

- **Ultralow back scatter**
 - enables true zero setting, to ensure accurate and reliable results below 0.1 NTU

- **Dry secondary standards supplied for zero and span verification**
 - accurate, repeatable, simple

- **Virtual lifetime zero**
 - ensures high accuracy, long term performance with minimum maintenance

- **Auto-clean systems**
 - optimizes the performance and reduces maintenance on high turbidity samples

- **Flow and dip systems**
 - satisfies a wide range of applications

- **Conforms to ISO7027**



***Long-term, reliable performance,
turbidity systems with low cost of
ownership***

THE 4670 Series TURBIDITY SYSTEMS

An ABB Instrumentation turbidity system comprises a 4670 wall-mounted, or 4675 panel-mounted, analyzer, together with one of four sensors Model 7997-100 to 7997-400 .

Turbidity Sensors

The sensors are available in flow and dip versions and, where appropriate, are supplied with auto-cleaning to minimize maintenance on more turbid samples.

Model 7997-100 is a flow through system, utilizing the 90° scattered light principle, designed specifically for monitoring final treated potable water, and filtered water, where accurate results below 0.1 NTU can be obtained.

High stability is the key to the virtual lifetime zero and the ultra low backscatter permits the unit to be used with full confidence well below 1 NTU.

Model 7997-200 is a flow-through system, utilizing the 90° scattered light principal, designed to operate over the range 0 to 250 NTU and is ideal for monitoring raw water on potable water treatment plants.

It incorporates auto-cleaning as standard and, when used with the 4670 or 4675 Analyzers, operates from 0 to 50 NTU, up to 250 NTU, by programming the 4600 Series to the desired range.

Model 7997-300 is also a flow-through system but designed for high levels of turbidity and utilizes the absorption principal of measurement. It operates over the range of 0 to 500 FTU with a minimum range of 0 to 100 FTU.

This model incorporates auto-cleaning as standard and is used primarily for effluent discharge monitoring and on water intakes where the river water can become very turbid. It is also used extensively on Filter Backwash applications.

Model 7997-400 is a dip system designed for use in open channels and tanks. It operates at over 1000 FTU and is used extensively for effluent discharge monitoring. The minimum operating range is 0 to 100 FTU.

Ambient light compensation ensures accurate results and auto-clean is a standard feature to ensure minimal maintenance.

Dry Secondary Calibration Standard

A key feature of the system is the dry secondary calibration standard, which simplifies routine calibration and virtually eliminates the need for chemical standards to be produced.

This is available for all models including the dip system and provides a very convenient, repeatable calibration technique.

Ease of Maintenance

As with all analyzers, the key to success is the reliability of the sensing device, coupled with simple maintenance procedures. The sensing systems are very easy to maintain and can be site-serviced without the need of a skilled technician.

Turbidity Analyzer

The analyzer provides the operator interface and communications to other devices. The signal from the sensing system is converted by the analyzer and the information is presented on a large, custom-designed, easy-to-read, backlit, liquid crystal display (LCD).

They can be programmed to work with any of the 7997 sensors and the operating range can also be configured to meet the users requirements.

Available in a wall-mount or 1/4DIN panel-mount version, the analyzer is protected to IP66, ensuring reliable operation in the most demanding situations. The same level of protection is maintained during programming and calibration.

Easy Installation, Commissioning and Maintenance

Compact panel or wall-mounting analyzers allow flexible and easy installation. The unique LCD is easy to read in all light conditions. Used in conjunction with the membrane key pad, it simply prompts the user through the set up procedure. Range, alarm levels, set point adjustments and system calibration are easily set.

