azbil Specification

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 to 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 (Ω), 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	
Resistance thermometer (RTD) as per IEC 60751:2008 (α = 0.003851)	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)	
as per JIS C1604-81 (α = 0.003916)	Pt100	-200 to +649 °C (-328 to +1200 °F)	
	• Type of connection: 2-wire, 3-wire or 4-wire connection, sensor current: ≤ 0.3 mA • With 2-wire circuit, compensation of wire resistance possible (0 to 30 Ω) • With 3-wire and 4-wire connection, sensor wire resistance to max. 50 Ω per wire		
Resistance transmitter	Resistance Ω	10 to 400 Ω 10 to 2000 Ω	
Thermocouples (TC) to IEC 584 part 1 to ASTM E988			Recommended temperature range:
	Type B (PtRh30-PtRh6)	+40 to +1820 °C (+104 to +3308 °F)	+100 to +1500 °C (+212 to +2732 °F)
	Type E (NiCr-CuNi)	–270 to +1000 °C (–454 to +1832 °F)	0 to +750 °C (+32 to +1382 °F)
	Type J (Fe-CuNi)	–210 to +1200 °C (–346 to +2192 °F)	+20 to +700 °C (+68 to +1292 °F)
	Type K (NiCr-Ni)	–270 to +1372 °C (–454 to +2501 °F)	0 to +100 °C (+32 to +2012 °F)
	Type N (NiCrSi-NiSi)	–270 to +1300 °C (–454 to +2372 °F)	0 to +100 °C (+32 to +2012 °F)
	Type R (PtRh13-Pt)	–50 to +1768 °C (–58 to +3214 °F)	0 to +1400 °C (+32 to +2552 °F)
	Type S (PtRh10-Pt)	–50 to +1768 °C (–58 to +3214 °F)	0 to +1400 °C (+32 to +2552 °F)
	Type T (Cu-CuNi)	–260 to +400 °C (–436 to +752 °F)	–185 to +350 °C (–301 to +662 °F)
	Type C (W5Re-W26Re)	0 to +2315 °C (+32 to +4199 °F)	0 to +2 000 °C (+32 to +3632 °F)
	Type D (W3Re-W25Re)	0 to +2315 °C (+32 to +4199 °F)	0 to +2 000 °C (+32 to +3632 °F)
	• Internal cold junction (Pt100) • External cold junction: configurable value –40 to +85 °C (–40 to +185 °F) • Max. sensor resistance 10 kΩ (if sensor resistance is greater than 10 kΩ, error message as per NAMUR NE89)		
Voltage transmitter (mV)	Millivolt transmitter (mV)	–20 to 100 mV	

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

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

Output

Output signal

Analog output	4 to 20 mA, 20 to 4 mA (can be inverted)
Signal encoding	FSK ±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	≤ 3.6 mA ("low") or ≥ 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

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

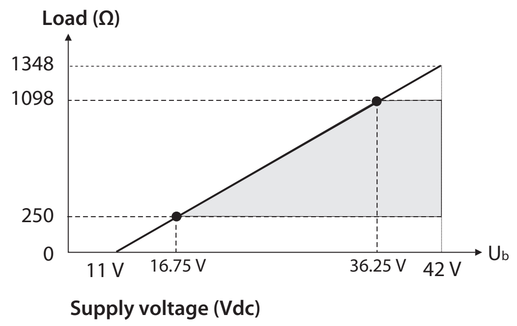


Fig 1. Load

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 ≤ 3.5 mA
- Current limit ≤ 23 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: www.hartcomm.org
Load (communication resistor)	min. 250 Ω

