

# 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;<br>Class I, Zone 2, Group IIC<br>AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G;<br>Class I, Zone 0, [AEx ia]/[Ex ia] IIC<br>T4 at Ta = 70°C<br>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 $\mu$ F                  |
| Max. permissible external inductance $L_o/L_a$ for IIC  | 90 mH                       |
| Max. permissible external capacitance $C_o/C_a$ for IIB | 570 $\mu$ F                 |
| Max. permissible external inductance $L_o/L_a$ for IIB  | 330 mH                      |
| Max. permissible external capacity $C_o$ for IIIC       | 570 $\mu$ 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 |

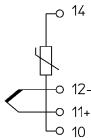
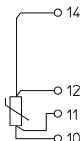
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|                                 |                                                                                     |                                                                                    |                                                                                     |  |
|---------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
| 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 ... 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             | 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        |

## 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)<br>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<br>Pt500<br>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<br>Ni500<br>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 <sup>*)</sup> | -- <sup>*)</sup> 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 <sub>L</sub>             | 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                                                                                                      |
| Line fault indication                      | 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<br>- pac-Bus, potential-free contact (30 V/100 mA) |
| Deviations / error note                    | Information in % of the measuring range (20 mA) at U <sub>N</sub> , 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)<br>-20 °C ... +60 °C (Group assembly)                                   |
| Ambient temperature °F            | -4°F ... +158°F (Single device)<br>-4°F ... +140°F (Group assembly)                                       |
| Note                              | The installation conditions affect the ambient temperature.<br>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;<br>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 in inches                    | 5.04 in   |
| Mounting depth in 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<br>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                  |

# Isolator Barriers

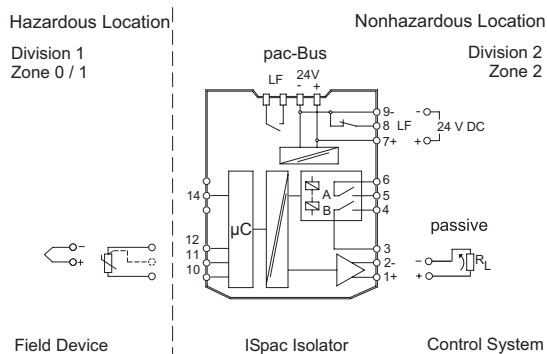
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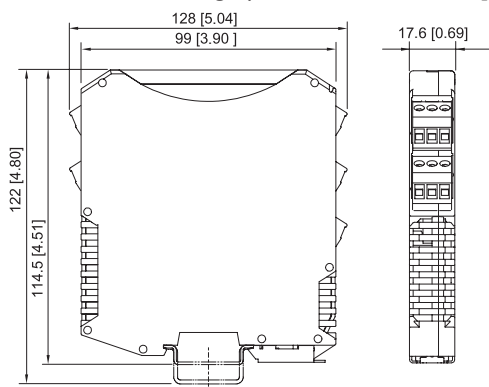
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## Technical Drawings – Subject to Alterations



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.</p> <p>For further information, see operating instructions.</p> <p>Form of delivery: USB stick; parameterization software incl. parameterization cable / adaptor</p> <p>System requirements:</p> <ul style="list-style-type: none"> <li>IBM compatible PC with MS XP, Vista, Windows 7, 10</li> <li>RS 232 C interface</li> <li>RS 232 / USB adaptor</li> </ul> | 202595   |

### 9182 Parameterisation

|                                                                                    |                                                                  | Art. No. |
|------------------------------------------------------------------------------------|------------------------------------------------------------------|----------|
|  | Parameterisation ex works optionally available for all variants. | 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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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.