Temperature Measurement

RTD Unit – 7XV5662-6AD10

Description

The RTD unit TR1200 can measure up to 12 temperatures with 12 measuring inputs. It supports 2-wire and 3-wire Pt 100 sensors. For 2-wire operation, the measured line resistance can be compensated with an appropriate setting. For commissioning purposes, the temperature measurement can be simulated.

The measured value is output to the protection device compatible with the TR600 using the bus cable 7XV5103-7AAxx via an RS485 bus.

All settings are made using three push-buttons on the front panel. Input can be inhibited by means of a code.

The TR1200 has a wide-range power supply unit, DC 24 V to 250 V and AC 115/230 V, and an alarm relay. A sensor interruption or a sensor short is reported and transmitted to the SIPROTEC device via protocol.

Benefits

- 3-digit temperature display
- 12 inputs for temperature sensors, 1 to 12 sensors can be connected
- Pt 100 thermocouples for 2-wire or 3-wire technology
- 1 fault relay (electrically isolated change-over contact)
- RS485 interface (ZIEHL standard protocol and Modbus RTU protocol)
- LEDs indicate the measuring channel, fault condition, relay function and RS485 activity
- A code lock prevents parameter manipulation
- TR600-compatible (to replace 1 TR600 with 6 connected sensors)
- Universal power supply unit, AC/DC 24 V to 240 V
- Snap-on mounting to 35-mm DIN rail according to EN 60715

[ph_7XV5662-6AD10_, 1, --_--]

Figure 8.1/1   RTD Box TR1200 – 7XV5662-6AD10

Applications

Communication over the RS485 bus

The RTD unit TR1200 is connected to a SIPROTEC 4 protection device with temperature function (for example, 7SJ6, 7UT6, 7UM6) or the Compact protection 7SK80 with serial RS485 interface (port B) via the RS485 interface. The special cable 7XV5103-7AAxx is used for connection. The RTD unit is connected to a SIPROTEC 5 device according to *Figure 8.1/4*). You can find detailed information at *www.siemens.com/siprotec*.

The RTD unit can be connected to a Reyrolle 5 (7SR5) device and used with the **49TS Temperature Sensor Supervision** function. For further details see the 7SR5 Device Manual.
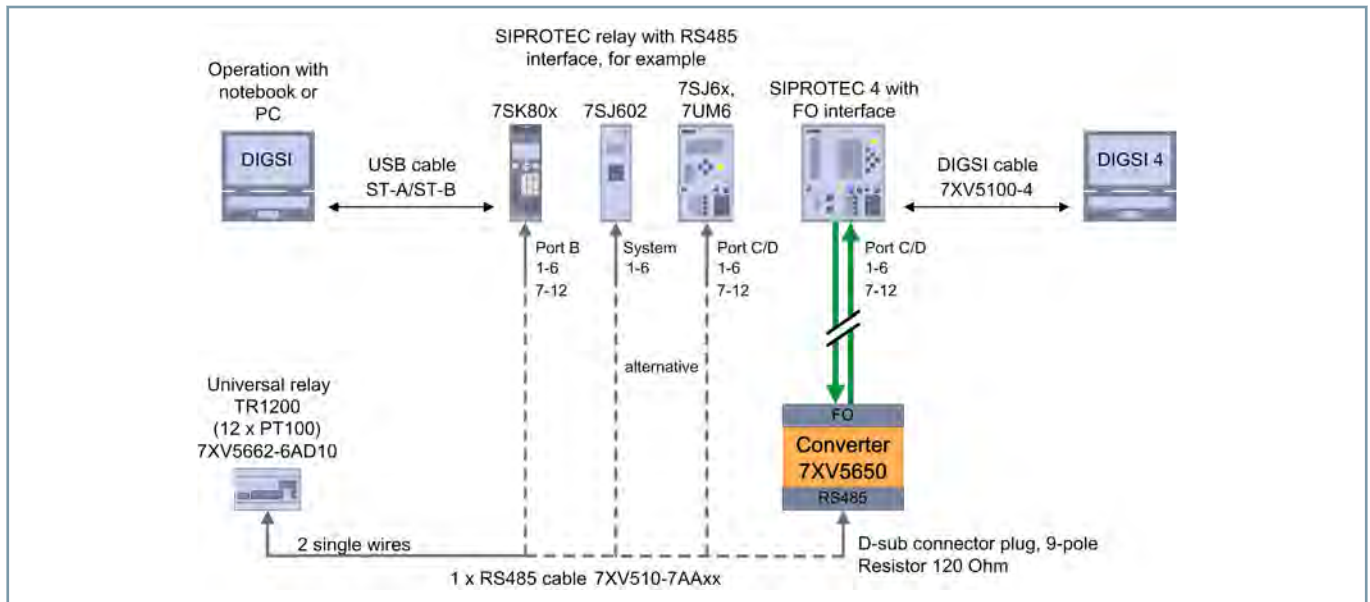
Connection Examples

