

Calibrated sensors and transducers



Programmable **sensors and transmitters**

Programmable transmitters with voltage or current output options

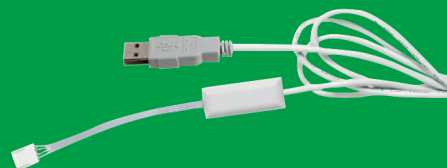
These transmitters are suitable for measuring **temperature, relative humidity, CO₂** or any combination of these parameters. In addition to the directly measured values, the transmitters can calculate and output **derived humidity parameters**, such as dew point or absolute humidity. Configuration and adjustment are performed using a PC connected via the optional **ATS-AC17 communication cable**. The intuitive **software** provides full access to device settings and measured data.

With TSensor software, you can:

- Set the required analog output range (voltage or current)
- Assign a specific measured value to the output
- Select and assign calculated values (e.g. dew point, absolute humidity)
- Perform user calibration and sensor adjustment
- Enable or disable the display



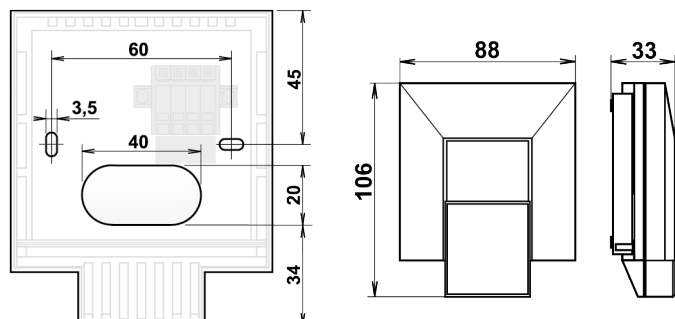
Duct mount CO₂ transmitter with 4-20 mA or 0-10 V output.



ATS-AC17
USB Interface cable to setup sensor

Modern design

Modern sensors offer all the advantages of the industrial sensors, combined with a modern design. They are based on the same digital microprocessor concept, ensuring reliable and accurate performance. The difference lies in the housing, which has been specifically designed to provide both functional benefits and an attractive appearance for indoor applications. The sensors are intended for easy installation in standard flush mounted wiring boxes.



Easy installation in a standard flush mounted wiring box.
The minimum required mounting depth is 40 mm.



AT-VLI-105DV – Programmable temperature/CO₂ sensor

LED limits can be adjusted by user



0 to 1000 ppm



1000 to 1200 ppm



1200 to 2000/10.000 ppm

Sensor models and technical specifications

Measured values		Temperature	Temperature + relative humidity	Temperature + CO ₂	Atm. pressure
SENSOR MODEL	Output 4 - 20 mA	TEA-105D	TRA-105D	AT-VLI-105DV	PV-105D
	Output 0 - 10 V	TEV-105D	TRV-105D	AT-VLI -105DV	PV-105D
Temperature	Range	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-
	Accuracy	± 0,5 °C	± 0,5 °C	± 0,5 °C	-
Relative humidity	Range	-	5 to 95 % RH	-	-
	Accuracy in range 5-60 % at 23 °C	-	± 2,5 % RH	-	-
	Accuracy in range 60-95 % at 23 °C	-	± 3 % RH	-	-
Atmospheric pressure	Range	-	-	-	600 to 1100 hPa
	Accuracy	-	-	-	± 1,3 hPa
CO ₂ **	Range	-	-	0 to 2000 ppm*	-
	Accuracy	-	-	± (50 ppm+2 % of measured value)	-
Computed values		NO	YES	NO	NO
Protection class of the electronics housing		IP20			

* Optional measuring range 0-10,000 ppm at extra cost

** The accuracy of CO₂ measurement is defined at 25 °C and 1013 hPa

Calculated values

Absolute humidity

Accuracy: ± 1,5g/m³ at ambient temperature T < 25 °C
for more details see manual.
Range: 0 to 400 g/m³

