

# Advanced Temperature Transmitter ATT082

## HART® protocol Model

### Application

- Temperature transmitter with 2 input channels and HART® communication for the conversion of different input signals into a scalable, analog 4...20 mA output signal
- ATT082 stands out due to signal reliability, long-term stability, high precision and advanced diagnostics (important in critical processes)
- For the highest level of safety, availability and risk reduction
- Usable for resistance thermometer (RTD), thermocouple (TC), resistance transmitter ( $\Omega$ ), voltage transmitter (mV)
- Optional installation in field housings even for use in Ex d areas
- Mounting bracket pipe or wall for the field housing

### Your benefits

- Safe operation in hazardous areas  
International approvals such as
  - FM IS, NI
  - ATEX for intrinsically safe installation in zone 1 and zone 2
- High accuracy through sensor-transmitter matching
- Reliable operation with sensor monitoring and device hardware fault recognition
- Diagnostics information according to NAMUR NE107
- Several mounting versions and sensor connection combinations



### Function and system design

#### Corrosion detection as per NAMUR NE89

Corrosion of the sensor connection cables can cause incorrect measured value readings. The head transmitter offers the possibility of detecting any corrosion of the thermocouples and resistance thermometers with 4-wire connection before a measured value is corrupted. The transmitter prevents incorrect measured values from being exported and can issue a warning via the HART® protocol when conductor resistance values exceed plausible limits.

#### Low voltage detection

The low voltage detection function prevents the device from continuously transmitting an incorrect analog output value (i.e. caused by an incorrect or damaged power supply system or a damaged signal cable). If the supply voltage drops below the required value, the analog output value drops to < 3.6 mA for approx. 5 seconds. The device then tries to output the normal analog output value again. If the supply voltage is still too low, this process is repeated cyclically.

#### 2-channel functions

These functions increase the reliability and availability of the process values:

- Sensor backup switches to the second sensor if the primary sensor fails
- Drift warning or alarm if the deviation between sensor 1 and sensor 2 is less than or greater than a predefined limit value
- Temperature-dependent switching between sensors which are used in different measuring ranges

## Input

### Measured variable

Temperature (temperature-linear transmission behavior), resistance and voltage.

### Type of input

Two independent sensors can be connected. The measuring inputs are not galvanically isolated from each other. Ambient temperature out-of-range detectionHardware

Type of input	Designation	Measuring range limits	
<b>Resistance thermometer (RTD)</b> as per IEC 60751:2008 ( $\alpha = 0.003851$ )  as per JIS C1604-81 ( $\alpha = 0.003916$ )	Pt100 Pt200 Pt500 Pt1000	-200 to +850 °C (-328 to +1562 °F) -200 to +850 °C (-328 to +1562 °F) -200 to +500 °C (-328 to +932 °F) -200 to +250 °C (-328 to +482 °F)	
	Pt100	-200 to 649 °C (-328 to 1200 °F)	
	<ul style="list-style-type: none"><li>• Type of connection: 2-wire, 3-wire or 4-wire connection, sensor current: <math>\leq 0.3</math> mA</li><li>• With 2-wire circuit, compensation of wire resistance possible (0 to 30 <math>\Omega</math>)</li><li>• With 3-wire and 4-wire connection, sensor wire resistance to max. 50 <math>\Omega</math> per wire</li></ul>		
<b>Resistance transmitter</b>	Resistance $\Omega$	10 to 400 $\Omega$ 10 to 2000 $\Omega$	
<b>Thermocouples (TC)</b>  to IEC 584 part 1 to ASTM E988	Type B (PtRh30-PtRh6) Type E (NiCr-CuNi) Type J (Fe-CuNi) Type K (NiCr-Ni) Type N (NiCrSi-NiSi) Type R (PtRh13-Pt) Type S (PtRh10-Pt) Type T (Cu-CuNi)	+40 to +1820 °C (+104 to +3308 °F) -270 to +1000 °C (-454 to +1832 °F) -210 to +1200 °C (-346 to +2192 °F) -270 to +1372 °C (-454 to +2501 °F) -270 to +1300 °C (-454 to +2372 °F) -50 to +1768 °C (-58 to +3214 °F) -50 to +1768 °C (-58 to +3214 °F) -260 to +400 °C (-436 to +752 °F)	Recommended temperature range: +100 to +1500 °C (+212 to +2732 °F) 0 to +750 °C (+32 to +1382 °F) +20 to +700 °C (+68 to +1292 °F) 0 to +100 °C (+32 to +2012 °F) 0 to +100 °C (+32 to +2012 °F) 0 to +1400 °C (+32 to +2552 °F) 0 to +1400 °C (+32 to +2552 °F) -185 to +350 °C (-301 to +662 °F)
	Type C (W5Re-W26Re) Type D (W3Re-W25Re)	0 to +2315 °C (+32 to +4199 °F) 0 to +2315 °C (+32 to +4199 °F)	0 to +2 000 °C (+32 to +3632 °F) 0 to +2 000 °C (+32 to +3632 °F)
	<ul style="list-style-type: none"><li>• Internal cold junction (Pt100)</li><li>• External cold junction: configurable value -40 to +85 °C (-40 to +185 °F)</li><li>• Max. sensor resistance 10 k<math>\Omega</math> (if sensor resistance is greater than 10 k<math>\Omega</math>, error message as per NAMUR NE89)</li></ul>		
<b>Voltage transmitter (mV)</b>	Millivolt transmitter (mV)	-20 to 100 mV	

