

TECHNICAL-NORMATIVE SPECIFICATIONS

Environmental features

Temperature limits:

Environment: -5...+45 °C (23...113 °F)

Protect the unit from direct sunlight and bad weather conditions when used in outdoor applications.

Storage: -20...+50 °C (-4...+122 °F)

Humidity limits:

Environment: 5%...95% (R.H without condensate)

Storage: 5%...95% (R.H without condensate)

Altitude limits: <2000 m above sea level

Degree of Protection: IP55 in accordance with EN60529

Conformity to Directives

LVD: 2006/95/EC and subsequent amendments

EMC: 2004/108/EEC and subsequent amendments

* CE marking of conformity to EU Directives.

The Standard System, structured depending on the model type, is made up of:

- OD01 main electrical panel
- OD01 water circuit panel
- Calculation & Management Unit, model MR02
- Digital Refractometer, model UR24-HA
- Integrated measurement cell to simultaneously accommodate a UR24 type Refractometer, a DP01-"wiper" cleaning device, a conductivity probe and a combination pH electrode
- Receiver/transmitter unit for the pH measurement
- Receiver/transmitter unit for the conductivity measurement
- Submersible pump for taking up waste water (optional)

All components except the pump are assembled and interconnected on a self-standing frame with a base fitted with adjustable supports.

OPERATING SPECIFICATIONS

Application: Measurement of industrial wastewaters with a high sugar content, such as those produced in plants bottling carbonated, sugary or diet soft drinks, or beverages containing alcohol, still soft drinks and beverages containing fruit juice.

- Type of measurement:
- A) Continuous non-chemical measurement of the pollutant content of wastewaters, expressed as COD – equivalent (Chemical Oxygen Demand) and expressed as mg/l-O₂. The COD value provided by the OD01 unit is called "equivalent" because it is obtained directly through the numerical processing of other measurements as specified in points B, C and D.
 - B) Continuous measurement of the refractive index and display of the results in "Brix" scale using the Refractometer Unit UR24-HA. The measurement includes the necessary temperature compensation.
 - C) Continuous measurement of the pH. The measurement includes the necessary temperature compensation for the electrode.
 - D) Continuous measurement of Conductivity expressed in µS/cm scale; the measurement is compensated to the reference

temperature of 20°C.

Concentration of pollutants in wastewater measurement:

Measurement limits: 0...958800 mg/l-O₂

Accuracy: ± 800 mg/l-O₂

Measurement scale: mg/l-O₂ of COD-equivalent.

Refractive Index measurement expressed in Bx:

Measurement limits: 0.10...85.00 Bx

Accuracy: ±0.05 Bx

Measurement scale: Bx (Brix)

Conductivity measurement:

Measurement limits: 0...5000 µS/cm@20°C

Accuracy: ±30 µS/cm

pH measurement:

Measurement limits: 0.00...14.00 pH

Accuracy: ±0.05 pH

Temperature compensation:

Automatic temperature compensations are carried out using the signals from the 1/8" PT100 Temperature Probe in stainless steel INOX AISI 316, Class "A" (in accordance with IEC751).

Fluid limit conditions:

Temperature: 0...60 °C (32...140 °F); max. 50°C (122°F) in the version equipped with submersible pump.

Pressure: max. 5 bar (73 psi) at 20 °C (68 °F)

Flow rate: max. 60 l/m (16 gpm)

GENERAL SPECIFICATIONS

Power supplies

Electric:

- AC 230 ±10% 50Hz ±2% 350VA
- AC 115 ±10% 60Hz ±2% 350VA

Selectable (other power supply values available on request).

Pneumatic: 5...10 bar (73...145 psi)

Water:

- Washing water
- 3...4 bar (43...58 psi)
- 20...30 l/min (5...8 gpm)

Water consumption is limited to the washing phases only, the duration (a few minutes max.) and frequency of which can be set by the user.

Sanitizer: A surfactant-free aqueous solution of NaClO at approximately 5%. (Sodium hypochlorite ; CAS No. 7681-52-9) Tank capacity 10 l (2.6 USgal).