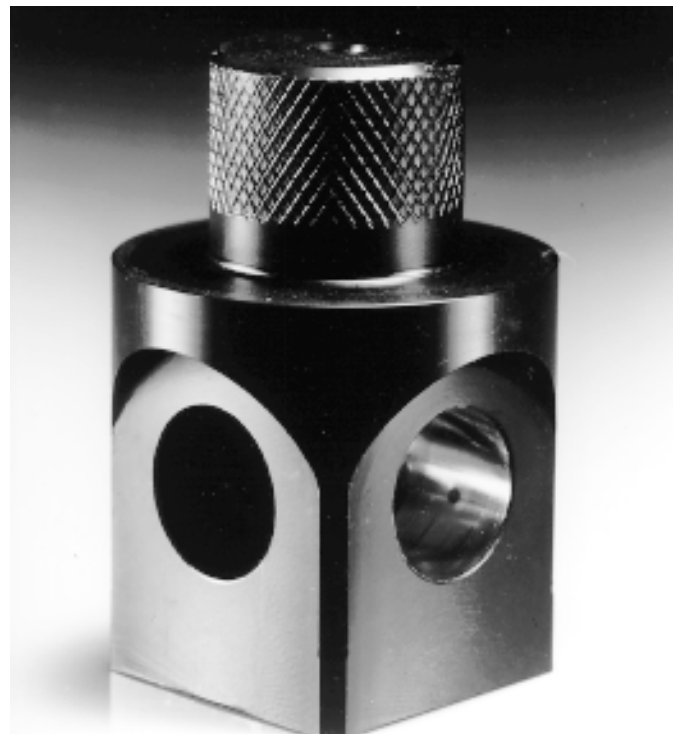
Confidence in Service

To complement the well proven design, unrivalled accuracy and reliability in service of the system, the entire sensing loop is regularly self-monitored, to ensure the light source is operating within the specification.

Ease of Calibration

Calibration can be carried out using Formazine standard or by using the optional secondary calibration device which can be ordered seperately.

This enables both zero and span checks to be carried out.



Dry secondary calibration standard

SPECIFICATION

Analyzer Models 4670–5/500

Display

Measured value

5-digit x 7-segment backlit L.C.D.

Information

16-character, single line, dot matrix, backlit L.C.D.

Ranges

Used with 7997–100	0 – 2 to 0 – 30 NTU
Used with 7997–200	0 – 50 to 0 – 250 NTU
Used with 7997–300	0 – 100 to 0 – 500 FTU and 0 – 1000mg/l
Used with 7997–400	0 – 100 to 0 – 1000 FTU and 0 – 2000mg/l

Units of measurement

NTU and FTU all models
mg/l on models 7997–300 and 7997–400

Accuracy

±0.2% f.s.d., ±1 digit

Linearity

±0.1% f.s.d.

Auto-clean timing

Programmable 15min, 30min, 45min or 1hour up to
24hours in 1hour increments

Environmental Data

Operating temperature limits

–20° to 55°C (–4° to 131°F)

Storage temperature limits

–25° to 55°C (–13° to 131°F)

Operating humidity limits

Up to 95% RH non-condensing

Power Supply

Voltage requirements

100 to 130V, 200 to 260V, 50/60Hz

Power consumption

< 6VA a.c.

Error due to power supply variation

Less than 0.1% for +6% –20% variation from nominal
supply

Insulation

Mains to earth (line to ground) 2kV r.m.s.

Relay Outputs and Set Points

No. of relays

Two

Relay contacts

Single pole changeover		
Rating	250V a.c. 3A a.c.	250V d.c. max. 3A d.c. max.
Loading (non-inductive)	750VA	30W max.
(inductive)		750VA 3W max.

Insulation

2kV r.m.s. contacts to earth (ground)

No. of set points

Two

Set point adjustment

Programmable

Set point hysteresis

±1% fixed

Local set point annunciation

Red L.E.D.

Retransmission

No. of retransmission signals

One fully isolated programmable 0 – 10mA, 0 – 20mA or
4 – 20mA

Accuracy

±0.25% f.s.d. ±0.5% reading

Resolution

0.1% at 10mA, 0.05% at 20mA

Max. load resistance

750Ω (20mA max.)