The following connection combinations are possible when both sensor inputs are assigned:

Sensor input 1					
Sensor input 2		RTD or resistance transmitter, 2-wire	RTD or resistance transmitter, 3-wire	RTD or resistance transmitter, 4-wire	Thermocouple (TC), voltage transmitter
	RTD or resistance transmitter, 2-wire	✓	✓	-	✓
	RTD or resistance transmitter, 3-wire	✓	✓	-	✓
	RTD or resistance transmitter, 4-wire	-	-	-	-
	Thermocouple (TC), voltage transmitter	✓	✓	✓	✓

## Output

### Output signal

Analog output	4 to 20 mA, 20 to 4 mA (can be inverted)
Signal encoding	FSK $\pm 0.5$ mA via current signal
Data transmission rate	1200 baud
Galvanic isolation	U = 2 kV AC (input/output)

### Failure information

#### Failure information as per NAMUR NE43:

Failure information is created if the measuring information is missing or not valid. A complete list of all the errors occurring in the measuring system is created.

Underranging	Linear drop from 4.0 to 3.8 mA
Overranging	Linear increase from 20.0 to 20.5 mA
Failure, e.g. sensor breakage; sensor short circuit	$\leq 3.6$ mA ("low") or $\geq 21$ mA ("high"), can be selected The "high" alarm setting can be set between 21.6 mA and 23 mA, thus providing the flexibility needed to meet the requirements of various control systems.

## Load

$$R_{b \max.} = (U_{b \max.} - 11 \text{ V}) / 0.023 \text{ A (current output)}$$

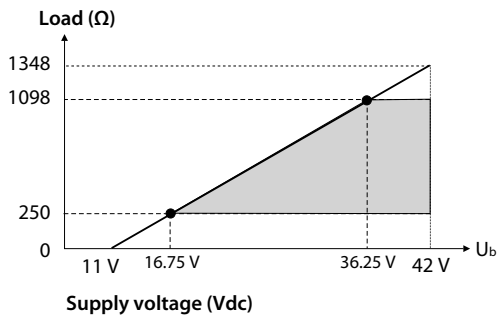


Fig 1.

## Linearization/transmission behavior

Temperature-linear, resistance-linear, voltage-linear

## Mains voltage filter

50/60 Hz

## Filter

1st order digital filter: 0 to 120 s

## Current consumption

- 3.6 to 23 mA
- Minimum current consumption  $\leq 3.5 \text{ mA}$
- Current limit  $\leq 23 \text{ mA}$

## Protocol-specific data

HART® version	7
Device address in multi-drop mode	Software setting addresses 0 to 63
Write protection	Hardware setting for activating write protection
Device description files (DD)	Information and files are available free of charge at: <a href="http://www.hartcomm.org">www.hartcomm.org</a>
Load (communication resistor)	min. 250 $\Omega$

## Switch-on delay

5 s, during switch-on delay  $I_a \leq 3.8 \text{ mA}$

## Power supply

### Electrical connection

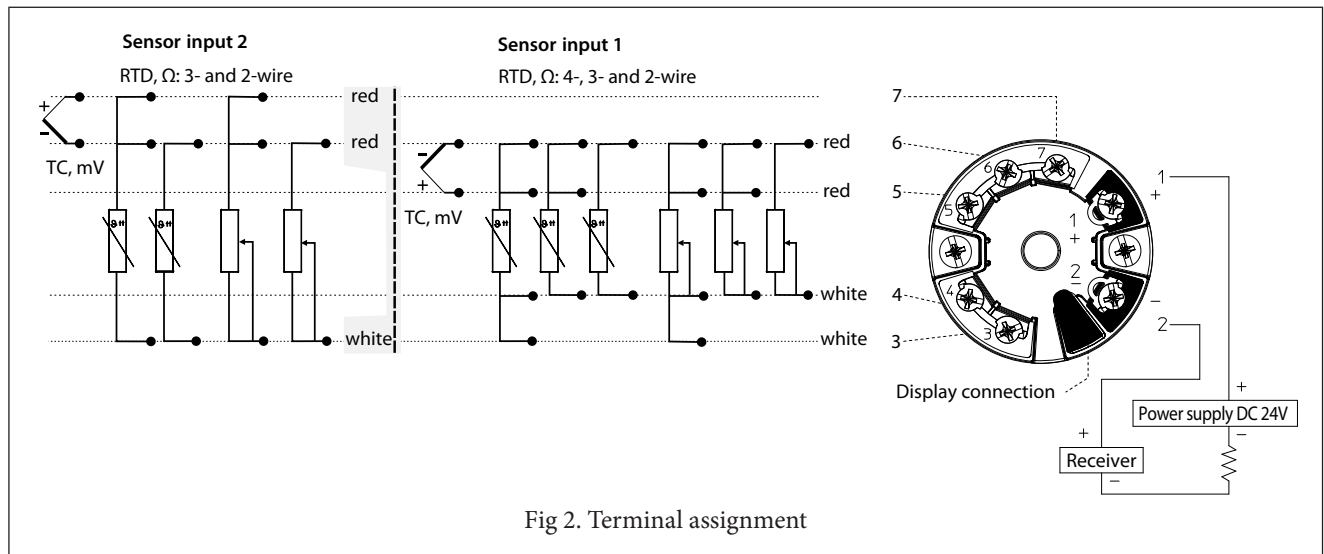


Fig 2. Terminal assignment

For the device operation via HART® protocol (terminals 1 and 2) a minimum load resistance of 250  $\Omega$  is necessary in the signal circuit.