Specific humidity

Accuracy: ± 2g/kg at ambient temperature T < 35 °C
Range: 0 to 550 g/kg

Mixing ratio

Accuracy: ± 2g/kg at ambient temperature T < 35 °C
Range: 0 to 995 g/kg

Specific enthalpy

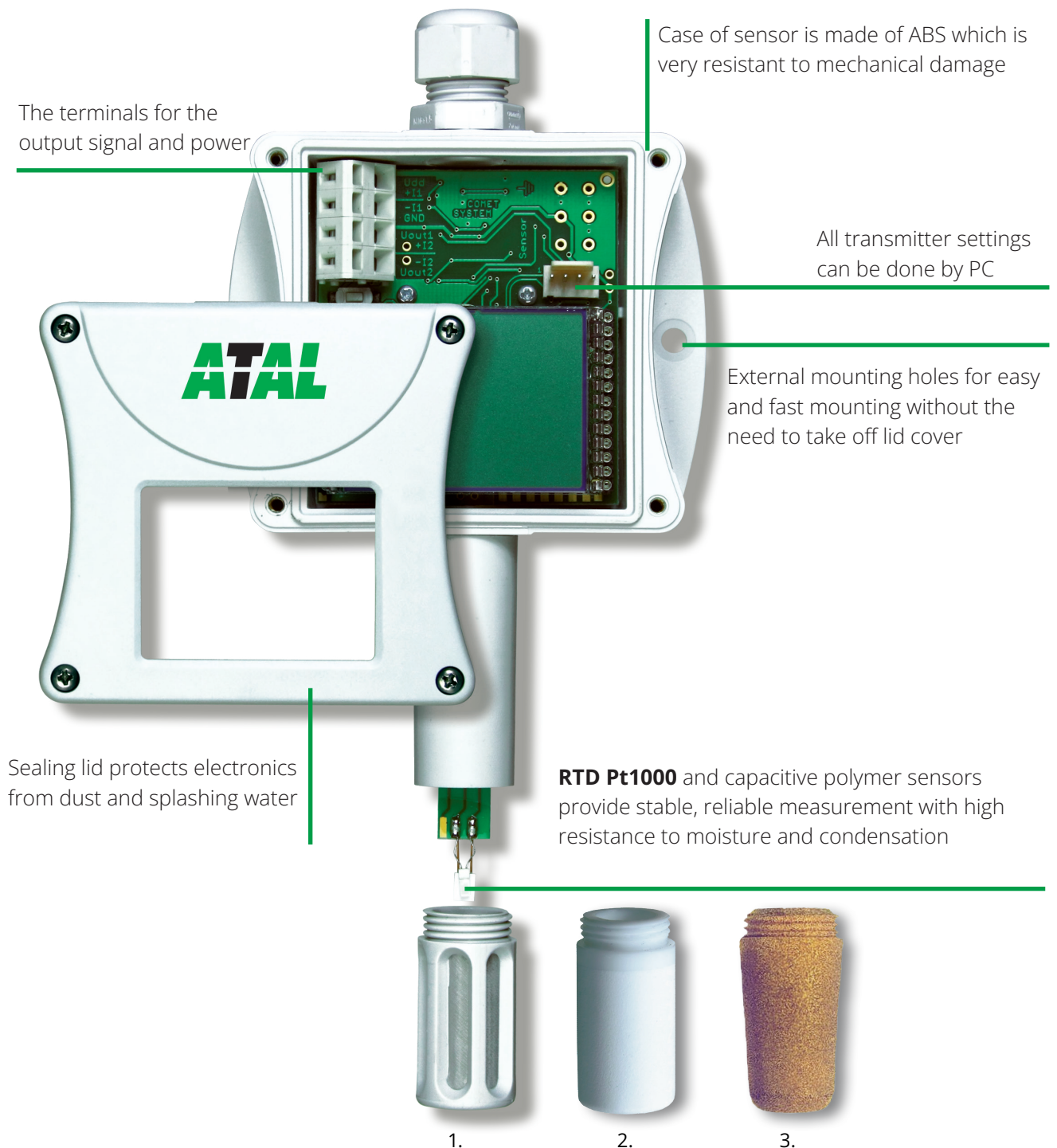
Accuracy: ± 3kJ/kg at ambient temperature T < 25 °C
Range: 0 to 995 kJ/kg

Dew point temperature

Accuracy: ± 1,5 °C at ambient temperature T<25 °C and relative humidity RH

Industrial design

The sensor range includes models with fully integrated sensors as well as versions with external sensors connected by a cable. For atmospheric pressure measurement, an integrated sensor is used in specific models.