[dw_connection_dev_via_serial-RS485-Bus_or_FO-cable, 2, en_US]

Figure 8.1/2   Connection of Devices using a Serial RS485 Bus or Fiber-Optic Cable
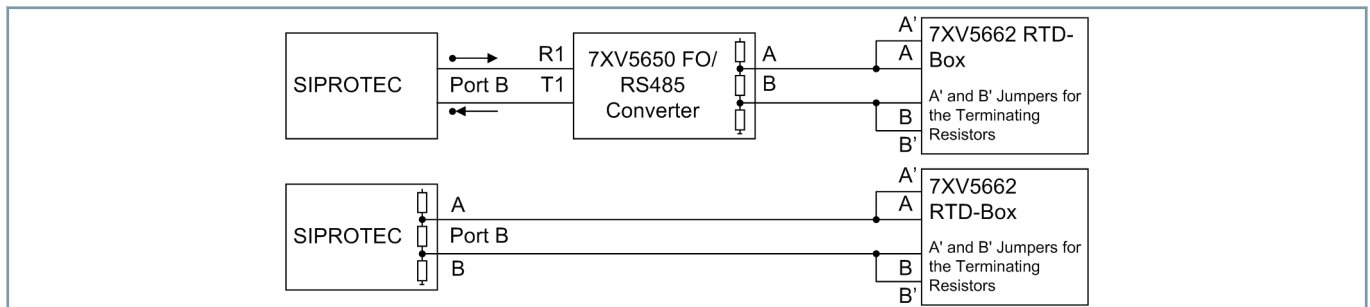

[halb-duplex-1-thermobox-060606, 1, en_US]