Switch-on delay

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

Power supply

Electrical connection

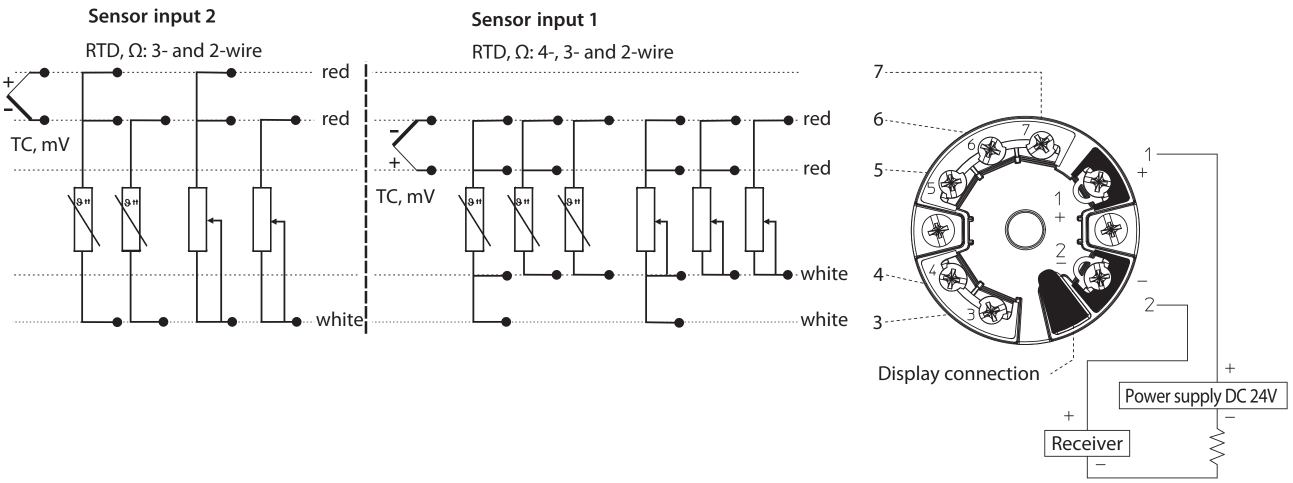


Fig 2. Terminal assignment

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

Supply voltage

U = 11 to 42 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 $U_{ss} \leq 3$ V at $U_b \geq 13.5$ V, $f_{max.} = 1$ kHz

Performance characteristics

Response time

Measured value update < 1 s per channel, depending on the type of sensor and connection method

Reference operating conditions

- Calibration temperature: +25 °C ±5 K (77 °F ±9 °F)
- Supply voltage: 24 Vdc
- 4-wire circuit for resistance adjustment

Maximum measured error

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

Designation/measuring range		Performance characteristics	
		Digital	D/A [1)]
Resistance thermometer (RTD) (3-wire, 4-wire)	Pt100 Pt500 Pt1000 Pt200	0.1 °C (0.18 °F) 0.3 °C (0.54 °F) 0.2 °C (0.36 °F) 1.0 °C (1.8 °F)	0.03 % 0.03 % 0.03 % 0.03 %
Resistance thermometer (RTD) (2-wire)	Pt100 Pt500 Pt1000 Pt200	0.8 °C (1.44 °F) 0.8 °C (1.44 °F) 0.8°C (1.44 °F) 1.5 °C (2.7 °F)	0.03 % 0.03 % 0.03 % 0.03 %
Thermocouples (TC)	Type: K, J, T, E Type: N, C, D Type: S, B, R	0.25 °C (0.45 °F) 0.5 °C (0.9 °F) 1.0 °C (1.8 °F)	0.03 % 0.03 % 0.03 %
Resistance transmitters (Ω)	10 to 400 Ω 10 to 2 000 Ω	±0.04 Ω ±0.8 Ω	0.03 % 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 Ω/K = 0.385 Ω/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 Δϑ = 10 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 % of 138.5 Ω) * 10 = 0.01385 Ω

Conversion to Kelvin: 0.01385 Ω / 0.385 Ω/K = 0.04 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

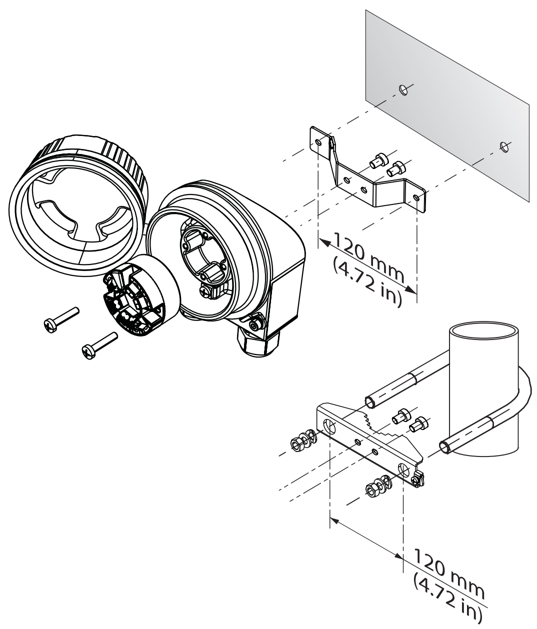


Fig 3. Mounting locations for the transmitter

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 (refar 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 asym.	
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

