COMET T3113 Programmable Duct Mount Transmitter Instruction Manual

Contents

COMET T3113 Programmable Duct Mount Transmitter

Specifications

- **Product Name:** Programmable Duct Mount Transmitter
- **Models:** T3113, T3113D, T3113L, T3113Ex, T3117, T3117D, T3117L
- **Measurements:** Temperature, Relative Humidity, Dew Point Temperature, Absolute Humidity, Specific Humidity, Mixing Ratio, Specific Enthalpy
- **Outputs:** 4 – 20 mA

FAQ

- **Q:** Can the transmitter be used in hazardous areas?
- **A:** The T3113Ex transmitter is specifically designed and certified for use in hazardous areas in compliance with European Directive 2014/34/EU (ATEX).
- **Q:** What are the factory settings of the device?
- **A:** The default factory settings include a temperature unit displaying, relative humidity range from 0 to 100%RH corresponding to 4-20 mA output on loop I1.

Programmable duct mount transmitter of temperature, relative humidity and other calculated humidity values with 4 – 20 mA outputs

General description

- The duct mount transmitters T3113 and T3117 with metal stems are designed for the measurement of temperature and relative humidity of air without aggressive substances. Measured values are converted to other humidity interpretations: dew point temperature, absolute humidity, specific humidity, mixing ratio and specific enthalpy.
- Measured and computed values are displayed on a two-line LCD. The first line displays the temperature (ºC / ºF). The value displayed on the second line is selectable among relative humidity and computed value. It is also possible to display both readings with cyclic overwriting (4-second interval) or to switch off the LCD at all.
- The transmitter communicates through two galvanically separated current loops of 4-20mA. Each loop has a two-wire connection and each loop requires power from the evaluation device. It is always necessary to connect loop I1 which is designed for supplying of measuring part of the device. Using the configuration software can be assigned to each current loop any measured or computed value.
- All transmitter setting is performed through the PC connected via the optional SP003 communication cable (not included in delivery). Using TSensor software (see **www.cometsystem.com**) you can assign to each output any measured or computed value and to set its measuring range. It is also possible to assign both outputs to the same value (with the same range), if two evaluation devices are necessary to connect. The program supports making adjustments to the device too. This procedure is described in the file „Calibration manual.pdf“ which is installed commonly with the software.

Device versions

- T3113, T3117 transmitter with cable gland for output cable connection
- T3113L, T3117L device version with a watertight male connector instead of a cable gland for easy connection/disconnection of the output cable (protection IP67)
- T3113D, T3117D transmitter with cable gland and LCD positioned perpendicular to stem
- T3113Ex intrinsically safe transmitter for use in potentially explosive environments
- T3113Z, T3117Z this marking is intended for non-standard versions of the transmitters. The description is not included in this manual.

T3113Ex transmitter

- Transmitter T3113Ex is designed and certified for use in hazardous areas. In compliance with European Directive 2014/34/EU (ATEX) the T3113Ex transmitter conforms to European Standards EN 60079-0:2018 and EN 60079-11:2012.
- The transmitter is suitable for use in potentially explosive atmospheres (Apparatus Groups IIC) in applications requiring devices category 3G.

- Type Examination Certificate number FTZÚ 13 ATEX 0189X is available at **www.cometsystem.com**.

Factory settings

If a special setting was not required in the order device is set by the manufacturer to the following parameters:

- value at output I1: relative humidity
- range 4-20 mA corresponds to 0 to 100 %RH
- value at output I2: temperature range 4-20 mA corresponds -30 to +125 ºC
- display: switched ON
- temperature unit: °C
- value displayed at line 2: relative humidity

Device installation

- Transmitters are designed for installation into the air-conditioning duct by clamping the metal stem into the cable gland Pg21. Also, it is possible to use the installation flanges PP4 or PP90 (see optional accessories). Pay particular attention to the safe installation of sensors T3113Ex.
- The connecting terminals are accessible after unscrewing the four screws in the corners of the case and removing the lid. Pass the connecting cable through the released gland and connect the wires to terminals (see “Typical application wiring”). Tighten the gland and screw the lid (check the integrity of the seal). The female connector for connecting the T3113(7)L transmitter connects according to the diagram at “Typical application wiring”.
- For device connection, it is recommended to use a shielded cable with a maximum length of 1200m. The external diameter of the cable for T3113(7), T3113(7)D and T3113Ex connection is 4 to 8 mm. For the T3313L connection use cable to female connector parameters (do not connect shielding at the connector side). When selecting the type of cable for T3113Ex connection and when choosing a location for T3113Ex mounting it is necessary to observe the conditions for safe installation in potentially explosive environments. The cables should be located as far as possible from potential interference sources.
- It is not recommended to use the device for a long time under condensation conditions or water aerosol conditions. It could be the cause of water steam condensation inside the sensor’s cover with a consequential increase in response time to humidity changes.
- It can cause sensor damage too.
- Devices don´t require special operation and maintenance. It is recommended to keep a clean sensor cover and periodically verify the accuracy of measurement.