Mechanical Data

	Model 4670/500	Model 4675/500
Mounting	wall mounting	panel mounting
Protection	IP66	IP66 front
Weight	2kg (4 ¹ / ₂ lb)	1.5kg (3 ¹ / ₄ lb)
Dimensions	160mm (6.30in) wide 214mm (8.43in) high 68mm (2.68in) deep	96mm (3.78in) wide 96mm (3.78in) high 191mm (7.52in) deep

Panel cutout for Model 4675/500

92 ^{+0.8} _{–0} mm x 92 ^{+0.8} _{–0} mm
(3.62 ^{+0.03} _{–0} in x 3.62 ^{+0.03} _{–0} mm)

SPECIFICATION

7997–100 Turbidity Sensor

Range

Programmable 0 – 2 NTU to 0 – 30 NTU

Principle

90° scattered light measurement. Compliant to ISO7027

Characteristic

Linear based on Formazine

Resolution

0.01 NTU

Repeatability

Better than 1% of span

Accuracy

±2% FSD (limited by uncertainty in Formazine standards)

Temperature drift

0.005 NTU/10°C

Response time

Varies with flow rate, typically 90% step change in less than 45s at 1 l/min

Flow rate

0.5 l to 1.5 l/min

Sample operating temperature

0 to 50°C

Sample pressure

Up to 3 bar

7997–200 Turbidity Sensor

Range

Programmable 0 – 50 NTU to 0 – 250 NTU

Principle

90° scattered light measurement. Compliant to ISO7027

Characteristic

Linear based on Formazine

Resolution

0.1 NTU

Repeatability

Better than 1% of span

Accuracy

±2% of FSD (limited by uncertainty in Formazine standards)

Temperature drift

0.005 NTU/10°C

Response time

Varies with flow rate, typically 90% step change in 2 minutes at 1 l/min.

Flow rate

0.5 l to 1.5 l/min

Integral wiper cleaning system

Programmable operational frequency every 0.25 hour, 0.5 hour, 0.75 hour or multiples of 1 hour up to 24 hours.

Sample operating temperature

0 to 50°C

Pressure

Up to 3 bar

7997–300 Turbidity Sensor

Range

Programmable 0 to 100 FTU to 0 to 500 FTU and 0 to 1000mg/l (or ppm)

Principle

Transmitted light

Characteristic

Logarithmic based on Formazine

Resolution

1 FTU

Repeatability

Better than 1% of span

Accuracy

±2% of FSD (limited by uncertainty in Formazine standards)

Temperature drift

0.2 FTU/°C

Response time

Varies with flow rate, typically 90% step change in 2 minutes at 1 l/min.

Flow rate

0.5 l to 1.5 l/min

Sample operating temperature

0 to 50°C

Integral wiper cleaning system

Programmable operational frequency every 0.25 hour, 0.5 hour, 0.75 hour or in multiples of 1 hour up to 24 hours

Pressure

Up to 3 bar

7997–400 Turbidity Sensor

Range

Programmable 0 – 100 to 0 – 1000 FTU and 0 – 2000mg/l *

Principle

Transmitted light

Characteristic

Logarithmic, based on Formazine

Resolution

1 FTU

Reproducibility

Better than 1% of span

Calibrated accuracy

±2% FSD (limited by the uncertainty of Formazine)

