06296E00

- One unit for nearly all temperature sensors indivdually configurable
- Signal duplication possible
- Galvanic isolation between input, output, power supply and configuration interface
- Open-circuit and short-circuit monitoring and messaging (can be switched off)
- Simple configuration with PC or DIP-switches
- Versions can be used up to SIL 2 (IEC 61508)

Basic function: temperature input, O, 1 and 2 channels.
The temperature transmitter is used for intrinsically safe operation of temperature sensors. Most currently available sensors can be connected, such as Pt 100, Pt 500, Pt 1000, Ni 100, thermocouples and resistance transmitters. The parameters can be set using parameterising software ISpac Wizard or alternative via DIP-switches.

	ATEX / IECEx					
Zone	0	1	2	20	21	22
Installation in			x*)			x*)

*) Restrictions see table explosion protection

WebCode 9182B

Selection Table

Version	Channels	Output	Limit value contact (per channel)	SIL	Order number	Tech. data see page
Temperature transmitter Series 9182, field circuit Non-Ex i	1	0/4 ... 20 mA active / source	without	2	**9182/10-51-63s**	A3/3
			2 NO / NC	2	**9182/10-51-64s**	A3/8
	2	0/4 ... 20 mA active / source	without	– –	**9182/20-51-61s**	A3/3
Note	The order numbers listed in the table are for devices equipped with screw-type terminals. For devices equipped with spring-type terminals, replace the ending "s" for screw-type terminals with "k" for spring-type terminals.					
	Signal duplication due to parallel connection of inputs of 9182/20-51-.. (dual channel). Further information see operating instruction.					
	Limited configuration possibilities via DIP switches - see section "configuration". Complete configuration possibilities by means of parameterisation software ISpac Wizard or customer specific parameterisation ex factory - please see "customer specific set-up sheet"					

Explosion Protection	
Global (IECEx)	
Gas	IECEx BVS 09.0046X Ex nA nC IIC T4 Gc
Europe (ATEX)	
Gas	BVS 08 ATEX E 016 X Ⓔx II 3 G Ex nA nC IIC T4 Gc
Certifications and certificates	
Certificates	IECEx, ATEX, Kazakhstan (TR), Korea (KCs), Russia (TR), Ukraine (TR), Belarus (TR)
Ship approval	DNV
Further parameters	
Installation	in Zone 2 and in the safe area
Further information	see respective certificate and operating instructions
Functional safety (IEC 61508)	
Version	**9182/10-51-63, SIL 2**
Test report	Exida FMEDA Stahl 07/07-23-R016
Max. SIL	2
Safe Failure Fraction SFF	78 %
MTBF	120 years (at 40 °C)
PFD_{AVG} at $T_{[Proof]}$	T[Proof] 1 year 3 years 5 years PFD_{AVG} 7.59×10^{-4} 1.44×10^{-3} 3.48×10^{-3}
Further information	see safety manual and test report

Technical Data	
Electrical data	
Auxiliary power	
Nominal voltage U_N	24 V DC
Voltage range	18 ... 31.2 V
Residual ripple within voltage range	≤ 3.6 V_{SS}
Nominal current at U_N	
1 channel	70 mA
2 channels	80 mA
Power consumption at U_N	≤ 1.9 W
Power dissipation at U_N	≤ 1.9 W
Polarity reversal protection	yes
Operation indication	LED green "PWR"
Undervoltage monitoring	yes (no faulty module / output states)
Galvanic separation	
Test voltages	
Input to output	1.5kV AC
Input to auxiliary power	1.5kV AC
Input to configuration interface	1.5 kV AC
Input to error message contact	1.5kV AC
acc. to standard	EN 50178
Output to auxiliary power	350 V AC
Output to configuration interface	350 V AC
Outputs interconnected	350 V AC
Error message contact to auxiliary power and outputs	350 V AC
I.S. inputs	
At thermocouples	20 V
At resistance sensors	– –

