Temperature Measurement

RTD Unit – 7XV5662-8AD10

Description

The RTD unit TR1200 IP has 12 sensor inputs and can thus measure up to 12 temperatures using Pt100 sensors.

Support is provided for 3-wire sensors For 2-wire operation, the measured line resistance can be compensated with an appropriate setting.

All settings on the TR1200 IP can be made using 3 push-buttons on the front of the device or in a web browser (for example, Internet Explorer).

For Ni100 or Ni120 sensors, the measured values must be converted in the protection device. The SIPROTEC 7SK80 supports with its integrated temperature function.

The measured values are output to the protection device via the Ethernet network using RJ45 plugs.

Note: The SIPROTEC 4 system interface with an EN100 module does not support temperature measurement by the RTD unit TR1200 IP.

Benefits

- 3-digit display for temperature at a maximum of 12 measuring points
- 12 sensor inputs; 1 to 12 sensors may be connected
- Pt100 in 2-wire or 3-wire technology; if connecting Ni100 or Ni120, conversion to the correct temperature is necessary in the evaluation device; SIPROTEC devices (for example, 7SK80) support this function. The EN100 module in the SIPROTEC 4 devices does not support the TR1200 IP.
- 1 alarm relay (1 change-over contact)
- Electrical 10 Mbps Ethernet interface (RTD IP protocol from ZIEHL or MODBUS IP protocol)
- Display, configuration, simulation and firmware update via a web browser
- Mozilla Firefox 3.5 and Microsoft Internet Explorer 8.0 were tested
- LEDs for measurement assignment, faults, relay status and Ethernet interface
- Code lock against changing the set point values
- Wide-range power supply unit AC/DC 24 V to 240 V
- Distributor housing for panel flush mounting, 8 HP, depth: 55 mm
- Mounting on 35-mm DIN rail according to EN 60715

Application Examples

Measurement of up to 12 measured values with an RTD unit TR1200 IP

For measuring up to 12 measured values, an RTD unit TR1200 IP is connected directly to the protection device (for example, 7SK80x/port A) via a double-shielded CAT 5 patch cable (1:1 or crossed).
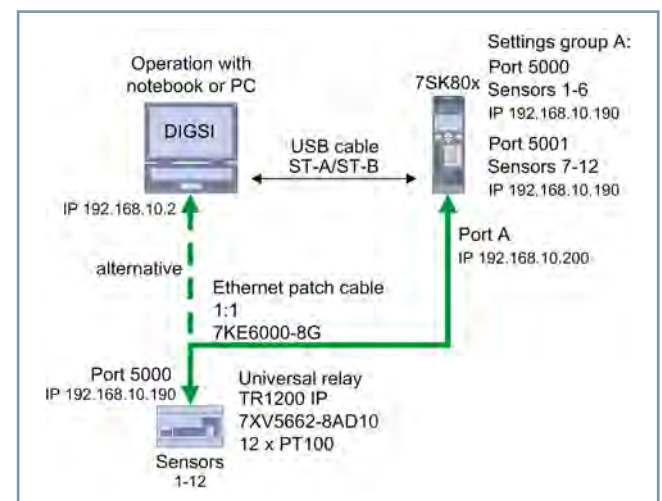

[ph_7XV5662-8AD10_, 1, –_–]

Figure 8.1/11   RTD Unit TR1200 IP (Ethernet) 7XV5662-8AD10

The protection device is parameterized with DIGSI 4 on a laptop computer using the USB front interface.

The TR1200 IP RTD unit is set with the front push-buttons or in a web browser on a laptop computer via the Ethernet interface. To do this, the patch cable must be moved from the protection device to a laptop computer.