Temperature drift

0.2 FTU/°C

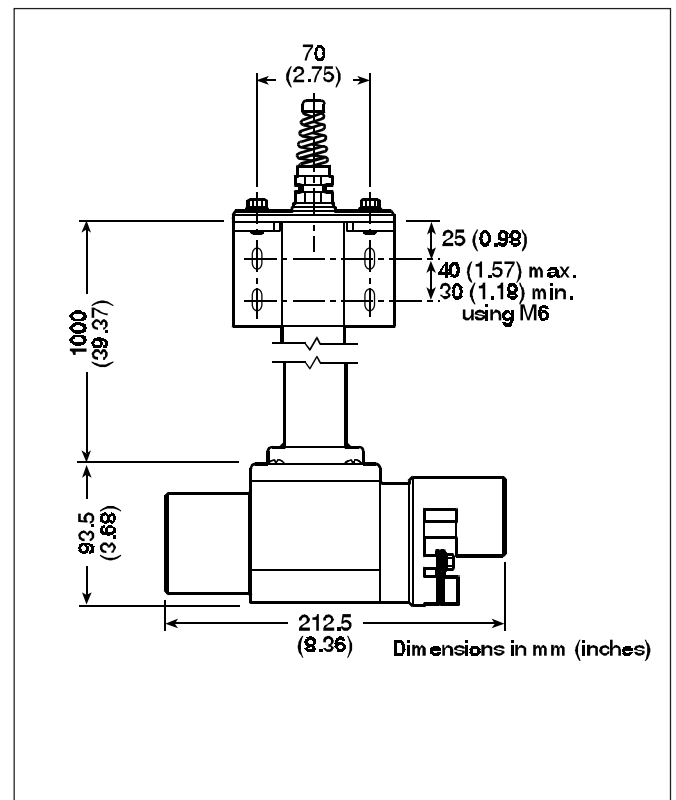
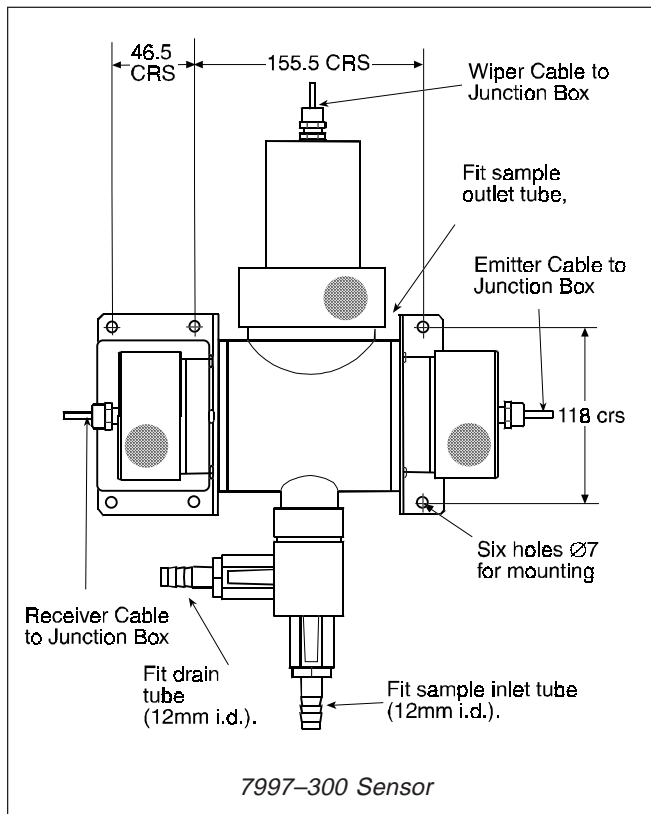
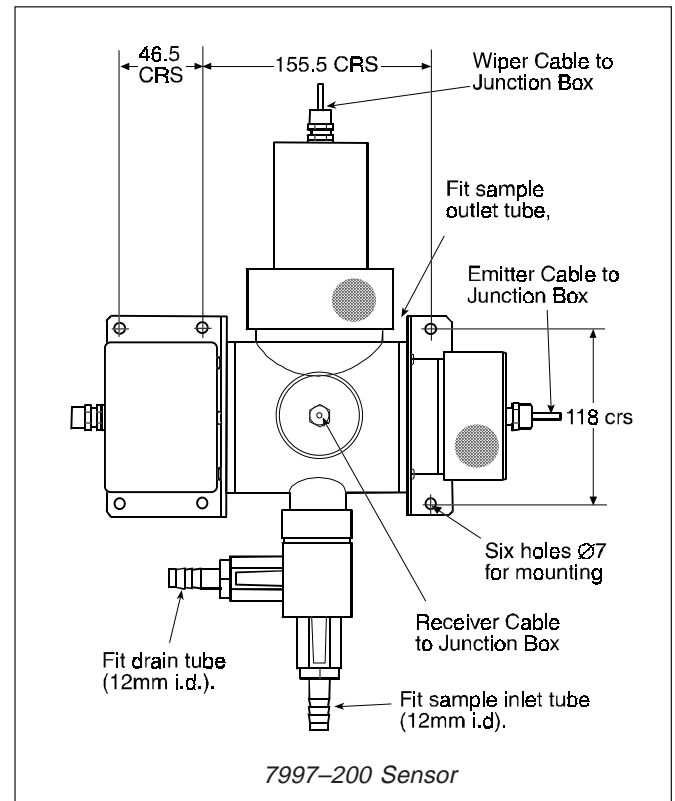
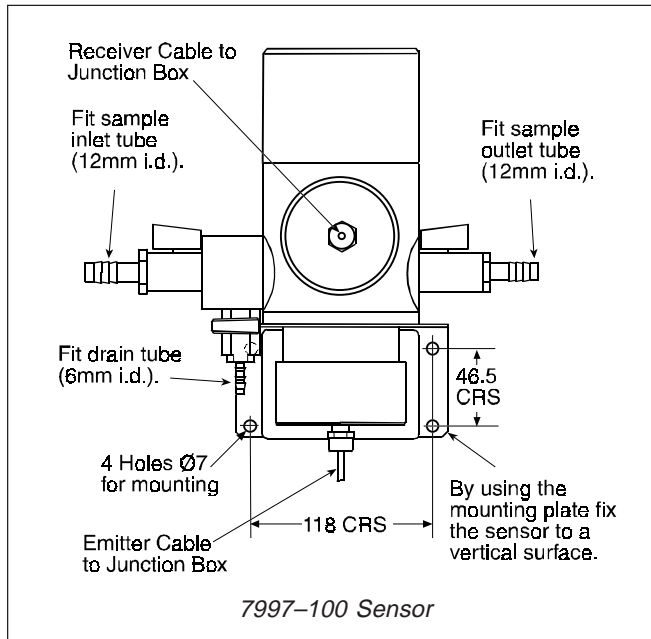
Integral wiper cleaning system