Technical Data

Electrical data

Version	**9182/20-51-61**	**9182/10-51-63, SIL 2**
Configuration		
Interface		
Version	RS 232 C	RS 232 C
Software	ISpac Wizard 9199	ISpac Wizard 9199
Connection	4-pole plug on the front	4-pole plug on the front
Settings	all device functions and diagnostics	all device functions and diagnostics
Switch		
Version	12 + 4-pole DIP switch	– –
Settings	Pt 100; thermocouple B, E, J, K, N, R, T with approx. 90 measurement ranges (°C + °F) Pt 100 in 2-, 3- or 4-wire connection Output signal 0/4 ... 20 mA Line fault monitoring activated / deactivated	– –
Input	The input parameters can be set via the parameterising software ISpac Wizard or DIP switch.	The input parameters can be set via the parameterising software ISpac Wizard.

Input resistance temperature detector (RTD)

Types	Standard	Basic range [°C]	Min. span	Middle resolution	Middle measurement error
Pt 100 Pt 500 Pt 1000	IEC 60751	- 200 ... + 850	50 K	0.1 K	0.35 K
Ni 100 Ni 500 Ni 1000	DIN 43760	- 60 ... + 180	31 K	0.1 K	0.25 K

Type of circuit	2-, 3-, 4-wire circuit
Linearity	temperature / resistance
Measuring current	≤ 0.25 mA
Max. line resistor each core	50 Ω (2-wire connection) 100 Ω (3-, 4-wire connection)

Input thermocouple

Types	Standard	Basic range [°C]	Min. span	Middle resolution	Middle measurement error
B	IEC 60584	250 ... 1800	314 K	0,1 K	1,2 K
E		- 200 ... 1000	36 K	0,1 K	0,2 K
J		- 200 ... 1200	42 K	0,1 K	0,2 K
K		- 200 ... 1370	63 K	0,1 K	0,3 K
N		- 200 ... 1300	75 K	0,1 K	0,3 K
R		- 50 ... 1767	171 K	0,1 K	0,7 K
S		- 50 ... 1767	185 K	0,1 K	0,8 K
T		- 200 ... 400	60 K	0,1 K	0,3 K
L	DIN 43710	- 200 ... 900	55 K	0,1 K	0,3 K
U		- 200 ... 600	48 K	0,1 K	0,3 K
XK	GOST	- 200 ... 800	50 K	0,1 K	0,2 K

Linearity	temperature / voltage
Max. line resistance per conductor	≤ 1000Ω
External references	Pt 100 2-wires connection (-40 ... +85 °C) constant temperature (-40 ... +85 °C)

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

Circuit type	3-wire connection
Measuring current	≤ 0.25 mA

Technical Data

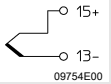
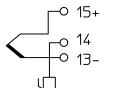
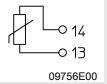
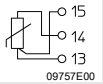
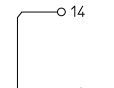
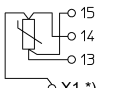
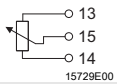
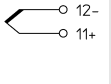
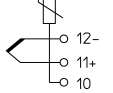
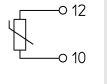
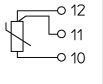
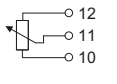
Electrical data	
Output	
Output signal	0/4 ... 20 mA (configurable)
Functional range	0 ... 21 mA
Connectable load resistance R_L	
1 channel	0 ... 750 Ω
2 channels	0 ... 600 Ω
Resolution	≤ 1 µA
Response time (10 ... 90 %)	≤ 35 ms
Delay input - output	≤ 500 ms
Error detection input	
Open-circuit	for resistance thermometers, thermocouples and resistance transmitters > 1 kΩ
Short-circuit	for resistance thermometers with temperature linearisation and resistance transmitters
Behaviour of the output	2,4 mA (configurable 0 ... 23 mA or "hold last value")
Settings (switch LF)	activated / deactivated
Error detection	LED red "LF"
Message of line fault and auxiliary power failure	- Contact (30 V / 100 mA) closed to ground in case of fault - pac-Bus, floating contact (30 V / 100 mA)
Error limits	
	Accuracy, typical data expressed as % of calibrated span at U_N, 23 °C
Middle measurement error	≤ 0.1 %
Temperature influence	≤ 0.1 % / 10 K
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in industrial environment; NAMUR NE 21
Ambient conditions	
Ambient temperature	
Single device	-20 ... +70 °C
Group assembly	-20 ... +60 °C
	The installation conditions affect the ambient temperature. Observe the "Cabinet installation guide".
Storage temperature	-40 ... +80 °C
Relative humidity (no condensation)	≤ 95 %
Use at the height of	< 2000