Protection of sensors

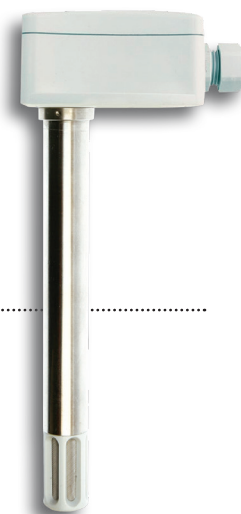
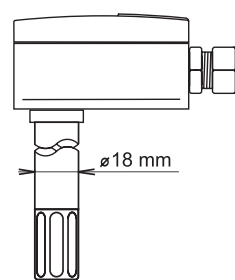
1. Sensor cover **ATS-AC12B** (**ATS - AC12B** - black) with filter from stainless steel mesh. Filtering ability 0.025 mm.

2. **ATS-AC12P** - Teflon (PTFE) sensor cover (white colour), with increased resistance against splashing water, nonabsorbent surface, does not rust. Porous size 25 µm. Temperature range -40 °C to +125 °C.

3. **ATXV-AC19** - Sintered bronze sensor cover for moderate aggressive environments. Filtering ability 0.025 mm.

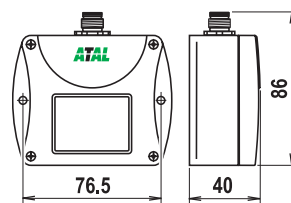
Specific models are available where the probe is mounted perpendicular to the housing

This construction is suitable for installation in air ducts and similar HVAC applications.



Easy connection of external sensor

Transmitters are available in a version with a **watertight male connector**. The waterproof connector (Lumberg RSFM4, IP67) allows easy connection and disconnection of the external sensor cable.

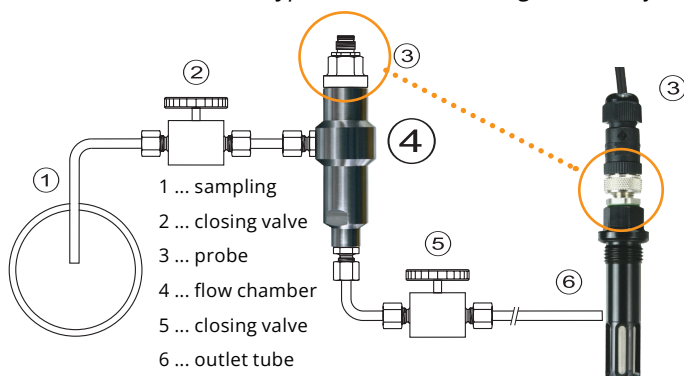


K1427 - Female connector ELKA for TxxxxL transmitters with male connector Lumberg for easy connection/disconnection of the output. IP67 protection.

Special sensor probes are available for humidity measurement in compressed air systems

For optimal accuracy and fast response, the probe can be mounted directly in the compressed air system. When direct installation is not possible due to high air velocity, elevated temperature, contamination, or limited installation space, the probe can be installed in a flow measuring chamber.

The illustration shows a typical installation using the SH PP flow chamber.



SH - PP - Flow chamber for compressed air measurement up to 25 bars - stainless steel
DIN 1.4301 inlet and outlet connection -
G1/8 thread humidity probe connection -
G1/2 thread screw-coupling not included.



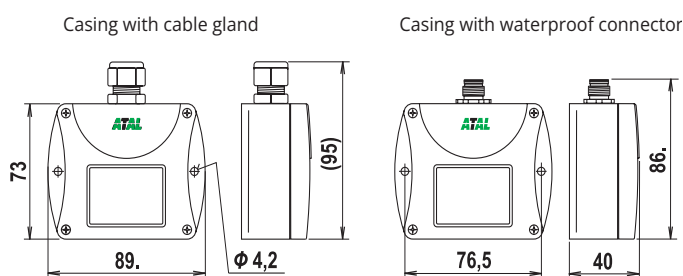
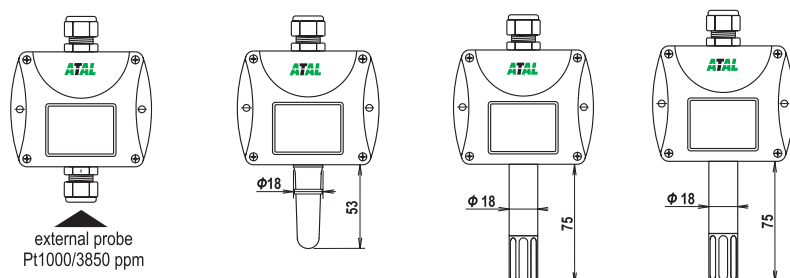
ATS - AC11 - Right-angled stainless steel flange.