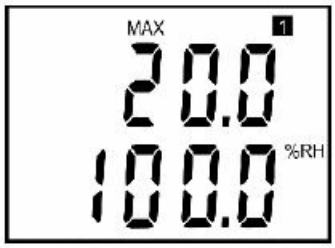
Warning

- Installation, commissioning and maintenance may only be carried out by personnel with qualifications by applicable regulations and standards.
- Don´t connect the transmitter while the power supply voltage is on.
- The ambient temperature of the housing with electronics of the T3113Ex transmitter is not allowed to exceed 60 ºC.
- Under certain extreme circumstances, the plastic enclosure of the T3113Ex transmitter may store an ignition-

capable level of electrostatic charge. The device shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge. The equipment shall only be cleaned with a damp cloth.

Info mode

Several settings of the installed transmitter are possible to verify without the use of the computer. It is necessary to connect at least the power of current loop I1. Unscrew the transmitter lid and shortly press a button between the display and interconnection terminals by means of a tool (e.g. screwdriver).



- The LCD shows the type of value assigned to 1. output (here „%RH“ = relative humidity and „1“ = loop I1). The upper line displays the value of the current corresponding to the measured value on the lower line (here 4 mA corresponds to 0 %RH).
- Press the button again to get the value for the upper point of the 1. output (here „%RH“ = relative humidity and 1“ = loop 1). The upper line displays the value of the current corresponding to the measured value on the lower line (here 20 mA corresponds to 100 %RH).
- After the next press of the button, the LCD shows the type of value assigned to 2. output (here „ºC“ = temperature and „2“= loop I2). The upper line displays the value of the current corresponding to the measured value on the lower line (here 4 mA corresponds to -30 ºC).
- Press the button again to get the value for the upper point of the 2. output (here „ºC“ = temperature and „2“ =

loop 2). The upper line displays the value of the current corresponding to the measured value on the lower line (here 20 mA corresponds to 80 ºC).

Press the button again to end info mode and display actual measured values.

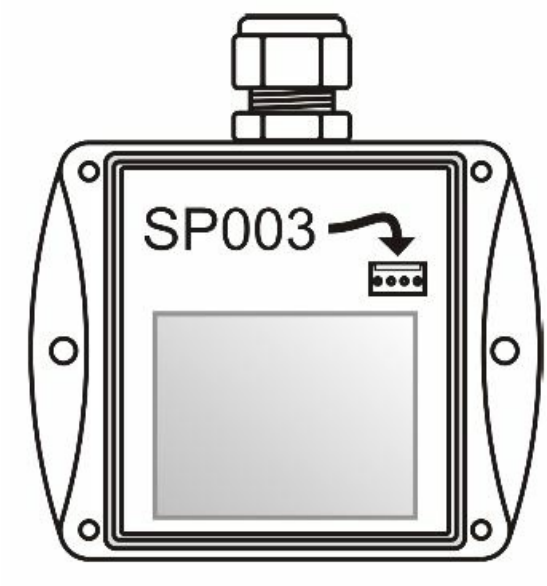
Warning

- During info mode, no measurement and no output current generation proceed. The transmitter stays in info mode for 15 s, and then automatically goes back to the measuring cycle.
- The verifying of settings of the T3113Ex transmitter is permitted only in a non-hazardous area.

Modification of device adjustment

Device adjustment is performed employing the optional SP003 communication cable, connected to the USB port of the PC. It is necessary to have installed the configuration program TSensor on the PC (the program is free to download at **www.cometsystem.com**). During installation please take care of the installation of the driver for the USB communication cable.

- unscrew four screws of the device lid and remove the lid. If a device is already installed in the measuring system, disconnect wires from terminals
- and connect the SP003 communication cable to the PC. Installed USB driver detect connected to cable and create virtual COM port inside the PC
- run installed Tsensor program and continue under his instructions
- when the new setting is saved and finished, disconnect the cable from the device, connect wires into its terminals and place the lid back to the device



Warning

- Modification of adjustment of the T3113Ex transmitter using a cable SP003 is permitted only in non-hazardous areas.

Error states of the device

The device continuously checks its state during operation. In case an error is found LCD corresponding error code:

- **Error 0** – the first line displays „Err0“ (output current value is < 3.8 mA). Check the sum error of the stored setting inside the device’s memory. This error appears if an incorrect writing procedure to the device’s memory occurs or if damage to calibration data appears. At this state device does not measure and calculate values. It is a serious error, contact the distributor of the device to fix it.
- **Error 1** – there is a reading „Err1“ on LCD (output current value is > 22 mA). The measured or computed value is higher than the upper limit. This state appears in the case of:
  - the measured temperature is higher than approximately 600 °C (i.e. high non-measurable resistance of temperature sensor, probably opened circuit)
  - relative humidity value is higher than 100 %, i.e. damaged humidity sensor or humidity calculation of humidity is not possible (due to error during temperature measurement)
  - calculation of the computed value is not possible (error during measurement of temperature or relative humidity or value is over range)
- **Error 2** – there is a reading „Err2“ on LCD (output current value is < 3.8 mA). The measured or computed value is below the lower limit of the allowed full-scale range. This state appears in the case of:
  - the measured temperature is lower than approximately -210 °C (i.e. low resistance of temperature sensor, probably short circuit).
  - relative humidity value is lower than 0 %, i.e. damaged sensor for measurement of relative humidity, or calculation of relative humidity is not possible (due to error during temperature measurement)
  - calculation of the computed value is not possible (error during measurement of temperature or relative humidity)
- **Error 3** – there is a reading „Err3“ on the LCD upper line. Error of internal A/D converter appeared (converter does not respond, probably damage of A/D converter). No measurement and calculations of values are proceeded. It is a serious error, contact the distributor of the instrument.

