

Isolator Barriers

Temperature transmitter

Ex i field circuit ISpac

9182/10-51-14k Art. No. 201683



- Ex i temperature transmitter, can be configured for virtually any common sensor type
- Broad range, including variants with signal conversion and trip amplifier function
- Variants for SIL 2 applications available

MY R. STAHL 9182A



9182 series Ex i temperature transmitters for field circuits can be used to connect temperature sensors and potentiometers. They are easy to configure for virtually any sensor type by means of software or a DIP switch. These sensor types include Pt100 sensors, thermocouples and potentiometers. Variants with a trip amplifier function allow the input signal to be analysed using two independent contacts.

Technical Data

| Explosion Protection | |
|---------------------------------|--|
| Application range (zones) | 2 |
| Ex interface zone | 0, 1, 2, 20, 21, 22 |
| IECEX gas certificate | IECEX BVS 09.0046 X |
| IECEX gas explosion protection | Ex ec nC [ia Ga] IIC T4 Gc |
| IECEX dust certificate | IECEX BVS 09.0046 X |
| IECEX dust explosion protection | [Ex ia Da] IIIC |
| ATEX gas certificate | DMT 02 ATEX E 243 X |
| ATEX gas explosion protection | ⊕ II 3 (1) G Ex ec nC [ia Ga] IIC T4 Gc |
| ATEX dust certificate | DMT 02 ATEX E 243 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 at Ta = 70°C See Doc. 91 826 01 31 1 |
| Certificates | ATEX (BVS), Brazil (ULB), Canada (FM), China (NEPSI), IECEX (BVS), India (PESO), Korea (KTL), SIL (exida), USA (FM) |
| Ship approval | CCS, EU RO MR (DNV) |
| Declaration of Conformity | ATEX (EUK), China (CCC) |
| Installation | in Zone 2, Division 2 and in the safe area |
| Further information | see respective certificate and operating instructions |
| Safety Data | |
| Max. voltage U_o/V_{oc} | 6.5 V |
| Max. current I_o/I_{sc} | 19.7 mA |

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Safety Data

| | |
|---|-----------------------------|
| Max. power P_o | 32 mW |
| Max. power P_o note | Linear characteristic curve |
| Max. permissible external capacitance C_o/C_a for IIC | 25 μ F |
| Max. permissible external inductance L_o/L_a for IIC | 90 mH |
| Max. permissible external capacitance C_o/C_a for IIB | 570 μ F |
| Max. permissible external inductance L_o/L_a for IIB | 330 mH |
| Max. permissible external capacity C_o for IIIC | 570 μ F |
| Max. permissible external inductance L_o for IIIC | 330 mH |
| Internal capacitance | Negligible |
| Internal inductance | Negligible |
| Safety-related max. voltage | 253 V |

Functional Safety

| | |
|------------------------------------|-----------------------------------|
| SIL | 2 |
| HFT | 0 |
| SFF | 78% |
| Lambda SD | 0 FIT |
| Lambda SU | 173 FIT |
| Lambda DD | 384 FIT |
| Lambda DU | 157 FIT |
| PFD_{avg} at T_{proof} 1 year | 7,59E-04 |
| PFD_{avg} at T_{proof} 2 years | 1,44E-03 |
| PFD_{avg} at T_{proof} 5 years | 3,48E-03 |
| Further information | See safety manual and test report |

Electrical Data

| | |
|--------------------|-----|
| Number of channels | 1 |
| LFD relay | Yes |

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| Electrical connection | Input configuration | | | |
|-----------------------|---------------------------------|--------------------|--------------|--------|
| | Thermocouple | Reference junction | | |
| | | Const. temp. | Ext. Pt. 100 | |
| Channel 2 | | | | |
| | | | | |
| | Resistance temperature detector | 2-wire | 3-wire | 4-wire |
| Channel 2 | | | | |
| | | | | |
| | Potentiometer | 3-wire | | |
| Channel 2 | | | | |

Auxiliary Power

| | |
|-------------------------------|-----------------------------------|
| Auxiliary power | 24 V DC |
| Nominal voltage V_{nom} | 24 V DC |
| Auxiliary power voltage range | 18 to 31.2 V |
| Voltage range residual ripple | $\leq 3,6 V_{SS}$ |
| Nominal current | 70 mA |
| Power consumption | 1.9 W |
| Max. power dissipation | 1.9 W |
| Polarity reversal protection | Yes |
| Undervoltage monitoring | Yes |
| Undervoltage monitoring note | no faulty devices / output states |
| 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 |
| Fault message contact to auxiliary power | 350 V AC |
| Fault message contact to output | 350 V AC |