ATS - AC10 - Plastic flat circular flange.

Measured values		Temperature		Relative humidity	
SENSOR MODEL	4 - 20 mA	TEA-200D	TEA-101D	RHA-102D	TRA-102D
	0 - 10 V	TEV -102	-	-	TEV-102D
Temperature	Range	$\pm (0,15+0,1 \% \text{ TMR}) ^\circ\text{C}$	-30 to +80 $^\circ\text{C}$	-	-30 to +80 $^\circ\text{C}$
	Accuracy	Accuracy of current output (device without probe) TMR ... temperature measuring range	$\pm 0,4 ^\circ\text{C}$	-	$\pm 0,4 ^\circ\text{C}$
Relative humidity	Range	-	-	0 to 100 % RH	0 to 100 % RH
	Accuracy*	-	-	$\pm 2,5 \% \text{ RH}$	$\pm 2,5 \% \text{ RH}$
Barometric pressure	Range	-	-	-	-
	Accuracy	-	-	-	-
CO ₂ (Absolute humidity Dew point temperature Mixing ratio Specific humidity Specific enthalpy)	Range	-	-	-	-
	Accuracy ***	-	-	-	-
Computed values		NO	NO	NO	YES
Protection class of the case with electronics		IP65 / -	IP65 / IP65	IP65 / IP40	IP65 / IP40

- * Accuracy in range of 5 to 95% at 23 $^\circ\text{C}$
 ** Custom range 10000 ppm.
 *** Accuracy at 25 $^\circ\text{C}$ and pressure of 1013 hPa.
 **** Stems length longer than 75 mm are made of stainless steel.



Calculated values

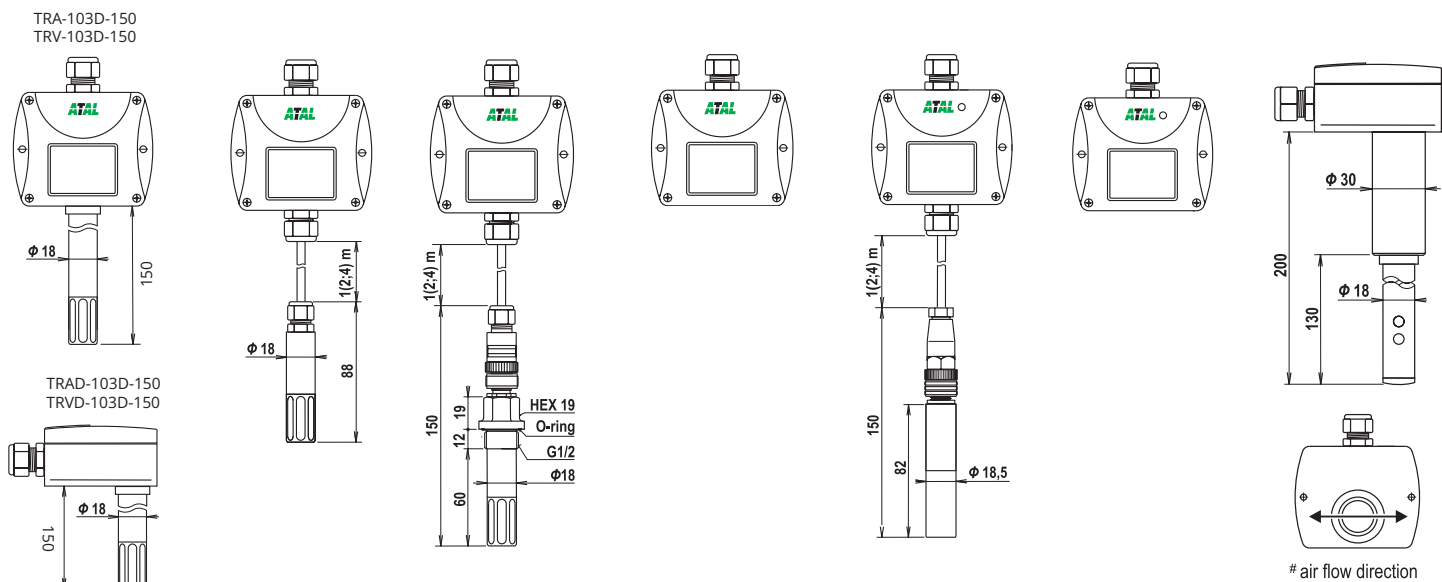
Absolute humidity

Accuracy: $\pm 1,5 \text{ g/m}^3$ at ambient
 temperature $T < 25 ^\circ\text{C}$
 for more details see manual.
 Range: 0 to 400 g/m^3