Tip: If, during commissioning, a commercially available switch is temporarily used with 3 patch cables, the protection device and the TR1200 IP can be set in parallel using a PC and DIGSI 4.
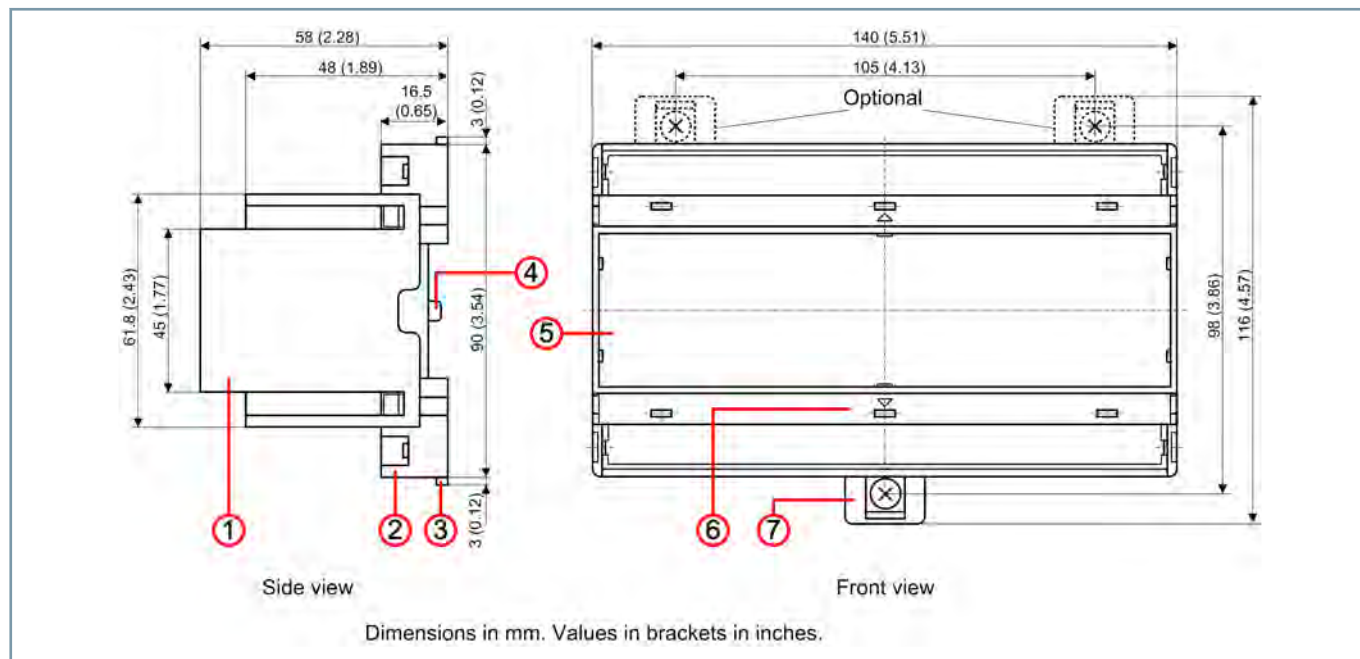
You can find detailed information at *www.siemens.com/siprotec*

[dw_connection_one_device_via_Ethernet_01, 2, en_US]

Figure 8.1/12   Connecting a Device via the Ethernet

Dimensioned Drawing

[dw_Dimensions_7XV5662-8AD10, 2, en_US]

Figure 8.1/13 Dimensions, RTD Unit 7XV5662-7AD10

Technical Data

Rated auxiliary voltage	
Auxiliary voltage V_H	24 to 240 VAC/VDC, 0/45 to 65 Hz, < 5 VA
Tolerance	20.4 to 297 VDC, 20 to 264 VAC
Isolation voltage	2000 VAC

