

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_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 μ F |

Safety Data

| | | | | | |
|--|---|---------------|---------------|---------------|---------------|
| Max. permissible external inductance L_o for IIC | 120 mH | | | | |
| Max. permissible external capacity C_o for IIB | 570 μ F | | | | |
| Max. permissible external inductance L_o for IIB | 450 mH | | | | |
| Max. permissible external capacity C_o for IIIC | 570 μ F | | | | |
| Max. permissible external inductance L_o for IIIC | 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 [μ F] | 1.100 μ F | 1.700 μ F | 2.300 μ F | 3.400 μ F |
| IIB | L_o [mH] | 100 mH | 20 mH | 2 mH | 0.500 mH |
| | C_o [μ F] | 5.300 μ F | 6.900 μ F | 11 μ F | 1.500 μ F |
| IIIC | L_o [mH] | 100 mH | 20 mH | 2 mH | 0.500 mH |
| | C_o [μ F] | 5.300 μ F | 6.900 μ F | 11 μ F | 1.500 μ F |

Electrical Data

| | |
|--------------------|--------------------|
| Number of channels | 1 |
| LFD relay | Yes |
| Measuring range | 18 to 391 Ω |

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 | 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 | 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 | 0.02 Ω |
| Input for resistance temperature detector | Pt 100 |
| Connection type RTD input | 2-, 3- and 4-wire circuits |
| 2-conductor adjustment | Via ADJ DIP switch |
| Sensor current RTD | ≤ 0.25 mA |
| Max. line resistance per wire RTD | 50 Ω (2-wire connection) 100 Ω (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 μ A ... 5 mA |
| LF switch user adjustment | Activated/deactivated |
| Wire breakage error detection input | > 394 ohm |
| Short circuit error detection input | < 16 ohm |
| Behaviour of the output at line fault | > 10 k Ω |
| 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 |

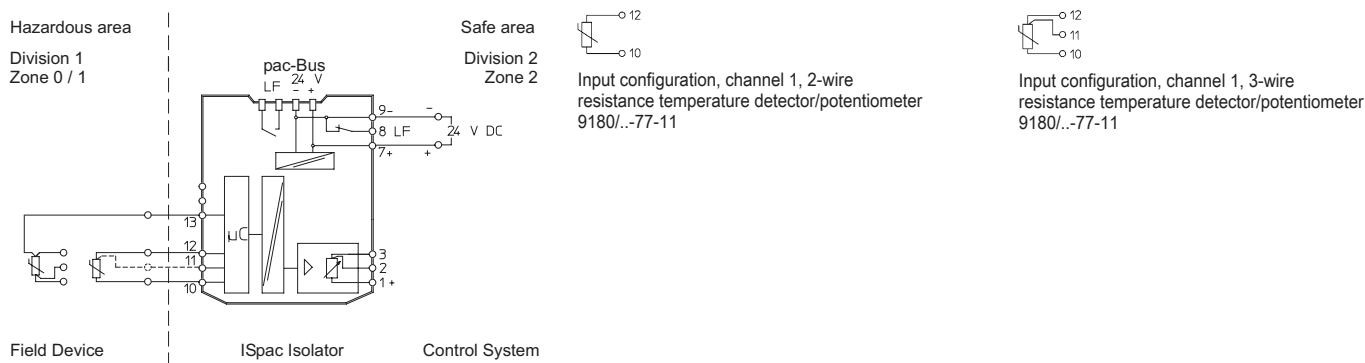
Mechanical Data

| | |
|--------------------------|--|
| Connection cross-section | 0.2 to 2.5 mm ² flexible 0.25 to 2.5 mm ² flexible with core end sleeve 0.2 to 2.5 mm ² rigid |
| Grid dimension | 17.6 mm |
| Width | 17.6 mm |
| Width, inches | 0.69 in |
| Height | 114.5 mm |
| Length | 108 mm |
| Length in inches | 4.25 in |
| Mounting depth in inches | 4.51 in |
| Weight | 160 g |
| Weight | 0.35 lb |

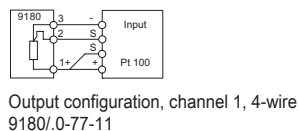
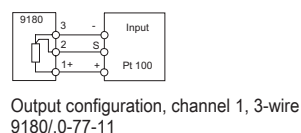
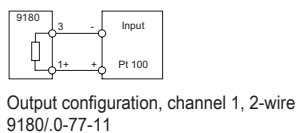
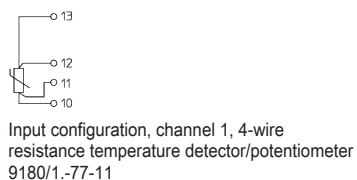
Mounting / Installation

| | |
|------------------------------------|----------------------------|
| 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 ² |
| Max. rigid conductor cross section | 2.5 mm ² |
| Min. flex conductor cross section | 0.2 mm ² |
| Max. flex conductor cross section | 2.5 mm ² |
| Connection cross-section AWG | 24 ... 14 |

Technical Drawings – Subject to Alterations



9180/1.-77-11 connection diagram



Isolators

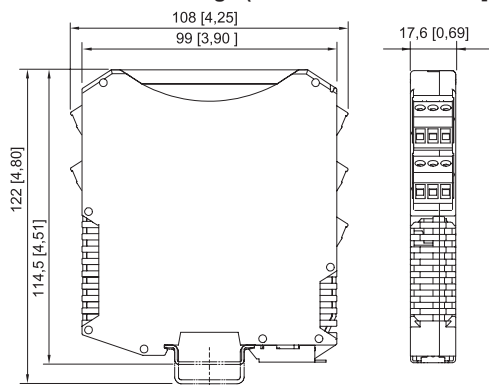
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Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



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

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