Programmable operational frequency every 0.25 hour, 0.5 hour, 0.75 hour or in multiples of 1 hour up to 24 hours

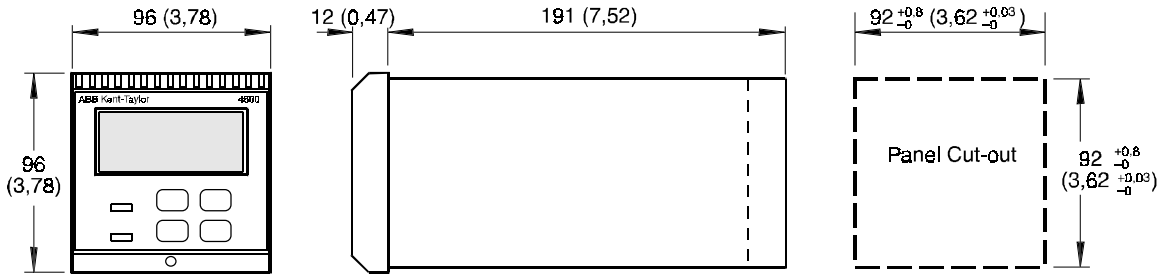
Dip stem

1m length

DIMENSIONAL DETAILS

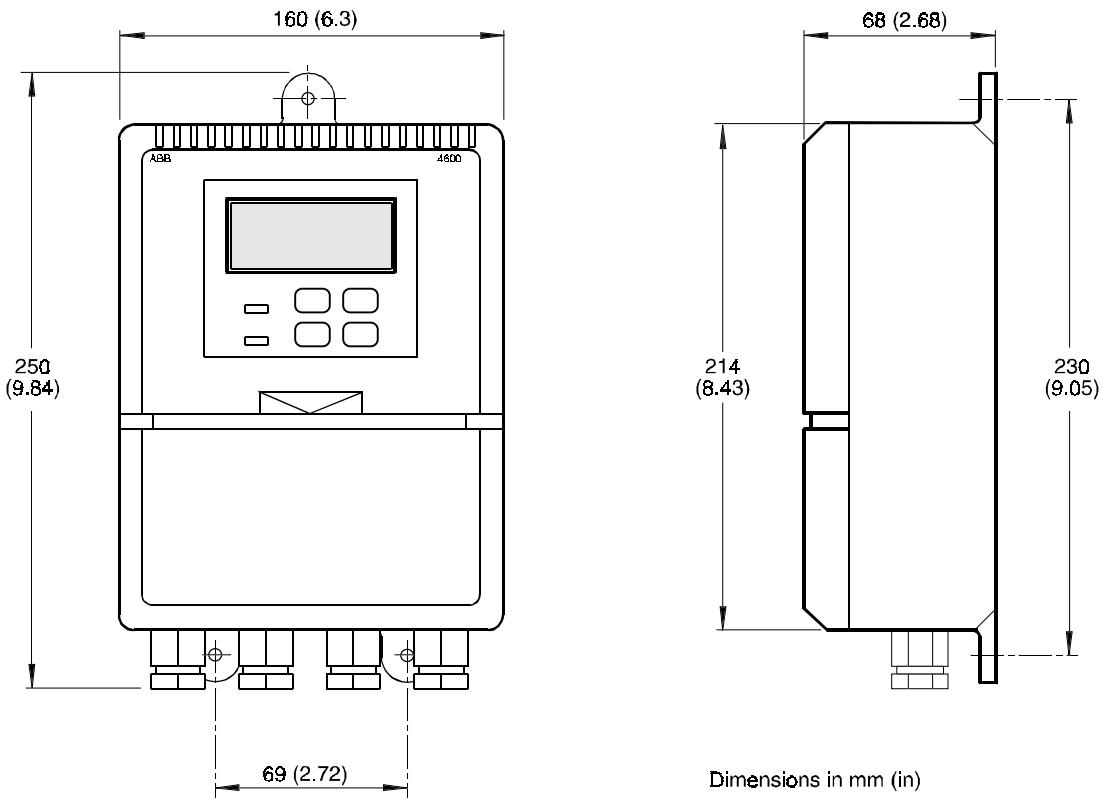


DIMENSIONAL DETAILS



Dimensions in mm (inches)

