Data Sheet DS/TTR200-EN Rev. C

TTR200
Rail-mount temperature transmitter

Temperature transmitter for HART protocol.
Suitable for all standard requirements.

Measurement made easy

Communication / output
- HART protocol
- 4 ... 20 mA

Input
- RTD, resistance thermometer
- Thermocouples
- Resistance-type remote sensor
- Voltages, mV voltages

Electrical isolation
- Input and output circuit

Input functionality
- Sensor error adjustment

Continuous sensor monitoring and self-monitoring
- Two function LEDs
- Supply voltage monitoring
- Wire break and corrosion monitoring in accordance with NE 89

Device safety in accordance with NE 53

Functional safety
SIL 2 / SIL 3 in accordance with IEC 61508

Configuration
- FIM
- DTM
- EDD

Global approvals for explosion protection
- ATEX, IECEx, Zone 0
- FM, CSA
- GOST, EAC Ex
- Inmetro

TTR200
Rail-mount temperature transmitter

Specifications

CE marking
— The device fulfills all requirements for CE marking in accordance with all applicable guidelines.

Electrical isolation
— 3.5 kV DC (approx. 2.5 kV AC), 60 s, input to output

MTBF time
— 28 years at 60 °C ambient temperature

Input filter
— 50 / 60 Hz

Switch-on delay
— < 10 s (I_a ≤ 3.6 mA during switch-on cycle)

Warm-up time
— 5 minutes

Rise time t90
— 400 … 1000 ms

Measured value update
— 10/s, independent of sensor type and sensor circuit

Output filter
— Digital filter 1st order: 0 ... 100 s

Weight
— 180 g

Material
— Housing: polycarbonate
— Color: gray RAL9002
— Sealing compound: hard sealing compound

Installation conditions
— Mounting position: no restrictions
— Installation options:
Rail mounting (35 mm) in accordance with EN 60175

Electrical connection
— Terminals with captive screws, plug-in with screw connections,
— Lines up to maximum 2.5 mm^2 (AWG 14)

Dimensions
See chapter "Dimensions" on page 9

Ambient conditions

Ambient temperature
— Standard -40 … 85 °C (-40 … 185 °F)
— Restricted range during operation with explosion-proof design: see corresponding certificate

Transport / storage temperature
— -40 … 85 °C (-40 … 185 °F)

Climate class in accordance with DIN EN 60654-1
— Cx -40 … 85 °C (-40 … 185 °F) at 5 … 95 % relative humidity

Max. permissible humidity in accordance with IEC 60068-2-30
— 100 % relative humidity

Vibration resistance in accordance with IEC 60068-2-6
— 10 … 2000 Hz at 5 g, during operation and transport

Shock resistance in accordance with IEC 68-2-27
— gn = 30, during operation and transport

IP rating
— Power supply circuit: IP 20 or IP class of the bay

Electromagnetic compatibility

Emitted interference in accordance with IEC EN and Namur NE 21.

Interference immune in accordance with IEC 61326 and Namur NE 21.
Pt100: measuring range 0 ... 100 °C (32 ... 212 °F), span 100 K.

Type of test	Testing accuracy	Effect
Burst to signal- / data lines	2 kV	< 0,5 %
Static discharge		
— Contact plate (indirect)	8 kV	NO
— Supply terminals[1)]	6 kV	NO
— Sensor terminals[1)]	4 kV	NO
Radiated field		
80 MHz ... 2 GHz	10 V/m	< 0,5 %
Coupling		
150 kHz ... 80 MHz	10 V	< 0,5 %
Surge		
between the supply lines	0,5 kV	No malfunction
Line to ground	1 kV	

1) Air discharge (at 1 mm (0.04 inch) distance)

SIL functional safety

Conforms with IEC 61508 as regards use in safety related applications, up to and including SIL 3 (redundant). While using the transmitter, the device fulfills the requirements in accordance with SIL 2. While using two redundant transmitters, the device fulfills the requirements in accordance with SIL 3.

