Sensors and transducers

with 4 - 20 mA or 0 - 10 V outputs

COMET

COMET SYSTEM 25 YEARS ANNIVERSARY
25 YEARS

Case of sensor is made of ABS which is very resistant to mechanical damage.

The terminals for the output signal and power.

All transmitter settings can be done by PC.

External mounting holes for easy and fast mounting without the need to take off lid cover.

The intrinsically safe transmitters are intended for use in potentially explosive environments (zone 2).

$\langle Ex \rangle$

$\langle Ex \rangle$	II	3G	Ex	ic	IIC	T6	Gc

Sealing lid protects electronics from dust and splashing water.

RTD Pt1000 temperature sensor together with state-of-the-art capacitive polymer sensor ensures excellent calibration, long term stability, inertia against water and condensation.

Sensor cover with filter from stainless steel mesh. Filtering ability is 0,025mm.

ANALOG SENSORS
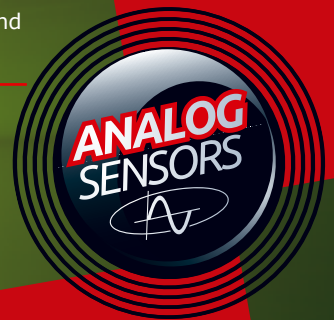
- programmable sensors of temperature, humidity, atmospheric pressure and CO_2
- industry and interior design ● high quality, accurate and stable sensors
- values computed from ambient temperature and relative humidity
- traceable calibration certificate with traceability with EN ISO/IEC 17025

Building management needs quality and reliable components. Our instruments which measure temperature, humidity, atmospheric pressure and CO_2 are an integral part of these industry-leading solutions.

Process industries is distinguished by its capital demands. A competition across the market is still growing and creates additional pressure on the prices. Our company has a good understanding of this situation and thus provides very reliable and precise products for a very competitive price.

Meteorology is the science of the atmosphere, whose knowledge is essential in many fields of human activity. For example, transportation, agriculture and the military need sensitive, accurate devices with a large dynamic range, which are very stable over time. COMET sensors meet these requirements. Our sensors along with a radiation shield may form the basis for a long-term weather station for monitoring climate and air quality.

In the food industry, environments, supermarkets and wherever there is a need to monitor critical variables in relation to HACCP regulations, COMET sensors and transducers may be used. Along with other COMET products such monitoring systems MS6 and MS55D, it is possible to create a comprehensive system for collecting, recording, analyzing and alerting.

Healthcare and laboratories are characterized by sterile environments. COMET sensors can serve well even in these demanding and wide range of applications focusing on monitoring temperature, CO_2 and other critical parameters in the context of GLP and GMP regulations.

Potentially explosive environments are not suitable for common sensors. Selected types of devices series T311x comply with the requirements of the ATEX directive for use in potentially explosive environments (zone 2).

Building management **Industry** **Meteorology** **Environments** **Pharmaceuticals and laboratories**

Measured values

Temperature

Temperature is measured by RTD sensor Pt1000/3850 ppm which can be integrated into the housing of transducer, into the duck stem or can be used on the cable as well. The measured temperature can be displayed in °C or °F, according to the settings of the sensor.

Relative humidity

State-of-the-art capacitive polymer sensor ensures excellent long term calibration stability and inertia against water and condensation. Transmitters are available in wall-mount, ductmount and bar types. Also with a T+RH probe on a cable are available. They are also available in modification for measuring into the pressure up to 25 bars (models T3111P, T0211P).

Computed values

Measured values are also converted to other humidity interpretation - dew point temperature, absolute humidity, specific humidity, mixing ratio or specific enthalpy.
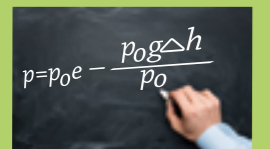
Barometric pressure

Transmitter for measuring of barometric pressure is equipped with an absolute pressure sensor of high accuracy which ensures excellent long term stability. The display reading and pressure output is user selectable in these units: hPa, kPa, mbar,mmHg, inHg, inH O, PSI, oz/in2.

$$p = p_0 e - \frac{p_0 g \triangle h}{p_0}$$

Carbon dioxide level - CO_2

The CO_2 measurement is based on a 2-source, 2-beam process. CO_2 measurement with long-term stability is guaranteed thanks to the proven non-dispersive infrared (NDIR) CO_2 measurement cell. The unique patented auto-calibration procedure compensates for aging of the infrared source and guarantees high reliability, long term stability and eliminates the need of periodical recalibration in the field.