Technical Data

Electrical connection

Version **9182/20-51-61**

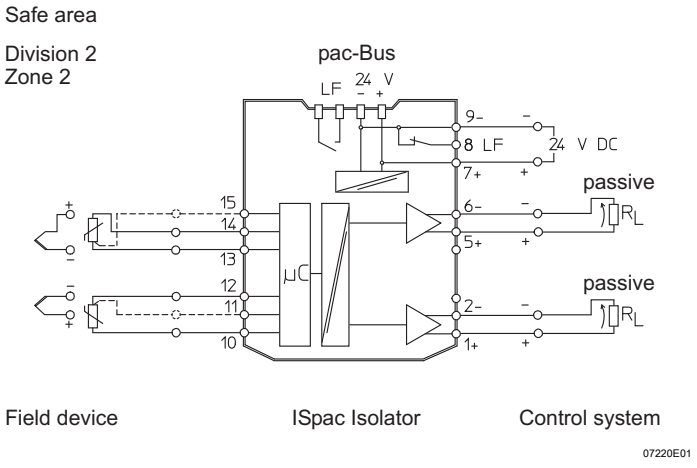
Configuration input

	Thermocouple		Resistance thermometer				Resistance transmitter (RTD)
	Cold junction compensation		2-wire	3-wire	4-wire (1 channel)	4-wire (2 channels)	3-wire
	const. temp.	ext. Pt. 100					
Channel 2							
Channel 1							

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

Connection diagram

2 channels
9182/20-51-61



A3

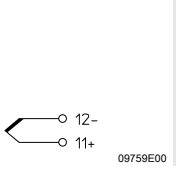
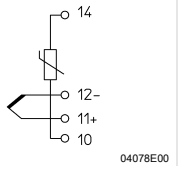
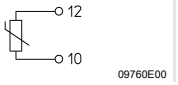
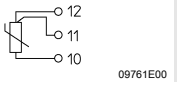
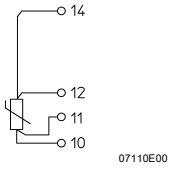
Technical Data

Electrical connection

Version

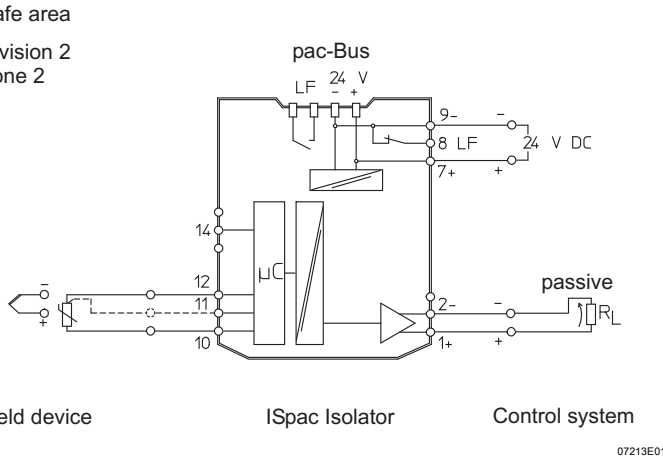
9182/10-51-63, SIL 2

Configuration input

Thermocouple		Resistance thermometer / Resistance transmitter (RTD)		
Cold junction compensation const. temp.	ext. Pt. 100	2-wire	3-wire	4-wire
				

Connection diagram

1 channel
9182/10-51-63



Explosion Protection

Global (IECEx)	
Gas	IECEx BVS 09.0046X Ex nA nC IIC T4 Gc
Europe (ATEX)	
Gas	BVS 08 ATEX E 016 X Ⓔx II 3 G Ex nA nC IIC T4 Gc
Certifications and certificates	
Certificates	IECEx, ATEX, Kazakhstan (TR), Korea (KCs), Russia (TR), Ukraine (TR), Belarus (TR)
Ship approval	DNV
Further parameters	
Installation	in Zone 2 and in the safe area
Further information	see respective certificate and operating instructions

