TU 8355 - TU 8555

Turbidity probes 4/20 mA – RS485 – Modbus RTU

These probes are designed for measuring high values of turbidity and suspended solids using the backscattering principle.
TU 8355 probe is for submersible installation.
TU 8555 probe is for overflow and in-line installation.

Thanks to the analog and digital outputs, the probes can be connected to the most common PLC's or data acquisition boards.
B&C Electronics offers MC 6587 and MC 7687 multi-channel controllers that allow complete management of up to three probes, displaying the measurements and the messages that guide calibration and configuration.

TU 8355

TU 8555

Main features

Ranges
The probes can be configured in a range from 100 to 10000 FTU. It is also possible to associate a scalability factor from 10% to 100% to obtain intermediate full-scale values on the 4/20 mA current loop through digital commands.

Suspended solids
The probes can be configured to measure suspended solids. If connected to MC 7687 - MC 6587, or through digital commands, the user can select various units of measurement, the full scale and the conversion factor specific to the sample.

Operating mode
The probes can be configured to operate in analog or digital mode. If connected to a master device it is possible to carry out several operations through specific digital commands.

Analog output
The 4/20 mA current loop is proportional to the main measurement value.The current loop is galvanically isolated, for direct connection to PLC or data acquisition boards.

Serial interface
The RS485 isolated serial interface allows for calibration and configuration of the probes, the simultaneous transmission of turbidity measurements, check signal and average value of ambient light and temperature.The boot loader function allows the user to update the probe's firmware

Communication protocols
The B&C ASCII protocol coexists with the MODBUS RTU protocol (03, 06, 16 function) for the transmission of the measurements, the configuration and calibration of the probe.

Filter software
A filter software operates on the sensor input signal with two selectable time constants. In order to obtain good reading stability and fast response to the changes in the process, the user can set the response time for both the small or large variation signals.

Self-diagnostic
The "check signal" is a unique feature that provides a continuous verification of the status of the optical lens and the potential absence of sample in the measuring cell or in the tank.
A dedicated alarm can be configured to alert the user in case of potential malfunctions.

Autocleaning
TU 8355 model is equipped with an automatic cleaning device. A blast of pressured air is sent onto the sensing elements keeping them clean from deposits of organic substances.

Zero stability
Thanks to a pulsed light source, an automatic zero is performed at every measurement cycle with consequent accuracy and stability of the measure.

Temperature compensation
The probes include a temperature sensor for internal compensation of optical efficiency.

Power supply
The probes are powered with 9/36 Vdc voltage on the current loop, supplied by a PLC or data acquisition boards or by a power supply placed in series between the analog output and the acquisition device. Even in digital mode the power is supplied by the current loop.

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Measuring method

The measurement of turbidity or suspended solids uses the method of back scattering.
A light pulse is sent into the sample through a transparent lens.
The light reflected by the particles suspended in the sample returns almost perpendicularly into the probe through a second lens.
Then it is converted into an electrical signal which depends on the concentration and the shape of the particles.
The infrared light source makes the measurement independent from the sample color.

Technical specifications

Turbidity ranges:	0/100.0 – 0/1000 – 0/10000 FTU
TSS/FTU factor:	0.010 ÷ 10.000
TSS unit measure:	%, ppt, ppm, ppb, g/l, mg/l, µg/l
Scalability factor 4/20 mA:	10/100 %
Sensitivity:	70/130 %
Zero:	± 10 FTU
Resolution:	0.001 FTU
Accuracy:	0.2 % of the full-scale selected
Repeatability:	0.1 %
Non-linearity:	0.1 %
Check signal:	0/200.0 %
Temperature limit:	50 °C
Dual filter software:	2/220 seconds
Power supply:	9/36 Vdc
Current loop:	4/20 mA isolated
Load:	600 Ohm max. a 24 Vdc
Digital Output:	RS 485 isolated
Protocols:	B&C ASCII e Modbus RTU (03, 06, 16 functions)
Baud rate:	2400 / 4800 / 9600 / 19200 baud
Probes ID:	01/99 (B&C protocol) 01/243 (Modbus protocol)
Probes network:	32 max.
Operating temperature:	60 °C max.
Operating pressure:	6 bar at 25 °C (TU 8555) 1 bar at 25 °C (TU 8355)
TU 8555 dimensions:	L=143 mm, D=40 mm
TU 8355 dimensions:	L=165 mm, D=60 mm
TU 8555 weight:	Body 160 g, cable 640 g
TU 8355 weight:	Body 420 g, cable 640 g
Body:	PVC-C (TU 8555.5 model in PVDF is available)
Cable:	10 m (100 m max.), PVC sheath
Protection:	IP 68
EMC/RFI conformity:	EN 61326-2-3/2013, EN 55011/2009

The technical specifications could be changed without notice.