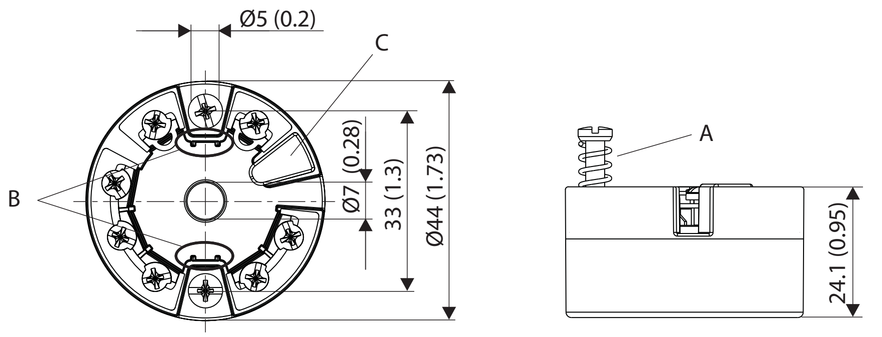


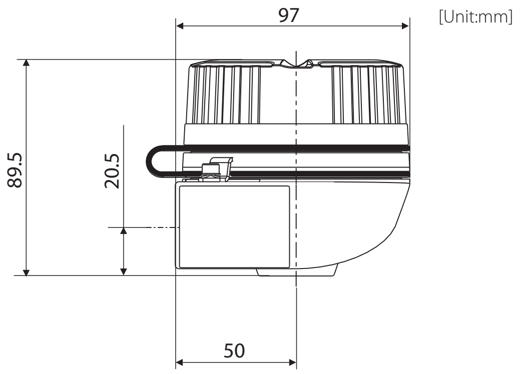
Fig 4. Version with screw terminals

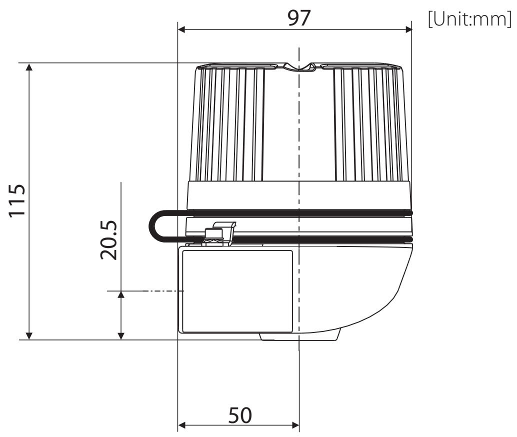
A Spring travel L ≥ 5 mm (not for US - M4 securing screws)

B Fasteners for attachable measured value display

C Interface for contacting the measured value display

Field housings

Without display	Specification
	• Flameproof (XP) version, explosion-protected, captive screw cap, with two cable entries • Temperature: –50 to +150 °C (–58 to +302 °F) for rubber seal without cable gland (observe max. permitted temperature of the cable gland!) • Material: aluminum; polyester powder coated • Cable entry glands: ½″ NPT, M20 × 1.5 • Head color: gray RAL 7035 • Cap color: gray RAL 7035 • Weight: 640 g (22.6 oz)

With display window in cover	Specification
	• Flameproof (XP) version, explosion-protected, captive screw cap, with two cable entries • Temperature: –50 to +150 °C (–58 to +302 °F) for rubber seal without cable gland (observe max. permitted temperature of the cable gland!) • Material: aluminum; polyester powder coated • Cable entry glands: ½″ NPT, M20 × 1.5 • Head color: gray RAL 7035 • Cap color: gray RAL 7035 • Weight: 860 g (30.33 oz)

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
Screw terminals (with latches at the fieldbus terminals for easy connection of a handheld terminal)	Rigid or flexible	≤ 2.5 mm² (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.

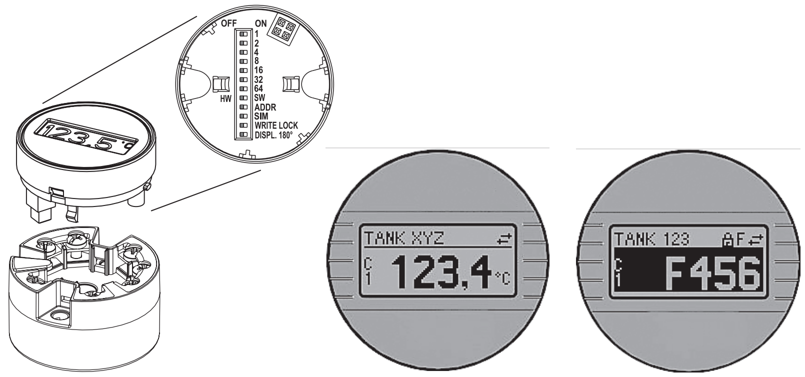


Fig 5. Pluggable display

If the head transmitter is installed in a field housing and used with a display, a housing with glass 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–)	Ui ≤ 30 Vdc Ii ≤ 130 mA Pi ≤ 800 mW Ci ≈ 0 Li ≈ 0

II3G Ex nA II T6/T5/T4	
Power supply (terminals 1+ and 2–)	U ≤ 42 Vdc
Output	I = 4 to 20 mA

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

• II 2G Ex d IIC T6...T4 Gb • II 2D Ex tb IIIC T85 °C…T105 °C Db		
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:

Ui ≤ 30 Vdc, Ii ≤ 130 mA, Pi ≤ 800 mW

Ci ≈ 0, Li ≈ 0

KCs (Korea)