Dew point temperature

Accuracy: $\pm 1,5 ^\circ\text{C}$ at ambient temperature
 $T < 25 ^\circ\text{C}$ and relative humidity $\text{RH} > 30 \%$,
 for more details see manual
 Range: -60 to +80 $^\circ\text{C}$ (-76 to 176 $^\circ\text{F}$)

Temperature + relative humidity			Atm. pressure	CO ₂		
TRA(D)-103D -150	TRA-104D	TRA-104DP	PA-101D	AT-VLI-104DA-1M	AT-VLI-101DA	AT-VLI-107DA
TRV(D)-103D-150	TRV-104D-1M	TRV-104DP-1M	PV-101D	AT-VLI-104DV-1M	AT-VLI-101DV	AT-VLI-107DV
-30 to +125 °C	-30 to +105 °C	-30 to +105 °C	-	-	-	-
± 0,4 °C	± 0,4 °C	± 0,4 °C	-	-	-	-
0 to 100 %RH	0 to 100 %RH	0 to 100 %RH	-	-	-	-
±2,5 %RH	±2,5 %RH	±2,5 %RH	-	-	-	-
-	-	-	600 to 1100 hPa	-	-	-
-	-	-	± 1,3 hPa	-	-	-
-	-	-	-	0 to 10000 ppm	0 to 2000 ppm**	0 to 2000 ppm**
-	-	-	-	± (110 ppm+2 % of measured value)	± (50 ppm+2 % of measured value)	± (50 ppm+ 2 % of measured value)
YES	YES	YES	NO	NO	NO	NO
IP65 / IP40	IP65 / IP40	IP65 / IP40	IP54 / -	IP65 / IP65	IP30 / -	IP65 / IP20



Specific enthalpy

Accuracy: ± 3 kJ/kg at ambient temperature
T < 25 °C
Range: 0 to 995 kJ/kg

Mixing ratio

Accuracy: ± 2 g/kg at ambient temperature
T < 35 °C
Range: 0 to 995 g/kg

Specific humidity

Accuracy: ± 2 g/kg at ambient temperature
T < 35 °C
Range: 0 to 550 g/kg

Intrinsically safe transmitters for **hazardous areas (with 2 x 4-20mA output)**

II	3G	Ex	ic	IIC	T6	Gc
II	Equipment group II, intended for use in surface industries (non mining applications).					
3G	Equipment category 3G, suitable for use in areas where an explosive gas atmosphere is not likely to occur in normal operation, and if it does occur, it will exist only for a short period of time (typically ATEX Zone 2).					
Ex	Indicates that the equipment has been designed and certified with an explosion protection concept.					
ic	Type of protection intrinsic safety "ic" according to EN 60079 11, providing protection suitable for Zone 2 applications.					
IIC	Gas group IIC, suitable for use in atmospheres containing hydrogen, acetylene, and other highly explosive gases (most demanding gas group).					
T6	Temperature class T6, indicating that the maximum surface temperature does not exceed 85 °C at a maximum ambient temperature of 60 °C.					
Gc	Equipment Protection Level (EPL Gc), meaning the equipment provides a high level of protection and is not a source of ignition during normal operation in explosive gas atmospheres.					

T311xEx transmitters are designed as intrinsically safe devices for use in hazardous areas.

