

# Catálogo

## Tratamento de

# ÁGUAS

Analísadores Clorómetros Medição de caudal  
Níveis Válvulas Instrumentação complementar  
Analísadores de gases



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# TECHNICAL SPECIFICATION TRANSMITTER AND CONTROLLER

## Micro2Chem<sup>®</sup>

### T17M\*4000B



CAPITAL CONTROLS ITALY

- **UP TO THREE SENSORS SUPPORTED**
- **AUTOMATIC TEMPERATURE COMPENSATION**
- **FLEXIBILITY IN ANALYTICAL MEASUREMENT SELECTION**
- **PID CONTROLLER WITH FEED FORWARD CAPABILITY**
- **SWIMMING POOL CONTROLLER**

Micro2Chem is a family of microprocessor based transmitters controllers for analytical values used in drinking and waste water plants, and in swimming pools.

Micro2Chem is able to measure simultaneously up to 3 of the following parameters, using Capital Controls Italy's sensors:

- **pH**
- **ORP**
- **dissolved oxygen**
- **residual chlorine**
- **chlorine dioxide**
- **ozone**
- **0/4÷20 mA analog**
- **temperature (Pt100)**

The type and number of sensors (max 3) can be freely chosen in any combination. The analytical values are retransmitted with 4÷20 mA analog signal.

New analysis can be added or modified in the field at any time. Micro2Chem automatically detects the number of installed sensors. All the measurements and the sample temperatures are displayed. The transmitter/controller has automatic temperature compensation.

The cleaning sequence time setting allows an easy sensors' maintenance. The new Micro2Chem family includes the following versions:

- **Micro2Chem Transmitter**  
This is the basic version. It receives and retransmits signal(s) from up to three of the above listed sensors.
- **Micro2Chem Controller**  
Micro2Chem controls the measured parameter value with a PID algorithm.



Fig. 1. *Micro2Chem: front view*

A feed forward action can be activated with a 4÷20 mA signal generated from a flow transmitter (in this case the maximum number of analysis sensors supported is 2).

Control output is available both as a 4÷20 mA analog signal or digital output.

If a very high measuring reliability is required, it is possible to install more identical sensors and then use averaged value to operate a more accurate control.

- **Micro2Chem Swimming Pool Controller**  
Micro2Chem Swimming Pool Controller measures and retransmits pH and residual chlorine or pH and ORP, and performs the control function according to a specific PID algorithm. Control output can be set as 0/4÷20 mA signal or digital output (relays contacts).

## DESIGN FEATURES

- Micro2Chem receives and retransmits up to 3 analytical or analog signals: pH, ORP, Dissolved Oxygen, Residual Chlorine, Chlorine Dioxide, Ozone, 0/4÷20 mA analog signal, temperature (Pt100).

### **FLEXIBILITY**

- It is possible to:
  - Change type of sensor in the field
  - Extend the number of measures (up to 3)
  - Modify original calibration data
  - Change type of Instrument, by simply adding or replacing an electronic chip (PIC)
- Hardware and software are identical for all types of instrument

### **EXTENDED FUNCTIONALITIES**

- Automatic temperature compensation and display of its value: if a faulty temperature sensor is detected, the system replaces its reading with a preset default value.
- 2 alarms for each measured parameter and dead band freely adjustable via software (if cleaning sequence is used, retransmission of the third measured parameter alarm is not available).
- Warning and Alarm messages available on display via one key touch.
- 2 digital inputs (contacts) are available to freeze the variables readings and/or the controller's output.
- To avoid unauthorised modifications, the electric calibration data and the configuration menu are password protected.
- Control of analysers' cleaning sequence is achieved through specific menu and relays output contacts.

- In-air calibration for Dissolved Oxygen.
- Single point calibration available for pH sensor.
- Damping separately settable for each channel.
- Micro2Chem Controller displays on dedicated pages the measured value and the temperature of the sample.
- Micro2Chem Controller provides a PID control function Feed Forward capability based on a measured flow signal
- Deviation detection capability of two or three identical sensors: if deviation exceeds a pre-set value an alarm is displayed.
- Micro2Chem swimming Pool Controller has a specific PID algorithm for dual control of pH/Residual Chlorine or pH/ ORP.
- The integrally mounted membrane keypad and display allow to perform configuration and calibration procedures without opening the instrument cover, so always assuring the IP65 protection and the safety of operation.
- Sensor sensitivity check during calibration procedure, with indication on display.
- Self-diagnostic capability during operation of the microprocessor unit.
- IP65 protection class (NEMA4X) for field installation.
- Mounting options: wall mounting or 2" pipe mounting, with or without sunshade.
- Instrument is CE certified.



## TECHNICAL SPECIFICATIONS

### Measuring Range:

Automatically adjusted within the below specified limits:

Parameter	Range
PH	0 ÷ 14
ORP	-1500 ÷ +1500 mV
Dissolved oxygen	0 ÷ 20 ppm
Ozone	0 ÷ 10 ppm
Residual chlorine	0 ÷ 10 ppm
Chlorine dioxide	0 ÷ 10 ppm
DC current (mA)	0/4 ÷ 20 mA
Temperature	0 ÷ 100 °C

### Sensitivity:

Parameter	Sensitivity
PH	0.0002 pH unit
ORP	0.0045 mV
Dissolved oxygen	0.15 µg/l (ppb)
Residual chlorine	0.33 µg/l (ppb)
Chlorine dioxide	0.33 µg/l (ppb)
Ozone	0.15 µg/l (ppb)

### Temperature compensation:

Automatically computed.

### Analog inputs:

Up to three sensors at choice among: pH, ORP, dissolved oxygen, residual chlorine, chlorine dioxide, ozone, 0/4÷20 mA analog signal and temperature (Pt100).

### Analog Outputs:

- One for each installed sensor
- Can be set as 0÷20 or 4÷20 mA
- Galvanically isolated from inputs
- Max. load: 1000 Ohm

### Digital inputs:

- 2 provided, with different functionality depending on model, mainly:
- Freeze measured values of one or two variables
  - Force to zero controller's output

### Digital outputs (alarms and/or controller):

- 7 outputs, relay contacts
- 24 Vdc and 24 Vac, 5 A max, 110/230 Vac
- Settable as High/Low alarms (or High/High Low/Low)
- Individually selectable as NO or NC.

### Serial Port:

RS485, RS422 and RS232 with RJ45 plug-in connectors and 9 pin terminal board.

### Temperature drift:

Within 0.000001% of f.s. for 10 °C ambient temperature change.

### Relative humidity:

95% without condensation.

### Operating Temperature:

-10 ÷ +55°C (14 ÷ 131°F)

### Stocking Temperature:

-40 ÷ +65°C (-40 ÷ +149°F)

### CPU cycle Time:

100 msec

### Display:

Digital LCD dot matrix, 2 lines 16+16 characters, backlighted

### Languages:

Italian, English, French, German, Spanish, software selectable

### Calibration:

- two points
- for pH: also single point
- for dissolved oxygen: in water and in air

### Mounting options:

- wall mounting
- wall mounting with sunshade
- 2" pipe mounting
- 2" pipe mounting with sunshade
- optional mounting bracket for Micro2Chem and sensor (only pH, ORP and DO) with sunshade

### Enclosure:

IP65 (NEMA 4X), reinforced ABS fiberglass (17%), RAL 9010 white, fire self-extinguishing class VØ (according to UL94)

### Power supply:

115/230 Vac ±10%, 50/60 Hz

### Dimensions:

220 (l) X 250 (h) X 120 (d) mm; 8.7 (l) X 9.8 (h) X 4.7 (d) in.

### Weight:

3 kg (7 lb); with sunshade: 5 kg (11 lb)

**MODEL NUMBER BREAKDOWN**

<b>Micro2Chem</b>	<b>T17M</b>	-	<b>4</b>	-	-	-	<b>B</b>	-	-	-	-
Type of Instrument											
Reserved	A										
Transmitter	B										
Transmitter with cleaning sequence (note 1)	C										
Controller (note 2)	D										
Swimming pool controller (note 3)	E										
Aeration basin controller	F										
Series of production - fixed code			4								
Type of measure, Channel 1											
Reserved				0							
pH				1							
mV (ORP)				2							
O2 (Dissolved Oxygen)				3							
Cl (Chlorine)				4							
CD (Chlorine Dioxide)				5							
O3 (Ozone)				6							
0/4÷20 mA				7							
PT100				8							
Type of measure, Channel 2											
Not requested					0						
pH					1						
mV (ORP)					2						
O2 (Dissolved Oxygen)					3						
Cl (Chlorine)					4						
CD (Chlorine Dioxide)					5						
O3 (Ozone)					6						
0/4÷20 mA					7						
PT100					8						
Type of measure, Channel 3											
Not requested						0					
pH (only for instruments types B, C)						1					
mV (only for instruments types B, C)						2					
O2 (only for instruments types B, C, F)						3					
Cl (only for instruments types B, C)						4					
CD (only for instruments types B, C)						5					
O3 (only for instruments types B, C)						6					
0/4÷20 mA (only for instruments types B, C D)						7					
PT100 (only for instruments types B, C D)						8					
Design level - Fixed code							B				



Power supply			
Reserved	0		
115 ± 10%, 50/60 Hz	1		
230 ± 10%, 50/60 Hz	2		
<hr/>			
Mounting			
Reserved		0	
Wall mounting w/o sunshade		1	
Wall mounting c/w sunshade		2	
2" pipe mounting w/o sunshade		3	
2" pipe mounting c/w sunshade		4	
<hr/>			
Serial link			
Reserved			0
Not required			1
RS 485			2
RS 422			3
RS 232			4
<hr/>			
Analog output (note 4)			
Reserved			0
4÷20 mA			1
0÷20 mA			2

*Note:*

1. When cleaning sequence is used, alarms retransmission will be possible for channels 1 and 2 only.
2. For Feed Forward control, set 4÷20 mA (flow ) on channel 2, the controlled sensor on channel 1, and the measured sensor on channel 3. With Feed Forward control, maximum two sensors can be installed.
3. Swimming pool controller is available in two different versions: pH and ORP; pH and Cl.
4. Selecting digit 1 or 2, all channels are set 0÷20 or 4÷20 mA. If you require different combinations, select Reserved and specify on your order the analog output for each channel.

**Options**

Immersion support beam assembly, 3 m. length, for the wet-end probe (pH, ORP, O2).

- Require P/N 1T624B022U01 for probe & transmitter
- Require P/N 1T624B022U03 for sensor only

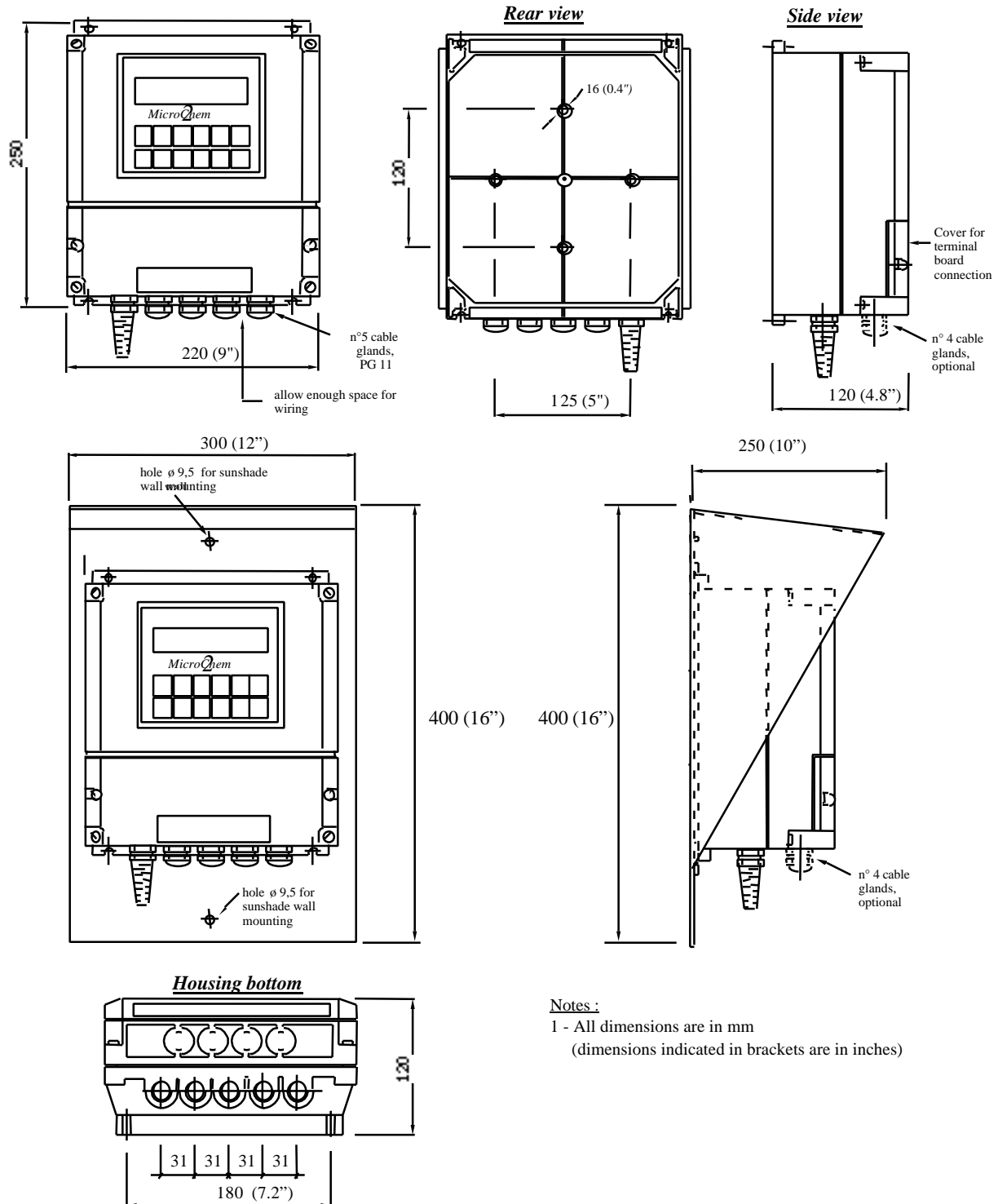
**Measuring Range**

Maximum measuring range and minimum span are as follows:

<u>Parameter</u>	<u>Minimum span</u>	<u>Maximum range</u>	<u>Default setting</u>
pH	1.00	0.00 ÷ 14.00	2.00 ÷ 12.00
ORP	100 mV	-1500 ÷ 1500 mV	-500 ÷ 500 mV
O2	2.0 ppm	0.00 ÷ 20.00 ppm	0.00 ÷ 10.00 ppm
O3	0.25 ppm	0.00 ÷ 10.00 ppm	0.00 ÷ 1.00 ppm
Cl	0.25 ppm	0.00 ÷ 10.00 ppm	0.00 ÷ 1.00 ppm
CD	0.25 ppm	0.00 ÷ 10.00 ppm	0.00 ÷ 1.00 ppm
T	5 °C	0 ÷ 100 °C	0 ÷ 100 °C
mA	2 mA	0/4 ÷ 20 mA	4 ÷ 20 mA

OUTLINE AND INSTALLATION DIMENSIONS

WALL MOUNTING

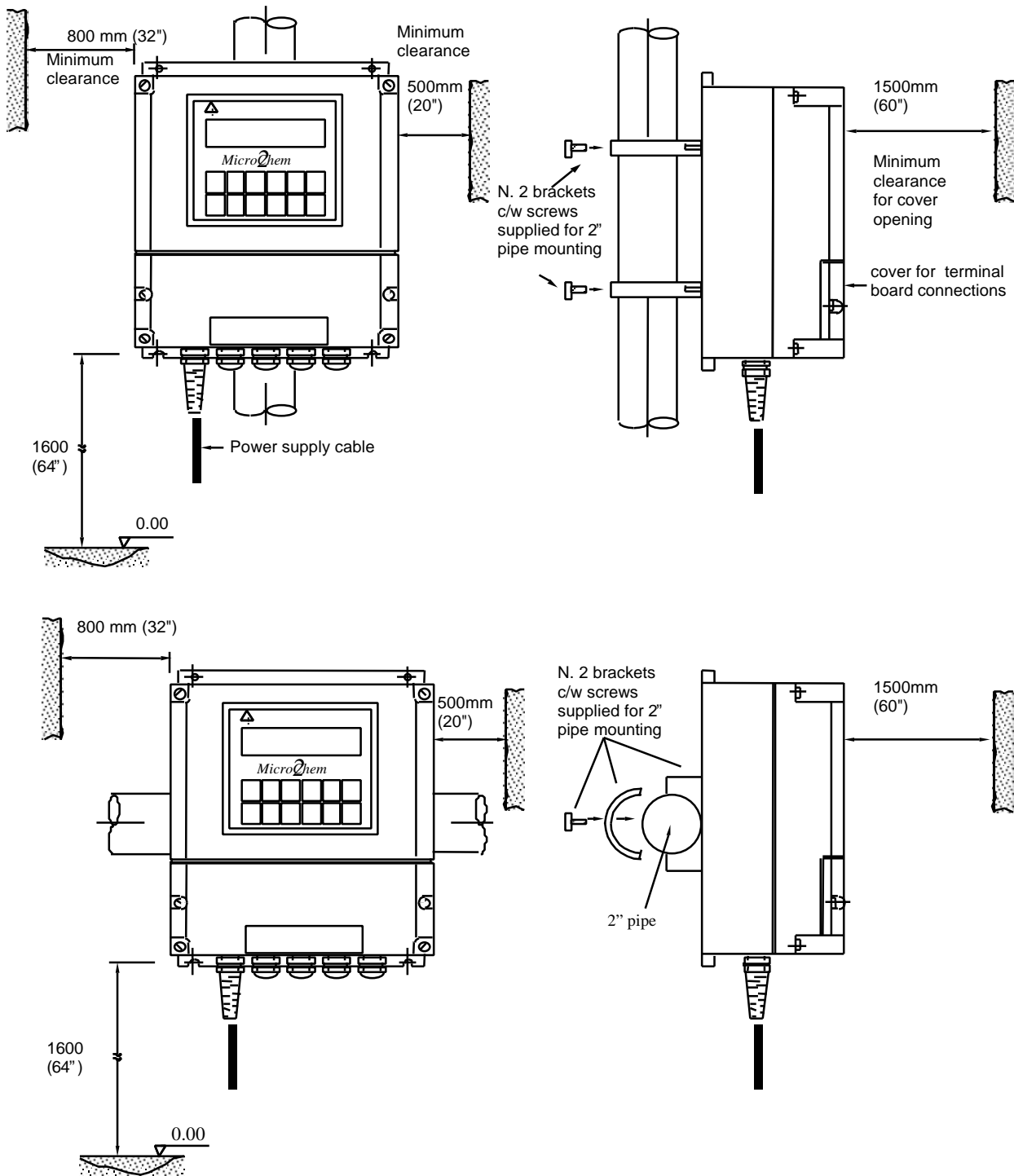


Notes :

1 - All dimensions are in mm  
(dimensions indicated in brackets are in inches)



2" PIPE MOUNTING



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# TECHNICAL SPECIFICATION

## pH – ORP sensor fitting

### T17PH4000 – T17RX4000



CAPITAL CONTROLS ITALY

## GENERAL DESCRIPTION

pH & ORP probes T17PH4000 & T17RX4000 provide, in conjunction with the Micro2Chem™ transmitter, a simple and reliable pH & ORP measuring system. The immersion sensor fittings are designed to insert combined electrodes for pH & ORP in tanks, open vessels and channels. The through-flow fittings are designed to permit the insertion of combined pH & ORP electrodes in a continuous sampling system, not in pressure. The fittings have the main function to give electrodes protection and to assure the direct installation in the process liquid.

The probes are designed to fit either a gel filled electrode or a liquid reference electrode. The gel filled pH & ORP electrode is a combined sensor suitable for all the typical installations in drinking water plants and waste water treatment plants. The reference electrolyte is made of a KCl pressurised gel which allows long periods of operation without filling requirements.

The liquid filled electrode is a double junction combined pH & ORP electrode, suitable for heavy applications where a high amount of interfering substances (sulphides, cyanides, silver ions), is present in the sample. The frosted glass conic diaphragm allows the connection with the sample even in very dirty liquids. The double diaphragm prevents any contamination of the reference electrode. The fitting is filled with reference solution in order to have a reserve of electrolyte and to give the positive hydraulic head on the porous diaphragm.

The combined pH & ORP electrodes are sealed into the probe body through O-Rings. The thermo-resistance for the temperature compensation (pH) is sealed into the lower end of the sensor.

The sensor protected by a perforated cylinder from mechanical shocks.

In case of faulty electrode the replacement is simple and fast. The fitting is shipped ready for the installation and only electrical connection is needed.

For application on samples with fouling or fat substances an optional accessory is designed for automatic cleaning to relieve a too heavy maintenance routine.



Fig. 1 pH & ORP fittings, immersion & through-flow cell type

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**DESIGN FEATURES**

- Easy to install : to start-up the measure only the electrical connection is required.
- High reliability : the combined electrode is perfectly sealed, preventing insulation loss due to liquid leakage.
- Relieved maintenance: the gel reference electrode assures long operation periods without refilling requirements. The positive hydraulic head of the salt bridge gives a good electrical continuity with the sample through the porous diaphragm. In the gel filled electrode the hydraulic head is assured by the pressurised gel; in the liquid reference electrode the positive hydraulic head and the electrolyte reserve are assured by filling the probe body with electrolyte solution.
- Elimination of interference : double junction electrodes include an external electrolyte not reacting with contaminants that may be present in the sample.
- Immersion and through-flow fittings are optionally supplied with a cleaning nozzle. To relieve the maintenance automatic cleaning devices are designed. During the sequence the system provides the freezing of the transmitter output signal.

**TECHNICAL SPECIFICATION**

**pH & ORP electrodes**

Type: combined, measure/reference

Material at contact: pirex glass body

Electrode dimensions: body diameter 12 mm  
length 120 mm

Signal cable: coaxial cable; the connection with the electrode is sealed

Insulating resistance:  $10^{17}$  Ohm

Termoresistance (pH only): Pt 100

**Immersion fitting general specification**

Length: tube 0,25 m, total length 0,47 m  
tube 1,0 m, total length 1,22 m  
tube 1,5 m, total length 1,72 m

Material at contact: PVC

Mounting bracket: PVC

Sample temperature limit: 0-50 °C

Immersion fitting can optionally be supplied with a nozzle for sensor cleaning with water or specific

reagent. The nozzle is supplied with a 5 m hose and is connected to the probe through brackets.

**Through-flow cell general specification**

Material at contact: PVC, hard rubber.

Hydraulic connections: 1/2" G.

Mounting: 2 brackets for wall mounting

Type of application: in sampling lines not in pressure

**pH electrode**

measuring element: glass membrane

Membrane resistance: 40-60 MOhm

Measuring range: 0 ÷ 14 pH

Reference: gel electrode: Ag/AgCl, KCl gel ceramic porous diaphragm

liquid reference electrode: Ag/AgCl internal electrolyte KCl solution, external electrolyte KNO<sub>3</sub> 3M solution; frosted glass conic diaphragm

Accuracy: 0.4 % f.s.; for pH higher than 12 accuracy decreases (alkaline error)

**ORP electrode:**

measuring element : platinum pin

Measuring range: -1500 ÷ +1500 mV

Reference: gel electrode : Ag/AgCl, KCl gel ceramic porous diaphragm liquid reference electrode : Hg/Hg<sub>2</sub>Cl<sub>2</sub> (calomel) internal electrolyte KCl solution, external electrolyte KNO<sub>3</sub> 3M solution frosted glass conic diaphragm

Accuracy: 0,4 % f.s.

Through-flow cell can optionally be supplied with a nozzle for sensor cleaning with water or specific reagent. The nozzle is supplied with a 5 m hose and is connected to the probe through brackets.

**Cleaning system general description**

Feeding line: PVC hose, 5 m

Hydraulic connections: 1/4" NPT

Nozzle consumption: with a 196 kPa water pressure (1,96 Kg/cm<sup>2</sup>) water consumption is approximately 250 l/h.

**MODEL NUMBER BREAKDOWN**

	T17	-	4	-	-	-	A	-	-
Analytical Line									
Sensor Fitting									
pH measure			PH						
ORP measure			RX						
Series of production			4						
Measure Parameter									
Reserved						0			
pH						1			
ORP						2			
Fitting Length									
Reserved						0			
tube 0,25 m, total length 0,47 m						1			
tube 1,0m, total length 1,22m						2			
tube 1,5 m, total length 1,72 m						3			
in through-flow cell						4			
Reference electrolyte									
Reserved						0			
Gel , KCl						1			
Liquid, KNO <sub>3</sub>						2			
Design Level							A		
Cable length									
Reserved						0			
3 m						1			
10 m						2			
Cleaning device									
Reserved						0			
Not required						1			
Required						2			

**ACCESSORIES**

**STANDARD**

- 3 m cable for the connection with the transmitter
- 1 key for electrode extraction
- for liquid reference electrodes only: 3 bags of KNO<sub>3</sub> powder, each one allows to prepare 500 ml reference solution.

**OPTIONAL**

**. for pH only:**

Maintenance kit for gelled reference electrode including five powder bags for the pH 4, five for pH 7, five for pH 9.

**P/N 1T141B008U02**

. Maintenance kit for liquid reference pH electrode including: five bags for the preparation of pH 4 buffer solutions, five bags for pH 7 solution, five bags for pH 9 and three KNO<sub>3</sub> powder bags for the preparation of the reference solution. Each bag is suitable to prepare 500 ml of solution.

**P/N 1T141B008U03**

**For Redox only**

Only for KNO<sub>3</sub> liquid reference electrode, three powder bags each suitable to prepare 500 ml solutions.

**P/N 1T141B007U02**

Handrail, anodised aluminium with sunshade, suitable for fitting and transmitter mounting; see Spec. Sheet T17M\*4000A and the part list included in this Instruction Bulletin for further information.

**MORE COMMON OPTIONAL SPARE PARTS**

Electrode extracting -handling tool	1T365B004U01
O-Ring (external electrode support)	101W905U01
O-Ring (internal electrode support)	101W902U01
O-Ring	101W706U01

**Spare electrodes**

- . pH gel P/N 1T614S029U01 cable length 3 mt  
1T614S029U02 cable length 10 mt
- . pH liquid P/N 1T614S023U17 cable length 3 mt.  
1T614S029U06 cable length 10 mt

**PH & ORP PROBE DESCRIPTION** (A guide for your offer inquiry)

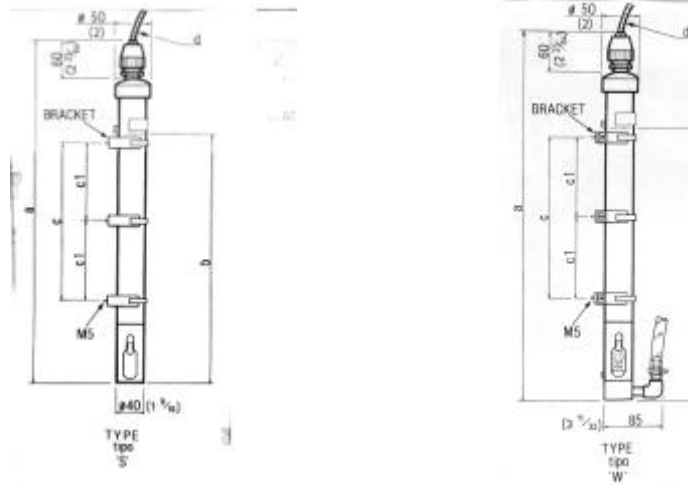
The fitting is designed for immersion installation or through-flow cell installation of combined electrodes for pH & ORP measure, with temperature compensation.

The immersion fittings are designed with three types of lengths : 0,25 m (total length 0,47 m) ; 1,0 m (total length 1,22 m) and 1,5 m (total length 1,72 m). The 0,25 m fitting can be supplied with through-flow cell.

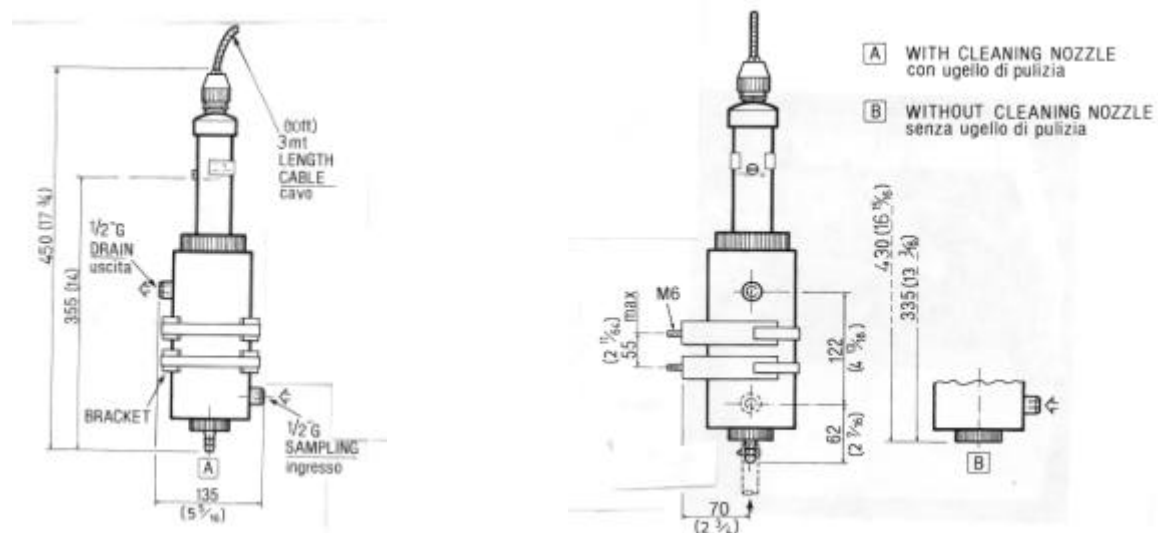
The sensor fitting and the electrode are sealed through O-Rings so that the sample cannot leak into the sensor. The probe is shipped ready for the installation.

Optionally the immersion fitting and the through-flow cell can be supplied with cleaning nozzle.

**OUTLINE AND MOUNTING DIMENSIONS**



MODEL	Type	d	a	b	c	c1
<b>Standard</b>						
T17PH/RX4x10A11	S	3m (10 ft)	400 (15" ¾)	310 (12" 3/16)	-	-
T17PH/RX4x20A11	S	3m (10 ft)	1150 (45" 5/64)	1060 (41" ¾)	600 (23" ? )	-
T17PH/RX4x30A11	S	3m (10 ft)	1650 (65")	1560(61" 7/16)	1200 (47" 9/32)	600 (23" ? )
<b>With cleaning device</b>						
T17PH/RX4x10A12	W	3m (10 ft)	422 (16" ? )	330 (13")	-	-
T17PH/RX4x20A12	W	3m (10 ft)	1170 (45" 5/64)	1080 (42" 9/16)	600 (23" ? )	-
T17PH/RX4x30A12	W	3m (10 ft)	1670 (65" ¾)	1580 (62" 1/4)	1200 (47" 9/32)	600 (23" ? )
Fittings in short execution Mod. T17PH/RX4x10B11 are shipped without mounting brackets						



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# TECHNICAL SPECIFICATION

## Dissolved Oxygen Probe

### T17DO4000



CAPITAL CONTROLS ITALY

## GENERAL DESCRIPTION

T17DO4000 sensor provide, in conjunction with the proper Micro2Chem™ transmitter, a simple and reliable Dissolved Oxygen measuring system. The immersion probes are designed to insert the D.O. sensitive element directly in tanks, open channels and basins. The probe in the through-flow cell version allows measurements in continuous sampling systems not in pressure.

The sensor is amperometric membrane type. The gold measuring electrode and the copper counterelectrode are immersed in the appropriate electrolyte and the electrodes chamber is separated from the sample by a teflon membrane permeable to oxygen gas.

The depolarizing effect due to oxygen presence into the electrolyte layer between membrane and gold electrode generates a current circulation passing through the cell, that is proportional to the concentration of dissolved oxygen in the sample.

The sensor includes a thermistor to compensate the measure for temperature variations in the process.

The probes are made of plastic material and assure the mechanical protection to the measuring cell and the IP68 sealing; the probe submersion depth is up to 3 m.

Optionally, when the measured sample contains suspended substances that may deposit on the membrane lowering the sensitivity, cleaning accessories are available, to relieve a too heavy maintenance routine. During the cleaning sequence the transmitter output is frozen.

## DESIGN FEATURES

- High reliability: the measuring cell is self polarizing, being made of two different metal electrodes. Thus a voltage control circuit is not needed and high measure stability is obtained.
- Large membrane surface: the higher gas exchange capability produces a higher reliability and reduced maintenance requirements.
- The membrane is easily replaceable since it is supplied together with its threaded support.
- Large electrolyte capacity: allows long functioning periods without substitution or refilling requirements.
- Automatic temperature compensation: a 4.2 k $\Omega$  thermistor immediately corrects the measure for temperature variations in the sample.
- Various probes length: the sensors are available in different lengths: (0.32, 1.18 and 1.7 m), maximum submersion depth is for all 3 m (probes are IP68



Fig. 1 Dissolved Oxygen Probe

protection). The 0.3 m probe can be optionally supplied with a through-flow cell.

- Immersion and through-flow fittings are optionally supplied with a cleaning nozzle. To relieve the maintenance, automatic cleaning devices are designed. During the sequence the system provides the freezing of the transmitter output signal.

- Signal noise protected: the reliable screening on signal cable and the preamplifier sealed module produce a strong signal free of troubles. The allowed transmitter to sensor distance is up to 100 m.

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**TECHNICAL SPECIFICATIONS****Sensor**

amperometric, with PTFE gas permeable membrane;  
measuring cell: Au/Cu electrodes, with thermocompensating element Pt100

Electrolyte: alkaline solution

Electrolyte content: approx. 50 ml

Probes length:  
Tube 0.12 m, total length 0.32 m  
Tube 1.0 m, total length 1.18 m  
Tube 1.5 m, total length 1.7 m

Mounting: brackets for wall mounting

Materials at contact: teflon, PVC, Neoprene, ABS

Maximum immersion depth: 3 m (IP68 protection)

Sample temp. limits: 0 ÷ 40 °C

Ambient temp. limits: -5 ÷ +50 °C

Sample minimum velocity: 60 mm/sec

Accuracy: ± 1 % of f.s.

Cable for the connection to the transmitter:  
5 cores shielded cable, maximum length 100 m, with junction box.

**Through-flow cell general specification**

Materials at contact: PVC, hard rubber

Hydraulic connections: 1/2" G.

Mounting: 2 brackets for wall mounting

Installation: for sampling lines not in pressure

**Cleaning system general specification**

Feed water tube: PVC hose, 5 m

Hydraulic connections: 1/4" NPT

Nozzle consumption: with a 196 kPa (1,96 Kg/cm<sup>2</sup>) pressure water consumption is approx. 250 l/h.

**MODEL NUMBER BREAKDOWN**

T17 DO	4	-	-	A
DO sensor				
Series of production	4			
Sensor length				
Reserved		00		
Tube 0,12 m, total leng. 0,32 m		01		
Tube 1,0 m, total leng. 1,18 m		02		
Tube 1,5 m, total leng. 1,70 m		03		
In through flow cell		04		
Cleaning device				
Reserved			0	
Not required			1	
Required			2	
Design level				A

**JET CLEANING DEVICE**

The probe can be optionally equipped with a nozzle for water and specific reagent jet cleaning. The nozzle is connected to a 5 m hose for water and reagent feeding.

The control unit for automatic cleaning sequence can be separately ordered.

Consult Spec. Sheet T17SU2000 for further information on the Cleaning Sequence Unit.

**DISSOLVED OXYGEN PROBE DESCRIPTION**

(A guide for your offer inquiry)

The immersion fitting Mod.T17DO4000 is realised to allow the measure of dissolved oxygen in channels, vessels and basins with a maximum depth of 3 m.

The sensor is amperometric membrane type, self-polarising, Au/Cu electrodes.

Electrolyte refilling shall be possible through a plugged hole on the sensor side; electrolyte refilling and membrane replacement frequency shall be low.

The gas-permeable membrane shall include a thermistor for the automatic thermocompensation of the measure.

The fitting shall be available with different lengths: 0,12 m (total length 0,32 m) ; 1,0 m (total length 1,18 m) and 1,5 m (total length 1,7 m). The 0,32 m probe may be optionally supplied with a through-flow cell.

Optionally the sensor shall be equipped with a nozzle device for water or specific reagent jet cleaning.

**ACCESSORIES**

**STANDARD**

- 5 m of cable for the connection to the transmitter
- 2 membrane assemblies
- 2 O-Rings
- 1 electrolyte bottle (250 ml)
- 1 grit paper sheet for copper electrode cleaning
- 1 plastic beaker for electrolyte refilling

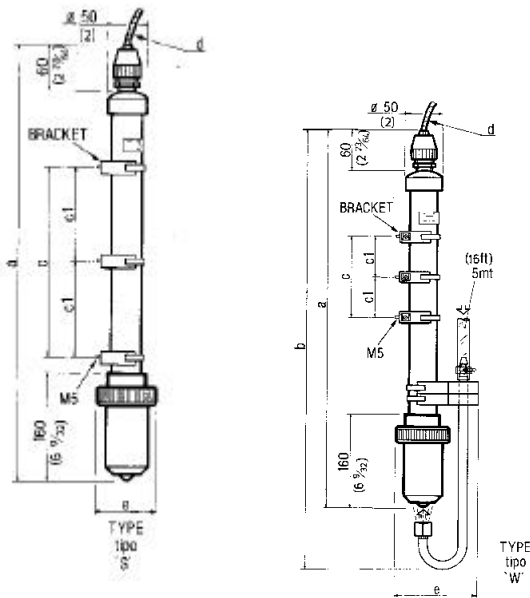
**OPTIONAL**

- Additional length extension cable (P/N 1T173J007U01) maximum length 100 m (junction box has to be always included). Order specifying the desired length.
- Junction box P/N 1T699B002U03
- Maintenance kit P/N 1T617B005U02 including
  - 5 membrane assembly
  - 5 O-Rings
  - 2 250 ml electrolyte bottles
  - 1 grit paper sheet
  - 1 plastic beaker

**MORE COMMON OPTIONAL SPARE PARTS**

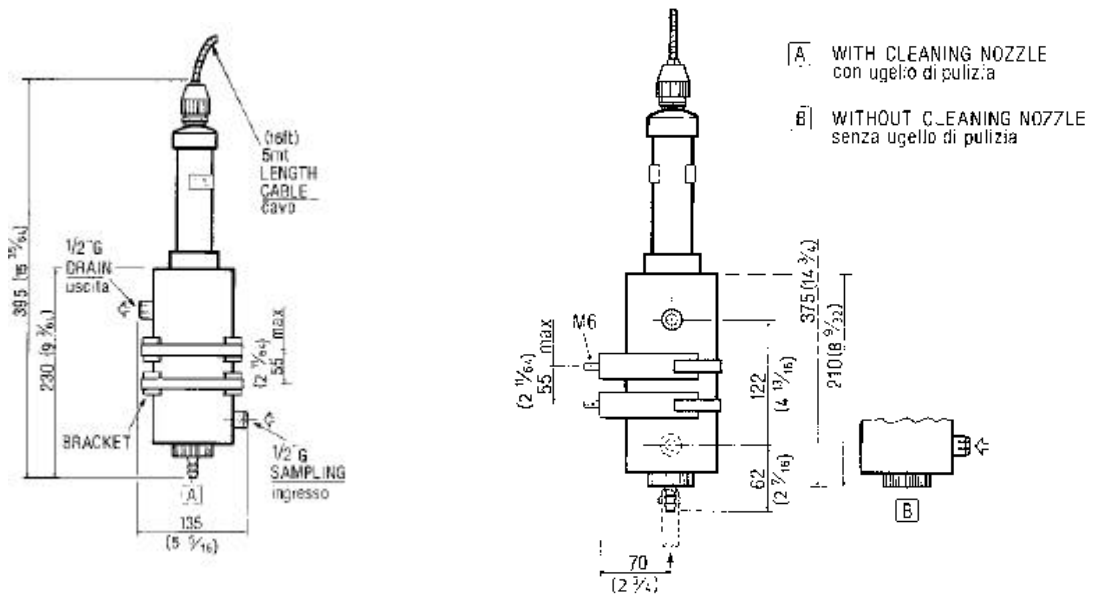
- Membrane assembly P/N 644B010U01
- O-Ring P/N 101A919U01
- Electrolyte P/N 141B102U02

OUTLINE AND MOUNTING DIMENSIONS



MODEL	Type	d	a (mm)	b (mm)	c (mm)	c (mm)	e (mm)
Standard							
T17DO4011A	S	4,65	320	-	-	-	Ø72
T17DO4021A	S	3,9	1180	-	600	-	Ø72
T17DO4031A	S	3,4	1700	-	1200	600	Ø72
With cleaning nozzle							
T17DO4012A	W	4,65	320	450	80	-	Ø130
T17DO4022A	W	3,9	1180	1310	600	-	Ø130
T17DO4032A	W	3,4	1700	1830	1200	600	Ø130

Note: all the measures are in (millimeters) and inch.



Capital Controls Italy reserve the right to make modifications without advance notice.

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# TECHNICAL SPECIFICATION

## Chlorine, Chlorine Dioxide, Ozone measuring cell

### Chlortrol II

### T17KC4000



CAPITAL CONTROLS ITALY

## GENERAL DESCRIPTION

The measuring cell T17KC4000, in conjunction with the microprocessor based Micro2Chem™ transmitter, constitutes a simple and reliable system for measuring residual chlorine (free and total), chlorine dioxide or ozone. optionally pH and ORP can be added.

The system is mainly used for measuring chlorine, chlorine dioxide or ozone in clean water, such as in swimming pools, drinking water treatment plants and cooling systems, but can be also used in waste water treatment plant applications when provided with the suitable filters.

The analysis is performed by an amperometric cell composed of two concentric electrodes. The sensitivity of the cell is kept constant through the gritting action of the measured amount of Corundum sand placed in the electrode chamber at start up. The amperometric cell is included in a plexiglass body internally shaped as a reverse cone; in this way the sand is kept in place preventing losses due to sample dragging.

The cell body can be mounted in three systems:

- with case IP66
- w/o pH electrode
- w/o pH and ORP electrode.

The pressure regulator allows to maintain constant the flow at the inlet without any valves for samples with pressure varying inside the limits 0.2 ÷ 4.0 bar.

The cell provides two PVC housings suitable to fit standard dimensions pH electrode and a temperature sensor. This system is specially indicated for swimming pool applications.

Usually no pH correction is required. The correction is only needed when measuring free chlorine in a sample with pH higher than 7.5 or highly variable. Fig.2 shows the allowed pH fluctuations as a function of the pH value of the sample.

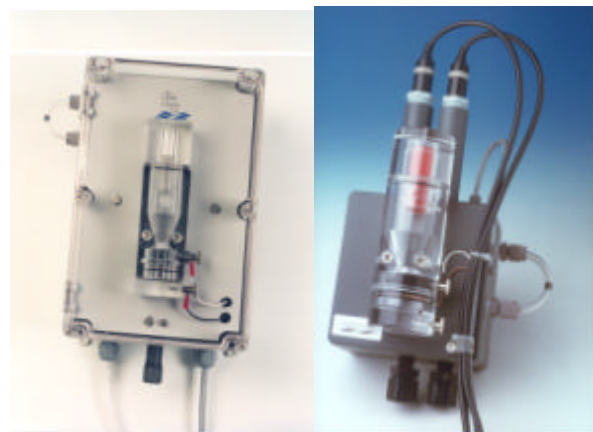


Fig. 1 Chlortrol measuring cell, w/o the case

The cell can be optionally supplied with a reagent feeding system that allows to add, in the above mentioned situations, a pH buffer solution; a similar system is used to condition the sample with a proper reagent when the required parameter is total chlorine. No reagent is needed when the cell measures chlorine dioxide and ozone. Temperature compensation is included as a standard.

## DESIGN FEATURES

1. *Easy to install:* to start up the measure only electrical connection is needed.
2. *Designed for easy maintenance:* Corundum sand in the measuring cell provides an automatic and continuous cleaning of the electrodes assuring long operation periods with high reliability.
3. Enables free or total residual chlorine and chlorine dioxide measurements

TABLE OF CONTENT	Page
General description	1
Design features	1
Technical specifications	2
System description	2
Model number breakdown	3
Accessories	3
Outline and mounting dimensions	4



## TECHNICAL SPECIFICATIONS

Electrodes: gold measuring electrode, copper counterelectrode

Type of measure: free chlorine, total chlorine (with sample conditioning system), chlorine dioxide, ozone, pH and ORP

Temperature compensation: standard, Pt 100 temperature element

Accuracy: chlorine/chlorine dioxide/ozone:  $\pm 5\%$  of f.s.  
pH: 0.4 % f.s.; for pH higher than 12 accuracy decreases (alkaline error)

Sample inlet pressure: Mod.T17KC4200: 0.2÷4.0 bar.  
For higher pressures install a pressure reducing valve.

Sample temperature: temperature compensation from 2 to 50 °C

Sample pH FREE chlorine measures ONLY: no pH correction needed when pH is inside the limits 4÷7,5. The higher the pH the smaller the fluctuations allowed (see Fig.2). The cell can be supplied with a complete reagent addition system.

Material of construction:  
electrodes: copper/gold  
cell: plexiglass  
Pressure regulator: PVC

Case protection: IP66 (only Mod T17KC4200)

Water flow : approximately 30 l/h for Mod T17KC4200,  
and 60 l/h for Mod. T17KC4400/500/600

Outline and mounting dimensions:  
Mod.T17KC4200: 263 (h) x 167 (l) x 135 (d) mm  
Mod.T17KC4400/500/600: 320 (h) x 200 (l) x 150 (d) mm.

Weight: 3 kg.

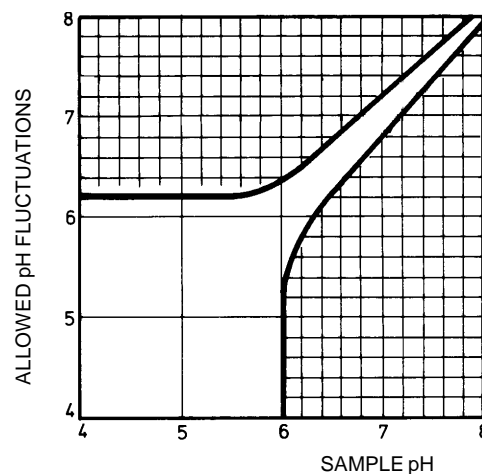


Fig. 2 Allowed pH fluctuations; Chlortrol for FREE chlorine measurements

## SYSTEM DESCRIPTION

(a guide for your offer inquiry)

The residual chlorine, chlorine dioxide and ozone measuring cell shall be a through-flow system and shall include pressure regulation to assure operating conditions inside the limits 0.2 to 4.0 bar. Pressure regulation is realised with a valve eventually including housing for pH and/or ORP electrodes and temperature sensor.

The gold and copper electrodes of the measuring cell, are included in a plexiglass body internally shaped as a reversed cone. This feature provides to the sample a tangential flow and avoid sand loss from the electrode chamber.

The Corundum sand keep active the electrodes surface.

The cell has the temperature compensation as a standard and is supplied with the connection cable of 1 m standard length (or other length upon request).

The cell housing must be in plastic material, with transparent cover in IP66 execution (Mod T17KC4200). As an option a reagent feeding system must be available to allow the total or free chlorine measuring in variable pH conditions.

No reagent addition shall be needed for chlorine dioxide and ozone measurement.

**MODEL NUMBER BREAKDOWN**

<b>Chlorine, Chlorine Dioxide, Ozone</b>	<b>T17KC4</b>	-	<b>00</b>	<b>A</b>
<b>Sensor configuration</b>				
With pressure regulator and IP66 case			<b>2</b>	
With pressure regulator			<b>4</b>	
With pressure regulator and pH			<b>5</b>	
With pressure regulator and pH & ORP			<b>6</b>	
Design level. Fixed code				<b>A</b>

**ACCESSORIES**

**STANDARD**

- Signal cable, connected to the measuring cell (max 1 m)
- Corundum sand, with dosing device (100 grams bottle).

**OPTIONAL**

- Signal cable, maximum optional length 10 m; specify desired length.

Mod.T17KC4200

- P/N 1T677B121U10 for the cell, 10 m

Mod.T17KC4400

- P/N 1T677B122U10 for the cell, 10 m
- P/N 1T168D026U10 for pT100, 10 m

Mod.T17KC4500

- P/N 1T677B122U10 for the cell, 10 m
- P/N 1T614S029U02 for electr. pH, 10 m
- P/N 1T168D026U10 for pT100, 10 m

Mod.T17KC4600

- P/N 1T677B122U10 for the cell, 10 m
- P/N 1T614S029U04 for electr. ORP, 10 m
- P/N 1T614S029U02 for electr. pH, 10 m
- P/N 1T168D026U10 for pT100, 10 m
- Additional cable extension (only for Mod. T17KC4200): P/N 1T173J011U01; junction box must always be included.
- Junction box P/N 1T699B015U02
- PVC filter and valve, R 3/8" - 3/8" (with 3/8" - 1/4" adapter) P/N 1D614L220U01
- Pressure reducing valve , R 1/2" - 3/8" (with adapter 3/8" -1/4" ) P/N 1D614L221U01
- Reagent feeder for free chlorine measures: P/N 1T617A012U01. For total chlorine measures: P/N 1T617A012U02
- Dechlorinating filter for zero calibration (suggested when working in the 0÷0,5 ppm measuring range) P/N 1D617A004U01 (3/8")
- pH buffer solution: P/N 141B076U01
- Total chlorine conditioning reagent: P/N 141B076U01 + P/N 141B075U01.

**MORE COMMON OPTIONAL SPARE PARTS**

- Gold electrode: P/N 1D608B007U01
- Copper electrode: P/N 1D321D1003 (to be kept as a spare part when measuring chlorine in sea water).

**ORDERING INFORMATION**

- Complete model number
- Type of measure: free chlorine / total chlorine / chlorine dioxide / ozono
- Type of application: wastewater, drinking water sea water:
- Site of installation: pre-treatment, flocculation, disinfection etc...
- Sample characteristics: pH, temperature, suspended solids, fat substances, flocculating agents
- Required accessories: dechlorinating filter, reagent adding system, additional length cable, etc...

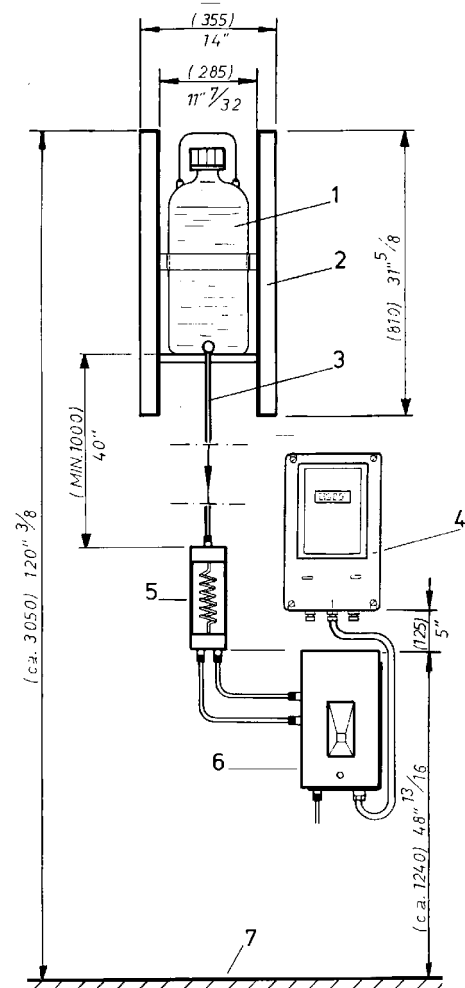
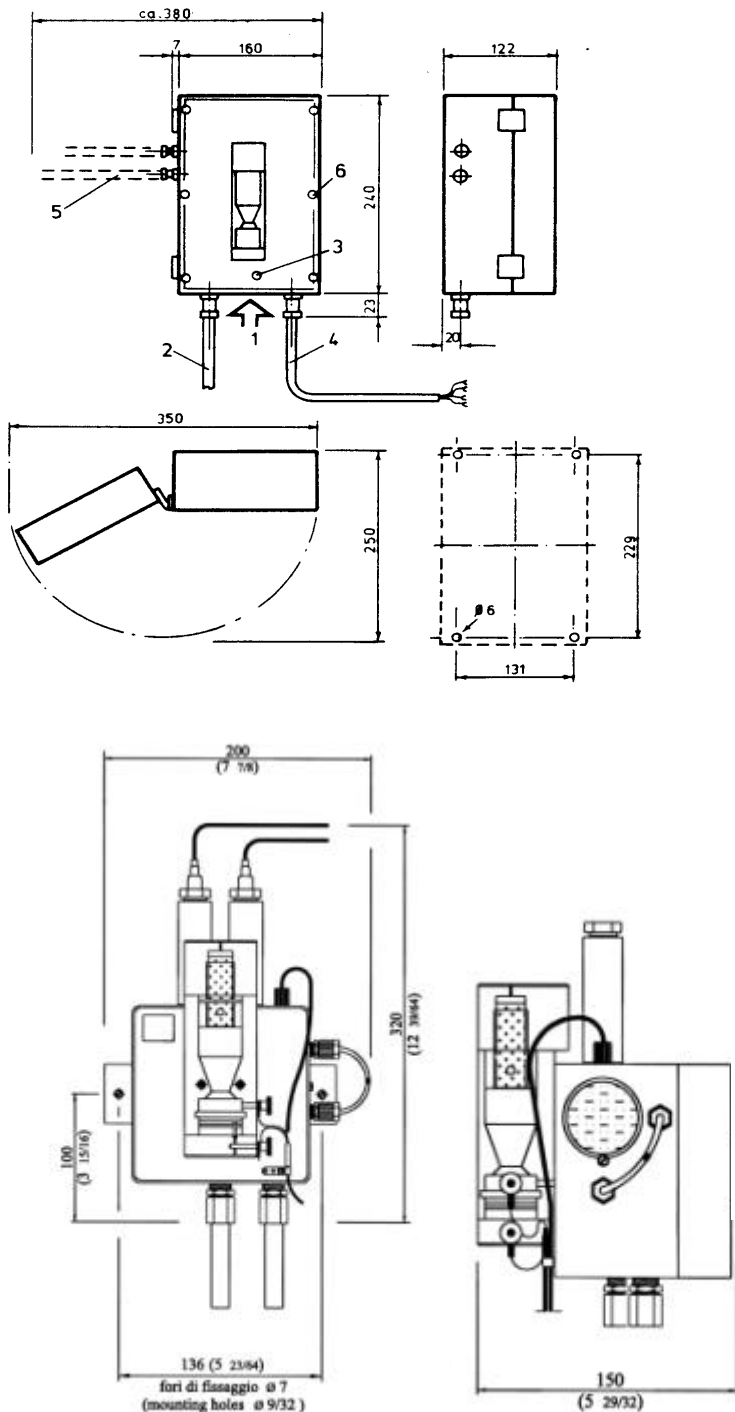
**NOTES**

If the sample includes high quantity of suspended solids (e.g. at WWTP outlet, or in drinking water plants, following the flocculating agent addition), the installation of a filter is recommended. Characteristics should be as follows:

cartridge filter including :

- plastic transparent housing (AS) for 10" cartridge.
- strain cartridge, nominal height 10" (250 mm). Contact Capital Controls Italy for further details.

**OUTLINE AND MOUNTING DIMENSIONS**



Note: all the measures are in (millimeters) and inch.

Capital Controls Italy reserve the right to make modifications without advance notice.

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## 401/U-K...

Conductivity cells for industrial applications

Conductivity cells  
data sheet DS 401/U.e. 76.2

### SERIES 401

Series 401/U conductivity cells for industrial applications are designed for direct insertion into closed tanks and pipelines, even when pressurized.

Thanks to their design these cells can withstand temperature up to 120°C and pressure up to 6 bar (at ambient temperature) and 2 bar at 120°C.

Series 401/U cells are made of PES with graphite electrodes and are available with various cell constant to cover all needed measuring ranges.

All these cells can be supplied c/w a Pt100 temperature sensor for measure thermocompensation and for temperature indication.

The cable is supplied c/w quadripolar sealed connector.

#### Applications:

- chemical processes
- concentration measurements
- water treatment plants
- food and beverage industry
- pharmaceutical industry
- demineralizing plants
- osmosis plants
- boiler feeding water
- power plants

**Sturdy and compact execution, PES**

**Operating temperature limits up to 120 °C**

**Operating pressure limits up to 6 bar**

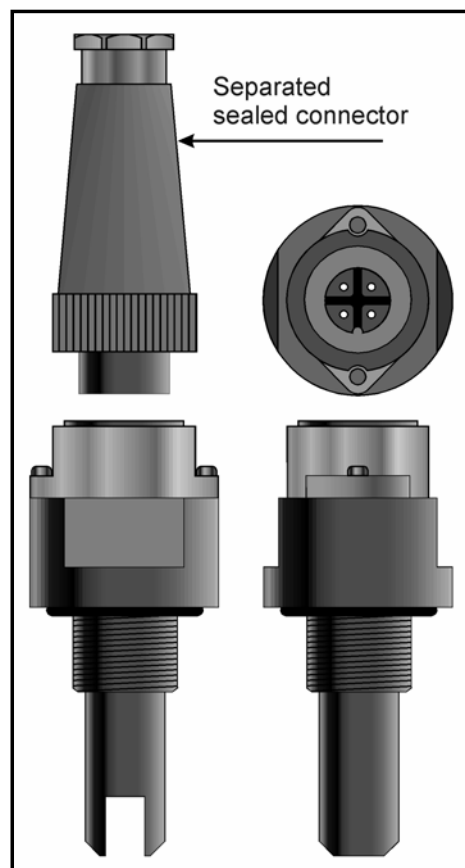
**Process connections: 1/2" threaded (other upon request)**

**Suitable for direct insertion into closed tank or pipeline**

**Cell constants 1 – 10 cm (other upon request)**

**Measuring ranges 0.05 S to 200 mS**

**Calibration certificate and test certificates available upon request**



#### Realization

Series 401/U cells are sturdy and compact conductivity sensors, with PES body and graphite measuring electrodes.

These cells are available with cell constants  $K = 1$  cm and  $K = 10$  cm (other upon request), they are therefore suitable for a large range of conductivity measure applications. Measuring ranges are 0,05 200 S ( $K=10$ ) and 0 50000 S ( $K=1$ ).

All the cells include a Pt 100 temperature sensor for automatic measure thermocompensation.

Process connection is threaded, 1/2" (other type of connection are available upon request) and the cell can be directly inserted into closed tanks or pipelines.

These sensors can withstand temperature up to 120°C with max pressure of 2 bar and pressure up to 6 bar at ambient temperature.

The cells are supplied with connecting cable, 6 x 0,25, shielded, c/w quadripolar sealed connector.

#### Available versions

401/U-C-K10.....conductivity cell, PES/Graphite, c/w Pt100  $K=10$ cm (0,0 200 S)

401/U-C-K1 .....conductivity cell PES/Graphite, c/w Pt100  $K=1$ cm (0 50000 S)

401/U-C-K0.1 .....conductivity cell PES/Graphite, c/w Pt100  $K=0.1$ cm (10 200 mS)

401/U-K10... .. conductivity cell PES/Graphite,  $K=10$ cm (0,0 200 S)

401/U-K1.....conductivity cell PES/Graphite,  $K=1$ cm (0 50000 S)

401/U-C-K0.1 .....conductivity cell PES/Graphite,  $K=0.1$ cm (10 200 mS)

## TECHNICAL SPECIFICATIONS

Cell body: .....	PES
Measuring electrodes: .....	Graphite
Cell constant (cm) 10%:.....	K=1 , K=10 (other upon request)
Measuring range: K=0.1cm (10cm <sup>-1</sup> ) .....	10 200 mS;
Measuring range: K=1cm (1 cm <sup>-1</sup> ) .....	0 50000 S
Measuring range: K=10cm (0.1cm <sup>-1</sup> ) .....	0.05 200 S
Operating temperature limits: .....	-20 120 °C
Operating pressure: .....	max 6 bar @ 20 °C, 2 bar a 120 °C
Process connection:.....	threaded
K = 1cm , K=10cm .....	½"
K = 0.1 cm.....	1"
Cable:.....	6 poles, shielded, c/w quadrupolar sealed connector
Cable length:.....	3m., 5m., 10m.
Dimensions: .....	40 mm, l.157 mm

### Installation, calibration and maintenance

These cells should be installed so that the sample flow is directed against the cell bottom. The liquid enters the cell, flows upwards and flows out from upper holes, so that there is no air bubbles entrapment. The cells should not be installed in locations with high turbulence. FS values, cell constant and set-point (min and max) of the instrument are laboratory calibrated. In any case all these values can be modified by the user, as stated in the user manual pertinent to conductivity transmitter. The cell K correction is the only calibration to be performed at start up. If the instrument is designed to accept the cell K, insert into the proper instrument parameter the value of cell K written on the cell tag. Otherwise, insert the cell in a solution with known conductivity and calibrate the slope to obtain the correct reading (the instrument should read the calibration solution conductivity value). Conductivity cells can be cleaned with mechanical means, as a brush, or with chemical means, as water or diluted acid or detergent.

