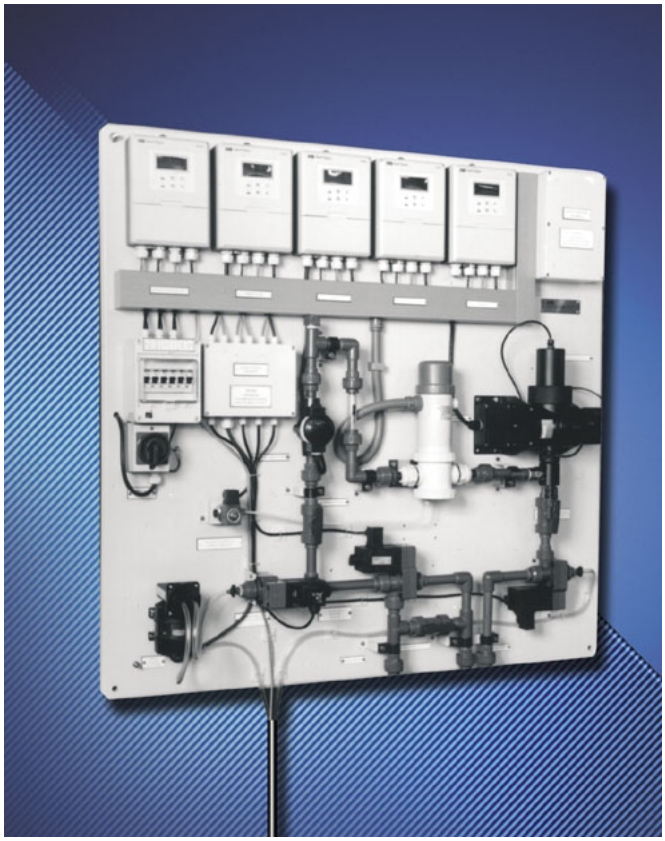
Data Sheet
SS/7976_4

Multi-parameter Water Quality Monitor

Model 7976

Industrial IT enabled

- **Five parameter Water Quality Monitor**
  – measures pH, conductivity, dissolved oxygen, temperature and turbidity in one convenient package
- **Compact, simple, ergonomic design**
  – ensures ease of operation with low installation and operating costs
- **Integral automatic cleaning systems**
  – maximize on-line availability in demanding applications
- **Easy-to-read display with full alarm and output facilities for each parameter**
  – ease of customer programming and maximum flexibility



Model 7976 – providing a compact solution to continuous on-line water quality monitoring

ABB

Introduction

The Model 7976 has been redesigned to meet the ever increasing demands for continuous monitoring of surface waters, reservoirs and intake protection sites. With over 20 years experience of this application the Model 7976 has evolved to give the user an easy-to-operate, easy-to-maintain monitor, providing accurate and reliable measurements. By utilizing standard, well-proven products, the monitor provides a neat and compact solution to continuous on-line water quality monitoring.

The design philosophy of the Model 7976 is to minimize and simplify the operational and maintenance aspects for the end user. This has been achieved through the mounting of the electronic transmitters and sampling systems on to a single back plate, which may be conveniently and easily wall-mounted. The main electronic transmitters are from the highly successful 4600 series product range, comprising separate instruments for the measurement of pH, Conductivity, Dissolved Oxygen, Electrolytic Conductivity, Turbidity and Temperature; the latter also controlling the operation of the integral biocide cleaning function.

General

The Model 7976 is designed for continuous on-line monitoring and engineered for versatility and robustness with a low maintenance and servicing requirement.

For each of the five parameters, an easy-to-read, backlit liquid crystal display gives local indication and an isolated current output, customer configurable to 0 to 10mA, 0 to 20mA or 4 to 20mA, is available. These can be individually programmed to suit the particular application requirements and may be expanded to a small window within the overall measuring range. An alarm relay output is supplied as standard, while an optional RS485 serial interface allows the monitor to be easily incorporated into an ABB, or other, supervisory system.

The large, easy-to-read display is used in conjunction with four tactile membrane key pads to prompt the user through the programming procedure for each of the five parameters. A five language software package includes options for configuration of the monitor in one of English, French, German, Italian or Spanish languages.

All the electronics are housed in IP66 rated enclosures, ensuring that the instrument can be installed in virtually any location without the need for additional protection.