Figure 8.1/3   SIPROTEC Compact Connection Example – Half-Duplex Operation with an RTD Unit (top: Optical version (2 optical fibers); bottom: RS485 Version. Optional Ethernet via Port A (EN100–LC)
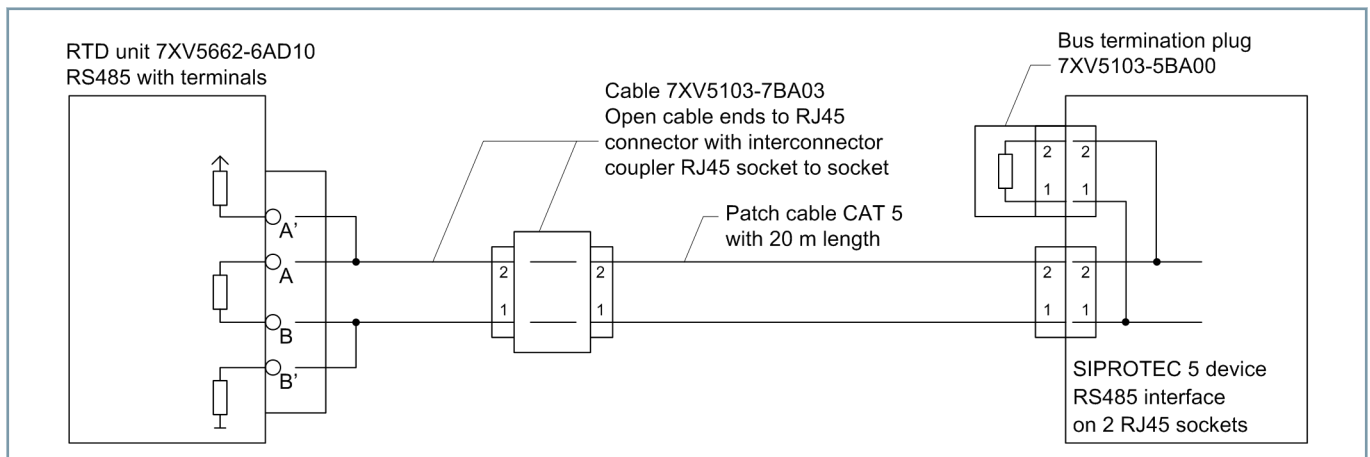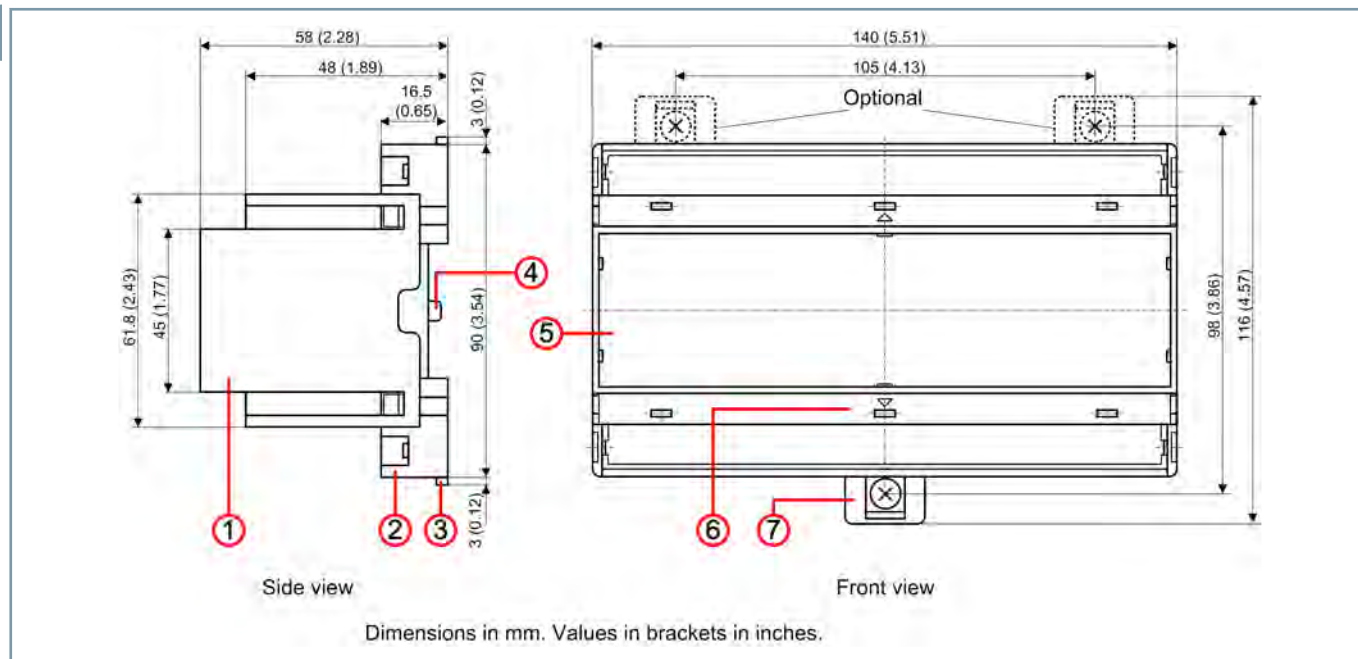

[dwverbau-201112-01.tif, 1, en_US]

