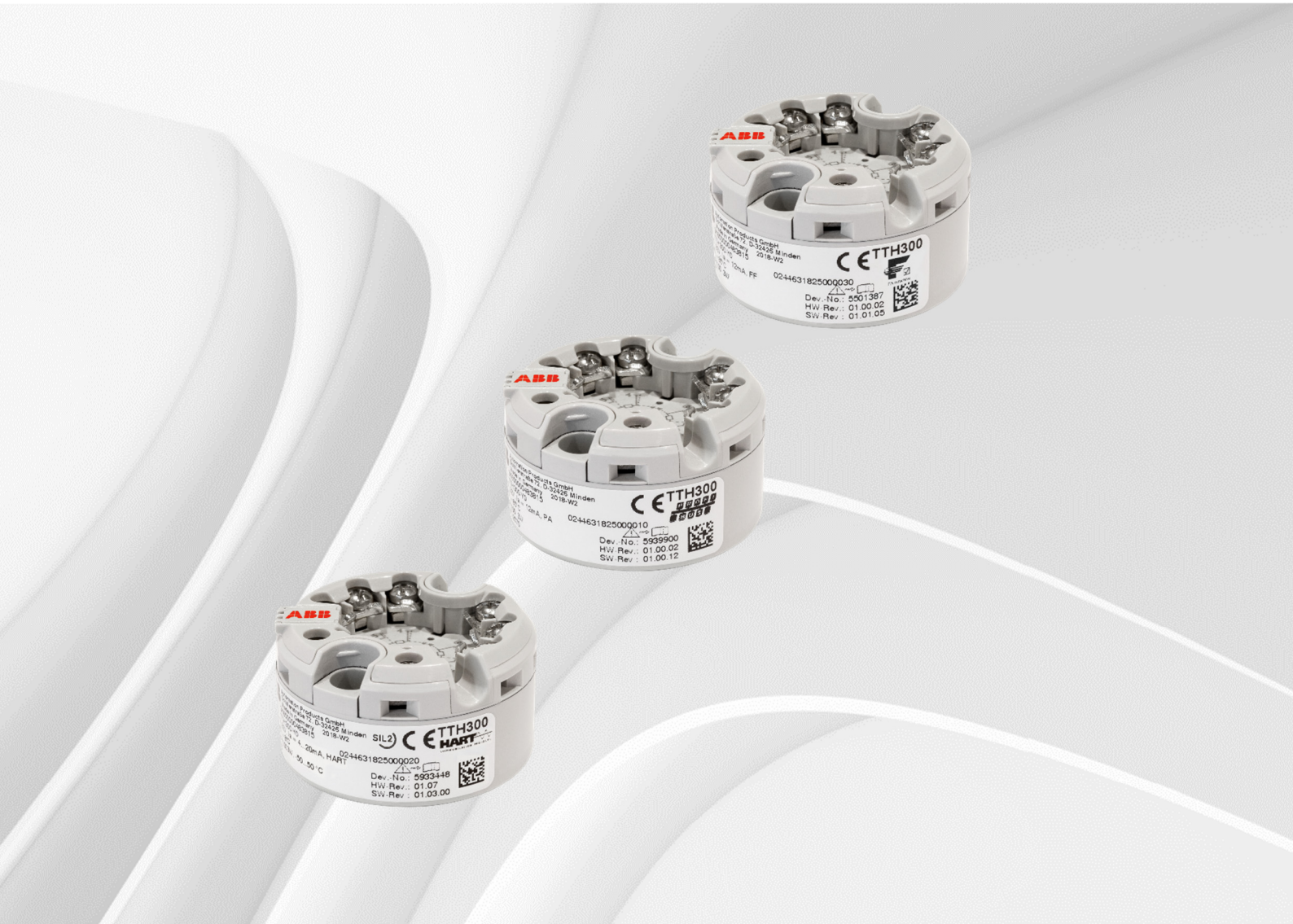
ABB MEASUREMENT & ANALYTICS | DATA SHEET

TTH300

Head-mount temperature transmitter



Specification

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 (Mean Time Between Failures)
190 years at 40 °C (104 °F) mean ambient temperature

Input filter
50 / 60 Hz

Switch-on delay
- HART: < 10 s (Ia ≤ 3.6 mA during switch-on cycle)
- PROFIBUS: 10 s, max. 30 s
- FOUNDATION Fieldbus: < 10 s

Warm-up time
5 minutes

Rise time t90
400 to 1000 ms

Measured value update
10/s with 1 sensor, 5/s with 2 sensors, depending on sensor type and sensor circuit

Output filter
Digital filter 1 order: 0 to 100 s

Weight
50 g

Material
- Housing: polycarbonate
- Color: gray RAL9002
- Encapsulation resin: polyurethane (PUR), WEVO PU-417

Installation conditions
- Mounting position: no restrictions
- Installation options:
  Connection heads in accordance with DIN 43729 form B
  Rail mounting (35 mm) in accordance with EN 60175 by means of latching base
  Field mount housing

Electrical connection
- Terminals with captive stainless steel screws, including soldering tags
- Lines up to a maximum of 1.5 mm^2 (AWG 16)
- Connection for handheld terminal

Dimensions
See chapter **Dimensions** on page 17.