Functional safety (IEC 61508)

Test report: Exida STAHL 07/07-23 R016 and STAHL 07/07-23 R017

Max. SIL: 2

Safe Failure Fraction SFF

4 ... 20 mA	Limit value contact	Limit value contact parallel
78 %	78.4 %	81.1 %

MTBF

4 ... 20 mA	Limit value contact	Limit value contact parallel
120 years	114 years	114 years

PFD_{AVG} at $T_{[Proof]}$

	4 ... 20 mA	Limit value contact	Limit value contact parallel
1 year	7.59×10^{-4}	7.03×10^{-4}	6.17×10^{-4}
2 years	1.44×10^{-3}	1.34×10^{-3}	1.17×10^{-3}
5 years	3.48×10^{-3}	3.23×10^{-3}	2.84×10^{-3}

Further information: see safety manual and test report

Technical Data

Electrical data	
Auxiliary power	
Nominal voltage U_N	24 V DC
Voltage range	18 ... 31.2 V
Residual ripple within voltage range	≤ 3.6 V_{SS}
Nominal current at U_N	70 mA
Power consumption at U_N	≤ 1.9 W
Power dissipation at U_N	≤ 1.9 W
Polarity reversal protection	yes
Operation indication	LED green "PWR"
Undervoltage monitoring	yes (no faulty module / output states)
Galvanic separation	
Test voltages	
Input to output	1.5 kV AC
Input to auxiliary power	1.5 kV AC
Input to configuration interface	1.5 kV AC
Input to error message contact	1.5 kV AC
acc. to standard	EN 50178
Output to auxiliary power	350 V AC
Output to configuration interface	350 V AC
Outputs interconnected	350 V AC
Error message contact to auxiliary power and outputs	350 V AC
I.S. inputs	
At thermocouples	20 V
At resistance sensors	– –

Technical Data

Electrical data

Configuration

Interface

Version	RS 232 C
Software	ISpac Wizard 9199
Connection	4-pole plug on the front
Settings	all device functions and diagnostics

Input

The input parameters can be set via parameterising software ISpac Wizard.

Input resistance temperature detector (RTD)

Types	Standard	Basic range [°C]	Min. span	Middle resolution	Middle measurement error
Pt 100 Pt 500 Pt 1000	IEC 60751	- 200 ... + 850	50 K	0.1 K	0.35 K
Ni 100 Ni 500 Ni 1000	DIN 43760	- 60 ... + 180	31 K	0.1 K	0.25 K

Type of circuit	2-, 3-, 4-wire circuit
Linearity	temperature / resistance
Measuring current	≤ 0.25 mA
Max. line resistor each core	50 Ω (2-wire connection) 100 Ω (3-, 4-wire connection)

Input thermocouple

Types	Standard	Basic range [°C]	Min. span	Middle resolution	Middle measurement error
B	IEC 60584	250 ... 1800	314 K	0,1 K	1,2 K
E		- 200 ... 1000	36 K	0,1 K	0,2 K
J		- 200 ... 1200	42 K	0,1 K	0,2 K
K		- 200 ... 1370	63 K	0,1 K	0,3 K
N		- 200 ... 1300	75 K	0,1 K	0,3 K
R		- 50 ... 1767	171 K	0,1 K	0,7 K
S		- 50 ... 1767	185 K	0,1 K	0,8 K
T		- 200 ... 400	60 K	0,1 K	0,3 K
L	DIN 43710	- 200 ... 900	55 K	0,1 K	0,3 K
U		- 200 ... 600	48 K	0,1 K	0,3 K
XK	GOST	- 200 ... 800	50 K	0,1 K	0,2 K

Linearity	temperature / voltage
Max. line resistance per conductor	≤ 1000Ω
External references	Pt 100 2-wires connection (-40 ... +85 °C) constant temperature (-40 ... +85 °C)