Input - resistance thermometer / resistances

Resistance thermometer
- Pt100 according to IEC 60751, JIS C1604, MIL-T-24388
- Ni according to DIN 43760
- Cu according to recommendation OIML R 84

Resistance measurement
- 0 ... 500 Ω
- 0 ... 5000 Ω

Sensor connection type
- Two-, Three-, Four wire-circuits

Connection lead
- Maximum sensor line resistance:
  of 50 Ω per line in accordance with NE 89
- Three-wire circuit:
  Symmetrical sensor line resistances
- Two-wire circuit:
  Compensation up to 100 Ω total lead resistance

Measurement current < 300 µA

Sensor short circuit < 5 Ω (for resistance thermometers)

Sensor wire break
- Measuring range: 0 ... 500 Ω > 0.6 ... 10 kΩ
- Measuring range: 0 ... 5 kΩ > 5.3 ... 10 kΩ

Corrosion detection in accordance with NE 89
- Three-wire resistance measurement > 50 Ω
- Four-wire resistance measurement > 50 Ω

Sensor error signaling
- Resistance thermometer: Sensor short circuit and sensor wire breakage
- Linear resistance measurement: Sensor wire break

Input - thermocouples / voltages

Types
- B, E, J, K, N, R, S, T in accordance with IEC 60584
- U, L in accordance with DIN 43710
- C, D in accordance with ASTM E-988

Voltages
- -125 ... 125 mV
- -125 ... 1100 mV

Supply line
- Maximum sensor line resistance
  1.5 kΩ per wire, 3 kΩ in total

Sensor wire break monitoring in accordance with NE 89
- Pulsed with 1 µA outside measurement interval
- Thermocouple measurement 5.3 ... 10 kΩ
- Voltage measurement 5.3 ... 10 kΩ

Input resistance > 10 MΩ

Internal reference junction Pt1000, IEC 60751 Cl. B
(no additional jumpers necessary)

Sensor error signaling
- Thermocouple: wire break
- Linear voltage measurement: wire break

HART output

Transmission behavior
- Temperature linear
- Resistance linear
- Voltage linear

Output signal
- Configurable 4 ... 20 mA (standard)
- Configurable 20 ... 4 mA
  (Dynamic range: 3.8 ... 20.5 mA in accordance with NE 43)

Simulation mode 3.5 ... 23.6 mA
Induced current consumption < 3.5 mA
Maximum output current 23.6 mA

Configurable error current signal
- Overrange 22 mA (20.0 … 23.6 mA)
- Underrange 3.6 mA (3.5 … 4.0 mA)

Power supply

Two-wire technology, polarity safe; power supply lines = signal lines

NOTICE

Following calculations apply for standard applications. This should be taken into consideration when working with a higher maximum current.

Input terminal voltage
- Non-Ex application:
  U_S = 11 ... 42 V DC
- Ex applications:
  U_S = 11 ... 30 V DC

Max. permissible residual ripple for input terminal voltage
- During communication in accordance with HART FSK "Physical Layer" specification.

Undervoltage detection on the transmitter
- If the terminal voltage on the transmitter falls below a value of 10 V, this may lead to an output current of $I_a \leq$ 3.6 mA.

Maximum load
- R_B = (supply voltage – 11 V) / 0.022 A

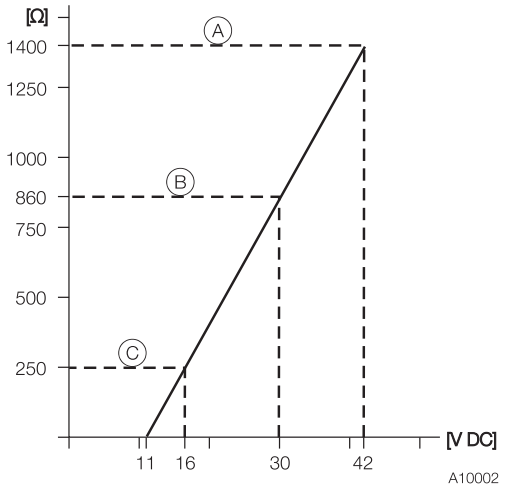

Fig. 1: Maximum load depending on input terminal voltage
(A) TTR200 (B) TTR200 In Ex ia hazardous area design (C) HART communication resistance

Maximum power consumption
- P = U_s x 0.022 A
- e. g. U_s = 24 V → P_{max} = 0.528 W

Measuring accuracy

Includes linearity error, repeatability / hysteresis at 23 °C (73.4 °F) ± 5 K and 20 V supply voltage.
Information on measuring accuracy corresponds to 3 σ (Gaussian distribution).