Technical support and service

Technical support and service is provided by the distributor. For contact see the warranty certificate. You can use the discussion forum at the web address **www.forum.cometsystem.cz**.

Technical data

Measured values

Temperature

- **Accuracy:** ±0.4 °C
- **Measuring range:** 0 to +125 °C
- **Resolution:** 0.1 °C
- **Response time:** t90 < 9 min (temperature step 20 ºC)

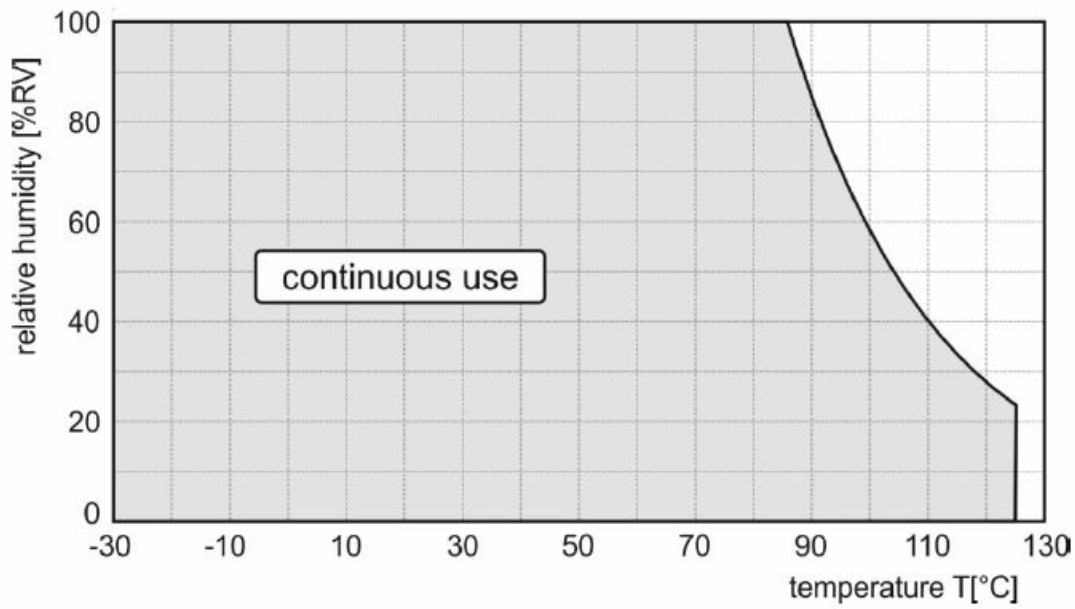
Relative humidity

- **Accuracy:** ±2.5 %RH from 5 to 95 %RH at 23 °C

- **Measuring range:** 0 to 100 %RH
- **Resolution:** 0.1 %RH
- **Response time:** t90 < 30 s (humidity step 65 %RH, constant temperature)

Accuracy data are valid for values displayed on LCD. For accuracy of analog outputs are valid this data in case, when the output range is set within the range of measurement.

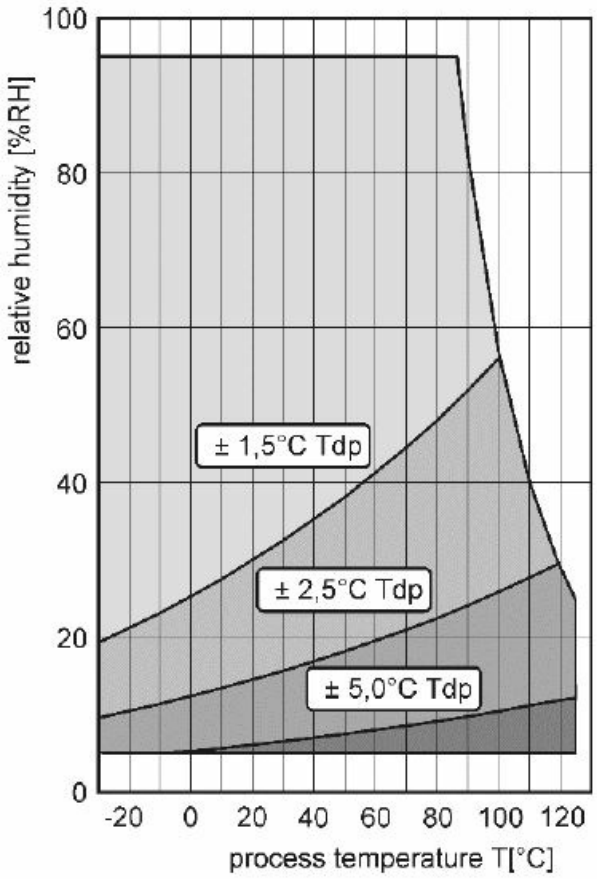
Relative humidity and temperature restriction

