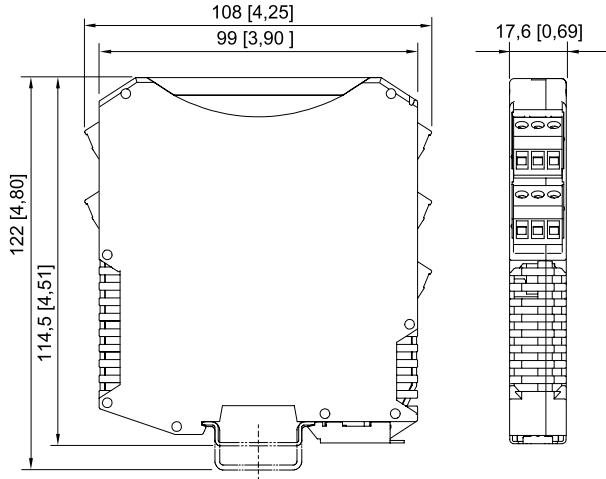


Configuration input, channel 1, 2-wire  
Resistance thermometer / RTD



Configuration input, channel 1, 3-wire  
Resistance thermometer / RTD


#### 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 screw terminal




## Accessories

### Front cover

	Art. No.
 <p>for ISpac modules 91xx yellow, transparent Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)</p>	200914

## Spare Parts

### Screw terminal

	Art. No.
 <p>3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: green</p>	112817
 <p>3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: black</p>	112816
 <p>3-pole plug, screw connector thread: M3 stripping length: 7 mm colour: blue</p>	112818

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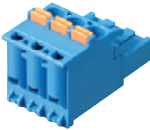
## Screw terminal with test tap

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.