Sensor		Measuring range limits	Minimum span	Digital measuring accuracy (24-bit AD-converter)	DA measuring accuracy[1] (16-bit DA)
Resistance thermometer/resistor					
DIN IEC 60751	Pt10 (a=0.003850)	-200 ... 850 °C (-328 ... 1562 °F)	10 °C (18 °F)	± 0.80 °C (± 1.44 °F)	± 0.05 %
	Pt50 (a=0.003850)			± 0.16 °C (± 0.29 °F)	± 0.05 %
	Pt100 (a=0.003850)[2]			± 0.08 °C (± 0.14 °F)	± 0.05 %
	Pt200 (a=0.003850)			± 0.24 °C (± 0.43 °F)	± 0.05 %
	Pt500 (a=0.003850)			± 0.16 °C (± 0.29 °F)	± 0.05 %
	Pt1000 (a=0.003850)			± 0.08 °C (± 0.14 °F)	± 0.05 %
JIS C1604	Pt10 (a=0.003916)	-200 ... 645 °C (-328 ... 1193 °F)	10 °C (18 °F)	± 0.80 °C (± 1.44 °F)	± 0.05 %
	Pt50 (a=0.003916)			± 0.16 °C (± 0.29 °F)	± 0.05 %
	Pt100 (a=0.003916)			± 0.08 °C (± 0.14 °F)	± 0.05 %
MIL-T-24388	Pt10 (a=0.003920)	-200 ... 850 °C (-328 ... 1562 °F)	10 °C (18 °F)	± 0.80 °C (± 1.44 °F)	± 0.05 %
	Pt50 (a=0.003920)			± 0.16 °C (± 0.29 °F)	± 0.05 %
	Pt100 (a=0.003920)			± 0.08 °C (± 0.14 °F)	± 0.05 %
	Pt200 (a=0.003920)			± 0.24 °C (± 0.43 °F)	± 0.05 %
	Pt1000 (a=0.003920)			± 0.08 °C (± 0.14 °F)	± 0.05 %
DIN 43760	Ni50 (a=0.006180)	-60 ... 250 °C (-76 ... 482 °F)	10 °C (18 °F)	± 0.16 °C (± 0.29 °F)	± 0.05 %
	Ni100 (a=0.006180)			± 0.08 °C (± 0.14 °F)	± 0.05 %
	Ni120 (a=0.006180)				± 0.05 %
	Ni1000 (a=0.006180)				± 0.05 %
OIML R 84	Cu10 (a=0.004270)	-50 ... 200 °C (-58 ... 392 °F)	10 °C (18 °F)	± 0.80 °C (± 1.44 °F)	± 0.05 %
	Cu100 (a=0.004270)			± 0.08 °C (± 0.14 °F)	± 0.05 %
	Resistance measurement	0 ... 500 Ω	4 Ω	± 32 mΩ	± 0.05 %
		0 ... 5000 Ω	40 Ω	± 320 mΩ	± 0.05 %
Thermocouples[3] / voltages					
IEC 60584	Type K (Ni10Cr-Ni5)	-270 ... 1372 °C (-454 ... 2502 °F)	50 °C (90 °F)	± 0.35 °C (± 0.63 °F)	± 0.05 %
	Type J (Fe-Cu45Ni)	-210 ... 1200 °C (-346 ... 2192 °F)			± 0.05 %
	Type N (Ni14CrSi-NiSi)	-270 ... 1300 °C (-454 ... 2372 °F)			± 0.05 %
	Type T (Cu-Cu45Ni)	-270 ... 400 °C (-454 ... 752 °F)			± 0.05 %
	Type E (Ni10Cr-Cu45Ni)	-270 ... 1000 °C (-454 ... 1832 °F)			± 0.05 %
	Type R (Pt13Rh-Pt)	-50 ... 1768 °C (-58 ... 3215 °F)	100 °C (180 °F)	± 0.95 °C (± 1.71 °F)	± 0.05 %
	Type S (Pt10Rh-Pt)				± 0.05 %
	Type B (Pt30Rh-Pt6Rh)	-0 ... 1820 °C (32 ... 3308 °F)			± 0.05 %
DIN 43710	Type L (Fe-CuNi)	-200 ... 900 °C (-328 ... 1652 °F)	50 °C (90 °F)	± 0.35 °C (± 0.63 °F)	± 0.05 %
	Type U (Cu-CuNi)	-200 ... 600 °C (-328 ... 1112 °F)			± 0.05 %
ASTM E 988	Type C	-0 ... 2315 °C (32 ... 4200 °F)	100 °C (180 °F)	± 1.35 °C (± 2.43 °F)	± 0.05 %
	Type D				± 0.05 %
	Voltage measurement	-125 ... 125 mV	2 mV	± 12 µV	± 0.05 %
		-125 ... 1100 mV	20 mV	± 120 µV	± 0.05 %