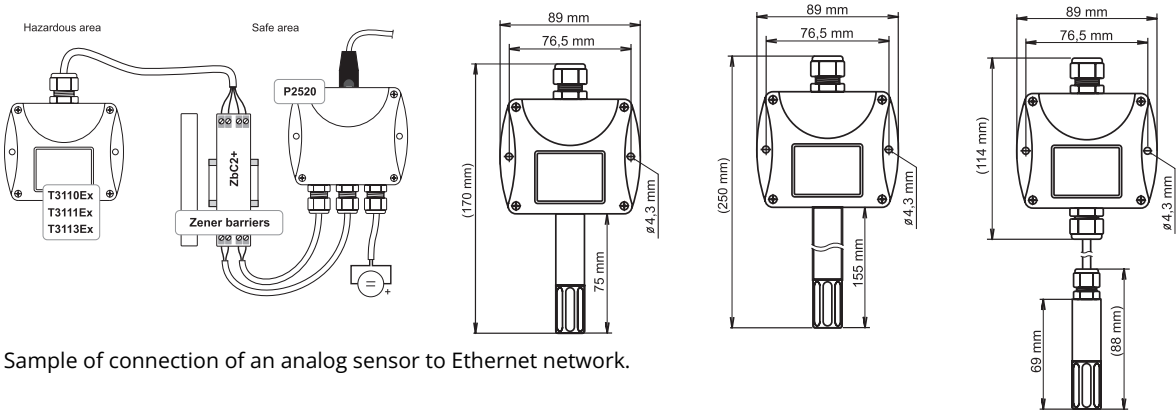
Intrinsic safety is a type of explosion protection based on limiting the electrical and thermal energy in the circuit to a level below that which could cause ignition of a specific explosive atmosphere.

Intrinsically safe Zener barriers and intrinsically safe isolating amplifiers are essential interface components used to protect electrical circuits installed in potentially explosive atmospheres. These devices ensure that the energy supplied to the field equipment remains within intrinsically safe limits.

Programmable transmitters T3110Ex, T3111Ex and T3113Ex, with 4–20 mA outputs, are intended for the measurement of relative humidity and temperature in potentially explosive environments, such as ATEX classified zones with the presence of flammable gases, vapours or mists.



Measured values		Temperature + relative humidity		
SENSOR MODEL		T3110Ex	T3113Ex	T3111Ex
Temperature	Range	-30 to +80 °C	-30 to +125 °C	-30 to +105 °C
	Accuracy	± 0,4 °C		
Relative humidity	Range	0 to 100 % RH		
	Accuracy	± 2,5 % RH from 5 to 95 % at 23 °C		
Computed values		YES		
Output		4-20 mA		
Recommended calibration interval		1 year		
Protection class of the case		IP65 / IP40		



Sample of connection of an analog sensor to Ethernet network.

Zener barrier **ZbC2+**

A Zener barrier is a certified intrinsically safe interface.

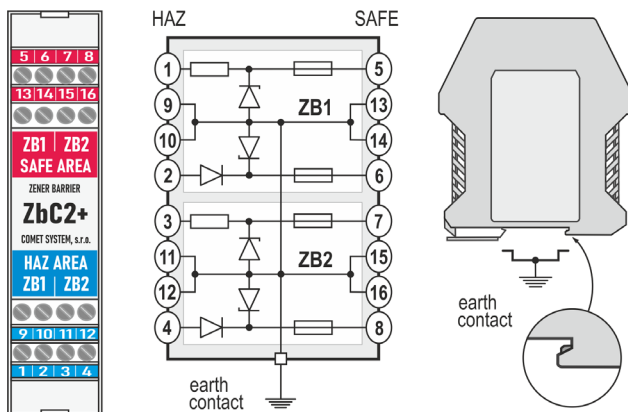
It is used to connect a certified intrinsically safe field device installed in a hazardous (potentially explosive) area to a non-certified device located in a safe area. The Zener barrier limits the electrical energy transferred to the hazardous area, ensuring that the connected circuit remains within intrinsically safe limits.

Electrical parameters

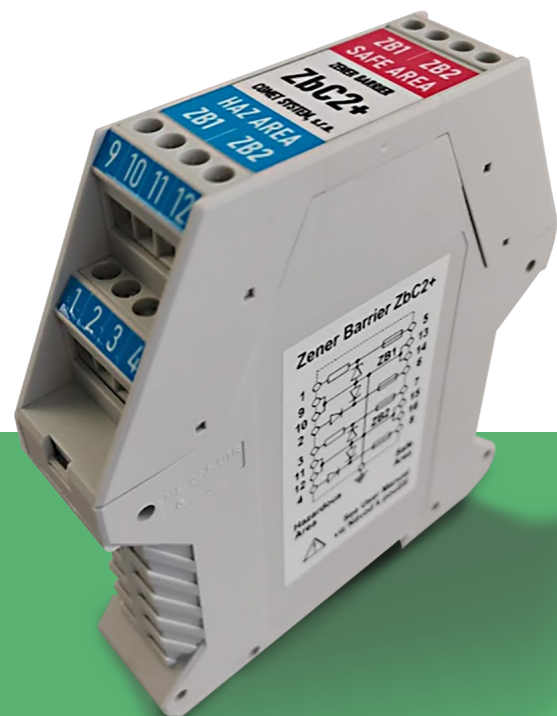
- Maximum voltage (U_0): 29.4 V
- Maximum current (I_0): 96 mA
- Minimum resistance (R_0): 306 Ω