Sodium hypochlorite solution consumption is limited to the washing-sanitization phases only, the duration (tens of seconds max.) and frequency (usually less frequent than water washing cycles) of which can be set by the user.

Overall dimensions and weight of the OD01 system:

720 (b) x 1585 (h) x 550 (d), 65 kg.

Interfaces

Analog: 4 completely separate channels 0...20mA or 4...20mA (470Ω) which can be configured in the "Max. and Min. Full Scale" values and in their association with the required measurement variable.

Digital: - RS422/485 for connection to PC with RS422 interfacing with the "CM00" ("Multilab

4") data acquisition and remote control Software Package.

Using a "Multidrop" connection it is possible to interface up to eight "OD01" Analysis Systems with the same CM00 Unit.

- PROFIBUS DP (on request).

Inputs:

1 volt-free digital input for acquisition of the "Line Stopped" status (optional).

Outputs:

1 relay output with 1A/24V DC/AC capacity, NO contact, for HI/LOW measurement alarm contact signaling; the activation values are fully configurable.

1 relay output with 1A/24V DC/AC capacity, contact in exchange, for "General System Alarm" alarm signaling (Equipment switched off or not working, no compressed air, sanitization failure, measurement blocked, etc.).

All interfaces are optically isolated from the power supply (VDEO160) and are completely configurable from the keypad. All connections must be made via connectors or terminal boards.

CONSTRUCTION FEATURES

"OD01" ELECTRICAL PANEL

Function: Management of the electrical power supply, measurement units and system sensors. It also holds the operator controls. Inside it houses the MR02 receiver and the transmitters for the pH and Conductivity measurements.

Execution: Panel in glass fiber reinforced polyester (IP55) fitted with hinged door and closure with special lock.

Electronic section:

- Circuits protected by fuses.
- Main power switch and illuminated indicators concerning the main operating functions located on the front of the panel.
- Inside the panel there is a 24VDC 5A power adapter.
- Mushroom head kill switch on panel front.
- Power connection using cable ending in a "2P+T" CEI EN 60309-2 plug.

"OD01" WATER CIRCUIT PANEL

Function: Contains the entire water circuit serving the integrated measurement cell. It also holds all the connectors for hooking up to the inlet and outlet lines of the wastewater to be measured, the washing water and compressed air lines needed to pilot the valves. This panel also houses the Refractometer Unit UR24-HA.

Execution: Panel in glass fiber reinforced polyester (IP55) fitted with hinged door and closure with special lock.

Measurement cell: Special integrated cell made from PP housing both the combination pH electrode and the conductivity probe. The Refractometer Unit is installed on the front, by means of the 3" "Tri-Clamp®" connector and directly behind it there is a DP01-"wiper" cleaning device installed using a 2"

"Tri-Clamp®" connector. The cell comes complete with a small sample taking tap which also acts as a cell emptying valve during maintenance and servicing operations.

Piping:

Made from food-quality, transparent ARMOVIN® wired rubber hose, Ø19 mm and Ø16 mm.

Prism cleaner:

Made entirely from AISI 316 stainless steel and fitted with an oscillating, pneumatically operated brush. The replaceable brush is made from VITON. The cleaning device is designed to remove any surface patina or bacterial colonies which may form on the prism used for the refractometric measurement.

System accessories:

Water:

Water pressure reducing unit and solenoid valve for piloting water delivery; both preceded by a check valve.

Pneumatic pinch valves for managing the washing and automatic flushing phases.

Venturi-type nozzle for sucking up the sanitizing liquid located immediately along the washing water inlet pipe.

Adjustable flow rate reducing valve for the sanitizing fluid flow; the regulator is preceded by a solenoid valve which controls delivery of the sanitizer solution.

Pneumatic:

Air treatment unit which includes a pressure reducing valve and a (manual) condensate discharge valve.

Electropneumatic block for management of the compressed air supply used to pilot the valves and the DP01-"wiper".