## Supply voltage

$U = 11$  to  $42 \text{ Vdc}$  (non-hazardous area), reverse polarity protected. Values for hazardous area see chapter 'Certificates and approvals' (refer to page 8 and 9).

## Residual ripple

Perm. residual ripple  $U_{ss} \leq 3 \text{ V}$  at  $U_b \geq 13.5 \text{ V}$ ,  $f_{\max.} = 1 \text{ kHz}$

## Performance characteristics

### Response time

Measured value update  $< 1 \text{ s}$  per channel, depending on the type of sensor and connection method

### Reference operating conditions

- Calibration temperature:  $+25 \text{ }^\circ\text{C} \pm 5 \text{ K}$  ( $77 \text{ }^\circ\text{F} \pm 9 \text{ }^\circ\text{F}$ )
- Supply voltage:  $24 \text{ Vdc}$
- 4-wire circuit for resistance adjustment

## Maximum measured error

The accuracy data are typical values and correspond to a standard deviation of  $\pm 3 \sigma$  (normal distribution), i.e. 99.8 % of all the measured values achieve the given values or better values.

Designation/measuring range		Performance characteristics	
Resistance thermometer (RTD) (3-wire, 4-wire)	Pt100	Digital	D/A <sup>1)</sup>
	Pt500	0.1 °C (0.18 °F)	0.03 %
	Pt1000	0.3 °C (0.54 °F)	0.03 %
	Pt200	0.2 °C (0.36 °F)	0.03 %
Resistance thermometer (RTD) (2-wire)	Pt100	1.0 °C (1.8 °F)	0.03 %
	Pt500	0.8 °C (1.44 °F)	0.03 %
	Pt1000	0.8 °C (1.44 °F)	0.03 %
	Pt200	0.8 °C (1.44 °F)	0.03 %
Thermocouples (TC)	Type: K, J, T, E	0.25 °C (0.45 °F)	0.03 %
	Type: N, C, D	0.5 °C (0.9 °F)	0.03 %
	Type: S, B, R	1.0 °C (1.8 °F)	0.03 %
Resistance transmitters (Ω)	10 to 400 Ω	±0.04 Ω	0.03 %
	10 to 2 000 Ω	±0.8 Ω	0.03 %
Voltage transmitter (mV)	–20 to 100 mV	±10 μV	0.03 %

1) % refers to the set span. Accuracy = digital + D/A accuracy

Physical input measuring range of sensors	
10 to 400 Ω	Pt100
10 to 2000 Ω	Pt200, Pt500, Pt1000
–20 to 100 mV	Thermocouples type: B, C, D, E, J, K, N, R, S, T

## Sensor adjustment

### Sensor transmitter matching

RTD sensors are one of the most linear temperature measuring elements. Nevertheless, the output must be linearized. To significantly improve temperature measurement accuracy, the device allows the use of two methods:

- Callendar-Van-Dusen coefficients (Pt100 resistance thermometer)

The Callendar-Van-Dusen equation is described as:

$$R_T = R_0 [1 + AT + BT^2 + C (T - 100) T^3]$$

The coefficients A, B and C are used to match the sensor (platinum) and transmitter in order to improve the accuracy of the measuring system. The coefficients for a standard sensor are specified in IEC 751. If no standard sensor is available or if greater accuracy is required, the coefficients for each sensor can be determined specifically with the aid of sensor calibration.

- Linearization for copper/nickel resistance thermometers (RTD)

The polynomial equation for copper/nickel is as follows:

$$R_T = R_0 (1 + AT + BT^2)$$

The coefficients A and B are used for the linearization of nickel or copper resistance thermometers (RTD).

The exact values of the coefficients derive from the calibration data and are specific to each sensor.

Sensor transmitter matching using one of the methods explained above significantly improves the temperature measurement accuracy of the entire system. This is because the transmitter uses the specific data pertaining to the connected sensor to calculate the measured temperature, instead of using the standardized sensor curve data.

### 1-point adjustment (offset)

Shifts the sensor value

### 2-point adjustment (sensor trimming)

Correction (slope and offset) of the measured sensor value at transmitter input

### Current trimming (current output fine adjustment)

Correction of the 4 or 20 mA current output value

### Non-repeatability

Input	
10 to 400 Ω	15 mΩ
10 to 2000 Ω	100 ppm * measured value
–20 to 100 mV	4 μV
Output	
≤ 2 μA	

### Influence of the supply voltage

≤ ±0.0025%/V, with reference to the span

### Long-term stability

≤ 0.1 °C/year (≤ 0.18 °F/year) or ≤ 0.05 %/year

Data under reference operating conditions. % refers to the set span. The larger value is valid.