Long-term drift: ± 0.05 °C (± 0.09 °F) or ± 0.05 %[1] per year, the larger value applies.

1) Percentages refer to the configured measuring span
2) Standard model
3) For digital measurement accuracy, the internal reference junction error must be added: Pt1000, DIN IEC 60751 Cl. B

Operating influence

The percentages refer to the configured measuring span.

Input terminal voltage effect / load effect: within the specified limit values for the voltage / load, the total influence is less than 0.001% per volt.

Common-mode interference: no influence up to 100 V_{eff} (50 Hz) or 50 VDC

Ambient temperature effect: based on 23 °C (73.4 °F) for an ambient temperature range of -40 ... 85 °C (-40 ... 185 °F)

Sensor		Ambient temperature effect per 1 °C (1.8 °F) deviation from 23 °C (73.4 °F) for digital measured value	Ambient temperature effect[1) 2)] per 1 °C (1.8 °F) deviation from 23 °C (73.4 °F) for DA-converter
Resistance thermometer for two-, three- and four-wire circuits			
IEC, JIS, MIL	Pt10	± 0.04 °C (± 0.072 °F)	± 0.003 %
	Pt50	± 0.008 °C (± 0.014 °F)	± 0.003 %
	Pt100	± 0.004 °C (± 0.007 °F)	± 0.003 %
IEC, MIL	Pt200	± 0.02 °C (± 0.036 °F)	± 0.003 %
	Pt500	± 0.008 °C (± 0.014 °F)	± 0.003 %
	Pt1000	± 0.004 °C (± 0.007 °F)	± 0.003 %
DIN 43760	Ni50	± 0.008 °C (± 0.014 °F)	± 0.003 %
	Ni100	± 0.004 °C (± 0.007 °F)	± 0.003 %
	Ni120	± 0.003 °C (± 0.005 °F)	± 0.003 %
	Ni1000	± 0.004 °C (± 0.007 °F)	± 0.003 %
OIML R 84	Cu10	± 0.04 °C (± 0.072 °F)	± 0.003 %
	Cu100	± 0.004 °C (± 0.007 °F)	± 0.003 %
Resistance measurement			
	0 ... 500 Ω	± 0.002 Ω	± 0.003 %
	0 ... 5000 Ω	± 0.02 Ω	± 0.003 %
Thermocouple, for all defined types		± [(0.001 % x (ME[mV] / MS[mv]) + (100 % x (0.009 °C / MS [°C])][3)]	± 0.003 %
Voltage measurement			
	-125 ... 125 mV	± 1.5 µV	± 0.003 %
	-125 ... 1100 mV	± 15 µV	± 0.003 %

1) Percentages refer to the configured measuring span of the analog output signal
2) Influence of the DA-converter
3) ME = voltage value of the thermocouple at the upper range value in accordance with the standard
MA = voltage value of the thermocouple at the lower range value in accordance with the standard
MS = voltage value of the thermocouple over the measuring span in accordance with the standard. MS = (ME - MA)

Electrical connections

Pin assignment

Resistance thermometers (RTD) / resistors (potentiometers)