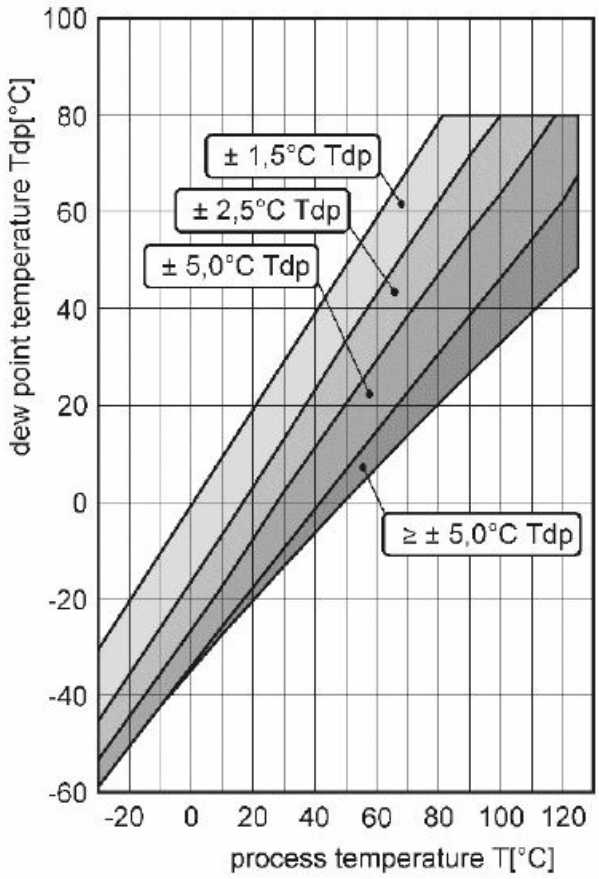


Calculated humidity values

Dew point temperature

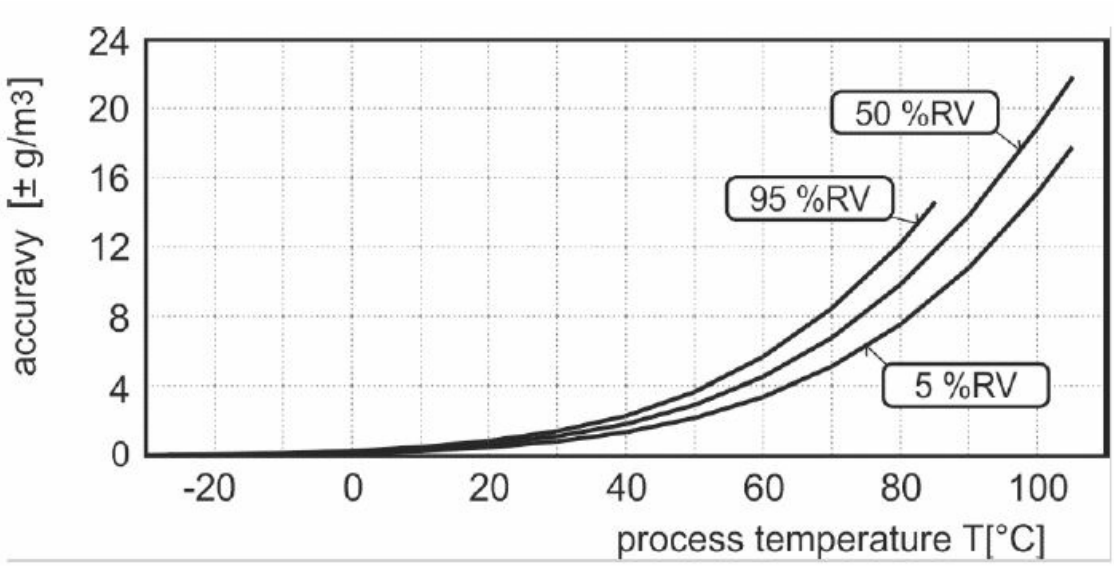
- **Accuracy:** ±1.5°C at ambient temperature T < 25 °C and RH > 30 %, for more details see graphs
- **Measuring range:** -60 to +80 ºC





Absolute humidity

- **Accuracy:** ±1.5 g/m3 at ambient temperature T < 25 °C, for more details see graph
- **Measuring range:** 0 to 400 g/m3



Specific humidity
This value depends on atmospheric pressure. Pressure for quantities calculation is stored in device memory. The default value is 1013hPa and can be changed by software.

- **Accuracy:** ±2 g/kg at ambient temperature T < 35 °C
- **Measuring range:** 0 to 550 g/kg

Mixing ratio
This value depends on atmospheric pressure. Pressure for quantities calculation is stored in device memory. The default value is 1013hPa and can be changed by software.