### Order information for the calibration solution

Mod. **T/401- A (1400 S / 12mS / 100mS) specify at order**

### Order information for connecting cable

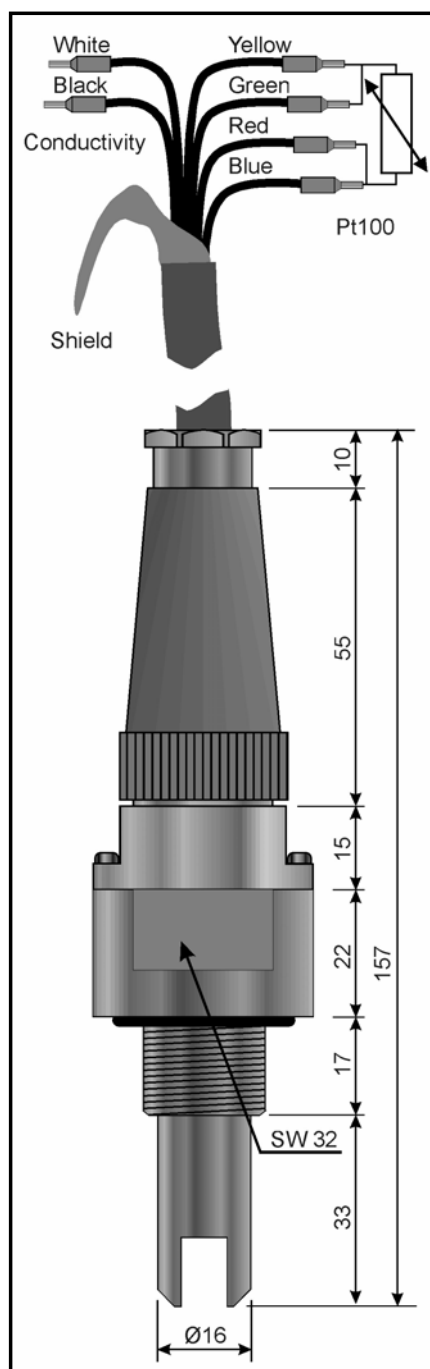
Mod. **CV/6025SCHCN20-5**.....Shielded cable, 5 m, c/w connector

Mod. **CV/6025SCHCN20-10**..... Shielded cable, 10 m, c/w connector

### Other instrument of the conductivity line

Conductivity line includes the series of sensors for direct installation in pressurized pipelines, in SS316 (401/PIPE-L-K...) and in platinum/glass (401/PIPE-L-K...) and the simple and economic Series 401/I for in pipe insertion: this line covers all possible applications (immersion, through flow, in pipe, laboratory) and measuring ranges (from 0.04 S to 2 S). A series of specific cells for different applications is also available.

The instrument for conductivity measure include the indicator controller Mod.Quick, the indicator-transmitter Mod.Sirio, the indicator-transmitter-controller Mod.DO97-6T.



# 701 / SI

## Immersion probe for turbidity measurement

Turbidity  
data sheet DS 701SI.gb.20.1

### SERIES 700

Mod.701/SI cell is a turbidity sensor for immersion installations.  
Measuring system is nephelometric type, single beam, with light receiver located at 90° with respect to the light source.  
The immersion probe body is made of PVC, 42 mm diameter, selectable length.  
A flange is optionally available for probe installation.

#### Applications:

- Drinking water plants
- Wastewater treatment plants
- Clarifiers and sedimenters

- ❑ **Sturdy execution, IP66 protection degree**
- ❑ **Suitable for direct immersion measurements**
- ❑ **Standard lengths 600 – 800 – 1000 – 1500 – 2000 mm**
- ❑ **Optical system power supply from instrument**
- ❑ **Good linearity**
- ❑ **Low maintenance requirements**

#### Measuring principle

The measuring system is an optical group composed of a light source and a light receiver, located at 90° from each other. The emitted light beam passes through the measured fluid and is scattered by the suspended solids present in the sample. Light scattered at 90° hits the light receiver and is there measured.  
This system is single beam type and is called “nephelometric” measurement; related measuring units are NTU (Nephelometric Turbidity Units).

#### Realisation

Nephelometric cell Mod.701/SI is powered by a highly stabilized source so that emitted light is perfectly constant even with power mains variations of 15%.

The light source is a CdS (cadmium sulphide) semiconductor with high light intensity and a peak of emission at 594 nm. The light source is designed to remain constant for years.

The light receiver is CdS type, encapsulated in a steel housing sealed under vacuum.

Optical group is immersed into the process but only the light receiver group is in contact with the fluid.

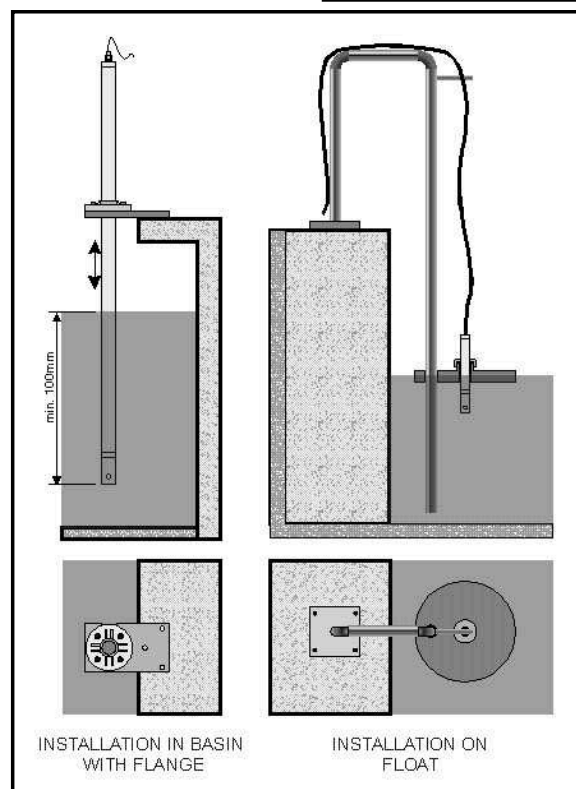
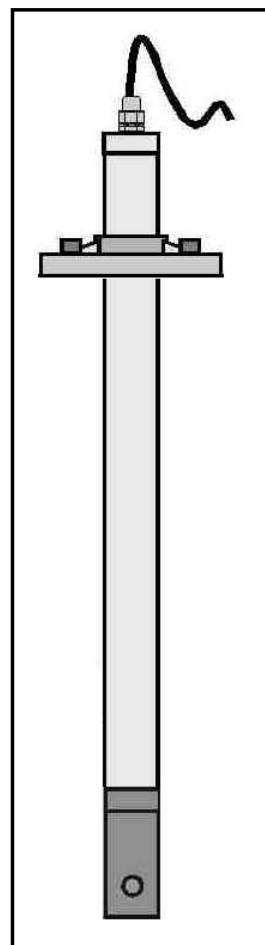
Mod.701/SI probe can be supplied complete with the hydraulic system for chemical cleaning (Mod.SI/CH-AP).  
An electronic unit is also available for frequency and duration control of chemical cleaning phases Mod.QAPCH.

Sensor body is PVC, 42 mm diameter, 600, 800, 1000, 1500 or 2000 mm standard lengths (other upon request).

A sliding flange, DN32, is optionally available for probe installation.

The cable for connection to the electronic unit is integral to the cell and can be supplied with various lengths up to 10 m. Cable outlet is from PG9 cable gland.

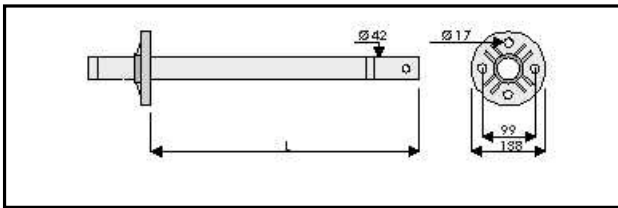
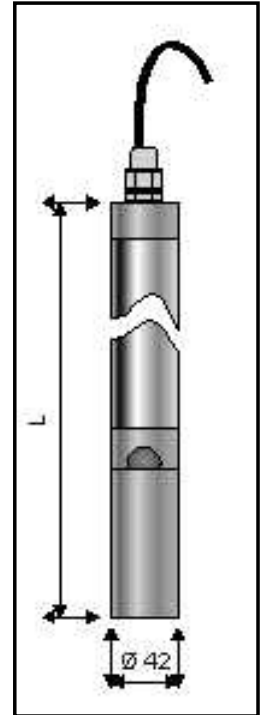
FURTHER INFORMATION Manual n.123.



#### Available versions

## TECHNICAL DATA

Light receiver: ..... Cadmium Sulphide (CdS), in steel housing sealed under vacuum  
 Light source: ..... AlIn Gap semiconductor, with high emission intensity  
 Measuring system: ..... nephelometric, single beam  
 Measuring range: ..... 0 2 / 2000 NTU  
 Receiver power source: ..... 50 mV/pp (from electronic unit)  
 Light emitter power source: ..... 1,9 Vdc (from electronic unit)  
 Max distance from cell to instrument: ..... 50 m  
 Immersion depth: ..... 10 2000 mm, according to chosen probe length  
 Flow direction: ..... any direction; the liquid should be free of bubbles  
 Mounting: ..... in vertical position  
 Optional mounting flange: ..... ISO/DIN DN32  
 Max. operating temperature: ..... 50 °C  
 Storage temperature limits: ..... -30 to +50 °C  
 Body material: ..... PVC  
 Seals material: ..... NBR (VITON upon request)  
 Protection degree: ..... IP66  
 Dimensions: ..... 42, length: 600, 800, 1000, 1500, 2000 mm,  
 ..... other upon request  
 Weight: ..... according to chosen probe length



L = 600mm – 800 mm – 1000 mm  
 – 1500 mm – 2000 mm

## Maintenance and calibration

701/SI cell has low maintenance requirements : it is just suggested to perform periodical cleaning of the light receiver. Optionally an automatic chemical cleaning system is available and can be installed on the cell itself (Mod.SI/CH-AP). A control panel, Mod.QAPCH is available to drive frequency and duration of the chemical cleaning phases. The panel is designed to control also a solenoid valve or a pump. The transmitter is factory calibrated in conjunction with the proper cell and according to the desired measuring range. No calibration is required at start up: should any measure check be required , proceed as follows :

- zero calibration : it is never required; the check for zero reading is performed through a sample with no suspended solids; if this is not available the sample can be filtered to obtain the zero solution. Should any zero adjustment be required consult Instruction Manual.
- pour into the cell (or immerse the cell) in a formazine solution with known and suitable concentration, let the measure stabilize then calibrate the sensitivity through the CALIBRATION trimmer on the front of the instrument TS/T or through the self-calibration key on microprocessor transmitter.

## Order information

### Mod. 701/SI

To be connected to an electronic unit (Mod. TS/T or Mod. SIRIO/T)

## Ordering informations: calibration solutions

Mod.T/701 Formazine solutions, 1000 cc bottles, turbidity 4000 NTU, to be diluted for the preparation of the desired calibration solution.





## 701 / D

Through flow cell for turbidity measurement

Turbidity  
data sheet DS 701D.e.6.2

### SERIE 700

701/D turbidity sensor is a through flow cell based on nephelometric principle of operation (90° scattering). Its design makes installation easy and operation simple.

#### Applications:

- Drinking water plants
- Swimming pools
- Food and beverage industry
- Wastewater treatment plants
- Chemical plants
- Clarifier monitoring



- Sturdy and compact execution, IP55**
- Suitable for through flow applications**
- 24 Vac power supply**
- 0/4 20 mA output, galvanically isolated**
- Very high linearity**
- Very low maintenance requirements**

#### Principle of operation

Measuring system includes a light source and a light receiver. The emitted light beam hits the liquid surface and is scattered by the suspended particles in the sample. The scattered light is measured at 90° (light scattering 90°); the intensity of this scattering is proportional to suspended solid content in the sample. This system is based on a single light beam and is called "nephelometric". Measuring units are NTU (Nephelometric Turbidity Units).

#### Construction

701/D cell is sturdy and compact and can be wall mounted through the supplied bracket. Hydraulic connections to the process are 1/2" F. The cell can also be supplied pre assembled on a support panel together with the blind 4 20 mA transmitter.

A system for the debubbling of sample (Mod.701/DEG) can be supplied to avoid interferences due to presence of air bubbles in the sample in the measure.

INSTRUCTIONS : Manual N.112, BT 701 D2.

#### Available versions

**Mod. 701/D-N** Turbidity through flow cell, wall mounting

#### Turbidef construction

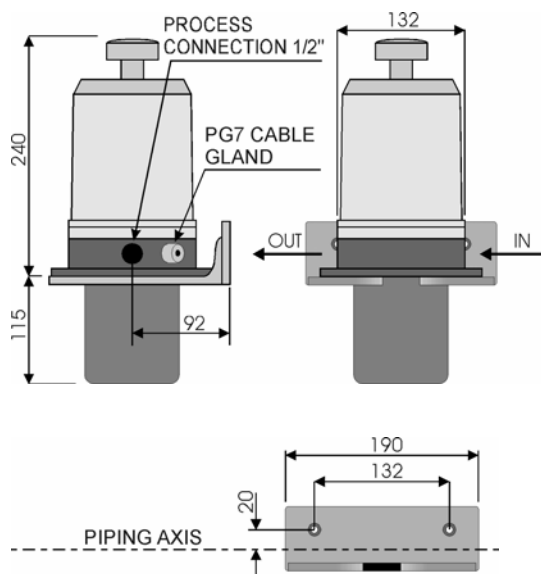
701/D Turbidef analyser includes the flow cell and the transmitter. The flow cell is a sealed through flow chamber in which the optical system is housed. The optical system includes the light receiver and the solid state light source (both working at 500 nm wavelength).

The available turbidity transmitters are Mod.TS/T (blind transmitter, isolated 4 20 mA output), Mod. P and Mod.SIRIO/T (microprocessor based transmitter, with digital display and self calibration capability).

## 701 / D Cell

### TECHNICAL DATA

Body material:.....Black PVC  
Light receiver ..... photoconductive cell 520 nm  
Light source: ..... solid state, collimated beam, 594 nm  
Operating temperature limits : ..... 5 to 50 °C  
Storage temperature limits : ..... -30 to +50 °C  
Light receiver power supply: 50 mV/pp from electronic unit  
Light source power supply: .... 1,9 Vdc from electronic unit  
Measuring system: ..... nephelometric, single beam  
Measuring range: ..... 0 2 / 2000 NTU  
Maximum distance from cell to transmitter: .....50 m  
Hydraulic connections: ..... 1/2" F.  
Sample flow rate: ..... < 0,5 l/min  
Operating pressure: ..... ambient  
Response time: .....20" depending upon flowrate  
Mounting: ..... wall mounting with cast aluminium bracket  
Dimensions: ..... h. 355 mm. l.190 mm 132 mm  
Weight: .....3 Kg with bracket



### Maintenance and calibration

701/D cell has very low maintenance requirements : it is just suggested to perform periodical cleaning of the light receiver.

Optionally an automatic chemical cleaning system is available and can be installed on the cell itself.

The transmitter is factory calibrated in conjunction with the proper cell and according to the desired measuring range. No calibration is required at start up: should any measure check be required , proceed as follows :

- zero calibration : it is never required; the check for zero reading is performed through a sample with no suspended solids; if this is not available the sample can be filtered to obtain the zero solution. Should any zero adjustment be required consult Instruction Manual.

- pour into the cell (or immerse the cell) in a formazine solution with known and suitable concentration, let the measure stabilize then calibrate the sensitivity through the CALIBRATION trimmer on the front of the instrument TS/T or through the self-calibration key on microprocessor transmitter.

### Order information

**Mod. 701/D-**(see available versions)

To be connected to an electronic unit (Mod. TS/T or Mod. SIRIO/T)

### Ordering informations :calibration solutions

Mod.T/701 Formazine solutions, 1000 cc bottles, turbidity 4000 NTU, to be diluted for the preparation of the desired calibration solution.

# TS / S

## Conductivity transmitter

Conductivity  
data sheet DS TS/ S.gb.40.2

### SERIE TS

Transmitter Mod.TS/ S is a high precision instrument for conductivity measurements in conjunction with two or three electrodes conductivity cells.

The transmitter receives the signal from conductivity measuring cells and transforms it into a proportional 0/4 20 mA current output.

Measuring range can be selected between 0 2 S, 0 20 S, 0 2 mS, 0 20 mS and 0 200 mS.

TS/ S transmitter is suitable for wall mounting or DIN bar mounting.

#### Applications:

- chemical processes
- water treatment plants
- concentration measures
- food and beverage industry
- pharmaceutical industry
- demineralization plants
- osmosis plants

- 0/4-20 mA output
- Cell constant calibration
- Different cell constants can be selected
- 24 Vca power supply
- Power supply for conductivity cell
- Measuring range selectable inside the limits 0 to 200 mS
- Wall mounting or DIN bar mounting



#### Principle of operation

This transmitter operates on the basis of phase determination of signal: this allows to have precise and linear readings without capacitive phenomena and to avoid any noises and interferences on the measure.

The conductivity cell is powered with a sinusoidal current with constant amplitude (50 mV/pp) and 800 Hz frequency.

The transmitter operates automatic temperature compensation through a Pt100 temperature sensor (either integral to the conductivity cell or separated):

Reference temperature is 20°C but different values can be required at order.

#### Realization

The instrument is sturdy and compact and is suitable for wall mounting or for DIN bar mounting. Housing protection degree is IP40, and TS/ S can be optionally supplied into a case with IP65 protection degree.

Measuring chain is composed of conductivity cell, TS/ S transmitter and optional indicator controller.

Available measuring ranges are: 0 2 S, 0 20 S, 0 2 mS, 0 20 mS 0 200 mS.

FURTHER INFORMATION: Intruccion Manual N.106.

#### Available versions

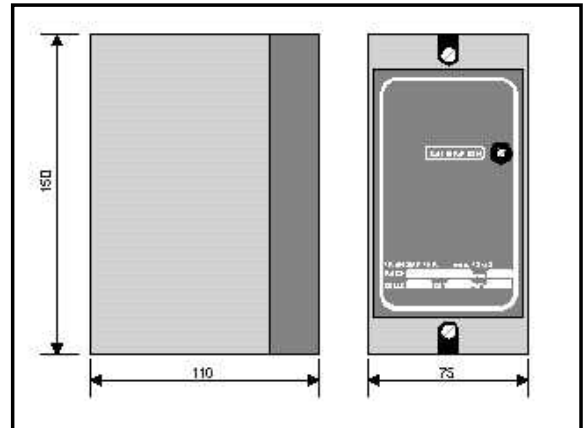
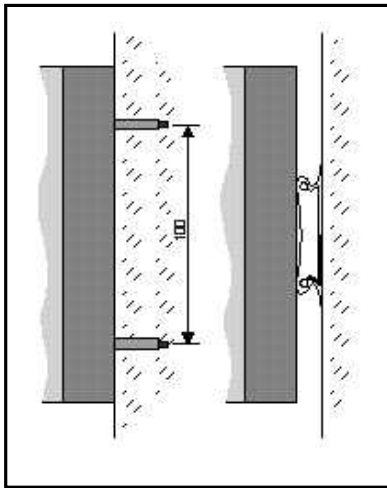
**Mod. TS/ S**..... Conductivity transmitter for wall mounting or DIN bar mounting, IP 40

**Mod. TS/ S- IP** Conductivity transmitter in IP 65 housi

# TS / S

## TECHNICAL DATA

Measuring ranges: ..... 0 2 S - 0 20 S - 0 2 mS - 0 20mS - 0 200 mS  
 Accuracy: ..... 0,5 % f.s.  
 Current output: .....proportional 0/4-20 mA  
 Max load: ..... 500  
 Input:.....from conductivity cell  
 Temperature input:..... from Pt100  
 Cell constant calibration: ..... through multi-turn trimmer  
 Conductivity cell power supply: ..... sinusoidal current, 50 mV/pp, 800 Hz operating frequency  
 Max distance cell to transmitter : ..... 10 m  
 Max distance transmitter to repeater: ..... 500 m  
 Operating temperature limits: ..... 5 to 45 °C  
 Storage temperature limits: ..... -30 to +60 °C  
 Power supply: .....24 Vac  
 Max consumption: .....800 mA  
 RFI protection: .....according to CE rules  
 Housing:.....Poliamyde 6.6 baseplate, polistirene cover  
 Dimensions: .....150 x 106 x 75 mm.  
 Weight: .....600 gr.



### Calibration

Conductivity measuring chain is factory set for range and cell constant. At start up only cell constant calibration is required. Immerse conductivity cell into a standard conductivity solution and calibrate the transmitter through the multiturn trimmer.

### Order information

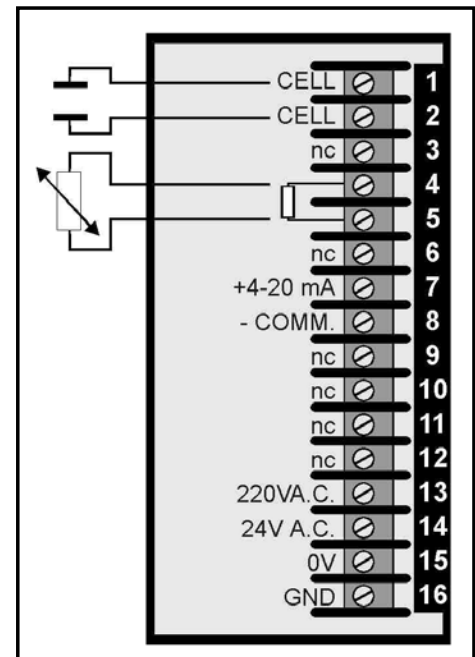
Mod. **TS/ S** (see versions) -

Measuring range	1	0-2 S	2	0-20 S
	3	0-2 mS	4	0-20 mS
	5	0-200 mS	6	other upon request

a richiesta

### Order information, conductivity calibration solution

Mod. **T/401- A** Standard conductivity calibration solution  
 Specify desired conductivity value: 1mS, 12 mS, 100 mS.



## TS / T Turbidity transmitter

Turbidity  
data sheet DS TS/T.gb.7.1

### SERIE TS

The turbidity transmitter serie TS provides a 0/4 20 mA signal proportional to the measured turbidity for retransmission to controllers, recorders and other control devices.

The measuring range can be selected from 0 2 to 0 2000 NTU. The transmitter has small dimensions and is suitable for the connection to all our turbidity cells.

#### **Sensors to be connected :**

- through flow turbidity sensors
- immersion turbidity sensors
- pipe turbidity sensors



- 0/4 20 mA output, galvanically isolated**
- Only slope calibration is required**
- 24 Vac power supply**
- Provides power supply for turbidity cell**
- Measuring range is selectable**
- Wall mounting and rack mounting**

#### **Principle of operation**

The operation of TS/T transmitter is based on phase determination of signal : a stabilized voltage powers the light source (a solid state source with collimated beam). The light receiver is powered by a low frequency, constant amplitude signal (50 mV pp). The light receiver feed back signal is converted into a normalized 4 20 mA signal. Light source and light receiver are both installed inside the turbidity measuring cell.

#### **Construction**

TS/T transmitter is sturdy and compact and is suitable for wall mounting and for rack mounting.

The turbidity measuring system is composed of TS/T transmitter and one of our turbidity sensors. Maximum allowed distance between sensor and transmitter is 50 m.

The wide ranging capability makes this instrument suitable for many different process applications.

Protection degree is IP40, and the IP65 version is available upon request.

Further information on instruction manual n.112.

#### **Available versions**

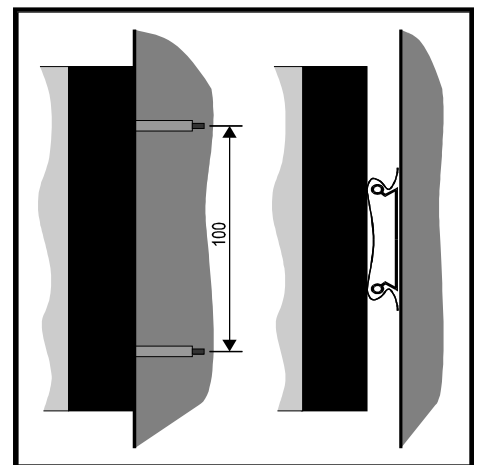
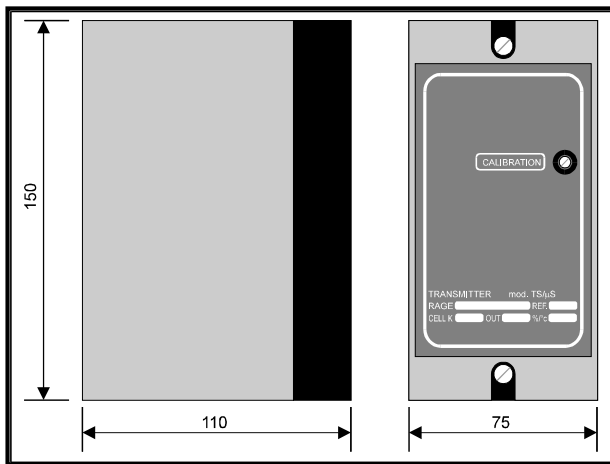
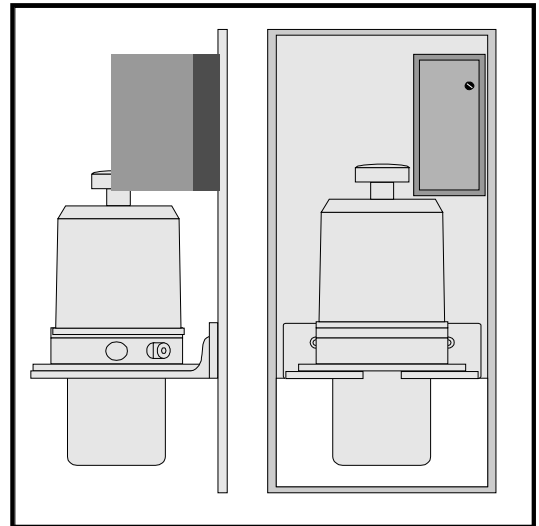
**Mod. TS/T** Transmitter for panel and rack mounting, IP 40

**Mod. TS/T- IP** Transmitter with IP 65 housing.

# TS / T

## TECHNICAL DATA

Available measuring ranges: ..... 0 2-20-200-2000 NTU  
 Output: ..... proportional 0/4-20 mA  
 Max.load: ..... 500  
 Input: ..... from turbidity sensor (various models)  
 Accuracy : ..... 0,5 % f.s.  
 Gain adjustment : ..... multiturn trimmer  
 Operating frequency: ..... 800 Hz  
 Maximum distance sensor/transmitter: ..... 50 m  
 Maximum distance transmitter to repeater : ..... 500 m  
 Operating temperature limits : ..... 5 to 45 °C  
 Storage temperature limits: ..... -30 to +60 °C  
 Power supply: ..... 24 Vac  
 Max.consumption: ..... 800 mA  
 RFI protection : ..... according to CE rules  
 Housing : ..... Polyamide 6.6 base, cover Polyst.  
 Dimensions: ..... 150 x 106 x 75 mm.  
 Weight: ..... 600 gr.



## Calibration

The transmitter is factory calibrated in conjunction with the proper cell and according to the desired measuring range. No calibration is required at start up. Should any measure check be required , proceed as follows :

- zero calibration : it is never required; the check for zero reading is performed through a sample with no suspended solids; if this is not available the sample can be filtered to obtain the zero solution. Should any zero adjustment be required consult Instruction Manual.
- pour into the cell (or immerse the cell) in a formazine solution with known and suitable concentration, let the measure stabilize then calibrate the sensitivity through the CALIBRATION trimmer on the front of the instrument.

## Order information

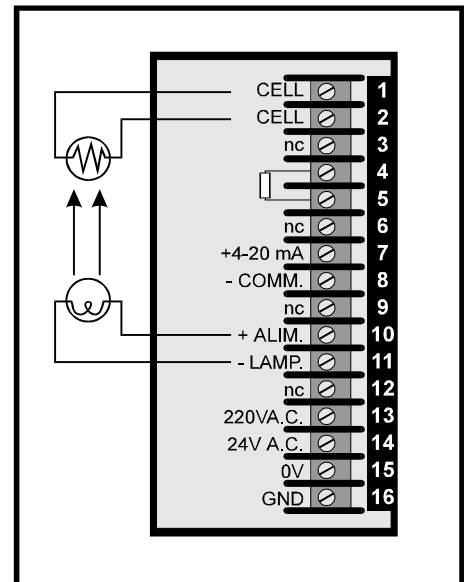
Mod. **TS / T** (see available versions) /

Measuring range	<b>1</b>	0-2 NTU	<b>2</b>	0-20 NTU
	<b>3</b>	0-200 NTU	<b>4</b>	0-2000 NTU
	<b>5</b>	other upon request		

## Ordering information : calibration solutions

### Mod. T/701

Formazine solutions, 1000 cc bottles, turbidity 4000 NTU, to be diluted for the preparation of desired calibration solution.



## P

Indicator/Transmitter/ Controller for pH, ORP, ISE, Conductivity, Turbidity, D.O.,  
Oxidising Substances and Reducing Substances

data sheet DS P.gb.63.4

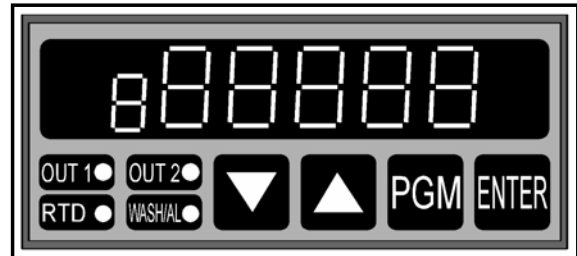
### SERIES P

Series P indicator/transmitter/controller is a group of microprocessor based instruments , fully programmable, suitable for panel mounting and in field installation.

The input signal conditioning pc board can be installed either inside the sensor or inside the transmitter.

Instrument configuration is easily performed via display and keyboard and calibration is automatic.

Measure and temperature are indicated on a 5 digit red LED display.



#### Applications:

- Chemical industry
- Pharmaceutical industry
- Food and beverage industry
- Water treatment plants

- 5 ½ digit display, 12,7 mm high**
- Input from sensors**
- Fully programmable**
- 4 20 mA or 0 10 V isolated output**
- 4 digital outputs, configurable**
- 2 digital inputs, configurable**
- Self diagnostic and sensor diagnostic capability**
- Automatic measure thermocompensation, through dedicated algorithms**
- Chemical sensor cleaning capability**
- Suitable for panel mounting and for outdoor mounting**

#### Description

Mod. P is a microprocessor based instrument for analysis of pH, ORP, ISE, Conductivity, Turbidity, Dissolved Oxygen, Oxidising Substances (as Chlorine, Chlorine Dioxide, Ozone, Peracetic Acid, Permanganate, Bromine), Reducing Substances (as Metabisulphite, sulphite, sulphur anhydride etc.).

It can be directly connected to the sensor of one of the a.m. parameters and to the pertinent temperature sensing element. The measure is compensated for temperature variations, displayed in engineering units and retransmitted on a 4 20 mA or 0 10 V analog output that can be freely associated to any interval inside the measuring range.

The instrument provides 4 digital outputs that can be configured as NC or NO via software and can be programmed as low alarm, high alarm, alarm with hysteresis or windows alarm.

The 4 digital outputs are from relays.

Two digital inputs are available, one for digital hold of the measure, and one for the input of an external alarm (e.g. level switch, temperature switch etc.)

The instrument is optionally available with cleaning sequence included: in this version it can drive the chemical cleaning of the sensor through a specific algorithm, with programmable timers, driving the detergent pump through R4 relay.

#### Realization

The instrument is sturdy and compact and is included into a plastic housing, 48 x 96 mm, suitable for panel mounting (protection degree IP54). The same instrument can also be supplied into an IP65 housing, suitable for in field installation.



**TECHNICAL DATA**

Housing for Mod. P□□T□□□, suitable for panel mounting: ..... IP 54 protection degree  
 .....Material: Noryl; Dimensions 48 x 96X100 mm. Installation space: 45 x 92 mm.  
 Housing Mod. P□□T□□□IP, suitable for outdoor installation:..... IP 65 protection degree  
 .....Material: ABS; Dimensions 185x130x115 mm.  
 Input signal:.....from sensor: pH, ORP, Conductivity, Turbidity, D.O., Cl<sub>2</sub>, ClO<sub>2</sub>, PAA, KMnO<sub>4</sub>, Br<sub>2</sub>  
 .....or other and from pertinent temperature sensor, Pt100.  
 Input signal conditioning pc board: ..... Mod. □□T□B□□□: integral to sensor;  
 ..... Mod. P□□T□A□□□: integral to transmitter  
 Digital inputs: ..... 2, from NPN static contact or from voltage free contact  
 ..... max.voltage 18 V; max. closure current 4 mA;  
 ..... I standard functionality mode: IN1 : Digital hold of reading (freezing);  
 ..... IN2: alarm from external equipment (level switch, pressure switch, temperature switch etc.).  
 .....If present, the alarm is locally indicated through LED "WASH/AL" flashing  
 Display: ..... red LED, h 12.5 mm, 5 digit and algebraic sign, programmable decimal point  
 ..... displayed range is selectable  
 Digital outputs: ..... 4 alarm setpoints, output from relays, SP, 3A – 250 V, resistive load.  
 ..... The alarms can be configured as low alarm, high alarm, window alarm, alarm with hysteresis.  
 ..... Each setpoint has programmable differential. R4 relay, in Mod. □□T□□2□□ instruments,  
 .....including cleaning sequence, is used to drive detergent dosing pump for sensor chemical cleaning  
 Analog output:.....proportional to analysis; can be selected among 4 20 mA and 0 10 V  
 ..... by choosing proper connection to terminal board.  
 ..... 4 20 mA: maximum load 500 ; 0 10 V: maximum load 1 k , maximum current 10 mA  
 .....Galvanic isolated outputs.; Accuracy: 0.01 %; Linearity: 0.0025 %  
 .....Output signal can be freely associated to any interval inside the measuring range

**Measuring range:**

pH	.....	-1.00	+15.00	pH	
pH (Sb)	.....	-1.00	+15.00	pH	
ORP	.....	- 2000	+2000	mV	
ISE	.....	- 2000	+2000	mV or 0÷9999 ppm	
Conductivity	.....	0.000	20.000 / 0.00	200.00 / 0.0	2000.0 S
	.....	0.000	20.000 / 0.00	200.00 / 0.0	2000.0 mS
Turbidity	.....	0.0	2000.0	NTU	
D.O.	.....	0.00	20.00	ppm	
Chlorine 602/I(E)	.....	0.0	2000.0 ppb / 0.00	10.00 ppm	
Chlorine 603/B	.....	0.0	2000.0 ppb / 0.00	10.00 ppm	
Oxidising Substances 603/L	.....	0.0	2000.0 ppb / 0.00	10.00 ppm	
Oxidising Substances 603/H	.....	0.0	2000.0 ppm		
Reducing substances 603/L 603/H	.....	0.0	2000.0 ppb / 0.00	10.00 ppm / 0.0	2000.0 ppm
Other	.....	-99999	+ 99999,	with selectable decimal point.	

Where required, sopecify desired measuring range at order.

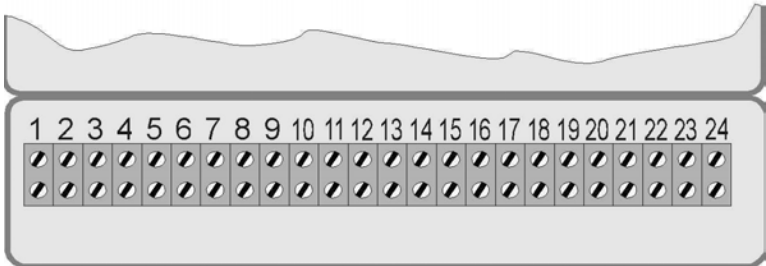
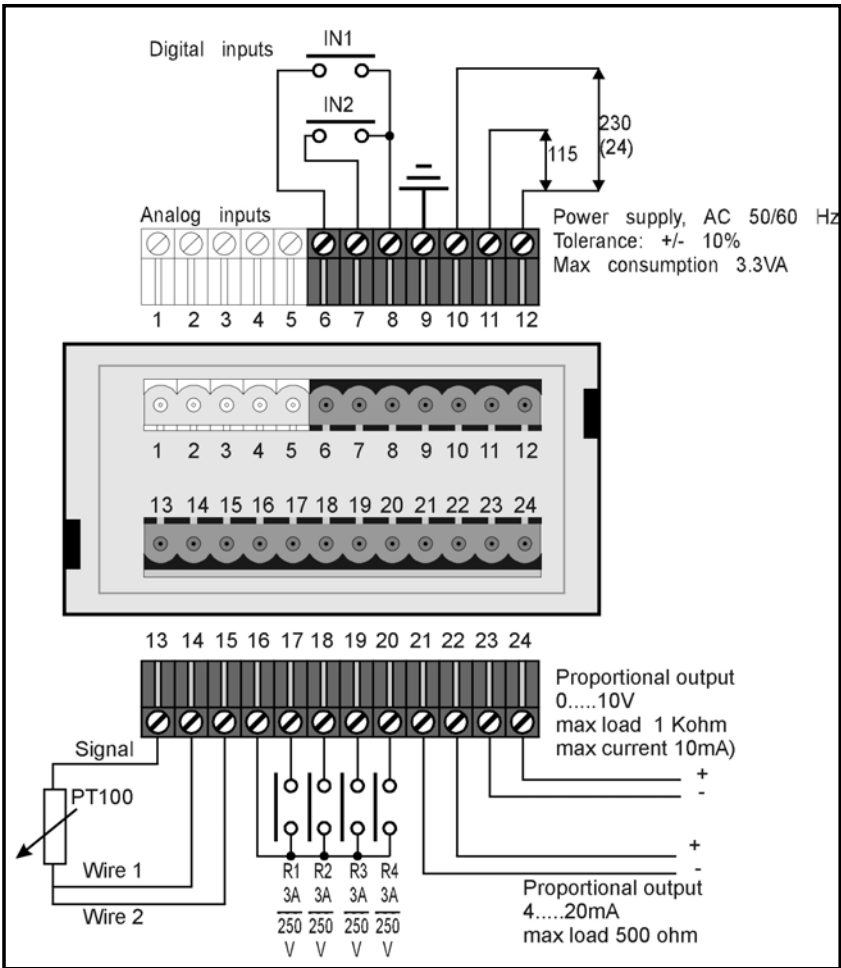
**Measure intervals associated to analog output:**

pH: ..... freely selectable inside the limits -1.00 and +15.00 pH  
 pH (Sb):..... freely selectable inside the limits-1.00 and +15.00 pH  
 ORP: .....freely selectable inside the limits - 2000 and +2000 mV  
 ISE: ..... freely selectable inside the limits - 2000 and +2000 mV or 0÷9999 ppm  
 Conductivity:..... freely selectable inside selected measuring range  
 ..... (0.000 20.000 / 0.00 200.00 / 0.0 2000.0 S; 0.000 20.000 / 0.00 200.00 / 0.0 2000.0 mS)  
 Turbidity: ..... freely selectable inside the limits 0.0 and 2000.0 NTU  
 D.O. .... freely selectable inside the limits 0.00 and 20.00 ppm  
 Cl<sub>2</sub> 602/I(E) .....freely selectable inside measuring range (0.0 2000.0 ppb, 0.00 10.00 ppm)  
 Cl<sub>2</sub> 603/B: .....freely selectable inside measuring range (0.0 2000.0 ppb, 0.00 10.00 ppm)  
 Oxidizing Substances, 603/L : ..... freely selectable inside  
 .....measuring range (0.0 2000.0 ppb, 0.00 10.00 ppm)  
 Oxidizing Substances, 603/H:..... freely selectable inside measuring range (0.0 2000.0 ppm)  
 Reducing Substances 603/L: ..... freely selectable inside  
 ..... measuring range (0.0 2000.0 ppb, 0.00 10.00 ppm or 0.0 2000.0 ppm)  
 Other: ..... freely selectable inside the limits -99999 e + 99999

Integration (smoothing): ..... programmable

P

Power supply: .....Mod. P00T10000 : 24 Vac, 10%, 50/60 Hz, maximum consumption 3.3 VA  
 .....Mod. P00T20000 : 115 Vac, 10%, 50/60 Hz, maximum consumption 3.3 VA  
 .....Mod. P00T30000 : 230 Vac, 10%, 50/60 Hz, maximum consumption 3.3 VA  
 Data storage: ..... E<sup>2</sup>prom stores data also during power shut off  
 CE compliance:..... according to pertinent rules (93/68CEE – electromagnetic compatibility; low voltage)  
 Electrical classification:..... for safe area installation  
 Ambient temperature limits during operation:..... 0 50 °C  
 Storage temperature limits:..... 0 60 °C



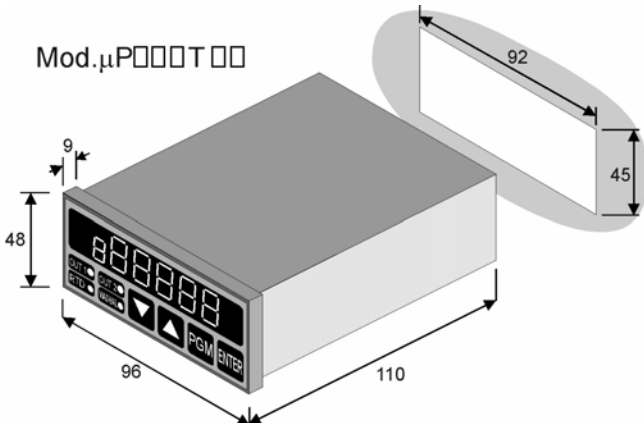
**Terminal board for µP in waterproof version**

P

**Available versions**

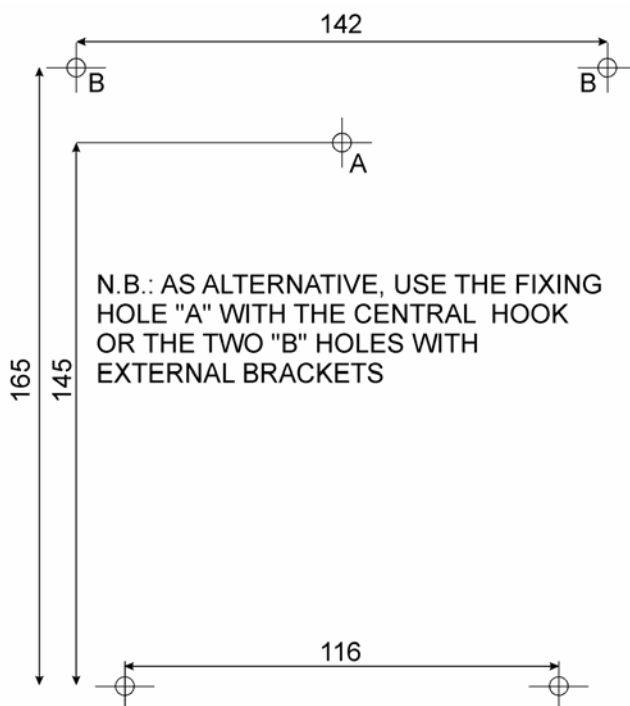
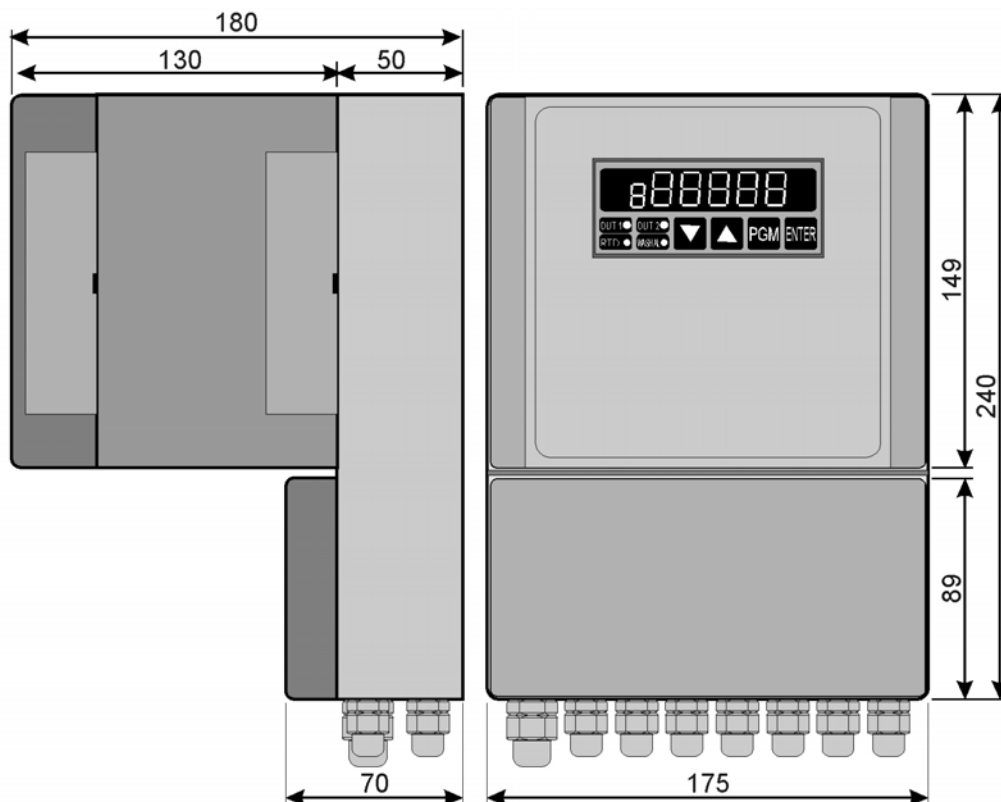
	P	□□	T	□	□	□	□□
<b>Microprocessor transmitter</b>	P						
<b>Measurement parameter</b>							
pH		01					
pH (Sb)		02					
ORP		03					
Conductivity		04					
Turbidity		05					
Dissolved Oxygen 332/I, 332/P		06					
Chlorine 602/E3		07					
Chlorine dioxide 602/E3		08					
Ozone 602/E3		09					
Peracetic Acid 602/E3		10					
Permanganate 602/E3		11					
Bromine 602/E3		12					
Chlorine 602/I(E)		13					
Dissolved Oxygen 332/Pb		21					
Chlorine, 603/B, 603/L, 603/H		22					
Chlorine dioxide 603/L 603/H		23					
Ozone 603/L 603/H		24					
Peracetic acid 603/L 603/H		25					
Permanganate 603/L		26					
Bromine 603/L 603/H		27					
Oxidizing Power 603/L 603/H		28					
ISE		30					
Metabisulphite 603/L		33					
Hydrogen Peroxide 603/L 603/H		40					
Other		99					
<b>Transmitter, fixed parameter</b>			T				
<b>Power supply</b>							
24 VAC 50/60 Hz					1		
115 VAC, 50/60 Hz					2		
230 VAC, 50/60 Hz					3		
<b>Signal conditioning board</b>							
In the transmitter						A	
In the sensor						B	
<b>Cleaning sequence</b>							
Not included							1
Included							2
<b>Housing</b>							
IP 54 for board assembling							--
IP 65 for field installation							IP

NOTE: specify at order the desired parameter and measuring range.



**Mounting and outline dimensios,**

Mounting and outline dimensions, in-field installation version



**Sede e armazém:**  
Rua Particular de São Gemil, 85  
São Gemil - Águas Santas - Maia - 4425-164 ÁGUAS SANTAS MAI  
telef. 229 724 550 - telefax 229 724 551  
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www.sistimetra.pt



**Sede:**  
Rua Braamcamp, 88-4º Dtº  
1269-020 LISBOA - tel. 213 860 500 - fax 213 864 027  
e-mail arcondicionado@contimetra.com - www.contimetra.com

**Armazém:**  
Rua do Proletariado, nº15-B r/c  
Portela de Carnaxide - 2790-138 CARNAXIDE telef. 21 416 11 12

# AZTEC™

## On-line Water Quality Instruments Series 1000

The Instrumentation Division of Severn Trent Services, based in Didcot, UK, specialises in the design, manufacture and support of a wide range of Water Quality Monitors supplied to the UK Water Utilities, to industrial water users, and to the export market.

Over the last 20 years the Aztec products have built up a reference base of over 1000 installations of on-line Water Quality Monitors operating across a variety of clean water, waste water and trade effluent applications in the UK alone.



### WATER QUALITY MONITORS

The AZTEC range is based on colorimetric, ion selective electrode and optical density methods of measurement, providing a comprehensive range of solutions to meet the most stringent applications.

### COLORIMETRIC

Our SERIES 1000 monitor range can be configured to any of the following parameters:

- ◆ Iron
- ◆ Aluminium
- ◆ Manganese
- ◆ Manganese Low Range
- ◆ Phosphate
- ◆ Ammonia
- ◆ Colour
- ◆ Colour/Turbidity
- ◆ Nitrite
- ◆ Silica

### ION SELECTIVE ELECTRODE

Our SERIES 1000 monitor range can be configured to any of the following parameters:

- ◆ Ammonia
- ◆ Fluoride
- ◆ Nitrate

### REAGENTS, BUFFERS AND STANDARDS

We produce high quality reagents, buffers and calibration solutions for all the leading makes of water quality analysers.

We supply to all the major Water Utilities and an increasing number of industries where this type of instrumentation is used.



### AUTOMATIC COAGULATION CONTROL SYSTEMS

With over 50 installations in the UK, Aztec has established a reputation of being a world leader in automatic coagulation control systems. The 'Aztec AC' system is based on a series of measurements throughout the water treatment process combined with a control algorithm (a result of 25 years practical on-site research and development).

The AC System range can be applied to any surface water to optimise coagulant dose rate, flocculation properties, clarification performance, filterability and filter run times, offering the potential for substantial improvements in plant performance and costs.

**Severn Trent Services**  
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Southmead Industrial Park  
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Tel: + 44 (0)1235 512000  
Fax: +44 (0)1235 512020  
e-mail: salesenq@severntrentservices.co.uk

**SEVERN  
TRENT  
SERVICES**

Visit us at [www.severntrentservices.com](http://www.severntrentservices.com)



# Aztec AL1000 on-line Aluminium Monitor

Part of the Aztec S1000 range of colorimetric water quality monitors, the AL1000 provides highly accurate, robust and low maintenance performance on surface and treated waters, municipal waste and industrial waste waters.

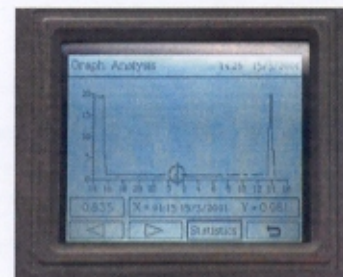
Following on from the Aztec RC100 monitor, which became the benchmark Aluminium monitor in the UK, the AL1000 combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston. This is particularly important when measuring surface raw waters and flotation waters where optical contamination can be a real issue without stringent cleaning.



The performance of the AL1000 on surface and floated water samples is further enhanced by the initiation of an acid digestion cycle. An acid reagent is introduced with the sample and heated in the temperature controlled optical measurement cell. This helps to hydrolyse any aluminium which is in suspension. This is particularly critical on floated waters containing floc particles, providing a much more accurate measurement whilst minimising the possibility of floc entrapment.

On multi-stream applications, the monitor rinses the optical cell twice with the next sample before measurement. This is critical in ensuring against cross contamination where there are great differences in the aluminium levels present in the samples being measured.



Data Trending Screen



Operator Help Screen

## Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

Visit us at [www.severntrentservices.com](http://www.severntrentservices.com)

SEVERN  
TRENT  
SERVICES



# Specification

## AZTEC AI1000 on-line Aluminium Monitor

### General

**Quality Standards:**  
ISO 9001 Manufacturing Company

**Compliance:**  
Fully CE compliant

**Instrument Range:**  
Auto Ranging 0-2mg/l

**Accuracy:**  
± 5 to ± 100 µg/l through range

**Resolution:**  
4 digit floating point display

**Method:**  
Pyrocatechol Violet

**Ambient Temperature:**  
0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**  
Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**  
28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**  
Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**  
Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**  
UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**  
Continuous, 20-500 ml/min

**Sample Temperature:**  
0°C – 40°C (32°F -104°F)

**Sample Pressure:**  
5 psi maximum

**Sample Quality:**  
Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**  
Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**  
85 Watts.

**Output Signal:**  
Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**  
Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**  
RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**  
Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**  
NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**  
Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¼" BSP elbow (imperial adaptors available)

**Shipping Weight:**  
21 kg (46 lbs.)

**Dimensions:**  
485 mm x 660 mm x 205 mm (19" x 26" x 8")

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Web: www.severntrentservices.com

Severn Trent Water Purification Ltd  
Registered in England & Wales Registration No. 1254271  
Registered Office: 2297 Coventry Road, Birmingham B26 3PU

The Aztec Series 1000 range includes monitors for Aluminium, Iron, Manganese, Phosphate, Colour, Ammonia, Nitrate, Nitrite, Fluoride & Silica



# Aztec Am1000 on-line

## Ammonia Monitor

Part of the Aztec S1000 range of colorimetric water quality monitors, the Am1000 provides highly accurate, robust and low maintenance performance on surface and treated waters, municipal waste and industrial waste waters

The Aztec Am1000 combines the latest generation optical measurement and fluid handling systems with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston.

This is particularly important when measuring raw surface waters and waste waters where optical contamination can be a real issue without stringent automatic cleaning.

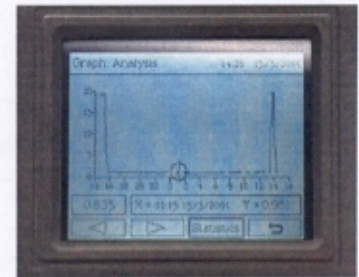
The salicylate method for the colorimetric measurement of ammonia used by the Am1000 is temperature critical.



The Am1000 overcomes this by heating and temperature controlling the optical measurement cell at all times. This significantly enhances the accuracy of the measurement when the ambient temperature is low, ensuring the readings do not depend on the weather or season.

The performance of the Am1000 on waste water and river water samples in particular, is further enhanced by initiating a menu selectable chemical rinse. This draws a biocide solution into the optical measurement cell, pumps the solution through the sample line and then re-introduces it before pumping to waste. This significantly reduces biological contamination throughout the fluid handling system, often eliminating the need for sample filtration.

The Am1000 is designed to provide very high levels of accuracy at low level measurements. Whilst not having the high end measurement range of the ion selective electrode method, the colorimetric method is significantly more accurate and stable at sub ppm levels. This makes it ideal in particular, for most W.T.W intake protection applications.



Data Trending Screen



Operator Help Screen

### Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 4 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC Am1000 on-line Ammonia Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-6 mg/l as NH<sub>3</sub> (0-5mg/l as NH<sub>3</sub>-N)

**Accuracy:**

± 2 to ± 100 µg/l through range

**Resolution:**

4 digit floating point display

**Method:**

Salicylate

**Ambient Temperature:**

0°C – 40°C (32°F - 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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The Aztec Series 1000 range includes monitors for Aluminium, Iron, Manganese, Phosphate, Colour, Ammonia, Nitrate, Nitrite, Fluoride & Silica



# Aztec C1000 on-line Colour Monitor

Part of the Aztec S1000 range of water quality monitors, the C1000 provides highly accurate, robust and low maintenance performance on surface and treated waters, municipal and industrial waste waters.

The Aztec C1000 combines the latest generation optical measurement and fluid handling systems with a highly powerful, four button user interface.

A single piston pump provides the fluid handling for routine measurement, two point calibration and disposal. This is stepper motor controlled for repeatability and precision and has the added benefit of cleaning the optical cell on every movement of the piston.

The C1000 has been robustly designed to operate accurately and reliably without the need for manual cleaning and routine maintenance. It is a batch measurement system providing up to 12 determinations per hour.

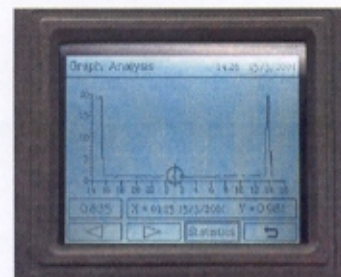


Raw surface waters, floated waters and manganese rich waters are particularly challenging for colour monitors given that no reagents are involved in the actual measurement, often leading to rapid fouling of the optical system.

In such applications the C1000 overcomes this, partly by the piston wiping action on the optical cell, but also by enabling an acid or alkali rinse function to be initiated. This can be programmed to a range of frequencies, drawing a solution (customised to the sample properties) into the optical measurement cell, pumping the solution through the sample line and then re-introducing it before pumping to waste.

This feature maintains the cleanliness of the optical measurement cell, obviating the need for sample filtration in such applications.

Where true colour measurement is required, the sample is filtered through as 0.45 micron membrane filter to remove all suspended matter. This is available as an optional extra.



Data Trending Screen



Operator Help Screen

## Key Features Include:

- ◆ 12 - 18 month maintenance interval, no servicing or spares required whatsoever during this period.
- ◆ Minimised ownership costs as a result of spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Intensity controlled LED optical measurement system, highly stable and accurate.

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# Specification

## AZTEC C1000 on-line Colour Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-500° Hazen Colour

**Accuracy:**

+/- 1° Hazen to +/- 20° Hazen through range

**Sampling:**

1-12 samples per hour

**Resolution:**

4 digit floating point display

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

**Colour**—Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/ week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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# Aztec CT1000 on-line

## Colour and Turbidity Monitor

Part of the Aztec S1000 range of water quality monitors, the CT1000 provides highly accurate, robust and low maintenance performance on surface, treated and industrial process waters.

The Aztec CT1000 combines the latest generation optical measurement and fluid handling systems with a highly powerful, four button user interface.

A single piston pump provides the fluid handling for routine measurement, two point calibration and disposal. This is stepper motor controlled for repeatability and precision and has the added benefit of cleaning the optical cell on every movement of the piston.

The CT1000 has been robustly designed to operate accurately and reliably without the need for manual cleaning and routine maintenance. It is a batch measurement system providing up to 12 determinations per hour.

Used for both process monitoring and as part of the Aztec AC1000 coagulation control system, the

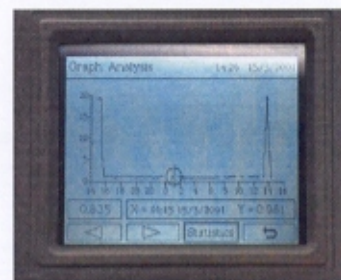


CT1000 uses a single detector and two LED light sources, one at 180° for the colour reading and one at 90° for the nephelometric turbidity reading.

When used as part of the AC1000 system, a strip paper filter is used on the raw water sample. The filtered sample is then measured and the colour reading is corrected for residual turbidity to provide an active colloidal colour reading. In all other applications, independent colour and turbidity readings are available on up to three streams of measurement.

Calibration of the turbidity measurement is simply performed by introducing a turbidity standard and selecting the turbidity calibration function.

A chemical rinse can be automatically activated, enabling the CT1000 to measure unfiltered surface and flocculated waters with high fouling properties, eliminating the need for manual cleaning of the optics and maintaining consistent accuracy.



Data Trending Screen



Operator Help Screen

### Key Features Include:

- ◆ Can be upgraded to a full automatic coagulation control system.
- ◆ 12 - 18 month maintenance interval, no servicing or spares required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Intensity controlled LED optical measurement system, highly stable and accurate.

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# Specification

## AZTEC CT1000 on-line Colour & Turbidity Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-500° Hazen Colour

Auto Ranging 0-100 NTU Turbidity

**Accuracy:**

+/- 1° Hazen to +/- 20° Hazen through range

+/- 0.2 NTU to +/- 5 NTU through range

**Sampling:**

1-12 samples per hour

**Resolution:**

4 digit floating point display

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

**Colour**—Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Turbidity**—Manual by introducing formazin standard

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer.

Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow

Overflow: 10mm O.D pushfit x ¾" BSP elbow (imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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The Aztec Series 1000 range includes monitors for Aluminium, Iron, Manganese, Phosphate, Colour, Ammonia, Nitrate, Nitrite, Fluoride & Silica

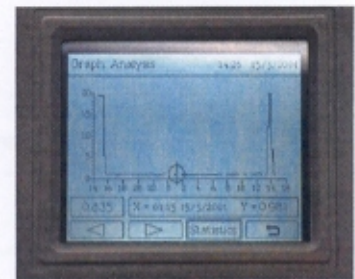


# Aztec Fe1000 on-line Iron Monitor

Part of the Aztec S1000 range of colorimetric water quality monitors, the Fe1000 provides highly accurate, robust and low maintenance performance on surface and treated waters, municipal waste and industrial waste waters.

Following on from the Aztec RC100 monitor, which became the benchmark iron monitor in the UK, the Fe1000 combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston. This is particularly important when measuring surface raw waters and flotation waters where optical contamination can be a real issue without stringent automatic cleaning.



Data Trending Screen



Operator Help Screen

The performance of the Fe1000 on surface and floated water samples is further enhanced by the initiation of an acid digestion cycle. An acid reagent is introduced with the sample and heated in the temperature controlled optical measurement cell. This helps to hydrolyse any iron which is in suspension. This is particularly critical on floated waters containing floc particles, providing a much more accurate measurement whilst minimising the possibility of floc entrapment.

On multi-stream applications, the monitor rinses the optical cell twice with the next sample before measurement. This is critical in ensuring against cross contamination where there are great differences in the iron levels present in the samples being measured.

## Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC Fe1000 on-line Iron Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-10mg/l

**Accuracy:**

± 5 to ± 200 µg/l through range

**Resolution:**

4 digit floating point display

**Method:**

TPTZ

**Ambient Temperature:**

0°C – 60°C (32°F- 140°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream – Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ⅜" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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The Aztec Series 1000 range includes monitors for Aluminium, Iron, Manganese, Phosphate, Colour, Ammonia, Nitrate, Nitrite, Fluoride & Silica

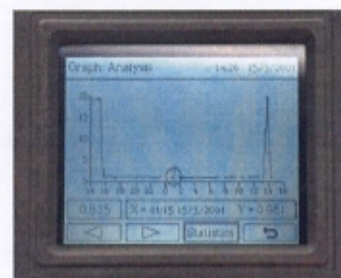


# Aztec Mn1000 on-line Manganese Monitor

Part of the Aztec S1000 range of water quality monitors, the Mn1000 provides highly accurate, robust and low maintenance performance on ground and surface waters, treated waters, and industrial waste waters.

Following on from the Aztec M100 monitor, the Mn1000 combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston. This is particularly important when measuring surface raw waters and flotation waters where optical contamination can be a real issue without stringent automatic cleaning.



Data Trending Screen



Operator Help Screen

The performance of the Mn1000 on surface and final water samples is further enhanced by the addition of an iron suppresser. A complexing reagent is introduced after the sample and heated in the temperature controlled optical measurement cell. This helps to remove any iron which can interfere with manganese determinations. This is particularly critical in waters where the allowable concentration is low and absolute accuracy is required.

On multi-stream applications, the monitor rinses the optical cell twice with the next sample before measurement. This is critical in ensuring against cross contamination where there are great differences in the manganese levels present in the samples being measured.

## Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC Mn1000 on-line Manganese Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-5000 µg/l

**Accuracy:**

± 10 to ± 200 µg/l through range

**Resolution:**

4 digit floating point display

**Method:**

Formaldehyde

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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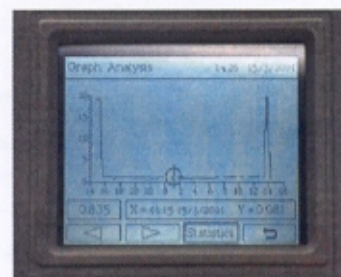
# Aztec Mn1000 on-line

## Manganese Monitor (Low Range)

Part of the Aztec S1000 range of colorimetric water quality monitors, the Mn1000 (Low Range) provides highly accurate, robust and low maintenance performance on ground and surface waters, treated waters, and industrial waste waters.

The Mn1000 (Low Range) instrument combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston. This is particularly important when measuring surface raw waters and flotation waters where optical contamination can be a real issue without stringent automatic cleaning.



Data Trending Screen



Operator Help Screen

The Mn1000 (Low Range) has been developed for applications where the measurement of ultra low level manganese concentrations are critical. Using an adaptation of the proven 'Leucomalachite Green' chemistry the instrument offers maximum sensitivity in the low ppb range whilst still maintaining a low cost of ownership.

On multi-stream applications, the monitor rinses the optical cell twice with the next sample before measurement. This is critical in ensuring against cross contamination where there are great differences in the manganese levels present in the samples being measured.

### Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC Mn1000 on-line Manganese Monitor (Low Range)

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-500 µg/l

**Accuracy:**

± 2 to ± 50 µg/l through range

**Resolution:**

4 digit floating point display

**Method:**

Leucomalachite Green

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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The Aztec Series 1000 range includes monitors for Aluminium, Iron, Manganese, Phosphate, Colour, Ammonia, Nitrate, Nitrite, Fluoride & Silica



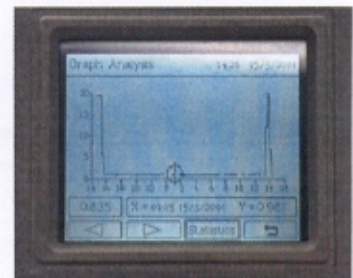
# Aztec Nt1000 on-line Nitrite Monitor

Part of the Aztec S1000 range of water quality monitors, the Nt1000 provides highly accurate, robust and low maintenance performance on treated, waste and industrial process waters.

The Aztec Nt1000 combines the latest generation optical measurement and fluid handling systems with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston.

The performance of the Nt1000 on waste water samples in particular, is further enhanced by initiating a menu selectable chemical rinse. This draws a biocide solution into the optical measurement cell, pumps the solution through the sample line and then re-introduces it before pumping to waste. This significantly reduces biological contamination throughout the fluid handling system, often eliminating the need for sample filtration.



Data Trending Screen



Operator Help Screen

On-line measurement of Nitrite is an emerging application in the Utilities and Industrial sectors, used to maximise energy efficiency and process quality.

## Typical applications include:

- Aerobic waste water treatment processes where ammonia is converted to Nitrite prior to Nitrate.
- Anaerobic processes due to bacterial reduction of nitrates to nitrites
- Where Nitrites are used as corrosion inhibitors in process waters and cooling towers.
- Where Nitrites are used as preservatives in the food industry.
- Aerobic processes where ammonia is converted to nitrite in large clean water storage facilities

## Key Features Include:

- Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- User interface screens, including comprehensive data trending, fault diagnostics etc.
- Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- Interchangeable between up to 8 different parameters
- Remote communications facility

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# Specification

## AZTEC Nt1000 on-line Nitrite Monitor

### General

**Quality Standards:**  
ISO 9001 Manufacturing Company

**Compliance:**  
Fully CE compliant

**Instrument Range:**  
Auto Ranging 0-3.5 mg/l as NO<sub>2</sub> (0-1.1 mg/l as NO<sub>2</sub>-N)

**Accuracy:**  
± 5 to ± 50 µg/l through range

**Resolution:**  
4 digit floating point display

**Method:**  
NEDD

**Ambient Temperature:**  
0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**  
Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**  
28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**  
Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**  
Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**  
UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**  
Continuous, 20-500 ml/min

**Sample Temperature:**  
0°C – 40°C (32°F -104°F)

**Sample Pressure:**  
5 psi maximum

**Sample Quality:**  
Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**  
Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**  
85 Watts.

**Output Signal:**  
Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**  
Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**  
RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**  
Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**  
NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**  
Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow (imperial adaptors available)

**Shipping Weight:**  
21 kg (46 lbs.)

**Dimensions:**  
485 mm x 660 mm x 205 mm (19" x 26" x 8")

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# Aztec P1000 on-line Phosphate Monitor

Part of the Aztec S1000 range of colorimetric water quality monitors, the P1000 provides highly accurate, robust and low maintenance performance on surface and treated waters, municipal waste and industrial waste waters.

There are increasing demands to measure phosphate on line in both the utilities clean and waste water sectors.

The Aztec P1000 combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston. This is particularly important when measuring waste waters where optical contamination can be a real issue without stringent automatic cleaning.



Data Trending Screen



Operator Help Screen

The standard method for measuring phosphate is temperature critical. The P1000 overcomes this by heating and temperature controlling the optical measurement cell at all times. This significantly enhances the accuracy of the measurement when the ambient temperature is low, ensuring the readings do not depend on the weather or season.

The performance of the P1000 on waste water samples in particular, is further enhanced by initiating a menu selectable chemical rinse. This draws a biocide solution into the optical measurement cell, pumps the solution through the sample line and then re-introduces it before pumping to waste. This significantly reduces biological contamination throughout the fluid handling system, often eliminating the need for sample filtration.

The P1000 has become highly established on clean water applications such as residual  $PO_4$ -P or  $PO_4$  monitoring for plumbosolvency systems, offering the highest levels of accuracy and reliability for both compliance monitoring and direct process control.

## Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 4 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC P1000 on-line Phosphate Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0-50mg/l as PO<sub>4</sub>  
(0-16mg/l as PO<sub>4</sub>-P)

**Accuracy:**

± 0.05 to ± 2 mg/l through range

**Resolution:**

4 digit floating point display

**Method:**

Molybdate blue

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**

Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**

Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")



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# Aztec Si1000 on-line Silica Monitor

Part of the Aztec S1000 range of colorimetric water quality monitors, the Si1000 provides highly accurate, robust and low maintenance performance on Industrial process waters where the measurement of trace silica levels is critical.

The Aztec Si1000 combines the latest generation optical measurement and fluid handling system with a highly powerful, four button user interface.

A single piston pump provides all the sample and chemical fluid handling for measurement, mixing and disposal. This is stepper motor controlled for repeatability and precision. This 'motorised syringe' approach has the added benefit of cleaning the optical cell on every movement of the piston.

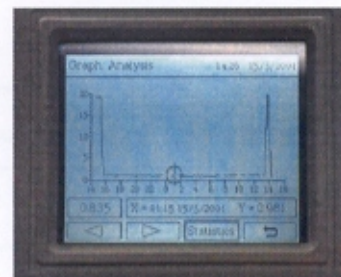
These monitors are controlled by an advanced microprocessor based system and operated via a graphical user interface with extensive data logging, diagnostic and trouble-shooting capabilities.



A discrete sample of water from the side sample pot is collected under vacuum by the piston pump into the optical cell area at intervals of 15 to 60 minutes determined by the user.

The transmission of light through the sample is measured (to remove the actual background colour and turbidity affects). Reagents, (based on the standard molybdenum blue method for silica) are added and mixed by the introduction of air bubbles and over a period of time, colour development in the sample will occur.

The light transmission is measured and the background value subtracted. The remaining light level is converted by the computer into a concentration value, using the value from the previously performed calibration.



Data Trending Screen



Operator Help Screen

## Key Features Include:

- ◆ Low reagent consumption – less than 3mls per determination. Rate of determination can be selected from 6 to 1 per hour.
- ◆ 12 - 18 month maintenance interval, no servicing required whatsoever during this period.
- ◆ Minimised ownership costs as a result of low reagent, spares and maintenance requirements.
- ◆ User interface screens, including comprehensive data trending, fault diagnostics etc.
- ◆ Temperature controlled LED optical measurement system, highly stable, accurate and virtually no consumable parts.
- ◆ Interchangeable between up to 8 different parameters
- ◆ Remote communications facility

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# Specification

## AZTEC Si1000 on-line Silica Monitor

### General

**Quality Standards:**  
ISO 9001 Manufacturing Company

**Compliance:**  
Fully CE compliant

**Instrument Range:**  
Auto Ranging 0-5000 µg/l

**Accuracy:**  
± 2 to ± 50 µg/l through range

**Resolution:**  
4 digit floating point display

**Method:**  
Molybdate Blue

**Ambient Temperature:**  
0°C – 40°C (32°F– 104°F)

**Automatic-Calibration:**  
Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Data Logging:**  
28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Number of Streams:**  
Single or up to 3 streams. Sequencing is programmable.

**Self Cleaning:**  
Programmable automatic acid/alkali/biocide rinsing facility. Piston cleaned optics on each measurement.

**Languages:**  
UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**  
Continuous, 20-500 ml/min

**Sample Temperature:**  
0°C – 40°C (32°F -104°F)

**Sample Pressure:**  
5 psi maximum

**Sample Quality:**  
Can operate directly on surface raw waters and final effluents without filtration. A sample settlement pot is recommended where large particles are present in the supply.

### Electrical

**Power Requirements:**  
Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**  
85 Watts.

**Output Signal:**  
Per stream - Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum. Optional extra output signals are available.

**Relay Contacts:**  
Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**  
RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**  
Wireless modem and digital network communications enabling remote interrogation and control of all software menus. Uses RS232 port in operation.

### Instrument Data

**Electronics Enclosure:**  
NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**  
Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow (imperial adaptors available)

**Shipping Weight:**  
21 kg (46 lbs.)

**Dimensions:**  
485 mm x 660 mm x 205 mm (19" x 26" x 8")

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# Aztec A1000 on-line

## Ammonia Monitor

Part of the Aztec S1000 range of ion selective electrode water quality monitors, the A1000 provides highly accurate, robust and low maintenance performance on treated, process and waste waters in municipal and industrial applications.

### Principle of operation

A single peristaltic pump provides all fluid and chemical handling. This draws in precise quantities of sample from the process and buffer from a container. The sample and buffer are combined directly after the pump and passed through the coils of the heat exchanger to raise the temperature and provide further mixing.

The conditioned sample travels up into the electrode block and is presented to the ammonia electrode. The output of the electrode is converted, by the microprocessor, to indicate the direct ammonia concentration in ppm, mg/l, ppb, or mg/l. Finally, the sample flows to waste.

During automatic calibration, the sample supply is isolated and the calibration standards presented to the electrode by sequencing of the pinch valves.



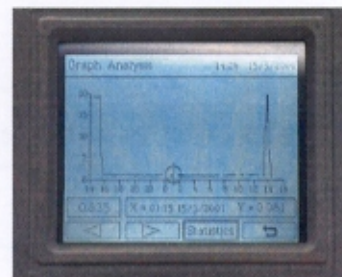
### Design Features

#### Sample Conditioning System:

Pre-conditioning of the sample with the addition of a pre-mixed Sodium Hydroxide and EDTA buffer raises the pH of the sample to the point where ammonia gas is liberated. The gas is measured by diffusion across a PTFE membrane at the probe end. The temperature control system for the sample and electrode is provided by an efficient mechanical heat exchanger.

**Fluid Handling:** The entire fluid handling system has been simplified to two pinch valves, a single pump, heater block and an electrode flow cell containing the probe. All these items are all easily accessible without tools, enabling simple cleaning and replacement, as and when required.

**User Interface:** Comprehensive and easy to use via a four button menu driven control panel. This includes data trending graphs, live operating status and diagrammatic diagnostic screens.



Data Trending



Electrode cell and heater



Easy tube replacement

#### Optional Remote

**Communications:** The instrument can be remotely interrogated and controlled via a wireless modem using internet technology. This enables the user to perform any task in the same way as operating the monitor from its control panel.

Please see our separate Aztec On-line data sheet which describes this option in detail.

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# Specification

## AZTEC A1000 on-line Ammonia Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0.05-1000 mg/l as NH<sub>3</sub> or NH<sub>3</sub>-N

**Accuracy:**

± 0.05 to ± 50 mg/l through range

**Resolution:**

4 digit floating point display

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Response:**

Ninety (90)% step change within 5 minutes.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Quality:**

Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration.

**Reagent Consumption:**

2.5 litres/week buffer, 50ml (per calibration) each calibration solution. Equates to changing the buffer and calibration standards on a monthly basis.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. RS232 functions not available.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow

Overflow: 10mm O.D pushfit x ¾" BSP elbow (imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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# Aztec F1000 on-line Fluoride Monitor

Part of the Aztec S1000 range of ion selective electrode water quality monitors, the F1000 provides highly accurate, robust and low maintenance performance on municipal fluoridation process waters and industrial process and waste waters

## Principle of operation

A single peristaltic pump provides all fluid and chemical handling. This draws in precise quantities of sample from the process and buffer from a container. The sample and buffer are combined directly after the pump and passed through the coils of the heat exchanger to raise the temperature and provide further mixing.

The conditioned sample travels up into the electrode block and is presented to the fluoride electrode. The output of the electrode is converted, by the microprocessor, to indicate the direct fluoride concentration in ppm, mg/l, ppb, or mg/l. Finally, the sample flows to waste.

During automatic calibration, the sample supply is isolated and the calibration standards presented to the electrode by sequencing of the pinch valves.

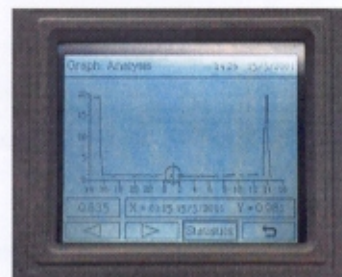


## Design Features

**Sample Conditioning System:** Pre-conditioning of the sample with the addition of a total ionisation buffer fixes the ionic strength of the sample for stable accurate fluoride measurement. The temperature control system for the sample and electrode is provided by an efficient mechanical heat exchanger.

**Fluid Handling:** The entire fluid handling system has been simplified to two pinch valves, a single pump, heater block and an electrode flow cell containing the probe. All these items are all easily accessible without tools, enabling simple cleaning and replacement, as and when required.

**User Interface:** Comprehensive and easy to use via a four button menu driven control panel. This includes data trending graphs, live operating status and diagrammatic diagnostic screens.



Data Trending



Electrode cell and heater



Easy tube replacement

## Optional Remote

**Communications:** The instrument can be remotely interrogated and controlled via a wireless modem using internet technology. This enables the user to perform any task in the same way as operating the monitor from its control panel.

Please see our separate Aztec On-line data sheet which describes this option in detail.

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# Specification

## AZTEC F1000 on-line Fluoride Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0.05 to 100 mg/l as F<sup>-</sup>

**Accuracy:**

± 0.02 to ± 5 mg/l through range

**Resolution:**

4 digit floating point display

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Response:**

Ninety (90)% step change within 5 minutes.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum.

**Sample Quality:**

Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration.

**Reagent Consumption:**

2.5 litres/week buffer, 50ml (per calibration) each calibration solution. Equates to changing the buffer and calibration standards on a monthly basis.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. RS232 functions not available.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow (imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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Severn Trent Water Purification Ltd  
Registered in England & Wales Registration No. 1254271  
Registered Office: 2297 Coventry Road, Birmingham B26 3PU

The Aztec Series 1000 range includes monitors for Aluminium, Ammonia, Colour, Fluoride, Iron, Manganese, Phosphate, Nitrate, Nitrite & Silica



# Aztec N1000 on-line Nitrate Monitor

Part of the Aztec S1000 range of ion selective electrode water quality monitors, the N1000 provides highly accurate, robust and low maintenance performance on municipal and industrial process and waste waters

## Principle of operation

A single peristaltic pump provides all fluid and chemical handling. This draws in precise quantities of sample from the process and buffer from a container. The sample and buffer are combined directly after the pump and passed through the coils of the heat exchanger to raise the temperature and provide further mixing.

The conditioned sample travels up into the electrode block and is presented to the nitrate electrode. The output of the electrode is converted, by the microprocessor, to indicate the direct nitrate concentration in ppm, mg/l, ppb, or mg/l. Finally, the sample flows to waste.

During automatic calibration, the sample supply is isolated and the calibration standards presented to the electrode by sequencing of the pinch valves.

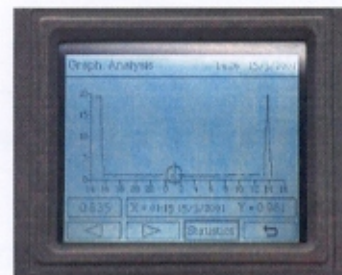


## Design Features

**Sample Conditioning System:** Pre-conditioning of the sample with the addition of a total ionisation buffer fixes the ionic strength of the sample for stable accurate nitrate measurement. The temperature control system for the sample and electrode is provided by an efficient mechanical heat exchanger.

**Fluid Handling:** The entire fluid handling system has been simplified to two pinch valves, a single pump, heater block and an electrode flow cell containing the probe. All these items are all easily accessible without tools, enabling simple cleaning and replacement, as and when required.

**User Interface:** Comprehensive and easy to use via a four button menu driven control panel. This includes data trending graphs, live operating status and diagrammatic diagnostic screens.



Data Trending



Electrode cell and heater



Easy tube replacement

## Optional Remote

**Communications:** The instrument can be remotely interrogated and controlled via a wireless modem using internet technology. This enables the user to perform any task in the same way as operating the monitor from its control panel.

Please see our separate Aztec On-line data sheet which describes this option in detail.

Visit us at [www.severntrentservices.com](http://www.severntrentservices.com)

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SERVICES



# Specification

## AZTEC N1000 on-line Nitrate Monitor

### General

**Quality Standards:**

ISO 9001 Manufacturing Company

**Compliance:**

Fully CE compliant

**Instrument Range:**

Auto Ranging 0.05 to 1000 mg/l as NO<sub>3</sub>

**Accuracy:**

± 0.05 to ± 50 mg/l through range

**Resolution:**

4 digit floating point display

**Ambient Temperature:**

0°C – 40°C (32°F- 104°F)

**Automatic-Calibration:**

Two point, automatic calibration, with optional manual initiation. Selectable from 4 times/day to once/week.

**Response:**

Ninety (90)% step change within 5 minutes.

**Data Logging:**

28 days (4 hourly), 7 days (hourly) or 24 hours (5 minutes).

**Languages:**

UK English, US English, Spanish and Italian. For other languages, consult Severn Trent Services.

### Sample Data

**Sample Flow:**

Continuous, 20-500 ml/min

**Sample Temperature:**

0°C – 40°C (32°F -104°F)

**Sample Pressure:**

5 psi maximum

**Sample Quality:**

Samples containing particles 100 microns (0.004 inches) in diameter and larger may require pre-filtration.

**Reagent Consumption:**

2.5 litres/week buffer, 50ml (per calibration) each calibration solution. Equates to changing the buffer and calibration standards on a monthly basis.

### Electrical

**Power Requirements:**

Automatic power recognition from 85 – 264 Vac, 47-63 Hz, single phase.

**Power Consumption:**

85 Watts.

**Output Signal:**

Single 4-20mA DC, 0-20mA DC, or 0-10mA DC isolated into 1000 ohms maximum.

**Relay Contacts:**

Six. Each configurable for high, low, attention or fail status. Includes settings for hysteresis, delay and action. Alarm contacts rated 5A @ 240 VAC, resistive load. Optional extra relays are available.

**Digital Output:**

RS232 capability or serial printer. Optional remote download of graphed data to PC using Companion CD supplied with the monitor.

**Remote Communications (Optional):**

Wireless modem and digital network communications enabling remote interrogation and control of all software menus. RS232 functions not available.

### Instrument Data

**Electronics Enclosure:**

NEMA 4X / IP65 Industrial ABS enclosure

**Sample Connections:**

Inlet: 6mm O.D pushfit x ¼" BSP elbow  
Overflow: 10mm O.D pushfit x ¾" BSP elbow  
(imperial adaptors available)

**Shipping Weight:**

21 kg (46 lbs.)

**Dimensions:**

485 mm x 660 mm x 205 mm (19" x 26" x 8")

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The Aztec Series 1000 range includes monitors for Aluminium, Ammonia, Colour, Fluoride, Iron, Manganese, Phosphate, Nitrate, Nitrite & Silica



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# Series *NXT3000* Gas Feed System



## CAPITAL CONTROLS



### DESIGN FEATURES

- **Modern Design:** Operates on sonic principle. No DP regulation required. Fewer parts means better reliability and improved ease of maintenance.
- **Modularity:** System consists of vacuum regulator, meter assembly and ejector. One vacuum regulator for all capacities up to 500 PPD.
- **Inlet Valve Body and Spring:** Both are manufactured from Hastelloy-C and warranted for life.
- **Versatility:** System adapts to automatic vacuum changeover by simply adding a second vacuum regulator. No separate changeover module required.
- **Safe Operation:** All vacuum operation prevents escape of gas to atmosphere.
- **Minimum Maintenance:** Simple design minimizes routine maintenance. PM kits available for all major components.
- **Superior Warranty:** Vacuum regulator and meter assembly carry 3-year warranty.

The *Series NXT3000* Gas Feed System is a family of vacuum-operated, solution-feed gas dispensing components including a vacuum regulator, meter assembly, and a selection of ejectors to meet customer needs for feeding chlorine, sulfur dioxide, ammonia or carbon dioxide gas. The *Series NXT3000* is a versatile, high quality system which operates at sonic conditions eliminating the need for regulating differential pressure across the rate control valve. Proven design, rugged construction, and the use of the best available materials assures precise gas feeding, low maintenance and dependable operation for the life of the equipment.

The vacuum regulator mounts directly on a 150 lb. cylinder, a ton container, or on the wall. When ton container or wall mounted a liquid trap and heater are provided to prevent liquified gas from reaching the regulator.

As required for the application, one meter assembly may be integrally mounted and a second remotely mounted in series. Only one control valve (manual or automatic) may be installed in the system. The meter assemblies are designed to permit ganging multiple meters for wall mounting to multiple feed points.

Several ejector choices are available for the *Series NXT3000* system. The EJ100/200/500 ejectors can be used for general applications. These incorporate an O-ring and diaphragm type check valve. For more demanding applications – for on-off service, anti-siphon and high back pressure, up to 200 psig (1380 kPa), the EJ17 ejector can be used. In addition, a Chlor-A-Vac chemical induction unit can be used as the vacuum source for the system.

For applications requiring uninterrupted gas feed a built-in automatic changeover function is provided in every vacuum regulator. All that is required is two vacuum regulators. No separate changeover module or valve is required, but for complex vacuum changeover systems the *Series NXT3000* vacuum regulators can be used with the Capital Controls series of automatic vacuum switchover modules.

Only one vacuum regulator is required to feed maximum capacities up to 500 PPD (chlorine). Maximum capacities for other gases are as follows: Sulfur Dioxide – same as chlorine; Ammonia – 250 PPD; Carbon Dioxide – 375 PPD. The maximum feed capacity is dependent on the gas source.

## ENGINEERING SPECIFICATIONS

**Capacities:** Standard metering tubes are available with the following maximum capacities: 1, 3, 10, 25, 50, 100, 200, 300, and 500 PPD (20, 60, 200, 500 g/h, 1, 2, 4, 6 and 10 kg/h) of chlorine gas. Any combination of capacities may be used on multiple feed point applications as long as the total does not exceed 500 lb/day (10 kg/h).

**Flowmeter Rangeability:** 20 to 1 for any one metering tube. For example, a chlorinator with a maximum capacity of 50 lb/day can measure and control gas feed over the range from 2.5 to 50 lb/day. Scale length for all capacities is 4 inches (100 mm) for easy readability, and all mount in the same universal meter assembly. All tubes for chlorine, sulfur dioxide and ammonia are direct reading. An easily removable plastic shield is provided to protect operating personnel from accidental tube breakage.

**Ejector Requirements:** Reasonably clean water at pressures of 4 psig (28 kPa) or greater is required to operate the ejector. Water consumption and required inlet pressure are dependent upon chlorinator capacity and ejector discharge pressure (back pressure). Refer to ejector sizing/nozzle curves for details. An ejector is normally required for each point of solution application. For swimming pool applications or where the solution discharge point is at a lower elevation than the ejector throat discharge elevation, an ejector with an integral anti-siphon valve is required.

**Mounting:** The vacuum regulator is designed for mounting on the gas valve of either a 100 or 150 lb cylinder or a ton container. The meter assembly can be integrally mounted on the vacuum regulator or remotely wall mounted. The ejector may be wall mounted for all capacities up to 500 PPD and up to 100 PPD for pipe mounting. Automatic control valves can be furnished separately for direct wall mounting, or as part of wall panel or wall cabinet installations.

**Control Modes:** The gas feeder can be controlled either manually or automatically by the use of a rate control valve. For a manual control application, a manual rate control valve is provided as part of the meter assembly. Where there are two meters in series in the same vacuum line, only one will have a rate control valve. There are numerous methods of automatic control. For all of these an automatic control valve consisting of a valve assembly (body, precision plug and valve seat) and an electric actuator is used. The actuator receives an electronic signal (typically from a flow meter or a residual controller) and positions the valve plug to permit an automatically regulated flow of gas to the process. Please contact your local Capital Controls representative for assistance with your control applications.

### Connections:

Vacuum Regulator Gas Outlet and Vent: 5/8" tubing  
 Meter Assembly Gas Inlet and Outlet: 5/8" tubing  
 Ejector:

	Gas Inlet	Water Inlet	Solution Outlet	Emergency Drain
EJ100	3/8" tubing	3/4" NPTE or 1" hose	3/4" NPTE or 1" hose	N/A
EJ200	1/2" or 5/8" tubing	1 1/4" NPT or 1 1/2" hose	1 1/4" NPT or 1 1/2" hose	NA
EJ500	5/8" tubing	1 1/4" NPT or 1 1/2" hose	1 1/4" NPT or 1 1/2" hose	N/A
EJ17	5/8" tubing	1" NPT	3/4" NPTE or 1" hose	5/8" tubing

**Note:** Vacuum regulator, meter assembly and ejector are furnished with an adaptor kit to permit reducing or increasing tubing sizes consistent with gas flow requirements.

**Electrical Requirements:** For wall or ton container mounting vacuum regulators 120 Vac or 240 Vac is required for operation of the 25 W electric heater on the liquid trap. Heater is furnished with a 10-foot (3.3 M) cord.

**Materials of Construction:** See 100.3201

### Temperature Limits:

Ambient maximum: 130°F (54°C)  
 Ejector water maximum:\* 100°F (38°C)  
 Normal vacuum regulator operating range: 38 - 130°F (2-54°C)

\*Ejector performance will be impaired due to decrease in gas solubility if water temperature is above 77°F (25°C)

### Shipping Weight:

	Shipping Weight	Volume
Vacuum Regulator	7 lb (3.2 kg)	1.7 cf (0.05 M <sup>3</sup> )
Liquid Trap	7 lb (3.2 kg)	1.0 cf (0.03 M <sup>3</sup> )
Meter Assembly	1 lb (0.5kg)	1.0 cf (0.03 M <sup>3</sup> )
Ejector	3 lb (1.5kg)	1.0 cf (0.03 M <sup>3</sup> )

### ACCESSORIES:

Standard:

- 1 - Ammonia leak test bottle
- 1 - Insect screen for vent line
- 4 - Spare lead gaskets
- 6 - Inlet valve filters
- 1 - Multipurpose wrench
- 1 - Tubing adaptor kit containing various tubing connectors (one kit for each component)
- 1 - Instruction bulletin and parts list

Options:

- Amperometric titrator
- Out of gas alarm switch
- Preventative Maintenance Kits



## DESCRIPTION OF OPERATION

The chlorine gas from the source enters the gas vacuum regulator where it is filtered to remove any foreign material which might be present. Water flowing through the ejector creates a vacuum which opens the inlet valve to admit the gas into the regulator. A diaphragm regulates the vacuum at this point to a closely controlled value.

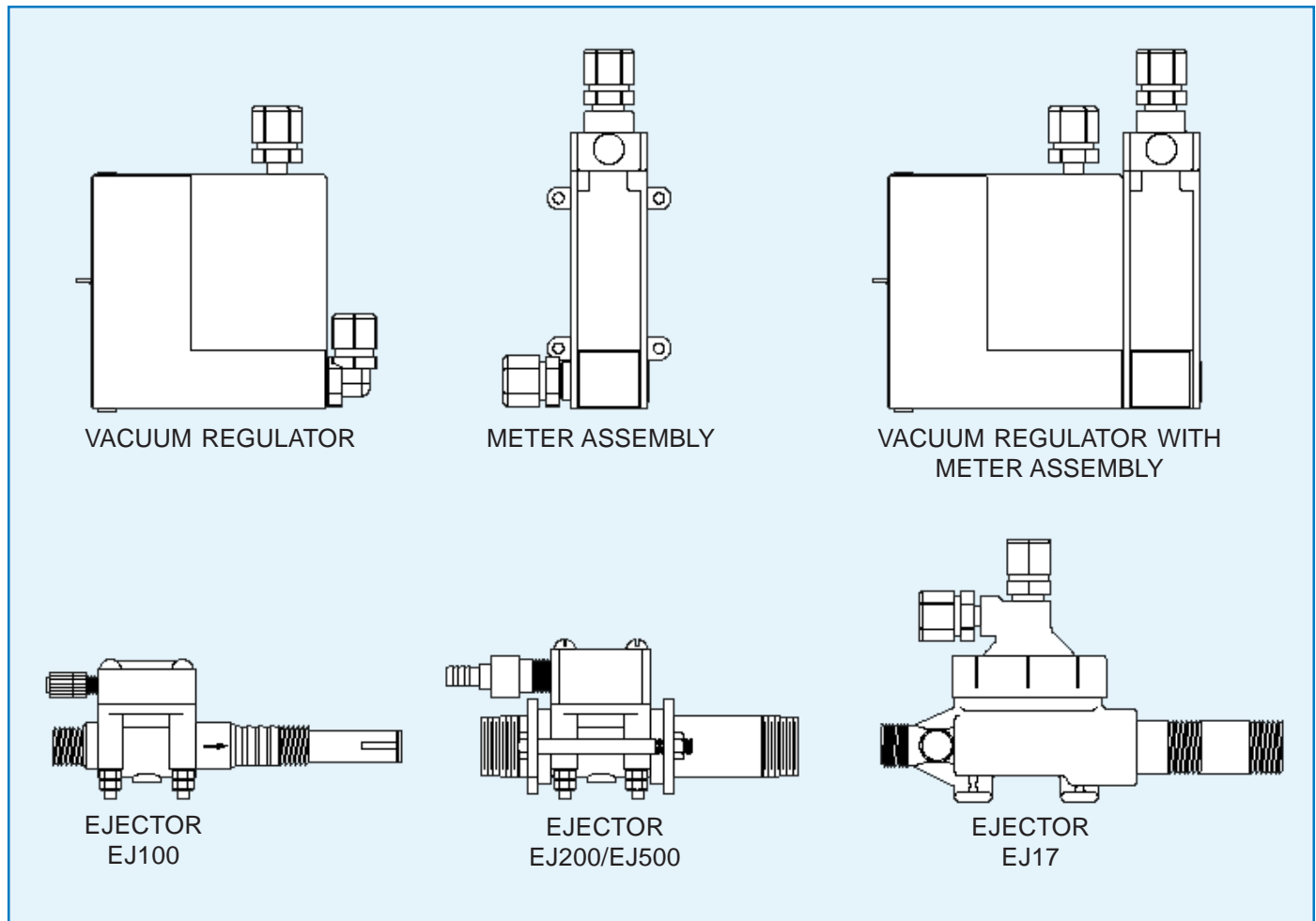
The gas passes through the flowmeter(s) and the rate control valves and then goes to the ejector or ejectors where it is thoroughly mixed and dissolved in the water and carried to the application point as a solution. When multiple metering tubes and ejectors are used, each operates independently of the others. Adjustment of one of the gas flow rates has no effect on the other rates.

The system is completely under vacuum from the ejector to the gas inlet valve during operation. If the water supply to the ejector is stopped, or the operating vacuum is lost for any other reason, the spring-loaded gas inlet valve immediately closes to isolate the chlorinator from the gas supply. Any gas, under pressure, which might enter the

regulator is vented from the system through the built-in pressure relief valve. If the source of chlorine gas is exhausted, the gas port closes to prevent excessive vacuum levels from developing upstream of the vacuum regulator and also prevents any moisture from being drawn back into the operating components or the gas supply lines.

At the same time, an indicating lever on the side of the vacuum regulator shows that the gas supply has been exhausted.

When the vacuum regulators are used in an automatic changeover system, either vacuum regulator is selected by the station operator allowing gas to flow until the chlorine source is exhausted. At that point, the second vacuum regulator automatically opens to allow gas feed to continue. Each regulator has an indicator to show whether it is in the "RESERVE", "OPERATING", or "EMPTY" mode.



## Equipment Description

The gas feed system shall be a vacuum-operated, solution feed type with a feed range of \_\_\_ to \_\_\_ lb/d of \_\_\_ gas.

The vacuum regulator shall be suitable for cylinder, ton container or wall mounting. When ton container or wall mounted it shall be provided with an integrally mounted manifold trap with built-in electric heater with ten foot cord. Power requirement shall be 120 Vac, 50/60 Hz. The manifold shall have a 5 square inch, removable filter having 90 micron pore size.

A positive tight shut-off valve with Hastelloy®C body shall be provided within the vacuum regulator to isolate gas under pressure from the control system should there be a loss of vacuum. An easily removable fiberglass filter shall be included upstream of the inlet valve. A spring-loaded pressure relief valve shall be provided to prevent the build-up of pressure within the gas control system. An excess vacuum shut-off valve shall be provided as an integral part of the vacuum regulator to isolate the regulator from the meter assembly and ejector on loss of gas supply pressure. Provisions for automatic changeover shall be incorporated within the vacuum regulator without the need for an external valve. An indicator shall provide a visual signal when the chlorine gas supply is exhausted or interrupted.

A meter assembly having a 20:1 range shall be provided to indicate the gas feed rate. The meter shall be calibrated for the gas being fed and shall be direct reading in both English and metric units. It shall be suitable for mounting on the wall or on the vacuum regulator. The meter assembly shall be fitted with a protective plastic shield. It shall be provided with a manual rate valve for manual control. When the system is automatically controlled no manual valve is provided.

An ejector shall be furnished with the system. The ejector nozzle and throat shall be sized for the application. The type of ejector to be supplied shall be application dependent. The ejector shall be designed for the following conditions:

Water supply pressure: \_\_\_\_\_psig  
Maximum water flow: \_\_\_\_\_gpm  
Maximum back pressure: \_\_\_\_\_psig

The vacuum regulator, meter assembly, rate control valve (manual or automatic), and ejector assembly shall be manufactured from materials resistant to corrosion from the chemicals being fed. All components shall be manufactured in a facility certified to meet the requirements of ISO9001 International Standards.

The vacuum regulator, meter assembly and ejector shall be furnished with connections for 5/8-inch tubing. Capacity adaptor kits shall be supplied with each to permit use of reduced tubing size as necessary. The following accessories shall be supplied: Insect screen, bottle for test solution, six spare filter pads, four spare lead gaskets, universal wrench, meter assembly mounting accessories, and instruction manual and parts list.

The gas feed system shall be Capital Controls Series *NXT3000* or approved equal.

Design improvements may be made without notice.

Represented by:



## CAPITAL CONTROLS

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# **TECHNICAL SPECIFICATION**

## **Chlorine gas leak detector,**

### **CHLORALERT**

#### **T17CA4000**



Severn Trent Water Purification S.p.A.

## **GENERAL DESCRIPTION**

The Severn Trent Water Purification chlorine gas leak detector, Chloralert T17CA4000 continually monitors air samples to detect the presence of chlorine.

It is usually installed in chlorine usage and storage areas to protect personnel and equipment.

The Chloralert is an amperometric device utilising the depolarizing effect of small quantities of chlorine gas reacting with a non evaporating electrolyte in a cell having two polarized platinum electrodes.

A small internal blower, designed for long operational life, continually withdraws a sample of air from the sampling area; a known and fixed amount of this sample is sent into the measuring cell and passes over the surface of the electrolyte. If chlorine is present it reacts with the electrolyte and, if the quantity of chlorine exceeds the preset value the alarm condition is triggered on. The alarm flashes and a relay is deenergized to allow remote devices (such as extractor fans or external alarms) to be actuated. The alarm is also actuated in case of power supply failure, as the power supply comes back (mod. T17CA41--). In addition, for mod. T17CA42--, the alarm is also actuated in case of circuit or fuse failure and loss of sample due to blocked sample tube, failure of the sample fan or any other defect. During the alarm condition the fan is stopped so that contaminated air is not blown into an otherwise safe area and the electrolyte is not allowed to become saturated.

The alarm condition needs the operator's acknowledgement to be reset.

A test switch is provided to enable the electronic circuits to be checked while the unit is in operation.



Fig. 1 Chlorine gas leak detector, Chloralert

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Model number breakdown	2
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Outline and mounting dimensions	3
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# TECHNICAL SPECIFICATION

## Chlorine Dioxide Generator

### T70G4000



CAPITAL CONTROLS ITALY

## INTRODUCTION

The Capital Controls Italy Chlorine Dioxide Generator is a feeding system operated by automatically controlled vacuum. This feature gives the complete operation safety and permits the continuous drawing of reagents without requiring any pump.

The reagents used to produce the chlorine dioxide are sodium chlorite and hydrochloric acid, utilised in commercially available concentrations.

An ejector operated by water in pressure produces the vacuum into the generator. The chlorine dioxide solution is dosed into the process mixed together with the ejector feeding water. The reagents flow through the generator drawn by the vacuum effect. Flowrates are measured and indicated by variable area flowmeters. In case of manually operated generator, the reagents feed rates and then the chlorine dioxide quantity is controlled by manual valves, available on the flowmeters body. Differential pressure regulators stabilise the reagent flows. The reagents and a controlled amount of water, required to optimise the reaction, are drawn into the contact tower, which is constructed to develop the maximum production yield. The chlorine dioxide solution outgoing the tower passes through a bull's eye indicator, which permits to estimate the product quality by colour.

If the system is provided with the automatic control action the reagents flowing from the flowmeters are drawn through the CHLOROMATIC™ three seats valve, whose plugs are shaped to give the correct dosing ratio. The valve actuator is controlled by an electronic current/ position converter, that receives the signal(s) from the process and optimises the ClO<sub>2</sub> production.

The generator is equipped with devices that assure the complete operation safety. When vacuum falls under a minimum value, a valve interrupts the reagent inlet lines; an optional switch is available to close a dry contact. Optical detectors installed on the flowmeters allow to detect the presence/absence of the reagents; if one or two of the three reagents lack, an alarm is generated. Two contacts are available for alarm retransmission; one of them can be used to operate the remote contact vacuum vent valve installed inside the generator itself. In case of vacuum excess, a valve restores the normal operating conditions.



Fig. 1 Chlorine dioxide generator, front view

The vacuum generated by the ejector is indicated by a gauge on the front side. The front side also includes the V/A flowmeters and, in case of automatic generator, the AUT/MAN and OPEN/ CLOSE control switches.

The automatic control generator is supplied with an output contact for the retransmission of the automatic/manual operating condition and a 4÷20 mA output signal for CHLOROMATIC™ valve position retransmission. All devices of the system are installed into a fiberglass reinforced polyester cabinet, free of maintenance.

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Model number breakdown	6
Mounting and outline dimensions	7

## DESIGN FEATURES

- Low operation cost: the generator has been designed for the maximum reaction efficiency, assuring the best production yield. Reagents are used at commercially available concentrations, without any need of cumbersome dilution (no need for production of softened water).
- Low maintenance costs: all parts included in the system are made of acid-proof material. The few parts subject to wear are easily replaceable.
- Absolute operation safety: the reagents dosing system is completely vacuum operated. This feature prevents any reagent or product leakage. The chlorine dioxide is directly fed into the process distribution line, without product stocking. Then, any risk due to overpressure or gas escaping is eliminated.
- Effective automatic control action: the CHLOROMATIC™ control valve is arranged to receive the process flow signal and/or the chlorine dioxide regulator signal in order to control chlorine dioxide production according to process needs.
- IP 65 protection: all electrical parts have IP65 sealing and connections are made of acid-proof material suitable for moist and aggressive environment

## TECHNICAL SPECIFICATIONS

Dosage capability: 80 - 150 - 300 - 500 - 1000 -2000 - 4000 - 6000 - 8000 -10000 g/h ClO<sub>2</sub>

Range (turndown): 10 : 1 of f.s.

Reagents flow indication: engraved on the flowmeters glass tube, with Dt/Df units, directly in relation with the flow measure according to Capital Controls Italy curves.

Vacuum indication: a direct reading indicator gauge is installed on the front side; reading in kPa.

Cabinet: fiberglass reinforced polyester.

Dimensions: 610 x 1524 x 650 mm.

Power supply: 110/220 V ca, 50 Hz; max. consumption 50 VA.

Input signals: 4÷20 mA, optionally 1 or 2 (automatic control generators).

Output signals: for automatic control generators only - 4÷20 mA current output for CHLOROMATIC™ valve position retransmission - a SPDT contact for automatic/manual operation retransmission - a SPDT contact for lack of vacuum retransmission - two SPDT contact for reagent lack alarm retransmission.

### Dosage control

- Manual control generator: chlorine dioxide production quantity can be adjusted by knobs on the reagent V/A flowmeters, setting the value indicated in the table on the front panel. The reagents feeding value is maintained stable by differential pressure regulators included in the system.
- Automatic control generator: the system is provided with a CHLOROMATIC™ three seats automatic control valve, able to receive, through a current/position converter included in the system, one or two 4÷20 mA signal(s) from a flowmeter (water to be treated) and a chlorine dioxide controller. When the control valve is not energised, a knob on its body allows the manual regulation of chlorine dioxide production.

### Vacuum control and safety devices

- Vacuum regulation: with a valve operating at the value of 40 kPa ca. A security valve has the function to decrease overpressure (> 20 kPa) that ca occur during stops of plant.
- vacuum is maintained at a value of approximately 40 kPa by a relief/vent valve that prevents both overpressure and excessive vacuum conditions.
- Reagents pneumatic interception valve: a three seats vacuum operated valve interrupts automatically the reagent inlet when the vacuum falls below the minimum value of 26 kPa.
- Vacuum switch: this optional device produces a dry contact when vacuum is below a minimum value. Contact rating: SPDT 10A, 220 V - 50 Hz.
- Reagents lack alarm: when one or two of the three reagents lack an alarm is energised on the front side and two contacts are generated.

### Reagents

- Reagents specifications: sodium chlorite 25 % (308 g/l, d<sub>15°C</sub> =1,22 ) and hydrochloric acid 32 % (371g/l, d<sub>15°C</sub> =1,16 - FREE OF HYDROFLUORIC ACID. The consumption of reagents used at commercial concentrations required to produce 1 g of ClO<sub>2</sub> is 6 ml of sodium chlorite, 4,3 ml of hydrochloric acid and 18,4 ml of water.
- In low range generators (80, 150 and 300 g/h) in order to permit a higher accuracy in dosage, diluted reagents are required. In this case it is not required to feed dilution water into the tower. Diluted reagents characteristics are: sodium chlorite 7,5 % (80 g/l, g<sub>15°C</sub> =1,07) and hydrochloric acid 8,5 % (88 g/l, g<sub>15°C</sub> = 1,04) FREE OF HYDROFLUORIC ACID). The consumption of diluted reagents required to produce 1 g of ClO<sub>2</sub> is 23,2 ml of acid and 23,2 ml of chlorite, while dilution water is not fed.
- If customer needs to use reagents which have remarkable different concentrations he just has to contact Capital Controls Italy for special generator execution.
- Dilution water pressure must be below 150 kPa and must be stable. If these conditions are not verified a pressure regulating valve must be provided. This part is supplied by Capital Controls Italy ordering P/N 1T132A003U01.
- Reagent tank installation: minimum hydraulic head required to make the reagent drawing into the system easy, is 1,5 m approx. The tanks must be installed equipped with recovery tanks.



- Connections between the generator and the reagent tanks must be realised using suitable hose and connectors, resistant to chemical aggressiveness. Capital Controls Italy can supply a complete connection kit, including 12 m of hose and 7 connectors 1/2"; order P/N 1T614S002U01.
- Reagents available on the market have often solid suspended impurities which may produce flowmeter reading inaccuracy and could make necessary frequent maintenance operation. The installation of cartridge filters on the reagent lines will avoid this problem. The filter is available at Capital Controls Italy with the P/N 1T127C002U01.

#### **Ejector feeding water**

- Water specifications: ejector must be fed with reasonably clean tap water; it is advisable to install a filter when water characteristics are not satisfactory.
- Water consumption and pressure: water flow and pressure required depend upon the maximum chlorine dioxide feed rate, the ejector backpressure and the distribution piping pressure drop. Ejector nozzle and throat dimensions are calculated by Capital Controls Italy for the specific process conditions, while the ejector body and fitting are the same for all generators. The ejector is installed inside the generator itself.
- Maximum allowed pressure for ejector feeding water is 20 Kg/cm<sup>2</sup>.

#### **Environmental characteristics**

- The system must be installed in a well ventilated environment. The room must be provided with water tap and waste facilities.
- Temperature: between 5 and 30 °C. The best production conditions occur at 20 °C. It should be remarked that at low temperature (below 5 °C) crystallisation of sodium chlorite can occlude piping and reservoir. If environment temperature falls below 0°C during a generator shut down it is necessary to empty completely the piping, the V/A flowmeters and the reaction tower. This operation is necessary to avoid the device breakage.

## **• SYSTEM DESCRIPTION**

The Capital Controls Italy Chlorine Dioxide Generator, Series T70G4000 is a production and feeding system that uses the reaction between sodium chlorite and hydrochloric acid. The generator is mounted in an epoxy-fiberglass reinforced cabinet and is able to produce max. quantity (80) or (150) (300) (500) (1000) (2000) (4000) (6000) (8000) (10000) g/h.

Regulation rangeability for production is 1: 10.

The generator is fed with reagents at the commercial concentration state without any dilution requirement (NaClO<sub>2</sub> 25 % and HCl 32 %) (only exception the models for low capacity of production) and the chlorine dioxide produced in the contact tower is directly sent to the process mixed with the ejector water, without any intermediate stocking reservoir.

Reagents are fed into the system by vacuum drawing effect. The generator is operated by manual control or by automatic control by three seats CHLOROMATIC™ valve. On the generator front panel three variable area flowmeters type are installed together with a vacuum indicator gauge and a bull's eye indicator.

When the generator is of automatic type an electronic current/position converter protected by a water-proof case is also installed on the front panel, including a AUTO/MAN switch, a CLOSE/OPEN switch and the DOSE potentiometer.

The generator includes a valve for excess vacuum level control, a reagent shut-off valve which is automatically operated when the vacuum falls down, a vacuum indicator gauge, and an alarm contact for reagent lack.

#### **Optional accessories**

- Differential pressure regulator for dilution water P/N 1T132A003U01
- Reagent connection kit P/N 1T614S002U01
- Interlock control panel for security block and alarms P/N 1T805B012U01. For plant security a panel is optionally available with the following functions included:
  - Block for power supply interruption: when the generator is in automatic control version the electrical power supply interruption represents a security deficiency; the block in this case shuts down the water supply to the ejector. The contacts must be connected to the supply pump or the solenoid valve on the ejector water supply line.
  - Block for vacuum lack: it is detected by the vacuum switch contact included in the generator.
  - Lack of one or two of the three reagents: two contacts are actuated and can be retransmitted to the interblock control panel.
  - Presence of chlorine dioxide in air.
  - The security panel includes also lamps for block state indication, for general power supply switch and for block exclusion switches. Power supply: 110/220 V ac, 50 Hz. Material: grey ABS, with hinged cover. Dimensions: 360 x 400 x 150 mm.
- Panel for reagent filling pumps, connected to the tanks, P/N 1T805BB013U01: it includes the push bottoms for start/stop and the automatic block of the pump connected to the low level switches of the stock tank and to the high level of reagent tank. The panel includes electrical protection. Power supply: 380 V ac, 50 Hz. Material: grey ABS, with hinged cover. Dimensions: 200 x 360 x 150 mm

## DOSAGE CONTROL SYSTEMS

The installation of the automatic generator together with measure and process control instrumentation allows to realise a control system suitable to optimise the automatic chlorine dioxide feeding. In order to select the most profitable instruments and control loop, it is necessary to know all the process plant characteristics. For the detailed instruments description consult pertinent spec.sheets.

### **A: Process with constant water flow and constant oxidable substances concentration**

For this application a manually operated generator can be used. (Diagram A)

### **B: Process with variable water flow and constant oxidable substances concentration**

The variable process flow requires the installation of a single signal automatic generator, with the CHLOROMATIC™ valve driven by the 4÷20 mA signal coming from the process water flowmeter. The ratio value can be set through a potentiometer present on the generator front panel and allows to get the correct chlorine dioxide residual. This application is a feed forward control loop without process feed back. (Diagram B)

### **C: Process with constant water flow and variable oxidable substances concentration**

Since chlorine dioxide demand changes with the oxidable substances concentration a chlorine dioxide analyser must be installed in the treated water. The point of installation must allow enough contact time. The 4÷20 mA signal generated by the analyser represent the process feed back and is used, through a controller, to drive the CHLOROMATIC™ valve actuator. (Diagram C).

### **D: Process with variable water flow and variable oxidable substances concentration**

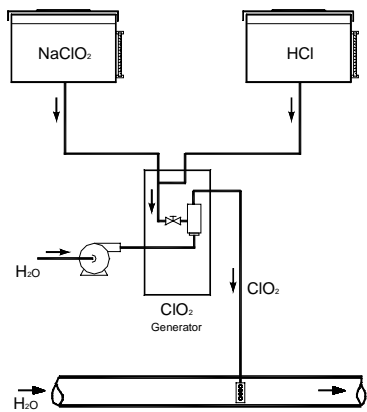
For this application the control loop must provide for a feed-forward control of chlorine dioxide proportional to the flow and a feed back control through the analytical measure. Thus the control system must include process water flowmeter, chlorine dioxide analyser and controller. The automatic control generator must be provided with two input signal actuator. (Diagram D).

### **E: Contact basin chlorine dioxide dosage with variable water flow and variable oxidable substances concentration**

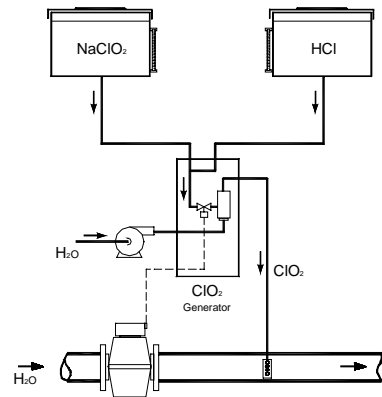
Chlorine dioxide automatic control for this application requires a particular control loop. Contact basin is normally used in processes where a long contact time (30' or more) is required to complete the disinfection and oxidation reaction. In this case the process is characterised by a feed back dead time that could give instability of the control loop in a normal PID controller. Thus, for this application it is advisable to install a microprocessor controller with a specific control software.

#### **Optional control devices**

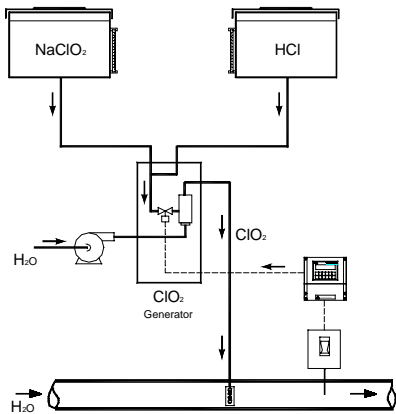
- Flowmeter
- Chlorine dioxide analyzer, MicroChem line
- Controller
- Recorder
- Chlorine in air detector.



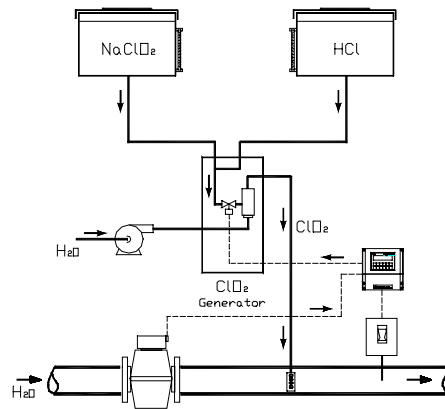
A. Process with constant flowrate and constant oxidable substances concentration



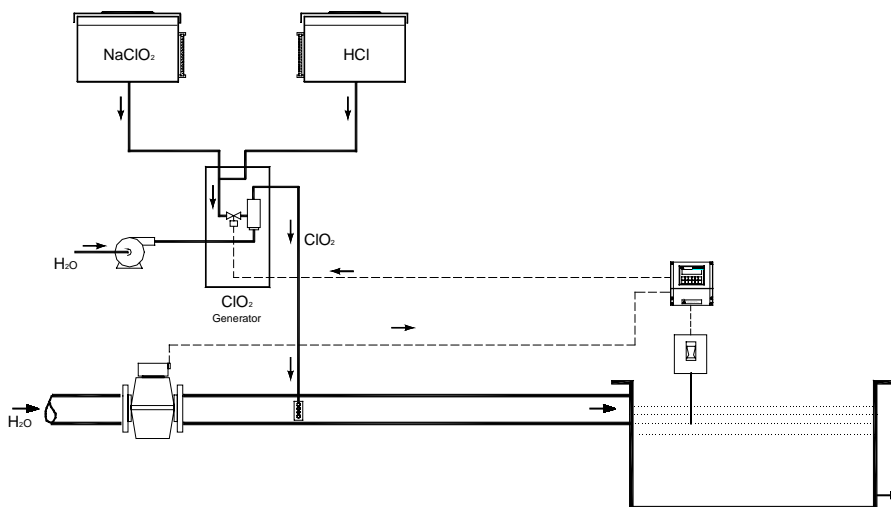
B. Process with variable flowrate and constant oxidable substances concentration; automatic control based on flowrate signal A.



C. Process with constant flowrate and variable oxidable substances concentration; automatic control based on chlorine dioxide control signal.



D. Process with variable flowrate and variable oxidable substances concentration; automatic control based on flowrate signal and chlorine dioxide control signal C.



Contact basin dosage; automatic control based on flowrate and chlorine dioxide control signal; a special algorithm is foreseen to keep in account for the long contact time.

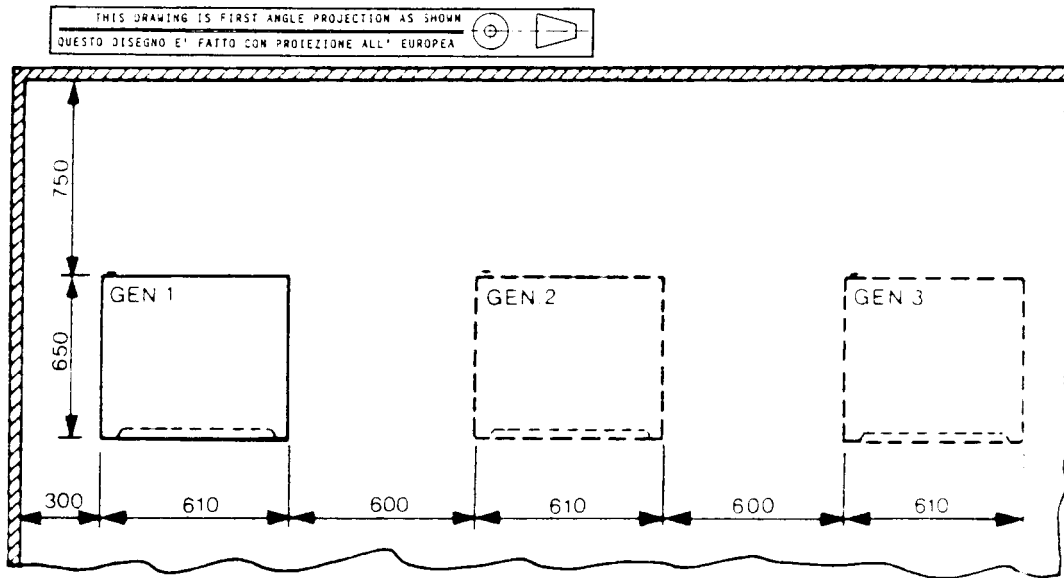
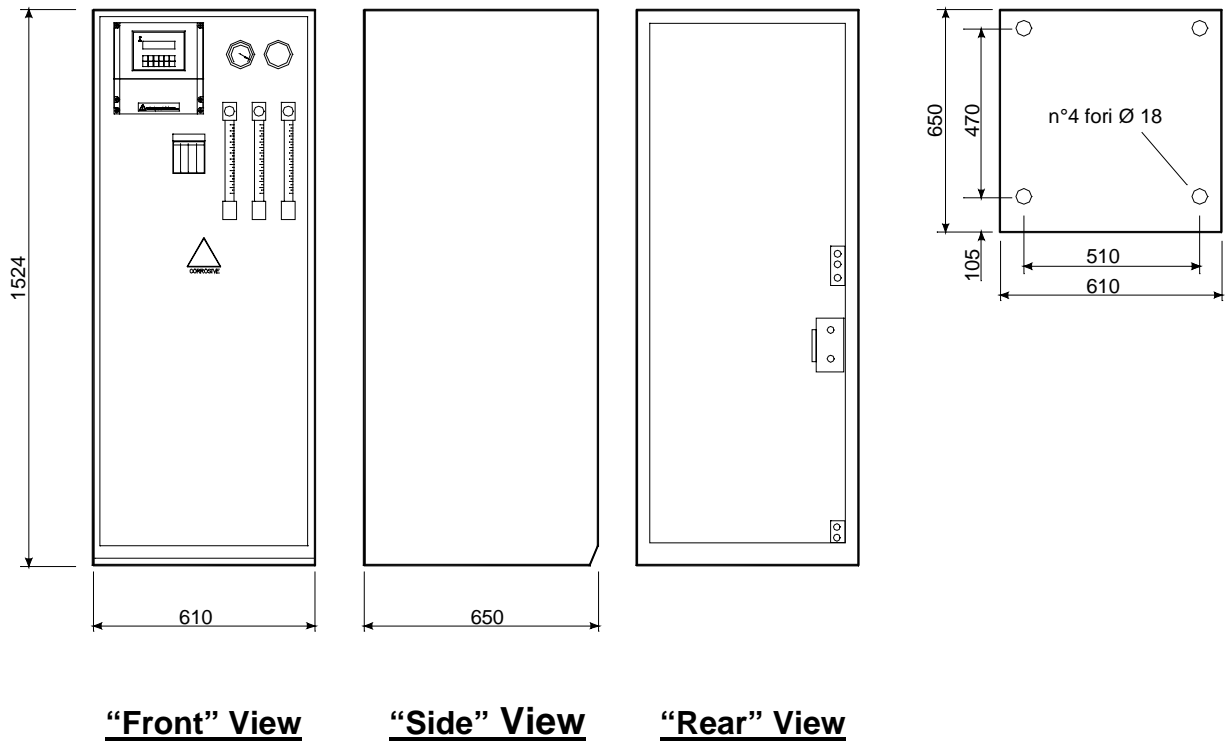


**MODEL NUMBER BREAKDOWN**

Chlorine Dioxide Generator	T70G4			A			
Production capacity							
Reserved	0						
80 g/h, pre-diluted reagents, man. or autom.	A						
150 g/h, pre-diluted reagents, man. or autom.	B						
300 g/h, pre-diluted reagents, man. or autom.	C						
150 g/h only manual generator	1						
300 g/h	2						
500 g/h	3						
1000 g/h	4						
2000 g/h	5						
4000 g/h	6						
6000 g/h	7						
8000 g/h	8						
10000 g/h	9						
Type of control action							
Reserved	0						
Manual	1						
Automatic *	2						
Low vacuum contact							
Reserved		0					
Standard included		1					
Design level				A			
Power supply							
Reserved					0		
110 V ac					1		
220 V ac					2		
Alarms							
Reserved						0	
Standard with alarms, manual reset						1	
Remote control vacuum vent valve							
Reserved							0
110 V ac							1
220 V ac							2
Not required							3
Serial line							
Reserved							0
Not required							1
RS 232, RS 422							2
RS 485							3

\* not available for 150 g/h generator, with concentrated reagents

**OUTLINE AND MOUNTING DIMENSIONS**



Note: all the measures are in millimeters.

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# TECHNICAL SPECIFICATION

## Chlorine Dioxide Generator for diluted liquid chemicals T70GD4000



CAPITAL CONTROLS ITALY

- **HIGH EFFICIENCY**  
Thanks to the excellent control of reagents' dosage and reaction time
- **MANUAL and/or AUTOMATIC CONTROL FUNCTION**
- **REMOTE CONTROL and SUPERVISION through serial link of:**
  - **Generator start/stop**
  - **Parameters set/change of ClO<sub>2</sub> production**
  - **Alarms and safety shut-down**
- **EASY of OPERATION and reduced maintenance requirements**



Fig. 1

The Capital Controls chlorine dioxide generator for diluted liquid chemicals is an integrated system for production of a ClO<sub>2</sub> solution, generated by diluted hydrochloric acid and sodium chlorite, with up-to 1000 g/h maximum capacity.

The process combines the vacuum technology and the dosing pumps flexibility:

1. an ejector operated by motive water produces the vacuum into the generator
2. the vacuum switch sends the start signal to the dosing pumps
3. the dosing pumps feed the reagents, hydrochloric acid 8.5% and sodium chlorite 7.5%, in the reaction tower with a 1:1 ratio.
4. the ClO<sub>2</sub> solution is sent through the ejector to a static mixer at ~ 1,8 g/l concentration.
5. the solution is then injected at the point of use.

The ClO<sub>2</sub> production and the generator's functionality are controlled by **Biochem** a microprocessor based control unit, part of the **Micro2Chem** analytical family.