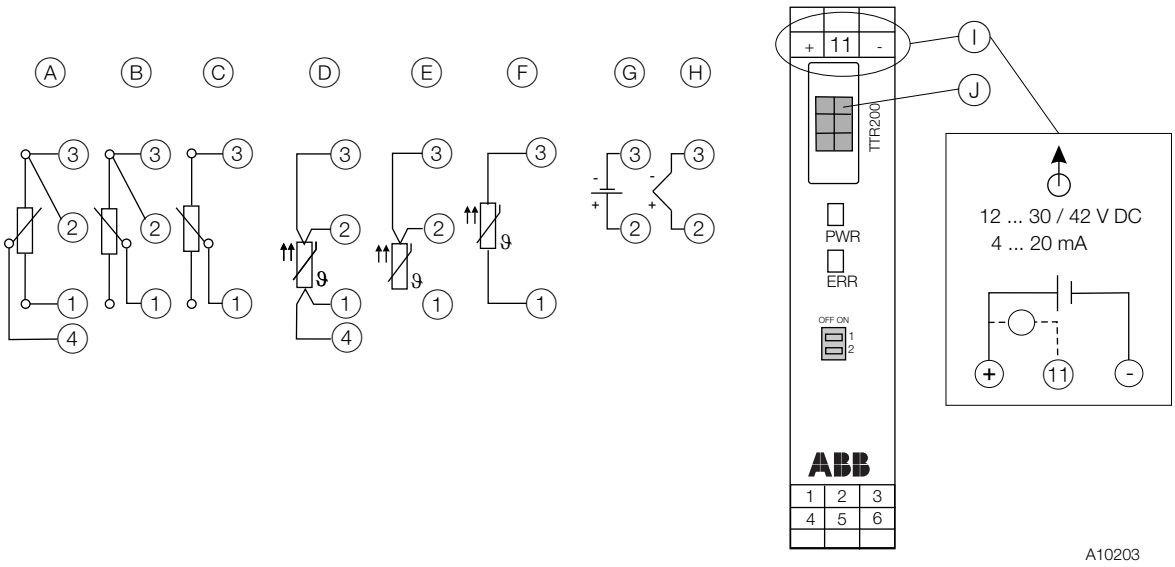

Fig. 2
(A) Potentiometer, four-wire circuit (B) Potentiometer, three-wire circuit (C) Potentiometer, two-wire circuit (D) RTD, four-wire circuit (E) RTD, three-wire circuit (F) RTD, two-wire circuit (G) Voltage measurement (H) Thermocouple (I) Terminal 11: Measurement of the 4 ... 20 mA output current without opening / interrupting the current loop (J) Without function (1) – (4) Sensor connection (from measuring inset)

- PWR / green LED: supply voltage display
- ERR / red LED: sensor, sensor lead & unit fault signaling
- DIP switch 1: on -> hardware write protection enabled
- DIP switch 2: without function

Communication

Configuration parameters

Measurement type
- Sensor type, connection type
- Error signaling
- Measuring range
- General information, e.g. TAG number
- Damping
- Output signal simulation
- Limit over/undershot "Order form configuration" on page 14

Write protection
- Software write protection

Diagnostic information in accordance with NE 107
- Sensor error signaling (wire break or short circuit)
- Device error
- Limit value overshot/undershot
- Measuring range overshot/undershot
- Simulation active

The device is listed with the FieldComm Group.

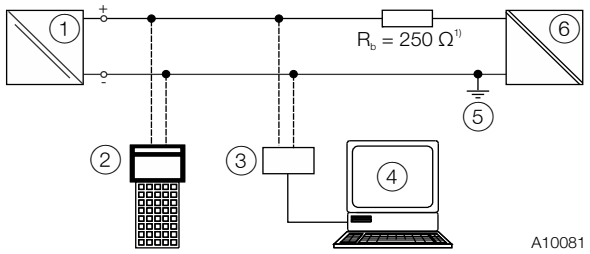

Fig. 3: Example for HART connection
(1) Transmitter (2) Handheld terminal (3) HART modem (4) FDT / DTM technology (5) Grounding (optional) (6) Power supply unit (process interface)

1) If required

Manufacturer ID	0x1A
Device Type ID	0x0D
Profile	HART 5.1
Configuration	DTM EDD
Transmission signal	BELL Standard 202

Operating modes
- Point-to-point communication mode – standard (general address 0)
- Multidrop mode (addressing 1 ... 15)
- Burst mode

Configuration options and tools
- Device management / asset management tools
- FDT / DTM technology – via TTX200-DTM driver
- EDD - via TTX200 EDD driver