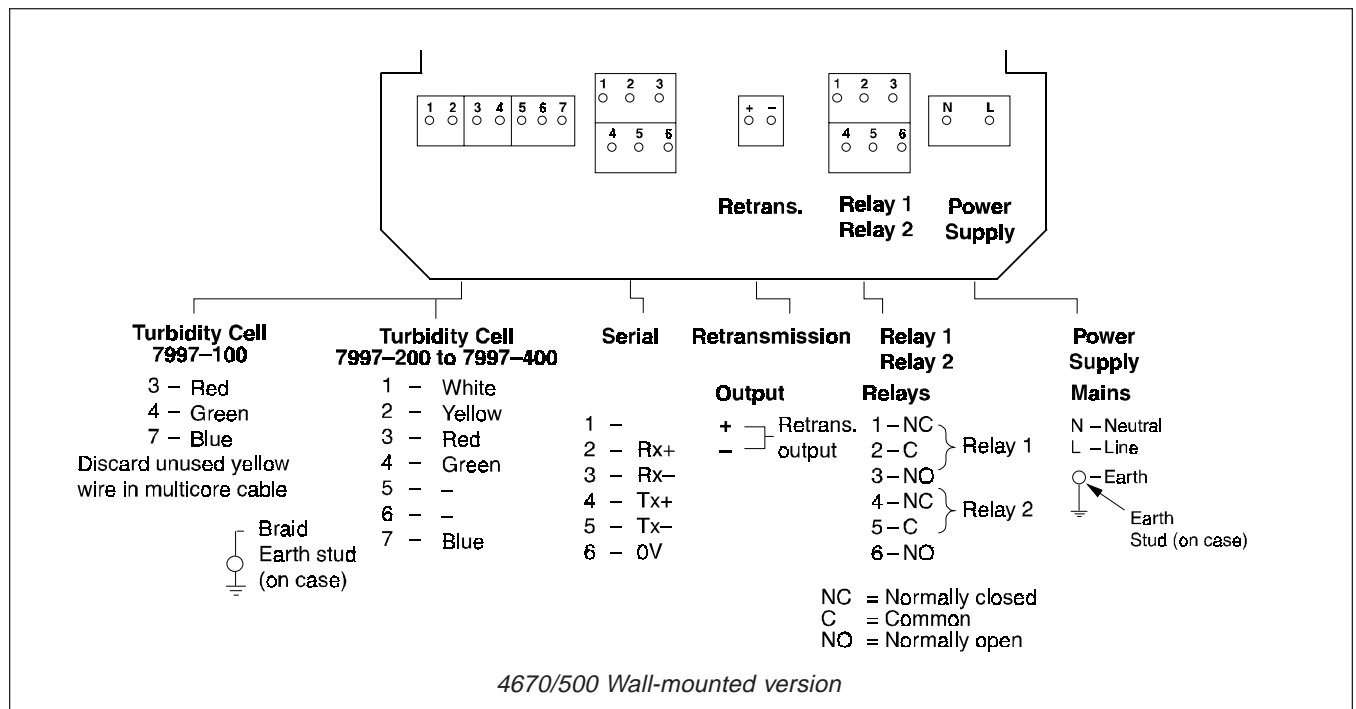
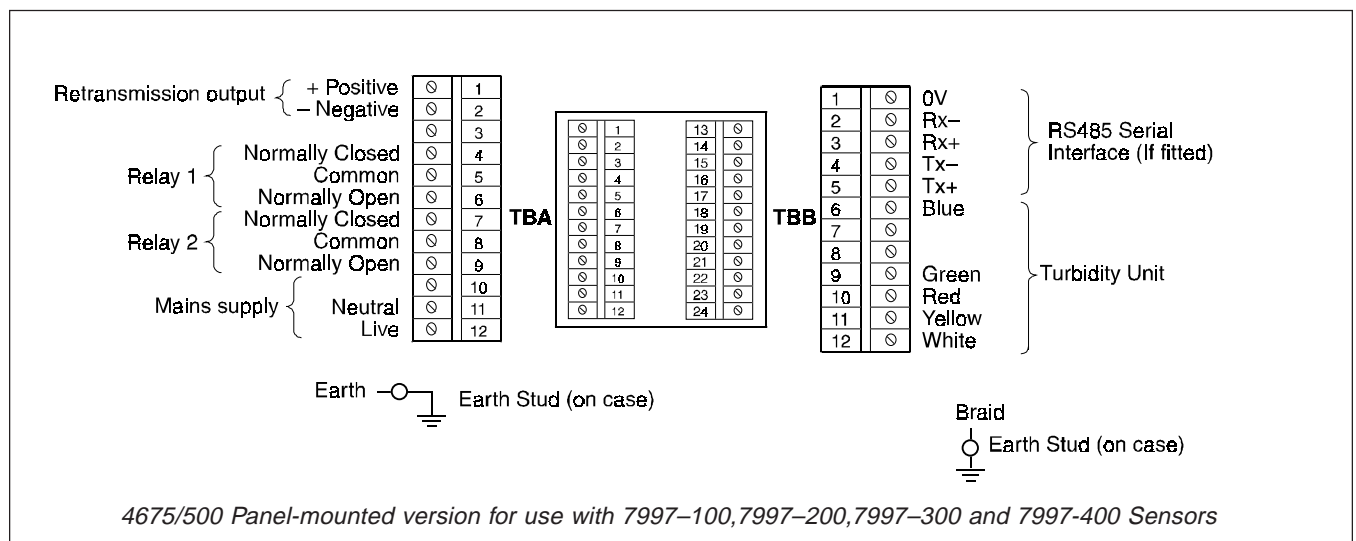