Input

| | |
|---|----------------------------|
| Sensor adjustment | Via software |
| Input for resistance temperature detector | See table |
| Connection type RTD input | 2-, 3- and 4-wire circuits |

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Input

| | | | | | | |
|---|---|-----------------|-------------------|-----------|-------------------|--------------------------|
| 2-conductor adjustment | Via ADJ DIP switch | | | | | |
| RTD linearisation | Temperature/resistance | | | | | |
| Sensor current RTD | ≤ 0.25 mA | | | | | |
| Max. line resistance per wire RTD | 50 Ω (2-wire connection) 100 Ω (3-, 4-wire connection) | | | | | |
| Input thermocouple | Types B, E, J, K, N, R, S, T, L, U, XK | | | | | |
| Linearisation thermocouple | Temperature/voltage | | | | | |
| Max. line resistance per loop thermocouple | 1000 Ω | | | | | |
| External reference junction | Pt100 2-conductor connection | | | | | |
| Potentiometer input | Up to 100 kΩ | | | | | |
| Potentiometer connection type | 3-conductor connection | | | | | |
| Potentiometer sensor current | ≤ 0.25 mA | | | | | |
| Input resistance temperature detector (RTD) | Types | Standard | Basic range | Min. span | Middle resolution | Middle measurement error |
| | Pt100 Pt500 Pt1000 | IEC 60751 | -200 ... +850 °C | 50 K | 0,1 K | 0.35 K |
| | Pt250 | IEC 60751 | -200 ... +850 °C | 40 K | 0,1 K | 0.5 K |
| | Pt2000 | IEC 60751 | -200 ... +850 °C | 40 K | 0,1 K | 0.35 K |
| | Ni100 Ni500 Ni1000 | DIN 43760 | -60 ... +180 °C | 31 K | 0,1 K | 0.25 K |
| | PT100 | GOST 6651-94 | -200 ... +1100 °C | 40 K | 0.1 K | 0.7 K |
| | M50 | GOST 6651-94 | -200 ... +200 °C | 70 K | 0.1 K | 0.7 K |
| | M53 | GOST 6651-94 | 0 ... +120 °C | 70 K | 0.1 K | 0.5 K |
| | M100 | GOST 6651-94 | -200 ... +200 °C | 40 K | 0.1 K | 0.45 K |

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| Input thermocouple | Types | Standard | Basic range | Min. span | Middle resolution | Middle measurement error |
|--------------------|-------|-------------|-------------------|-----------|-------------------|--------------------------|
| | B | IEC 60584-1 | 250 ... +1800 °C | 314 K | 0.1 K | 1.2 K |
| | E | | -200 ... +1000 °C | 36 K | 0.1 K | 0.2 K |
| | J | | -200 ... +1200 °C | 42 K | 0.1 K | 0.2 K |
| | K | | -200 ... +1370 °C | 63 K | 0.1 K | 0.3 K |
| | N | | -200 ... +1300 °C | 75 K | 0.1 K | 0.3 K |
| | R | | -50 ... +1767 °C | 171 K | 0.1 K | 0.7 K |
| | S | | -50 ... +1767 °C | 185 K | 0.1 K | 0.8 K |
| | T | | -200 ... +400 °C | 60 K | 0.1 K | 0.3 K |
| | L | DIN 43710 | -200 ... +900 °C | 55 K | 0.1 K | 0.3 K |
| | U | | -200 ... +600 °C | 48 K | 0.1 K | 0.3 K |
| | XK | GOST | -200 ... +800 °C | 50 K | 0.1 K | 0.2 K |

| Input potentiometer | Basic measuring range | Middle measurement error |
|---------------------|-----------------------------|---|
| | 50 ... 500 Ω | 0.1 Ω |
| | 0.5 ... 5 kΩ | 1 Ω |
| | 1 ... 10 kΩ | 2 Ω |
| | 10 ... 100 kΩ ^{*)} | -- ^{*) with parallel 10 kΩ Shunt, no open-circuit detection} |

Output

| | |
|--|---|
| Output | 0/4 to 20 mA active/source |
| Output signal | 0/4 to 20 mA (configurable) |
| Function range output | 0 – 21 mA |
| Load resistance R _L | 0 ... 750 Ω |
| Output signal resolution | ≤ 1 µA |
| Settling time output | ≤ 35 ms |
| Response time output | ≤ 500 ms |
| Limit contact (per channel) | 2 NO/NC |
| Switching voltage limiting values | ≤ ± 30 V |
| Switching current limiting values | ≤ 100 mA |
| Switching state indication | Yellow "A, B" LED |
| LF switch user adjustment | Activated/deactivated |
| Wire breakage error detection input | > 1 kΩ |
| Wire breakage error detection input note | for resistance temperatur detectors, thermocouples and resistance transmitters |
| Short circuit error detection input note | for resistance temperatur detectors with temperature linearisation and for resistance transmitters |
| Behaviour of the output at line fault | configurable |
| Indication of line fault | Red "LF" LED |
| Fault message contact switching capacity | 30 V / 100 mA |
| Line fault and loss of power signalization | - 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 °C |
| Average measurement fault | < 0,1% |
| Temperature influence | ≤ 0,25 %/10K |