Diagnostic message
- Overrange / underrange in accordance with NE 43
- HART diagnosis

Dimensions

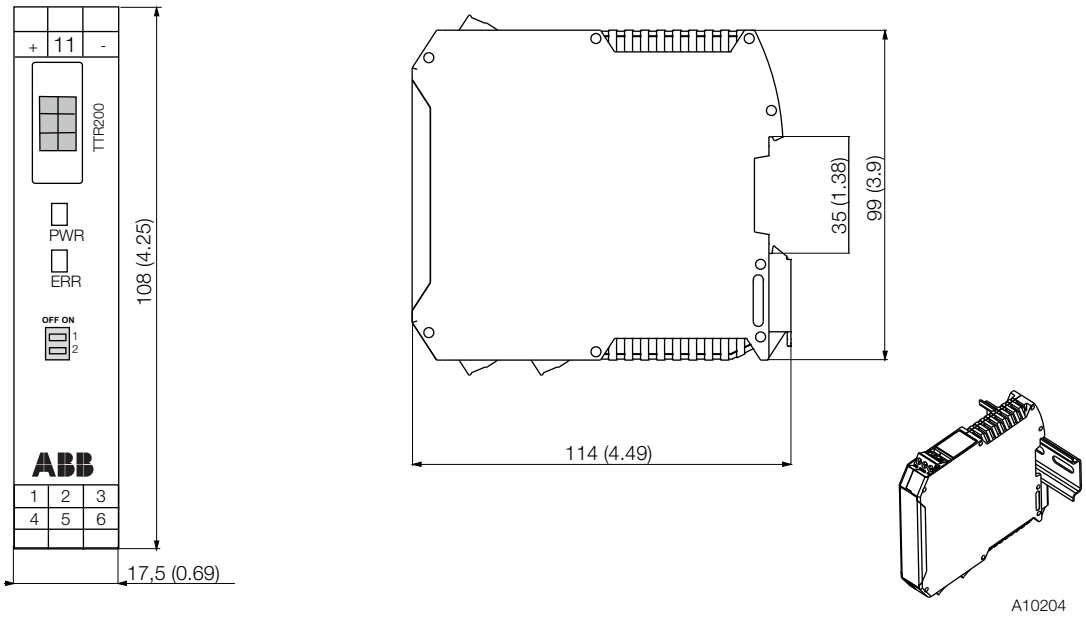

Fig. 4: Dimensions in mm / inch

Use in potentially explosive atmospheres according to ATEX and IECEx

NOTICE

- Further information on the approval of devices for use in potentially explosive atmospheres can be found in the explosion protection test certificates (at www.abb.com/temperature).
- Depending on the design, a specific marking in accordance with ATEX or IECEx applies.

Ex-marking

ATEX intrinsic safety

The device fulfills the requirements of Directive 2014/34/EU in case of corresponding purchase orders and is approved for use in Zone 0, 1 and 2.

Model TTR200-E1	
Type Examination Test Certificate:	PTB 05 ATEX 2017 X
II 1 G Ex ia IIC T6 Ga	
II 2 (1) G Ex [ia] ib IIC T6 Gb (Ga)	
II 2 G (1D) Ex [iaD] ib IIC T6 Gb (Da)	

Non-sparking ATEX

The device fulfills the requirements of Directive 2014/34/EU in case of corresponding purchase orders and is approved for use in Zone 2.

Model TTR200-E2	
Declaration of conformity	
II 3 G Ex nA IIC T1-T6 Gc	

IECEx intrinsic safety

Approved for use in Zone 0, 1, and 2.

Model TTR200-H1	
IECEx certificate of conformity	IECEx PTB 09.0014X
Ex ia IIC T6...T1 Ga	
Ex [ia] ib IIC T6...T1 Gb (Ga)	
Ex [ia IIIC Da] ib IIC T6...T1 Gb	

Temperature data

ATEX / IECEx intrinsic safety

Temperature class	Permissible ambient temperature range	
	Device category 1 use	Device category 2 / 3 use
T6	-40 … 44 °C (-40 … 111.2 °F)	-40 … 56 °C (-40 … 132.8 °F)
T5	-40 … 56 °C (-40 … 132.8 °F)	-40 … 71 °C (-40 … 159.8 °F)
T4-T1	-40 … 60 °C (-40 … 140.0 °F)	-40 … 85 °C (-40 … 185.0 °F)