The company COMET System, s.r.o. produces inexpensive sensors and temperature transmitters **P series with fixed and unchangeable temparature range.**

Programmable sensors T series offer more flexibility. Device contains a microprocessor based control circuitry. This concept allows the user to choose measuring range for each output. Moreover, there is an option to set up computed values such as dew point, absolute humidity, specific humidity, mixing ratio and specific enthalpy. Programmable transmitter also allows adjustment of the sensor by the user.

These sensors exist in several design - industrial, interior or in implementation for explosive environments.

Basic division of sensors and transducers T and P series:

T - Programmable transmitters with display
» Measuring of temperature, humidity, atm. pressure, CO_2
» Computed values (dew point, etc.)
» Industrial and interior design
» Possibility of voltage or current output
» Variable measuring range
» Computed values
» Long-term stability of sensors
» User adjustment of sensors

P - inexpensive sensors and temperature transmitters with a fixed measuring range

T - Programmable sensors and transducers with output 4 – 20 mA, 0 - 10 V

Programmable transmitters with possibility of voltage or current output. Transmitters can be used for measuring Temperature, Relative humidity, CO_2 or combination. Measured values are also converted to other humidity interpretation All transmitter are with Dual line LCD. All transmitter settings are performed by means of the PC connected via the optional SP003 communication cable. The Free program.Tsensor for setting is available to download from www.cometsystem.com.

Software TSensors allows you to:

» Set the desired range of the analog output
» Assign measured value to output
» Select and assign the computed value
» Make a user adjustment of the sensor
» Turn the display off

**TSensor** - freeware software for sensor configuration.

Transmitter version TxxxxD The sensors are available with integrated sensors, with sensors on the cable and probe into the pressure environment. Outside these there is a version TxxxxD with display positioned perpendicular to measuring Stem. This construction is suitable for installation into the air channels as well as into the radiation shield COMETEO see. pg. 10.

ø18 mm
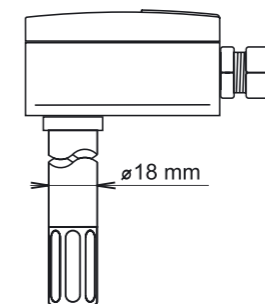
Sensor fits to meto shiled - COMETEO.

Transmitter version with watertight male connector TxxxxL Waterproof connector for easy connection and disconnection of the output cable (connector Lumberg RSFM4 IP67). Please specify your order with letter L behind model code (e.g. TxxxxL).

76.5 40 86
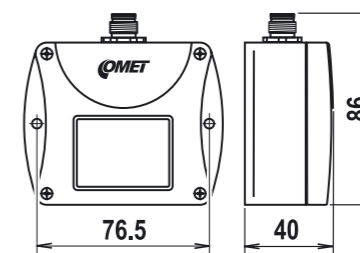
Common parameters for sensors T series
» for sensors with current output each loop is galvanically isolated
» sensors with current output are powered by the current loop (9-30 V), sensors with voltage output are powered by voltage 15-30 V or 24 Vac ± 10 %
» in case of error output for devices with 4-20 mA is <3.8 mA or > 24 mA
» in case of error output for devices with 0-10 V output is <-0.1 V or > 10.5 V

ANALOG SENSORS

T3113 – temperature and humidity transmitter ****

measured values		temperature		relative humidity	temperature + relative humidity				atm. pressure	CO_2		
SENSOR MODEL	4 - 20 mA	T4111	T0110	T1110	T3110	T3113(D), T3117(D)	T3111	T3111P	T2114	T5141	T5140	T5145
	0 - 10 V	T4211	-	-	T0210	T0213(D)	T0211	T0211P	T2214	T5241	T5240	T5245
temperature	range	-200 to +600 °C	-30 to +80 °C	-	-30 to +80 °C	-30 to +125 °C	-30 to +105 °C	-30 to +105 °C	-	-	-	-
	accuracy	±(0,15+0,1%TMR)°C	±0,4 °C	-	±0,4 °C	±0,4 °C	±0,4 °C	±0,4 °C	-	-	-	-
relative humidity	range	accuracy of current output (device without probe) TMR ... temperature measuring range	-	0 to 100 %RH	0 to 100 %RH	0 to 100 %RH	0 to 100 %RH	0 to 100 %RH	-	-	-	-
	accuracy*		-	±2,5 %RH	±2,5 %RH	±2,5 %RH	±2,5 %RH	±2,5 %RH	-	-	-	-
barometric pressure	range	-	-	-	-	-	-	-	600 to 1100 hPa	-	-	-
	accuracy	-	-	-	-	-	-	-	±1,3 hPa	-	-	-
CO_2	range	-	-	-	-	-	-	-	-	0 to 10000 ppm	0 to 2000 ppm**	0 to 2000 ppm**
	accuracy ***	-	-	-	-	-	-	-	-	± (110 ppm+2 % of measured value)	± (50 ppm+2% of measured value)	± (50 ppm+2% of measured value)
computed values		NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
recommended calibration interval		two years	two years	one year	one year	one year	one year	one year	one year	five years	five years	five years
protection class of the case with electronics		IP65	IP65	IP65	IP65	IP65	IP65	IP65	IP 54	IP 65	IP 30	IP65
protection class of the sensors cover		-	IP65	IP40	IP40	IP40	IP40	IP40	-	IP 65	-	IP20
temperature operating range of the case with electronics		-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +60 °C	-30 to +60 °C
temperature operating range of the sensing element		-	-30 to +80 °C	-30 to +80 °C	-30 to +80 °C	-30 to +125 °C	-30 to +105 °C	-30 to +105 °C	-	-40 to +60 °C	-	-
humidity operating range		0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	0 to 100 % RH	5 to 95 % RH	5 to 95 % RH
barometric pressure operating range		-	-	-	-	-	-	probe for compressed air up to 25 bars	600 to 1100 hPa	850 to 1100 hPa	850 to 1100 hPa	850 to 1100 hPa