The generator includes the protection from high pressure, the pumps stroke counter, the non-return

valves to protect the water line and the internal equipment, the reagent tanks level sensors (optional)

### Dosage and production control

The ClO<sub>2</sub> dosage and production control is available as follows:

- manual, through **Biochem** control unit keyboard
- automatic, with flow signal of treated water or residual ClO<sub>2</sub> analysis, directly with **Biochem** control unit.
- automatic, from **Micro2chem** PID controller for residual chlorine dioxide analysis and/or flow measurement.

### Safety

The control unit allows the generator's safe operation and the following alarms signals :

- malfunctions of dosing pumps
- low vacuum (low flow/pressure of ejector motive water)
- presence of chlorine in air
- reagents shortage (tanks level)



**TECHNICAL SPECIFICATIONS**

- Dosage capacity: 25 – 50 – 100 – 250 – 500 – 1000 g/h ClO<sub>2</sub>
- Range (turndown): 10:1
- Dosing pumps: electromagnetic membrane /piston type
- Vacuum indication: a direct reading gauge is installed on the front side: reading in Kpa (-100 ÷ 0)
- Vacuum switch: voltage free retransmission contact for loss of vacuum  
Contact rating SPDT 10A, 220V-50Hz
- Hydraulic connections:
  - Dilution water inlet: DN 15, (1/2")
  - Solution outlet: DN 15, (1/2")
  - Drain outlet: DN 15, (1/2")
- materials
  - frame: epoxy resin painted steel
  - holding plates: PVC
  - reaction tower: PVC
  - ejector: PVC
  - mixing chamber: PVC
  - inside tubing and connections: teflon/PVDF
  - **Biochem** enclosure: ABS, reinforced fiberglass (17%)
- Environmental temperature: 5 - 45 °C
- Power supply: 115/230 Vac ±10%, 50/60 Hz, max. consumption 50 VA
- dimensions: 1630 x 870 x 550 mm
- weight: 54 kg (Mod T70GD46XXA: 58 kg)
- floor mounting
- protection: BIOCHEM IP65, dosing pumps IP 65
  
- display: digital LCD, 16+16 characters, back lighted

**BIOCHEM control unit**

**Digital and analog inputs/outputs**

- analog inputs: 1 (one), 0-4÷20 mA, from flow transmitter/residual chlorine dioxide analyser or from residual chlorine dioxide/flow controller
- analog outputs: 1 (one), 0-4÷20 mA, galvanically isolated, resistive load 0-1000 Ohm max.
- digital inputs: 8 (eight) NPN transistor
- digital outputs: 8 (eight); 5 (five) 24 Vdc and 24 Vac, 5 A max, 3 (three) for pumps control
- serial port : 1 (one) RS485, RS422 or RS232 with plug-in connector

**Functionality**

**Biochem** control unit allows the following signal retransmissions (some coming from external sensors):

- low vacuum due to low ejector water pressure/flow
- dosing pumps malfunctions
- generator's start/stop
- presence of chlorine in air (from **Chloralert** sensor)
- reagents shortage

The generator is also equipped with:

- non return valve on motive water line
- non return valve on ClO<sub>2</sub> solution line
- pressure relief valve
- bull's eye indicator to view the ClO<sub>2</sub> quality by colour.

**Generator's operative features**

		T70GD41XX	T70GD42XX	T70GD43XX	T70GD44XX	T70GD45XX	T70GD46XX
Maximum capacity ClO <sub>2</sub>	g/h	25	50	100	250	500	1000
Maximum consumption NaClO <sub>2</sub> (7,5%)	l/h	0,575	1,15	2,3	5,8	11,5	23
Maximum consumption HCl (8,5%)	l/h	0,575	1,15	2,3	5,8	11,5	23
Water minimum pressure	bar	depending on the generator's downstream conditions					

Chlorine dioxide analyzer/controller **Micro2chem** line  
Chlorine in air detector **Chloralert**

## **AUTOMATIC CONTROL SYSTEMS**

The installation of the automatic generator together with measurement and process control instrumentation allows to build a control system suitable to optimise the automatic chlorine dioxide dosage. In order to select the most suitable instruments and control function, it is necessary to know all the process data. For the detailed instruments description consult pertinent spec. sheets.

### ***Process with constant water flow and constant oxidizable substances concentration***

For this application a manually operated generator can be used (diagram A)

### ***Process with variable water flow and constant oxidizable substances concentration***

For this application it is advisable to use an automatic generator with an input signal from a flowmeter.

**Biochem** allows to set and change the ratio constant "K"

This is a predictive control scheme and it doesn't require any feed-back signal from process. "K" represents the dosage as ratio of flow and guarantees a predefined value of chlorine dioxide residual. (Diagram B)

### ***Process with constant water flow and variable oxidizable substances concentration***

Since chlorine dioxide demand changes with the oxidizable substances concentration a chlorine dioxide analyser must be installed in the treated water in order to measure/control (PID) the residual  $\text{ClO}_2$ .

The control scheme must therefore include an analyser/controller (**Micro2chem**) that sends a 4÷20 mA signal to the **Biochem** control unit for the required amount of  $\text{ClO}_2$  (Diagram C).

### ***Process with variable water flow and variable oxidizable substances concentration***

Control of this process scheme is made through a PID Feed-forward algorithm as a function of a flow signal and chlorine dioxide analyser provided by **Micro2chem**.

(Diagram D).

### ***Contact basin chlorine dioxide dosage with variable water flow and variable oxidizable substances concentration***

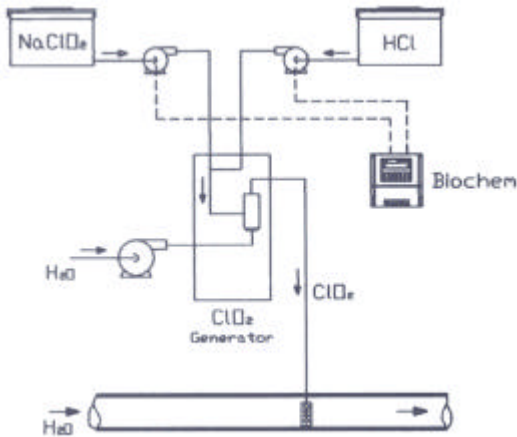
Automatic chlorine dioxide dosage in this application uses a specific software program with time related PID control algorithm.

A flowmeter, a chlorine dioxide analyser and a **Micro2chem** controller with a special software program are needed for this application. (Diagram E).

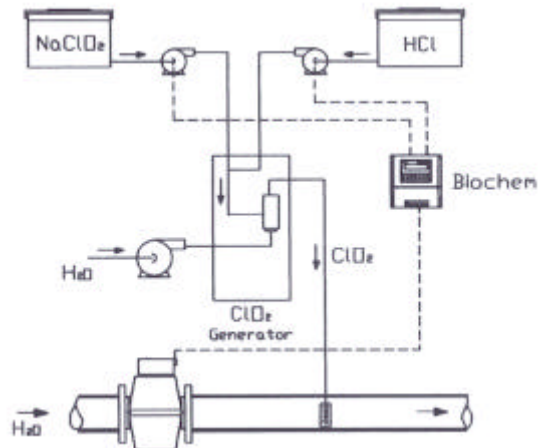
### ***Optional control devices***

Flowmeter

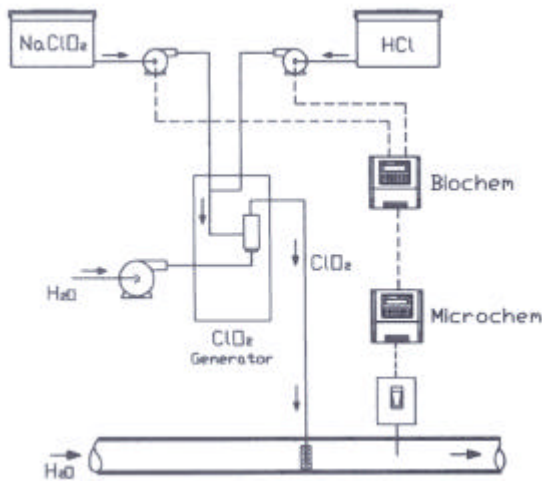
DOSING SYSTEMS



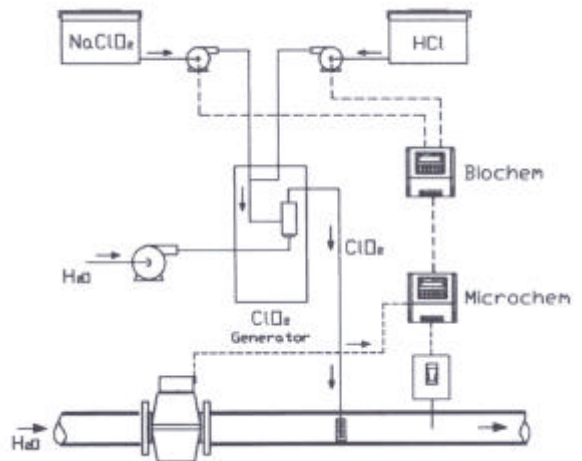
A. Process with constant flowrate and constant oxidizable substances concentration; manual control



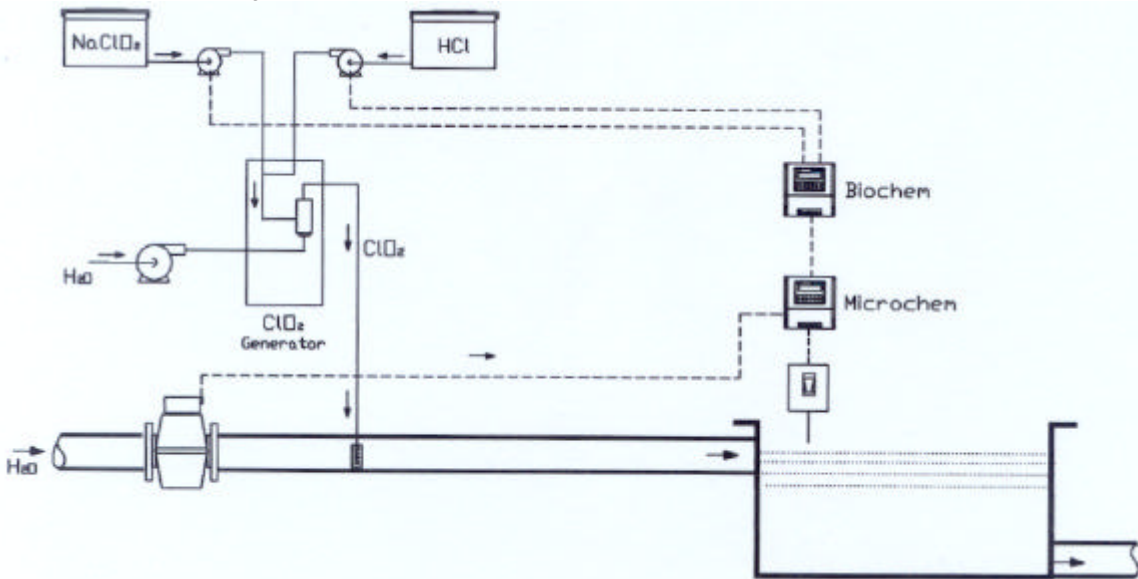
B. Process with variable flowrate and constant oxidizable substances concentration; automatic control based on flowrate signal.



C. Process with constant flowrate and variable oxidizable substances concentration; automatic control based on chlorine dioxide control signal.



D. Process with variable flowrate and variable oxidizable substances concentration; automatic control based on flowrate signal and chlorine dioxide control signal.



E. Contact basin dosage: automatic control based on flowrate and chlorine dioxide control signal; a special algorithm is foreseen to keep in account for the long contact time.



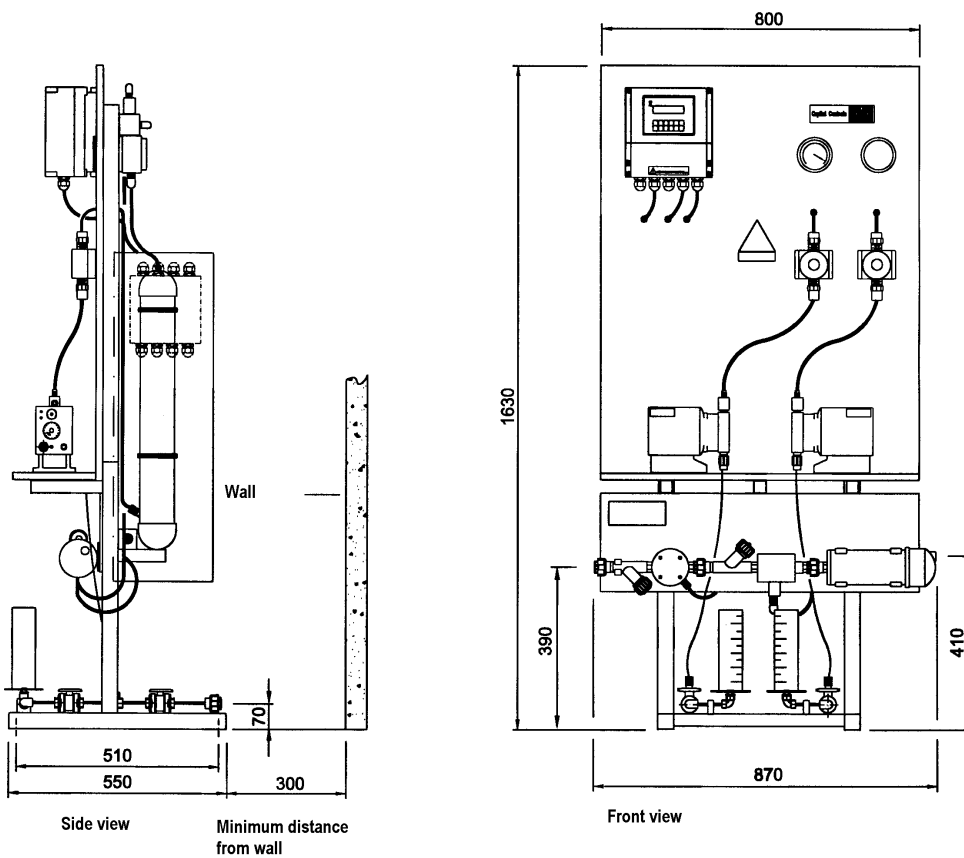
**MODEL NUMBER BREAKDOWN**

Chlorine Dioxide Generator T70GD4				A	
Production capacity					
Reserved	0				
25 g/h	1				
50 g/h	2				
100 g/h	3				
250 g/h	4				
500 g/h	5				
1000 g/h	6				
Type of control action					
Reserved		0			
Manual		1			
Automatic		2			
Power Supply					
Reserved			0		
110 V ac			1		
220 V ac			2		
Design level				A	
Serial Link					
Reserved					0
Not required					1
RS 232, RS 422					2
RS 485					3

**Options**

- **Chlorine gas leak detector Chloralert T17CA2000:** 110/220 V 50/60 Hz, alarm level at 1 and/or 3 ppm Cl<sub>2</sub> by volume; consult instrument Technical Specification Sheet

**OUTLINE DIMENSIONS**



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**TECHNICAL SPECIFICATION**

Detection level: factory preset at 3 mg/m<sup>3</sup> (1 ppm )  
or 9 mg/m<sup>3</sup> (3 ppm )

Power supply: 230V ac, 50/60Hz +/- 10%, 12 W  
115 V ac, 50/60Hz +/- 10%, 25 W

Relay contacts: DPDT, 10 A, 240 V ac, resistive  
load or 28 V cc

Cell response  
time : instantaneous

Warm up time : approx. 20 sec.

Sampling rate : 0,05 m<sup>3</sup>/min

Ambient  
temperature : -20 ÷ +65 °C

Sample inlet  
connections : 3/4" GAS

Max.sample  
pipe length : 8 m max.with 1" pipe

Weight : 2,5 kg appr.

Mounting : wall

Dimensions : 215 (h) x 162 (w) x 235 (d) mm

Material of construction

Housing : ABS  
Cell : ABS  
Electrodes : platinum

**MODEL NUMBER BREAKDOWN**

T17 CA	4	-	--	A	-
<b>Chlorine gas leak detector</b>					
<b>Series of production</b>					
Fixed code					
Standard		1			
Fail Safe Design		2			
<b>Power Supply</b>					
115 V ac, 50/60 Hz, +/-10%		10			
230 V ac, 50/60 Hz, +/-10%		20			
<b>Design level</b>					<b>A</b>
<b>Alarm level</b>					
Reserved					0
Reserved					1
Reserved					2
Fixed at 1 ppm Cl <sub>2</sub> in air					3
Fixed at 3 ppm Cl <sub>2</sub> in air					4

**STANDARD ACCESSORIES**

1 kit P/N 614S071U01 including :

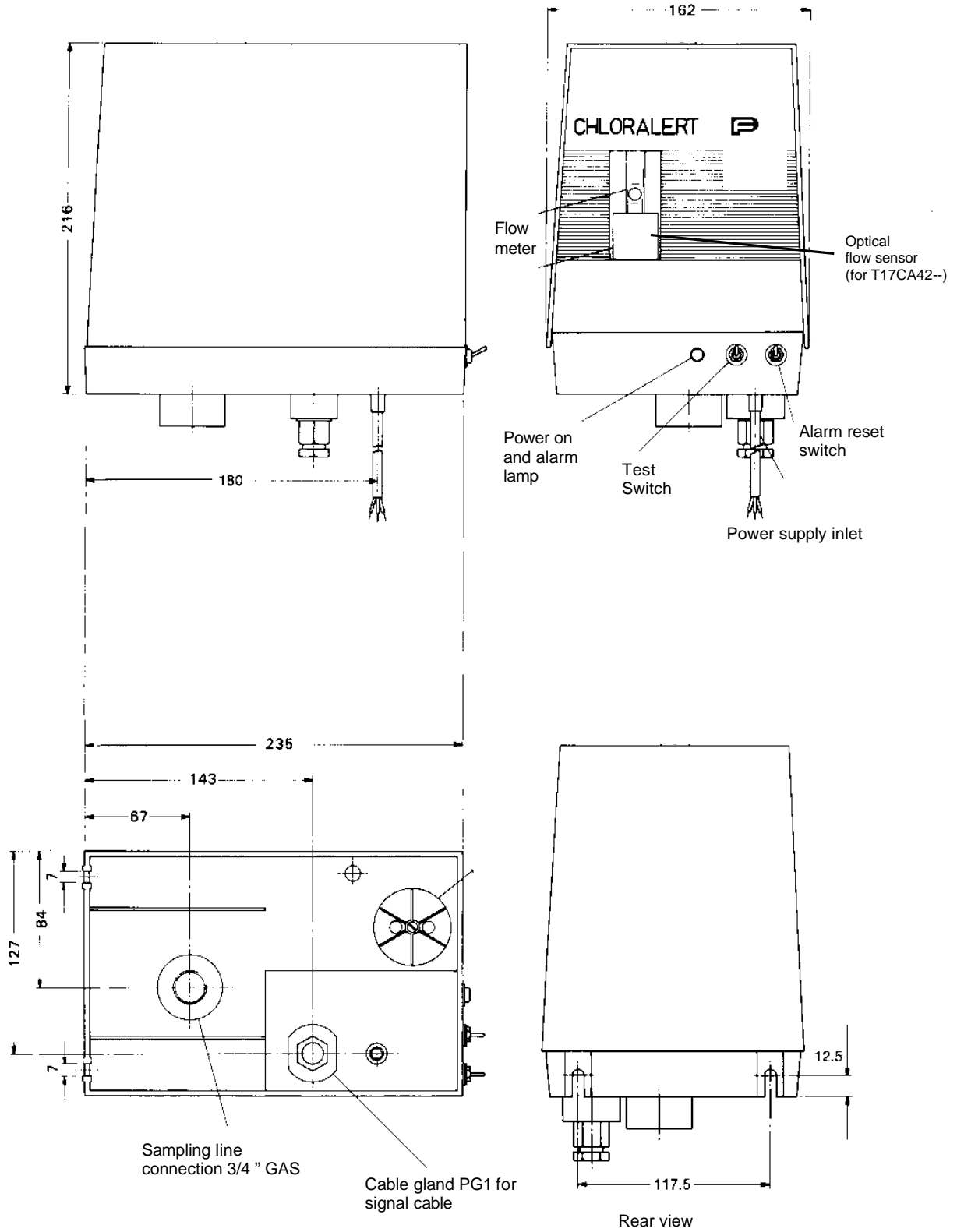
- 1 electrolyte bottle
- 1 spare float
- 1 set of spare O-Ring
- 1 Insect screen.

**OPTIONAL ACCESSORIES**

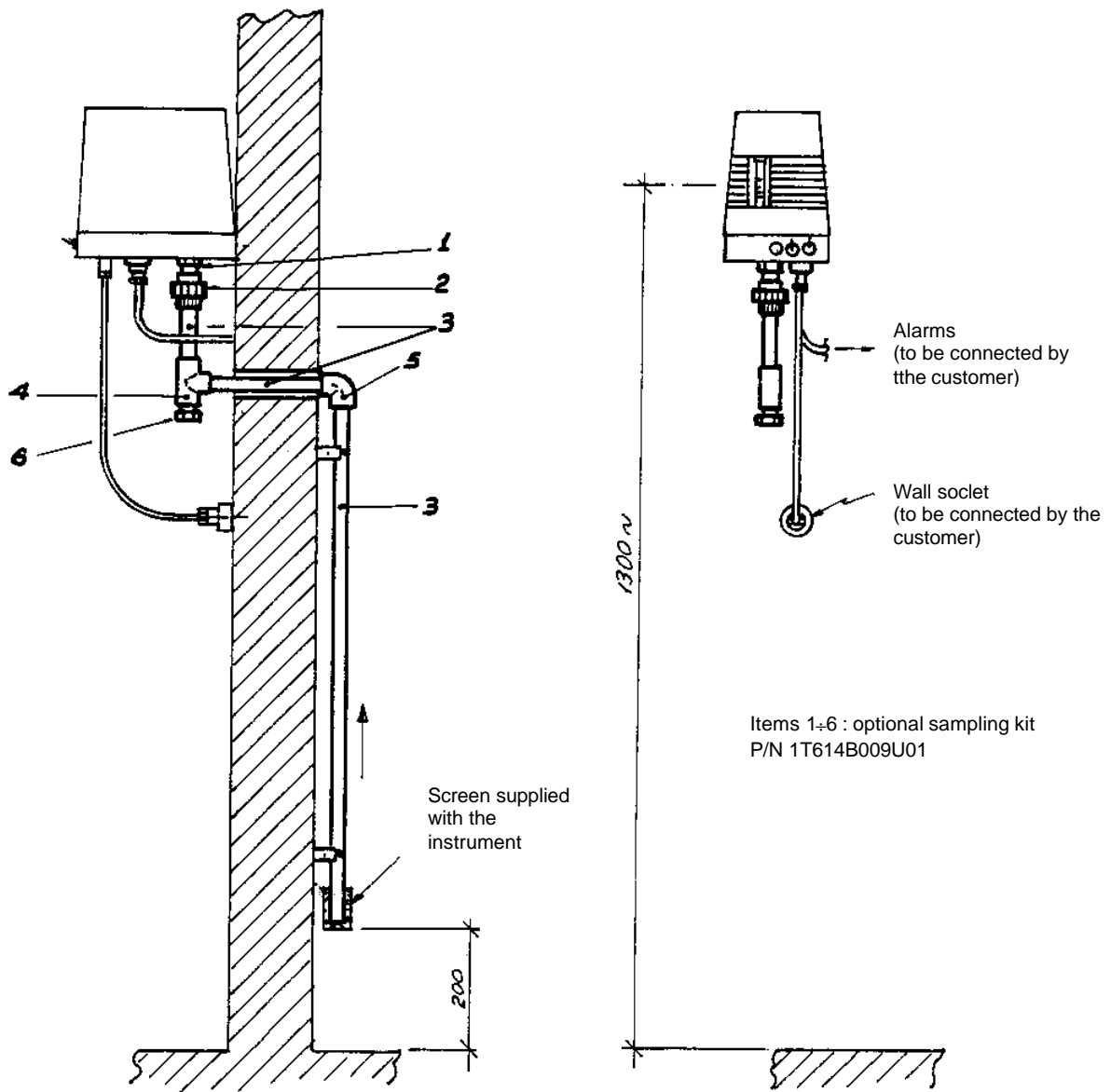
- 8 m PVC piping, 1" + 1 hose adapter, 1" NPT , 1" ID. P/N 614S071U02.
- Sampling kit (See pag.4) P/N 1T614B009U01



OUTLINE AND MOUNTING DIMENSIONS



SUGGESTED INSTALLATION



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Serven Trent Water Purification S.p.A. reserve the right to make modifications without advance notice.

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SEVERN

TRENT

SERVICES

# UltraDynamics™

## Providing Customer Focused Solutions For Your Water & Wastewater Needs.

### Disinfection Products

#### Series 8400



**Vertical Open Channel**  
0.5 MGD - 4.0 MGD

#### Series 8102-GIE



**General Industrial**  
24 GPM - 100 GPM

#### Series 8200



**Horizontal Open Channel**  
10 - 2000 GPM

#### Series 8102-LIE



**Light Industrial**  
7 GPM - 30 GPM

#### Series 8102-HIE



**Heavy Industrial**  
35 GPM - 280 GPM

#### Automatic Wiper Option



#### 8102-HO



**High Output UV**  
150 - 4000 GPM



**Severn Trent Services**  
www.severntrentservices.com  
**Disinfection Group**

**Ultraviolet Disinfection Applications at a Glance**

	<b>Disinfection</b>	<b>Deionization</b>	<b>Oxidation</b>	<b>Ozone Destruction</b>	<b>Reverse Osmosis</b>	<b>TOC Reduction</b>	<b>Ultra Filtration</b>
<b>Aquaculture</b>	X						
<b>Beverage</b>	X				X		X
<b>Chemical</b>	X		X				
<b>Cosmetics</b>	X	X			X		X
<b>Electronics</b>	X	X	X	X	X	X	X
<b>Food</b>	X						
<b>Laboratories</b>	X	X			X	X	X
<b>Marine</b>	X				X		
<b>Oil/Gas/Petro-chemical</b>	X				X		
<b>Pharmaceutical</b>	X	X	X	X	X	X	X
<b>Potable Water</b>	X						X
<b>Waste Water</b>	X						

**Severn Trent Services**

3000 Advance Lane

Colmar, PA 18915

Telephone 215 997 4000

Fax 215 997 4062

marketing@severntrentservices.com

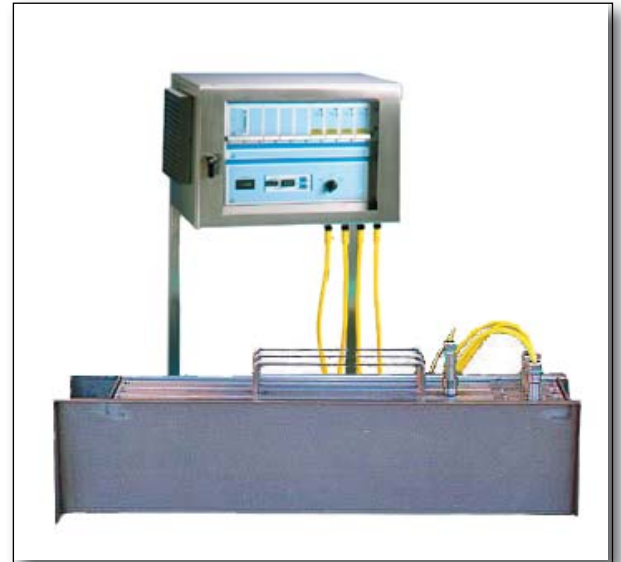
# UltraDynamics®

## Series 8300

### Horizontal Open Channel

The Series 8300 Ultraviolet Disinfection product line is designed to provide user friendly operation, ease of installation and maintenance. The Series 8300 incorporates state-of-the-art components to provide a simple, reliable product for the control of waterborne microorganisms in wastewater. Low pressure germicidal arc lamps are protected by quartz sleeves and positioned horizontally, in an open channel, parallel with the flow of effluent.

Reliability is our number one priority at Severn Trent Services. Each 8300 Series system includes rugged stainless steel UV lamp modules designed to be light weight and easy to handle. Lamp modules may be mounted in a prefabricated stainless steel channel or in a concrete channel built on site. A compact, power supply center houses all of the UV lamp power supplies and controls, providing easy access for operation and maintenance. Interconnecting cables are protected with rugged PVC insulation and terminate through waterproof, multi-pin connectors.



#### Features:

- ◆ Easy Installation
- ◆ Light Weight, Stainless Steel Lamp Modules
- ◆ Quick Disconnect Power Cables
- ◆ Efficient, Plug-In Electronic Power Supplies
- ◆ UV Intensity Monitor
- ◆ Designed for Outdoor Operation
- ◆ Compact control panel bolts to a wall or railing near the channel
- ◆ UV intensity monitor alerts operators when sleeve maintenance is required



## GENERAL

### Prefabricated Channel

- ◆ 304 stainless steel construction
- ◆ Optional level control weir and inlet transition box
- ◆ Built-in lamp module service rack

### UV Lamp Module

- ◆ 304 stainless steel construction
- ◆ 2 and 4 lamp configurations
- ◆ Maximum weight including lamps & sleeves - 20 pounds
- ◆ Low pressure, slimline, UV lamp with single end connection
- ◆ Test tube type protective quartz sleeves; PVC insulated, waterproof cable and connector

### System Control Panel

- ◆ Corrosion resistant stainless steel enclosure
- ◆ Key lockable hinged door
- ◆ Wall mounted within 25 feet of lamp modules

### Lamp Power Supplies

- ◆ Plug-in circuit card design
- ◆ Electronic, high frequency
- ◆ Integral ground fault circuit interrupter
- ◆ LED indication of ground fault; LED indication of lamp failure
- ◆ Automatic shutdown on lamp failure

### Technical Data

#### UV Intensity Monitor

- ◆ 0-100% indication of germicidal UV intensity
- ◆ Dual, fully adjustable alarm set points
- ◆ Dual, form-C, alarm output contacts
- ◆ 240 Vac  $\pm 20\%$ , 50/60 Hz, single phase, 3 Watts
- ◆ 4-20 mA output - 400 ohm maximum

### Warranty and Capability

Severn Trent Services UltraDynamics® Ultraviolet Disinfection products are warranted for eighteen months from the date of invoice, or twelve months from the date of installation, whichever is earlier.

Disinfection technologies, water quality monitors and instrumentation for water and wastewater are areas of specialization. Over 35 years of industrial and municipal application experience in the water and wastewater industries.

### Brief Specification

The Ultraviolet Disinfection System shall incorporate low pressure, germicidal UV lamps, positioned horizontally in an open channel, parallel with the flow of wastewater. The system shall include UV lamp modules consisting of a stainless steel frame, protective quartz sleeves, germicidal lamps and power cable.

The UV system shall include a prefabricated stainless steel channel with flanged connections.

A corrosion-resistant control panel shall include electronic UV lamp power supplies, UV intensity monitor, elapsed time meter and power cable receptacles.

System control shall be manual or automatic through the use of an optional PLC Based System Controller. The controller shall provide automatic on/off control of UV lamp banks based upon a 4-20 mA dc flow signal.

#### Severn Trent Services

3000 Advance Lane

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165.0005.12 09/06



# UltraDynamics®

## Series 8200

### Horizontal Open Channel

The Series 8200 Ultraviolet Disinfection product line is designed to provide user friendly operation, easy installation and maintenance. The Series 8200 incorporates state-of-the-art components to provide a simple, reliable product for the control of waterborne microorganisms in wastewater. Low pressure germicidal arc lamps are protected by quartz sleeves and positioned horizontally, in an open channel, parallel with the flow of effluent.

Reliability is our number one priority at UltraDynamics®. Each 8200 Series system includes rugged stainless steel UV lamp modules designed to be light weight and easy to handle. Lamp modules may be mounted in a prefabricated stainless steel channel (provided by UltraDynamics®) or in a concrete channel built onsite. A compact, power supply center houses all of the UV lamp power supplies and controls, providing easy access for operation and maintenance. Interconnecting cables are protected with rugged PVC insulation and terminate through waterproof, multipin connectors.

Also available is our automatic quartz sleeve wiping option, as well as low pressure-high output lamp technology



#### Standard System Features:

- ◆ Easy installation
- ◆ Proven horizontal lamp configuration
- ◆ Light weight, stainless steel lamp modules
- ◆ Quick disconnect power cables
- ◆ UV intensity monitor
- ◆ Designed for outdoor operation
- ◆ Compact control panel bolts to a wall or railing near the channel



#### Auto Wiping System Features:

- ◆ Reduced O & M costs associated with manual cleaning
- ◆ Improved lamp efficiency for enhanced UV dose delivery
- ◆ Cleans automatically while the system is in operation
  - ◆ No need to shut down the system or bypass lamp modules for routine cleaning
- ◆ Uses existing proven wiper timer technology
  - ◆ Operator can adjust frequency and duration of cleaning cycles
- ◆ Module submersible during limited flood events
- ◆ Wipes sensor lens every wipe cycle to reduce false alarms due to sensor fouling



Model No.	Peak Flow (GPM- m3/hr)**	Lamp Type	No. of Lamps Modules	No. of Lamps	Power Requirements	Power Consumption
82S2-01	10 (2.25)	Short	1	2	120/240 Vac, 50/60 Hz	100 Watts
82S2-02	20 (4.5)	Short	2	4	120/240 Vac, 50/60 Hz	200 Watts
82S2-03	30 (6.8)	Short	3	6	120/240 Vac, 50/60 Hz	300 Watts
82S2-04	40 (9.0)	Short	4	8	120/240 Vac, 50/60 Hz	400 Watts
82S2-05	50 (11.0)	Short	5	10	120/240 Vac, 50/60 Hz	500 Watts
82S2-06	55 (12.5)	Short	6	12	120/240 Vac, 50/60 Hz	600 Watts
82L2-01	25 (5.65)	Long	1	2	120/240 Vac, 50/60 Hz	185 Watts
82L2-02	50 (11.0)	Long	2	4	120/240 Vac, 50/60 Hz	370 Watts
82L2-03	75 (17.0)	Long	3	6	120/240 Vac, 50/60 Hz	555 Watts
82L2-04	100 (22.7)	Long	4	8	120/240 Vac, 50/60 Hz	880 Watts
82L2-05	130 (29.5)	Long	5	10	120/240 Vac, 50/60 Hz	930 Watts
82L2-06	140 (31.8)	Long	6	12	120/240 Vac, 50/60 Hz	1,115 Watts
82L2-07	180 (40.9)	Long	7	14	120/240 Vac, 50/60 Hz	1,300 Watts
82L4-03	150 (34.0)	Long	3	12	120/240 Vac, 50/60 Hz	1,115 Watts
82L4-04*	200 (45.4)	Long	4	16	120/240 Vac, 50/60 Hz	1,485 Watts
82L4-05	250 (56.75)	Long	5	20	120/240 Vac, 50/60 Hz	1,850 Watts
82L4-06*	300 (68.1)	Long	6	24	120/240 Vac, 50/60 Hz	2,225 Watts
82L4-07	350 (79.5)	Long	7	28	120/240 Vac, 50/60 Hz	2,600 Watts
82L4-08*	400 (90.8)	Long	8	32	120/240 Vac, 50/60 Hz	2,965 Watts
82L4-09	450 (102.2)	Long	9	36	120/240 Vac, 50/60 Hz	3,335 Watts
82L4-10*	500 (113.5)	Long	10	40	120/240 Vac, 50/60 Hz	3,705 Watts
82L4-11	550 (124.9)	Long	11	44	120/240 Vac, 50/60 Hz	4,075 Watts
82L4-12*	600 (136.2)	Long	12	48	120/240 Vac, 50/60 Hz	4,445 Watts

\* These Models available with the automatic wiper option

\*\* Peak flow based on year round disinfection 65%T, TSS<30 mg/l, Fecal Limit< 200MPN/100ml

## Warranty and Capability

Severn Trent Services UltraDynamics® ultraviolet disinfection products are warranted for eighteen months from the date of invoice, or twelve months from the date of installation, whichever is earlier.

Disinfection technologies, water quality monitors and instrumentation for water and wastewater are areas of specialization. Over 35 years of industrial and municipal application experience in the water and wastewater industries.

## Brief Specification

The ultraviolet disinfection system shall incorporate low pressure, germicidal UV lamps, positioned horizontally in an open channel, parallel with the flow of wastewater. The system shall include UV lamp modules consisting of a stainless steel frame, protective quartz sleeves, germicidal lamps and power cable.

The UV system shall include a (optional) prefabricated stainless steel channel.

A corrosion-resistant control panel shall include UV lamp power supplies, UV intensity monitor, elapsed time meter and power cable receptacles.

The UV system shall be UltraDynamics® Series 8200

The UV system shall include an (optional) automatic quartz sleeve wiping mechanism.

### Severn Trent Services

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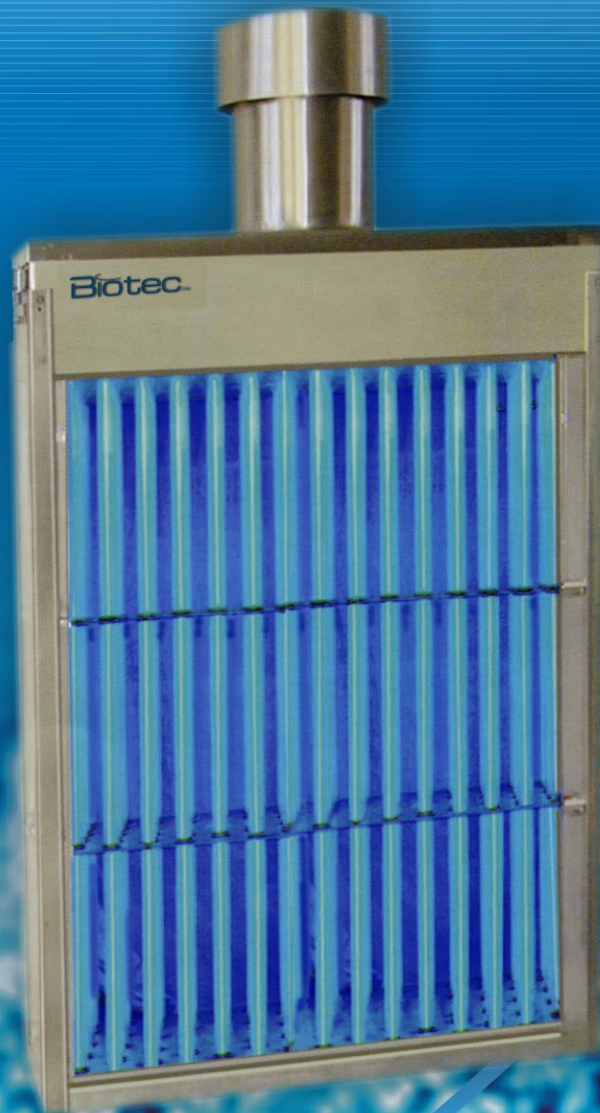
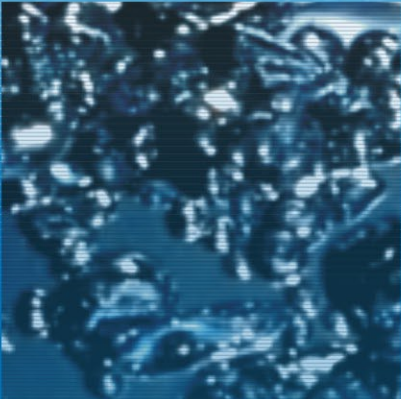
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**Biotec** s.n.l.  
UV Division

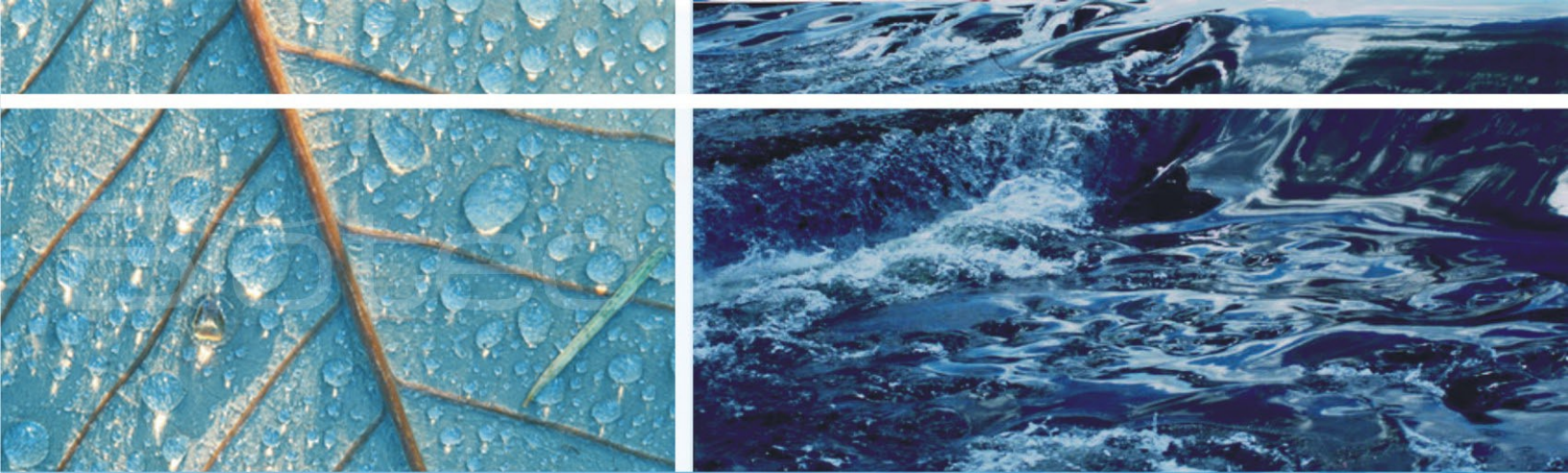
## From Tradition to Technological Innovation

Open channel vertical UV-C disinfection system



# UV-C





## Features :

The UV-LV open channel system, with traditional, low pressure, high intensity, mercury vapour or amalgam lamps, positioned vertically and transversally to the water flow, is applied mainly to the disinfection of waste water.

The UV-LV system is composed by a vertical module, a stainless steel support frame, UV lamps, quartz sleeves, power distribution centre, UV monitoring system.

The system can be equipped with:

1 - Pneumatically activated, automatic cleaning system, with wiper rings made of UV resistant material. This allows the cleaning of the quartz sleeves at preset intervals. Use of the automatic cleaning system allows the plant operator to keep the quartz sleeves clean, without having to remove them or stop the UV system's operation.

2 - PLC based control system.







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## Instrumentos Complementares de Medição

### Indicador digital programável

#### TIS - 800 -013

Dimensão (frontal) . . . . . 96 x 48 mm  
Entrada . . . . . RTD / mA / mV / V / Termopar  
Escala . . . . . programável  
Alarmes . . . . . 2 configuráveis  
Protecção . . . . . IP65 e NEMA 4X (frontal)  
Programação . . . . . Via painel frontal  
Precisão . . . . . +/- 0,1 %



### Totalizadores

#### 7110 DIN

##### Auto alimentado

Display . . . . . 8 dígitos LCD  
Frequência máxima entrada . . . . . 10 K Hz  
Protecção . . . . . IP65 e NEMA 4X (frontal)



### Registador

#### Minitrace 200/1

Entrada . . . . . 4-20 mA  
Alimentação . . . . . 220V ca / 50 Hz  
Escala . . . . . programável  
Registo contínuo, tipo ponta de feltro  
Gráfico . . . . . tipo harmónio  
9 velocidades de registo comutáveis:  
15, 20, 40, 60, 120, 200, 400, 600, 1200 mm/h  
Dimensões . . . . . 144 x 144 x 200 mm





## Série ISOMAG MS501 - Caudalímetro electromagnético sensor Microflow

**Material do corpo** ..... aço inox AISI 304

**Diâmetro** ..... de DN3 até DN20

**Pressão nominal** ..... PN16 ou PN40 (opcional)

### Ligações ao processo

Roscadas UNI338

Roscadas NPT

Tri-clamp

Sanitárias DIN11851

Flangeadas

Tri-clover

SMS

### Material das ligações

Aço inox AISI 304

AISI 316

**Revestimento interno** ..... PTFE

### Material dos eléctrodos

Aço inox AISI 316

Hastelloy C

Titânio

Tântalo

Platina

### Temperatura máxima de funcionamento

**versão compacta** ..... 100°C

**versão separada** ..... 150°C

### Protecção

**versão compacta** ..... IP67

**versão separada** ..... IP68

**Condutividade mínima do fluido** ..... 5µs/cm



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).

## Série ISOMAG MS600

### Caudalímetro electromagnético, sensor Microflow em polypropileno

<b>Material do corpo</b> . . . . .	polypropileno
<b>Diâmetro</b> . . . . .	DN3 até DN20
<b>Pressão nominal</b> . . . . .	PN16
<b>Ligações roscadas</b> . . . . .	GAS/NPT
<b>Gama de temperatura</b> . . . . .	0-60°C
<b>Resistência ao vácuo</b> . . . . .	10 kPa a 60°C
<b>Revestimento interno</b> . . . . .	polypropileno
<b>Material dos vedantes</b> . . . . .	Viton/EPDM
<b>Material dos eléctrodos</b>	
- AISI 316 L	
- Hasteloy C	
- Titânio	
- Platina - Rhodio	
- Tântalo	
<b>Protecção versão compacta</b> . . . . .	IP67
<b>Protecção versão separada</b> . . . . .	IP68
<b>Precisão/Conversor</b>	
- <b>ML 110</b> . . . . .	0,8% - 0,4%
- <b>ML3F1</b> . . . . .	0,4%
- <b>ML21X</b> . . . . .	0,4%
<b>Repetibilidade</b> . . . . .	0,2%



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).

## Série ISOMAG MS1000

### Caudalímetro electromagnético sensor tipo "wafer" para montar entre flanges

#### Material do corpo

Aço carbono

Aço inox AISI 304

**Diâmetro** ..... de DN25 até DN400

#### Pressão nominal

**Revestimento em PP** ..... PN16

**Revestimento em ebonite** (DN 200-400) .... PN16

**Revestimento em PTFE** (DN 25-150) ..... PN40

**Revestimento em PTFE** (DN 200-400) ..... PN16

**Ligação processo** ..... Wafer

#### Revestimento interno

Polipropileno (DN25-150)

Ebonite (DN 200-400)

PTFE (DN25-400)

#### Temperatura máxima de funcionamento

**Revestimento PP** ..... 60°C

**Revestimento ebonite** ..... 80°C

**Revestimento PTFE**, versão compacta ..... 100°C

**Revestimento PTFE**, versão separada ..... 150°C

#### Material dos eléctrodos

Aço inox AISI 316L

Hastelloy B

Hastelloy C

Tântalo

Platina

#### Protecção

**versão compacta** ..... IP67

**versão separada** ..... IP68



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).



## Série ISOMAG MS2400

### Caudalímetro electromagnético sensor "sanitário" para aplicações na indústria alimentar e farmacêutica

#### Material do corpo

Aço inox AISI 304

Aço inox AISI 316

**Diâmetro** ..... de DN15 até DN100

**Pressão nominal** ..... PN16

#### Ligações ao processo

Sanitária DIN11851

Tri-clamp

Tri-clover

SMS

**Revestimento interno** ..... PTFE

#### Temperatura máxima de funcionamento

**Versão compacta** ..... 100°C

**Versão separada** ..... 150°C

#### Material dos eléctrodos

Aço inox AISI 316L

Hastelloy B

Hastelloy C

Titânio

Tântalo

Platina

#### Protecção

**versão compacta** ..... IP67

**versão separada** ..... IP68

**Condutividade mínima do fluido** ..... 5µs/cm



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).

## Série ISOMAG MS2500

### Caudalímetro electromagnético sensor flangeado

#### Material do corpo

Aço carbono

Aço inox AISI 304

**Diâmetro** . . . . . de DN25 até DN2000

**Pressão nominal** . . . PN16 standard, outras em opção

#### Ligações ao processo

Flange UNI/DIN

Flange ANSI

Flange JIS

#### Revestimento interno

Polipropileno

Ebonite

PTFE

#### Temperatura máxima de funcionamento

**Revestimento em PP** . . . . . 60°C

**Revestimento em ebonite** . . . . . 80°C

**Revestimento em PTFE, versão compacta** . . . 100°C

**Revestimento em PTFE, versão separada** . . . 150°C

#### Material dos eléctrodos

Aço inox AISI 316L

Hastelloy B

Hastelloy C

Titânio

Tântalo

Platina

#### Protecção

**versão compacta** . . . . . IP67

**versão separada** . . . . . IP68

**Condutividade mínima do fluido** . . . . . 5µs/cm



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).

## Série ISOMAG MS3700/MS3770

### Caudalímetro electromagnético sensor de inserção para montagem "T"

**Material do corpo** ..... aço inox AISI 304

**Diâmetro da tubagem**

- **MS3700** ..... de DN250 até DN2000

- **MS3770** ..... de DN80 até DN2000

**Pressão nominal** ..... PN16

**Ligações ao processo**

- **MS3700** ..... roscado com válvula de isolamento

- **MS3770** ..... flangeado DN32

**Material de ligação**

- **MS3700** ..... aço carbono e válvula em bronze

- **MS3770** ..... aço inox AISI 304

**Revestimento** ..... PTFE

**Material dos eléctrodos** ..... aço inox AISI 316L

**Temperatura máxima de funcionamento**

**Versão compacta** ..... 100°C

**Versão separada** ..... 150°C

**Protecção**

**versão compacta** ..... IP67

**versão separada** ..... IP68

**Precisão do conjunto**

+/- 1,5-2% com inserção 1/8 do DN

**Condutividade mínima do fluido** ..... 5µs/cm



MS3700



MS3770



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).



## Série ISOMAG MS5000 (CIAO) Caudalímetro electromagnético

<b>Material do corpo</b> . . . . .	borracha poliuretânica
<b>Diâmetro</b> . . . . .	DN25 até DN80
<b>Ligações</b> . . . . .	por abraçadeira
<b>Pressão nominal</b> . . . . .	PN6
<b>Gama de temperatura</b> . . . . .	0-50°C
<b>Resistência ao vácuo</b> . . . . .	20 kPa a 50°C
<b>Revestimento interno</b> . . . . .	borracha poliuretânica
<b>Material dos vedantes</b> . . . . .	Viton/EPDM
<b>Material dos eléctrodos</b>	
- AISI 316 L	
- Hastelloy C	
- Titânio	
<b>Protecção</b>	
- Versão compacta . . . . .	IP 67
- Versão separada . . . . .	IP68
<b>Precisão</b> . . . . .	+/- 2% (ML110)
<b>Repetibilidade</b> . . . . .	+/-0,5%



Versão compacta (conversor incorporado)

Todos os modelos podem ser fornecidos com conversor incorporado (versão compacta) ou separado.

A distância entre o sensor e o primário pode ir até 500 metros, utilizando um pré-amplificador (necessário para distâncias superiores a 10/20 metros).

## Série ISOMAG ML110

### Conversor para caudalímetros electromagnéticos servido por microprocessador - precisão 0,8% / 0,4%

#### Material da caixa

Nylon com fibra de vidro

Aço inox AISI 304 (opcional - ML190)

**Dimensões** . . . . . 127x124x79 mm

**Classe de protecção** . . . . . IP65

**Temperatura ambiente de trabalho** . . . . . 0 a 50°C

**Display** . . . . . 2 linhas, 16 caracteres

**Programação** . . . . . 3 teclas internas

#### Frequência máxima impulso

1250Hz (100mA, 40V dc)

#### Saída

0/4-20mA (opcional), impulsos e alarme

ou outra programável, isoladas galvanicamente

**Leitura** . . . . . bi-direccional

**Função especial** . . . . . auto diagnóstico

**Memorização de dados** . . . . . em EEPROM

#### Alimentação

90-265V/45-60 Hz

18-63V dc ou 15-45V ac/45-60 Hz (opcional)

**Precisão** . . . . . 0,8 ou 0,4%

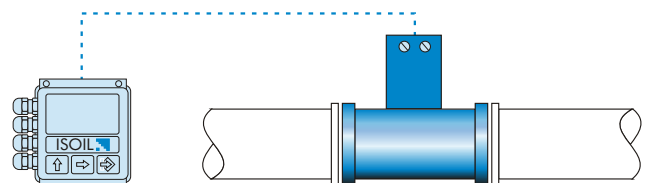
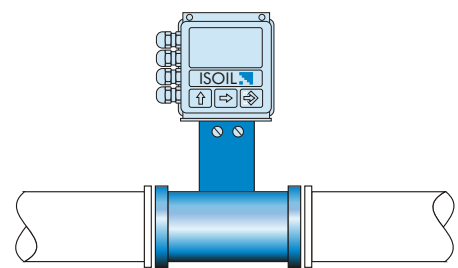
**Repetibilidade** . . . . . 0,2%

**Consumo** . . . . . 5VA ou 3W

#### Montagem

**Compacta** . . . . . sobre o sensor

**Separada** . . . . . mural ou em painel



## Série ISOMAG ML210

### Conversor para caudalímetros electromagnéticos servido por microprocessador - precisão 0,2%

#### Material da caixa

Alumínio

Aço inox AISI 304 (opcional -ML200)

**Dimensões** ..... 140 x 140 x 160 mm

**Classe de protecção** ..... IP67

**Temperatura ambiente de trabalho** .... -20 a 70°C

**Display** ..... 8 linhas, 16 caracteres, 128 x 64 pixel

**Programação** ..... 3 teclas via painel frontal

#### Frequência máxima impulso

1250Hz e 12,5 KHz(100mA, 40V dc)

**Saída** ..... 0/4-20mA (opcional), impulsos e alarme

**Saída série** ..... RS485

**Leitura** ..... bi-direccional

#### Funções especiais

Pré-selecção (doseamento)

Auto diagnóstico

Data logger, com módulo opcional

Medição de energia térmica,  
com módulo opcional- ML 211

Controlador PID - ML 212

**Memorização de dados** ..... em EEPROM

#### Alimentação

90-265V/45-60 Hz

10-25V dc (opcional)

18-63V dc ou 15-45V ac/45-60 Hz (opcional)

**Precisão** ..... 0,2%

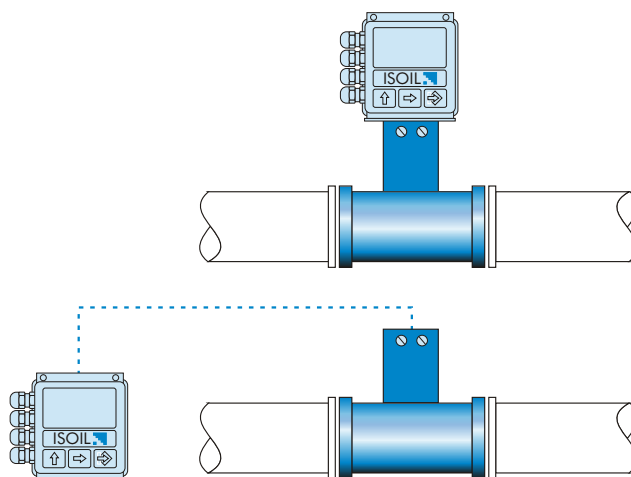
**Repetibilidade** ..... 0,1%

**Consumo** ..... 25VA ou 21W

#### Montagem

**Compacta** ..... sobre o sensor

**Separada** ..... mural ou em painel





## Série ISOMAG ML250

### Conversor para caudalímetros electromagnéticos

**Material da caixa** . . . . . Alumínio

**Dimensões** . . . . . 140x140x160 mm

**Classe de protecção** . . . . . IP67

**Temperatura ambiente de trabalho** . . . . . -20/+60°C

**Display** . . . . . 2 linhas, 16 caracteres

**Programação** . . . . . 3 teclas via painel frontal

#### Módulos de expansão

- Saída 4-20 mA (passiva, também usada com alimentação pelo loop)
- 1 saída por relé ON/OFF
- 1 entrada por relé ON/OFF
- Profibus PA

**Datalogger** . . . . . 1024 valores + 64 eventos de alarme

**Leitura** . . . . . bi-direccional

#### Funções especiais

- Auto diagnóstico
- Detecção tubagem vazia

**Memorização de dados** . EEPROM, RAM, backup bateria

**Precisão** . . . . . 1% do valor lido

**Repetibilidade** . . . . . 0,5%

#### Alimentação

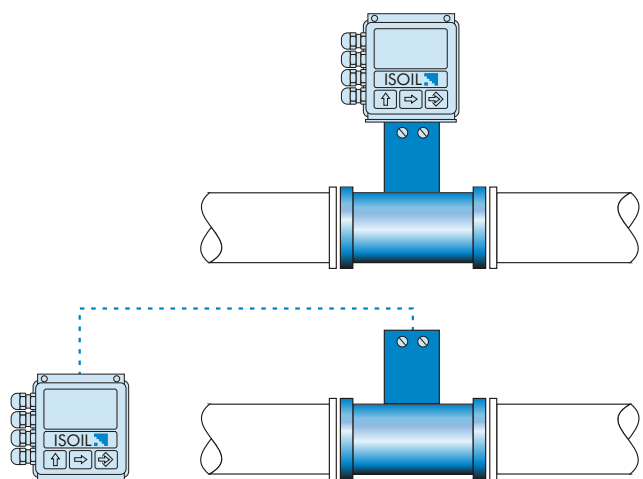
- 1 bateria de lítio tamanho D não recarregável, autonomia 1 ano usando amostragem de 15 s, 1 mês usando amostragem contínua.
- Universal 10V dc - 265 V ac/dc (backup bateria)
- Pelo loop (4-20 mA 2 fios)
- Até 4 baterias permitindo autonomia até 4 anos

#### Consumo

- 0,1 W com bateria
- 0,3 W com alimentação

#### Montagem

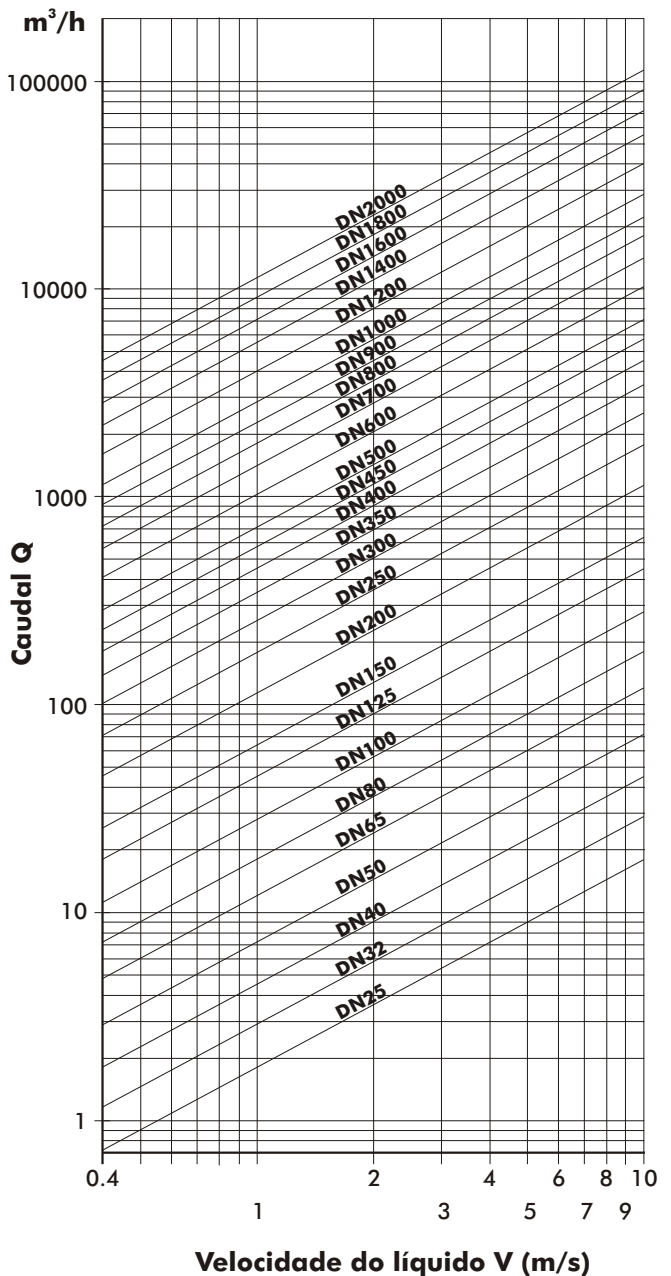
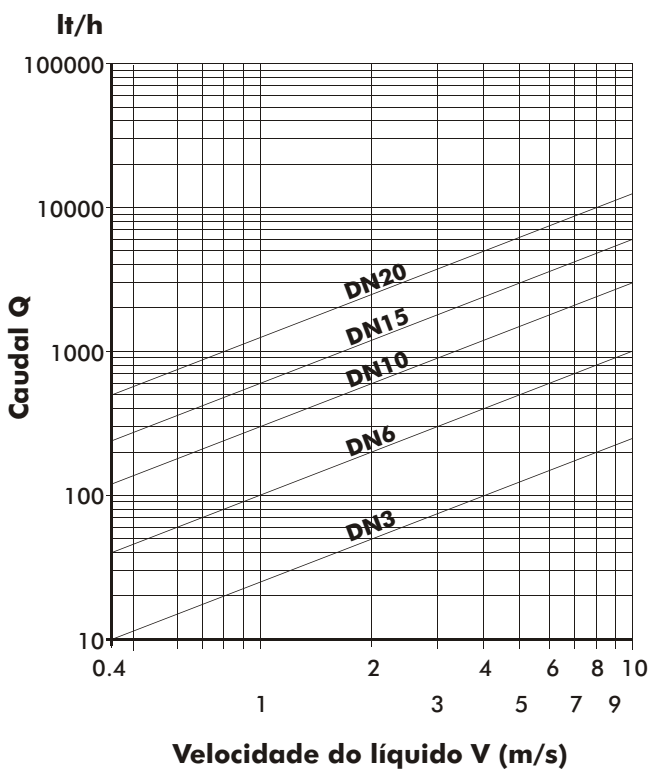
- Compacta . . . . . sobre o sensor
- Separada . . . . . mural ou painel



## DADOS TÉCNICOS - 1 para caudalímetros electromagnéticos

### Tabelas de selecção do diâmetro em função do caudal

Não existindo limitações da instalação, o diâmetro deve ser dimensionado para uma velocidade de cerca de 3m/s no valor máximo do caudal.