Sensors:

Air presence sensor

CONNECTION OF "OD01" UTILITIES

Wastewater:

Inlet and return via a ¾" GAS pipe holder for Ø27mm hoses installed on the bottom of the water circuit panel. Both fittings are preceded by a special manual shut-off valve.

Water:

½" GAS pipe holder for Ø17mm hoses installed on the bottom of the water circuit panel.

Compressed air:

Quick-fit connector for 6 x 4 hoses installed on the bottom of the water circuit panel.

INTERNAL OPERATING UNITS

MULTIPARAMETRIC RECEIVER MR02

Function:

System management, data processing, operator interface, interfacing with analysis unit, interfacing with additional elements and with the process line.

Electronic section:

- Central "CPU" unit with microprocessor with management software on Flash, updatable via PC; communication, interfaceability with analysis units via serial RS485 protocol.
- Scratch-resistant polyester control keyboard with domed keys and preforming.
- Indication of measurement, software menu display, diagnostics menus, error messages

and operating status indicator icons on graphic backlit LCD 240x128 pix display with "LCD Saving" function.

- 3-level programming software complete with password protection and check menu.
- Possibility to choose from two menu and messages display languages (Italian, English).
- Process temperature expressed in "°C" or "°F".

DIGITAL REFRACTOMETER "UR24"

Function: Refractometric measurement of the Refractive Index of the wastewaters and display in the Brix Scale of the relative concentration of pollutants, with temperature compensation already applied.

Execution: INOX AISI 316 stainless steel Enbloc casing with cover.
Installation of the probe inside the integrated measurement cell by means of a 3" "Tri-Clamp®" connector.

Measurement section:

- Synthetic sapphire measurement prism
- LED light source.
- CCD sensitive element

The optical section of the equipment is dehumidified by means of a "B" type desiccant molecular sieve cartridge (for environments which particularly high humidity) installed by means of a special mechanical adapter.

Electronic section:

- Central "CPU" unit with microprocessor
- Indication of measurement and software menus and alarm conditions displayed on graphic backlit LCD display with 128x64 characters
- Scratch-resistant polyester control keyboard with domed keys.

Power supply

Electric:

Electrical connections to the supply cabinet by means of metal multipolar connector; communication, programming and interfacing with the Multiparametric Receiver MR01 via RS485 serial protocol.

Parts in contact with the product:

- PT100 in AISI 316 stainless steel
- O-rings and seals in VITON and silicone rubber
- Synthetic sapphire measurement prism.

Dimensions and weight:

Ø176 (b) x 192.5 (h) x 132.5 (p), 3.3 kg.

Degree of Protection:

IP67 in accordance with EN 60529.

PH TRANSMITTER

Type of measurement:

Continuous measurement of the pH value by means of a special electrode and display of the results in the relative scale; temperature compensation is already applied ("Nernstiana" compensation of the electrode).

Power supply

Electric:

Provided "passively" by means of a current loop through the mA analog channel

(minimum excitation current of the transducer = 0.5 mA).

Interfaces

Analog:

Passive type 4...20mA signal connected to the MR02 unit via the "CN10" connector and terminal board in the electrical panel (accuracy = 0.5% of the reading ±0.02mA).

- 1 optoisolated input for the Measurement Sensor.
- 1 input for the PT100 type Temperature Sensor.

Execution:

Enbloc polycarbonate container, color RAL7035, UV resistant and nonflammable; for mounting vertically on the wall.

Electronic section:

- Central "CPU" unit with microprocessor
- Indication of the measurement and display of the software menus by means of a 2x3½ LCD digit + symbols alphanumeric display.
- Scratch-resistant polycarbonate control keyboard with membrane keys.
- Simultaneous reading of the Main Parameter (pH) and the Temperature value with display of the calculated value of the process measurement and indication of any alarm conditions which may arise.
- Manual calibration of the pH scale, Temperature and Out_mA; function for automatic recognition of the buffers.
- Analog output proportional to the reading and configurable in the "Max. and Min. full scale" values
- Unit of measurement for the temperature scale which can be selected (°C or °F).