computed values

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

Dew point temperature
Accuracy: ±1,5°C at ambient temperature T<25°C and relative humidity RH >30%, for more details see manual.
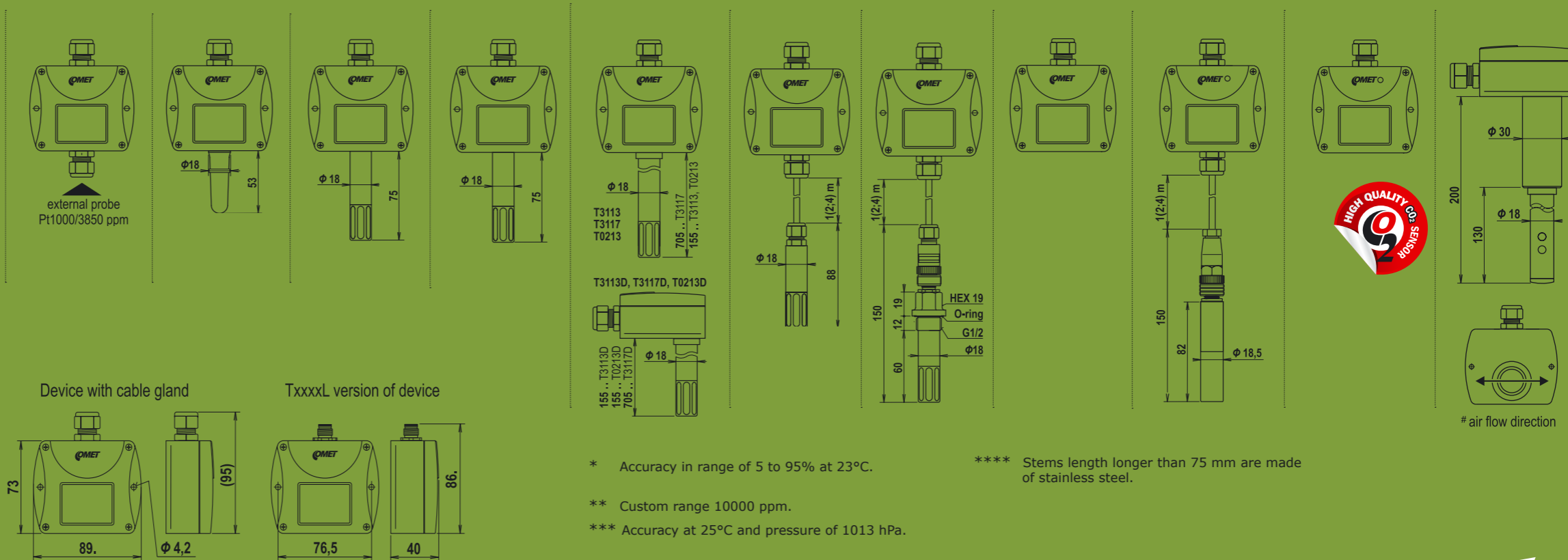Range: -60 to +80 °C (-76 to 176 °F)

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

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

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

external probe Pt1000/3850 ppm

Device with cable gland

TxxxxL version of device

φ18, 53, Φ18, 75, Φ18, 75

Φ18, T3113 T3117 T0213, 705...T3117, 155...T3113, T0213

T3113D, T3117D, T0213D

155...T3113D, 155...T0213D, 705...T3117D, φ18

φ18, 88, 1(2,4) m

1(2,4) m, 150, 12, 19, 60, HEX 19, O-ring, G1/2, φ18

1(2,4) m, 150, 82, φ 18,5

φ 30, φ18, 200, 130

air flow direction

HIGH QUALITY CO_2 SENSOR

* Accuracy in range of 5 to 95% at 23°C.