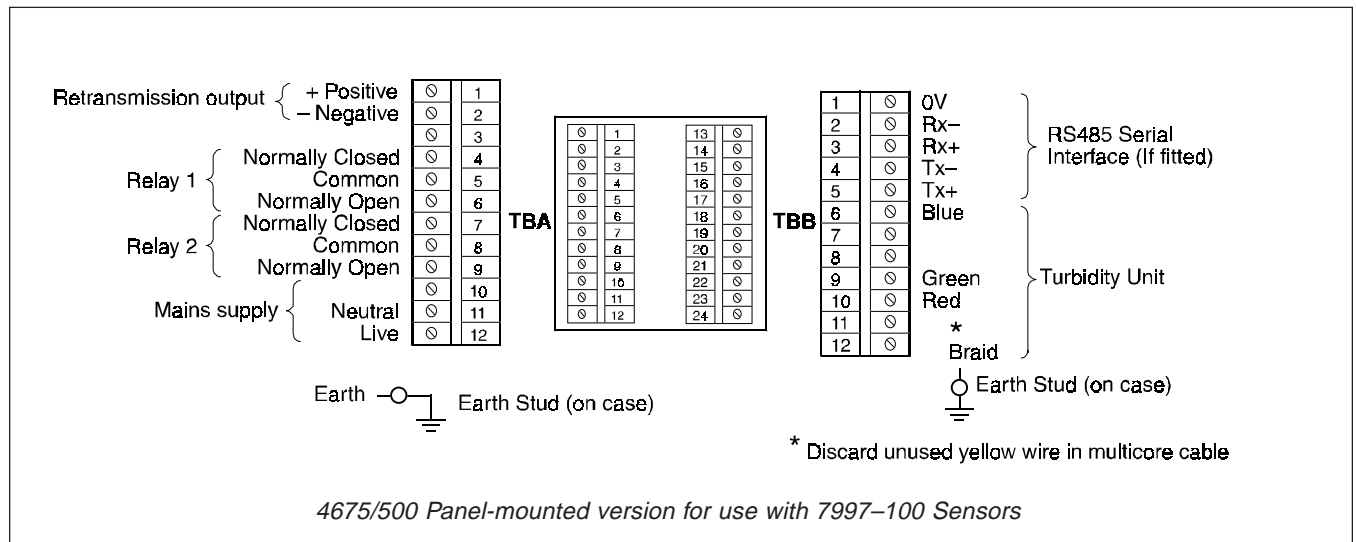
Model 4675/500