## Influence of ambient temperature (temperature drift)

Total temperature drift = input temperature drift + output temperature drift

Impact on accuracy when ambient temperature changes by 1 K (1.8 °F):	
Input 10 to 400 Ω	Typ. 0.001 % of the measured value, min. 1 mΩ
Input 10 to 2000 Ω	Typ. 0.001 % of the measured value, min. 10 mΩ
Input -20 to 100 mV	Typ. 0.001 % of the measured value, min. 0.2 μV
Output 4 to 20 mA	Typ. 0.0015 % of the span

Typical sensitivity of resistance thermometers		
Pt: $0.00385 * R_{nom}/K$	Cu: $0.0043 * R_{nom}/K$	Ni: $0.00617 * R_{nom}/K$
Example Pt100: $0.00385 * 100 \Omega/K = 0.385 \Omega/K$		

Impact on accuracy when ambient temperature changes by 1 K (1.8 °F):				
B: 9 μV/K at 1000 °C (1 832 °F)	C: 18 μV/K at 1000 °C (1 832 °F)	D: 20 μV/K at 1000 °C (1832 °F)	E: 81 μV/K at 500 °C (932 °F)	J: 56 μV/K at 500 °C (932 °F)
K: 43 μV/K at 500 °C (932 °F)	N: 38 μV/K at 500 °C (932 °F)	R: 13 μV/K at 1000 °C (1832 °F)	S: 11 μV/K at 1000 °C (1832 °F)	T: 46 μV/K at 100 °C (212 °F)

### Example of calculating the measured error with ambient temperature drift:

Input temperature drift  $\Delta\theta = 10 \text{ K}$  (18 °F), Pt100, measuring range 0 to 100 °C (32 to 212 °F). Maximum process temperature: 100 °C (212 °F)

Measured resistance value: 138.5 Ω (IEC 60751) at maximum process temperature

Typical temperature drift in Ω:  $(0.001 \% \text{ of } 138.5 \Omega) * 10 = 0.01385 \Omega$

Conversion to Kelvin:  $0.01385 \Omega / 0.385 \Omega/K = 0.04 \text{ K}$  (0.072 °F)

### Influence of the reference junction (internal cold junction)

Pt100 DIN IEC 60751 Cl. B (internal cold junction with thermocouples TC)

## Installation conditions

### Installation instructions

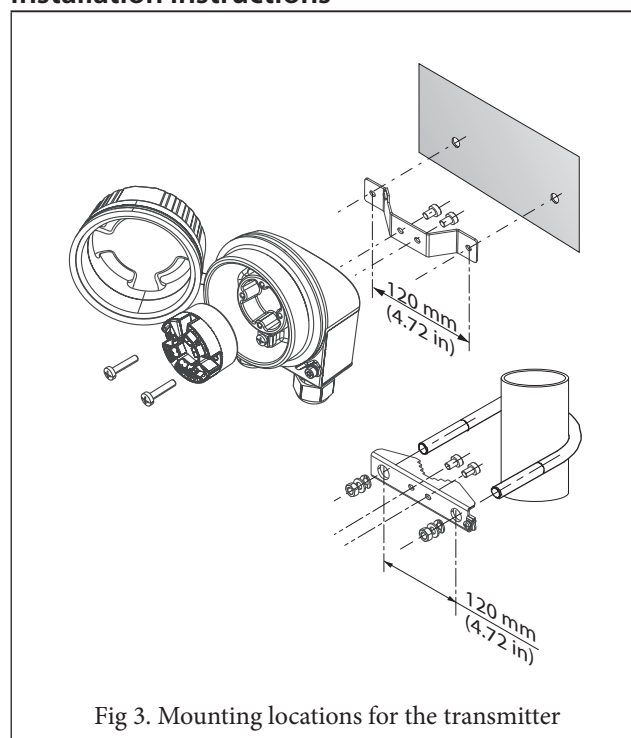


Fig 3. Mounting locations for the transmitter

Separated from process in field housing, wall or pipe mounting

Orientation: No restrictions

## Environment

### Ambient temperature range

-40 to +85 °C (-40 to +185 °F), for hazardous area see Ex documentation and 'Certificates and approvals' section (refer to page 8 and 9)

**Storage temperature**  
–40 to +100 °C (–40 to +212 °F)

**Altitude**  
Up to 4000 m (4374.5 yards) above mean sea level as per IEC 61010-1

**Climate class**  
As per IEC 60654-1, Class C

**Humidity**

- Condensation permitted as per IEC 60 068-2-33
- Max. rel. humidity: 95% as per IEC 60068-2-30

**Degree of protection**

- IP 66/67

**Vibration**  
25 to 100 Hz for 4g (increased vibration stress) as per GL-guidelines, chapter 2, edition 2003

**Electromagnetic compatibility (EMC)**  
**CE compliance**  
Electromagnetic compatibility in accordance with all the relevant requirements of the EN 61326 series and NAMUR Recommendation EMC (NE21). Details are provided in the Declaration of Conformity.