** Custom range 10000 ppm.

*** Accuracy at 25°C and pressure of 1013 hPa.

**** Stems length longer than 75 mm are made of stainless steel.

73, (95), 89., Φ4,2

86., 76,5, 40

ATEX certification for use in potentially explosive environments with output 4 – 20 mA

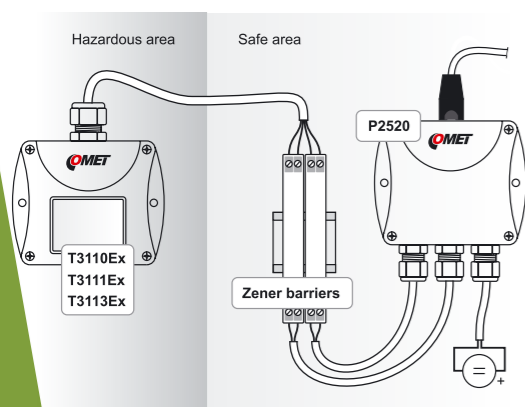| Ex	II	3G	Ex	ic	IIC	T6	Gc

II	The product is intended to surface sites with the presence of explosive atmospheres.
3G	The product is intended for use in areas where an explosive mixture of gas (vapour, mist) and air is not likely to occur in normal operation and if it occurs it will exist only for a short time.
Ex	It identifies that a protection mode against explosions has been adopted.
ic	The protection mode by intrinsic safety according standard EN 60079-11.
IIC	The product is intended to surface sites with the presence of explosive atmosphere - subgroup of C gas.
T6	The temperature class (maximum surface temperature of the device is 85 °C at ambient temperature 60 °C).
Gc	Equipment protection level (equipment for use in explosive atmospheres due to the presence of gas, with a level of protection "increased" that is not a source of ignition in normal operation).

Programmable transmitters T3110Ex, T3111Ex, T3113Ex with 4-20 mA outputs are designed for measurement of relative humidity and temperature in a potentially explosive environments.
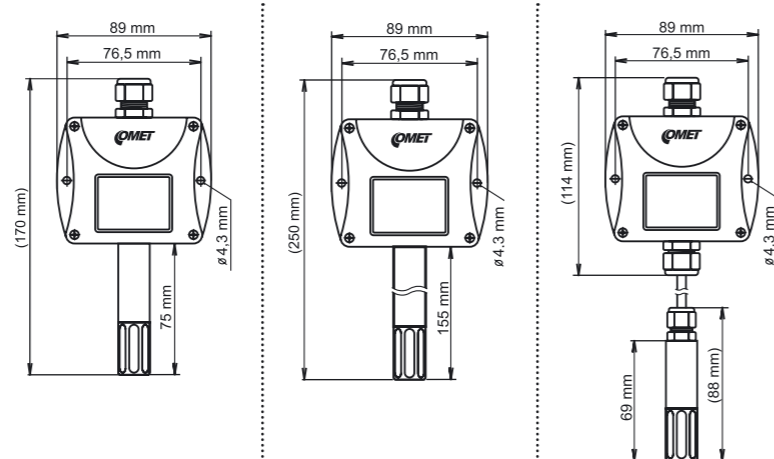
T311xEx transmitters are intrinsically safe. It is a way of equipment protection, which is based on the limitation of energy (electrical and thermal) at a level lower than the level that could cause ignition a specific hazardous atmospheric mixture. Intrinsically safe zener barriers and intrinsically safe isolation amplifiers are an elemental types of intrinsically safe interfaces designed to protect electrical circuits installed in a potentially hazardous areas.
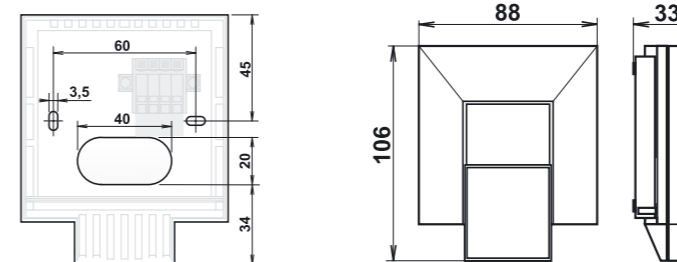
Interior design
with output 4 – 20 mA, 0 - 10 V

Interior sensors have all the advantages of T series sensors in industrial design. This is the same concept with a digital microprocessor. It differs by the type of housing which has been designed with regard to functional and attractive design. They are made for easy installation in a standard way into a flush-mounted wiring box.