Key features

- Two identical Zener barriers (ZB1 and ZB2) in a common housing
- Positive polarity with return diode
- Series resistance:
 $R_{s1} = 355 \Omega$ (terminals 1–5 and 3–7)
 $R_{s2} = 42 \Omega$ (terminals 2–6 and 4–8)
- Fuse rating: 40 mA
- DIN rail mounting in a safe area



Two identical Zener barriers ZB1 and ZB2 in a common case.



NOTICE

Installation, commissioning, and maintenance may only be performed by appropriately qualified personnel and in compliance with all applicable regulations and standards. Refer to the product user manual for complete information.

Certificate: FTZU 22 ATEX 0018X

Temperature transducers with **analog output, fixed range**

Transducers TEV 101 and TEV 102 to TEV 105, which do not incorporate an internal temperature sensor, are designed for signal conversion from an external RTD Pt1000 sensor (3850 ppm/°C) to a 4–20 mA current output. The TEP-101 probe is intended for air temperature measurement, while TEP 103 is designed for temperature measurement using a stainless steel thermowell (thermowell not included). The temperature range of all models is fixed and not user adjustable. All transducers provide a 4–20 mA analog output and can be powered directly from the current loop (loop powered). The electronics housing provides a protection class of IP65.

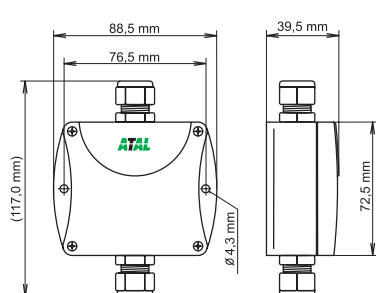
Measured range	Transducer for external probe Pt1000			Built-in temperature sensor		
	Type	0 - 10 V**	Accuracy	Type	0 - 10 V	Accuracy
- 100 °C to +200 °C	TEP-300	-	± 0,3 °C***	-	-	-
- 50 °C to +50 °C	TEP-301	-	± 0,3 °C	-	-	-
- 100 °C to +30 °C	TEP- 200	-	± 0,3 °C	-	-	-
- 50 °C to +50 °C	TEP-206	-	± 0,3 °C	-	-	-
- 30 °C to +80 °C	TEP-201	TEV-102	± 0,3 °C	TEPA-101	TEV-101, TEV-103	± 0,4 °C
0 °C to +35 °C	TEP-203	-	± 0,2 °C	-	-	-
0 °C to +150 °C	TEP-202	-	± 0,3 °C	TEA-103-150C	-	± 0,4 °C****
0 °C to +250 °C	TEP-204	-	± 0,4 °C	-	-	-
0 °C to +400 °C	TEP-205	-	± 0,7 °C	-	-	-

* Model for Pt100 probe - connection of a two-wire, three-wire or two-wire probe with a compensation loop

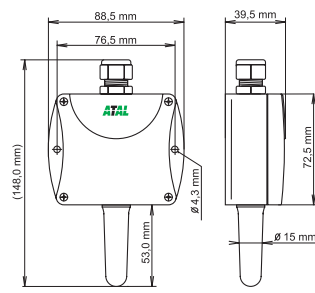
** Voltage sensors can also be powered from 24 Vac

*** ± 0.4 °C above 100 °C

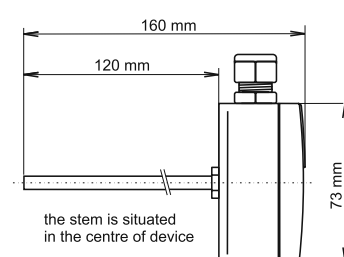
**** above 100 °C 0.4 % °C from the measured value



TEP-200 , TEV-102



TEPA-101, TEV-101



TEA-103-150C, TEV-103

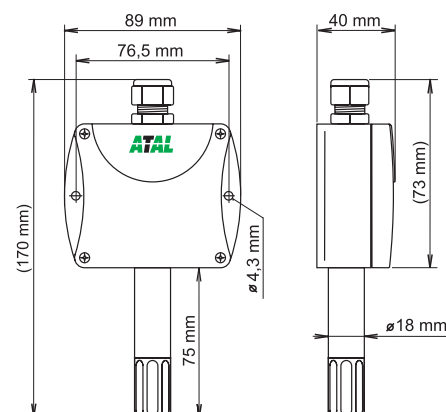
Temperature and relative humidity sensor, fixed range

Output 2 x 4 - 20 mA

The TRA-102ND-E is a cost effective sensor designed for the measurement of temperature and relative humidity in non chemically aggressive environments. The sensor provides a 4–20 mA analog output and is suitable for general HVAC and industrial monitoring applications.