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

Circuit type	3-wire connection
Measuring current	≤ 0.25 mA

Output

Output signal	0/4 ... 20 mA (configurable)
Functional range	0 ... 21 mA
Connectable load resistance R_L	0 ... 750 Ω
Resolution	≤ 1 µA
Response time (10 ... 90 %)	≤ 35 ms
Delay input - output	≤ 500ms

Technical Data

Electrical data

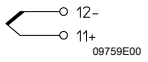
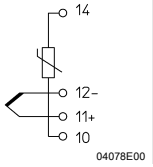
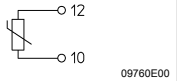
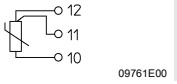
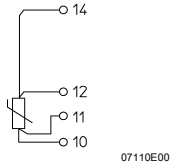
Limiting values	
Message	2 NO / NC (configurable using ISpac Wizard)
Switching voltage	≤ ± 30 V
Switching current (resistive load)	≤ 100 mA
Switch on resistance	≤ 2.5 Ω (typical < 1 Ω)
Reclosing lockout	Reset using the DIP switch or „Power-Off“ (configurable)
Error detection input	
Open-circuit	for resistance thermometers, thermocouples and resistance transmitters > 1 kΩ
Short-circuit	for resistance thermometers with temperature linearisation and resistance transmitters
Behaviour of the output	2,4 mA (configurable 0 ... 23 mA or "hold last value")
Settings (switch LF)	activated / deactivated
Error detection	LED red "LF"
Message of line fault and auxiliary power failure	- Contact (30 V / 100 mA) closed to ground in case of fault - pac-Bus, floating contact (30 V / 100 mA)
Error limits	
	Accuracy, typical data expressed as % of calibrated span at U_N, 23 °C
Middle measurement error	≤ 0.1 %
Temperature influence	≤ 0.1 % / 10 K
Electromagnetic compatibility	Tested under the following standards and regulations: EN 61326-1 Use in industrial environment; NAMUR NE 21

Ambient conditions

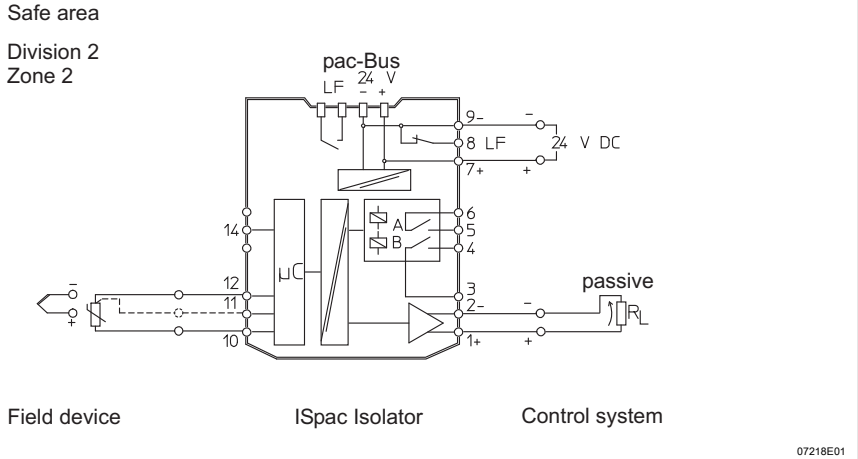
Ambient temperature	
Single device	-20 ... +70 °C
Group assembly	-20 ... +60 °C The installation conditions affect the ambient temperature. Observe the "Cabinet installation guide".
Storage temperature	-40 ... +80 °C
Relative humidity (no condensation)	≤ 95 %

Electrical connection

Configuration input

Thermocouple		Resistance thermometer / Resistance transmitter (RTD)		
Cold junction compensation const. temp.	ext. Pt. 100	2-wire	3-wire	4-wire
				