Software:

- Simultaneous reading of the Main Parameter (pH) and the Temperature value with display of the calculated value of the process measurement and indication of any alarm conditions which may arise.
- Manual calibration of the pH scale, Temperature and Out_mA; function for automatic recognition of the buffers.
- Analog output proportional to the reading and configurable in the "Max. and Min. full scale" values
- Unit of measurement for the temperature scale which can be selected (°C or °F).

Electrode:

Combination electrode with both the reference electrode and glass membrane electrode in the same body. Internal polymer gel electrolyte. Electrical connection by means of S8 type connector; length=120mm and threaded fitting PG13.5.

Dimensions and weight:

120 (b) x 122 (h) x 56 (p) without cable glands
~400 g.

Degree of Protection:

IP64 in accordance with EN 60529.

Conductivity TRANSMITTER

Type of measurement:

Continuous measurement of the Electrical Conductivity of the liquid being analyzed by means of special sensors and display of the results in the relative scale; temperature compensation is already applied.

Reading resolution:

Display: 1 µS/cm o 10 µS/cm with dependence on the range.

Measurement scale:

Display: "µS/cm" up to 1999 µS/cm, then "mS/cm"; mA: "µS/cm".

Power supplies:

Electric:

Provided "passively" by means of a current loop through the mA analog channel (minimum excitation current of the transducer = 0.5 mA).

Interfaces:

Analog: Passive type 4...20mA signal connected to the MR02 unit via the "CN10" connector and terminal board in the electrical panel (accuracy = 0.5% of the reading ± 0.02 mA).

- 1 optoisolated input for the Measurement Sensor.
- 1 input for the PT100 type Temperature Sensor.

Execution: Enbloc polycarbonate container, color RAL7035, UV resistant and nonflammable; for mounting vertically on the wall.

Electronic section:

- Central "CPU" unit with microprocessor
- Indication of the measurement and display of the software menus by means of a 2x3½ LCD digit + symbols alphanumeric display.
- Scratch-resistant polycarbonate control keyboard with membrane keys.

Software:

- Simultaneous reading of the Main Parameter (Conductivity) and the Temperature value with display of the calculated value of the process measurement and indication of any alarm conditions which may arise.
- Manual calibration of the Conductivity, Temperature and Out_mA scale.
- Analog output proportional to the reading and configurable in the "Max. and Min. full scale" values
- Unit of measurement for the temperature scale which can be selected (°C or °F).

Sensor: Conductivity sensor with nominal cell constant $K=1\text{cm}^{-1}$ and graphite electrodes. Integrated PT100 temperature sensor. Epoxy resin body, 120mm, and threaded fitting PG13.5 and extraction ring nut to avoid twisting the cable.

Dimensions and weight:

120 (b) x 122 (h) x 56 (p) without cable glands
~400 g.

Degree of Protection:

IP64 in accordance with EN 60529.

SUBMERSIBLE PUMP

Execution: Stainless steel submersible centrifugal pump for waters free from coarse solids. The pump has a floater switch to prevent operation in the absence of water.

Materials:

- Pump body, suction grille, seal holder disc and motor casing in AISI 304.
- Impeller, diffuser and motor cover in glass fiber reinforced technopolymer.
- AISI 303 shaft.
- Carbon/ceramic/NBR mechanical seals.

Motor: 2-pole single-phase motor with isolation class F and degree of protection IP68 (in accordance with EN 60529).

Immersion: Maximum = 5m.

F / P: Maximum flow rate = 9000 l/h at 0.15 bar;
Minimum flow rate at maximum head = 1200 l/h at 0.7 bar.

Power supplies: 230 VAC $\pm 10\%$, 50 Hz; 0.25 kW

Delivery fitting:

Threaded GAS - 1"1/4 - F

Dimensions and weight:

$\varnothing 167 \times 273$ (h); 5.1 kg.

Degree of Protection:

IP68 in accordance with EN 60529.