- **Accuracy:** ±2 g/kg at ambient temperature T < 35 °C
- **Measuring range:** 0 to 995 g/kg

Specific enthalpy
This value depends on atmospheric pressure. Pressure for quantities calculation is stored in device memory. The default value is 1013hPa and can be changed by software.

- **Accuracy:** ±4 kJ/kg at ambient temperature T < 35 °C
- **Measuring range:** 0 to 995 kJ/kg

General

- **Power supply voltage:** 9 to 30 Vdc
- **Current output in case of error:** < 3.8 mA or > 22 mA
- **Recommended calibration interval:** 1 year (relative humidity 1 year, temperature 2 years)
- **Protection:** housing with electronics IP65, sensors are located in cover with IP40 protection
- **Working position:** in the air-conditioning duct arbitrarily, in free space, the steel stems downwards
- **Storage temperature range:** -30 to +80 °C
- **Storage relative humidity range:** 0 to 100 %RH (no condensation)
- **Certification of T3113Ex transmitter:**
- **Certificate: FTZÚ 13 ATEX 0189X**
- **Marking:**  II 3G Ex ic IIC T6 Gc
- **Compliance with standards:** EN 60079-0:2018 and EN 60079-11:2012
- **Intrinsically safe parameters of current loops I1 and I2:**
  - Ui = 30 V, Ii = 100 mA, Pi = 1W
  - Io = 22 mA, Ci ~ 0, Li ~ 0
- **Special condition for safe use (sign "X"):** Under certain extreme circumstances, the plastic enclosure may store an ignition-capable level of electrostatic charge. The device shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge. The equipment shall only be cleaned with a damp cloth.
- **Electromagnetic compatibility:** EN 61326-1
- **Weight:** approximately T3113, T3113L, T3113D, T3113Ex 150 g T3117, T3117L, T3117D 580 g
- **Housing material:** ASA

Operating conditions

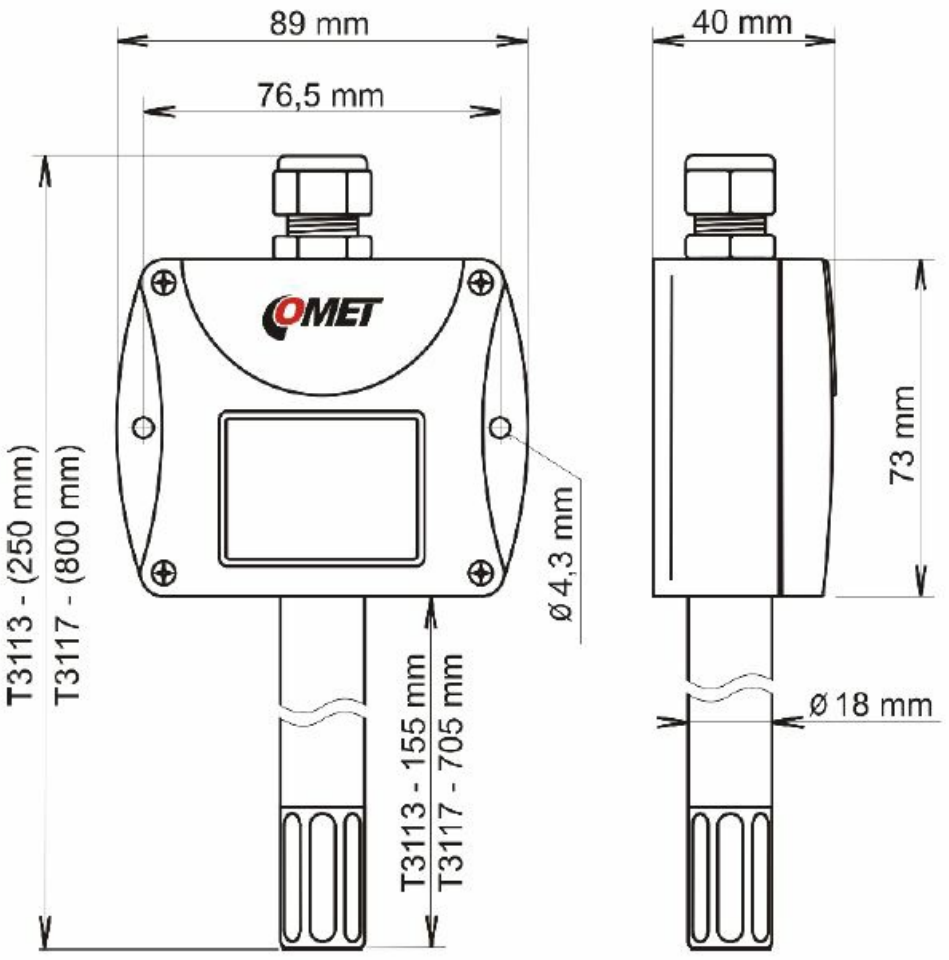
- Temperature operating range of the housing with electronics:
  - 30 to +80 ºC T3113(7)
  - 30 to +80 ºC T3113(7)L
  - 30 to +80 ºC T3113(7)D
- Ambient temperature range of the housing with electronics:

    - 30 to +60 ºC T3113Ex
- Temperature operating range of the measuring end of the stem:
    - 30 to +125 ºC
- Relative humidity operating range: 0 to 100 %RH (no condensation)

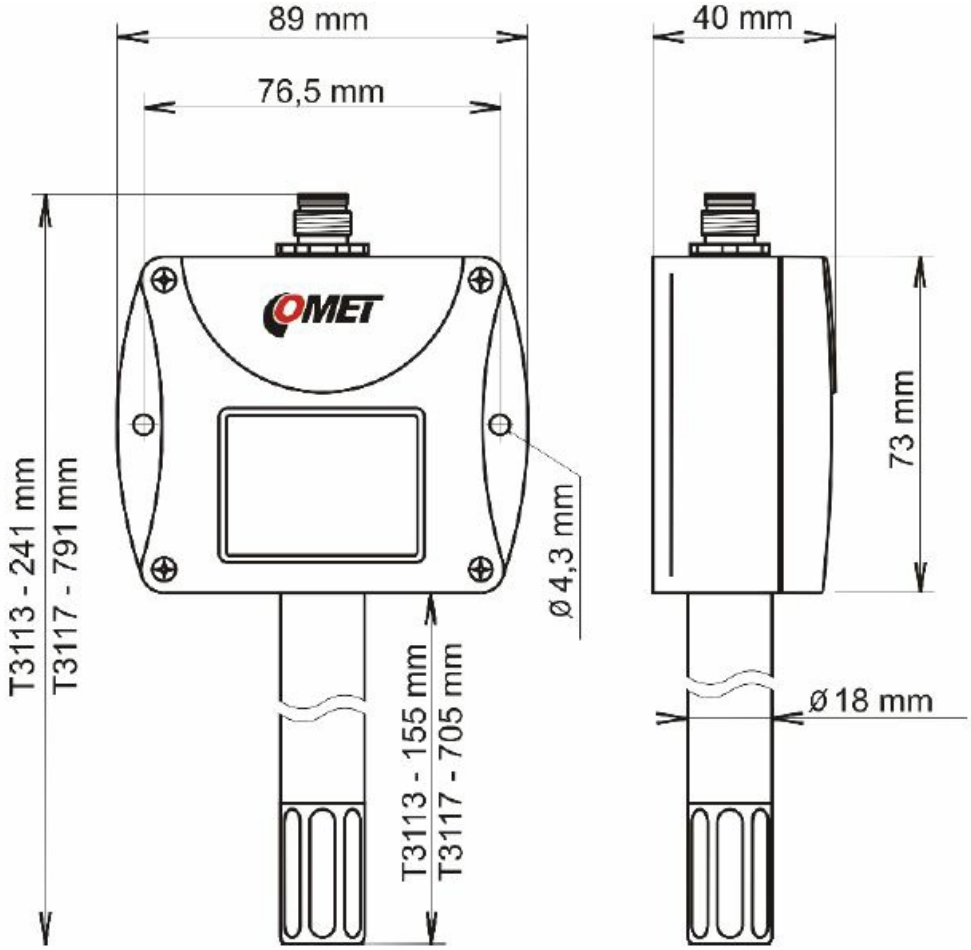
End of operation
Dispose of the device according to statutory regulations.