0 až 1000 ppm

1000 až 1200 ppm

1200 až 2000/10 000 ppm

Limits of LED indicationmay be changed by user.

Easy installation in a standard way into a flush-mounted wiring box. Minimal depth of the box is 40 mm.

T8148 - programmable sensor of temperature and C0$_2$.

Measured values / Temperature + relative humidity

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 % RV od 5 do 95 % at 23 °C		
computed values		YES		
output		4-20 mA		
recommended calibration interval		1 year		
protection class of the case		IP65		
protection class of the sensors cover		IP40		
temperature operating range of the case with electronics		-30 to +60 °C		
temperature operating range of the sensing element		-30 to +80 °C	-30 to +125 °C	-30 to +105 °C
humidity operating range		0 to 100% without condensation		

Hazardous area | Safe area

P2520

T3110Ex
T3111Ex
T3113Ex

Zener barriers

Sample of connection of an analog sensor to Ethernet network

Sensor models and their specification

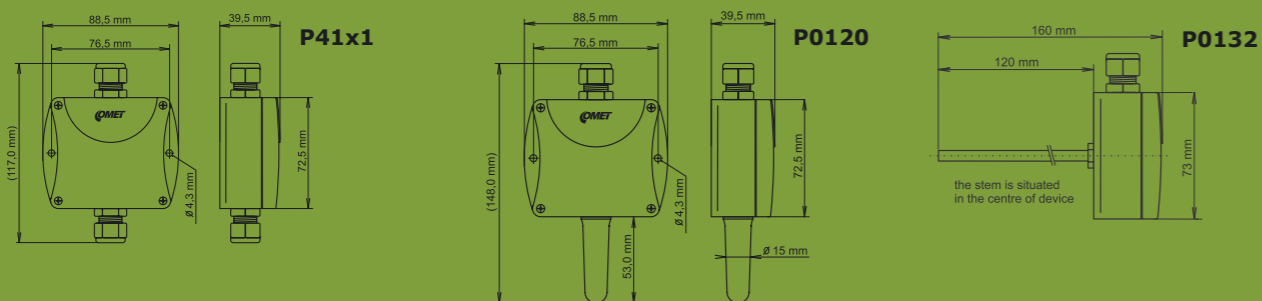| Measured values		Temperature	Temperature + relative humidity	Temperature + CO$_2$	Atm. pressure
SENSOR MODEL	výstup 4 - 20 mA	T0118	T3118	T8148	T2118
	výstup 0 - 10 V	T0218	T3218	T8248	T2218
temperature	range	-10 to +50 °C	-10 to +50 °C	-10 to +50 °C	-
	accuracy	±0,5 °C	±0,5 °C	±0,5 °C	-
relative humidity *	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
C0$_2$ **	range	-	-	0 to 2000 ppm	-
	accuracy	-	-	± (50 ppm+2% of measured value)	-
computed values		NO	YES	NO	NO
recommended calibration interval		two years	one year	two years (temperature)/five years (CO$_2$)	one year
protection class of the case with electronics		IP20			
temperature operating range of the sensing element		0 to +50 °C			
humidity operating range		0 to 100 % RH			
rozsah provozního tlaku přístroje		-	-	850 to 1100 hPa	600 to 1100 hPa

* Accuracy in range of 5 to 95% at 23°C.

** Accuracy at 25°C and pressure of 1013 hPa.

Sensors and temperature transmitters with fixed and unchangeable temparature range output 4 - 20 mA

Transducers P4121 to P4171 without own temperature sensor are designed for signal conversion from RTD sensor Pt1000 (3850ppm/°C) to the current flow. Probe P0120 is designed for measurement of air temperature, transducer P0132 for temperature measurement in stainless steel well (well is not included). Temperature range af all models is unchangeable and the output is an analog signal 4-20 mA. All transducers can be powerd from current loop. Protection of electronic part is IP65.

Sensor models and their specification

measured range	transducer for exteral probe Pt1000 (*Pt100)		built-in temperature sensor	
	type	accuracy	type	accuracy
- 100 °C to +200 °C	P6181*	±0,3 °C, ±0,4 °C nad 100 °C		
- 50 °C to +50 °C	P6191*	±0,3 °C		
- 100 °C to +30 °C	P4141	±0,3 °C		
- 50 °C to +50 °C	P4191	±0,3 °C		
- 30 °C to +80 °C	P4121	±0,3 °C	P0120	±0,4°C
0 °C to +35 °C	P4151	±0,2 °C		
0 °C to +150 °C	P4131	±0,3 °C	P0132	±0,4 °C, above 100 °C 0,4% °C in MV**
0 °C to +250 °C	P4161	±0,4 °C		
0 °C to +400 °C	P4171	±0,7 °C		