Ex d II C T6 TSurFace ≤ 85 °C

-40 °C ≤ Tamb ≤ +65 °C

Ex d II C T5 TSurFace ≤ 100 °C

-40 °C ≤ Tamb ≤ +80 °C

Ex d II C T4 C TSurFace ≤ 105 °C

-40 °C ≤ Tamb ≤ +85°C

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)

HART® communication

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

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
		KCs Ex d T6 Gb, Ex tb IIIC Db	HA
		IECEx Ex d T6 Gb, Ex tb IIIC Db	I6
II	Communication; Output Signal	HART 7; 4 to 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

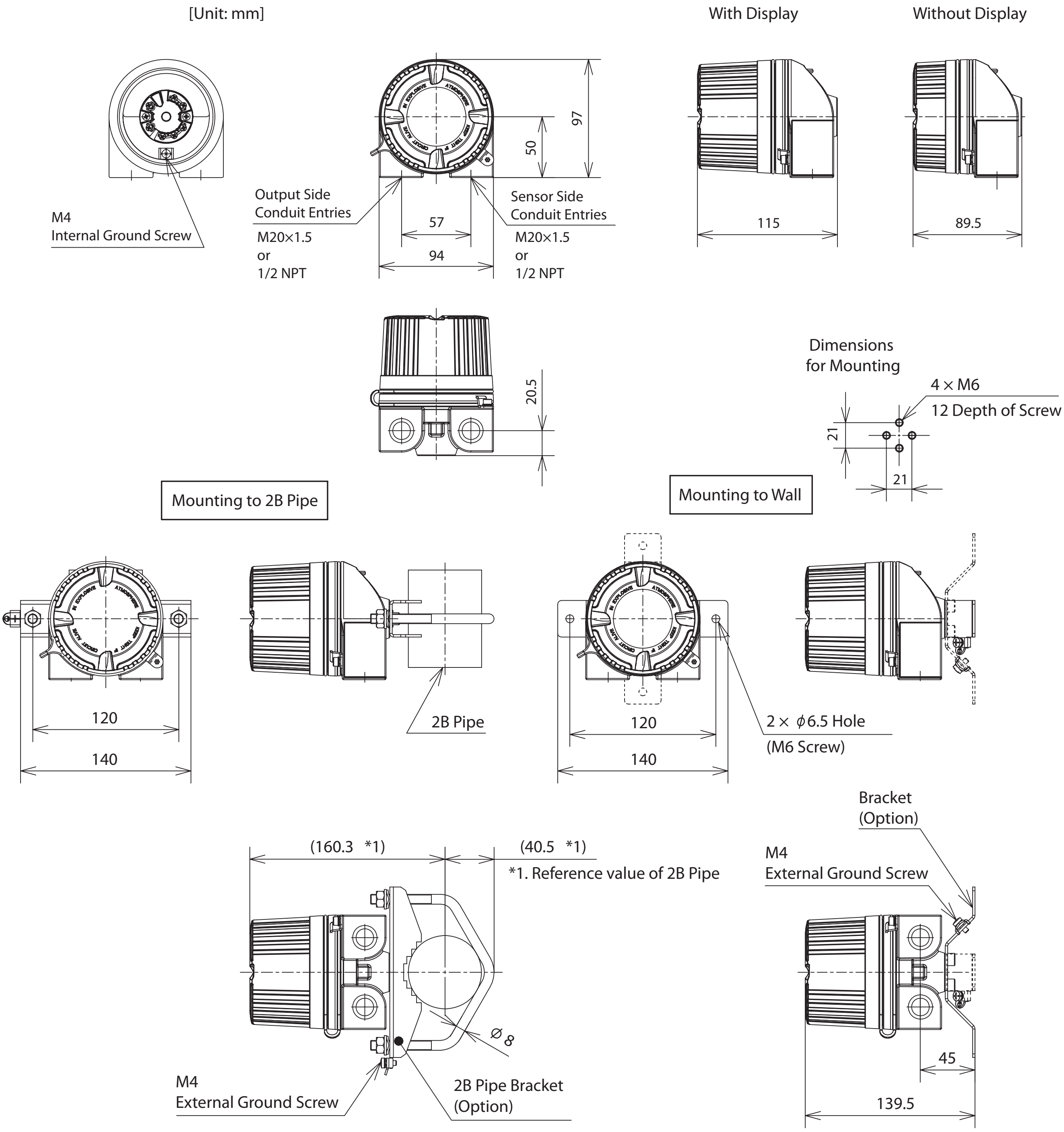


Fig 6. Dimensions

Please read “Terms and Conditions” from the following URL before ordering and use.

http://www.azbil.com/products/factory/order.html

Specifications are subject to change without notice.

Azbil Corporation

Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: http://www.azbil.com/

1st edition: Jan. 2015
4th edition: Aug. 2016