Dimensions

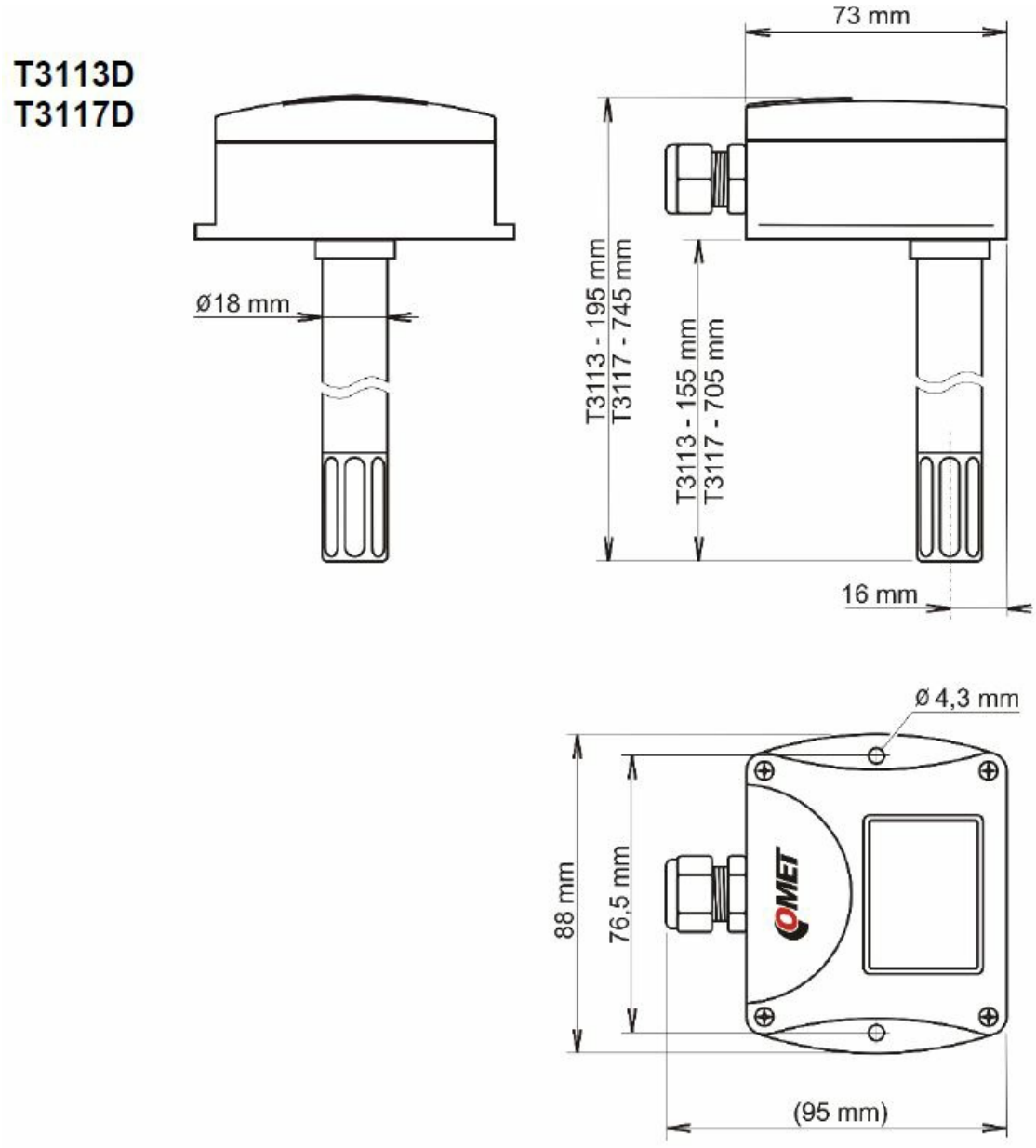
T3113
T3117
T3113Ex



T3113L
T3117L

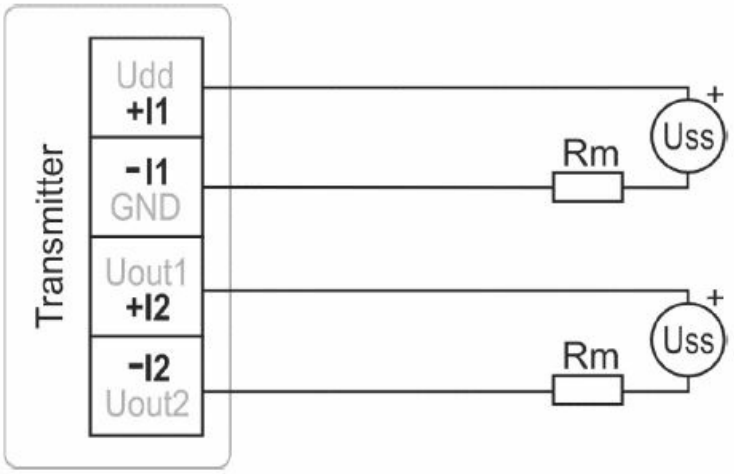


T3113D
T3117D



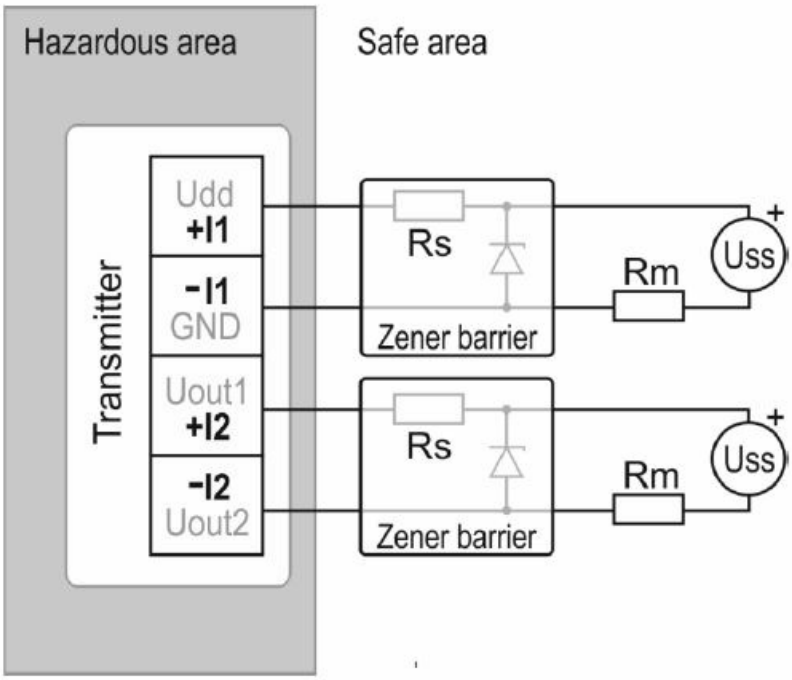
Typical application wiring

T3113
T3113D
T3117
T3117D



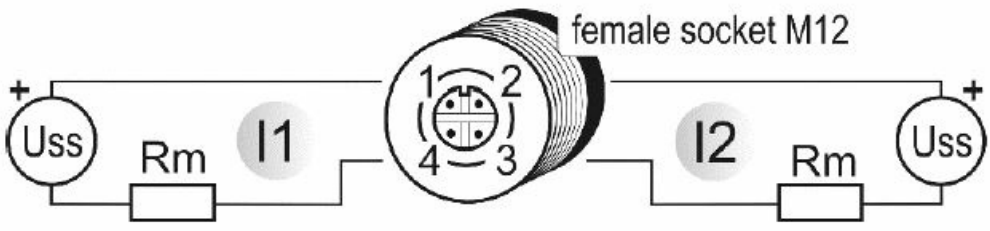
Loop resistance value **Rc = Rm + resistance of wires** shall fulfill the condition **Rc[Ω] < 40 x Uss[V] – 360**.

T3113Ex



- Loop resistance value Rc = Rm + Rs + resistance of wires shall fulfil the condition Rc[Ω] < 40 x Uss[V] – 360.
- Intrinsically safe parameters of the transmitter:
- Ui = 30 V, Ii = 100 mA, Pi = 1W
- Io = 22 mA, Ci ~ 0, Li ~ 0

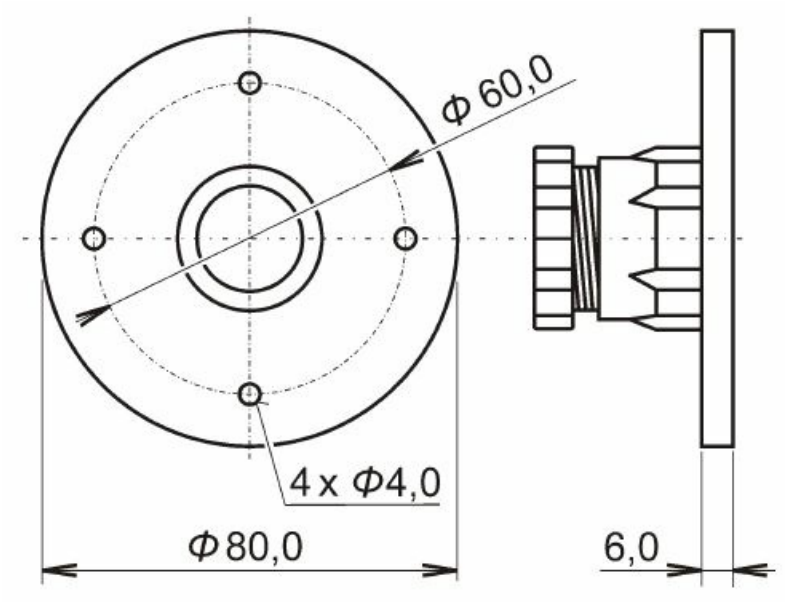
T3113L
T3117L



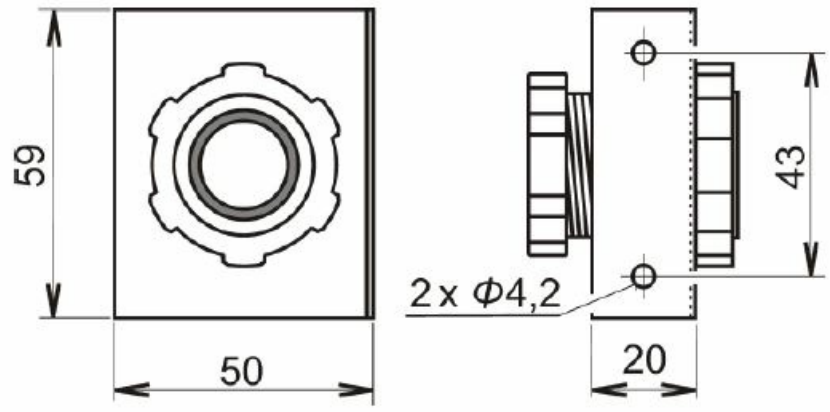
- Loop resistance value Rc = Rm + resistance of wires shall fulfil the condition Rc[Ω] < 40 x Uss[V] – 360.

Optional accessory

Mounting flange PP4



Mounting flange PP90



CONTACT

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- 756 61 Roznov pod Radhostem
- Czech Republic
- www.cometsystem.com.

Documents / Resources

	**COMET T3113 Programmable Duct Mount Transmitter** [pdf] Instruction Manual T3113 Programmable Duct Mount Transmitter, T3113, Programmable Duct Mount Transmitter, Duct Mount Transmitter, Mount Transmitter, Transmitter

References

- **Manufacturer of Dataloggers, Thermometers, Hygrometers,CO2 meters**
- **Manufacturer of Dataloggers, Thermometers, Hygrometers,CO2 meters**
- **Comet system forum**
- **User Manual**