Non-sparking ATEX

Temperature class	Device category 3 use
T6	-40 … 56 °C (-40 … 132.8 °F)
T5	-40 … 71 °C (-40 … 159.8 °F)
T4	-40 … 85 °C (-40 … 185.0 °F)

Electrical data

Intrinsic safety type of protection Ex ia IIC (part 1)

	Supply circuit
Max. voltage	U_i = 30 V
Short-circuit current	I_i = 130 mA
Max. power	P_i = 0.8 W
Internal inductance	L_i = 160 µH[1)]
Internal capacitance	C_i = 0.57 nF[2)]

1) From HW rev. 1.12, previously L_i = 0.5 mH.
2) From HW rev. 1.07, previously C_i = 5nF.

Intrinsic safety type of protection Ex ia IIC (part 2) Thermocouples, voltages

	Measurement circuit: resistance thermometer, resistances	Measurement circuit: thermocouples, voltages
Max. voltage	U_o = 6.5 V	U_o = 1.2 V
Short-circuit current	I_o = 17.8 mA[1)]	I_o = 50 mA
Max. power	P_o = 29 mW[2)]	P_o = 60 mW
Internal inductance	L_i = 0 mH	L_i = 0 mH
Internal capacitance	C_i = 118 nF[3)]	C_i = 118 nF[3)]
Maximum permissible external inductance	L_o = 5 mH	L_o = 5 mH
Maximum permissible external capacitance	C_o = 1.55 µF	C_o = 1.05 µF

1) From HW rev. 1.12, previously I_o = 25 mA.
2) From HW rev. 1.12, previously P_o = 38 mW.
3) From HW rev. 1.12, previously C_i = 49 nF.

Use in potentially explosive atmospheres in accordance with FM and CSA

NOTICE

- Further information on the approval of devices for use in potentially explosive atmospheres can be found in the explosion protection test certificates (at www.abb.com/temperature).
- Depending on the design, a specific marking in accordance with FM or CSA applies.

Ex-marking

FM Intrinsically Safe

Model TTR200-L6	
Control Drawing	TTR200-L6H (I.S.)
Class I, Div. 1 + 2, Groups A, B, C, D	
Class I, Zone 0, AEx ia IIC T6	

FM Non-Incendive

Model TTR200-L6	
Control Drawing	TTR200-L6H (N.I.)
Class I, Div. 2, Groups A, B, C, D	

CSA Intrinsically Safe

Model TTR200-R6	
Control Drawing	TTR200-R6H (I.S.)
Class I, Div. 1 + 2, Groups A, B, C, D	
Class I, Zone 0, Ex ia Group IIC T6	

CSA Non-Incendive

Model TTR200-R6	
Control Drawing	TTR200-R6H (N.I.)
Class I, Div. 2, Groups A, B, C, D	

TTR200
Rail-mount temperature transmitter

Ordering Information

Main ordering information TTR200

Base model	TTR200	XX	X	XX
TTR200 Rail Mounted Temperature Transmitter, HART, Pt100 (RTD), thermocouples, electrical isolation				
Explosion Protection				
Without explosion protection		Y0		
ATEX Intrinsic Safety type of protection: Zone 0: II 1 G Ex ia IIC T6, Zone 1 (0): II 2 (1) G Ex [ia] ib IIC T6,				
Zone 1 (20): II 2 G (1D) Ex [iaD] ib IIC T6		E1		
ATEX Non-sparking type of protection: Zone 2: II 3 G Ex nA T6		E2		
IECEx Intrinsic Safety type of protection: Zone 0: Ex ia IIC T6, Zone 1 (0): Ex [ia] ib IIC T6, Zone 1 (20): Ex [iaD] ib IIC T6		H1		
FM Intrinsic Safety (IS): Class I, Div. 1+2, Groups A, B, C, D, Class I, Zone 0, AEx ia IIC T6,				
Non-incendive (NI): Class I, Div. 2, Groups A, B, C, D		L6		
CSA Intrinsic Safety (IS): Class I, Div. 1+2, Groups A, B, C, D,				
Non-incendive (NI): Class I, Div. 2, Groups A, B, C, D		R6		
GOST Russia - metrological approval		G1		
GOST Russia - metrological approval and EAC-Ex, Ex i - Zone 0		P2		
GOST Kazakhstan - metrological approval		G3		
GOST Kazakhstan - metrological approval and EAC-Ex, Ex i - Zone 0		T2		
GOST Belarus - metrological approval		M5		
GOST Belarus - metrological approval and EAC-Ex, Ex i - Zone 0		U2		
Inmetro Ex ia IIC T6...T4 Ga, Ex ib [ia Ga] IIC T6...T4 Gb Exib [ia IIIC Da] IIC T6...T4 Gb		C1		
Communication Protocol				
HART			H	
Configuration				
Standard configuration				BS
Customer-specific configuration, except user curve			1)	BF