Dimensions in mm (in)

Model 4670/500

CONNECTION DETAILS



ORDERING INFORMATION

TURBIDITY SYSTEMS

Select one character or set of characters from each category and specify complete catalog number per sample below.

Code No.	Description
	BASE NUMBER - 1st thru 3rd characters
467	Turbidity Systems
	ANALYZER TYPE - 4th character
0	Wall-mounted Turbidity Analyzer case IP66/NEMA4X. Range programmable from 0 - 2 NTU to 0 - 250 NTU or 0 - 50 FTU to 0 - 1000 FTU. Complete with High and Low alarm relays and isolated current output (programmable 0 - 10mA, 0 - 20mA or 4 - 20mA) and auto-clean. Power supply 110/240V a.c.
5	Panel-mounted Turbidity Analyzer 96 x 96mm DIN case IP66. Range programmable from 0 - 2 NTU to 0 - 250 NTU or 0 - 50 FTU to 0 - 1000 FTU. Complete with High and Low alarm relays and isolated current output (programmable 0 - 10mA, 0 - 20mA or 4 - 20mA) and auto-clean. Power supply 110/240V a.c.
	UNUSED - 5th character
—	None
	SENSOR TYPE - 6th character
1	Flow-through system range 0 - 30 NTU max. 0 - 2 NTU minimum utilising 90° scattered light. Process connections. Inlet/Outlet barb hose use 14mm ID tube.
2	Flow-through system range 0 - 250 NTU utilising 90° scattered light. Process connections. Barb hose, Inlet 14mm ID tube, Outlet 6mm ID tube. Complete with auto-clean.
3	Flow-through system range 0 - 500 FTU, 0 - 1000mg/l utilising light absorption. Process connections. Barb hose inlet 14mm I/D tube outlet 6mm I/D tube. Complete with auto-clean.
4	Dip system range 0 - 1000 FTU, 0 2000mg/l utilising light absorption. Process connections. N/A. Complete with auto-clean.
	UNUSED - 7th character
0	None
	LANGUAGE - 8th character
1	English language manual
2	German language manual
3	French language manual
4	Spanish language manual

4670-101 SAMPLE CATALOG NUMBER

Accessories

155S997	Pipe-mounting Bracket
	Connection Cable All systems are supplied with 5m of connection cable. For longer lengths, up to a maximum of 100m, please order:
0233-840	Connection cable for Model 467X-1
0233-828	Connection cable for Models 467X-2, 467X-3 and 467X-4
	Secondary Standard – supplied as an optional extra
7997-050	Secondary standard for 467X-1
7997-087	Secondary standard for 467X-2
7997-165	Secondary standard for 467X-3 Nominal Values of 150 FTU
7997-166	Secondary standard for 467X-3 Nominal Values of 300 FTU
7997-160	Secondary standard for 467X-4 Nominal Values of 70 FTU
7997-161	Secondary standard for 467X-4 Nominal Values of 550 FTU



The Company's policy is one of continuous product improvement and the right is reserved to modify specifications contained herein without notice.
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