Submersible installation

Both probes can be installed in a tank. B&C Electronics offers a series of accessories that guarantee the correct inclination of the probe and the protection of the cable and connector from organic deposits.

SZ 7521 Adapter for TU 8555. It can be glued to an extension pipe having DN20 or DN32.
0012.450043 Adapter for TU 8355. It requires an extension pipe with 1" FNPT thread.
0012.000624 Swivel mount to fix the probe to a standard handrail on the side of the tank. The supply includes 0012.450043
0012.440040 Hose for automatic air injection. Can be used with TU 8355 only.

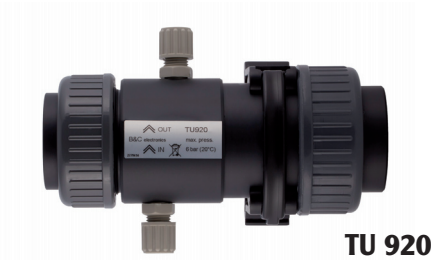
Typical installation of the probes with adapter and extension pipe.

In-line installation

YAT75M0021

TU 8555 probe can be mounted in a pipeline directly with a flow Tee adapter.
YAT75M0021 (with 1892702 adapter + 2713118 O-Ring) guarantees perfect installation and maintenance safety.
This fitting is glue type and must be installed to the bypass pipe having an outer diameter of 2".
This type of installation is recommended for values above 40 NTU, and in any case in samples without air bubbles.

Overflow installation



TU 920

The TU 8555 probe can be installed in overflow with TU 920 cell. Equipped with fittings suitable for the passage of liquid with high turbidity, TU 920 guarantees measurement stability.
The cell is supplied with a wall mounting bracket.

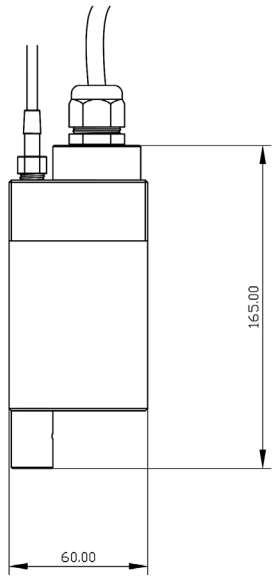
Technical specifications

Sample flow	0.2 ÷ 0.5 l/min
Temperature	0 ÷ 50 °C
Sample temperature	0 ÷ 50 °C
Sample pressure	max 6 bar a 20 °C
Body material	PVC
Seals material	NBR
Fittings	1/8" for 6x8 mm pipe

PC connection

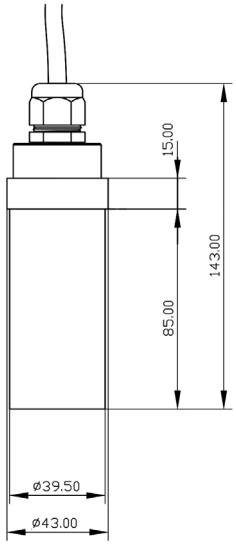
Customers that use the probes in analog mode can also take advantage of the functions available through the digital mode.
B&C Electronics offers BC 8701 a RS485/USB converter to connect the probes to a PC. An easy-to-use software, supplied on demand and free of charge, guides the user through configuration and calibration operations.

TU 8355 dimensions



Dimensions in mm

TU 8555 dimensions



Dimensions in mm

Applications

- Drinking water
- Aquaculture
- Food and Beverage
- Pulp and Paper
- Chemical Industry
- Pharmaceutical Industry
- Electroplating
- Printing Industry
- Textile Industry
- Fertirrigation
- Waste Water Treatment
- Surfaces Treatment