ESD (electrostatic discharge)	EN/IEC 61000-4-2	6 kV cont., 8 kV air	
Electromagnetic fields	EN/IEC 61000-4-3	0.08 to 2.7 GHz	10 V/m
Burst (fast transients)	EN/IEC 61000-4-4	2 kV	
Surge (surge voltage)	EN/IEC 61000-4-5	0.5 kV sym. 1 kV assym.	
Conducted RF	EN/IEC 61000-4-6	0.01 to 80 MHz	10 V

**Measuring category**  
Measuring category II as per IEC 61010-1. The measuring category is provided for measuring on power circuits that are directly connected electrically with the low-voltage network.

**Degree of contamination**  
Pollution degree 2 as per IEC 61010-1.

**Mechanical construction**

**Design, dimensions**  
Dimensions in mm (in).

**Head transmitter**

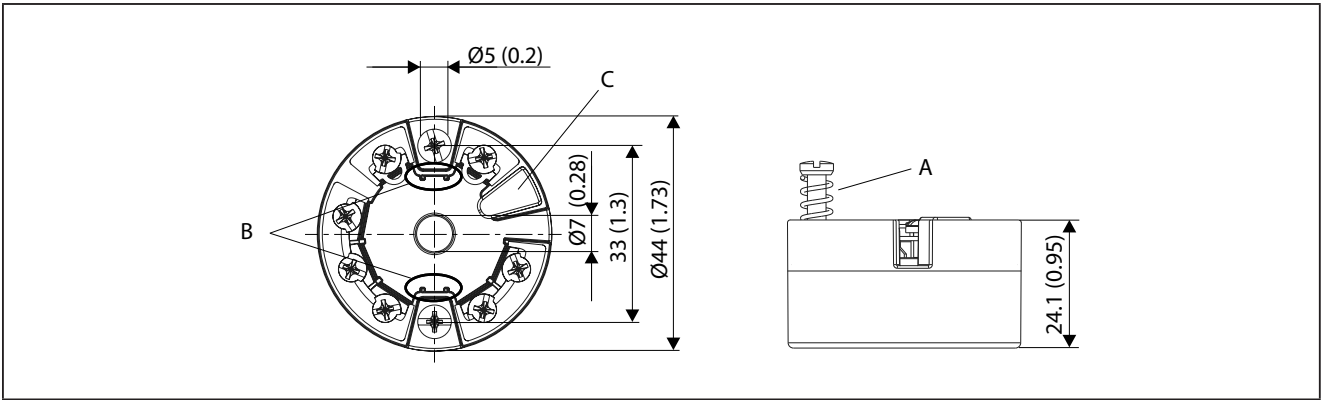
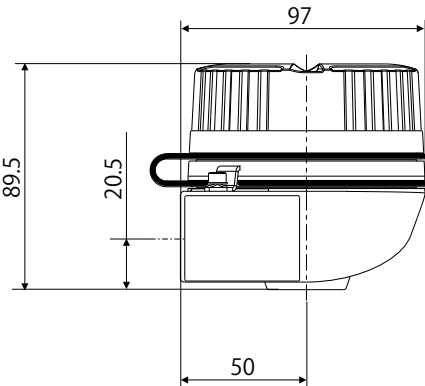
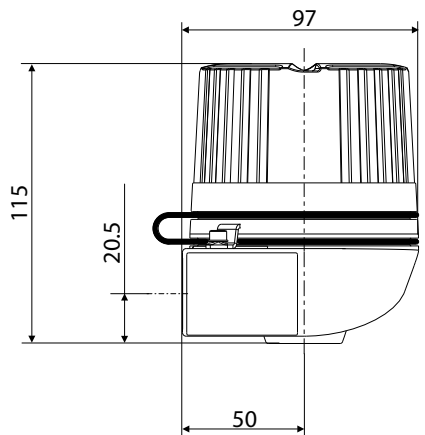


Fig 4. Version with screw terminals

- A Spring travel  $L \geq 5$  mm (not for US - M4 securing screws)
- B Fasteners for attachable measured value display
- C Interface for contacting the measured value display

## Field housings

Without display	Specification
 <p>Fig 5.</p>	<ul style="list-style-type: none"> <li>• Flameproof (XP) version, explosion-protected, captive screw cap, with two cable entries</li> <li>• Temperature: -50 to +150 °C (-58 to +302 °F) for rubber seal without cable gland (observe max. permitted temperature of the cable gland!)</li> <li>• Material: aluminum; polyester powder coated</li> <li>• Cable entry glands: ½" NPT, M20 × 1.5</li> <li>• Head color: gray RAL 7035</li> <li>• Cap color: gray RAL 7035</li> <li>• Weight: 640 g (22.6 oz)</li> </ul>

With display window in cover	Specification
 <p>Fig 6.</p>	<ul style="list-style-type: none"> <li>• Flameproof (XP) version, explosion-protected, captive screw cap, with two cable entries</li> <li>• Temperature: -50 to +150 °C (-58 to +302 °F) for rubber seal without cable gland (observe max. permitted temperature of the cable gland!)</li> <li>• Material: aluminum; polyester powder coated</li> <li>• Cable entry glands: ½" NPT, M20 × 1.5</li> <li>• Head color: gray RAL 7035</li> <li>• Cap color: gray RAL 7035</li> <li>• Weight: 860 g (30.33 oz)</li> </ul>

### Weight

- Head transmitter: approx. 40 to 50 g (1.4 to 1.8 oz)
- Field housing: see specifications

### Material

All materials used are RoHS-compliant.