Connection diagram



Technical Data

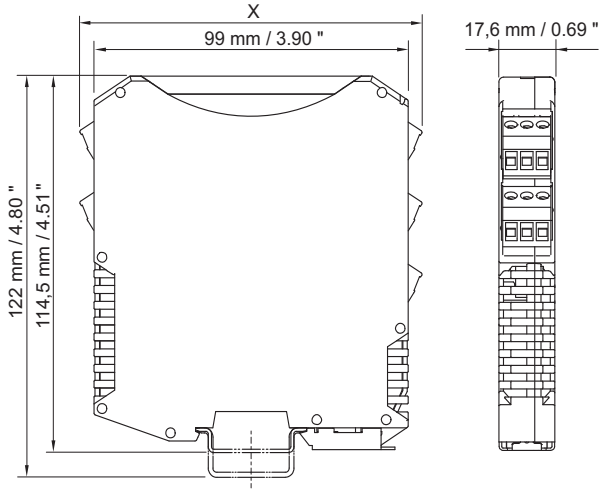
Mechanical data

		Screw-type terminals	Spring-type terminals
Connection			
	Single-wire connection		
	- rigid	0.2 ... 2.5 mm²	0.2 ... 2.5 mm²
	- flexible	0.2 ... 2.5 mm²	0.2 ... 2.5 mm²
	- flexible with core end sleeves (without / with plastic sleeve)	0.25 ... 2.5 mm²	0.25 ... 2.5 mm²
	Two-wire connection		
	- rigid	0.2 ... 1 mm²	- -
	- flexible	0.2 ... 1.5 mm²	- -
	- flexible with core end sleeves	0.25 ... 1 mm²	0.5 ... 1 mm²
Weight	approx. 160		
Mounting type	on top hat rail (NS35/15, NS35/7.5) or in pac-Carrier		
Mounting orientation	horizontal or vertical		
Degree of protection			
Enclosure	IP30		
Terminals	IP20		
Enclosure material	PA 6.6		
Fire resistance (UL-94)	V0		

Accessories and Spare Parts

Designation	Description	Order number
Front cover	yellow, transparent. Clear marking of the device for SIL applications. (Packaging unit: 10 pieces)	**200914**
Reference	Serves for measurement of the junction temperature with a Pt 100 in 2-wires circuit	
	Compact screw terminal (applicable for single- or dual-channel terminal)	**9191/VS-05**
	Terminal (DIN-rail assembly) for the single-channel version 9182	**9191/VS-03**
	Terminal (DIN-rail assembly) for the dual-channel version 9182	**9191/VS-04**
Parameterising set - ISpac - Wizard	The software serves for commissioning, configuring and diagnosing the ISpac isolators Series 9146, 9162 and 9182. For further information, see operating instructions. Form of delivery: CD-ROM; parameterising software incl. parameterising cable / adaptor System requirements: • IBM compatible PC with MS Windows 98, NT, 2000, XP, Vista, Windows 7 • CD-ROM drive • RS 232 C interface • RS 232 / USB adaptor	**9199/20-02**

Dimensional Drawings (All Dimensions in mm / inch) - Subject to Alterations



	Dimension X
Screw-type terminals	108 mm / 4.25″
Spring-cage terminals	128 mm / 5.04″

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.

Customer-specific parameterisation

R. STAHL offers the service to configure ISpac isolators according to your requirements.
There are two options:

1. The form can be downloaded on the product page ISpac, section "Data sheet". Please edit the form directly on your PC.
2. Download the software at ISpac Wizard free: "http://www.r-stahl.com/downloads/software/ex-i-isolators.html".
   Create them using the software configuration. Forward the .prj file to your R. STAHL sales office.

Order-No.: **- Pos.:** **Pieces:**

	Type	Channels	Output	Limit value
☐	9182 / 10 - 51 - 61.	1	0/4...20 mA	none
☐	9182 / 10 - 51 - 63.	1	0/4...20 mA	none
☐	9182 / 20 - 51 - 61.	2	0/4...20 mA	none
☐	9182 / 10 - 51 - 62.	1	0/4...20 mA	2 NC / NO
☐	9182 / 10 - 51 - 64.	1	0/4...20 mA	2 NC
☐	9182 / 10 - 59 - 63.	1	passive	none

with: ☐ Screw terminal s (standard) ☐ Spring clamp terminal k

Please read the operating instructions before you fill in the following form. Please select only one item parameter and channel.