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Ambient Conditions

| | |
|-----------------------------------|---|
| Ambient temperature °C | -20 °C ... +70 °C (Single device) -20 °C ... +60 °C (Group assembly) |
| Ambient temperature °F | -4°F ... +158°F (Single device) -4°F ... +140°F (Group assembly) |
| Note | The installation conditions affect the ambient temperature. Observe the "Cabinet installation guide". |
| Storage temperature °C | -40 °C ... +80 °C |
| Storage temperature °F | -40°F ... +176°F |
| Max. 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 |
| Width, inches | 0.69 in |
| Height | 114.5 mm |
| Length | 128 mm |
| Length, inches | 5.04 in |
| Mounting depth, inches | 4.51 in |
| Weight | 170 g |
| Weight | 0.37 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 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 |

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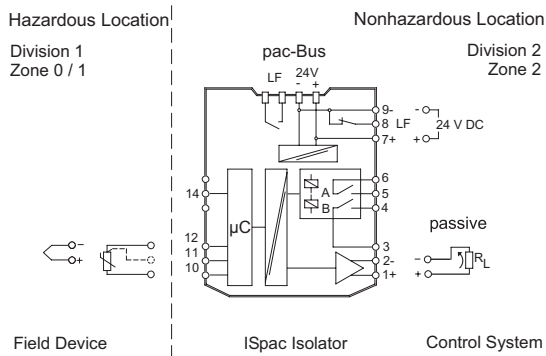
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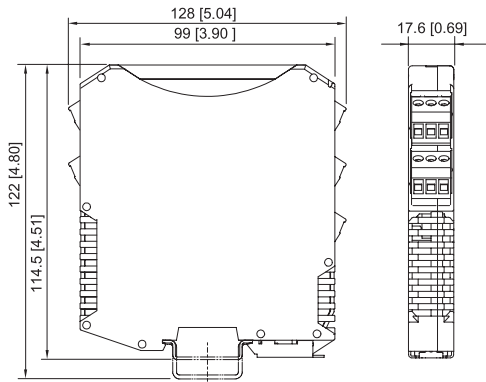


Technical Drawings – Subject to Alterations



Connection diagram 9182/10-51-12; 9182/10-51-14


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, Fieldbus Power Supply Series 9412 with spring clamp terminal

Accessories


Parameterization set ISpac - Wizard

| | Art. No. |
|--|----------|
|  <p>The software serves for commissioning, configuring and diagnosing the ISpac isolators Series 9146, 9162, 9182 and 9282. For further information, see operating instructions. Form of delivery: USB stick; parameterization software incl. parameterization cable / adaptor System requirements: IBM compatible PC with MS XP, Vista, Windows 7, 10 RS 232 C interface RS 232 / USB adaptor</p> | 202595 |

9182 Parameterisation

| | Art. No. |
|--|----------|
|  <p>Parameterisation ex works optionally available for all variants.</p> | 270433 |

Resistive coupling element

| | Art. No. |
|--|----------|
|  <p>The 0/4 to 20 mA signal of channel 1 is converted to a 0/2 to 10 V signal. The resistive coupling element replaces the existing connection terminal. (Set with 5 pieces)</p> | 273968 |

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External reference junction




Art. No.

| | | |
|--|--|--------|
|  | External reference junction for 2 x thermocouple (1 x Pt100 for 2-, 3- or 4-wire connection) integrated into the 4-pin terminal block. Mounted on a DIN rail. | 160675 |
|  | External reference junction for 1 x thermocouple (Pt100 in 2-wire connection) integrated into the pluggable terminal (3-pin). Mounted in the ISpac device instead of the standard connection terminal. | 160676 |

Spare Parts



Screw terminal

Art. No.

| | | |
|--|--|--------|
|  | 3-pole plug, screw connector thread: M3 stripping length: 7 mm color: green | 112817 |
|  | 3-pole plug, screw connector thread: M3 stripping length: 7 mm color: black | 112816 |
|  | 3-pole plug, screw connector thread: M3 stripping length: 7 mm color: blue | 112818 |




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 color: green | 112825 |
|  | 3-pole plug with test tap, spring clamp connection stripping length: 10 mm color: black | 112824 |
|  | 3-pole plug with test tap, spring clamp connection stripping length: 10 mm color: blue | 112826 |

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