Head transmitter

- Housing: polycarbonate (PC), complies with UL94, V-2 UL recognized
- Terminals:
  - Screw terminals: nickel-plated brass and gold-plated contact
  - Spring terminals: tin-plated brass, contact spring V2A
- Potting: WEVO PU 403 FP / FL

Field housing: see specifications

### Terminals

Terminals version	Wire version	Conductor cross-section
<b>Screw terminals</b> (with latches at the fieldbus terminals for easy connection of a handheld terminal)	Rigid or flexible	≤ 2.5 mm <sup>2</sup> (14 AWG)

Human interface

Display and operating elements

There are no display or operating elements present at the head transmitter. Optional the plug-on display can be used in connection with the head transmitter. It will display information regarding the actual measured value and the measurement point identification. In the event of a fault in the measurement chain this will be displayed in inverse color showing the channel ident and diagnostics code. DIP-switches can be found on the rear of the display. This enables the hardware set-up such as write protection.

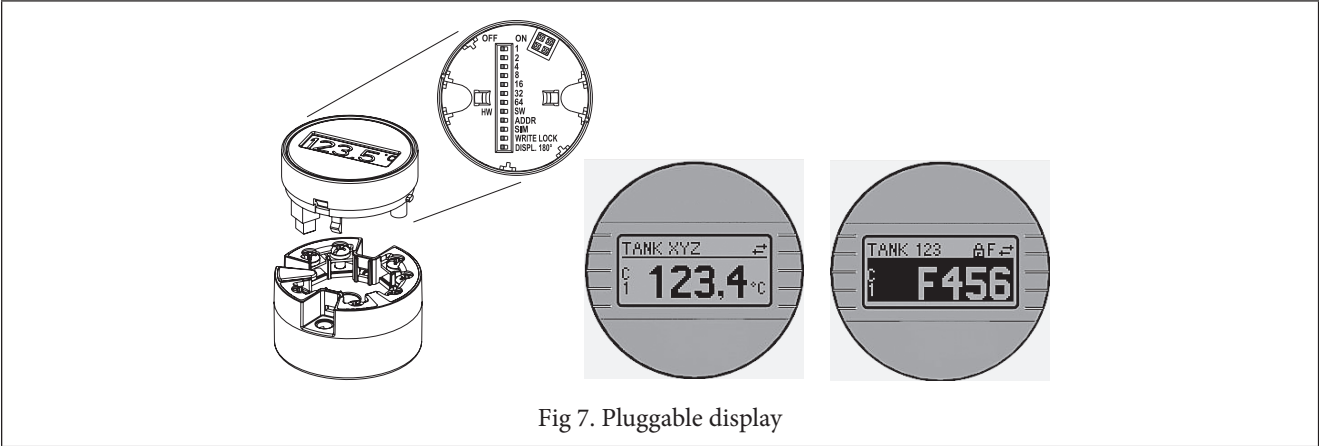


Fig 7. Pluggable display

If the head transmitter is installed in a field housing and used with a display, a housing with glas window needs to be used.

Remote operation

The configuration of HART® functions and of device-specific parameters is performed via HART® communication or via CDI interface. Special configuration systems provided by various manufacturers are available for this purpose.

Certificates and approvals

CE mark

The measuring system meets the legal requirements of the EC guidelines. The manufacturer confirms successful testing of the device by affixing to it the CE mark.

ATEX/IECEX

II1G Ex ia IIC T6/T5/T4	
Power supply (terminals 1+ and 2-)	$U_i \leq 30 \text{ Vdc}$ $I_i \leq 130 \text{ mA}$ $P_i \leq 800 \text{ mW}$ $C_i \approx 0$ $L_i \approx 0$

II3G Ex nA II T6/T5/T4	
Power supply (terminals 1+ and 2-)	$U \leq 42 \text{ Vdc}$
Output	$I = 4 \text{ to } 20 \text{ mA}$

Temperature range Ta			
without display		Zone 1, 2	Zone 0
	T6	-40 to +58 °C (-40 to +136.4 °F)	-40 to +46 °C (-40 to +115 °F)
	T5	-40 to +75 °C (-40 to +167 °F)	-40 to +60 °C (-40 to +140 °F)
	T4	-40 to +85 °C (-40 to +185 °F)	-40 to +60 °C (-40 to +140 °F)
with display	T6	-40 to +55 °C (-40 to +131 °F)	
	T5	-40 to +70 °C (-40 to +158 °F)	
	T4	-40 to +85 °C (-40 to +185 °F)	