Measured values		Temperature + relative humidity
SENSOR MODEL		TRA-102ND-E
Temperature	Range	-30 to +80 °C
	Accuracy	±0,6 °C
Relative humidity	Range	0 to 100 % RH
	Accuracy*	± 3 % RH
Output		4-20 mA
Calculated values		NO
Protection class of the electronics housing		IP65 / IP40

* Relative humidity accuracy from 5 to 95 % at 23 °C



Professional radiation shields for **weather sensors**

This multi plate radiation shield is designed to protect weather monitoring sensors against solar radiation, precipitation and other environmental influences, enabling highly accurate climate measurements. The design allows the use of sensors from various manufacturers, making the shield suitable for a wide range of meteorological and environmental monitoring applications.

The radiation shield is recognized as one of the best-performing thermometer screens currently available and was the winner of the "Intercomparison of Thermometer Screens in the Arctic" conducted under the auspices of the World Meteorological Organization (WMO).

The uniquely engineered shield minimizes direct solar radiation reaching the sensor, reduces radiation absorbed by the shield itself, and maximizes natural airflow around the sensor to ensure fast response and high measurement accuracy.

The outer surfaces exposed to sunlight are manufactured from highly reflective, UV resistant, long term stable ASA plastic. The inner surfaces are made of matte black plastic to minimize internal reflections and measurement errors. The large 210 mm diameter, 14 plate design provides complete protection of the weather sensor.

Each of the fourteen louvres is equipped with a circular ventilation slot, allowing vertical airflow through the entire radiation shield. This slot also thermally separates the sun exposed outer surface from the inner section, effectively reducing heat transfer to the sensor.

1.

ATF8000 - has large diameter of lamels 210 mm and provides full protection of the measuring devices that can be located inside in the cylindrical space with a diameter of 110 mm.

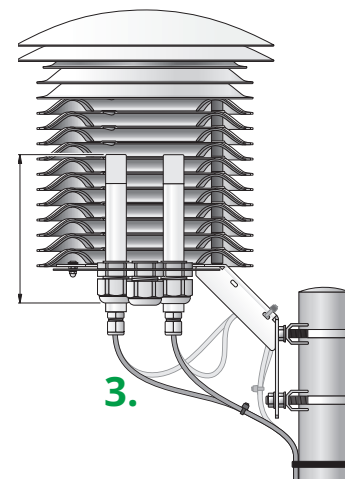
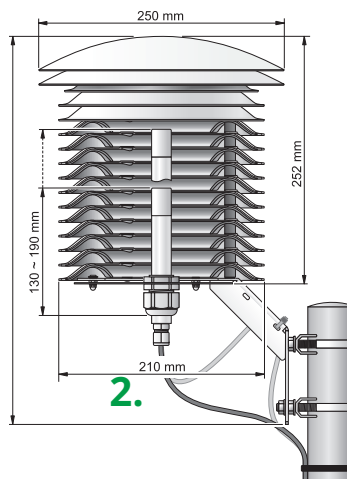
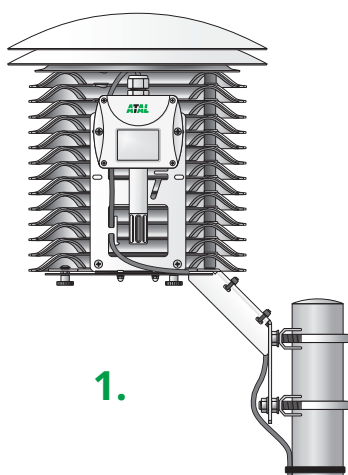
2.

ATF8001 - Universal naturally ventilated weather cover any measuring probes with diameter 13 to 18 mm before weather effects. As required a weather cover can be provided another size mounting bushings for the probe.

3.

ATF8004 - version with four bushings

Version 2 and 3 can be used with most devices and probes, e.g. Vaisala, Rotronic.





Your distributor

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