P41x1

P0120

P0132

the stem is situated in the centre of device

* For Pt100 probe - two-wire, three-wire and two-wire with compensation loop connection
** MV - measured value

Temeprature and humidity sensor with fixed and unchangeable measuring range output 4 - 20 mA

Inexpensive sensor P3110E with 4-20mA output is designed to measure temperature and relative humidity in a no chemically aggressive environment.

| Measured values		Temperature + relative humidity
SENSOR MODEL		P3110E
temperature	range	-30 to +80 °C
	accuracy	±0,6 °C
relative humidity	range	0 to 100 % RH
	accuracy*	±3% RH
output		4-20 mA
computed values		NO
protection class of the case with electronics		IP65
protection class of the sensors cover		IP40
temperature operating range		-30 to +80 °C
humidity operating range		0 to 100 % RH
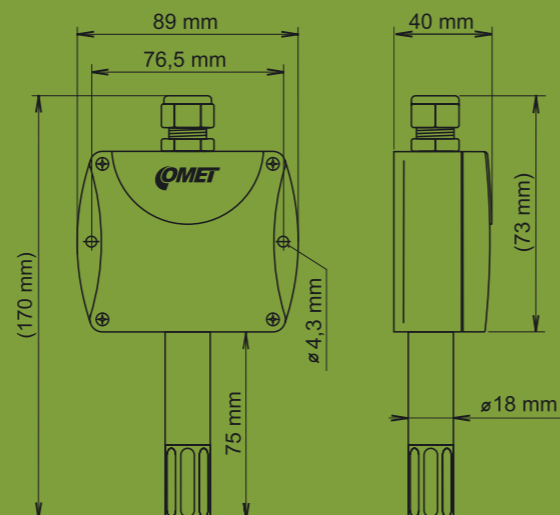
* Accuracy in range of 5 to 95% at 23°C.

The settings of programmable sensors and transducers

All transmitter settings are performed by means of the PC connected via the optional SP003 communication cable. Program Tsensor for transmitter setting is available to download free http://www.cometsystem.cz/products/reg-Sensors The software enables to assign each current loop output measure value (temperature, relative humidity, computed value) and its range.

T-sensor also enables adjustment of the sensor. Adjustment means action resulting in setting instrument to state, when its actual measurement accuracy is identical or better than measurement accuracy specified in instruction manual. For this operation is needed the same equipment as for calibration - a special equipment for constant temperature, relative humidity or pressure generation (a calibration box). For calibration and adjustment of relative humidity can be used humidity standards HM023 and HM024.
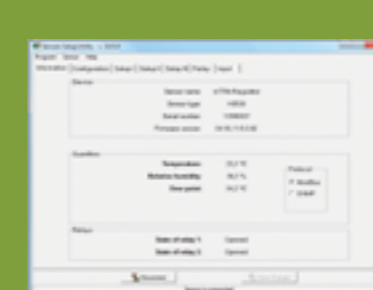
TSensor - freeware software for sensor configuration

SP003 - cable for transmitter adjustment via USB port.

MD046 - Vessel for adjustment and calibration of humidity.

HM023 - Set of humidity standards 10% RH with 5 application pads.

HM024 - Set of humidity standards 80% RH with 5 application pads.

Mounting accessories

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

PP4 –plastic flat circular flange

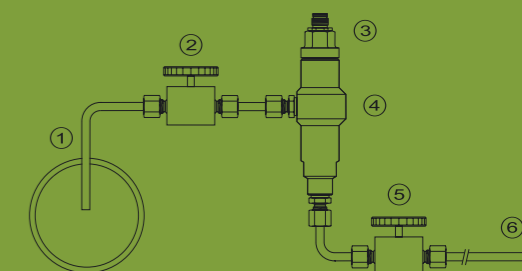**PP90** – Right-angled stainless steel flange.

SP004 - Plastic gland for direct mounting of the humidity probe to a 29 mm diameter hole.

The probe for measuring the moisture of compressed air should be placed directly on the pressure pipelines to achieve higher measurement accuracy and fast response times. But there are cases where such placement is not possible. The reason is the high air speed, high temperature, high pollution, small diameter pipes, etc. Such situation can be solved by placing the probe into the flow measuring chamber. The picture shows the basic layout of the sampling system with chamber SH- PP.

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.

Protection of sensors

F5200B - Black sensor cover with filter from stainless steel mesh, filtering ability 0,025mm.

F5200 - Grey sensor cover

F0000 - Sintered bronze sensor cover. Filtering ability 0.025mm.