<ul style="list-style-type: none"> <li>• II 2G Ex d IIC T6...T4 Gb</li> <li>• II 2D Ex tb IIIC T85 °C...T105 °C Db</li> </ul>		
Power supply (terminals + and -)		9 to 32 Vdc
Temperature range	T6 T5 T4	-40 °C ≤ Ta ≤ +65 °C -40 °C ≤ Ta ≤ +80 °C -40 °C ≤ Ta ≤ +85 °C
Maximum surface temperature housing	T85 °C T100 °C T105 °C	-40 °C ≤ Ta ≤ +65 °C -40 °C ≤ Ta ≤ +80 °C -40 °C ≤ Ta ≤ +85 °C

## FM approval

Labeling:

IS / I / 1 / ABCD / T4 Ta = 85°C — Entity\*;

NI / I / 2 / ABCD / T4 Ta = 85°C — NIFW\*;

I / 0 / AEx ia IIC T4 Ta = 85°C — Entity\*;

XP, NI, DIP I, II, III / 1+2 / A-G

\*= Entity and NIFW parameters in accordance with Control Drawings (CD)

Electrical parameters:

$U_i \leq 30 \text{ Vdc}$ ,  $I_i \leq 130 \text{ mA}$ ,  $P_i \leq 800 \text{ mW}$

$C_i \approx 0$ ,  $L_i \approx 0$

## HART® communication

The temperature transmitter is registered by HART® Communication. The device meets the requirements of the HART Communication Protocol Specifications, Revision 7.0.

## Other standards and guidelines

- IEC 60529: Degrees of protection provided by enclosures (IP code)
- IEC 61010-1:2001, 2nd Edition: Safety requirements for electrical equipment for measurement, control and laboratory use
- EN 61326 Series: Electromagnetic compatibility (EMC requirements)
- Guidelines for the performance of type approvals, chapter 2, edition 2003: Vibrations
- NAMUR: International user association of automation technology in process industries ([www.namur.de](http://www.namur.de))

# Model Number Configuration Table

ATT082, HART model

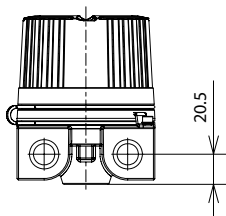
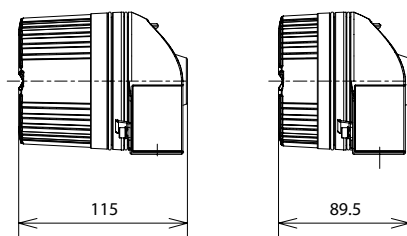
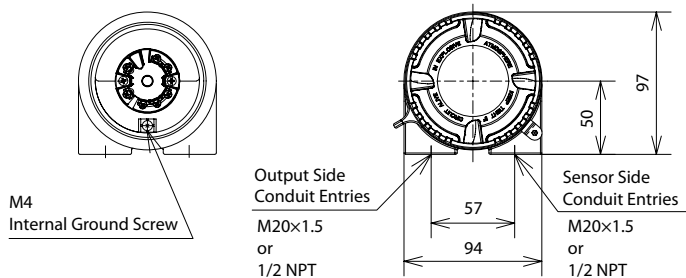
Basic model			Selections							Options		
ATT082										AA +		
I	Approval	Non-hazardous area	AA									
		ATEX II 2 G Ex d T6, II 2 D Ex tb IIIC	B6									
		ATEX II 1 G Ex ia IIC T4/T5/T6	BA									
		FM IS,NI I / 1+2/A-D	F1									
		FM XP, NI, DIP I, II, III/1+2/A-G	F3									
		IECEX Ex d T6 Gb, Ex tb IIIC Db	I6									
		IECEX Ex ia IIC T4/T5/T6	IA									
II	Communication: Output Signal	HART 7; 4-20 mA, 2 channel	A									
III	Electrical Connection	Screw terminals		2								
IV	Field Housing	2 entry (M20 × 1.5) w/o display						D				
		2 entry (M20 × 1.5) with display						E				
		2 entry (1/2NPT) w/o display						F				
		2 entry (1/2NPT) with display						G				
V	Configuration Universal Input	Ch1: RTD 2-wire, Ch2: inactive							A1			
		Ch1: RTD 2-wire, Ch2: RTD 2-wire							A2			
		Ch1: RTD 2-wire, Ch2: RTD 3-wire							A3			
		Ch1: RTD 2-wire, Ch2: TC							A4			
		Ch1: RTD 3-wire, Ch2: inactive							B1			
		Ch1: RTD 3-wire, Ch2: RTD 2-wire							B2			
		Ch1: RTD 3-wire, Ch2: RTD 3-wire							B3			
		Ch1: RTD 3-wire, Ch2: TC							B4			
		Ch1: RTD 4-wire, Ch2: inactive							C1			
		Ch1: RTD 4-wire, Ch2: TC							C2			
		Ch1: TC, Ch2: inactive							D1			
		Ch1: TC, Ch2: TC							D2			
VI	Sensor Type Input 1	Pt100, -200 to +850 °C, min. span 10K, IEC60751 (a = 0.00385)							A1			
		Pt200, -200 to +850 °C, min. span 10K, IEC60751 (a = 0.00385)							A2			
		Pt500, -200 to +500 °C, min. span 10K IEC60751 (a = 0.00385)							A3			
		Pt1000, -200 to +250 °C, min. span 10K IEC60751 (a = 0.00385)							A4			
		Pt100, -200 to +510 °C, min. span 10K, JIS C1604-81 (a = 0.003916)							B1			
		Typ B, 40 to 1820 °C, min. span 500K IEC 584							TB			
		Typ C (W5Re-W26Re), 0 to 2315°C, min. span 500K, ASTM E988/E230							TC			
		Typ D (W3Re-W25Re), 0 to 2315°C, min. span 500K, ASTM E988/E230							TD			
		Typ E, -270 to +1000 °C, min. span 50K IEC 584							TE			
		Typ J, -210 to +1200 °C, min. span 50K IEC 584							TJ			
		Typ K, -270 to +1372 °C, min. span 50K IEC 584							TK			
		Typ N, -270 to +1300 °C, min. span 50K IEC 584							TN			
		Typ R, -50 to +1768 °C, min. span 500K IEC 584							TR			
		Typ S, -50 to +1768 °C, min. span 500K IEC 584							TS			
		Typ T, -260 to +400 °C, min. span 50K IEC 584							TT			
VII	Sensor Type Input 2	Pt100, IEC60751 (a = 0.00385)							A1			
		Pt200, IEC60751 (a = 0.00385)							A2			
		Pt500, IEC60751 (a = 0.00385)							A3			
		Pt1000, IEC60751 (a = 0.00385)							A4			
		Inactive							AA			
		Pt100, JIS C1604-81 (a = 0.003916)							B1			
		Type B, IEC 584							TB			
		Type C (W5Re-W26Re), ASTM E988/E230							TC			
		Type D (W3Re-W25Re), ASTM E988/E230							TD			
		Type E, IEC 584							TE			
		Type J, IEC 584							TJ			
		Type K, IEC 584							TK			
		Type N, IEC 584							TN			
		Type R, IEC 584							TR			
		Type S, IEC 584							TS			
		Type T, IEC 584							TT			
VIII	Input; Interconnection	PV = CH1; CH2 inactive							A1			
		PV = CH1; SV = CH2							A2			
		PV = difference; PV = CH1-CH2							A3			
		PV = average; PV = (CH1+CH2)/2							A4			
		Sensor backup; PV = CH1 (or CH2)							A5			
Options		Display								E1		
		Calibration Certificate								F1		
		Configuration alarm limit low								H1		
		SIL declaration of conformity								LA		
		Mounting bracket wall, 316L								PA		
		Mounting bracket pipe, 316L diameter 1-2"								PB		
		Tagging (TAG), metal plate hanging								Z1		
		Tagging (TAG), on name plate								Z2		
		Tagging (LONG TAG), Write the TAG in the memory, up to 32 digit								Z4		