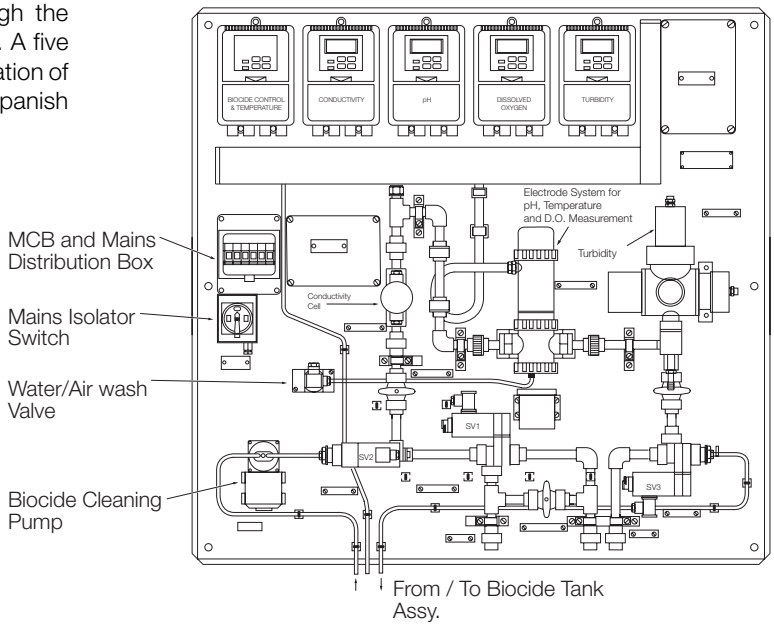
All interconnections between the sensors and transmitters are supplied ready wired, ensuring that installation costs and commissioning time are kept to a minimum.

The design has been aimed at providing an easy-to-use, easy-to-maintain system. Calibration of the pH and dissolved oxygen parameters is a semi-automatic process, whereby introducing the pH sensors to buffer solutions and the oxygen sensor to air enables the measuring instruments to automatically apply any correction that is necessary. Dry calibration standards are an important feature of the calibration procedure for the turbidity unit, obviating the requirement for formazine calibration standards. Electrode status checks are carried out by the measuring instruments and full diagnostics are available on all parameters.

Cleaning

The Model 7976 includes the facility for a fully automatic biocide cleaning cycle, the frequency of which is user-programmable to suit application requirements from 2 hours to 14 days. This feature maximizes the on-line availability of the monitor through minimizing down time for cleaning that would otherwise be necessary to overcome problems of, for example, algal growth.

Air cleaning is also available for the pH measurement system to overcome potential problems of sensor contamination in samples containing matter likely to promote fouling. An air clean valve is controlled by the pH transmitter which allows compressed air (not exceeding 1.4 bar above sample line pressure), from an external source, to be directed at the combination pH electrode mounted in the flow cell. A pulsating air cleaning cycle is used to guarantee optimum effectiveness.



Specification

Displays

5-digit, 7-segment, digital upper display line and a 16-character dot-matrix lower display line. The upper display line shows actual values of temperatures, alarm set points and programmable parameters. The lower display line shows the associated programming units or programming information.

Alarms

Alarms available each for pH, conductivity, dissolved oxygen, temperature and turbidity. Configuration programmable. Volt-free relay contacts, single pole changeover, rated at 250V AC 3A. Non-inductive loading 750VA, 30W max.

General

a) pH

Range	0 to 14pH (programmable)
Accuracy	±0.02pH

b) Conductivity

Range	any range within 0 to 10,000µS cm^{-1} (max.)
Accuracy	±1% FSD

c) Dissolved Oxygen

Ranges	0 to 10ppm, 0 to 20ppm, 0 to 100% saturation and 0 to 200% saturation

d) Temperature

Range	–5 to 40°C (41 to 104°F)
Accuracy	±0.5°C (±0.9°F)

e) Turbidity

(depends on the 7997 Series Turbidity Unit Model supplied as detailed below)

7997-100
Range Programmable 0 to 2, 0 to 5 and 0 to 30 NTU

7997-200
Range Programmable 0 to 50, 0 to 100 and 0 to 250 NTU

7997-300
Range Programmable 0 to 100 or 0 to 500 FTU

Outputs

All five parameters programmable for 0 to 10, 0 to 20 or 4 to 20mA

pH, conductivity, dissolved oxygen, turbidity and temperature isolated retransmission outputs