Figure 8.1/4   Connection Example of the RTD Unit to a SIPROTEC 5 Device

Dimensioned Drawing

[dw_Dimensions_7XV5662-8AD10, 2, en_US]

Figure 8.1/5   Dimensions, RTD Unit 7XV5662-6AD10

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

Relay/output			
Quantity	1 change-over contact (CO)		
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 $\varphi = 0.7$	0.5		
Electrical rated data V_L:	250 VAC, 3 A, general purpose		
	D300 1 A, 240 VAC		
Rated operating current I_E	AC 15	$I_E = 2$ A	$V_E = 250$ V
	DC 13	$I_E = 2$ A	$V_E = 24$ V
		$I_E = 0.2$ A	$V_E = 125$ V
		$I_E = 0.1$ A	$V_E = 250$ V
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/5 A		

Sensor connections	
Quantity	24 to 240 VAC/VDC, 0/45 to 65 Hz, < 5 VA
Measuring cycle/measurement time	20.4 to 297 VDC, 20 to 264 VAC
Measuring cycle/line resistance	0.25 to 30 s (each measuring cycle of a sensor)
Measuring range	−199 to 850 °C
Resolution	1 °C
Accuracy	± 0.5% of the measured value ± 1 K
Sensor current	≤ 0.8 mA
Temperature drift	< 0.04 °C
Short circuit	< 15 ohm
Open circuit	> 400
Sensor resistance + line resistance	max. 500 ohms

RS485 interface	
Device address	0 to 96
Measuring cycle/measurement time	20.4 to 297 VDC, 20 to 264 VAC
Measuring cycle/line resistance	0.25 to 30 s (each measuring cycle of a sensor)
Measuring range	−199 to 850 °C
Resolution	1 °C
Accuracy	± 0.5% of the measured value ± 1 K
Sensor current	≤ 0.8 mA
Temperature drift	< 0.04 °C
Short circuit	< 15 ohm

RS485 interface	
Open circuit	> 400
Sensor resistance + line resistance	max. 500 ohms

RS485 interface	
Device address	0 to 96
Baud rate	4800, 9600, 19200 bit/s
Parity	N, O, E (no, odd, even)
Max. cable length	1000 m at 19200 bit/s
Serial protocol	serial RTD protocol Ziehl/SIPROTEC, detailed protocol description in the manual

Test conditions	
According to	EN 61010-1
Rated surge immunity	4000 V
Overvoltage category	III
Degree of pollution	2
Rated insulation voltage V_I	300 V
Operational time	100%
Permissible ambient temperature	-20 °C bis +65 °C, EN 60068-2-2, dry heat
Galvanic separation	Power supply – measuring inputs 3820 VDC
No galvanic separation	RS 485-interface – measuring inputs
EMC Tests	EN 61326-1
EMC test for emitted interference	EN 61000-4-3

Test conditions	
Fast transient bursts	EN 61000-4-4 ± 4 kV, Pulse 5/50 ns, f = 5 kHz, t = 15 ms, T = 300 ms
Energy surge voltages (SURGE)	IEC 61000-4-5 ± 1 pulse: 1.2/50 µs (8/20 µs)
Electrostatic discharge test	IEC 61000-4-2 ± 4 contact discharge, ± 8 kV air discharge

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 mm^2 each
Braided conductor with end sleeve	1 × 1.0 mm^2 each
Tightening torque for terminal screw	0.5 Nm
Degree of protection of the housing/ terminal	IP30/IP20
Vertical/horizontal mounting	optional
Fastening	Snap-on mounting to 35-mm DIN rail according to EN 60715 or screw fixing(with 2 additional angle brackets)
Weight	about 370 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	-	6	A	D	1	0
For SIPROTEC 4, SIPROTEC Compact and all SIPROTEC 5 devices (except 7SS85, 7VK87, 7KE85)														
With 12 temperature sensors Pt100 [1]; with RS485 interface for DIN rail mounting														
24 to 250 VAC/VDC														
RS485 copper cable		7	X	V	5	1	0	3	-	7				
see *Selection and Ordering Data, Page 168*														

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