# Dimensions

[Unit: mm]

With Display

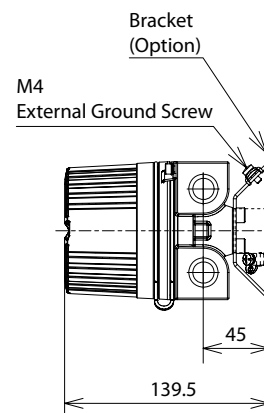
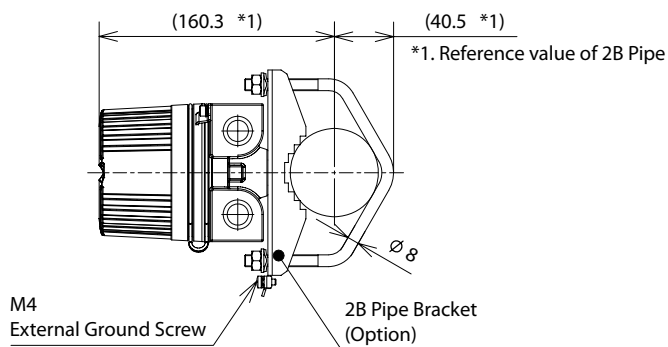
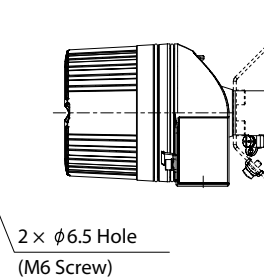
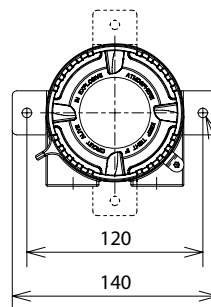
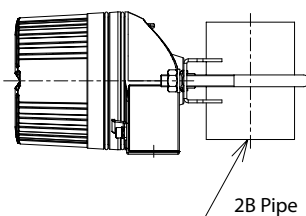
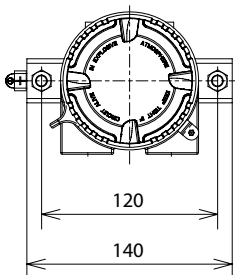
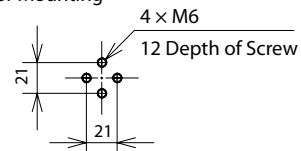
Without Display



Mounting to 2B Pipe

Mounting to Wall

Dimensions for Mounting



Please read the "Terms and Conditions" from the following URL before ordering or use:

<http://www.azbil.com/products/bi/order.html>

*Specifications are subject to change without notice.*

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