Optional RS485 serial output

Power Requirements

220/240V or 110/120V 50/60Hz

Note. Solenoid valves are not voltage interchangeable and are supplied to match the ordered mains voltage system

Overall Dimensions

1180mm (46½ in.) high x 1220mm (48 in.) wide

Weight

Approximately 140kg (308 lbs)

Sample Conditions

Sample temperature 0 to 35°C (32 to 95°F)

Flow rate 5 to 50lmin^{-1} dependent on the suspended solids in the water

Ambient Conditions

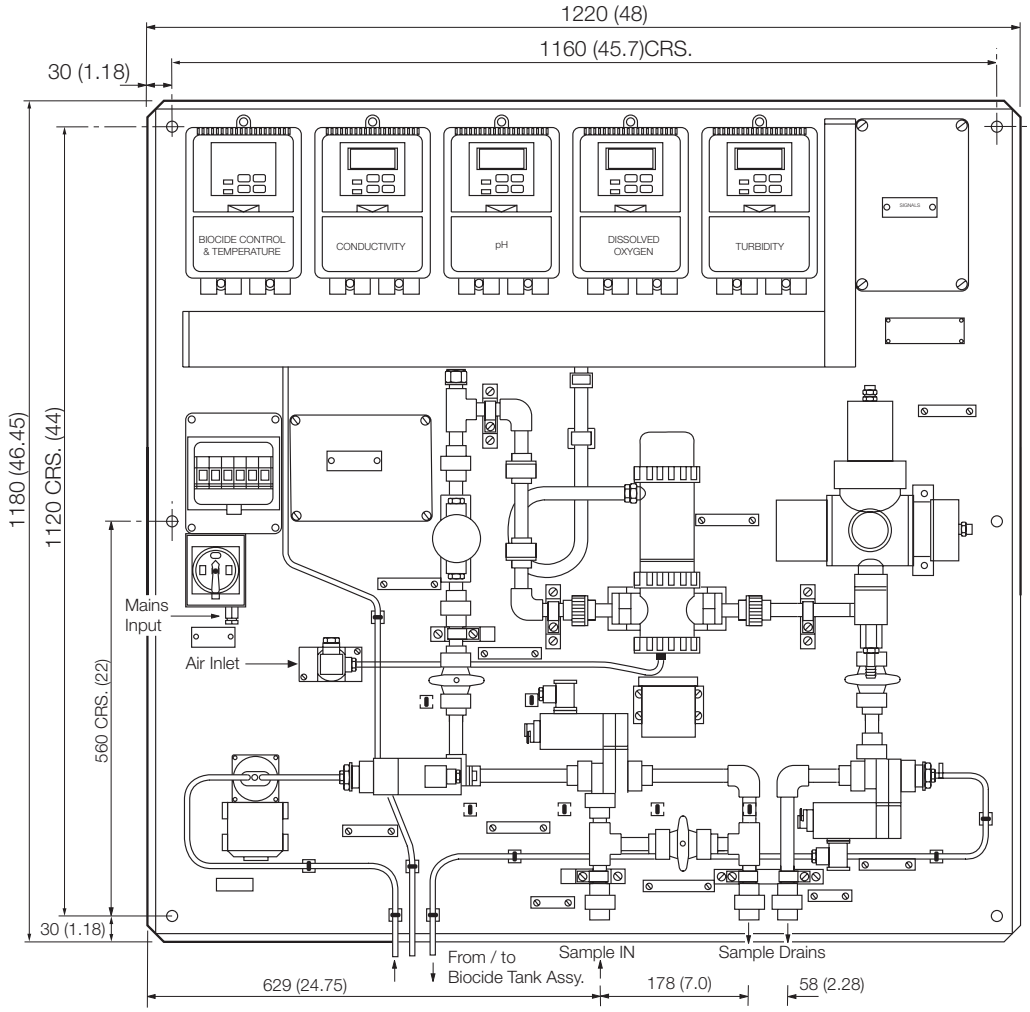
Temperature	0 to 55°C (32 to 131°C) All electronic components protected to IP66
Relative Humidity	0 to 95% non-condensing

Materials of Construction

Valve bodies	uPVC with EPDM seals
Piping	uPVC
Flow cells for pH, dissolved oxygen and temperature	Glass coupled polypropylene
Flow cells for conductivity	Epoxy resin
Flow cells for turbidity	Delrin
Air Cleaning Valve	Stainless Steel 316
Air Pipe	Nylon

Overall Dimensions

Dimension in mm (in.)



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