## Gama de medida

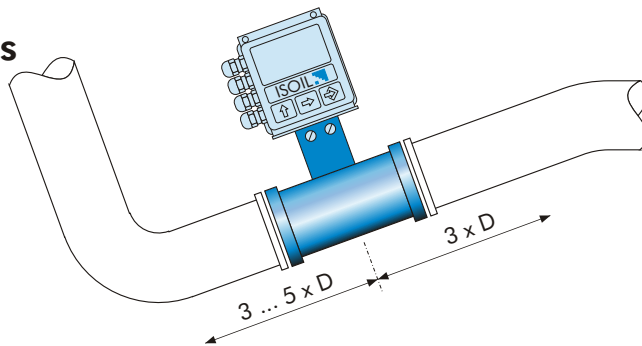
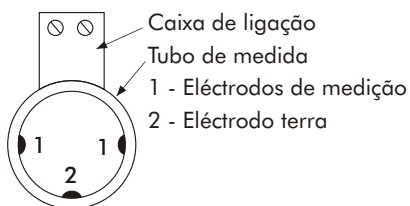
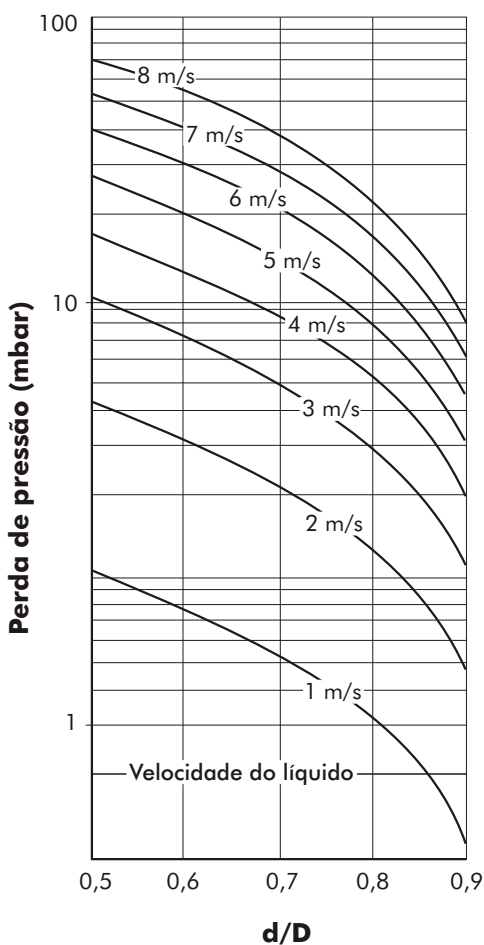
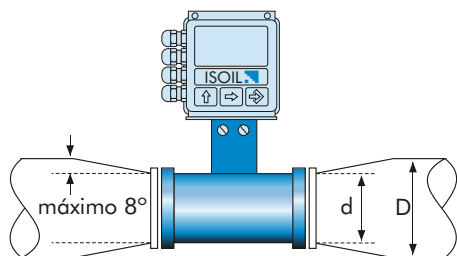
DN	min. 0 ... 0,4 m/s		min. 0 ... 10 m/s	
3	0 ... 10	l/h	0 ... 250	l/h
6	0 ... 40		0 ... 1000	
10	0 ... 120		0 ... 3000	
15	0 ... 240		0 ... 6000	
20	0 ... 500		0 ... 12500	
25	0 ... 0,72	m <sup>3</sup> /h	0 ... 18	m <sup>3</sup> /h
32	0 ... 1,60		0 ... 29	
40	0 ... 1,80		0 ... 45	
50	0 ... 2,88		0 ... 72	
65	0 ... 4,80		0 ... 120	
80	0 ... 7,20		0 ... 180	
100	0 ... 11,20		0 ... 280	
125	0 ... 17,67		0 ... 442	
150	0 ... 25,60		0 ... 640	
200	0 ... 45,20		0 ... 1130	
250	0 ... 70,80		0 ... 1770	
300	0 ... 100,80		0 ... 2520	
350	0 ... 138,00		0 ... 3450	
400	0 ... 180,00		0 ... 4500	
450	0 ... 228,80		0 ... 5720	
500	0 ... 284,00		0 ... 7100	
600	0 ... 408,00		0 ... 10200	
700	0 ... 560,00		0 ... 14000	
800	0 ... 720,00		0 ... 18000	
900	0 ... 920,00		0 ... 23000	
1000	0 ... 1140,00	0 ... 28500		
1200	0 ... 1600,00	0 ... 40000		
1400	0 ... 2200,00	0 ... 55000		
1600	0 ... 2880,00	0 ... 72000		
1800	0 ... 3640,00	0 ... 91000		
2000	0 ... 4520,00	0 ... 113000		



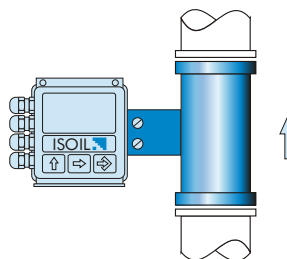
## DADOS TÉCNICOS - 2

### para caudalímetros electromagnéticos

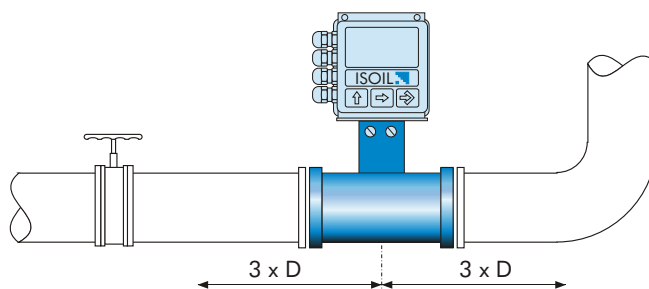
#### Exemplos de montagem



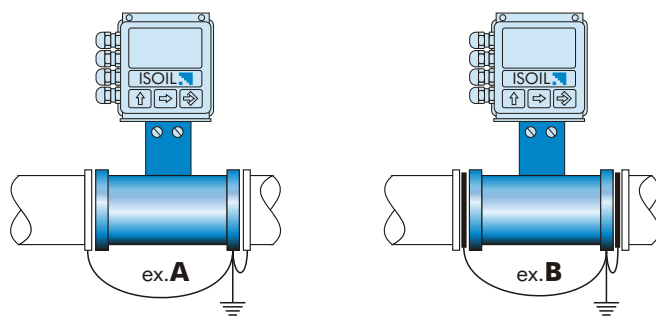
A figura ilustra uma instalação tipo para garantir que a conduta está cheia, condição indispensável para o correcto funcionamento do caudalímetro.



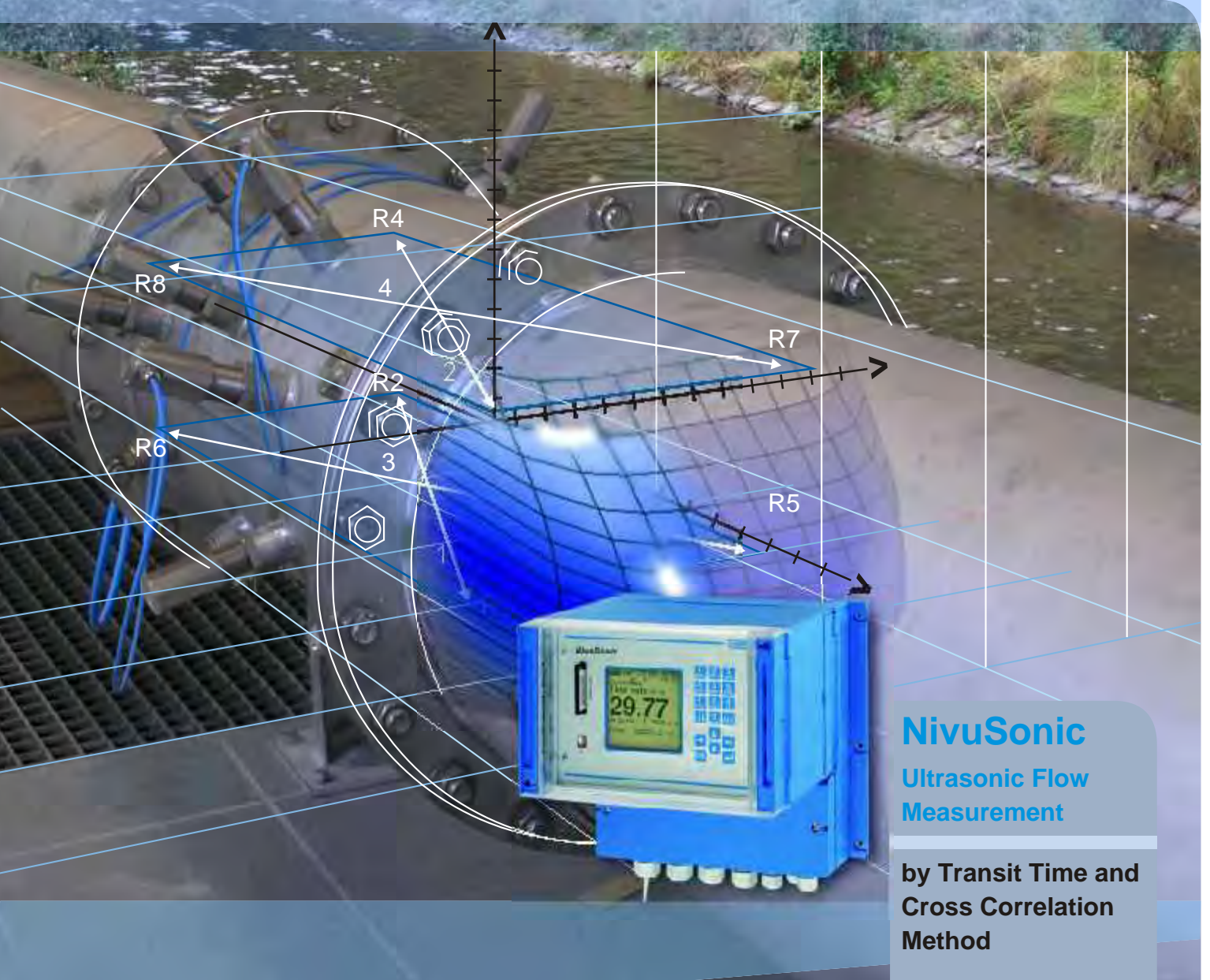
O melhor desempenho é obtido quando o caudalímetro é montado verticalmente, com o fluxo ascendente.



O caudalímetro deve ser instalada afastado de fontes de turbulência (ex. válvulas, curvas, bombas). A distância mínima corresponde a 3 vezes o diâmetro da conduta.



A ligação terra é essencial para uma leitura correcta.  
Ligação em tubagens metálicas, exemplo A.  
Ligação em tubagens plásticas, exemplo B. (usando anéis de terra)  
Alternativamente o caudalímetro pode ser fornecido com eléctrodo de terra.  
Em caso de montagem horizontal, os eléctrodos de medição (1) devem ficar no mesmo plano, e o eléctrodo de terra (2) na parte de baixo.

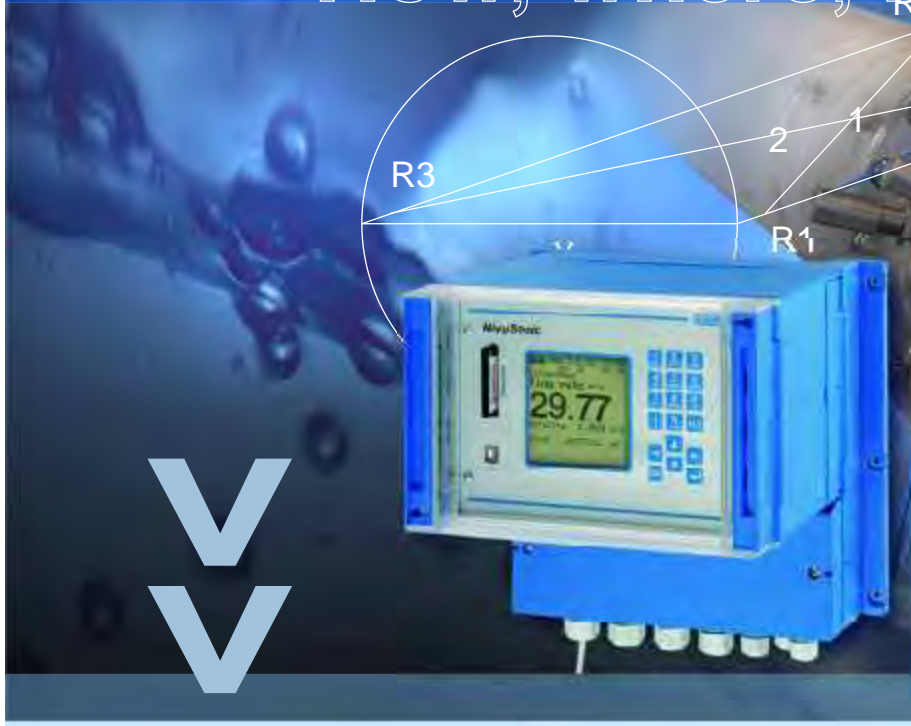


**NivuSonic**  
Ultrasonic Flow  
Measurement

by Transit Time and  
Cross Correlation  
Method

# How, where, how much? A constant flow of news!

## How, where, how much?



### Precise transit time detection through cross correlation

The transit time of ultrasonic pulses will be determined accurately by using cross correlation. Hence this measurement is significantly less sensitive to interferences than other common measurement methods.

#### New:

Using cross correlation technology with digital pattern detection in combination with transit time.

- transit time combined with cross correlation with digital pattern detection
- ultrasonic transit time measurement with 1 to 8 measurement paths
- flow profile detection by combining with ultrasonic cross correlation
- highest measurement accuracy
- measurement in clear to heavily polluted water
- meets IEC 41 (ASME PTC 18) standards
- measurement in pipes and open channels
- easy and multilingual parameter setting in dialog mode
- large, back-lit graphic display
- storage of all measurement data on flash card
- internet access

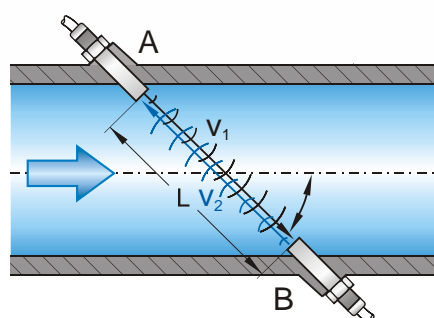
## Measurement principle

### Transit time

$$v_m = \frac{c^2}{2 L \cos} (t_2 - t_1)$$

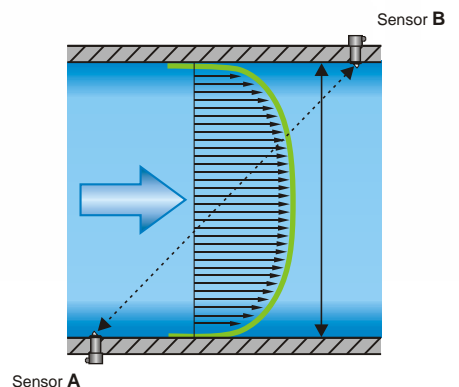
$c$  = sound travel time  
 $t_1$  = time from A to B,  $t_2$  = time from B to A

The measurement principle is based on detecting the transit time of ultrasonic pulses between two sensors (A and B). The transit time transmitting in the flow direction is shorter than the time against the flow direction. The difference between both signals ( $t_2 - t_1$ ) hence is proportional to the average flow velocity  $v_m$ .



The determination of flow velocity profiles, which has been proven using OCM Pro and PCM Pro for many years, is applied here.

Knowing the flow profile enables the determination of average flow velocity with very high accuracy. This has a positive effect on measurement results particularly in the case of slightly distorted velocity profiles. This measurement method enables to apply two-dimensional grid measurements.



The innovative measurement technologies are used in various applications:



## Open channels

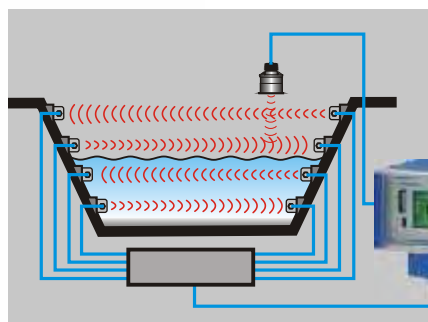
Measurement in open channels and rivers makes high demands on the measurement technology used.

Undefined cross-sectional profiles or flowing river bottoms represent conditions which complicate the use of standard measurement technology.

With the NivuSonic in combination with other measurement units NIVUS is able to implement many of these applications. In the case of the level and sludge level measurements required, NIVUS is able to access measurement systems which have been proven for many years.

Known as state of the art, the easy handling of uncommon profiles was transferred from OCM Pro to NivuSonic.

The number of measurement paths useable will increase measurement accuracy the way it does in full pipes. Up to 8 measurement paths are available for use in open channels as well. The NivuSonic implements their positions and weighting according to DIN EN 6416 standards.

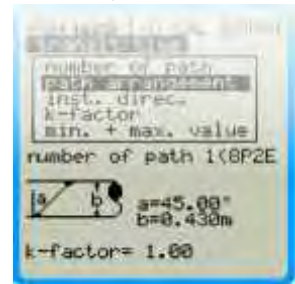


Each transit time sensor additionally offers flow velocity profile determination by using cross correlation, which in contrast to common ADCP systems, provides the well-known advantages.

- high accurate flow velocity detection
- independent from sound velocity (compensation of temperature effects)
- resolution of total flow profiles
- ....

## Operation

The NivuSonic continues to use the intelligent menu-driven operational philosophy known from the OCM Pro and PCM Pro. A clear display layout and a menu structure which is suitable for various applications enable an easily measurement system operable.



## Communication

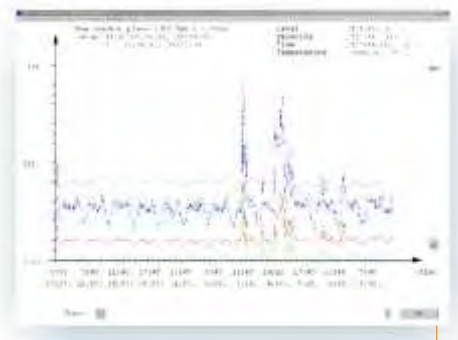
In order to meet the requirements of modern measurement technology the NivuSonic provides communication options for remote maintenance, remote analysis and data transfer purposes as standard.



In this connexion commonly available communication channels were chosen.

- TCP / IP via ethernet
- TCP / IP via analog modem and ISDN
- TCP / IP via GPRS / GSM

Additional data evaluation can be carried out using the NIVUS standard software NivuDat.



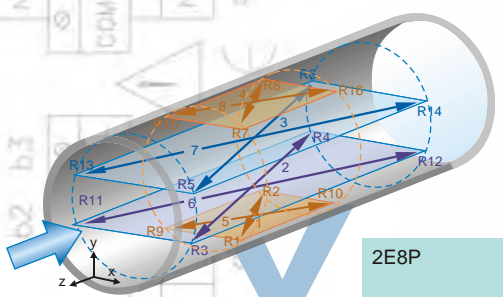
## Full pipes

Traditionally the transit time method is used in full pipes.

In the case of fully developed velocity profiles it is sufficient to use a single path measurement (1E1P).

We normally encounter distorted flow profiles however which have negative effects on the measurement accuracy. These effects can be compensated by using up to 8 measurement paths.

This enables the NivuSonic to achieve the highest accuracy even in difficult applications.



NIVUS with the NivuSonic meets the IEC 41 standard, which determines position and weighting of measurement paths.

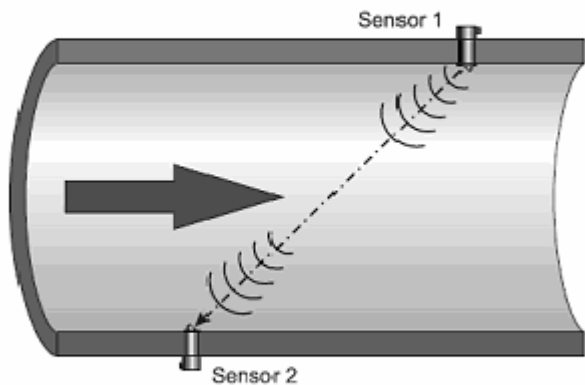
## Stationary ultrasonic flow measurement by transit time and cross correlation method



Power supply	100 to 240 V AC, +10 % / -15 %, 47 to 63 Hz or 24 V DC $\pm$ 15 %, 5 % residual fluctuation
Power consumption	<ul style="list-style-type: none"> <li>• Transmitter: max. 40 VA</li> <li>• with adapter box: max. 48 VA</li> </ul>
Enclosure transmitter	Wall mount enclosure <ul style="list-style-type: none"> <li>• material: Polycarbonate</li> <li>• protection: IP 65</li> </ul>
Enclosure adapter box	<ul style="list-style-type: none"> <li>• material: Aluminium die-cast</li> <li>• protection: IP 65</li> </ul>
Operating temperature	-20° C to +50° C ( -4°F to 122°F)
Storage temperature	-30° C to +70° C ( -22°F to 158°F)
Max. humidity	80 %, non-condensing
Display	Back-lit graphic display, 128 x 128 pixel
Operation	18 buttons, menu driven in German, English, French and Italian
Inputs	<ul style="list-style-type: none"> <li>• 1 x 4 - 20 mA for external level measurement (2-wire sensor)</li> <li>• 4 x 0/4 - 20 mA with 12 bit resolution for external level measurement, setpoint values and data storage</li> <li>• 4 x digital input 2 sensor pairs directly connectable up to 8 sensor pairs can be connected using the adapter box</li> </ul>
Outputs	<ul style="list-style-type: none"> <li>• 4 x 0/4 - 20 mA, load 500 Ohm, 12 bit resolution, accuracy better than 0.1 %</li> <li>• 5 x switchable relays, chargeable to 230 V AC / 2 A (cos <math>\phi</math> 0,9)</li> </ul>
Data storage	Pluggable Compact Flash Card up to 64MB
Data transmission	<ul style="list-style-type: none"> <li>• via plug-in Compact Flash Card</li> <li>• via TCP / IP (optional)               <ul style="list-style-type: none"> <li>• modem, analogue or ISDN</li> <li>• Ethernet or</li> <li>• GPRS / GSM</li> </ul> </li> </ul>

Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
 E:\T\_eng\NivuSonic\NS-DB-A4.p65 / 31.05.2006

# NivuSonic Sensors



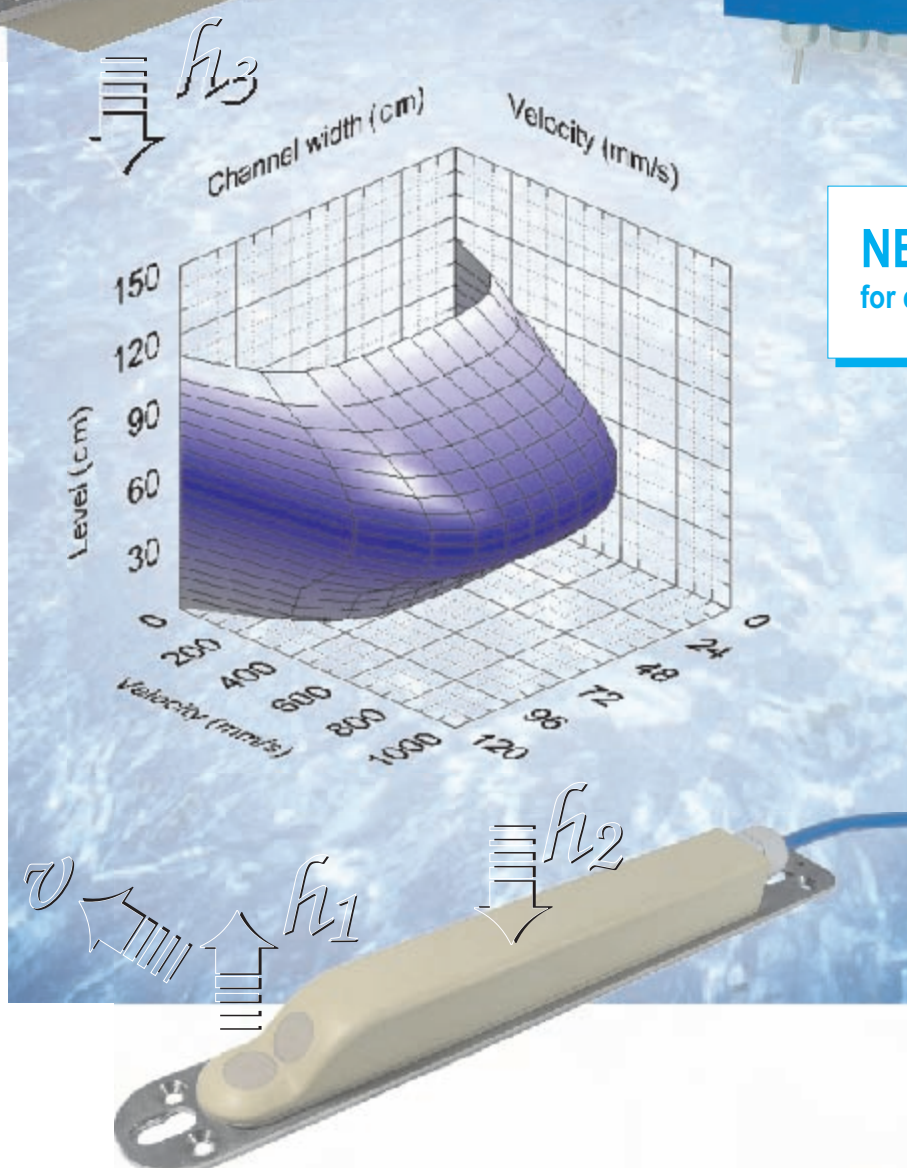
*screw-in sensor  
for pipe installation  
from outside*



*plug-in sensor  
for pipe installation  
from inside*

<b>Measurement principle</b>	<ul style="list-style-type: none"> <li>• <b>Ultrasonic transit time and</b></li> <li>• <b>Cross correlation with digital pattern detection</b></li> </ul>
<b>Flow velocity measurement</b>	in full filled pipes
Measurement range	from -20 m/s to +20 m/s
Error limits (depending on hydraulic conditions)	$\leq 0,5 \%$ of measurement value Depending on hydraulic conditions and number of measurement paths used Plus offset error $\pm$ mm/s
Nominal width measurement range	from 0,2 m to 12 m inside diameter (DN 200 to DN 12000)
Number of sensor pairs	1 to 8 measurement paths; pipes: 1E1P to 2E8P, according to IEC41
Measuring frequency	1 MHz
Protection rating	IP 68
Operating temperature	-20° C to +50° C ( -4°F to 122°F)
Storage temperature	-30° C to +70° C ( -22°F to 158°F)
Operating pressure	max. 80 bar
Cable length	10/15/20/30/50/100 m, extendable up to max. 200 m cable length via adapter box
Cable type	shielded Twinax cable, 100 Ohm
Cable outside diameter	8.5 mm
Interface	RS 485
Sensor types	for use in pipes (wall thickness 10 to 60 mm): <ul style="list-style-type: none"> <li>• screw-in sensors for pipe installation from outside</li> <li>• plug-in sensors for pipe installation from inside</li> </ul>
Medium contacting materials	<ul style="list-style-type: none"> <li>• Sensor enclosure: stainless steel 1.4301</li> <li>• Sensor: CFK (Carbon), Viton</li> </ul>
<b>Temperature measurement via sound velocity</b>	
Measurement range	0° C to +60° C
Measurement error	$\pm 1$ K





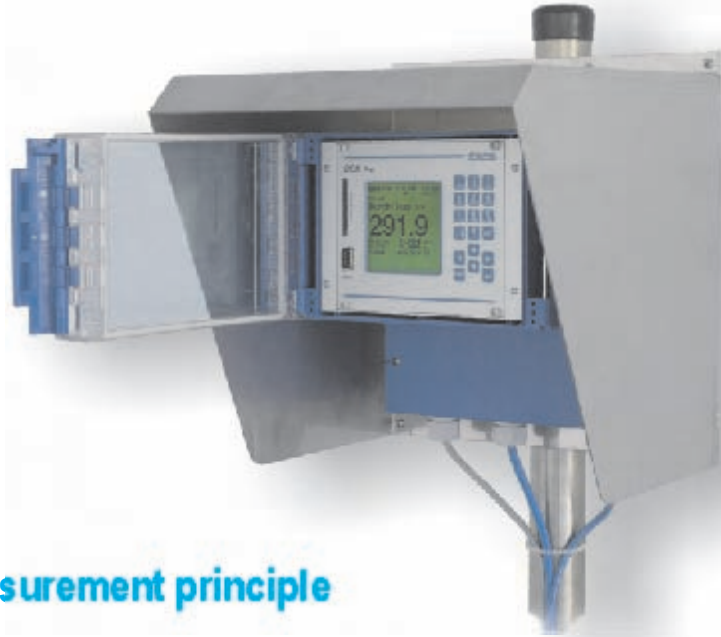
**NEW** with active sensor  
for even faster measurement

## OCM Pro -active-

High accurate flow measurement in part filled and full pipes and channels

## New in the field of flow measurement

- ★ Suitable for MCERTS applications
- ★ Measurement of the real flow velocity profile
- ★ Spatial allocation of single velocities
- ★ Cross correlation with digital pattern recognition
- ★ Very high accuracy
- ★ No calibration required
- ★ No electrodes, no conductivity required
- ★ Absolutely zero point stable and drift-free
- ★ Measurement in part filled and full pipes and channels
- ★ Suitable for all channel profiles
- ★ Easy to install, no additional constructions
- ★ Measurement in highly contaminated and abrasive liquids
- ★ For use in difficult applications too
- ★ Simple, menu-driven operation
- ★ Large graphical backlit display
- ★ Ex Approval for Zone 1 according to ATEX
- ★ All data stored on flash card
- ★ Internet access (available soon)
- ★ Distances of up to 250 m between sensor and transmitter



### Measurement principle

The magnitude >>Flow "Q"<< cannot be measured directly. The principle for flow calculation is based on the following general equation:

$$Q = A \cdot \bar{v}$$

A = wetted cross-sectional Area

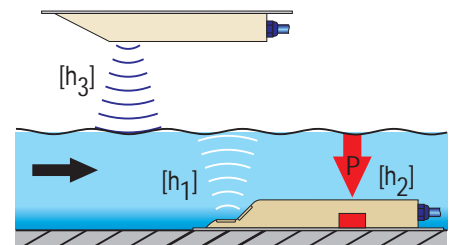
$\bar{v}$  = average Flow Velocity

The wetted cross-sectional area A depends on the section profile and the flow level. In fully pipes, e.g. pressure pipes, the cross-sectional area is always the same and thus can be entered as a constant. In case of a part filled pipe the flow level is determined by an external or integrated level measurement device.

Then the wetted cross-sectional area is calculated by taking the section profile into account.

The flow height, which is determined as a result from that, is proportional to the measured time.

This method stands out for its accuracy and long-term stability. Measuring from the bottom up is particularly advantageous since no dead zones above the water surface are to be taken into account. Thus, the measurement can be carried out in part filled pipes without dome tops up to full fill. Foam or any other substances on the water surface do not affect the measurement result.

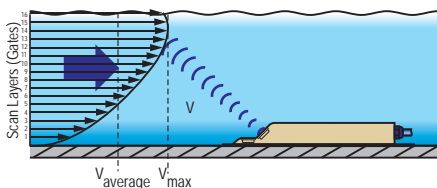


### Flow level measurement

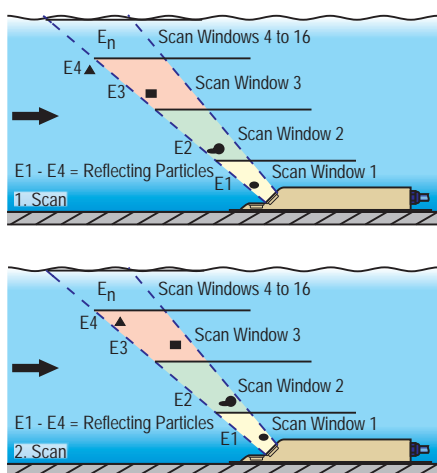
Based on ultrasonic-echo-sounding principle the flow height (flow level) is measured [h<sub>1</sub>] either in the medium from the bottom up or from top down [h<sub>3</sub>] through air-ultrasonic. In both cases the water/air sonic boundary (water surface) is recognised and the sonic time of travel between sensor and water surface is measured.

In conditions where liquids are strongly absorbant or the combi-sensor is off-set the internal pressure transducer over-rides the integrated ultrasonic level sensor.

## Flow velocity measurement



An ultrasonic converter (sensor) sends a short ultrasonic impulse into the medium. This impulse is reflected by particles or gas bubbles in the medium. The sensor operates in impulse-echo-mode. This means that the ultrasonic converter switches to receive mode immediately after emitting an impulse and then receives the reflected echo as a characteristic pattern. The echo patterns from the first scan are stored digitally.



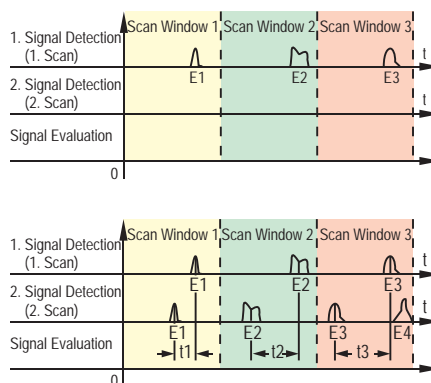
In the second scan another ultrasonic impulse is emitted and the received echo patterns are stored as well.

The runtime between the moment of reception and transmission determines the particles' position within the flow section taking the beam angle into account. Due to resolution purposes the flow section will be subdivided in up to 16 time slots (segments) depending on the flow level.

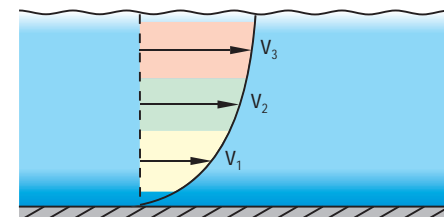
By using the **cross correlation method** the echo patterns of the time slots are checked for agreement. The cross correlation also provides the pattern's temporal movement in the second scan in comparison with the first scan. This temporal movement can be converted directly to the flow velocity in the scan windows respective to the beam angle.

### Formula

$$x(t) \cdot y(t-t) \int_{-T/2}^{T/2} \frac{1}{T} f(t) g(t) dt$$

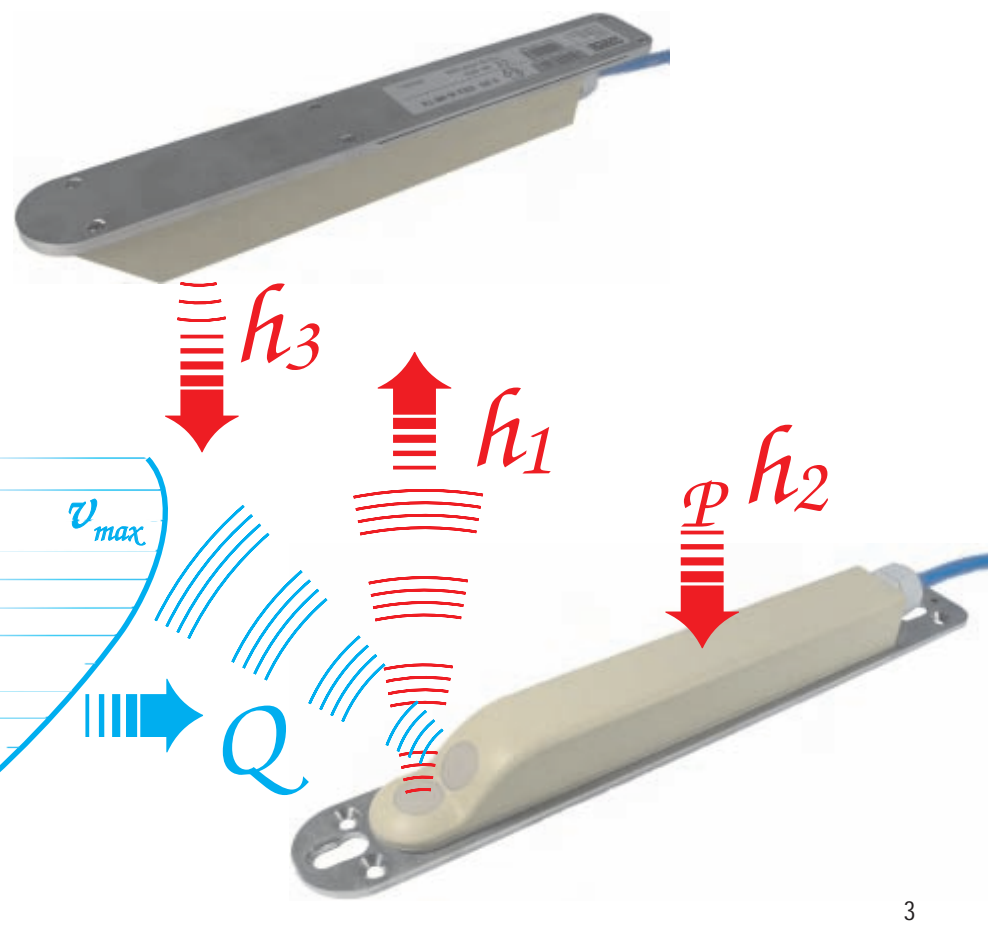
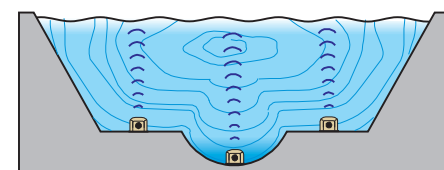


This event is repeated up to 2000 times per second. Using the sensor/integrated signal processor (DSP) the flow profile will be investigated directly in real time by using the individual velocities within the precisely spatially allocated measurement windows.



Hence, it is possible to obtain high accurate measurement values without additional calibration.


In complex or very large channel profiles full-coverage flow profiles can be investigated and evaluated by placing 2 or 3 sensors respectively.

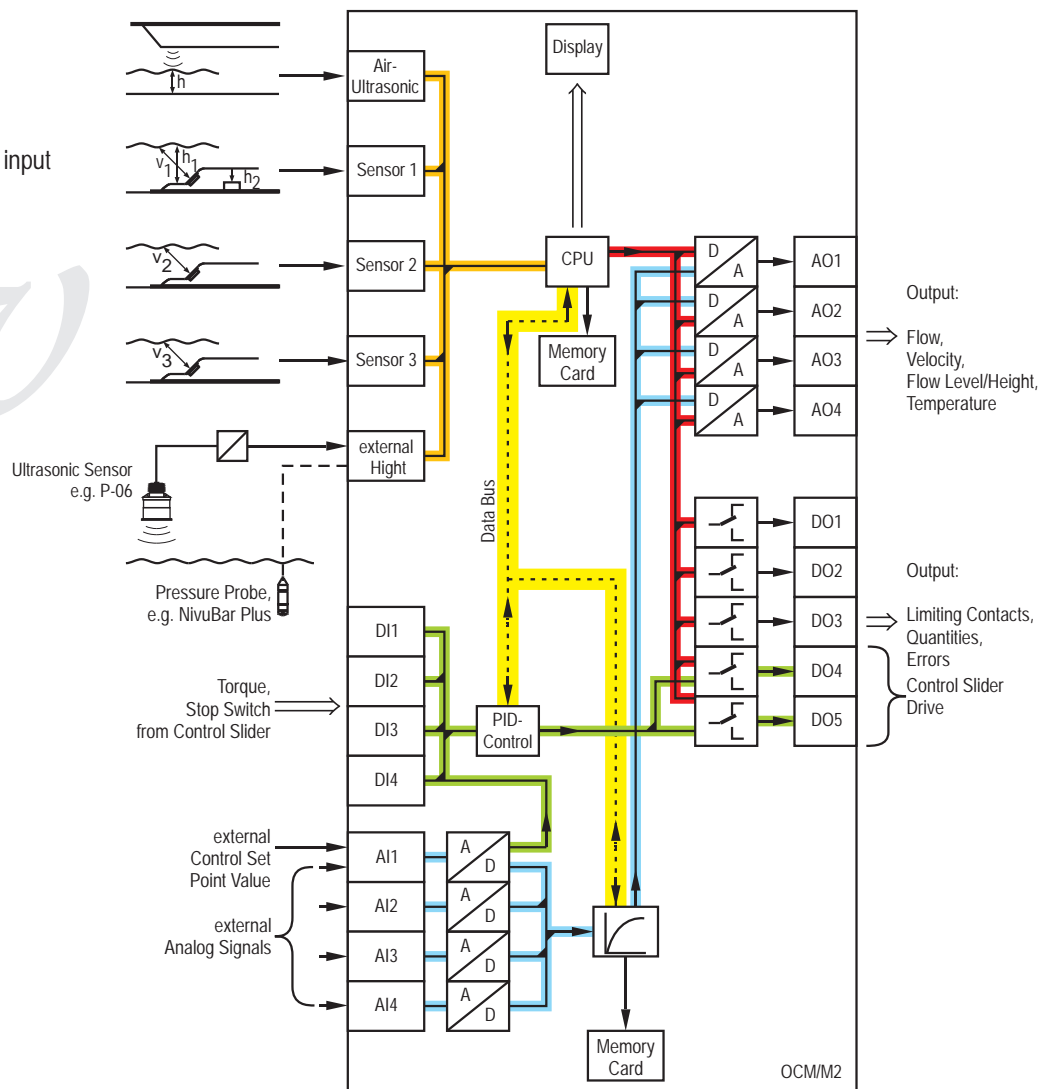




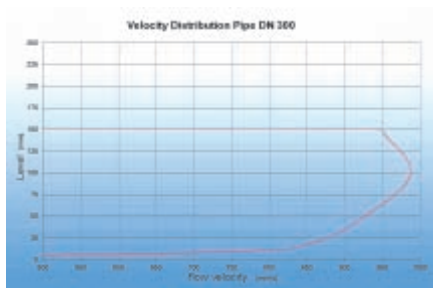
# Transmitter

## Overview of the most important features:

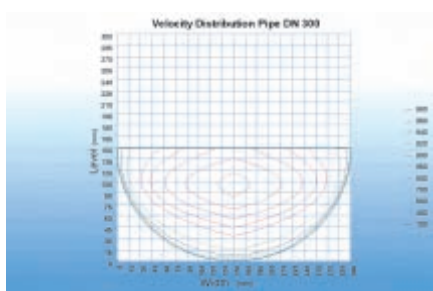
- Large graphical backlit display
- Graphical and numerical value display
- Graphical display of the hydraulic conditions at the measurement place
- Menu driven user interface; users only enter channel shape and dimensions
- Use of most modern DSPs (digital signal processors) and 32-bit controller technology
- RS232 interface
- Up to 4 analog inputs 0 - 10V or 4 - 20mA
- Up to 4 digital inputs
- Ex Approval for Zone 1 according to ATEX 
- Ex-version: additional 4 - 20mA input with power supply
- Up to 4 analog outputs 4 - 20mA
- Up to 5 relays (center-zero relays)
- 12-bit inputs and outputs
- Potential-free isolated inputs and outputs
- Integrated 3-point step controller with free programmable flush functions, quick close function and slide monitoring
- Memory card (flash card), up to 64 MB, for data storage and data transmission to PC
- Recording function of the most important measurement data up to 14 days
- Internet access via modem or radio (GSM, available soon)
- Enclosure: wall mount, panel mount and 19" plug-in unit



## Sensors



Axial Velocity Profile



Isovel Chart

For direct connection to the OCM Pro -active- flow velocity sensors are available with or without integrated flow level measurement as well as air-ultrasonic sensors .

By combining water-ultrasonic, air-ultrasonic and hydrostatic measurement it is possible to have a level measurement with triple redundancy.



Depending on the application various constructions are used.



Wedge sensors (mouse) for mounting in flumes and open channels as well as pipe (insertion) sensors for mounting in steel, concrete and plastic pipes.

The mounting expenses are extremely low. In case of upgrading steps huge investment costs can be saved since the measurement place does not need to be modified.

Cables can be extended up to 250 m without any problems by using standard signal cables.

## Controller

The OCM Pro -active- is optionally equipped with a 3-point step controller, which has been functionally optimized for the requirements in the wastewater field. Thus, quick close function and automatic obstruction control are standard, as well as selectable external/internal set points and slide valve runtime monitoring.

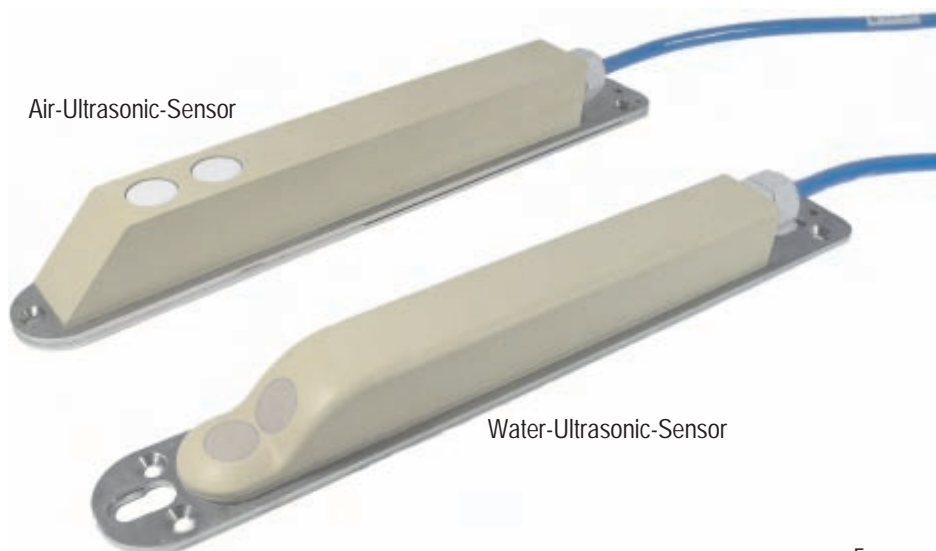
For measurement sections which tend to soiling a programmable flush algorithm can be activated, which automatically removes sludge sedimentation from the sensors.



For measurement in aggressive liquids, e.g. chemical industry wastewater, high resistant sensors are available.



Air-Ultrasonic-Sensor



Water-Ultrasonic-Sensor

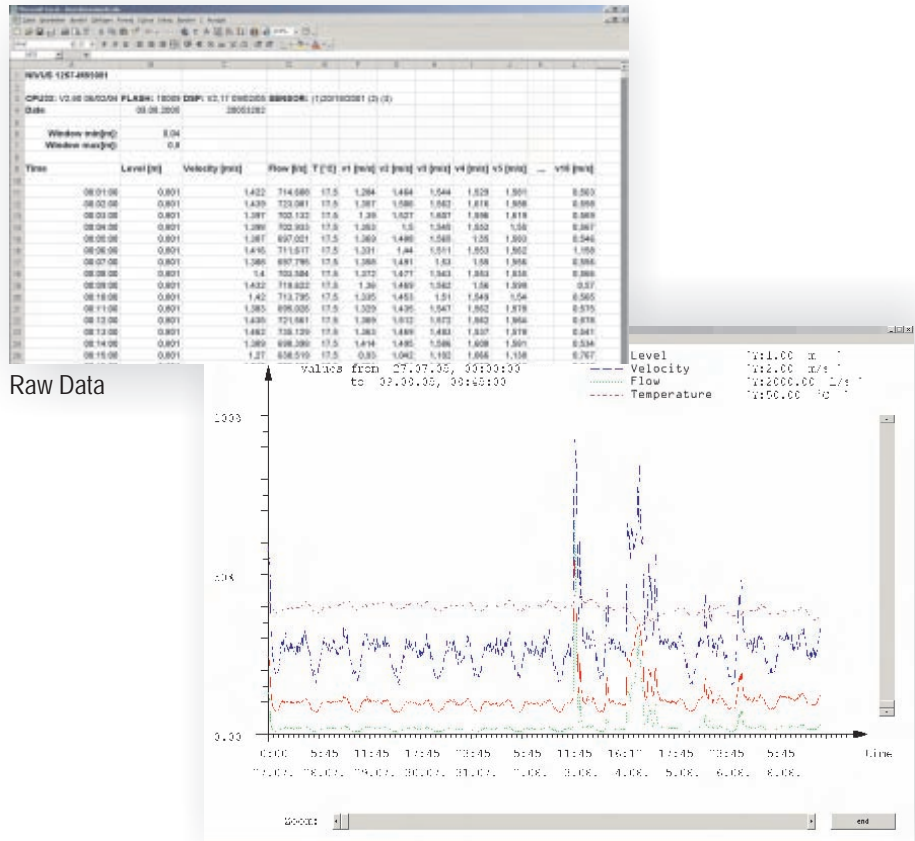
## Storage (data logging)

If the OCM Pro -active- is equipped with a flash card, all recorded values as well as 4 additional external analog signals can be stored in selectable intervals. The data is stored as txt-files and hence can be evaluated and processed with the software NivuDat Pro or other current software, e.g. Excel or similar.

System failures or irregularities which may occur will be saved on this memory card and hence are available for diagnostic or service purposes.

The parameters set will be saved on the same storage medium as standard.

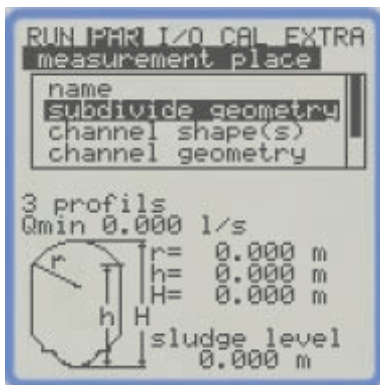
The 64 MB memory enables up to 20 years of capacity per interval and input number.



Measurement value screen of the NivuDat Pro software

## Programming

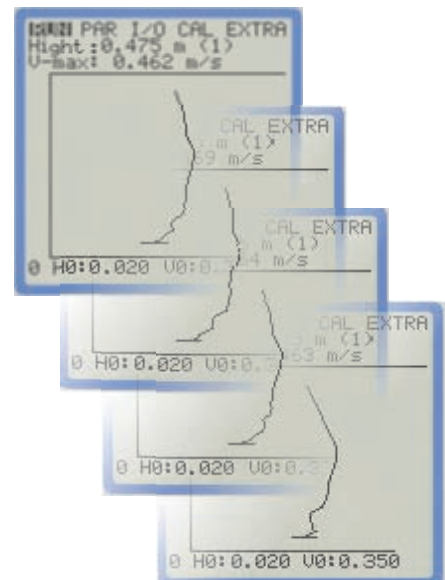
The programming is easy to operate. The comprehensive windows-like user interface in addition with the large graphical display guides the user setting up the system through the menu. Programmed settings are displayed graphically as standard, e.g.



This is why incorrect programming is almost impossible. Access protection options to prevent unauthorized or wrong adjustment are standard.

## Display

The large backlit display allows for easy and obvious programming as well as simply requesting inputs, outputs, sensor data, echo profiles and much more.



Direct flow profile indication on the display.

This enables the user to get information about the system status, errors, day quantities, memory capacity, controller parameters and more at any time. For this reason eventual troubleshooting is easily facilitated.



## Advantages in relation to other methods

The OCM Pro -active- stands out with a high accurate flow velocity determination. The measured velocities can be accurately allocated spatially and are displayed on a large backlit display. This makes it easy to hydraulically assess the selected measurement place and critical applications are recognized or avoided even by inexperienced users.

The system operates with a high velocity resolution. Even lowest medium movements within a range of a few mm/s are recognized and evaluated safely in contrast to common magnetic inductive systems. Depending on the channel geometry measurement dynamics up to 1 : 10 000 at partial filling are possible.

The OCM Pro -active- is based on ultrasonic. Thus, it is independent of medium conductivity or electrode covering by oil films or bacteria coating. In contrast to magnetic-inductive methods the system is completely drift-free. Sensor cleaning is not necessary.



The system can be applied in existing channels, pipes, constructions and more. Additional modifications, throats, inverted syphons or similar constructions will not be required. For that reason it is possible to install an accurate and reliable system even in large channels in a short time at low costs and without additional constructions.



In spite of soiling the sensor operates reliably.



Special application in a silty channel



## Successful operation

NIVUS measurement technology is synonymous for innovation and accuracy.

Thanks to decades of experience and application know-how of our engineers, technicians and authorized staff even almost impossible applications mean a challenge to us. Where other tested systems failed, we succeeded in creating uncommon solutions which completely satisfied our customers.

**Just talk with us.**

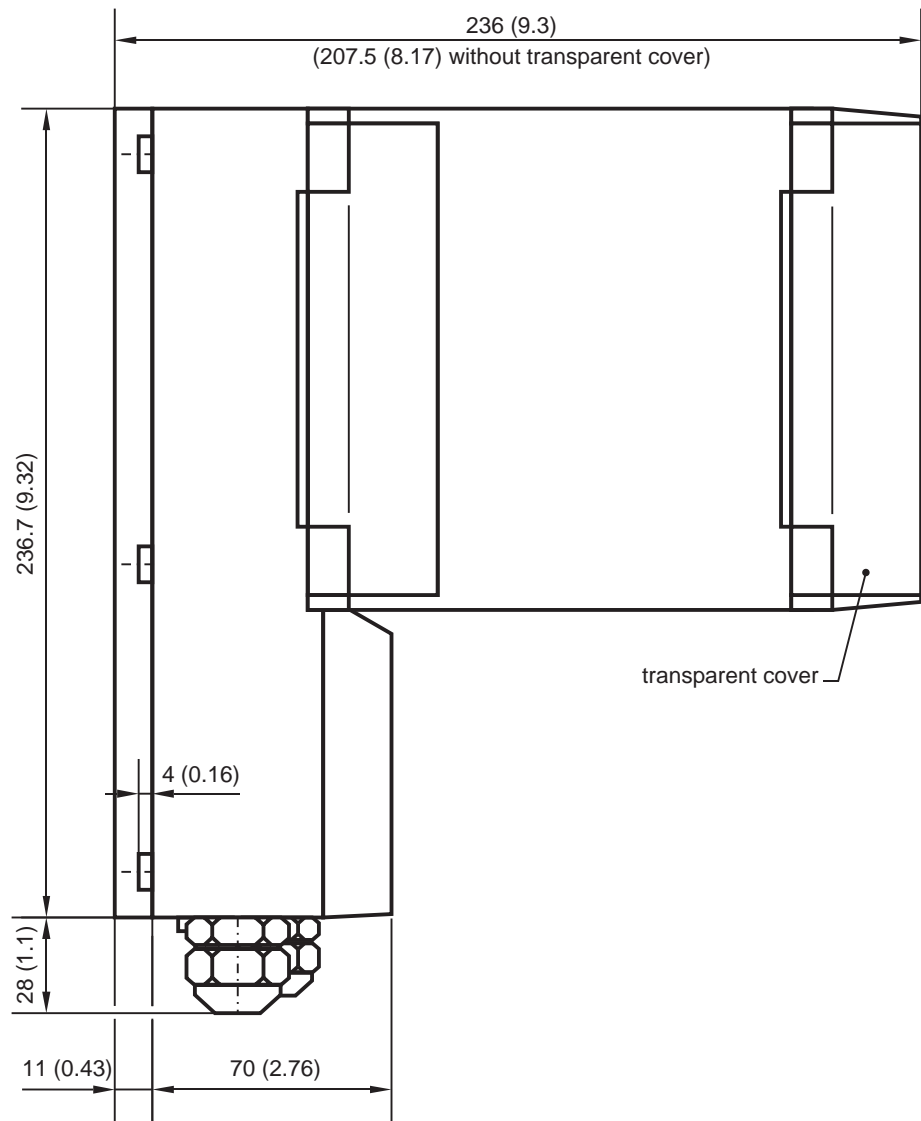
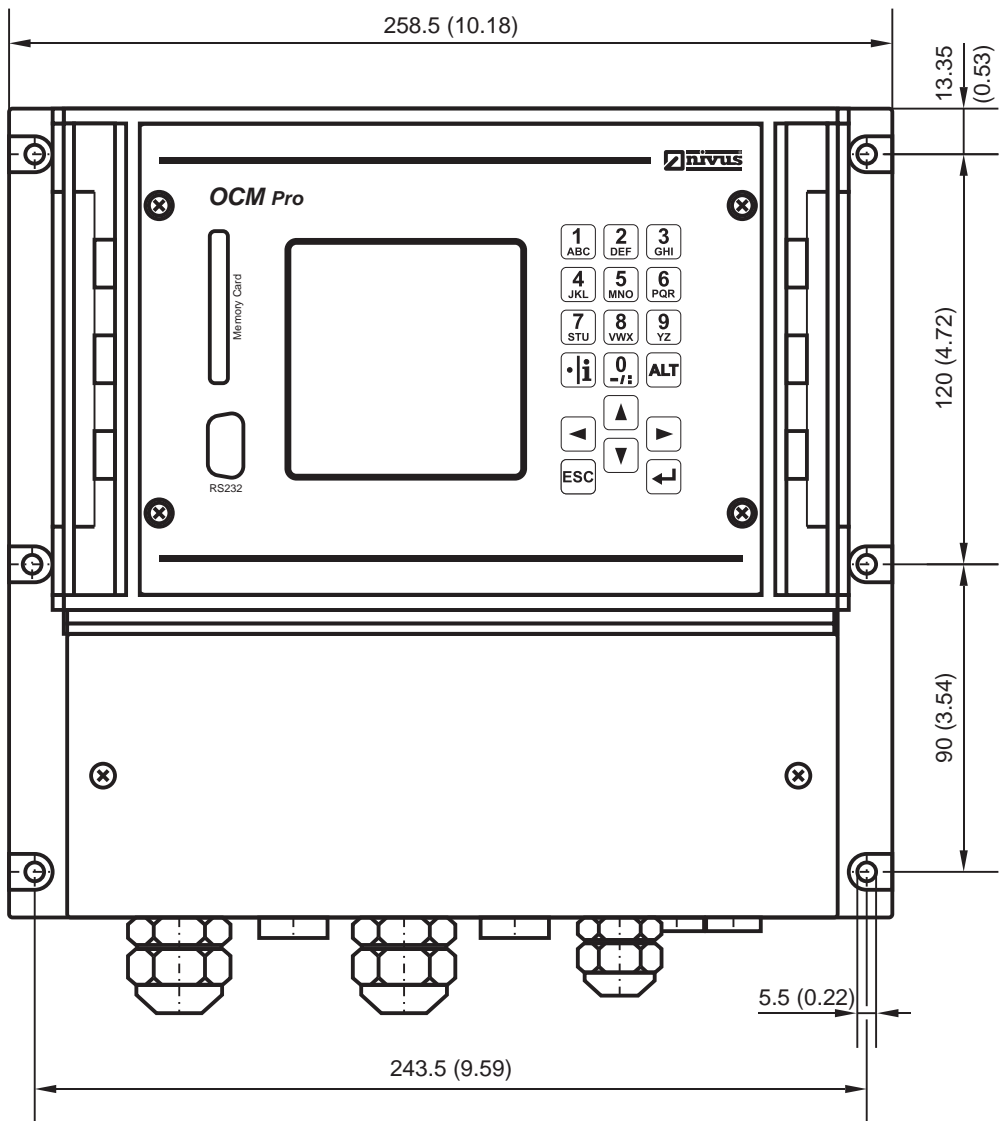
# OCM Pro "active"

## Velocity Profiler for partially and fully filled pipes





Power supply	100 to 240V AC, +10% /-15%, 47 to 63Hz or 24V DC $\pm$ 15%, 5% residual fluctuation
Power consumption	Max. 20VA
Enclosures	<ul style="list-style-type: none"> <li>Material: Polycarbonate</li> <li>Weight: <ul style="list-style-type: none"> <li>- Wall mount: approx. 2.9 kg (6.39 lbs), IP 65 (NEMA 4)</li> <li>- Panel mount: approx. 2.8 kg (6.17 lbs), IP 54 (front side)</li> <li>- 19"-slide in unit: approx. 2.5 kg (5.51 lbs), IP 20</li> </ul> </li> </ul>
Approval	II(2)G [Ex ib] IIB
Operating temperature	-20°C to +50°C ( -4°F to 122°F)
Storage temperature	-30°C to +70°C ( -4°F to 158°F)
Max. humidity	80%, non-condensing
Display	Back-lit graphic display, 128 x 128 pixel
Operation	18 buttons, menu driven in German, English, French and Italian
Inputs	<ul style="list-style-type: none"> <li>• 1 x 4 - 20mA for external level measurement (2-wire sensor)</li> <li>• 1 (4) x 0/4 - 20mA with 12 bit solution for external level measurement, external setpoint values and data storage (for type S2/M2)</li> <li>• 4 x digital input (only type M2)</li> <li>• 1 (2/3) sensors connectable (2/3 - type M2)</li> </ul>
Outputs	<ul style="list-style-type: none"> <li>• 2 (4) x 0/4 – 20mA (4 - type M2), load 500 Ohm, 12 bit solution, accuracy better than 0.1%</li> <li>• 2 (5) switchable relays, loadable to 230V AC / 2A (cos <math>\phi</math> 0.9 )</li> </ul>
Data storage	Pluggable Compact Flash Card up to 64MB
Data transmission	By pluggable Compact Flash Card, open protocol via RS 485, internal telephone or radio modem (available soon)

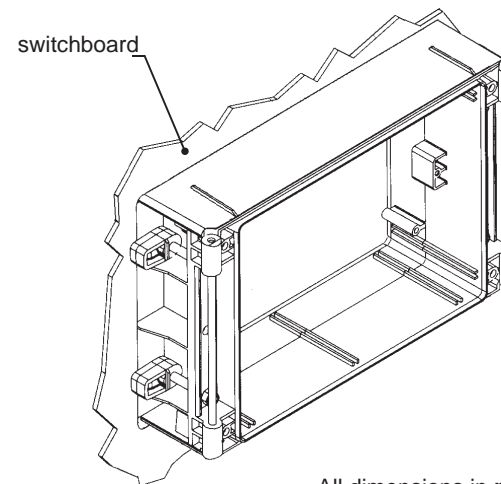
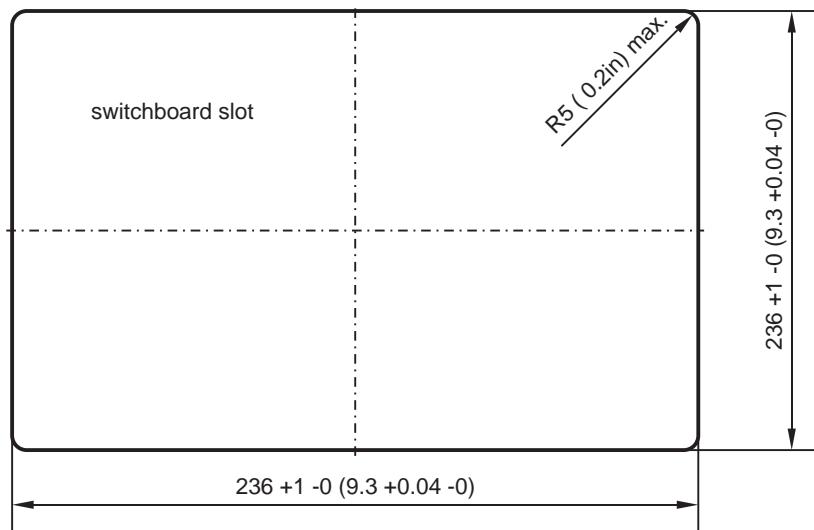
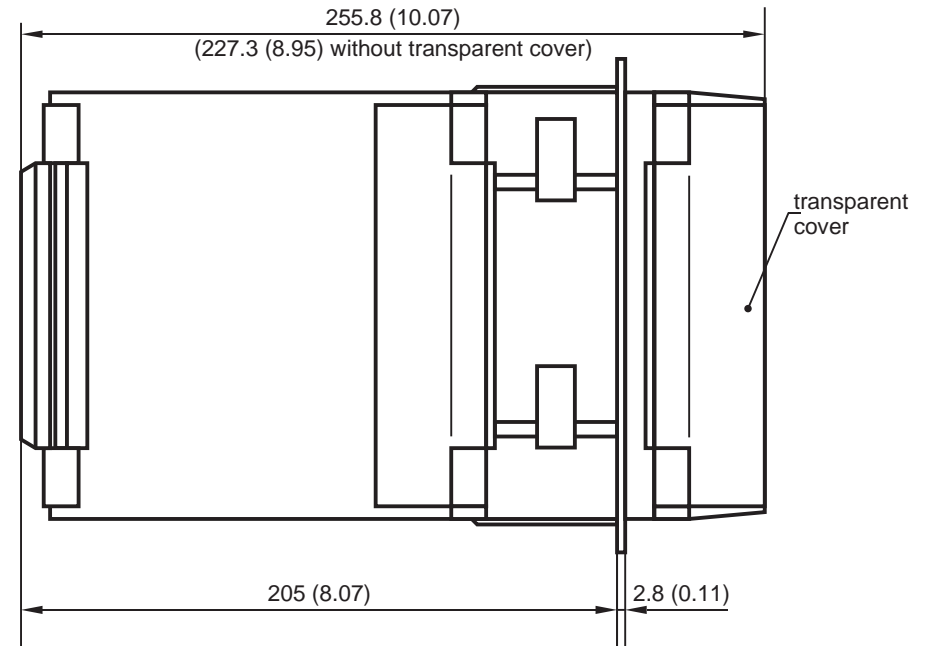
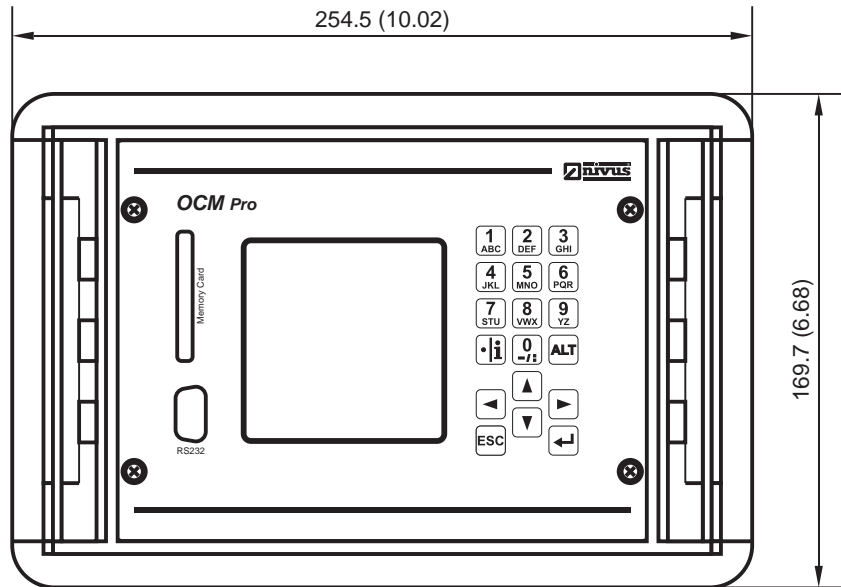
Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
 E:\1\_eng\OCMProAktiv\OKA-DB-AA-1.p65/16.04.2005



All dimensions in **mm** and **(inch)** unless otherwise stated.

	Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1	von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
gezeichnet drawn	18.02.05	IM	A4				OKA-TZ-02 / 0500	OCM Pro wall mount dimensions (W0) IP65 colour blue	
geprüft checked	18.02.05	SL				Nur für intern! For internal use only!			





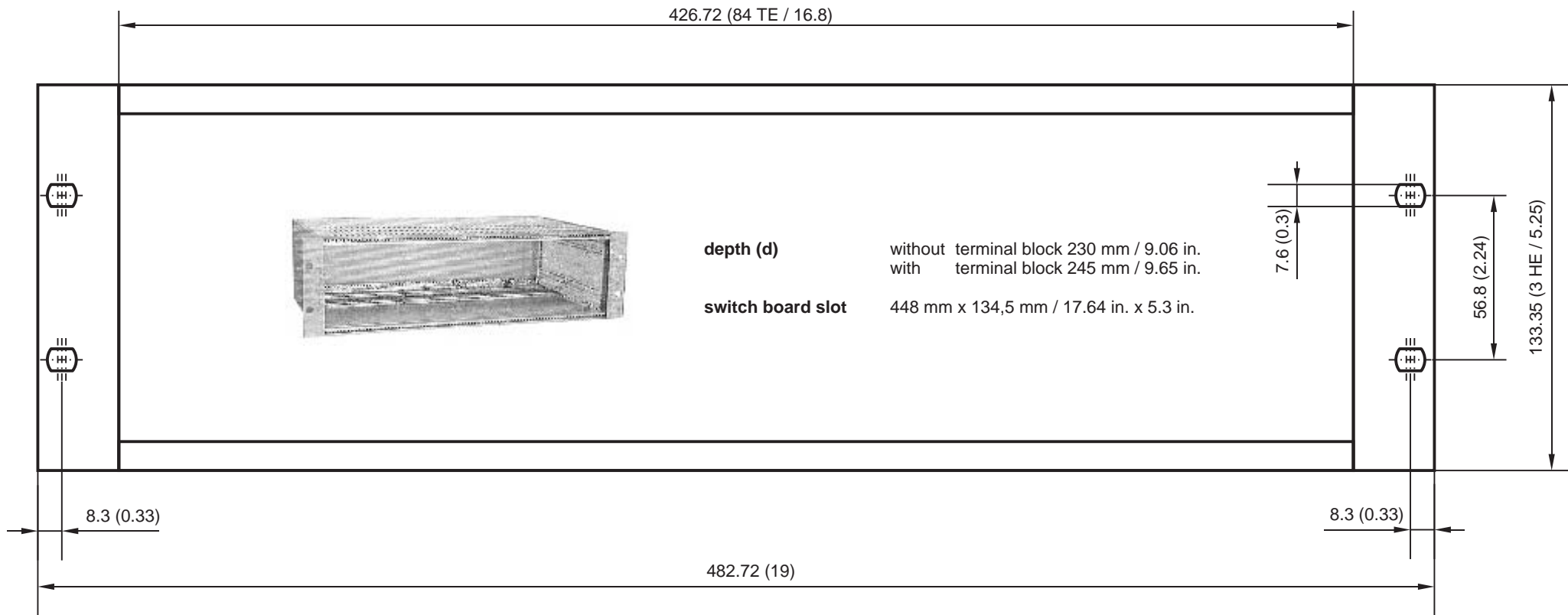
All dimensions in mm and (inch) unless otherwise stated.

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	gezeichnet drawn	18.02.05			IM
	geprüft checked	18.02.05	SL		

Zeichnungs Nr. - drawing No.  
OKA-TZ-03 / 0500

Benennung - Description  
OCM Pro panel mount dimensions (F0) IP65  
(rear side IP20) colour grey





All dimensions in **mm** and **(inch)** unless otherwise stated.

	Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
	gezeichnet drawn	21.03.05			IM			
geprüft checked	21.03.05	SL						

# PCM Pro / OCM Pro "active" sensors

## Wedge sensors:



Water-ultrasonic combi sensor



Air-ultrasonic level sensor

## Pipe sensor:



Measurement principle	<ul style="list-style-type: none"> <li>• Ultrasonic transit time (level measurement)</li> <li>• Piezoresistive pressure measurement (level measurement)</li> <li>• Correlation with digital pattern detection (flow velocity)</li> </ul>
Measuring frequency	1MHz
Protection	IP 68
Ex approval (optional)	II 2 G EEx ib IIB T4
Operating temperature	-20° C to +50° C (-4° F to 122° F) (+40° C (104° F) in Ex Zone 1)
Storage temperature	-30° C to +70° C (-22° F to 158° F)
Operating pressure	max. 4 bar (combi sensor with pressure element max. 1bar)
Cable length	10/15/20/30/50/100 m (33/50/66/99/165/330 ft), extendable up to 250 m max. (820 ft) cable length, in case of using sensors with pressure measurement after 30 m (99 ft) a pressure compensation element is required
Cable types	<ul style="list-style-type: none"> <li>• Combi sensor with pressure measurement: LiYC11Y 2x1.5 + 1x2x0.34 + PA 1.5/2.5</li> <li>• Sensors without pressure measurement: LiYC11Y 2x1.5 + 1x2x0.34</li> </ul>
Outside cable diameter	<ul style="list-style-type: none"> <li>• Combi sensor with pressure measurement: 8.7 ±0.25 mm (0.34 ±0.010 in)</li> <li>• Sensors without pressure measurement: 7.6 ±0.25 mm (0.3 ±0.010 in)</li> </ul>
Sensor connection	<ul style="list-style-type: none"> <li>• pre-configured cable end for connection to OCM Pro, for sensor types "K" and "L"</li> <li>• cable with plug for connection to PCM Pro, for sensor without pressure measurement, type "S"</li> <li>• cable with plug and exchangeable filter element for connection to PCM Pro, for sensors with pressure measurement, type "F"</li> </ul>
Sensor types	<ul style="list-style-type: none"> <li>• Flow velocity sensor with v-measurement using cross correlation and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via water-ultrasonic and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via pressure and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via water-ultrasonic as well as redundant pressure measurement and temperature measurement to compensate the temperature effect on sound velocity</li> </ul>
Types of construction	<ul style="list-style-type: none"> <li>• Wedge sensor for installation on channel bottom</li> <li>• Pipe sensor for installation in pipes with nozzle and cutting ring</li> </ul>
Medium contacting materials	Polyurethane, stainless steel 1.4571, PPO GF30, PA (wedge sensor only) Option: sensor made of PEEK, resistant to chemical substances, Hastelloy mounting plate, Titanium mounting plate, cable with FEP coating

Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
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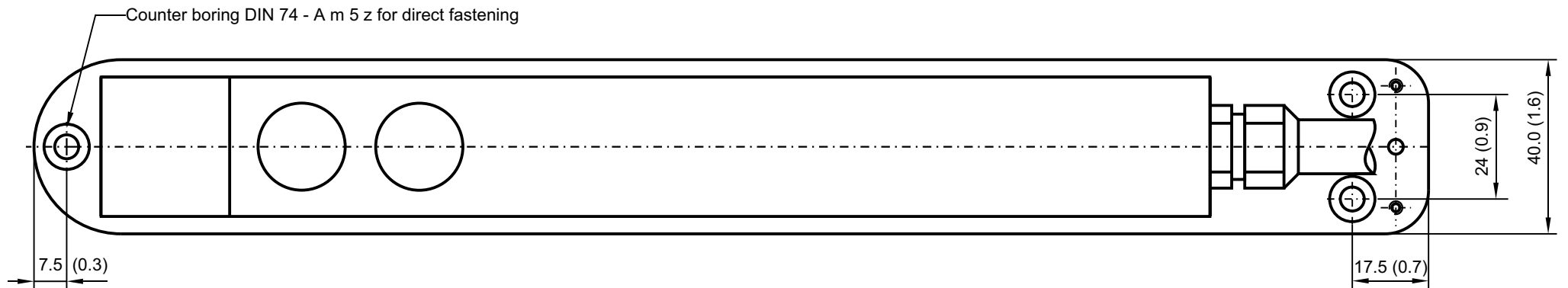
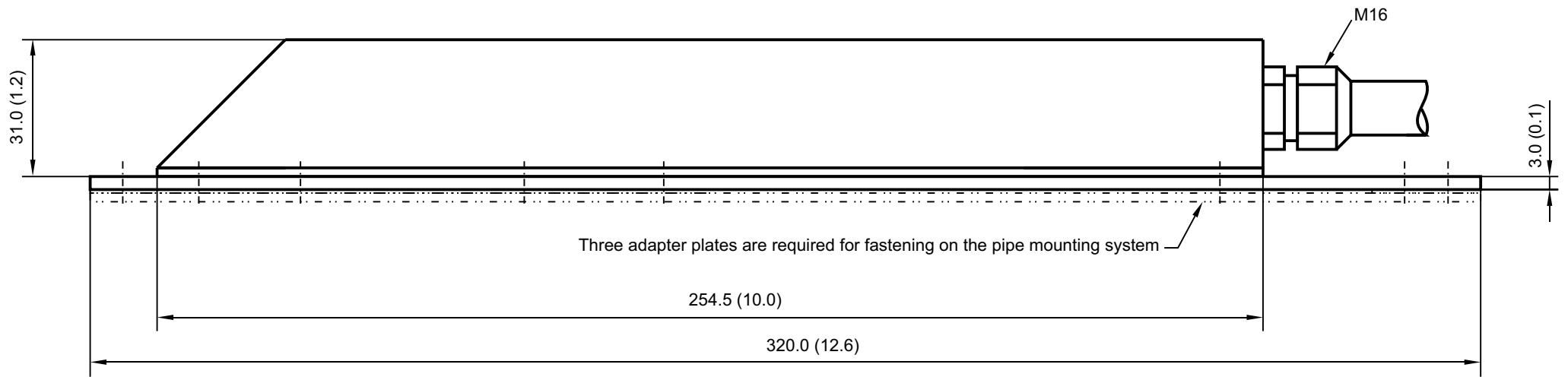
# PCM Pro / OCM Pro "active" sensors

<b>Level measurement – water-ultrasonic</b>	
Measurement range	0 to 200 cm (0 to 6.56 ft), lowest absolutely measurable level 5 cm (0.16 ft)
Zero drift	absolutely stable zero point
Measurement error	less than $\pm 2$ mm ( $\pm 0.08$ in)
<b>Level measurement - pressure</b>	
Measurement range	0 to 350 cm (0 to 11.5 ft)
Zero drift	max. 0.75 % of final value (0 to 50° C (32° F to 122° F))
Measurement error (standing medium)	$\leq 0.5$ % of final value
<b>Level measurement - external sensor</b>	
Measurement range	depending on device used
Zero drift	
Measurement error	
<b>Flow velocity measurement</b>	
Measurement range	-100 cm/s to +600 cm/s (- 3.28 fps to 19.7 fps)
Number of scan layers	max. 16
Zero drift	absolutely stable zero point
Error limits (per scan layer)	$\leq 1$ % of measurement value ( $v > 1$ m/s (3.28 fps)) $\leq 0.5$ % of measurement value +5 mm/s (0.2in/s) ( $v < 1$ m/s (3.28 fps))
Number of sensors	1 to 3 per measurement transmitter
Sonic beam angle	$\pm 5$ degrees
<b>Temperature measurement</b>	
Measurement range	-20° C to +60° C (-4°F to 140°F)
Measurement error	$\pm 0.5$ K

<b>Active sensor air-ultrasonic</b>	
Measurement principle	Ultrasonic transit time
Measuring frequency	120kHz
Protection rating	IP68
Ex approval	II 2 G EEx ib IIB T4
Operating temperature	-20° C to +50° C (-4° F to 122° F) (+40° C (104° F) in Ex Zone 1)
Storage temperature	-30° C to +70° C (-22° F to 158° F)
Operating Pressure	max. 1 bar
Cable length	10/15/20/30/50 m (33/50/66/99/165 ft), extendable up to 250 m max. (820 ft) cable length
Cable type	LiYC11Y 2x1.5 + 1x2x0.34
Cable outside diameter	7.6 $\pm$ 0.25 mm (0.3 $\pm$ 0.010 in)
Sensor connection	<ul style="list-style-type: none"> <li>• pre-configured cable end for connection to OCM Pro, for sensor type "K"</li> <li>• cable with plug for connection to PCM Pro, for sensor type "S"</li> </ul>
Types of construction	Wedge sensor for installation in channel vertex
Medium contacting materials	Polyurethane, stainless steel 1.4571, PPO GF30, PA
<b>Level measurement</b>	
Measurement range	0 to 200 cm (0 to 6.56 ft)
Dead zone	10 cm (0.33 ft)
Measurement error	less than $\pm 5$ mm (0.2in)
<b>Temperature measurement</b>	
Measurement range	-20° C to +50° C (-4°F to 122°F)
Measurement error	$\pm 0.5$ K

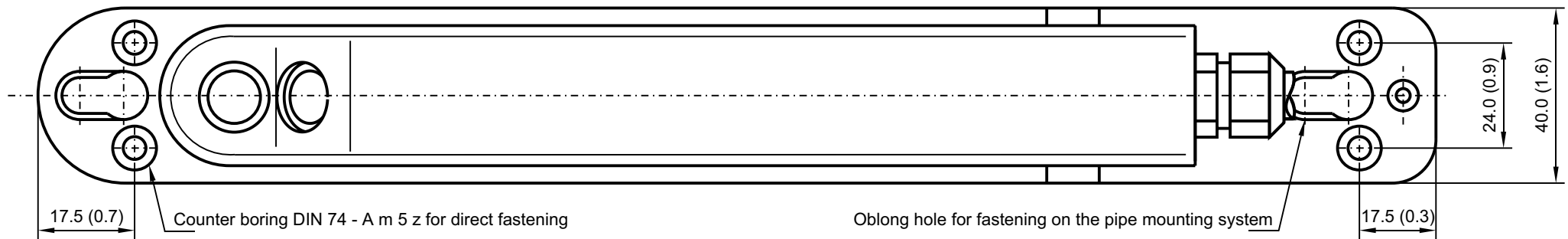
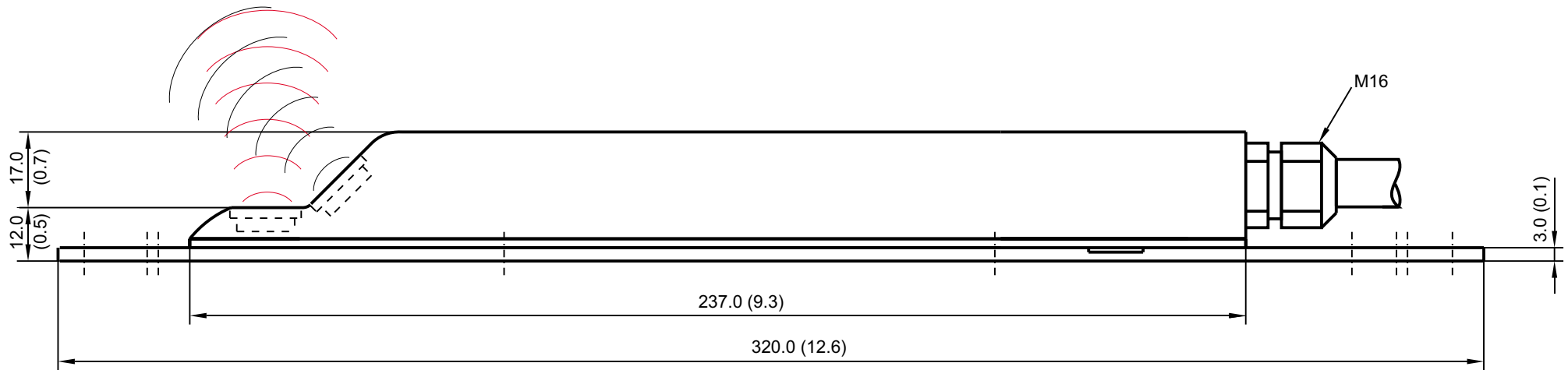
Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
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All dimensions in **mm** and (**inch**) unless otherwise stated.

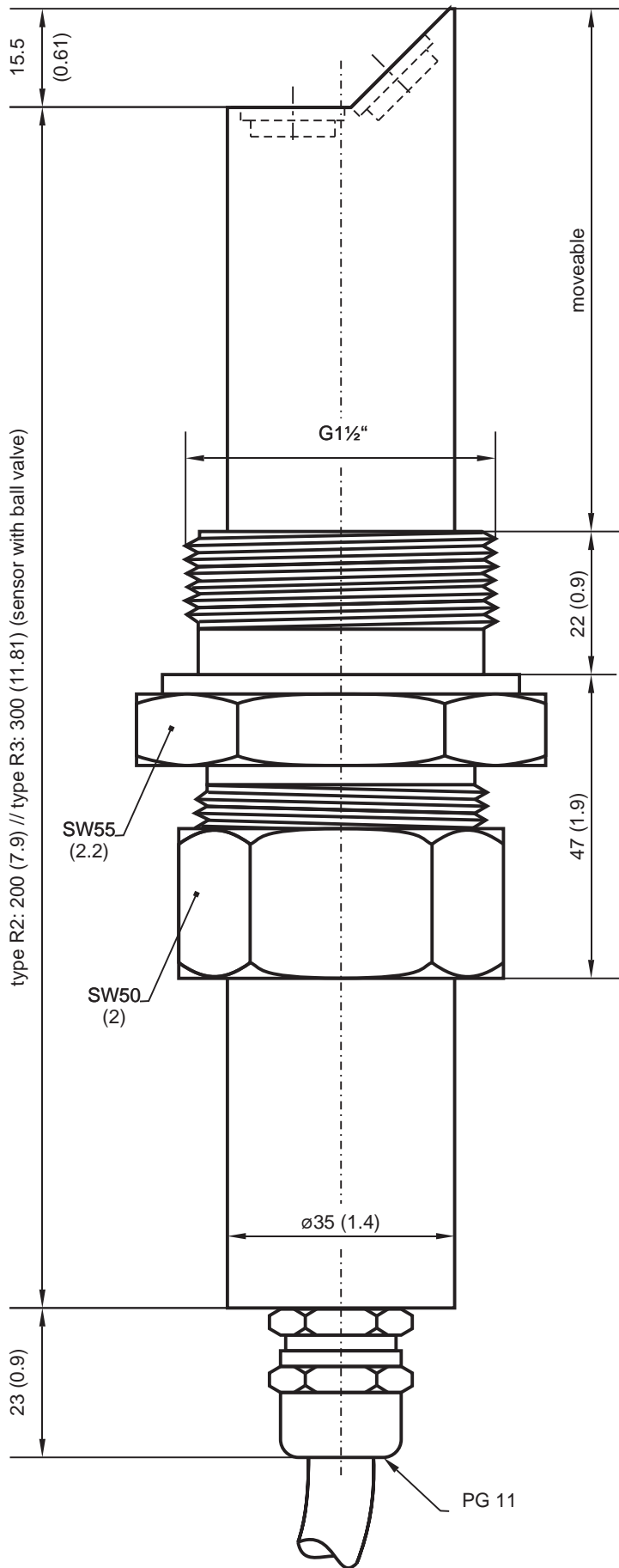
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geprüft checked	04.01.05	SL			<input type="radio"/> Nur für intern! Only for internal!			



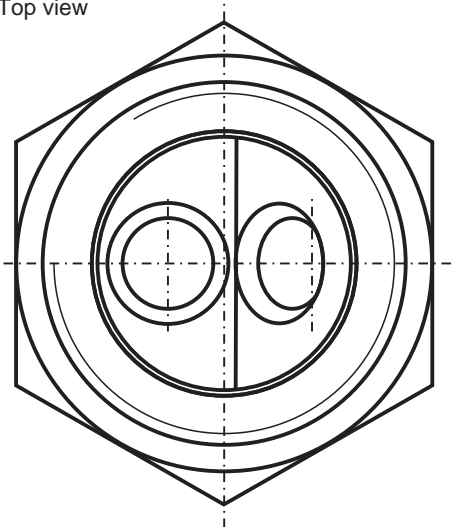
All dimensions in **mm** and (**inch**) unless otherwise stated.

		Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
gezeichnet drawn	04.01.05	IM	A4				SO-AS-TZ-01 / 0500	Wedge sensor water ultrasonic combi sensor	
geprüft checked	04.01.05	SL							






Top view

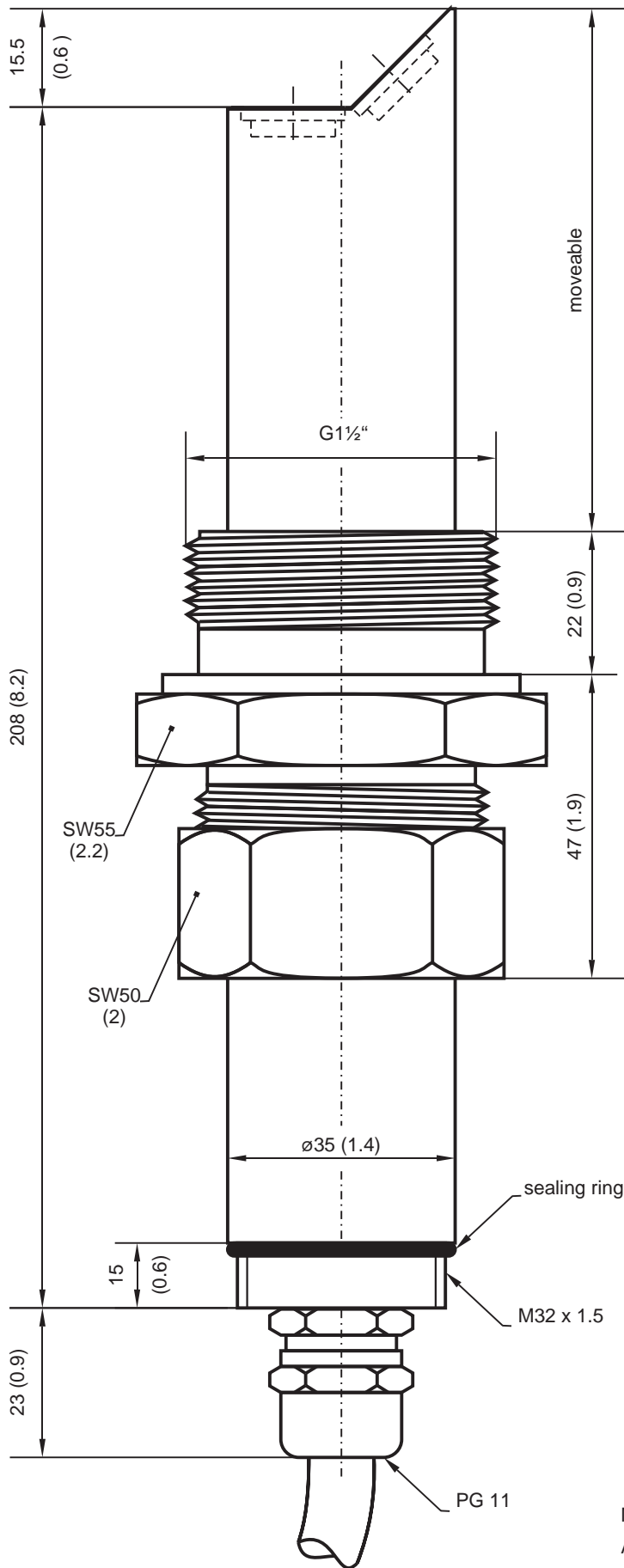


Material: pipe stainless steel 1.4571

All dimensions in **mm** and **(inch)** unless otherwise stated.

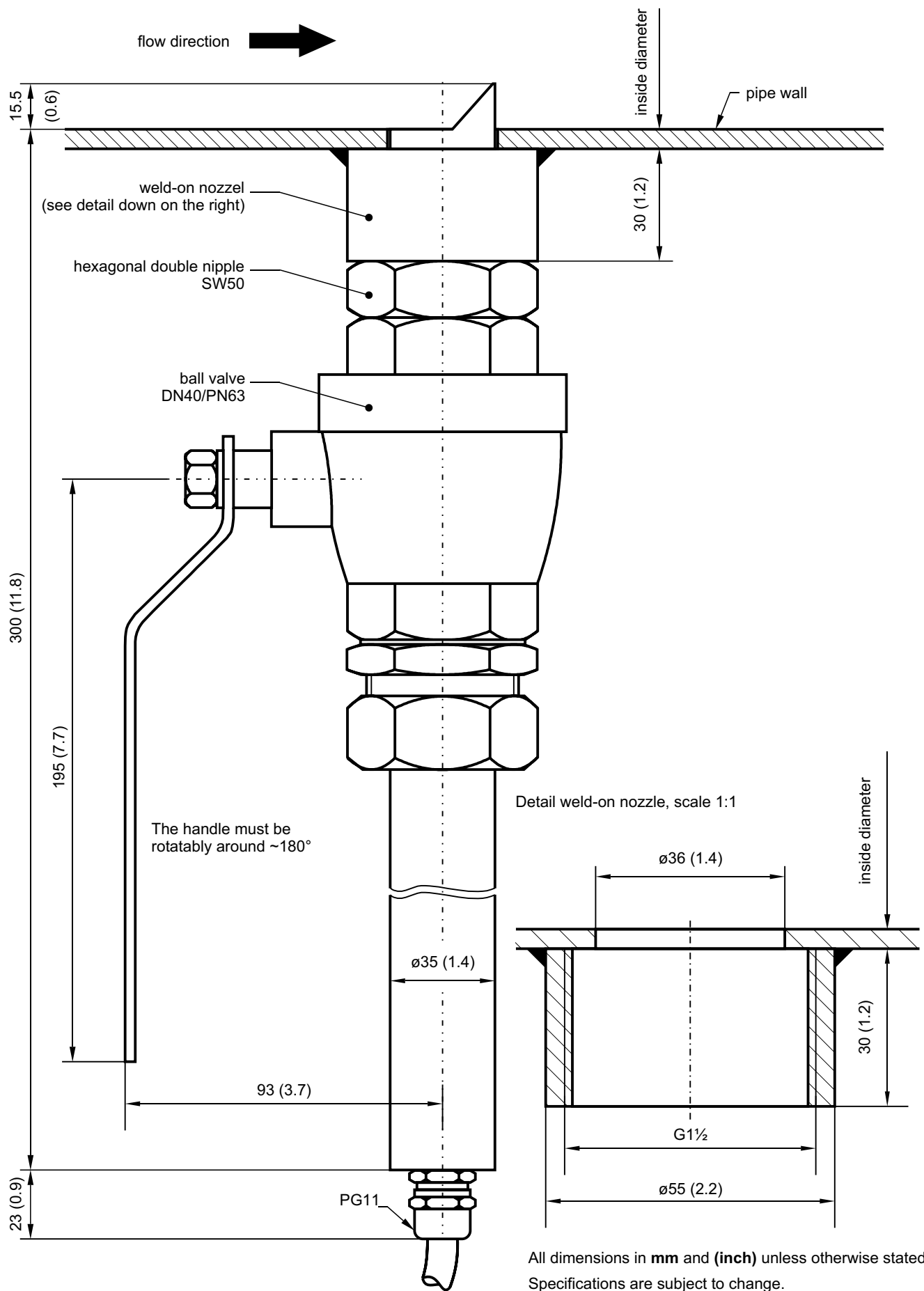
Specifications are subject to change.

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gezeichnet drawn	21.03.05	IM	Format	OKA-TZ-05 / 0500	
geprüft checked	21.03.05	SL	A4	Benennung - Description	
Nur für intern!	○	Blatt 1 von 1		Pipe sensor for insertion in pipes with 1 1/2" nozzle	



Material: pipe stainless steel 1.4571  
 All dimensions in **mm** and **(inch)** unless otherwise stated.  
 Specifications are subject to change.

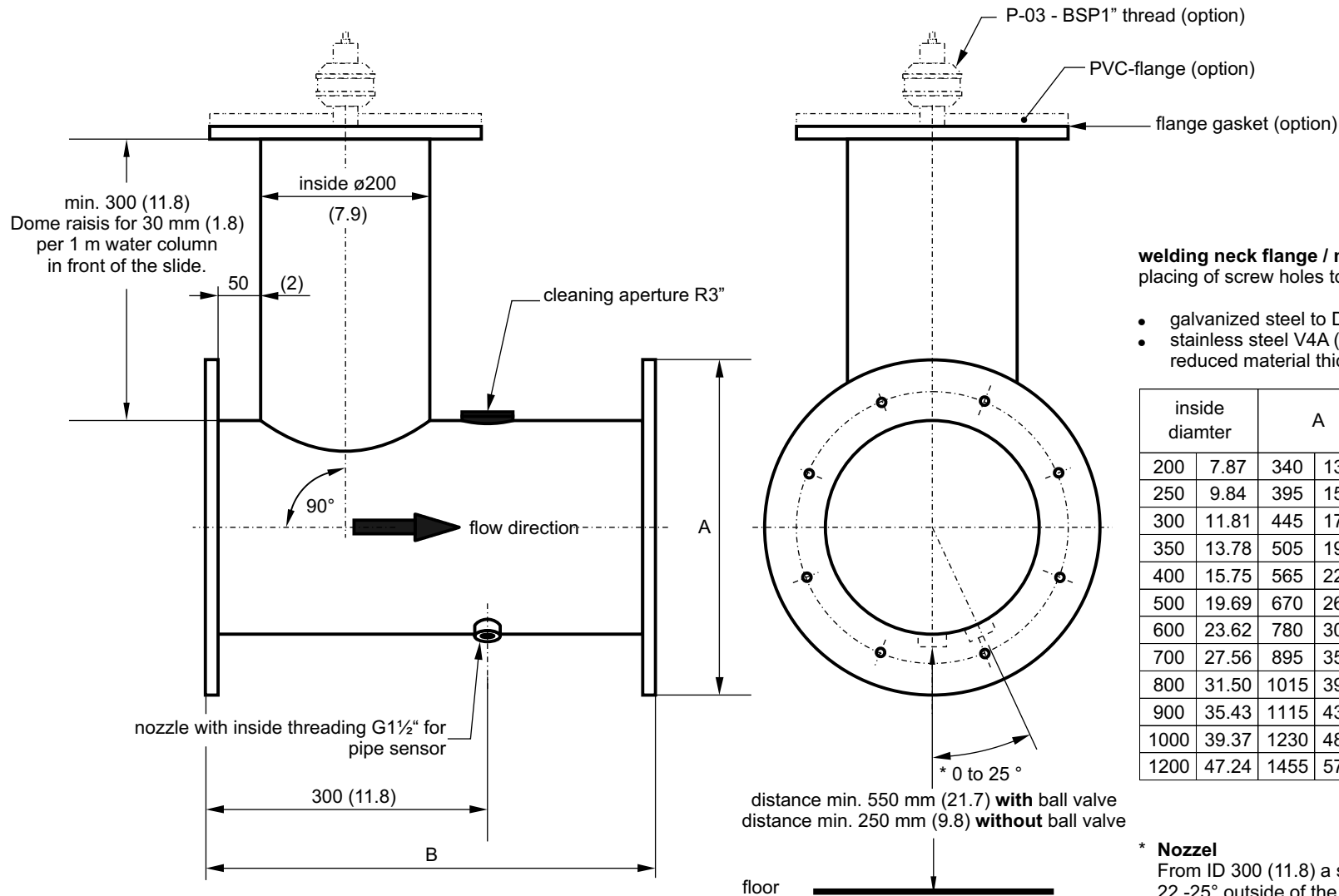
	Datum date	Name name	Maßstab scale	Zeichnungs Nr. - drawing No. <b>OKA-TZ-11 / 0500</b>	
	gezeichnet drawn	21.03.05	IM		
geprüft checked	21.03.05	SL	A4	Benennung - Description <b>OCM Pro pipe sensor with extension for insertion in pipes with 1 1/2" nozzle</b>	
Nur für intern!	<input type="radio"/>	Blatt sheet 1 von from 1			



All dimensions in **mm** and **(inch)** unless otherwise stated.  
Specifications are subject to change.

	Datum date	Name name	Maßstab scale	Zeichnungs Nr. - drawing No. <b>SO-AS-TZ-03 / 0500</b>	
	gezeichnet drawn	25.01.05	IM		
geprüft checked	25.01.05	SL	A4	Benennung - Description	
Nur für intern!	○	Blatt sheet 1 von from 1		Pipe sensor with extension for insertion in pipes with 1½" nozzle and ball valve	





**welding neck flange / nominal pressure PN10:**  
placing of screw holes to DIN 2501, PN10

- galvanized steel to DIN 2632, PN10
- stainless steel V4A (material 1.4571) similar DIN 2576 with reduced material thickness ( $t = 20$  (0.79))

inside diameter		A		B		no. holes	ø holes		hole circle ø	
200	7.87	340	13.39	500	19.69		8	22	0.87	295
250	9.84	395	15.55	500	19.69	12	22	0.87	350	13.78
300	11.81	445	17.52	500	19.69	12	22	0.87	400	15.75
350	13.78	505	19.88	500	19.69	16	22	0.87	460	18.11
400	15.75	565	22.24	750	29.53	16	26	1.02	515	20.28
500	19.69	670	26.34	750	29.53	20	26	1.02	620	24.41
600	23.62	780	30.71	1000	39.37	20	30	1.18	725	28.54
700	27.56	895	35.24	1000	39.37	24	30	1.18	840	33.07
800	31.50	1015	39.96	1000	39.37	24	33	1.3	950	37.40
900	35.43	1115	43.90	1250	49.21	28	33	1.3	1050	41.34
1000	39.37	1230	48.43	1250	49.21	28	36	1.42	1160	45.67
1200	47.24	1455	57.28	1500	59.06	32	39	1.54	1380	54.33

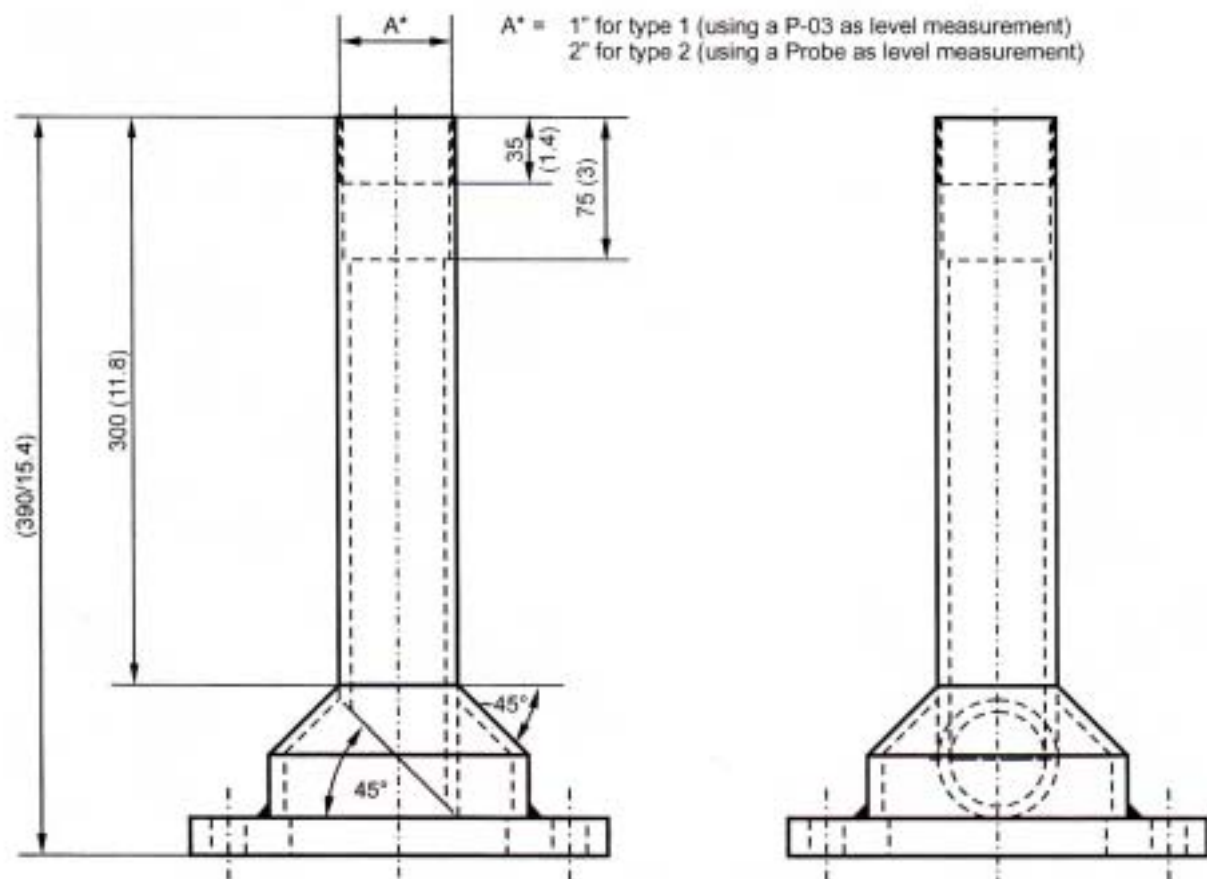
\* 0 to 25 °  
distance min. 550 mm (21.7) **with** ball valve  
distance min. 250 mm (9.8) **without** ball valve

**\* Nozzel**

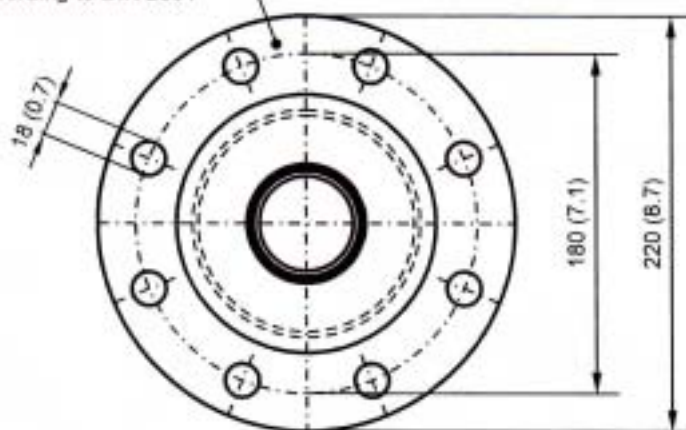
From ID 300 (11.8) a second nozzle must be attached between 22-25° outside of the bottom to be capable of screwing in the sensor at the side in case of sanding up.

All dimensions in **mm** and (**inch**) unless otherwise stated.  
Specifications are subject to change.

	Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
	gezeichnet drawn	12.07.06			IM			
geprüft checked	12.07.06	SL						



Flange ID100 (3.94),  
 similar to DIN 2576;  
 Screw Hole Layout  
 according to DIN 2501



All dimensions in **mm** and **inch** unless stated otherwise.  
 Specifications are subject to change.  
 Material: PE, 1bar pressure-proof

	Datum date	Name name	Maßstab scale	Zeichnungs Nr. - drawing No. <b>RE-TZ-06 / 0400</b>	
	gezeichnet drawn	02.08.04	IM		
geprüft checked	02.08.04	SL	Benennung - Description <b>Dome Top for          Pipe Measurement Section "short"</b>		
Nur für intern! Only for internal! <input type="checkbox"/>		Blatt sheet	1 von of	1	

# Retractable Fitting for Pipe Sensors

## Manually retractable Fitting for Pipe Sensors



- › Easy sensor installation and removal under process conditions
- › Suitable for pressure pipes
- › For pipe sensors type DAR/DER, PFR/2 and OCS/R and POA/R with 35 mm (1.38 in) outside diameter

### Description

This easy to operate fitting enables to extend and to retract 1½" flow velocity sensors into/from process pipelines under operational conditions without the use of tools.

The extended sensor allows to clean process pipelines.

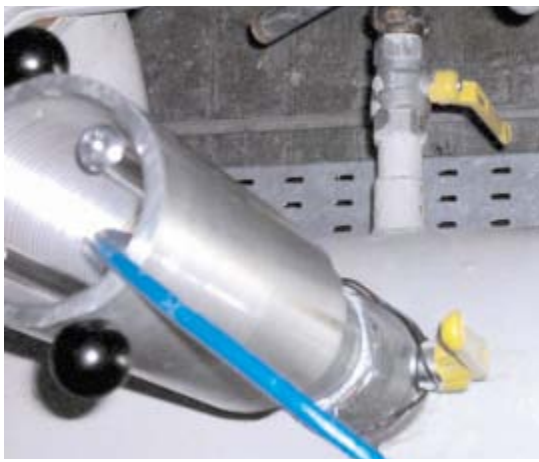
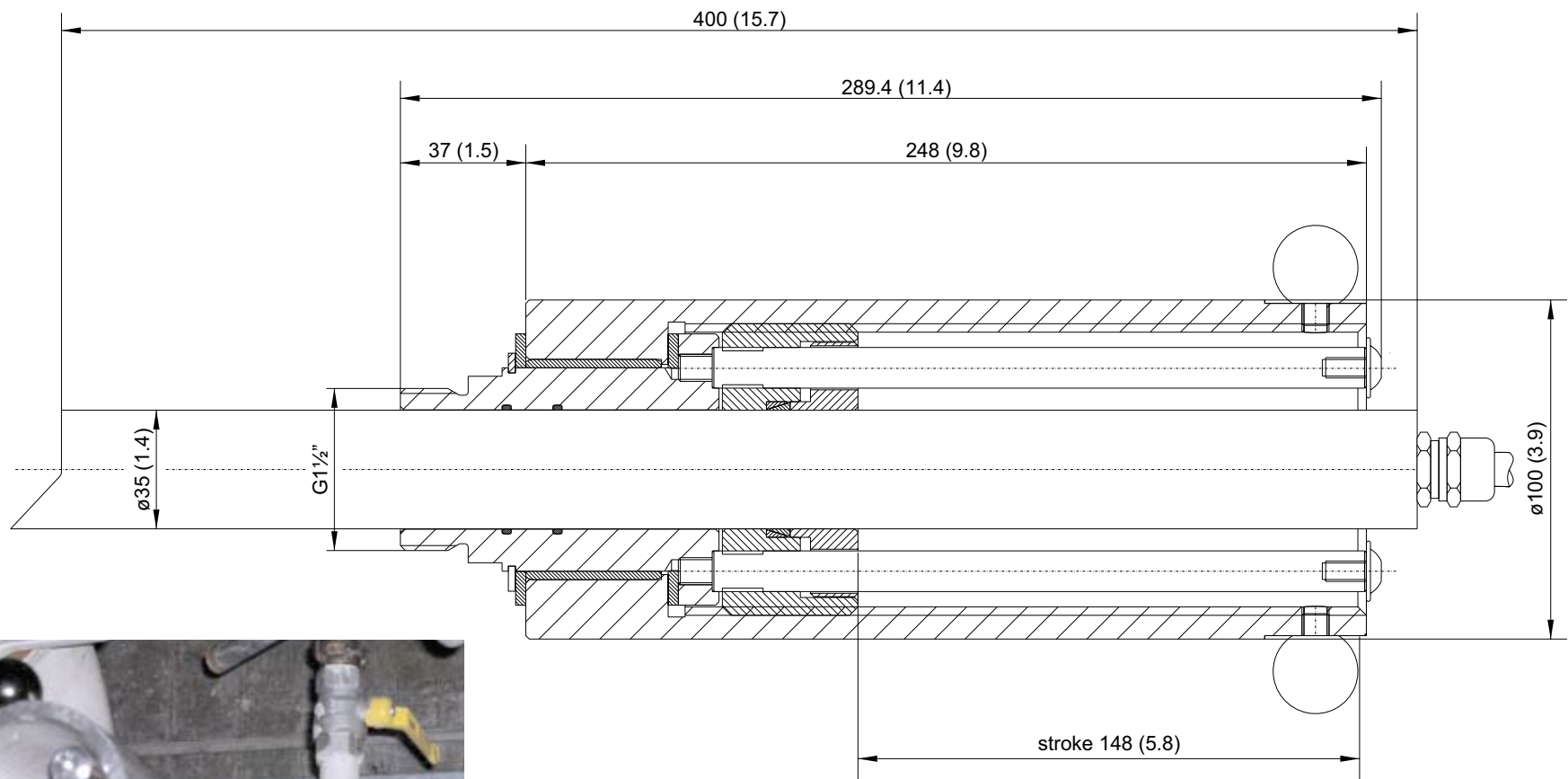
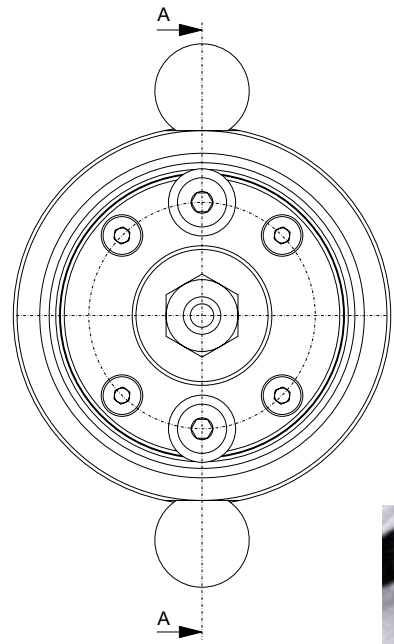
(required minimum sensor length: 400 mm (15.7 in))

### Specifications

Overall Length:	290 mm (11.4 in)
Outside Diameter:	100 mm (3.9 in)
Retractable Length Sensor:	approx. 150 mm (5.9 in)
Weight:	approx. 5.5 kg (12 lbs)
Material:	AlMg-alloy, brass
Connections:	R1½" outside screw thread
max. Pressure:	4 bar (58 psi)



Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
E:\1\_eng\Sensoren\Ausfahrarmatur\SO-A-DB-A4.p65/12.07.2006





Application: sludge return pipeline DN400

All dimensions in **mm** and **(inch)** unless otherwise stated.  
Specifications are subject to change.

 Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
gezeichnet drawn	20.06.05	IM	A4	1:2	SO-A-TZ-01 / 0500	Retractable fitting for 1 1/2" pipe sensor	
geprüft checked	20.06.05	KP		<input type="radio"/> Nur für intern! <input type="radio"/> Only for internal!			

## Selective Criteria for the OCM Pro "active" Transmitter

<b>OCP/</b>	<b>S2 =</b>	Transmitter with 1 connection for combination sensor ; 1 connection for external level measurement (passive or 2-wire); 1 analog input 0/4-20mA; 2 analog outputs 0/4-20mA as well as 2 relays, programmable on signal failure, total or boundary contact; data storage for pluggable Flash Card from 8MB to 64MB			
	<b>M2 =</b>	Transmitter with 3 connection for combination sensors or for external ultrasonic sensor; 1 connection for external level measurement (passive or 2-wire); 4 analog inputs 0/4-20 mA; 4 analog outputs 0/4-20 mA; 4 digital inputs as well as 5 relays, programmable for controller functions; signal failure, total or boundary contact; data storage for pluggable Flash Card from 8MB to 64MB			
		<b>00 =</b>	no data transmission		
		<b>M0*</b> =	internal data storage 1MB and transfer via internal telephone modem		
		<b>MF*</b> =	internal data storage 1MB and transfer via internal radio modem in the D-net		
		<b>A2 =</b>	Power supply over 100 - 240V / 47 - 63 Hz		
		<b>D2 =</b>	Power supply over 24V DC stabilized		
		<b>W0 =</b>	wall mount (IP65)		
		<b>F0 =</b>	panel mount (IP54 – front side)		
		<b>19 =</b>	19"-slide in unit inclusive clamp board		
		<b>0 =</b>	without Ex-approval		
		<b>E =</b>	with Ex- approval for intrinsically safe supply of the sensors in Ex-zone 1		
<b>OCP/</b>	<b>??</b>	<b>??</b>	<b>??</b>	<b>??</b>	<b>?</b>

article number of the assigned OCM Pro transmitter

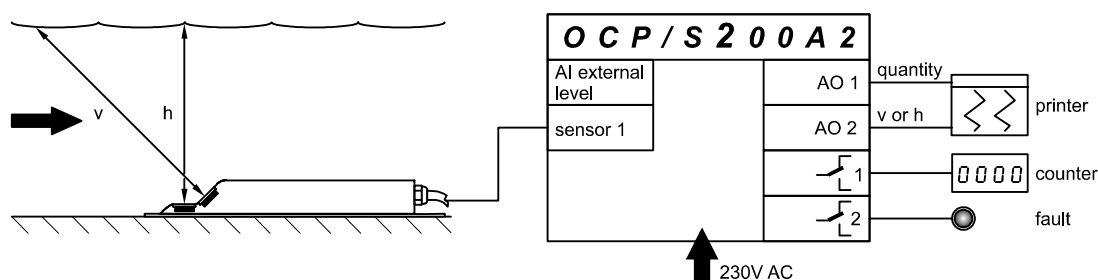
\* = (currently not available)

## Applications Examples

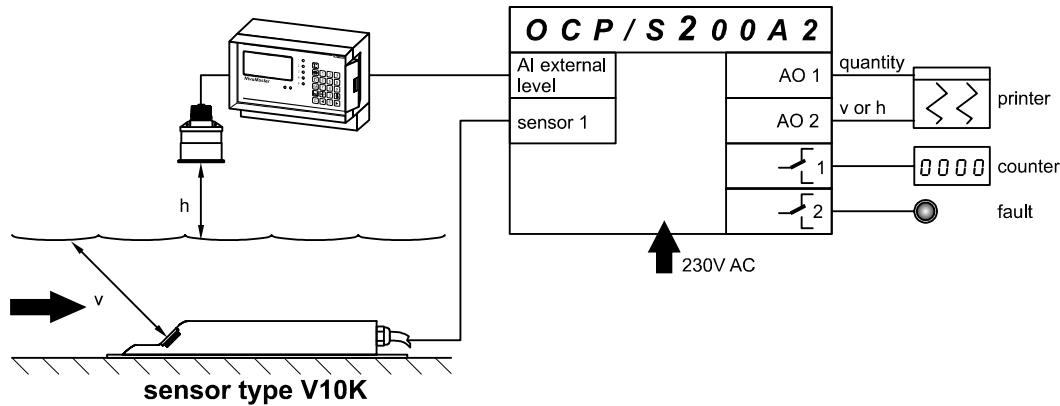
For all applications, please refer to the technical specifications of the sensors and transmitters, for the different combination of sensors to be used.

The following examples only represent the most common applications and their respective sensor combination options. For specific applications, please contact NIVUS.