F5300 - Teflon (PTFE) sensor cover (white colour), with increased resistance against splashing water, non-absorbent surface, does not rust. Porous size 25µm. Temperature range -40°C to +125°C.

1 ... sampling
2 ... closing valve
3 ... probe
4 ... flow chamber SH-PP
5 ... closing valve
6 ... outlet tube

Cometeo radiation shield is designed for no chemically aggressive environments. The meteo shield protects the measuring sensor and equipment that is hidden under the roof. Compact size, light weight and resistant plastic material make this shield useful for many applications. A variety of temperature and humidity probes are available. There exist two variants of Cometeo.

The type F8100 is designed especially for all Comet dataloggers, sensors, transducers and regulators. This type of meteo shild is global unique because of possibuility to use it together with sensors withouth IP protection or with Comet Web Sensors with Ethernet output.

The type F8110 for developed for third part devices with stem and probe diameter from 13 to 18 mm.

F8100
22 cm
25 cm

F8110
22 cm
25 cm
12 cm
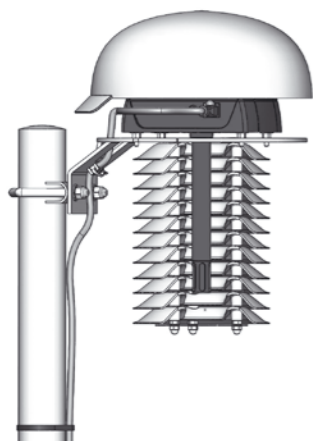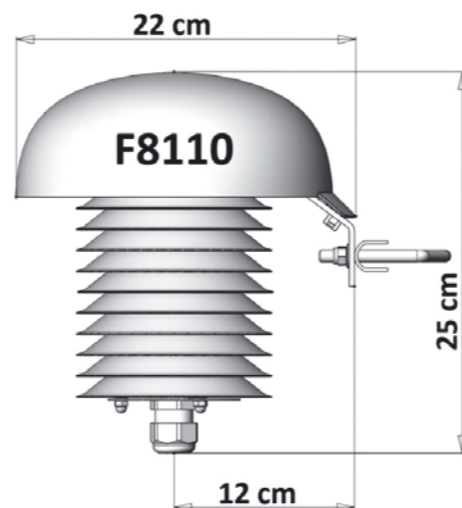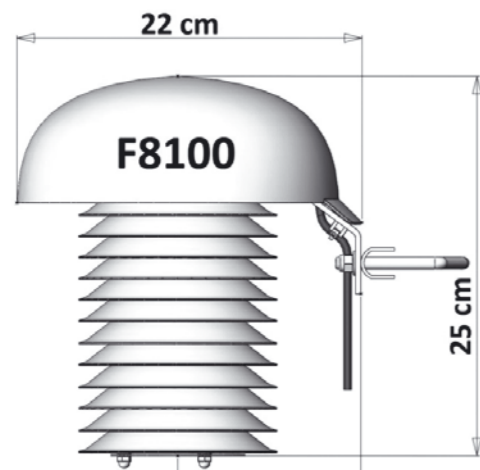
Can be used together with temperature and humidity sensors with cable gland and LCD display positioned perpendicular to stem such types T3113D, T0213D.
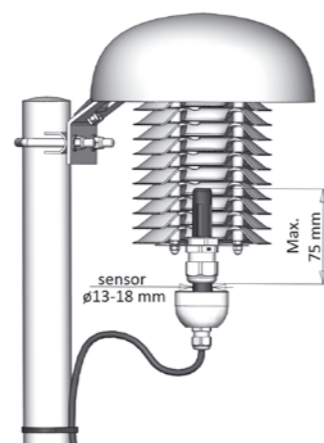
Radiation and weather shelter F8110 is designed for the protection of any meteo sensor with a diameter of 13 to 18 mm.

sensor ø13-18 mm
Max. 75 mm
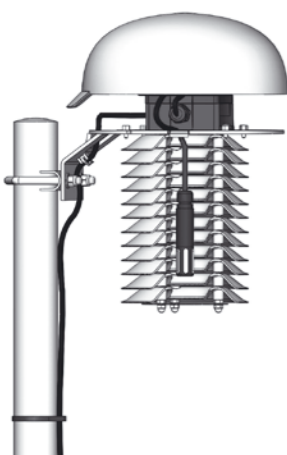
Can be used together with temperature and humidity dataloggers, sensors or regulators with external probe on the cable such T3111, T0211, T3111P, T0211P and T3111Ex.

MS monitoring system MS6D and MS55D in conjunction with analog sensors and transducers listed in this catalog are used for measuring, recording and evaluation of physical quantities. The inputs of the MS system can be configured for almost any input signal.