Ambient conditions

Ambient temperature
- Standard: −40 to 85 °C (−40 to 185 °F)
- Optional: −50 to 85 °C (−58 to 185 °F)
- Restricted range during operation with LCD-indicator: −20 to 70 °C (−4 to 158 °F)
- Restricted range during operation with explosion-proof design: see corresponding certificate

Transport- / Storage temperature
−50 to 85 °C (−58 to 185 °F)

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

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

Vibration resistance in accordance with IEC 60068-2-6
10 to 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
- Measurement current circuit: IP 00 or IP-rating of installation housing

… Specification

Electromagnetic compatibility

Emitted interference in accordance with IEC EN 61326 and Namur NE 21.

Interference-resistant in accordance with IEC 61326 and Namur NE 21.
Pt100: measuring range 0 to 100 °C (32 to 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*	6 kV	No
• Sensor terminals*	4 kV	No
Radiated field		
80 MHz to 2 GHz	10 V/m	< 0.5 %
Coupling		
150 kHz to 80 MHz	10 V	< 0.5 %
Surge		
between the supply lines	0.5 kV	No malfunction
Line to ground	1 kV	

* Air discharge (at 1 mm (0.04 in) distance)

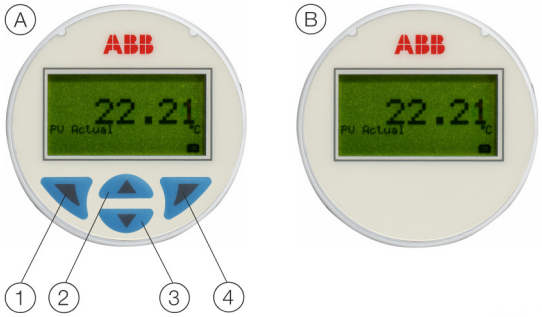
SIL functional safety

Only for devices with HART communication.
With conformity according to IEC 61508 for the use in safety relevant applications up to and including SIL 3 (redundant).

- In the use of one transmitter the device fulfills the requirements according to SIL 2.
- In the use of redundant handled transmitters the requirements can be fulfilled according to SIL 3.

Instructions on this can be found in the SIL-Safety Manual.

Type A and type AS LCD indicators



1 Quit / Cancel
2 Scroll back
3 Scroll forward
4 Select

Figure 1: (A) LCD indicator Type A (B) LCD indicator Type AS

The LCD indicator type AS has a display function; the LCD indicator type A allows additional configuration functions to be carried out.
Both LCD indicators can only be ordered in conjunction with temperature transmitter.

CE-Marking

The type A and type AS LCD indicator fulfill all requirements for CE marking in accordance with all applicable guidelines.

Properties

Transmitter-controlled graphic (alphanumeric) LCD indicator

- Character height, mode-dependent
- Sign, 4 digits, 2 decimal places
- Bargraph display
- Turnable in 12 increments of 30° each

Display options

- Sensor 1 process value
- Sensor 2 process value
- Electronics- / ambient temperature
- Output value
- Output %

Display diagnostic information related to transmitter and sensor status

Specification
Temperature range
−20 to 70 °C (−4 to 158 °F)

Restricted display function (contrast, reaction time) in the temperature ranges:
- −50 to −20 °C (−58 to −4 °F)
  or
- 70 to 85 °C (158 to 185 °F)

Humidity
0 to 100 %, condensation permitted

Configuration function
- Sensor configuration for standard sensors
- Measuring range
- Behavior in the event of a fault (HART)
- Software write protection for configuration data
- Device address for HART and PROFIBUS PA

Input - resistance thermometer / resistances

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

Resistance measurement
- 0 to 500 Ω
- 0 to 5000 Ω

Sensor connection type
Two-, three-, four-wire circuit

Connection lead
- Maximum sensor line resistance
  per line 50 Ω 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 thermometer)

Sensor wire break
- Measuring range: 0 to 500 Ω > 0.6 to 10 kΩ
- Measuring range: 0 to 5 Ω > 5.3 to 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 break
- Linear resistance measurement:
  Sensor wire break

... Specification

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 to 125 mV
- −125 to 1100 mV

Connection lead
- Maximum sensor line resistance:
  per line 1.5 kΩ, total 3 kΩ

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

Input resistance
> 10 MΩ

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

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

Functionality input

Freestyle characteristic / 32-points-sampling point table
- Resistance measurement up to a maximum of 5 kΩ
- Voltages up to maximum 1.1 V

Sensor error adjustment
- Through Callendar-Van Dusen coefficients
- Through value table, 32 support points
- Through single-point adjustment (offset adjustment)
- Through two-point adjustment

Input functionality
- 1 Sensor
- 2 Sensors:
  mean measurement,
  differential measurement,
  sensor redundancy,
  Sensor drift monitoring

HART® output

Transmission characteristics
- Temperature linear
- Resistance linear
- Voltage linear

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

Simulation mode
3.5 to 23.6 mA

Induced current consumption
< 3.5 mA

Maximum output current
23.6 mA

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