	Default	Channel 1	Channel 2
Signal-Tag	ID-Nr.		
Input			
Resistance Thermometer	☒	☐	
Sensor type	PT 100	☐ PT 100 ☐ PT 500 ☐ PT 1000 ☐ NI 100 ☐ NI 500 ☐ NI 1000	☐ PT 100 ☐ PT 500 ☐ PT 1000 ☐ NI 100 ☐ NI 500 ☐ NI 1000
Circuit type	3-Wires	☐ 2-Wires ☐ 3-Wires ☐ 4-Wires	☐ 2-Wires ☐ 3-Wires ☐ 4-Wires
Measurement range	0 °C ... 400 °C	from to ☐ °C ☐ °F ☐ K ☐ Ω	from to ☐ °C ☐ °F ☐ K ☐ Ω
Thermocouple		☐	
Type		☐ Type B ☐ Type E ☐ Type L ☐ Type K ☐ Type N ☐ Type R ☐ Type S ☐ Type T ☐ Type J ☐ Type U ☐ Type XK	☐ Type B ☐ Type E ☐ Type J ☐ Type K ☐ Type N ☐ Type R ☐ Type S ☐ Type T ☐ Type L ☐ Type U ☐ Type XK
CJC type		☐ external PT 100 ☐ fixed Temp. ☐ internal	☐ external PT 100 ☐ fixed Temp. ☐ internal
Measurement range		from to ☐ °C ☐ °F ☐ K ☐ mV	from to ☐ °C ☐ °F ☐ K ☐ mV
Resistance Transmitter		☐	
Range		☐ up to 500 Ω ☐ up to 5 kΩ ☐ up to 10 kΩ ☐ up to 100 kΩ (+ Shunt)	☐ up to 500 Ω ☐ up to 5 kΩ ☐ up to 10 kΩ ☐ up to 100 kΩ (+ Shunt)
Measurement range		from % to %	from % to %
Output (only 9182/*0-51-6* and 9182/*0-59-6*)			
Signal	4 mA ... 20 mA	☐ 0 mA ... 20 mA ☐ 4 mA ... 20 mA	☐ 0 mA ... 20 mA ☐ 4 mA ... 20 mA
Fault behavior	Output Fault value	☐ Hold last value (start with fault value) ☐ Fault control off ☐ Output Fault value: (standard 2.4 mA)	☐ Hold last value (start with fault value) ☐ Fault control off ☐ Output Fault value: (standard 2.4 mA)
Limit value for Relay A (9182/10-51-62 and 9182/10-51-64.)			
Signaling	inactive	☐ active ☐ inactive	☐ active ☐ inactive
Value	25 %	% or absolute:	% or absolute:
Behavior contact	inactive	☐ inactive ☐ closes, if value > limit value *) ☐ closes, if value < limit value *) ☐ opens, if value > limit value ☐ opens, if value < limit value	☐ inactive ☐ closes, if value > limit value *) ☐ closes, if value < limit value *) ☐ opens, if value > limit value ☐ opens, if value < limit value
Hysteresis	1 %	% (0.1 % ... 10 %)	% (0.1 % ... 10 %)
Lockout function	inactive	☐ active ☐ inactive ☐ active-pwrrst	☐ active ☐ inactive ☐ active-pwrrst
Limit value for Relay B (9182/10-51-62 and 9182/10-51-64.)			
Signaling	inactive	☐ active ☐ inactive	☐ active ☐ inactive
Value	75 %	% or absolute:	% or absolute:
Behavior contact	inactive	☐ inactive ☐ closes, if value > limit value *) ☐ closes, if value < limit value *) ☐ opens, if value > limit value ☐ opens, if value < limit value	☐ inactive ☐ closes, if value > limit value *) ☐ closes, if value < limit value *) ☐ opens, if value > limit value ☐ opens, if value < limit value
Hysteresis	1 %	% (0.1 % ... 10 %)	% (0.1 % ... 10 %)
Lockout Function	inactive	☐ active ☐ inactive ☐ active-pwrrst	☐ active ☐ inactive ☐ active-pwrrst

*) Not for ISpac 9182/10-51-64.

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