Relay/output			
Quantity	1 change-over contact		
Contact voltage	max. 415 VAC		
Switched current	max. 5 A		
Switching power	max. 2000 VA (resistive load)		
	max. 120 W at 24 VDC		
Reduction factor at cos φ = 0.7	0.5		
Electrical rated data V_L:	250 VAC, 3 A, general purpose		
	AC 240 V, ¼ hp. 2.9 FLA		
	120 VAC, ¹/₁₀ hp. 3.0 FLA		
	C 300		
	D 300 1 A, 240 VAC		
Rated operating current I_E	AC 15	I_E = 1 A	V_E = 400 V
	DC 13	I_E = 2 A	V_E = 250 V
		I_E = 2 A	V_E = 24 V
		I_E = 0.2 A	V_E = 125 V
		I_E = 0.1 A	V_E = 250 V

Relay/output	
Recommended fuse	3.5 A (gL)
Contact service life, mechanical	1×10^7 switching cycles
Contact service life, electrical	1×10^5 switching cycles at 250 VAC/6 A
	2×10^5 switching cycles at 250 VAC / 3 A
	6×10^5 switching cycles at 250 VAC / 1 A

Temperature measurement	
Measurement time, sensor	0.25 to 3 s (depending on the number of sensors)
Measurement time, sensor	0.25 to 30 s (each measuring cycle of a sensor)
Measuring range	-199 °C bis 850 °C
Resolution	1 °C

Sensor connection				
12 × Pt100 according to EN 60751, the connection of Ni100 and Ni120 sensors is possible				
The measured values must be converted in the evaluation device.				
	Measuring range °C		Short circuit, ohms	Open circuit, ohms	Sensor resistance + line resistance, ohms
Sensor	min.	max.	<	>	> max.
Pt 100	-199	860	15	400	500
Tolerance	± 0.5% of the measurement ± 1 K				

Temperature Measurement

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Sensor connection	
Sensor current	≤ 0.8 mA
Temperature drift	< 0.04 °C

Ethernet interface	
Transmission rate	10 Mbps
IP address	Standard: 192.182.1.100, adjustable
Subnet mask	Standard: 255.255.255.0, adjustable
UDP port	Standard: 5000 (5001), adjustable
Max. cable length	20 m when using a CAT 5 patch cable
Max. response time, RTD/Modbus	< 700 µs

Test conditions	
According to	EN 61010-1
Rated surge immunity	4000 V
Surge category	III
Degree of pollution	2
Rated insulation voltage V_I	300 V
Operational time	100%
Permissible ambient temperature during operation	-20 °C bis +65 °C EN 60068-2-2, dry heat
Electromagnetic compatibility – immunity	EN 61000-6-2
EMC – emitted interference	EN 61000-6-4

Test conditions	
Galvanic separation of control voltage – measuring input	3820 VDC
Ethernet – control voltage – measuring input	500 VDC

Housing	
Housing type	V8, distribution panel mounting
Dimensions (W x H x D)	140 × 90 × 58 mm
Depth/width	55 mm / 8 HPs
Line termination, single conductor	1 × 1.5 mm² each
Braided conductor with end sleeve	1 × 1.0 mm² each
Tightening torque for terminal screw	0.5 Nm
Degree of protection of the housing/ terminal	IP30/IP20
Flush mounting	any
Fastening	Snap-on mounting to 35-mm DIN rail according to EN 60715 or screw fixing(with 2 additional angle brackets)
Weight	about 350 g

Selection and Ordering Data

Description	Order no.											
	1	2	3	4	5	6	7	8	9	10	11	12
Temperature measuring device (RTD unit)	7	X	V	5	6	6	2	- 8	A	D	1	0
For SIPROTEC 4, SIPROTEC Compact and all SIPROTEC 5 devices (except 7SS85, 7VK87, 7KE85)												
With 12 temperature sensors Pt100 [1]												
SIPROTEC 7SK80 port A (Ethernet, RJ45)												
Mounting on a DIN rail												
24 to 250 VAC/VDC												
Note: Not compatible with the SIPROTEC 4 EN100 printed circuit board assembly												

(1)   Replaces one or two 7XV5662-2AD10 or 7XV5662-5AD10