MS monitoring system is characterized by a wide variety of communication interfaces such as RS232, RS485, USB, Ethernet and GSM or GPRS modem.
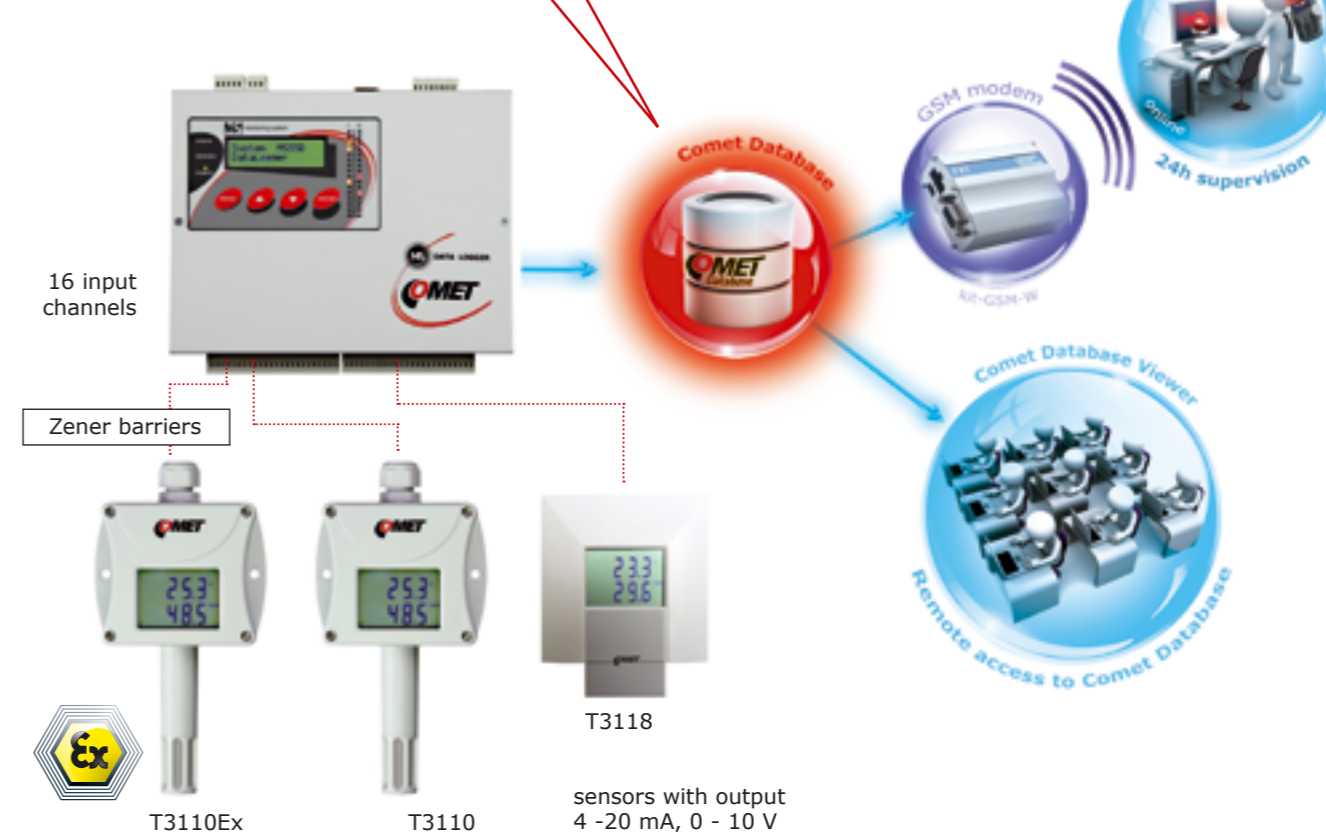
The device enables:

- **measure** and process 1 to 16 input signals as current, voltage, resistance (resistance pro bes, thermistors) frequency or two-state signal, a digital signal 485
- **records** measured variables (memory for 480,000 values)
- acoustic, optical, email or SMS **alarms**
- **controlling** by a relay / relay outputs
- **monitor on-line** measured values and events

Comet Database
- software for data management, analysis and alarming

- **24 hours supervision**
- **storage place for your data**
- **simple and clear access to your measured values**
- **storage place for all Comet System devices**
- **alarm SMS texts and e-mails**

16 input channels

Zener barriers

T3110Ex   T3110

T3118

sensors with output
4 -20 mA, 0 - 10 V

Alarm SMS text
GSM modem
24h supervision
Comet Database
Comet Database Viewer
Remote access to Comet Database

Premium quality and great price

building automation - HVAC •
warehouses •
greenhouses •
productionmuseums, archives, •
galleries

Calibration certificate included

ANALOG SENSORS