

# Isolators

Temperature transmitter

Ex i field circuit ISpac

9182/10-51-11s Art. No. 160546



- Ex i temperature transmitter, can be configured for virtually any common sensor type
- Extensive range including variants with signal conversion and trip amplifier function
- For use up to SIL 2 (IEC/EN 61508)

MY R. STAHL 9182A



9182 series 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 analyzed using two independent electronic 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
Certificate ULus	E81680
Marking ULus	providing intrinsically safe circuits for use in Class I,II,III, GROUPS A,B,C,D,E,F,G; See Doc. 91 826 01 31 3
Certificates	ATEX (BVS), Brazil (ULB), Canada (FM), China (NEPSI), IECEX (BVS), India (PESO), Korea (KTL), USA (FM), USA (UL)
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

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## Explosion Protection

Further information	see respective certificate and operating instructions
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## Safety Data

Max. voltage $U_o$	6.5 V
Max. current $I_o$	19.7 mA
Max. power $P_o$	32 mW
Max. power $P_o$ note	Linear characteristic curve
Max. permissible external capacity $C_o$ for IIC	25 $\mu$ F
Max. permissible external inductance $L_o$ for IIC	90 mH
Max. permissible external capacity $C_o$ for IIB	570 $\mu$ F
Max. permissible external inductance $L_o$ for IIB	330 mH
Max. perm. ext. capacit. IIIC	570 $\mu$ F
Max. permis. ext. induct. IIIC	330 mH
Internal capacitance	Negligible
Internal inductance	Negligible
Safety-related max. voltage	253 V

## Electrical Data

Number of channels	1
LFD relay	Yes

Electrical connection	Input configuration				
	Thermocouple	Reference junction			
		Const. temp.	Ext. Pt. 100		
Channel 2					
Channel 1					
Resistance temperature detector	2-wire	3-wire	4-wire (1 channel)	4-wire (2 channels)	
Channel 2					
Channel 1					
	*) Connection of two sensors using 4-wire technology requires an additional external terminal X1				
Potentiometer	3-wire				
Channel 2					
Channel 1					

### 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	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

#### Galvanic Isolation

Fault message contact to output	350 V AC
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#### Input

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

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>*) with parallel 10 kΩ Shunt, no open-circuit detection</sup>

### 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)	without
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 output during LF	configurable
Line fault indication	Red &quot;LF&quot; 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 <sub>N</sub> , 23 °C
Average measurement fault	< 0,1%
Temperature influence	≤ 0,25 %/10K

### Ambient Conditions

Ambient temperature	-20 °C ... +70 °C (Single device) -20 °C ... +60 °C (Group assembly)
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#### Ambient Conditions

Ambient temperature	-4°F ... +158°F (Single device) -4°F ... +140°F (Group assembly)
Note	Installation conditions influence the ambient temperature. Please observe the "Cabinet installation guide".
Storage temperature	-40 °C ... +80 °C
Storage temperature	-40°F ... +176°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

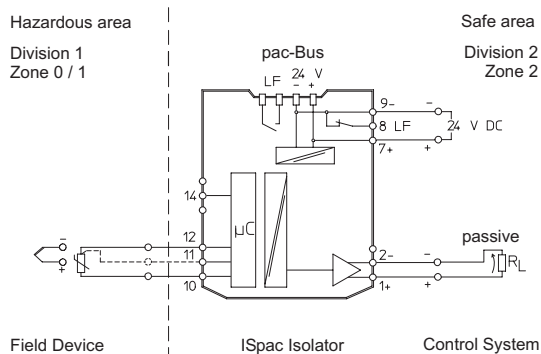
#### Mechanical Data

Degree of protection (IP)	IP30
Degree of protection (IP) terminals	IP20
Fire resistance (UL 94)	V0
Enclosure material	Polyamide
Connection cross-section	0.2 to 2.5 mm <sup>2</sup> flexible 0.2 to 2.5 mm <sup>2</sup> rigid 0.25 to 2.5 mm <sup>2</sup> flexible with core end sleeve
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	195 g
Weight	0.43 lb

#### Mounting / Installation

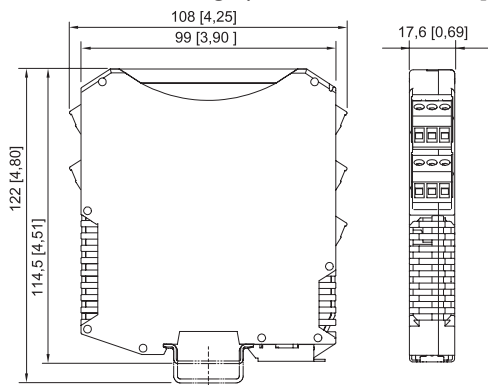
Mounting type	DIN rail NS35/15, NS35/7.5
Mounting orientation	Vertical Horizontal
Connection type	Screw terminal
Min. rigid conductor cross section	0.2 mm <sup>2</sup>
Max. rigid conductor cross section	2.5 mm <sup>2</sup>
Min. flex conductor cross section	0.2 mm <sup>2</sup>
Max. flex conductor cross section	2.5 mm <sup>2</sup>
Connection cross-section AWG	24 ... 14

#### Technical Drawings – Subject to Alterations



Connection diagram 9182/10-51-11, 9182/10-51-13

#### 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

### ISpac Wizard parameterising set



The software is used to commission, configure and diagnose Series 9146, 9162 and 9182 ISpac isolators.  
 For further information, see the operating instructions.  
 Delivery form: USB stick; parameterising software incl. parameterising cable/adaptor  
 System requirements:  
 IBM-compatible PC with MS XP, Vista, Windows 7, 10  
 RS 232 C interface  
 RS 232/USB adaptor

**Art. No.**

202595

### 9182 Parameterisation



Parameterisation ex works optionally available for all variants.

**Art. No.**

270433

### Resistive coupling element



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)

**Art. No.**

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  
colour: green

112817



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: black

112816



3-pole plug, screw connector  
thread: M3  
stripping length: 7 mm  
colour: 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  
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



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