Additional ordering information TTR200

	XX	XX	XXX	XX	XX
Certificates					
SIL2 - Declaration of Conformity	CS				
Declaration of compliance according EN 10204-2.1, with the order	C4				
Inspection certificate according EN 10204-3.1, visual, dimensional and functional test	C6				
Calibration Certificates					
With 5-point factory certificate		EM			
Inspection certificate according EN 10204-3.1, 5-point calibration		EP			
Handling of Certificates					
Send via e-mail			GHE		
Send via mail			GHP		
Send via mail express			GHD		
Send with instrument			GHA		
Only archived			GHS		
Customer-specific Versions					
(Please specify)				Z9	
Documentation Language					
German					M1
English					M5
Language package Western Europe / Scandinavia (Languages: DA, ES, FR, IT, NL, PT, FI, SV)					MW
Language package Eastern Europe (Languages: EL, CS, ET, LV, LT, HU, HR, PL, SK, SL, RO, BG)					ME

1) E. g. set measuring range, TAG no.

Trademarks

® HART is a registered trademark of FieldComm Group, Austin, Texas, USA

TTR200
Rail-mount temperature transmitter

Order form configuration

HART device design: Instructions for customer-specific configuration

Configuration		Selection
IEC 60751 JIS C1604 MIL-T-24388 DIN 43760 OIML R 84	Resistance Thermometer	☐ Pt10 ☐ Pt50 ☐ Pt100 (Standard) ☐ Pt200 ☐ Pt500 ☐ Pt1000 ☐ Pt10 ☐ Pt50 ☐ Pt100 ☐ Pt10 ☐ Pt50 ☐ Pt100 ☐ Pt200 ☐ Pt1000 ☐ Ni50 ☐ Ni100 ☐ Ni120 ☐ Ni1000 ☐ Cu10 ☐ Cu100
	Resistance measurement	☐ 0 … 500 Ω ☐ 0 … 5000
IEC 60584 DIN 43710 ASTM E-988	Thermocouple	☐ Type K ☐ Type J ☐ Type N ☐ Type R ☐ Type S ☐ Type T ☐ Type E ☐ Type B ☐ Type L ☐ Type U ☐ Type C ☐ Type D
	Voltage measurement	☐ -125 … 125 mV ☐ -125 … 1100 mV
Sensor circuit (for resistance thermometer and resistance measurement only)		☐Two-wire ☐ Three-wire (standard) ☐ Four-wire Two-wire circuit: Compensation of sensor-wire resistance max. 100 Ω ☐ Sensor 1: ____ Ω
Reference junction (for thermocouples only)		☐ Internal (for standard thermocouple, except type B) ☐ None (type B) ☐ External / temperature: ____°C
Measuring range		☐ Lower range value : _____ (standard: 0) ☐ Upper range value : _____ (standard: 100)
Unit		☐Celsius (default) ☐ Fahrenheit ☐ Rankine ☐ Kelvin
Characteristic behavior		☐ Rising 4 ... 20 mA (standard) ☐ Falling 20 ... 4 mA
Output behavior for error		☐ Overrange / 22 mA (standard) ☐ Underrange / 3.6 mA
Output damping (T_{63})		☐ Off (standard) ☐ ____ seconds (1 … 100 s)
TAG number		☐ _____ (maximum 8 characters)
Software write protection		☐ Off (standard) ☐ On

Notes

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3KXT241001R1001

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DS/TTR200-EN Rev. C 12.2016