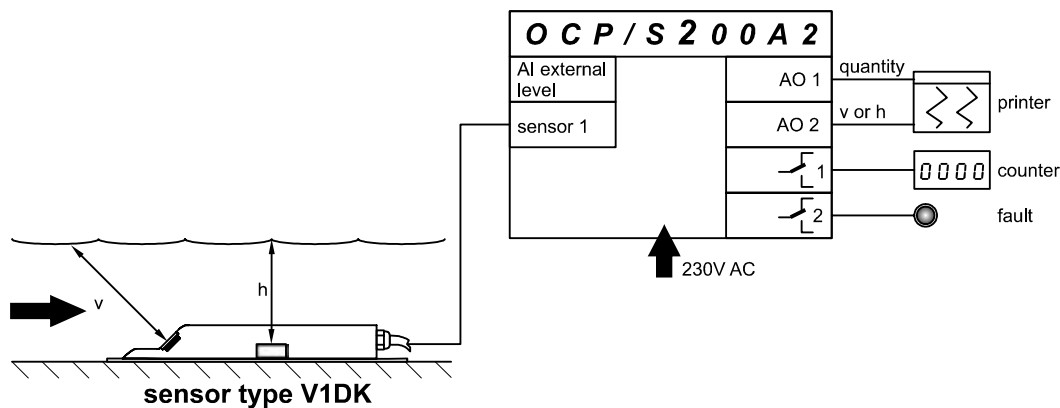
### 1. Flow measurement with 1 velocity sensor and level measurement with submerged ultrasonic sensor, bottom up



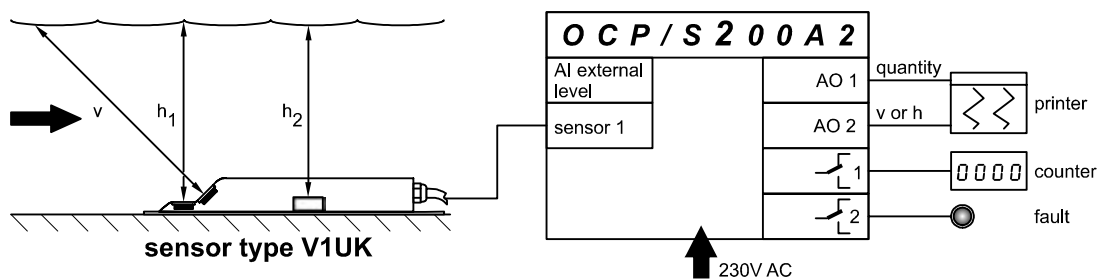
2. Flow measurement with 1 velocity sensor and level measurement with external measurement sensor



3. Flow measurement with 1 velocity combi sensor and level measurement with in the sensor integrated pressure probe



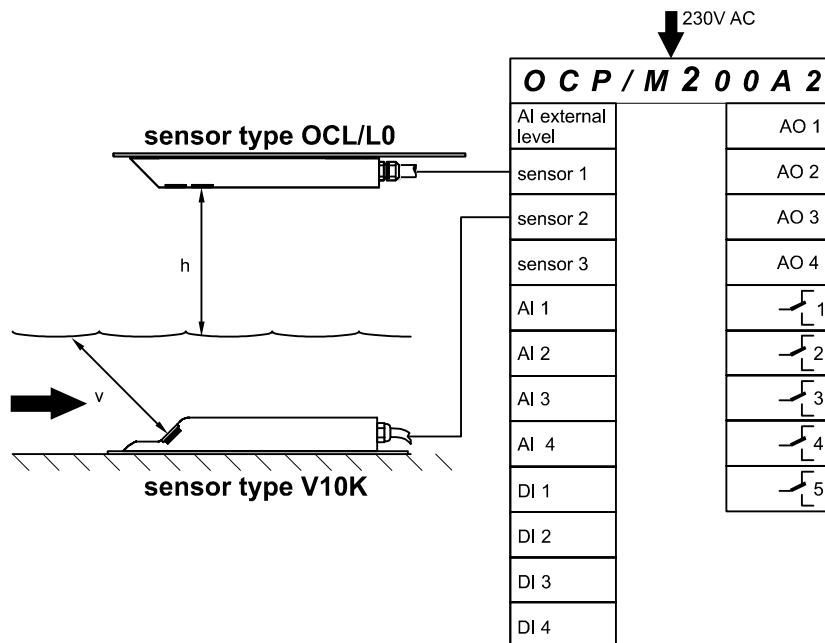
4. Flow measurement with 1 velocity combi sensor and level measurement with in the sensor integrated pressure probe, bottom up as well as an additional level measurement with submerged ultrasonic sensor, bottom up



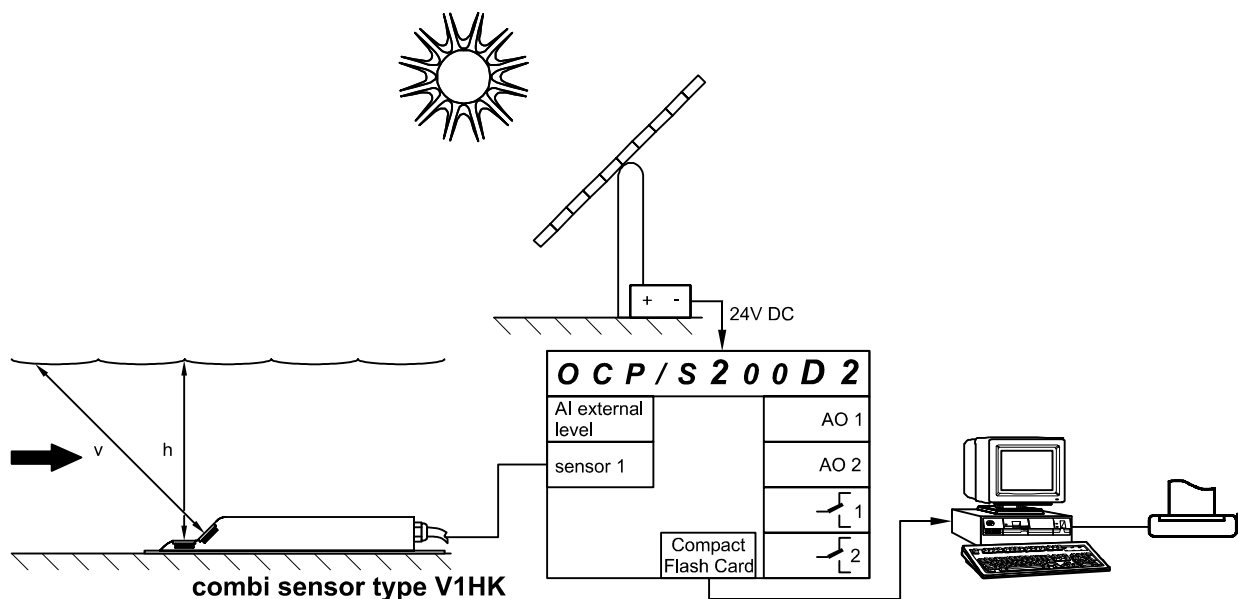


OCM Pro "active" - Transmitter

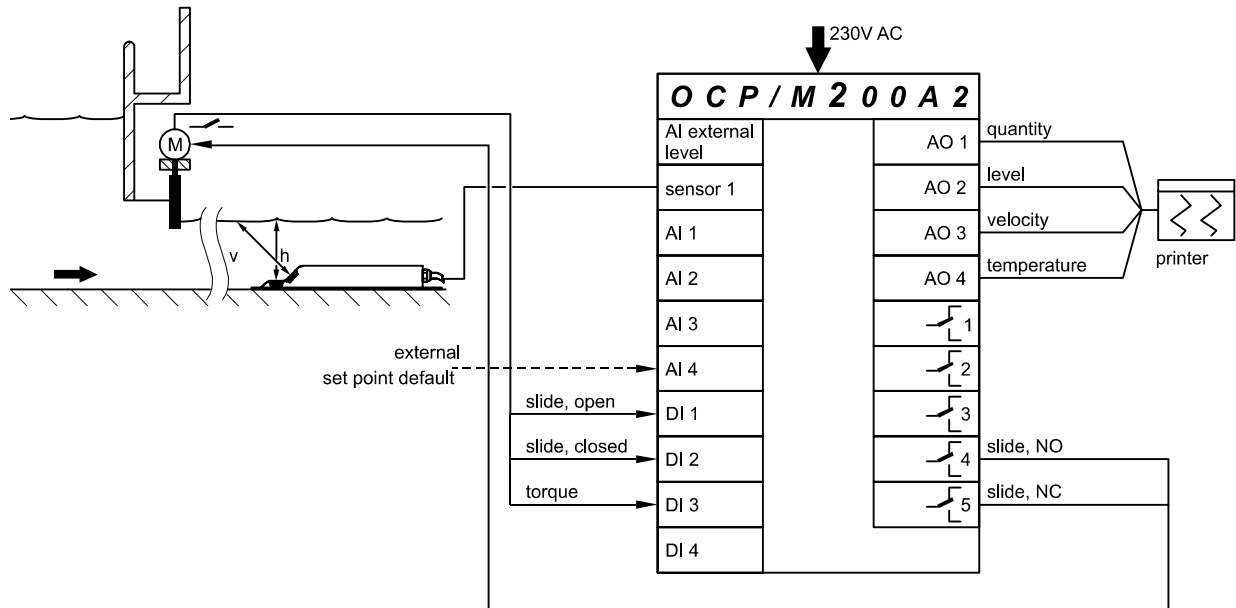
5. Flow measurement with 1 velocity sensor and controlled level measurement ultrasonic sensor, top down



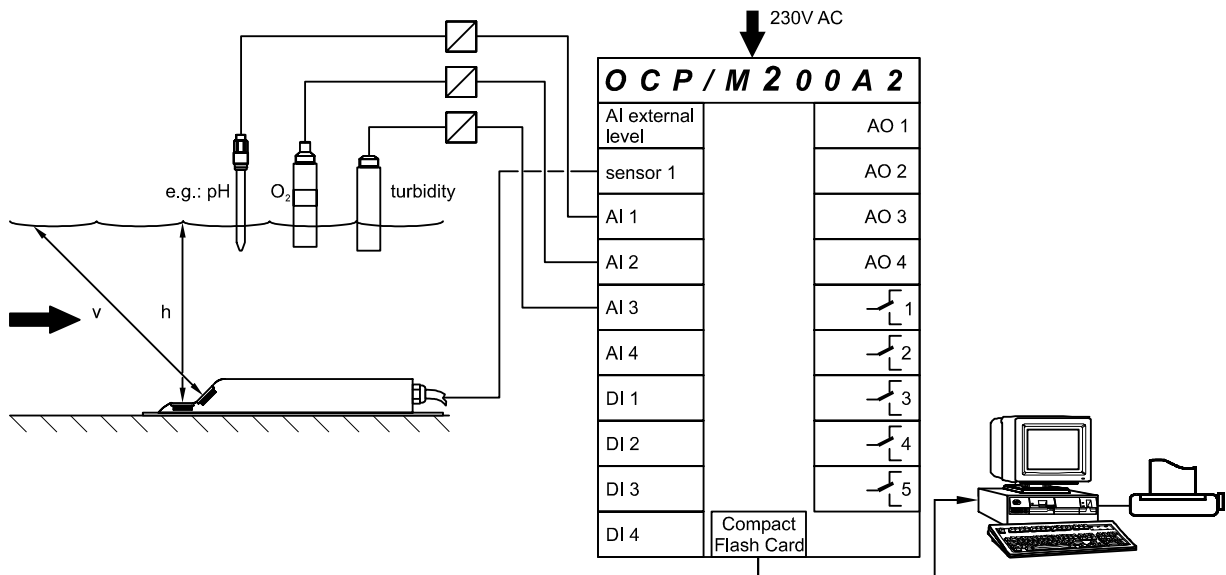
6. Flow measurement with 1 velocity sensor and level measurement submerged ultrasonic sensor, bottom up, 24V-power supply, data transfer with the memory card



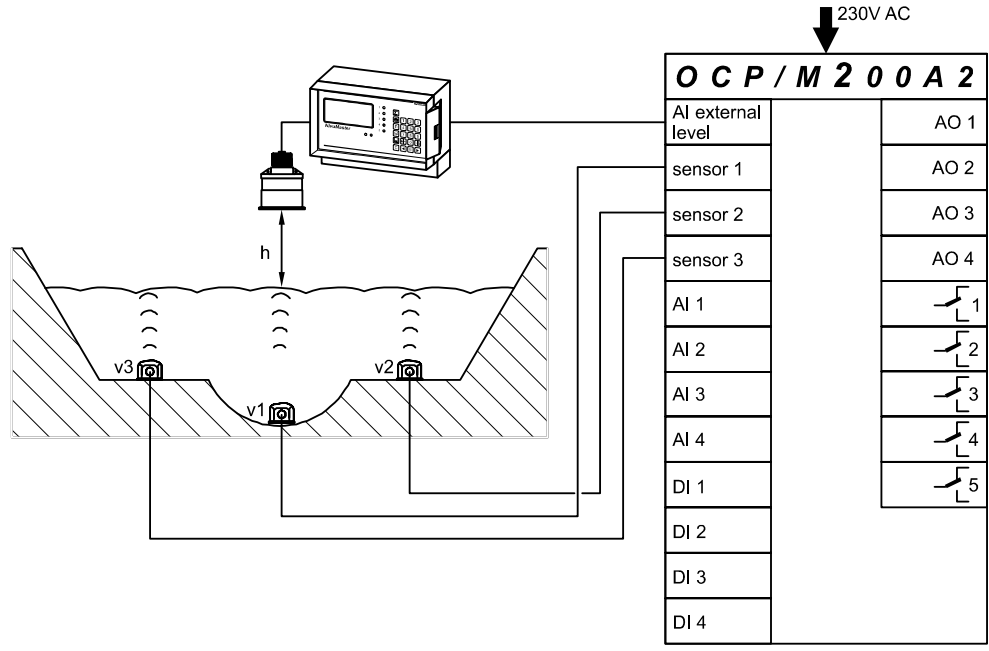
7. Flow measurement and control with 1 velocity sensor and level measurement with submerged ultrasonic sensor, bottom up, output of 4 analog values



8. Flow measurement with 1 velocity sensor and level measurement submerged ultrasonic sensor, bottom up, storage of additional measured values and data transfer with the memory card



9. Flow measurement with 3 velocity sensors and level measurement with external measurement sensor

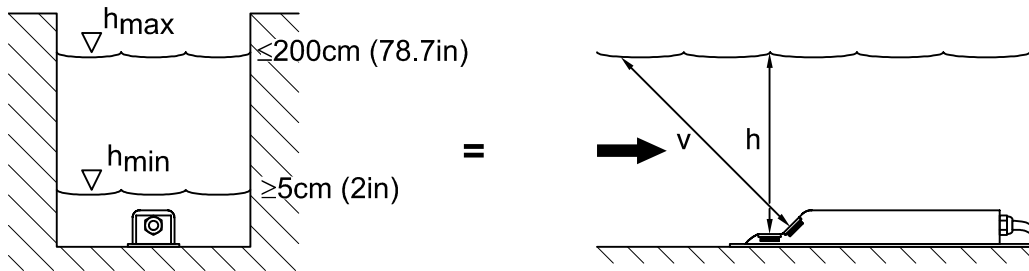


## Selective Criteria for the OCM Pro "active" Sensors

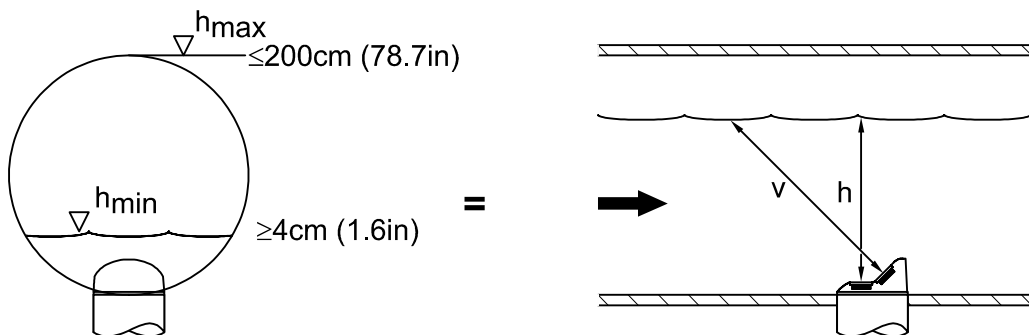
<b>POA/</b>	<b>V1 =</b>	sensor for OCM Pro "active" transmitter	
		<b>0 =</b>	only velocity measurement by 16 scan layers
		<b>H =</b>	velocity measurement as well as level measurement by water-ultrasonic sensor, bottom up
		<b>D =</b>	velocity measurement as well as level measurement by pressure, bottom up
		<b>U =</b>	velocity measurement as well as level measurement by water-ultrasonic sensor and pressure, bottom up
		<b>K =</b>	Wedge sensor for installation at the bottom of the channel
		<b>R =</b>	Pipe sensor for insertion with 1½" nozzle (type <b>D</b> and <b>U</b> not possible)
<b>OCS/</b>	<b>V1</b>	<b>?</b>	<b>?</b> article number of the assigned sensor

## Applications Examples

### 1. Combination sensor type V1HK

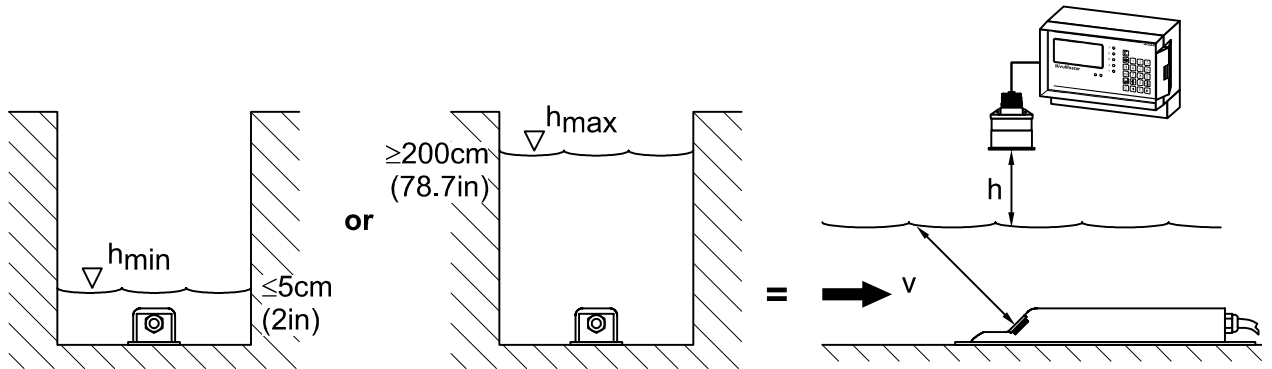


### 2. Combination sensor type V1HR

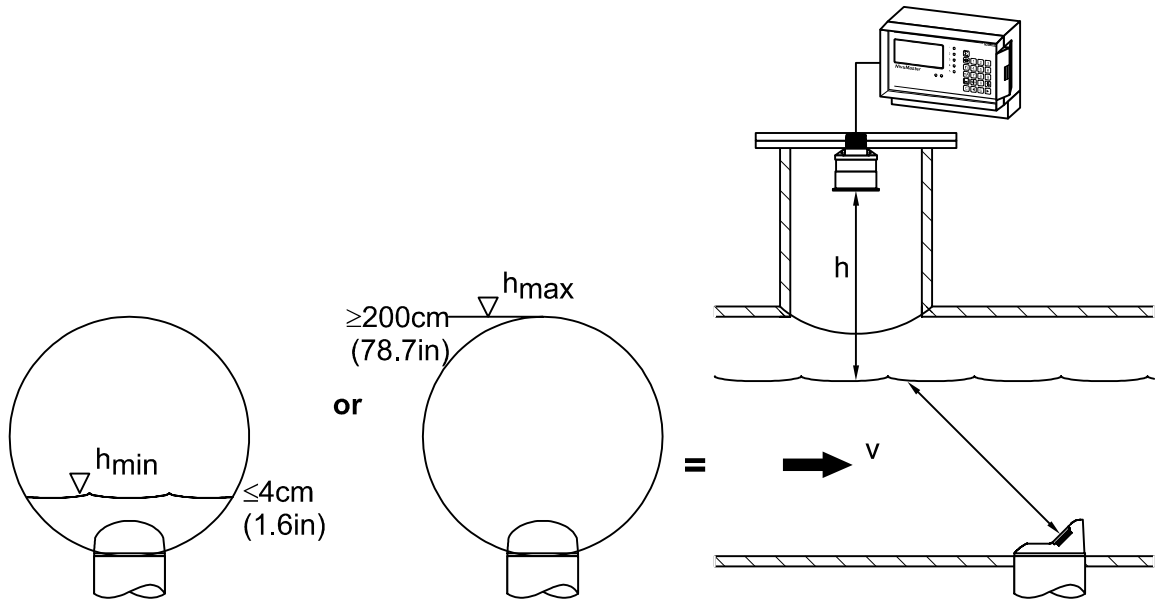




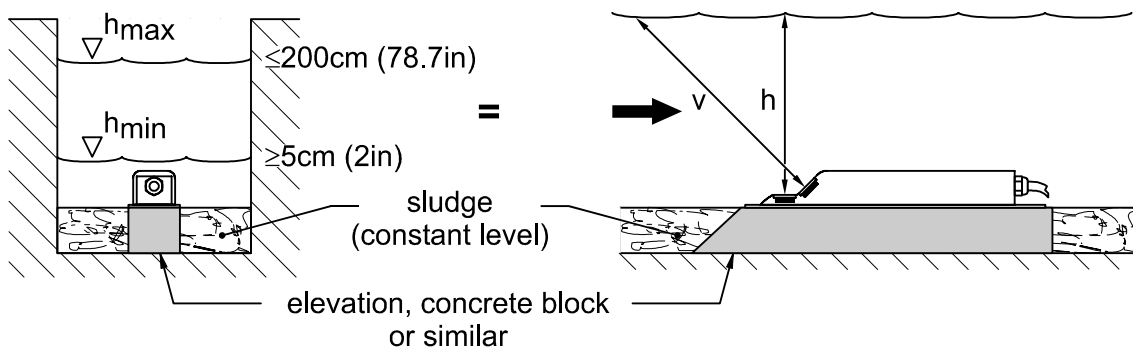
3. Sensor type V10K + external ultrasonic measurement; e.g. NivuMaster



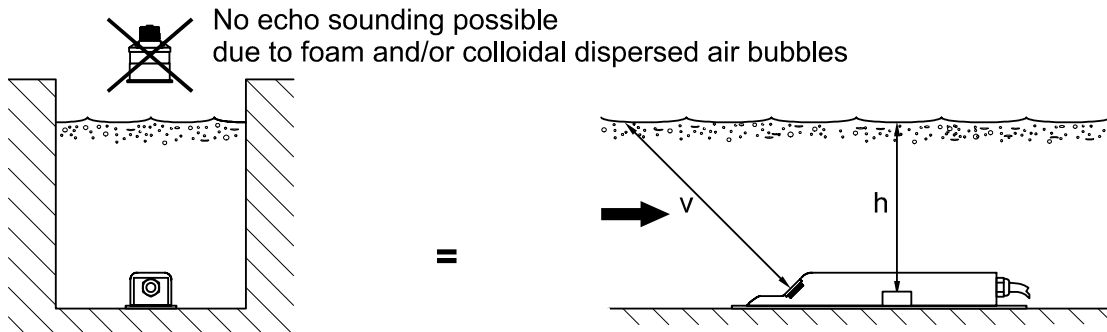
4. Sensor type V10R + external ultrasonic measurement; e.g. NivuMaster



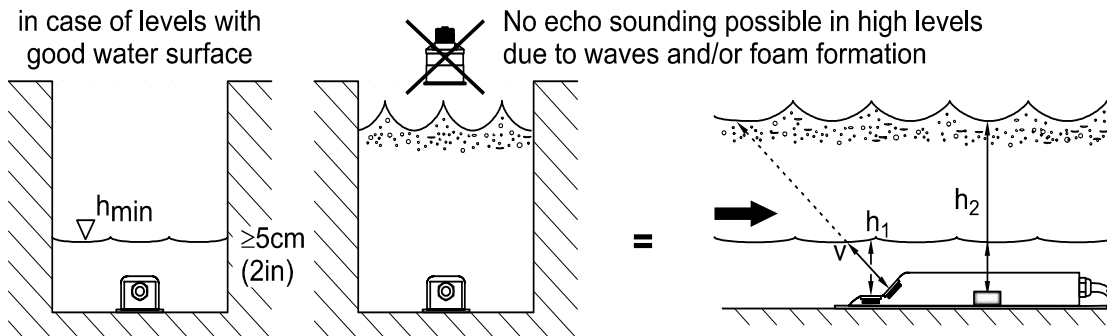
5. Combination sensor type V1HK



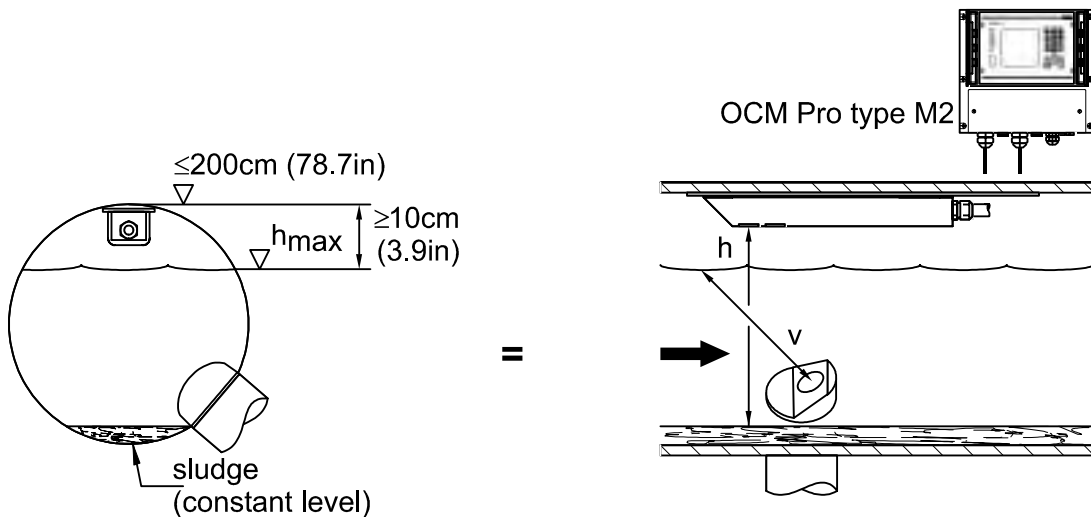
6. Combi sensor type V1DK



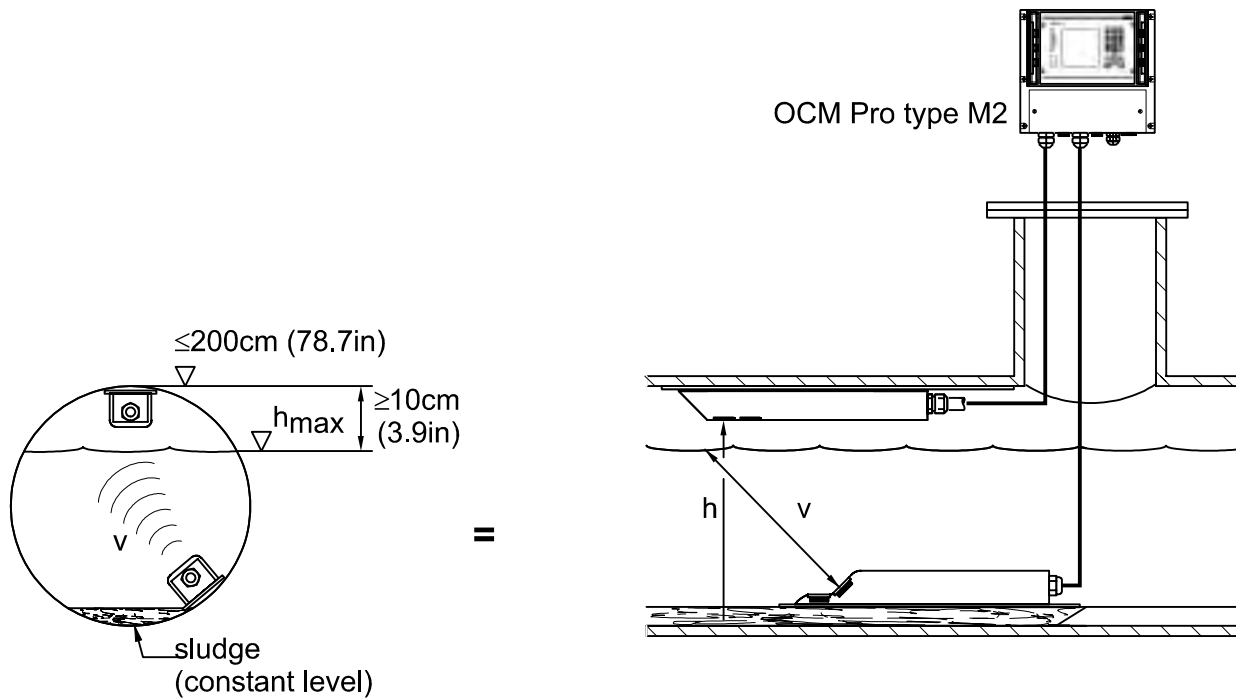
7. Combi sensor type V1UK



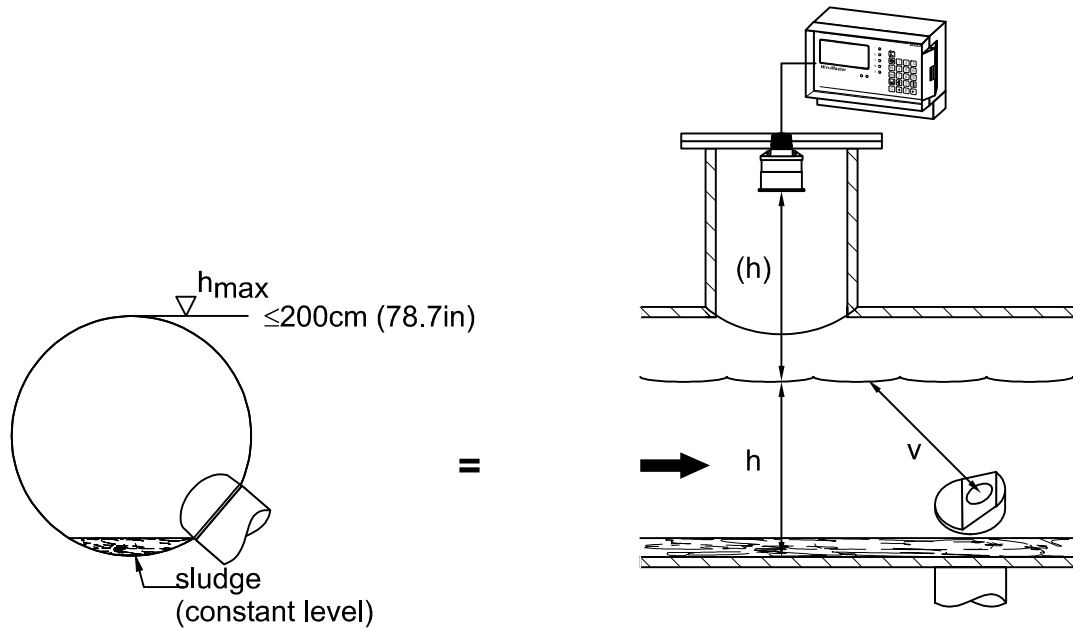
8. Sensor type V10R + OCL/L0



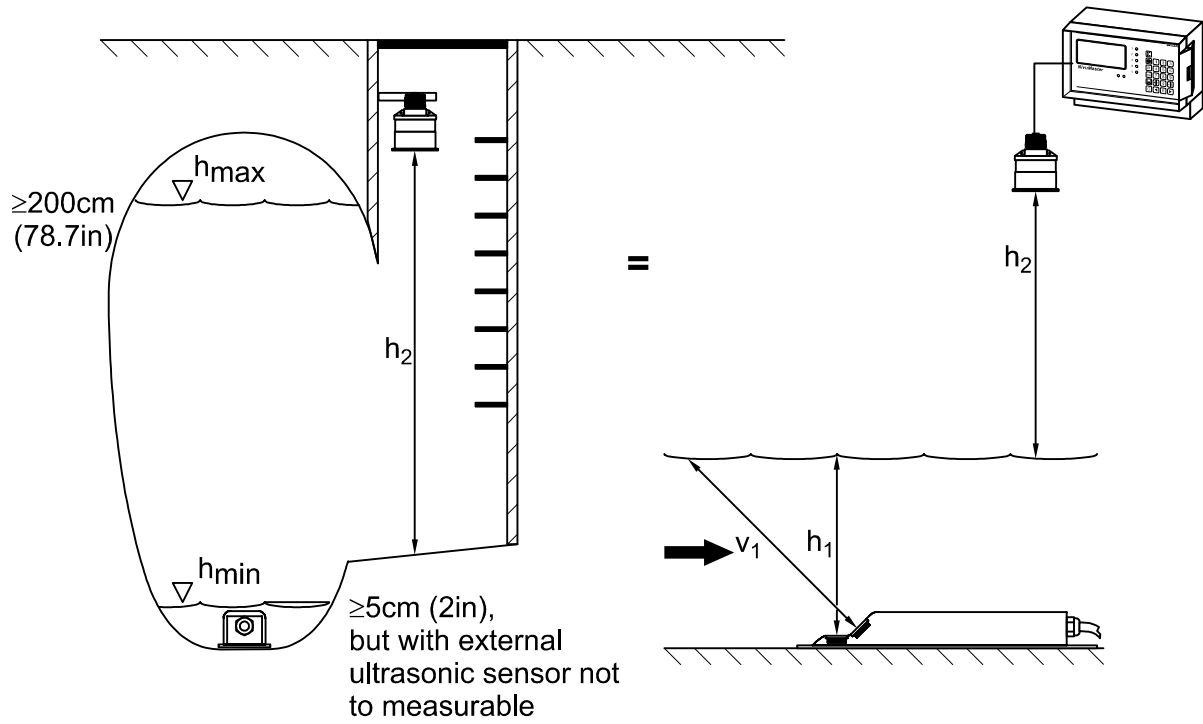
9. Sensor type V10K + OCL/L0



10. Sensor type V10R + external ultrasonic measurement; e.g. NivuMaster



11. Sensor type V1HK + external ultrasonic measurement; e.g. NivuMaster





## General installation conditions for the sensors

Flow measurements require regular flow conditions. This is why disturbing constructions, steps, curves/bends, changes of cross sections and profiles in front of the measurement section have to be avoided.

The calming section in front of the measurement point should be 5 - 10 x diameter at least.

Depending on type of flow and application greater distances may be required (in case of uncertainties contact NIVUS taking the construction plans as a basis).

Behind the measurement point normally a distance of 3 x diameter is sufficient.

Sensors have to be installed on the channel bottom. The sensor front must look exactly 180° against the flow direction. In case of pipe sensor installation only the bevelled part of the sensor must reach into the measurement medium. The area which is inclined by 45° must look exactly against the flow direction.

If there are risks of sludge sedimentation or damage by stones the pipe sensors have to be installed slightly out of the center. Please install wedge sensors on a separate streamlined block out of the area which is at risk. In case of a round bottom (U profile, egg shaped or similar) wedge sensors can be easily placed slightly out of the channel center as well.

Various examples can be found on the following pages >>Technical Information - Sensors<<.

The measurement must be wired according to the wiring diagrams below depending on device configuration. Special wiring diagrams will be provided on request.

If any questions or uncertainties should arise please contact our technical personnel or ask NIVUS in Eppingen, Dept. Flow by taking sketches, drawings or photos as a basis.

## Requirements for the use of pipe measurement sections

Flanges have to be welded from the outside and possibly existing weld seams on the inside must be smoothed.

**Flanges and sealings must not reach into the inside of the pipe measurement section. The nominal inside dimensions of the used pipes and slide valves must correspond exactly.**

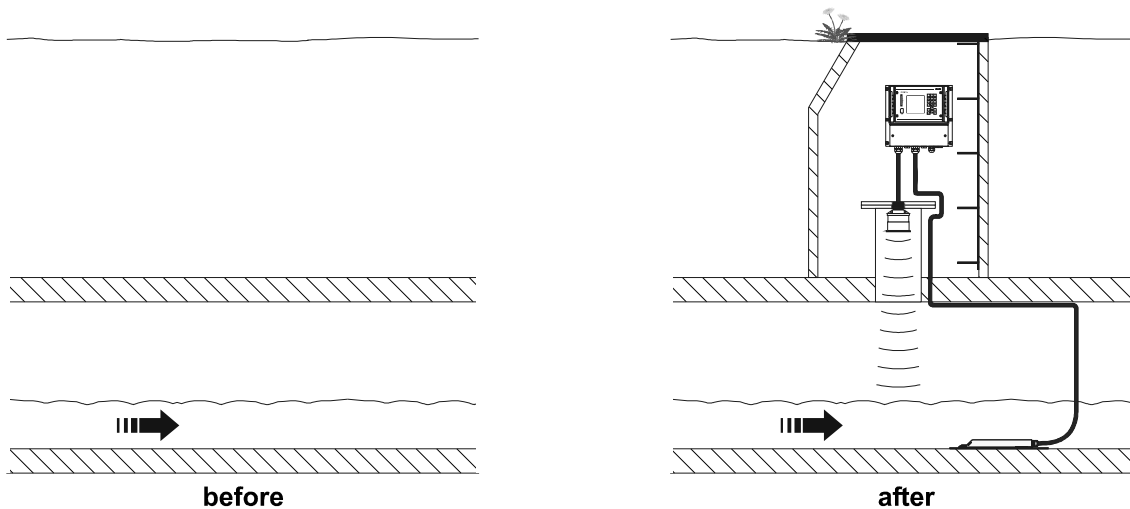
Please observe the minimum distance between sensor surface and maximum water level if external ultrasonic measurement is used. This distance is 30 cm (11.8 in) for the P06/P10 and 12.5 cm (4.9 in) for the P03 depending on the sensor used. Pipe measurement sections with dome top available from NIVUS are designed for these requirements up to a preliminary pressure of 10 m (30 ft) water column.

In case of higher preliminary pressures we recommend to use a pipe measurement section completely made of stainless steel (please request separately).

If you use pipe measurement sections not supplied by NIVUS we recommend a technical inspection by our expert personnel prior to use. Please submit revealing drawings or dimensioned sketches with your request.

In case of existing applications with large pipes (e.g. concrete or plastic) we often are able to offer low-cost special solutions in order to minimize constructional expenses so that there is no need to install a separate pipe measurement section. Please ask for our experiences and special solutions while you are planning your application.

## Example special solution concrete pipe with 1600 mm (63 in) diameter



## Control oriented hints

An OCM Pro Type M2 is required for direct control. If you use a transmitter Type M2 you need an appropriate and if possible universally programmable external controller or you need to drive and to monitor the controller and slider functions by using an SPS.

Normally a plate gate or an aperture control valve with 3-point step control must be used as control element. Analog controlled sliders cannot be driven.

In order to correctly drive the slider and for error monitoring, it is absolutely necessary to provide the end-of-way switches "OPEN" and "CLOSE" as well as the torque switch "CLOSE". These signals must be routed to the digital inputs of the OCM Pro. It is not possible to return the slider position as analog signal to the OCM Pro.

The OCM Pro operates as 3-point step controller with surge recognition, quick close control, slider monitoring and automatic flush function. The digital outputs 4 and 5 are fixed in order to drive the control element. Here, digital output 4 is defined as „close slider“ and digital output 5 as „open slider“.

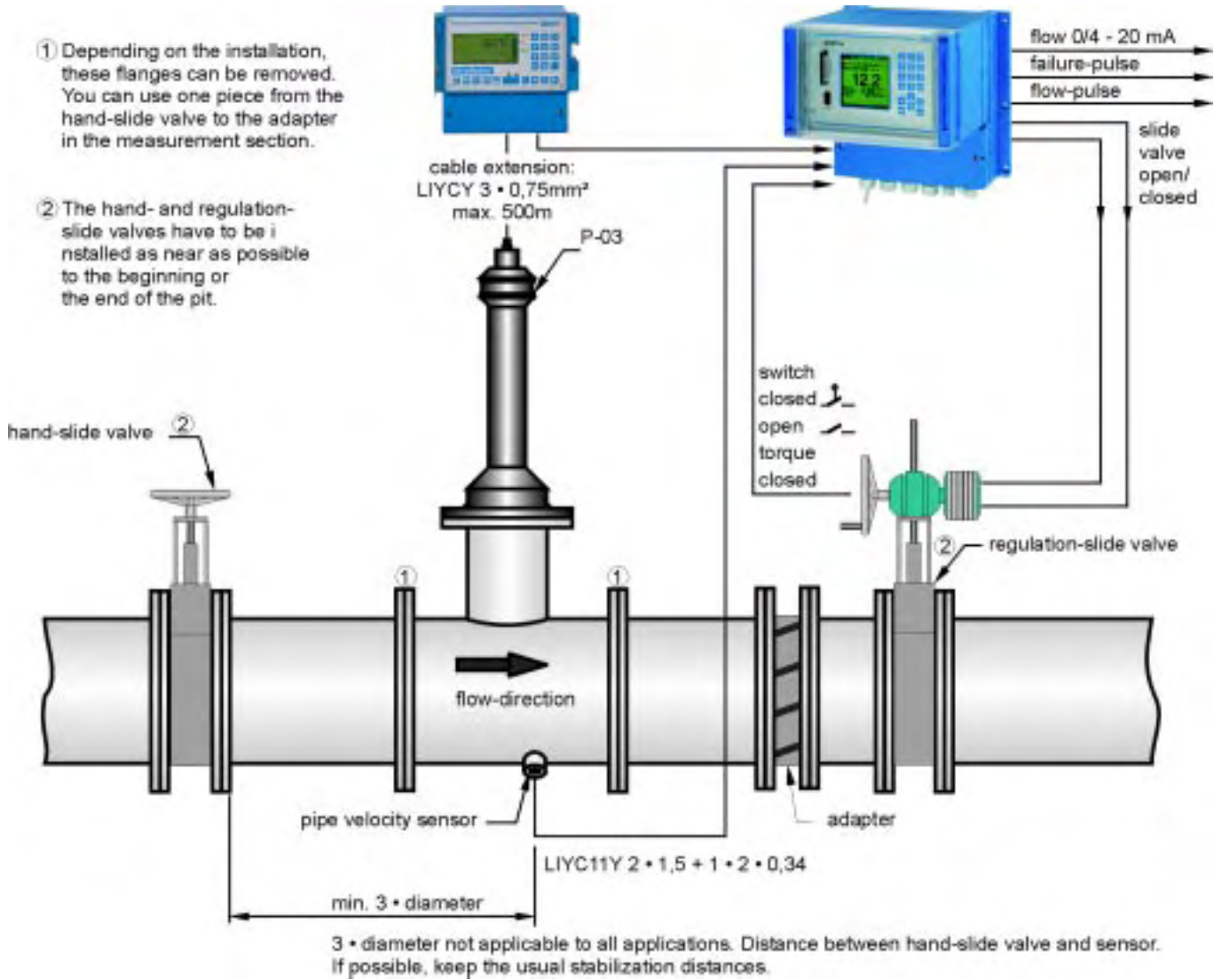
To enter an external setpoint value analog input 4 must be used.

**Control slide valves** normally must be installed **behind** the OCM measurement. The distance between flow velocity sensor and control slide depending on discharge setpoint should be 3 x diameter at least, however better is 5 x diameter (see drawing below).

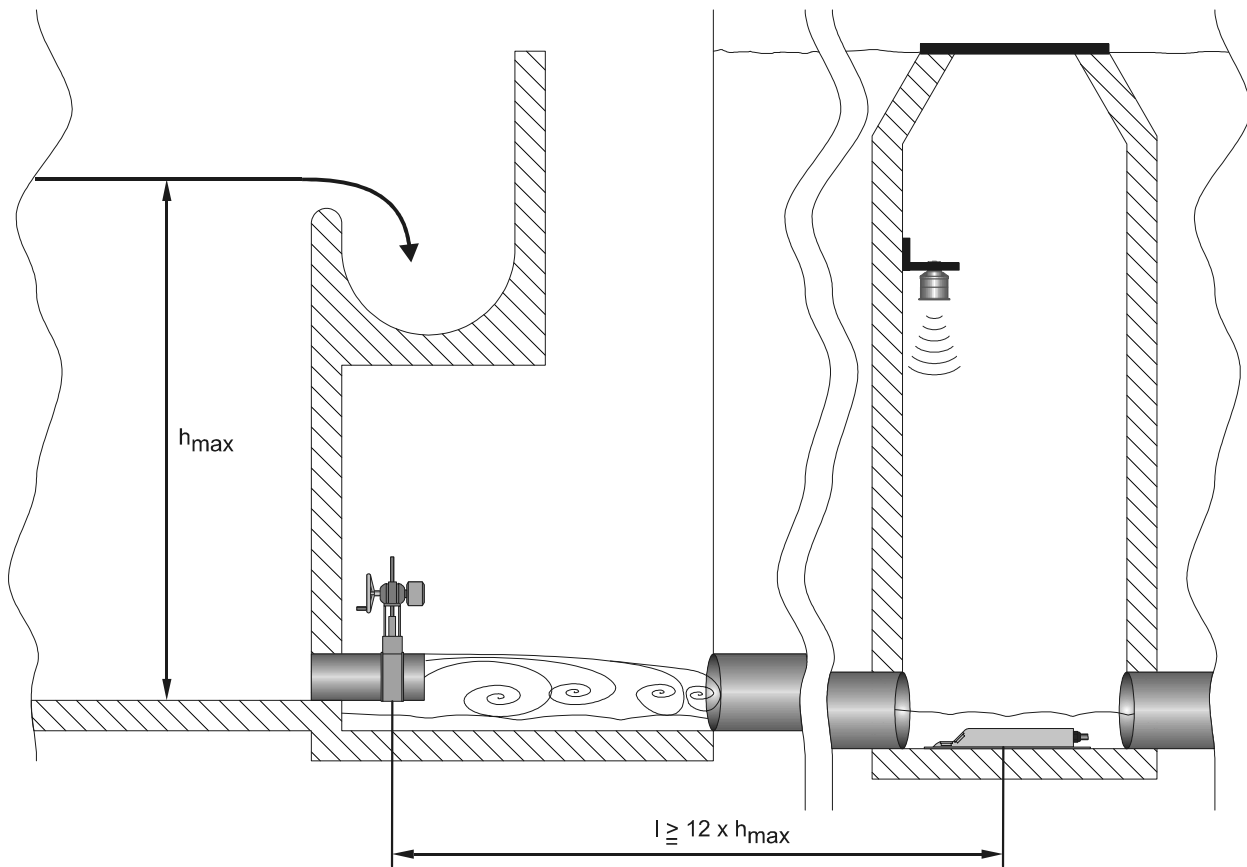
If the OCM measurement is **behind** the control slide, the length of the calming distance from slider to measurement point must be 12 x max. dam-up level in front of the slider at least.

Due to reasons of stability the average flow velocity within the controlled area should not fall below 30 cm/s (1 ft/s). Please let NIVUS check the section dimensions in case of uncertainty.

## Common setup of a pipe measurement and control section



## Position of the measurement behind the slider



## Electrical connection

For electrical installation local regulations must be taken into account. Due to reasons of interference safety always keep sensor cables short and do not run them together with power lines.

Lines have to be laid in a way that they are protected from mechanical damage. Sensor lines in sewer channels must be laid on the bottom and covered subsequently. Alternatively run the lines in a trench and seal it with mastic to avoid the risk of build-up.

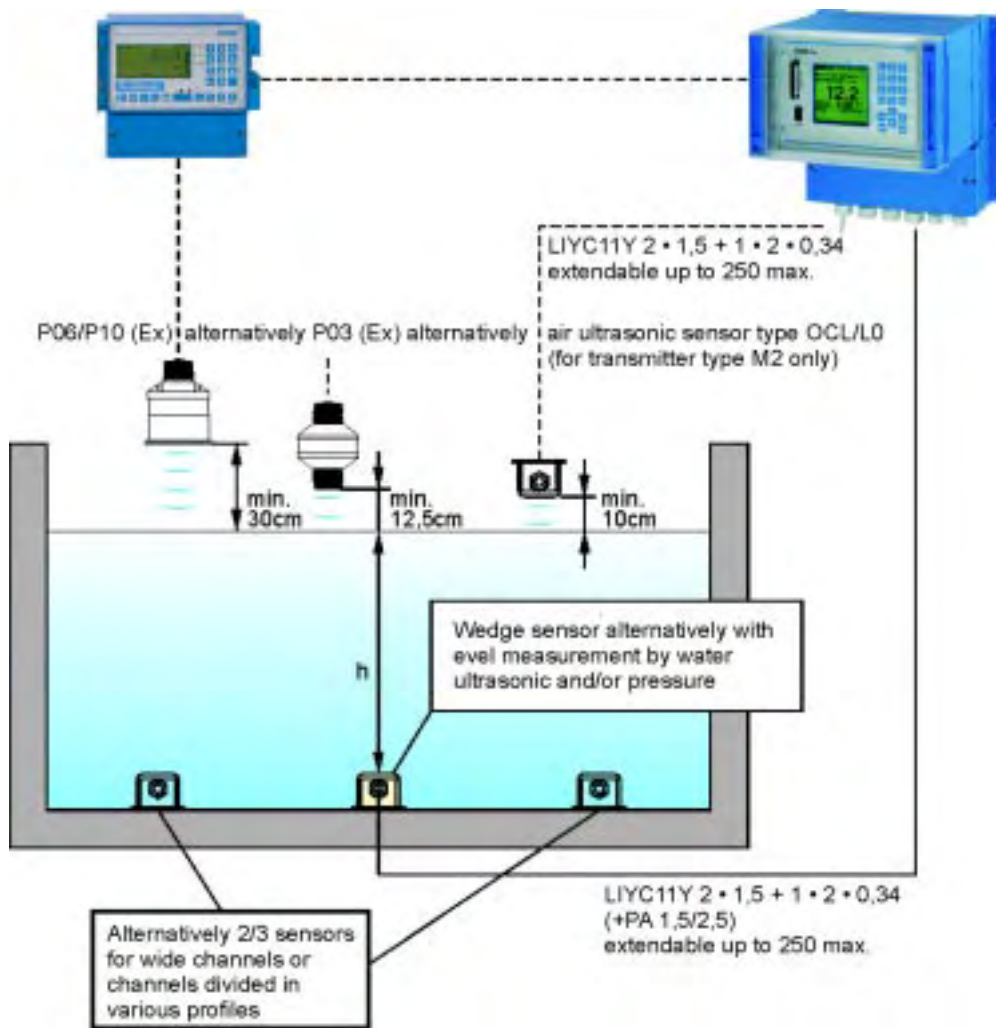
If cable lengths (sensor cables as well as data cables) exceed 10 m (30 ft) we recommend to use appropriate overvoltage protection equipment. In case of lengths exceeding 30 m (90 ft) the selective protection of sensor and transmitter is recommended.



## Measurement setup in open channels

For selecting the appropriate sensors and transmitters please note the following sheets  
 >>Technical Information - Transmitter or Sensors<<.

The drawing below represents the basic setup only.



# OCM EM

## Flow Meter for Partially and Fully Filled Pipes and Open Channels



- For all channel shapes, sizes, weirs and flumes
- 24V DC or 230V AC - 115V AC powered
- Depth, velocity and flow measurement
- System operation by on-board membrane keypad and back-lit LC display
- 2 x 0/4-20mA inputs, 2 x 0/4-20mA outputs and 4 relays

A reliable flow meter designed for continuous operation in both, sanitary and storm sewers and open channels.

OCM EM flow monitoring system is an AC or DC powered system consisting of a level sensor (hydrostatic pressure or air ultrasonic) and a fully-bidirectional ultrasonic velocity sensor.

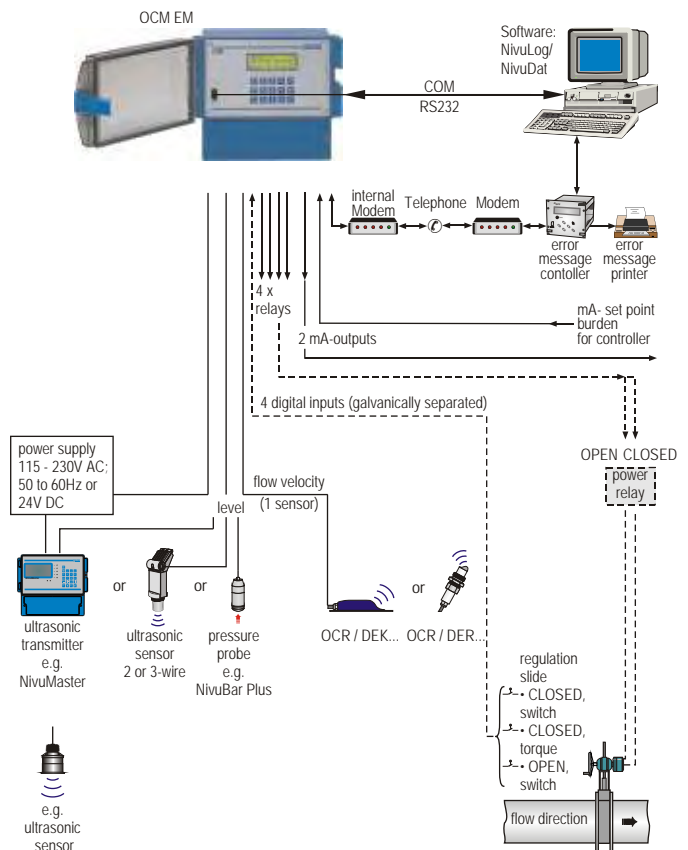
OCM EM has a menu-driven membrane keypad and backlit LC display for programming and status check, and can be programmed for any pipe and channel shape and size, and for flumes and weirs.

The OCM EM also has an internal 64KB data logger. Optional available is a modem for data transmission.

### OCM EM - Equipment Configurations

The minimum equipment configuration for the operation of an OCM EM Flow Monitor consists of a measurement transmitter with an ultrasonic level sensor (or a hydrostatic level sensor) and a velocity sensor.

### OCM EM - Overview



Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
E:\1\_eng\OCM\_EM\OL-DB-A4.cdr / 09.07.2003

## OCM EM - Transmitter Specifications

Display / Operation:	4 x 20 digit LCD (backlit), membrane keypad (15 buttons)
Enclosure:	Polycarbonate IP65 (NEMA 4)
Internal data logger:	64KB
Internal modem:	optional
Inputs:	2 x 0/4-20mA for level (200 Ohm, 12 bit) 1 x velocity 1 x slide-end/regulator control 1 x torque
Outputs:	2 x 0/4-20mA; galvanically isolated (max. 600 Ohm, 12 bit) 4 x relays as totalizer, boundary contact, error message or slide control programmable, max. capacity 1A/230V AC (cos phi = 1) or 1A/60V DC
Control:	3-point-step regulator with PID-behaviour, fast end control, adjustable slide construction at disturbance, auto flush function at slide transfer
Power supply:	115-230V AC, 50/60Hz; or 24V DC, $\pm 15\%$
Power consumption:	max. 18V A
Operating temperature:	-10 to +50°C (14 to 122°F)
Storage temperature:	-20 to +60°C (-4 to +140°F)
Dimensions (L x W x D):	192 x 160 x 106mm (7.55 x 6.30 x 4.17in)
Weight:	approx. 1.5kg (3.3lbs)
Interface:	RS232

## OCM EM - Applications

- Influent and Effluent Flow Monitoring
- Storm and CSO Monitoring
- Industrial Effluent Monitoring and Control
- WWTP Process Control
- Pre-treatment Compliance
- NPDES Permitting
- Power Plant Cooling- and Feed Water Measurement and Control
- Mining By-Wash Monitoring
- Pump Station Monitoring and Control

## OCM EM - Velocity Sensor Specifications

Minimum reflecting particle size:	100ppm; >0.6mm (0.02in)
Transmission frequency:	750 KHz or 2 MHz
Measurement range:	-6m/s to 6m/s (-20 fps to 20 fps)
Material:	Stainless steel; Epoxy resin; Polyurethane
Cable length:	10m (33ft) or 30m (99ft), extendable up to 150m (492ft)
Protection:	IP 68 (NEMA 6)
Zero drift:	100% zero stable
Long-time drift:	0%
Accuracy:	$\pm 1\%$ of measurement reading or $\pm 0.03\text{mm/s}$ (whichever is higher)
Operating temperature:	-10°C to 50°C (14 F to 122 F)
Storage temperature:	-20°C to 60°C (4 F to 140 F)

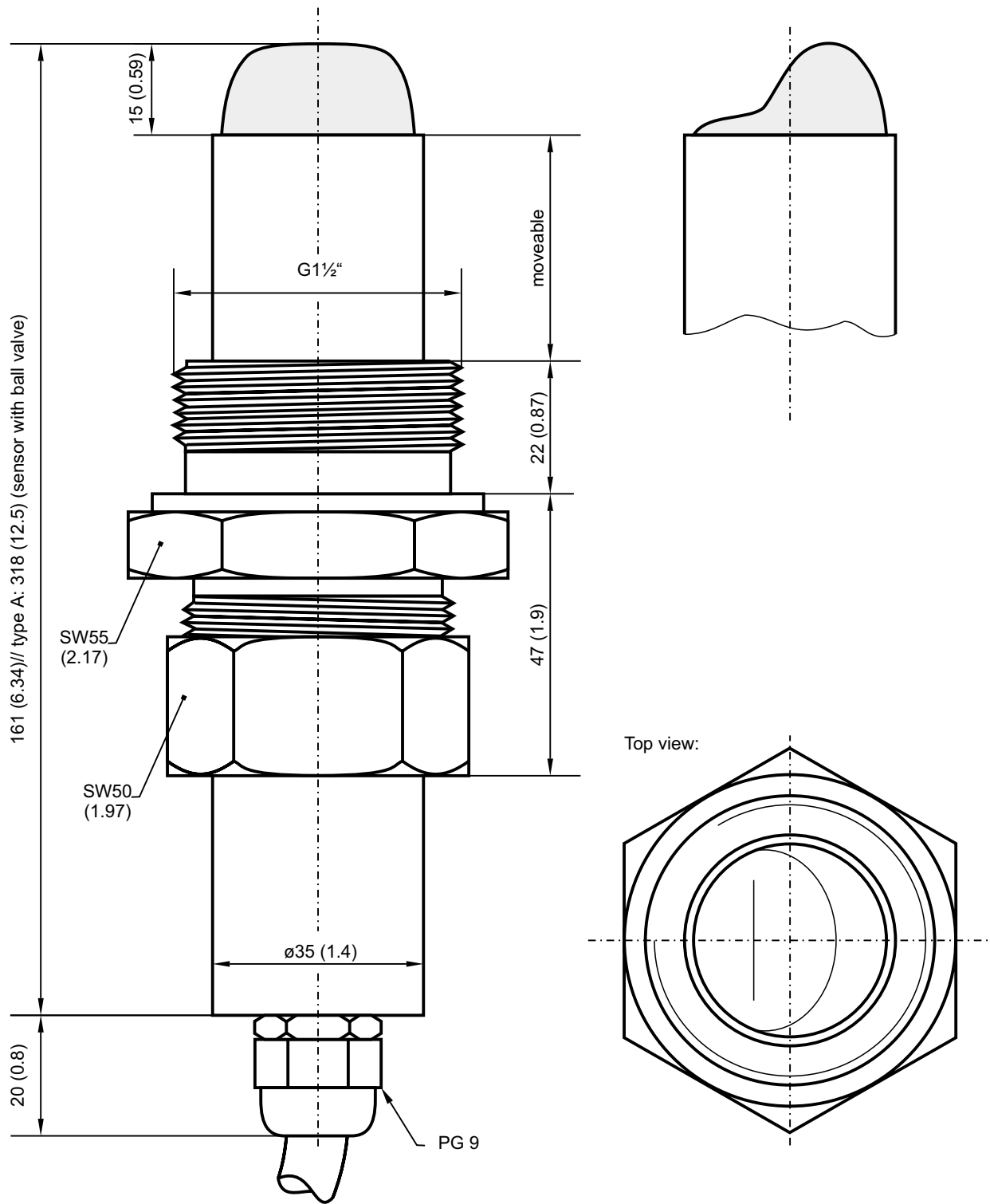


Flow measurement in discharge pipes  
Interruption-free assembling  
of the measurement device



Foul-resistant velocity sensor  
due to stream optimized construction

Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
E:\1\_eng\OCM\_EM\OL-DB-A4.cdr / 09.07.2003



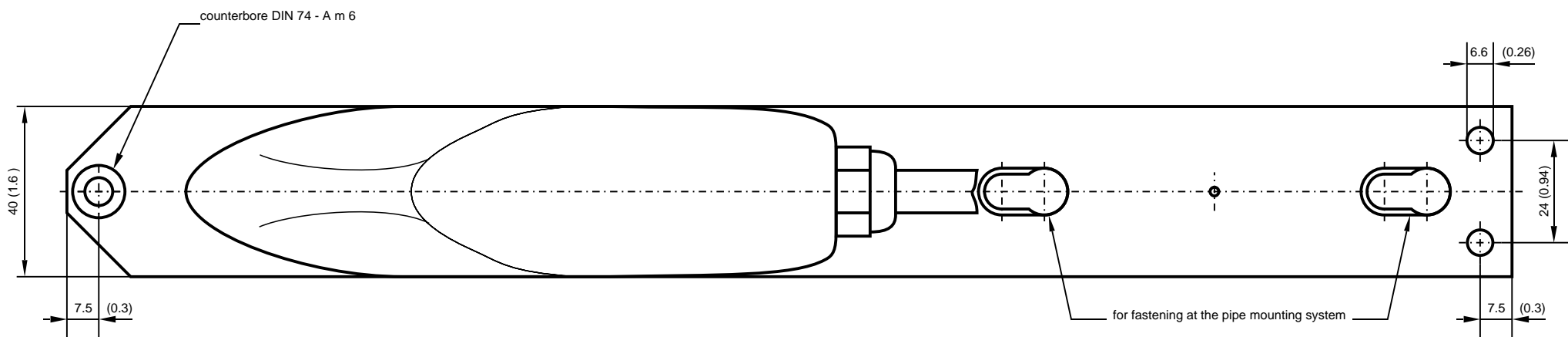
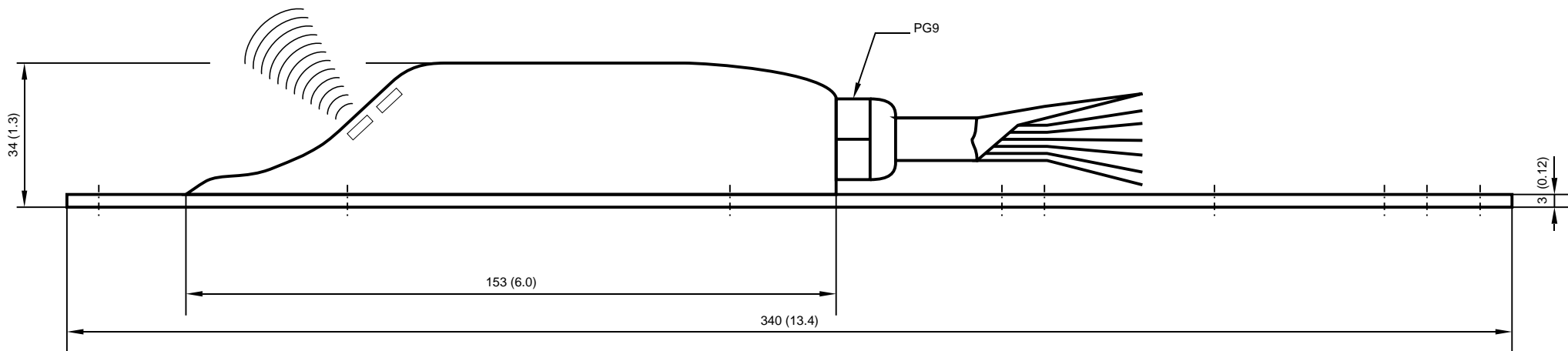
All dimensions in **mm** and **inch** unless otherwise stated.

Material: pipe stainless: steel 1.4571  
 sensor surface: Polyurethane

Specifications are subject to change.

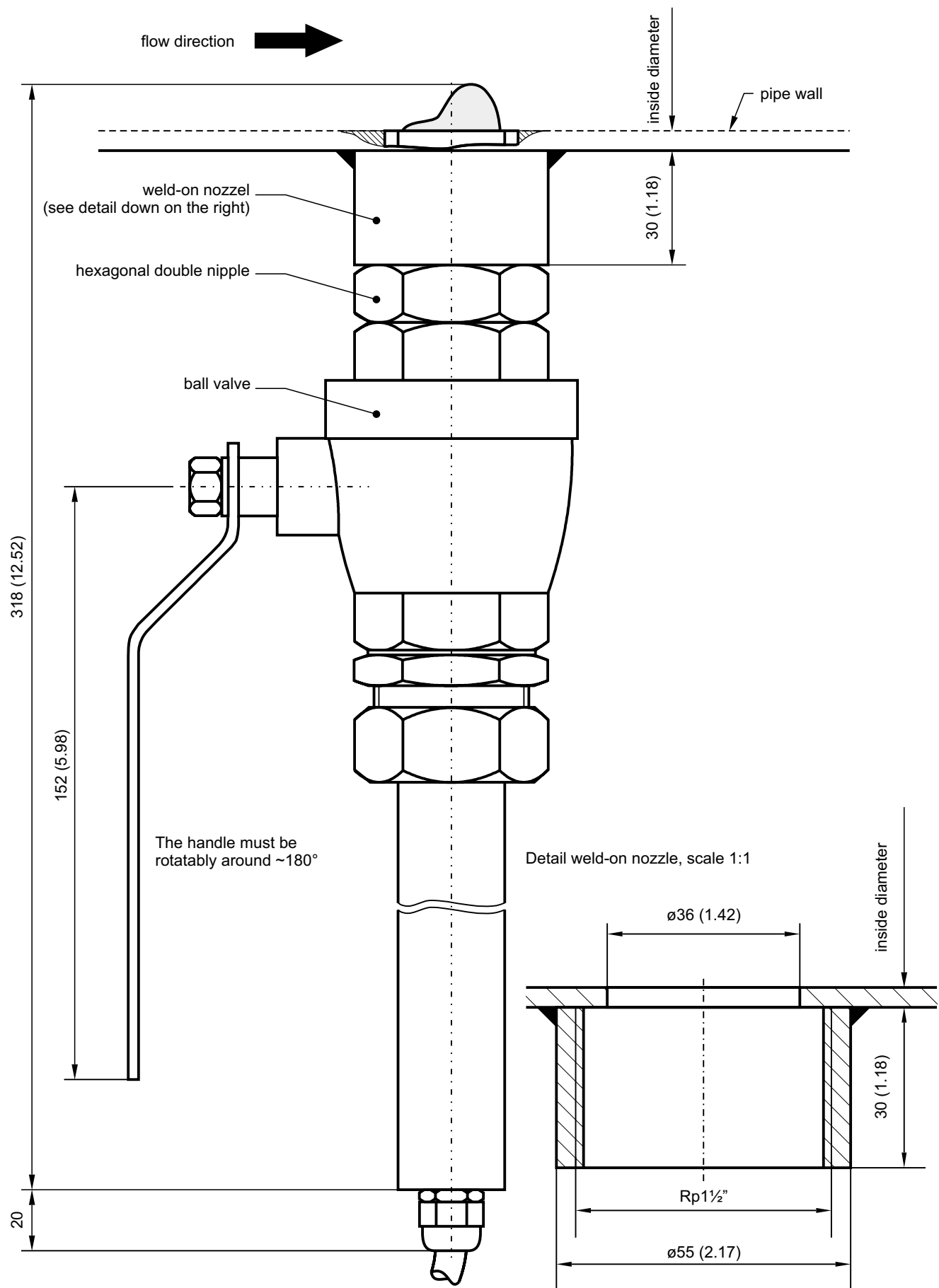
	Datum date	Name name	Maßstab scale 1:1	Zeichnungs Nr. - drawing No. OE-TZ-03 / 0201	
	gezeichnet drawn	18.12.02	IM	Benennung - Description Pipe sensor for insertion in pipes with 1 1/2" nozzle	
geprüft checked	18.12.02	SL	Format size A4		
Nur für intern!	<input type="radio"/>	Blatt sheet 1 von from 1			





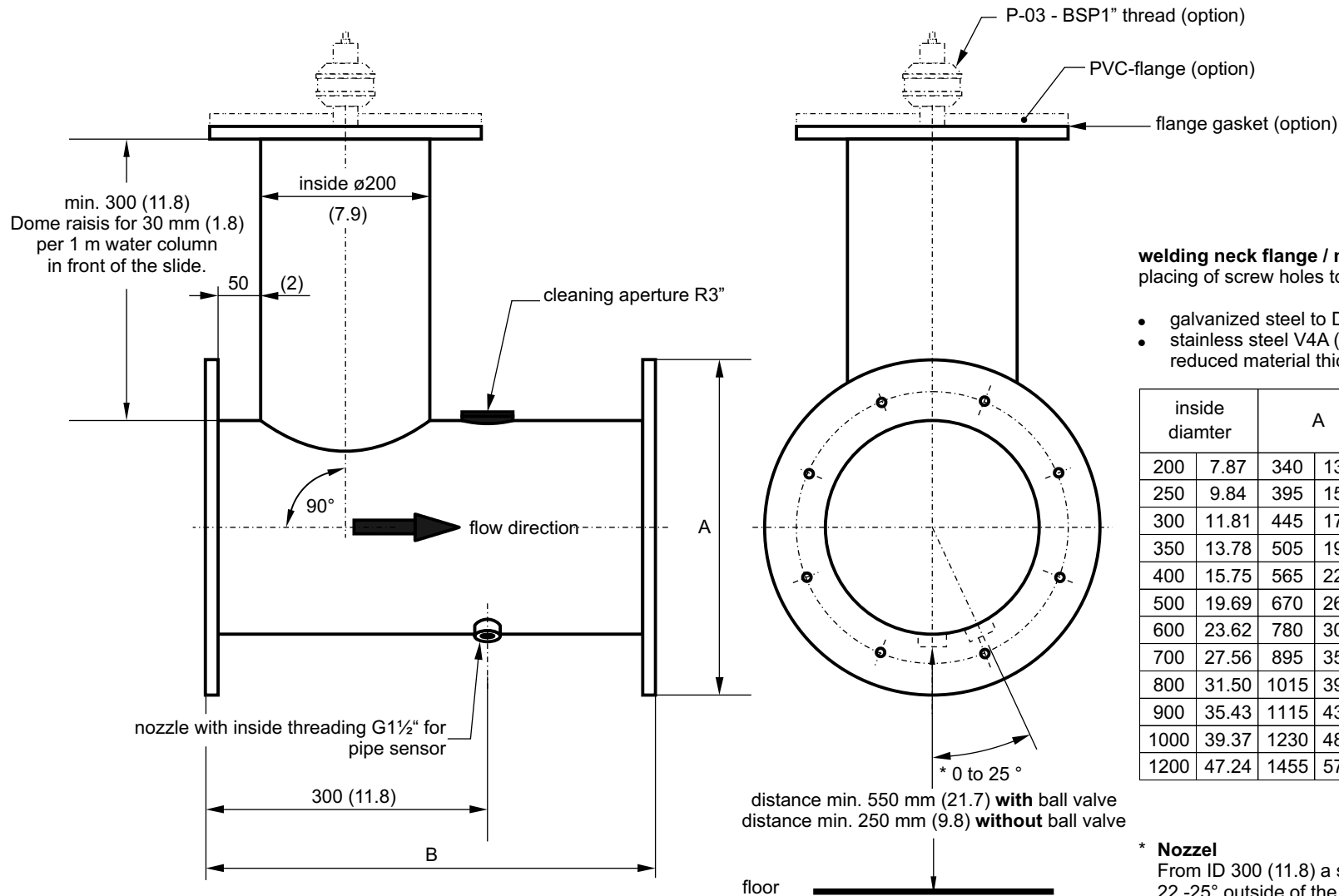
All dimensions in mm and inch unless otherwise stated.  
Specifications are subject to change.

		Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
gezeichnet drawn	04.07.03	IM	A3	1:1		OE-TZ-04 / 0300	OCM E wedge sensor		
geprüft checked	04.07.03	SL			Nur für intern! <input type="radio"/>				



Specifications are subject to change.

	Datum date	Name name	Maßstab scale	Zeichnungs Nr. - drawing No. <b>OE-TZ-13 / 0200</b>	
	gezeichnet drawn	11.04.02	IM		
geprüft checked	11.04.02	SL	A4	Benennung - Description <b>Pipe sensor for insertion in pipes with 1½" nozzle and with ball valve</b>	
Nur für intern!	○	Blatt sheet 1 von from 1			



**welding neck flange / nominal pressure PN10:**  
placing of screw holes to DIN 2501, PN10

- galvanized steel to DIN 2632, PN10
- stainless steel V4A (material 1.4571) similar DIN 2576 with reduced material thickness ( $t = 20$  (0.79))

inside diameter		A		B		no. holes	ø holes		hole circle ø	
200	7.87	340	13.39	500	19.69		8	22	0.87	295
250	9.84	395	15.55	500	19.69	12	22	0.87	350	13.78
300	11.81	445	17.52	500	19.69	12	22	0.87	400	15.75
350	13.78	505	19.88	500	19.69	16	22	0.87	460	18.11
400	15.75	565	22.24	750	29.53	16	26	1.02	515	20.28
500	19.69	670	26.34	750	29.53	20	26	1.02	620	24.41
600	23.62	780	30.71	1000	39.37	20	30	1.18	725	28.54
700	27.56	895	35.24	1000	39.37	24	30	1.18	840	33.07
800	31.50	1015	39.96	1000	39.37	24	33	1.3	950	37.40
900	35.43	1115	43.90	1250	49.21	28	33	1.3	1050	41.34
1000	39.37	1230	48.43	1250	49.21	28	36	1.42	1160	45.67
1200	47.24	1455	57.28	1500	59.06	32	39	1.54	1380	54.33

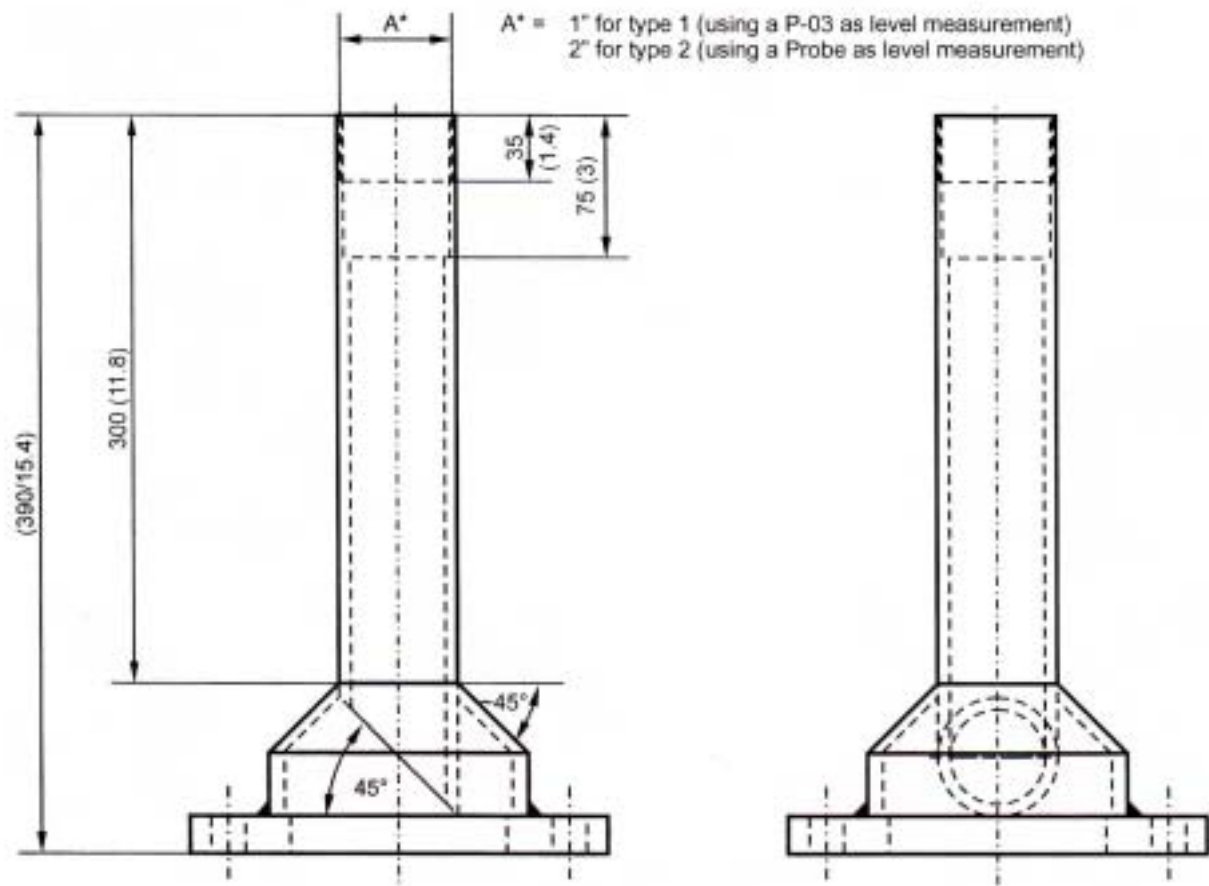
distance min. 550 mm (21.7) **with** ball valve  
distance min. 250 mm (9.8) **without** ball valve

**\* Nozzel**

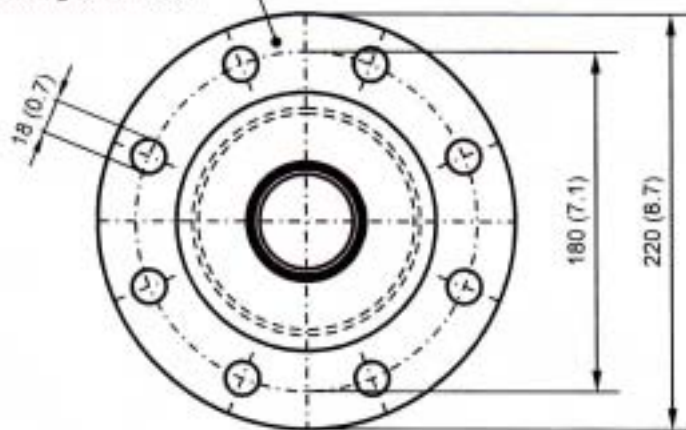
From ID 300 (11.8) a second nozzle must be attached between 22-25° outside of the bottom to be capable of screwing in the sensor at the side in case of sanding up.

All dimensions in **mm** and (**inch**) unless otherwise stated.  
Specifications are subject to change.

	Datum date	Name name	Format size	Maßstab scale	Blatt sheet 1 von from 1	Zeichnungs Nr. - drawing No.	Benennung - Description	
	gezeichnet drawn	12.07.06			IM			
geprüft checked	12.07.06	SL						



Flange ID100 (3.94),  
 similar to DIN 2576;  
 Screw Hole Layout  
 according to DIN 2501



All dimensions in **mm** and **inch** unless stated otherwise.

Specifications are subject to change.

Material: PE, 1bar pressure-proof

	Datum date	Name name	Maßstab scale	Zeichnungs Nr. - drawing No. <b>RE-TZ-06 / 0400</b>	
	gezeichnet drawn	02.08.04	IM		
geprüft checked	02.08.04	SL	Benennung - Description <b>Dome Top for          Pipe Measurement Section "short"</b>		
Nur für intern! Only for internal! <input type="checkbox"/>		Blatt sheet <b>1</b> von of <b>1</b>			





## PCM 4

**Portable Flow  
Measurement for  
universal use**

# Undoubtedly the most accurate portable flow measurement

The portable PCM 4 is designed for temporary flow measurement over long-term periods in open channel applications such as wastewater collection systems, storm sewer systems, and combined sewer systems. The battery powered system provides highly accurate depth and velocity data.

The PCM 4 can be used for many project applications, like

- infiltration/inflow analysis and reduction
- master plan studies
- storm sewer monitoring
- ...

Some of the most important features for using the PCM 4 even in difficult applications are:

- measures the real flow velocity profile
- spatial allocation of single velocities
- no calibration required
- absolutely stable zero point and drift-free
- triple redundant level measurement
- measurement in all part filled and full pipes and channels
- measurement in heavily polluted and abrasive media
- multilingual parameter setting in dialog mode
- also available as PCM Pro, for the use in Ex areas



## Flow level measurement

You are free to select between 5 different detection principles depending on your application.

- water-ultrasonic integrated in combi sensor [h1, measurement from bottom up]
- pressure measurement cell integrated in combi sensor [h2, measurement from bottom up]
- wedge sensor with air-ultrasonic [h3, measurement from top down]
- variable external level sensor [h4, 4-20 mA]
- fixed value at constant fill level

## Measurement principle

The quantity >>flow "Q"<< cannot be measured directly. The following general equation is the basis for flow calculation:

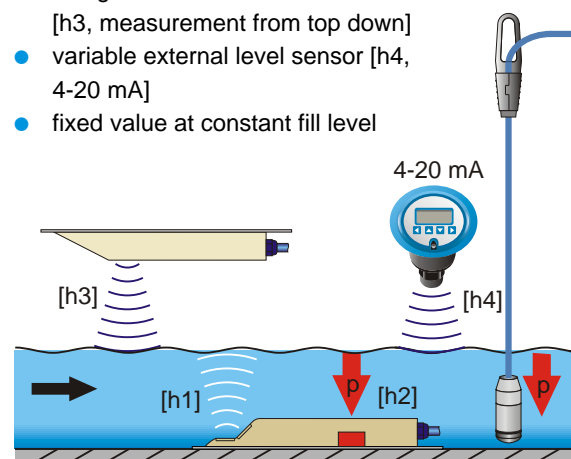
$$Q = A \cdot \bar{v}$$

A = wetted cross-sectional area  
 $\bar{v}$  = average flow velocity

The wetted cross-sectional area A depends on the cross-sectional profile and the flow level.

This flow level will be determined by using integrated and / or external sensors.

The wetted cross-sectional area will be calculated taking the cross-sectional profile into account.





## Ultrasonic

In case of water-ultrasonic as well as in case of air-ultrasonic [h1; h3] the flow level will be detected using the echo sounder principle.

The interface between water and air (water surface) will be detected in both cases and the sound transit time between sensor and water level will be measured.

The flow level is proportional to the measured time which will be determined as a result from that. This measurement method stands out for its accuracy and its long-term stability.

Foam or other substances floating on the water surface do not affect the result of the water-ultrasonic measurement.

## Hydrostatic

Level measurement is even possible in strongly absorbing media by using a hydrostatic measurement [h2] which can also be integrated into the sensor. The high-resistant Hastelloy diaphragm allows the sensor to be used in heavily contaminated or aggressive media.

By detecting atmospheric pressure and the hydrostatic pressure of the measurement medium simultaneously air pressure fluctuations are compensated ideally.

The additional use of a resistant-free air filter reduces measurement inaccuracies to a minimum.

## External sensors

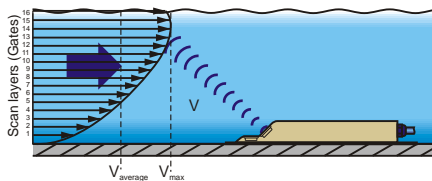
External level sensors with 4-20 mA signals can be integrated into the system without any problems.

In case of constant fill levels no additional level sensors are required due to the use of a fixed value.

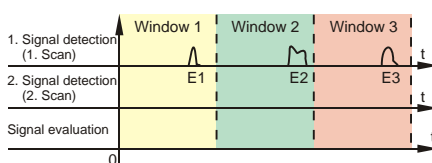
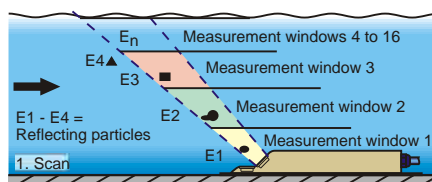


## Flow velocity measurement

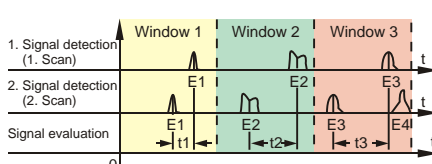
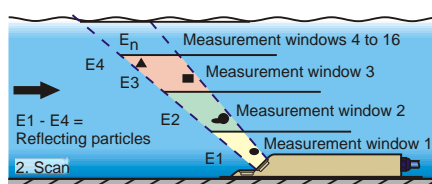
An ultrasonic converter (sensor) sends an ultrasonic burst into the medium. The particles or gas bubbles in the medium reflect this impulse. The sensor operates in impulse-echo mode, i.e. the ultrasonic converter will switch to receiving mode immediately after transmitting the burst, receiving the reflected ultrasonic echo as a characteristic echo image pattern.



These echo patterns from the first scan will be digitised and saved.



During the second scan, an ultrasonic burst will be sent again and the reflected echo patterns will be saved as well.



By using the **cross correlation method** the characteristic echo image patterns within the time slots are now checked for compliance. The temporal shift of the echo image pattern of the second scan compared to the first scan can be converted directly into the flow velocity within the individual measurement windows taking the beam angle into account.

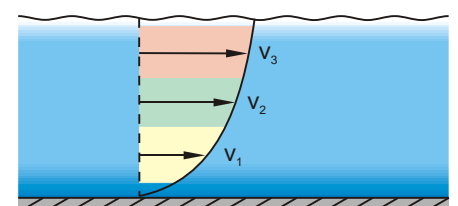
### Formula

$$x(t) \cdot y(t-t) \cdot V$$

$$f_g(\cdot) = \lim_{T \rightarrow \infty} \frac{1}{T} \int_{-T/2}^{+T/2} f(t) g(t + \cdot) dt$$

This event will be repeated up to 2000 times per second.

The flow profile will be determined directly from the individual velocities in real time by the integrated digital signal processor (DSP). This allows the user to obtain measurement values with the highest accuracy without additional calibration.



Determined flow profile

# Transmitter: lightweight

## The most important details at a glance:

- large back-lit graphic display
- dialog mode user interface
- graphic indication of hydraulic conditions at the measurement place
- numeric and graphic sensor diagnosis
- protocol function for the most important measurement data
- logging of current flow measurement values ( Q, h, v, T ) and system parameters
- variable measurement modes for cyclic, event-based and continuous measurement with free selectable storage interval
- removable data memory (flash card) up to 64 MB for data storage and data transfer to PC
- operating time per battery charge 40.000 measurement cycles 3 months / 5 minute cycle
- environmentally acceptable rechargeable battery
- can be used with standard batteries (size D) alternatively
- line powered operation possible
- recording of pump run times, switching events and rain gauge data
- storage of external analog signals (fill levels, flows, analysis values...)
- enclosure rating: IP 67
- analog output of measured values
- sampler driving
- transmission of error messages
- output of limit values
- connection of external counters
- telemetered communication (pending)

## Programming



Programming the unit is remarkably simple. The user will be guided through the menu thanks to the windows-like program and the dialog mode on the large graphic display. Programmed settings will be clearly indicated graphically. The program structure is perfectly set for the requirements of a portable measurement system.



This virtually eliminates any possibility of faulty programming. As a standard, access can be restricted in order to prevent the unit from unauthorised modification.

## Display

The back-lit display can be clearly read even in dark shafts and manholes. It enables the user to easily program the unit as well as to simply recall sensor data, echo profiles, velocity distributions, historical trend graphs...



Direct flow profile indication on the display



## System diagnostics

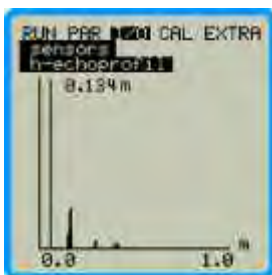
Recalling the most important system data on the display



Internal protocol functions to assess the measurement progress without any aid onsite



Diagnostic tools to assess the measurement quality, e.g. flow level

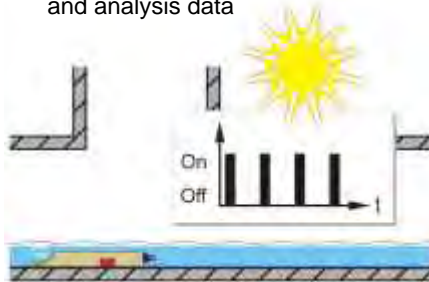


Echo profile analysis

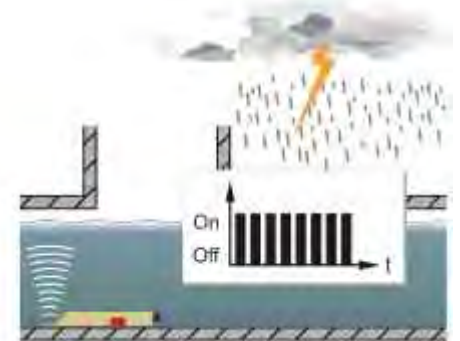
The versatile diagnosis options allow the user to perfectly select a measurement place and trouble-free operation of the measurement system.

## Storage

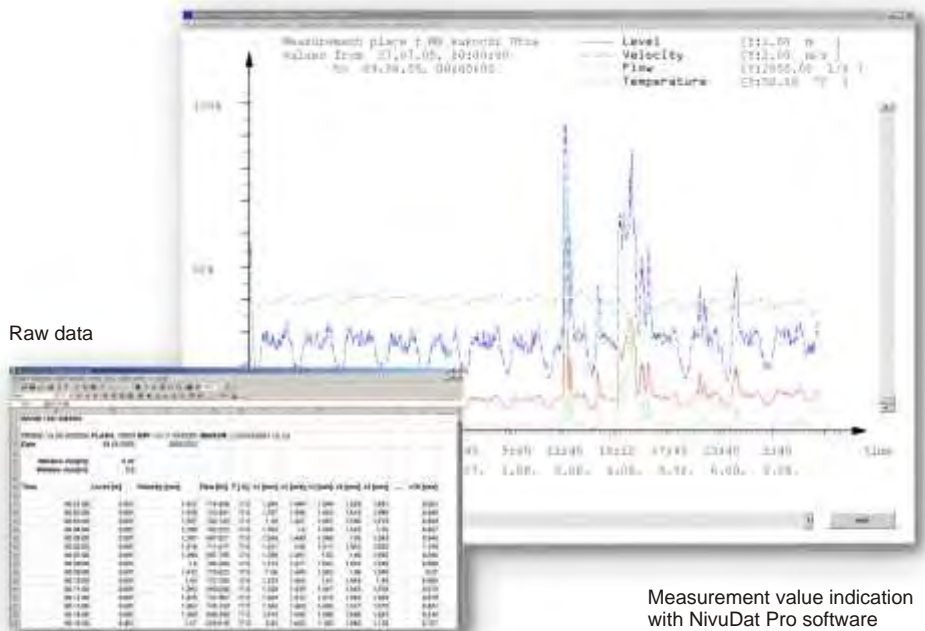
- plug-in industry standard data memory
- redundant data saving
- data files in txt format
- additional storage of parameter and analysis data



## Event-based memory changeover



High-level data availability requires unusual solutions. Since standard memory cards do not meet these requirements, NIVUS relies on industry standard. A redundant memory management (parallel data storage on memory card and the internal RAM) virtually eliminates any possibility of data loss. The additional storage of parameter settings and analysis data completes the safety kit. The storage in txt-format ensures compatibility with any standard calculation and spreadsheet applications.



Raw data

Measurement value indication with NivuDat Pro software

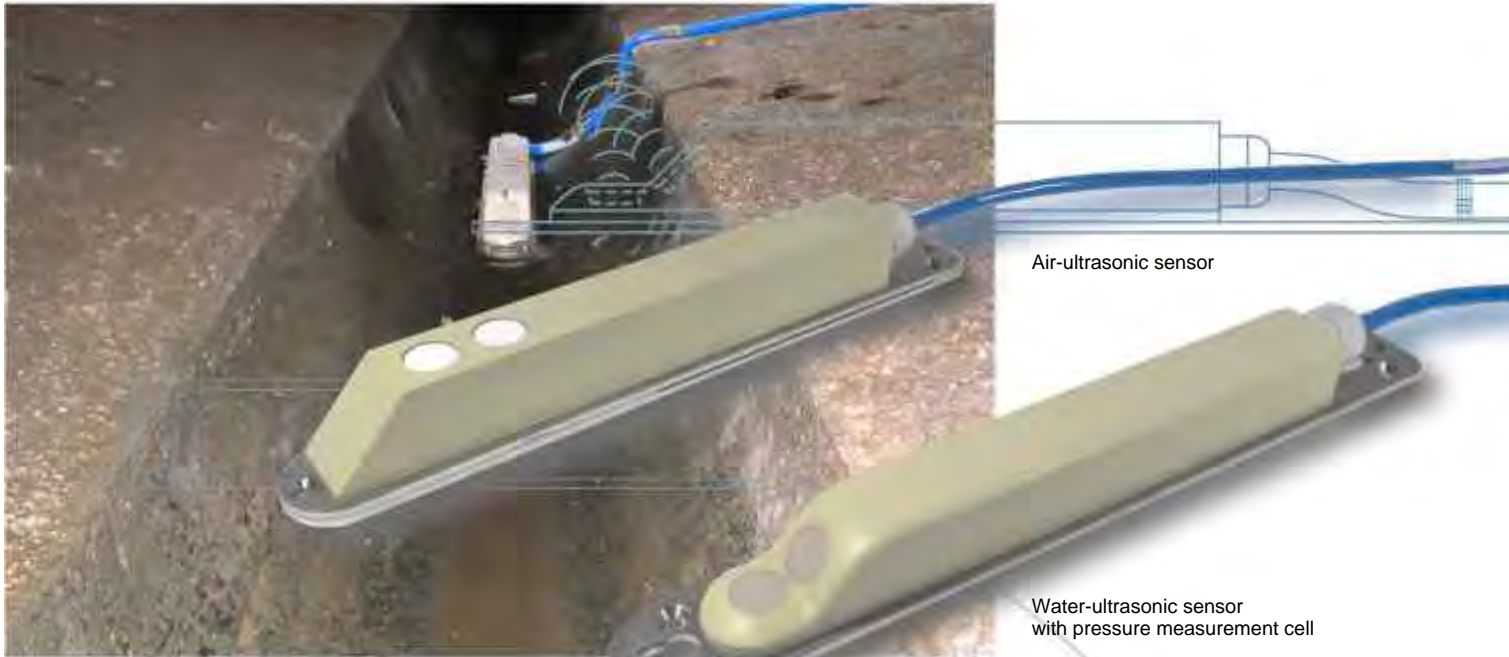
## NivuDat Pro

Apart from options to evaluate data using common spreadsheet applications, the NivuDat Pro software allows the user to clearly and quickly represent measurement data as tables or graphs under Windows XP / Windows 2000.

Additional editing options such as sequential data export, averaging functions, min. and max. value output, administration of measurement places and more complete the program.

# NivuDat Pro

# Sensors: unrivalled in versatility

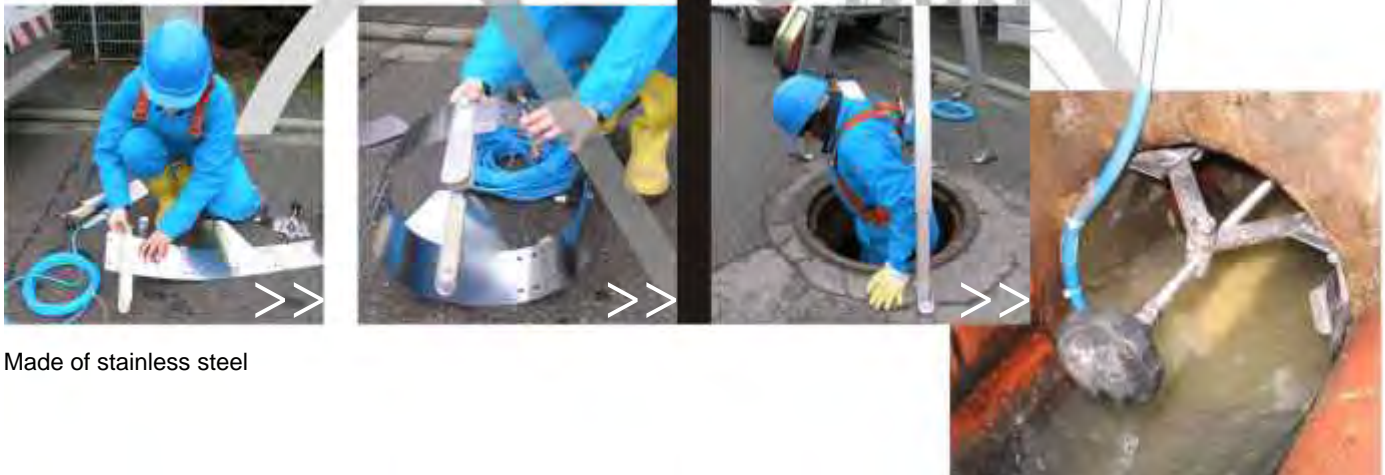


Air-ultrasonic sensor

Water-ultrasonic sensor with pressure measurement cell

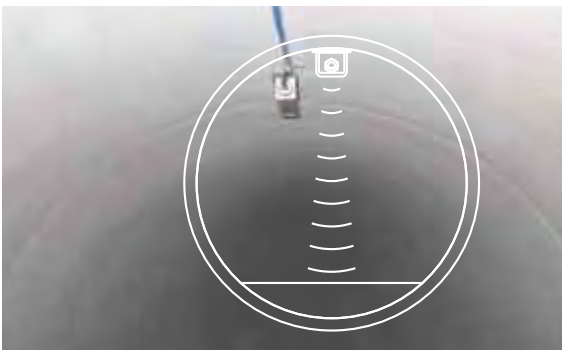
- triple redundant level measurement (air-ultrasonic, water-ultrasonic, hydrostatic)
- high accurate flow velocity measurement
- external level sensors can be connected
- high measurement dynamics from 5mm/s to 6m/s
- measurement in both flow directions
- standard sensors with high medium resistance (PPO, PEEK, 1.4571, Hastelloy)
- sensors resistant to chemical substances for highest demands
- IP 68
- flexible to use
- easy to install using variable fastening system

## ... remarkably easy to install



Made of stainless steel

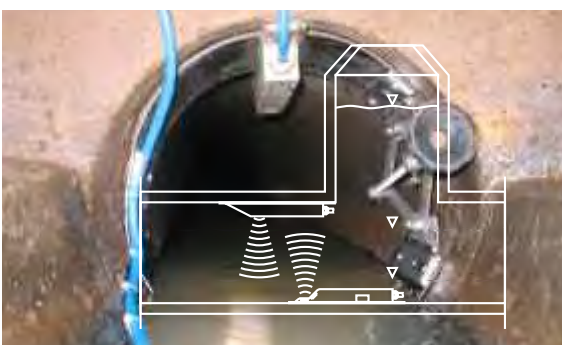
... goes with any application.



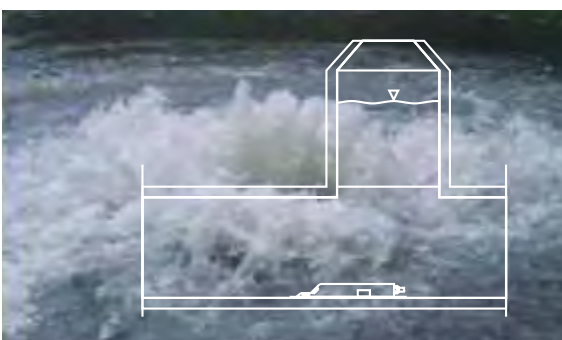
Air-ultrasonic - detection of low flow levels, e.g. for investigation of extraneous water



Hydrostatic measurement - flow level detection, e.g. in channels tending to sedimentation



Air-ultrasonic, water-ultrasonic and hydrostatic measurement - investigation of channel efficiency



Hydrostatic measurement - submergence detection

## Areas of use

- investigation for infiltration
- data collection for the hydraulic calibration of sewer network models
- billing networks
- collection of basic planning data for storm water detention basins
- recording of rainwater feed
- throttle calibration
- verification of existing sewer systems

- indirect influent monitoring
- temporary verification of process flows
- and much more

No matter if used by local councils, water and environment authorities, engineering consultants and planning agencies, test centres or authorised experts - with its versatile and universal areas of use, its high accuracy and user-friendliness the PCM4 represents a long-life and reliable working tool.

## Logging and controlling

### More than just a flow measurement

The standard peripheral interfaces of the PCM 4 not only allow accurate and comfortable flow measurement, but also enable to easily embed additional measurement systems into a complete recording concept.

Variable output interfaces enable the integration of the PCM 4 into existing systems without any problems. This flexibility allows the creation of solutions for various tasks such as:

#### Sampling

Relay and analog output enable to drive sampling devices either based on volume, time or flow (freely selectable). Presetting a minimum level for sample drawing ensures reliable sampling.

#### Throttle verification

By measuring throttle volume and tank fill level simultaneously the PCM 4 simply meets any requirements of throttle verifications.

#### Pump efficiency measurement

Recording pumping rate and pump run times simultaneously enables the control of the current pump efficiency. This point is useful to clarify cost-cutting potentials.

#### Event monitoring

External switching contacts (float switches, pump relays and similar) or internal limit values either allow to start the flow measurement based on events or to switch over measurement and storage cycles dynamically. This results in long battery life and high data density during flow-relevant measurement periods.

#### Signal transfer

Digital and analog output signals allow information transfer to main systems. Freely definable output ranges, impulse lengths and limit values enable connection to devices from various manufacturers.

**Measuring - Controlling - Logging >>PCM 4**  
**One measurement system many possibilities**



# PCM 4

## Portable flow monitoring system for all part filled and full pipes and channels



Power supply	<ul style="list-style-type: none"><li>• 12 V DC, 12 Ah lead rechargeable battery</li><li>• 8 x mono cells 1.5 V, 18 Ah</li><li>• power pack 100-240 V AC, 50/60 Hz</li></ul>
Enclosure	<ul style="list-style-type: none"><li>• Material: shock-resistant plastic - Polypropylene (PP)</li><li>• Weight: approx. 2.0 kg (4.41 lbs) (without sensor and rechargeable battery)</li><li>• Protection: IP 67 if lid is closed and locked</li></ul>
Operating temperature	-5° C to +40° C (23° F to 104° F)
Storage temperature	-10° C to +60° C (14° F to 140° F)
Max. humidity	90%, non-condensing
Display	Back-lit graphic display, 128 x 128 pixel
Operation	18 buttons, menus in German, English, French and Czech
Connections via plug-in socket IP68	<ul style="list-style-type: none"><li>• 1 x 4-20 mA for external level (2-wire probe) or 1 x active air-ultrasonic for level measurement</li><li>• 1 x active water-ultrasonic/pressure combi sensor for velocity and level measurement</li><li>• 1 x multifunction plug for digital and analog in- and outputs</li><li>• 1 x power supply unit or charger</li></ul>
Inputs via multifunction plug	<ul style="list-style-type: none"><li>• 1 x active digital input, power supply 3.3 V DC</li><li>• 1 x analog input 0/4-20 mA</li></ul>
Outputs via multifunction plug	<ul style="list-style-type: none"><li>• 1 x relays (SPDT) contact rating: 250 V AC, 5 A / 30 V DC, 5 A, switching frequency: 5 Hz</li><li>• 1 x voltage output 0-10 V, load min. 1 kOhm, 10 kOhm recommended</li></ul>
Storage cycle	1 to 60 minutes, time-cyclical or depending on events
Data storage	<ul style="list-style-type: none"><li>• external, on plug-in flash card up to 64 MB</li><li>• internal RAM with 8 MB</li></ul>
Data transmission	via compact flash card

Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
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# PCM Pro / OCM Pro "active" sensors

## Wedge sensors:



Water-ultrasonic combi sensor



Air-ultrasonic level sensor

## Pipe sensor:



Measurement principle	<ul style="list-style-type: none"> <li>• Ultrasonic transit time (level measurement)</li> <li>• Piezoresistive pressure measurement (level measurement)</li> <li>• Correlation with digital pattern detection (flow velocity)</li> </ul>
Measuring frequency	1MHz
Protection	IP 68
Ex approval (optional)	II 2 G EEx ib IIB T4
Operating temperature	-20° C to +50° C (-4° F to 122° F) (+40° C (104° F) in Ex Zone 1)
Storage temperature	-30° C to +70° C (-22° F to 158° F)
Operating pressure	max. 4 bar (combi sensor with pressure element max. 1bar)
Cable length	10/15/20/30/50/100 m (33/50/66/99/165/330 ft), extendable up to 250 m max. (820 ft) cable length, in case of using sensors with pressure measurement after 30 m (99 ft) a pressure compensation element is required
Cable types	<ul style="list-style-type: none"> <li>• Combi sensor with pressure measurement: LiYC11Y 2x1.5 + 1x2x0.34 + PA 1.5/2.5</li> <li>• Sensors without pressure measurement: LiYC11Y 2x1.5 + 1x2x0.34</li> </ul>
Outside cable diameter	<ul style="list-style-type: none"> <li>• Combi sensor with pressure measurement: 8.7 ±0.25 mm (0.34 ±0.010 in)</li> <li>• Sensors without pressure measurement: 7.6 ±0.25 mm (0.3 ±0.010 in)</li> </ul>
Sensor connection	<ul style="list-style-type: none"> <li>• pre-configured cable end for connection to OCM Pro, for sensor types "K" and "L"</li> <li>• cable with plug for connection to PCM Pro, for sensor without pressure measurement, type "S"</li> <li>• cable with plug and exchangeable filter element for connection to PCM Pro, for sensors with pressure measurement, type "F"</li> </ul>
Sensor types	<ul style="list-style-type: none"> <li>• Flow velocity sensor with v-measurement using cross correlation and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via water-ultrasonic and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via pressure and temperature measurement to compensate the temperature effect on sound velocity</li> <li>• Combi sensor with flow velocity sensor using cross correlation, level measurement via water-ultrasonic as well as redundant pressure measurement and temperature measurement to compensate the temperature effect on sound velocity</li> </ul>
Types of construction	<ul style="list-style-type: none"> <li>• Wedge sensor for installation on channel bottom</li> <li>• Pipe sensor for installation in pipes with nozzle and cutting ring</li> </ul>
Medium contacting materials	Polyurethane, stainless steel 1.4571, PPO GF30, PA (wedge sensor only) Option: sensor made of PEEK, resistant to chemical substances, Hastelloy mounting plate, Titanium mounting plate, cable with FEP coating

Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
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# PCM Pro / OCM Pro "active" sensors

<b>Level measurement – water-ultrasonic</b>	
Measurement range	0 to 200 cm (0 to 6.56 ft), lowest absolutely measurable level 5 cm (0.16 ft)
Zero drift	absolutely stable zero point
Measurement error	less than $\pm 2$ mm ( $\pm 0.08$ in)
<b>Level measurement - pressure</b>	
Measurement range	0 to 350 cm (0 to 11.5 ft)
Zero drift	max. 0.75 % of final value (0 to 50° C (32° F to 122° F))
Measurement error (standing medium)	$\leq 0.5$ % of final value
<b>Level measurement - external sensor</b>	
Measurement range	depending on device used
Zero drift	
Measurement error	
<b>Flow velocity measurement</b>	
Measurement range	-100 cm/s to +600 cm/s (- 3.28 fps to 19.7 fps)
Number of scan layers	max. 16
Zero drift	absolutely stable zero point
Error limits (per scan layer)	$\leq 1$ % of measurement value ( $v > 1$ m/s (3.28 fps)) $\leq 0.5$ % of measurement value +5 mm/s (0.2in/s) ( $v < 1$ m/s (3.28 fps))
Number of sensors	1 to 3 per measurement transmitter
Sonic beam angle	$\pm 5$ degrees
<b>Temperature measurement</b>	
Measurement range	-20° C to +60° C (-4°F to 140°F)
Measurement error	$\pm 0.5$ K

<b>Active sensor air-ultrasonic</b>	
Measurement principle	Ultrasonic transit time
Measuring frequency	120kHz
Protection rating	IP68
Ex approval	II 2 G EEx ib IIB T4
Operating temperature	-20° C to +50° C (-4° F to 122° F) (+40° C (104° F) in Ex Zone 1)
Storage temperature	-30° C to +70° C (-22° F to 158° F)
Operating Pressure	max. 1 bar
Cable length	10/15/20/30/50 m (33/50/66/99/165 ft), extendable up to 250 m max. (820 ft) cable length
Cable type	LiYC11Y 2x1.5 + 1x2x0.34
Cable outside diameter	7.6 $\pm$ 0.25 mm (0.3 $\pm$ 0.010 in)
Sensor connection	<ul style="list-style-type: none"> <li>• pre-configured cable end for connection to OCM Pro, for sensor type "K"</li> <li>• cable with plug for connection to PCM Pro, for sensor type "S"</li> </ul>
Types of construction	Wedge sensor for installation in channel vertex
Medium contacting materials	Polyurethane, stainless steel 1.4571, PPO GF30, PA
<b>Level measurement</b>	
Measurement range	0 to 200 cm (0 to 6.56 ft)
Dead zone	10 cm (0.33 ft)
Measurement error	less than $\pm 5$ mm (0.2in)
<b>Temperature measurement</b>	
Measurement range	-20° C to +50° C (-4°F to 122°F)
Measurement error	$\pm 0.5$ K

Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
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# NivuCompact

## Self-contained non-contacting ultrasonic level measurement



- › Measurement range from 0.15 to 10 m
- › Digital echo processing
- › Linearisation
- › View echo profiles on PC
- › Simple menu navigation
- › Integrated keypad
- › Unit programming without opening the enclosure
- › High acoustic power with narrow beam angles
- › Temperature compensation as standard

### Description

NivuCompact can be used wherever reliable non-contacting level measurement is required: high transducer power and tight beam angle in addition with digital echo processing make the NivuCompact ideal for many "difficult" applications. The integrated display makes programming extremely simple. NivuCompact can be completely configured using the integrated keypad alone with no need for a PC.

2 and 3-wire NivuCompact versions (depending on connection) as 3 m, 6 m and 10 m measurement ranges available.

Software that extends NivuCompact's capabilities, allowing you to:

- Download, analyse and store echo profiles. A great way to see exactly what is happening in the application. Fine tuning for ultimate performance.
- Set-up NivuCompact. All programming parameters are instantly visible in the programming screens.

Program the NivuCompact unit on a desktop before installation, or "clone" the device settings to save valuable time for applications e.g. in tank farms.

Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
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## Specifications

Dimensions:	175 mm overall height x 130 mm diameter	NivuCompact may be wired as either a 2-wire or 3-wire, giving the features below:
Cable entry:	2 off cable glands 4.5 - 10 mm	2-wire configuration: RS232 (RJ12 port) connection for diagnostics and software updates, 4 digit LC display, 4 button keypad for parameter entry, power consumption: 3.8 - 22 mA
Mounting:	1.5" (3 m / 6 m versions), 2" (10 m versions) BSP or NPT	3-wire configuration: see 2-wire, with additional backlit LC display, 0 - 10 V analogue output 2 relays single pole two way, 1 A 30 VDC/AC; Power consumption: relays energised <60 mA, relays not energised <12 mA
Weight:	approx. 1 kg	
Temp. range:	process: -40° C to +80° C ambient: -20°C to +65°C	
IP Rating:	IP67	
Beam angle (-3dB half power):	10°	
Variants NivuCompact:	3 / 6 / 10	
Measurement range:	3: 0.15 m - 3 m 6: 0.3 m - 6 m 10: 0.3 m - 10 m	
Operating frequency:	3: 125 kHz 6: 75 kHz 10: 41 kHz	
Input voltage range:	11 - 30 V (12 - 28 V for Ex), 3.8 - 22 mA	
Accuracy:	±0.25 % or 6 mm (whichever is greater)	
Resolution:	0.1% of measurement range or 2 mm (whichever is greater)	
Output:	4 - 20 mA, resolution 5 µA	
Temperature compensation:	via internal temperature sensor (±0.5° C tolerance)	
Ex approval:	only for 2-wire II 1 G EEx ia IIC T4 (Tamb = -40°C to +80°C)	



# AquaBar

## Hydrostatic level measurement transmitter with stainless steel diaphragm



- Piezoresistive principle
- Measurement range up to 100mWS (328.1ft water column)
- 2-wire technology (output 4-20 mA)
- Excellent long term stability
- Small temperature failure
- Rugged and reliable under most conditions
- Integrated overvoltage protection

### Description

The AquaBar is a hydrostatic level measurement probe for continuous level measurement in the water industry.

The diameter of only 27mm (1.06in) allows it to use the AquaBar in stand pipe applications which are mainly used in the ground water measurement.

By removing the protection cap at the end of the probe, the AquaBar can also be used in more viscous media as for example sludges.

The only thing you have to consider is the compatibility of the sensor materials.

The well-tryed piezoresistiv technology of the AquaBar guarantees a high reliability.

The AquaBar has a high resistance against electrical faults caused by incorrect wiring, short circuit and overvoltage.

The robust probe enclosure is made of 1.4305 stainless steel with 1.4404 stainless steel diaphragm. It is hold by a self-carried Polyurethane cable.

For installation a stainless steel clamp type AKL-1 can be used.

Cause using 2-wire technology, the installation costs are very low.

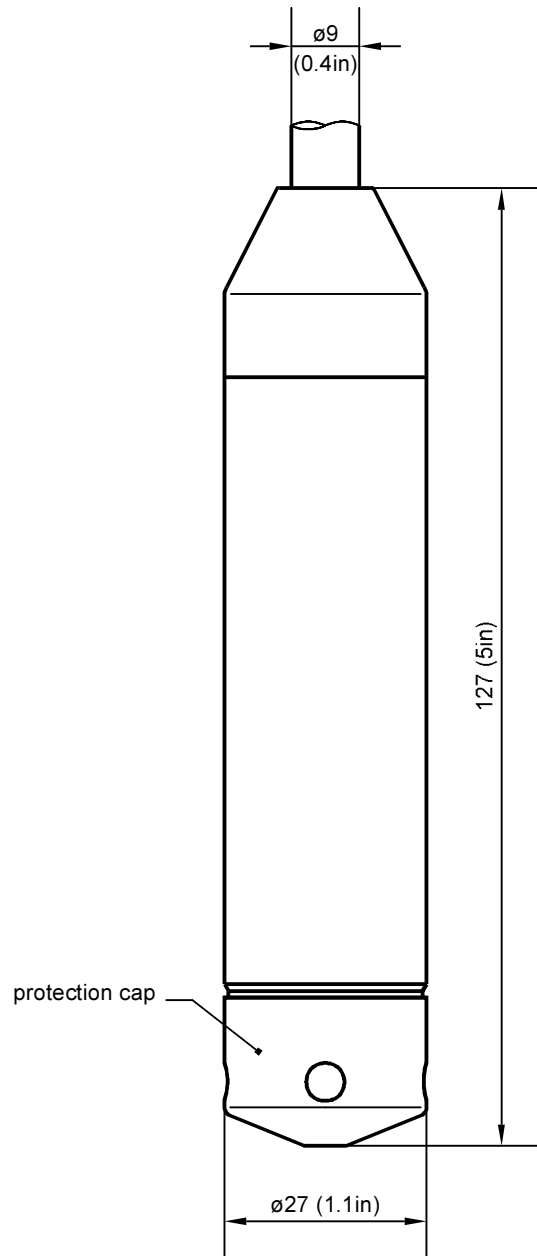
Customer-designed modifications, e.g. special range calibration, are possible.

Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
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## Technical Specifications

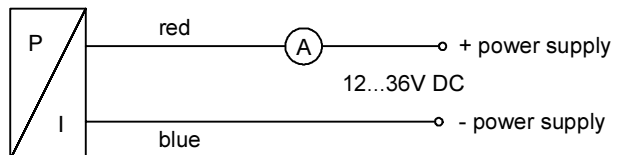
Measurement range:	4, 6, 10 and 20 meter WS (13ft, 20ft, 33ft and 66ft water column) Specials ranges up to 100m WS (328.1ft water column) on request.
Output signal:	4-20 mA 2-wire-technology
Accuracy:	0,35% / 0,5% FSO
Long-term stability:	± 0,1% FSO / year
Power supply:	12 to 36V DC
Electrical connection:	free cable end
Load:	Power 2-wire [U <sub>B</sub> (v) - 12v]: 0.02A
Overvoltage protection:	-120 to 150 VDC (1sec at 25°C) (77°F)
Protection:	IP 68
Operating temperature:	-10°C to +70°C (14°F to 158°F)
Storing temperature:	-25°C to +70°C (-13°F to 158°F)
Enclosure material:	Stainless steel 1.4305
Cable material:	Polyurethane ø9mm (0.4in)
Cable length:	standard: measurement range plus 5m (16.4ft) or on request
Diaphragm:	Stainless Steel 1.4404
Measurement principle:	piezoresistiv
Sealing:	Viton®
Approval:	CE

## Dimensions AquaBar



### Wiring diagram

2-wire: 4...20mA



Technische Änderungen vorbehalten.  
 Specifications are subject to change.  
 Sous réserve de modifications techniques.  
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# PVM-PD

## Ultrasonic Portable Flow Velocity Meter

### PVM - Velocity Meter



- No mechanically moving parts
- High accuracy
- Long-life rechargeable battery pack

### Telescopic Wading Rod



- Easy operation
- Light weight
- No risk of build-up

### Description

**PVM** „Portable Velocity Measurement“ for spot measurements in rivers, streams, sewers and open channels. The meter stands out for its high accuracy, easy operation and a light, robust construction.

The **PVM** is supplied with an internal 12V DC rechargeable battery pack. The display of flow velocity is digital and instantaneous.

The **PVM** achieves high accuracies even in turbulent and rapidly changing flow conditions.

The completely seamless and compact sensor works on the known and tested ultrasonic measurement principles.

The sensor construction makes it easy to handle and its flow is optimised.

The ultrasonic sensor can be adjusted in to any angle of flow and can be adapted to the local field conditions by the telescopic wading rod.

The meter has no moving parts and is therefore especially suitable for measurements in extremely dirty waters. Floating faeces, paper or other solids that effect mechanical flow devices have no influence on the **PVM**.

## Specifications

Measurement range:	0 - 3 m/s (0 - 9.8 fps)	Materials	
Accuracy:	± 1 % of the measurement range (in water); ± 0.01 m/s (0.03 fps) (whichever is higher)	Sensor:	High-grade steel and Polyurethane
		Telescope:	Aluminium
Power supply:	internal battery 12 V / 2 Ah	Electronics:	Plastic housing
Battery life:	4 - 6 hours	CE Test	
Battery charger:	primary: 115/230 V AC secondary: 12 V / 500 mA	Error emission:	EN50011
Temperature range:	electronics: 0°C to + 40°C (32°F to 104°F) sensor: - 20°C to + 60°C (-4°F to + 140°F)	Error resistance:	EN50082-2
		Level of accuracy:	IEC 801.2C IEC 801.3C IEC 801.4C
Display:	LC-Display (4 x 20 characters)		
Keys:	6 membrane keys		
Enclosure			
Dimensions:	180 x 110 x 220 mm (7.08 x 4.33 x 8.66 in)		
Weight:	3,75 kg (8.25 lbs)		
Telescope length:	0.7 - 1.6 m (2.29 - 5.25 ft)		
Cable length:	6 m (20 ft)		
Enclosure rating:	enclosure: IP65 (NEMA 4) sensor: IP68 (NEMA 6)		



# Rain Gauge

## Rain Gauge type RM 200 / 202 and type RM 200 MC / 202 MC

*Rain Gauge with stand  
ZMS156 for field use  
(optional) and data  
logger (optional)*



- Precipitation measurement based on tipping scale principle
- MC model optional with integrated data logger
- Type 202 with heating for trouble-free winter operation

### Description

The Rain Gauge detects liquid precipitation (rain) falling on the ground or, equipped with an integrated heating, solid precipitation (snow or hail) as well.

The measurement is based on the tipping scale principle, where a Reed-switch triggers an impulse per 0.1 mm of precipitation. This pulse is passed on to an external counter or can be routed to a SPS to create a motion pulse report.

The model with integrated data logger saves the pulses corresponding to date, time and rain level on a MemoryCard (Jeida-Standard) within a one-minute cycle. The data logger is supplied by a 12V / 24Ah rechargeable battery pack.

Data evaluation is made by the Windows software NivuDat.

The precipitation pickup's body is made of stainless steel and hence can be used under various environmental conditions. The device comes with a sieve which prevents the drop collector stage from getting blocked by foliage or bird's excrements.

The precipitation pickup is fixed optionally on a stand with a ground plate or on a stand for field operation.

The model RM 202 (MC) with integrated heating is equipped with a 230V power supply.

Technische Änderungen vorbehalten.  
Specifications are subject to change.  
Sous réserve de modifications techniques.  
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<b>Rain Gauge RM200 / 202 and RM200 / 202 MC</b>	
Dimension of drip pad	200 cm <sup>2</sup>
Capacity of tipping scale	2 cm <sup>3</sup>
Intensity	max. 7 mm/min
Resolution	0,1 mm NS
Output accuracy 1 at 0 - 7 mm/min	±3 %
Ambient temperature (without heating)	0 to 60°C
Ambient temperature (with heating)	-25 to 60°C
Rain gauge dimensions	ø160 x 350 mm
Mounting on stand	ø50 mm
Weight	3.3 kg
<b>Output signal 1</b>	
Length of impulse	125 ms
Impulse frequency	0 to 2 Hz
Supply voltage	5 to 24 V DC
Closed current (no precipitation)	50 µA
Impulse current	80 mA
R <sub>a</sub> max. (R <sub>a</sub> in interface (V <sub>cc</sub> =5V))	10 kOhm
R <sub>v</sub> (series resistance in rain gauge)	100 Ohm
<b>Output signal 2</b>	
Length of impulse	50 ms
Impulse frequency	0 to 2 Hz
Switching capacity	0.5 W
Switching voltage (V <sub>cc</sub> )	42 V
<b>Accessories</b>	
<b>Heating</b>	
Type	RM202 and RM202 MC
Heating	24 V DC
Heating power	70 W
Heating – turn-on temperature	5° C
Heating - hysteresis	2° C
<b>Data logger</b>	
Type	RM200 / 202 MC
Storage medium	MemoryCard, Jeida standard
Memory capacity	512 kB
Battery operation for data logger	12 V, 4 Ah
Data evaluation	RS 232 interface and Windows software, e.g. NivuDat
<b>Power adapter for RM 202 with heating</b>	
<b>Type</b>	<b>NTH</b>
Primary	230 V AC
Secondary	24 V DC
Power consumption	75 W
Enclosure protection	IP 65
<b>Power adapter for RM 202 MC with heating and data logger</b>	
<b>Type</b>	<b>NTHD</b>
Primary	230 V AC
Secondary	24 V DC (heating) and 13.2 V DC (data logger)
Power consumption	75 W (heating), approx. 4 W (data logger)
Enclosure protection	IP 65

## Série 807 - Rotâmetros de plástico

**Tubo** .....Trogamid-T (0 a 60°C)  
**"O" ring** ..... EPDM  
**Flutuador** ..... aço inox 1.4571  
**Fluido** ..... H<sub>2</sub>O  
**Escala** ..... leitura directa  
**Ligações** ..... conforme tabela abaixo

Existe uma vasta gama de rotâmetros para outras escalas, e outras construções nomeadamente em **PVDF**, assim como rotâmetros com interruptores de máximo e mínimo e transmissão contínua.



Modelo	Ligações	DN mm	Escala
807/20/72114-x-46-250	d25	20	15 - 250 l/h
807/20/72114-x-47-400	d25	20	40 - 400 l/h
807/20/72114-x-48-640	d25	20	75 - 640 l/h
807/20/72114-x-49-1000	d25	20	75 - 1000 l/h
807/25/72114-x-52-400	d32	25	40 - 400 l/h
807/25/72114-x-53-640	d32	25	60 - 640 l/h
807/25/72114-x-54-1000	d32	25	100 - 1000 l/h
807/25/72114-x-55-1600	d32	25	150 - 1600 l/h
807/32/72114-x-61-1600	d40	32	150 - 1600 l/h
807/32/72114-x-62-2500	d40	32	200 - 2500 l/h
807/32/72114-x-63-4000	d40	32	400 - 4000 l/h
807/40/72114-x-67-2500	d50	40	200 - 2500 l/h
807/40/72114-x-68-4000	d50	40	400 - 4000 l/h
807/40/72114-x-69-5000	d50	40	500 - 5000 l/h
807/50/72114-x-71-4000	d63	50	0,4 - 4,0 m <sup>3</sup> /h
807/50/72114-x-72-6400	d63	50	0,6 - 6,4 m <sup>3</sup> /h
807/50/72114-x-73-10000	d63	50	1,0 - 10,0 m <sup>3</sup> /h
807/65/72114-x-75-14000	d75	65	1,5 - 14,0 m <sup>3</sup> /h
807/65/72114-x-77-20000	d75	65	2,0 - 20,0 m <sup>3</sup> /h

↑  
**Tipo de ligações** (2 uniões)

**X = 1** PVC (standard)

**X = 6** Ferro fundido

**X = 7** Aço inox 1.4571

# Questionnaire

## Stationary flow measurement



In order to correctly assess measurement place conditions and for appropriate device selection we kindly ask you to answer the following questions as thorough as possible.

In case of need for further clarification please contact phone +49 (0)7262/9191-0 or [flow@nivus.de](mailto:flow@nivus.de)

**Please fax the completed form to:  
+49 (0)7262-9191-999**

**Company name:**

Contact person:

Phone:

Street:

Fax:

Postal code, City:

E-mail:

**Place of installation:**

Postal code, City:

Country:

Contact person:

Phone:

**1. Measurement place**

- sewage plant influent
- sewage plant discharge
- pump station
- receiving water overflow measurement
- discharge measurement from impound chamber or storm water basin to sewage plant
- surface water sewer
- raw drinking water pipeline / channel
- waste water channel system measurement
- pressure pipeline
- run-through chamber
- other (please describe below):

.....

.....

.....

.....

.....

.....

.....

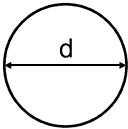
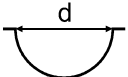
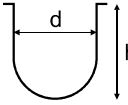
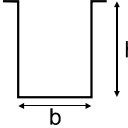
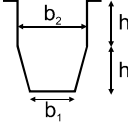
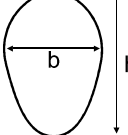
.....

.....

.....

(if more space required, please use separate sheet)

**2. Channel/Pipe shape**

-  d = ..... mm/in
-  d = ..... mm/in
-  d = ..... mm/in h = ..... mm/in
-  b = ..... mm/in h = ..... mm/in
-  b<sub>1</sub> = ..... mm/in h<sub>1</sub> = ..... mm/in  
b<sub>2</sub> = ..... mm/in h<sub>2</sub> = ..... mm/in
-  b = ..... mm/in h = ..... mm/in
- ? Please enclose detailed drawing.



**3. Channel / pipe material**

- |  |  |
|--|--|
| <input type="checkbox"/> plastics                  | <input type="checkbox"/> steel / stainless steel |
| <input type="checkbox"/> hard-baked tiles          | <input type="checkbox"/> new concrete            |
| <input type="checkbox"/> old concrete (scoured)    | <input type="checkbox"/> rubble stone            |
| <input type="checkbox"/> honeycomb structure slabs | <input type="checkbox"/> natural bed             |

**4. Measurement medium**

- expected min. temperature: .....
  - expected max. temperature: .....
  - expected max. pressure: .....
- untreated waste water or combined sewage
- treated waste water
- sludge (please specify dry solid contents): .....
- rain water / surface water
- drinking water
- cooling water
- process water (please describe):  
.....  
.....
- other (please describe):  
.....  
.....
- fibrous material contents
- may tend to foaming
- particular impurification; chemicals, lye, acids etc. (detailed description):  
.....  
.....  
.....  
.....

**5. Location of measurement place**

- length of undisturbed influent distance in front of measurement point: ..... m/ft.
  - length of undisturbed discharge distance behind measurement point: ..... m/ft.
- bed jump ..... cm/in  
 in front of meas. point  behind meas. point
- sill height ..... cm/in  
 in front of meas. point  behind meas. point
- elbow ..... ° ..... m/ft.  
 in front of meas. point  behind meas. point
- measurement located within elbow
- change of channel profile  
from profile: .....  
• profile dimensions: .....  
to profile: .....  
• profile dimensions: .....  
• distance between profiles ..... m/ft  
 in front of meas. point  behind meas. point
- distance to ball valve..... m/ft  
 in front of meas. point  behind meas. point
- distance to feed from the side ..... m/ft  
 in front of meas. point  behind meas. point
- distance to additional constructions (sampling, analysis, pipes etc.): ..... m/ft  
 in front of meas. point  behind meas. point
- other hydraulic obstructions (please attach detailed description or drawing)
- Do you expect backwater conditions?  
 no  temporarily  permanently
- risk of sedimentation build-up  
 no  yes - sedimentation  
 constant approx. .... cm/in  
 fluctuating approx. .... cm/in to  
..... cm/in



## Série 857 - Rotâmetros de plástico

**Tubo** .....Trogamid-T (0 a 60°C)  
**"O" ring** ..... EPDM  
**Flutuador** ..... aço inox 1.4571  
**Fluido** ..... H<sub>2</sub>O  
**Escala** ..... leitura directa  
**Ligações** ..... conforme tabela abaixo



Existe uma vasta gama de rotâmetros para outras escalas, e outras construções nomeadamente em **PVDF**, assim como rotâmetros com interruptores de máximo e mínimo e transmissão contínua.

Modelo	Ligações	DN mm	Escala
<b>857/10/D72114-x-11-40</b>	d16	10	4 - 40 l/h
<b>857/10/D72114-x-12-60</b>	d16	10	5 - 60 l/h
<b>857/10/D72114-x-13-100</b>	d16	10	10 - 100 l/h
<b>857/10/D72114-x-14-160</b>	d16	10	15 - 160 l/h
<b>857/10/D72114-x-15-250</b>	d16	10	20 - 250 l/h
<b>857/15/D72114-x-21-100</b>	d20	15	10 - 100 l/h
<b>857/15/D72114-x-22-160</b>	d20	15	15 - 160 l/h
<b>857/15/D72114-x-23-250</b>	d20	15	20 - 250 l/h
<b>857/15/D72114-x-24-400</b>	d20	15	40 - 400 l/h
<b>857/15/D72114-x-25-500</b>	d20	15	50 - 500 l/h
<b>857/20/D72114-x-31-250</b>	d25	20	20 - 250 l/h
<b>857/20/D72114-x-32-400</b>	d25	20	40 - 400 l/h
<b>857/20/D72114-x-33-600</b>	d25	20	60 - 600 l/h
<b>857/20/D72114-x-34-1000</b>	d25	20	100 -1000 l/h
<b>857/25/D72114-x-41-400</b>	d32	25	40 - 400 l/h
<b>857/25/D72114-x-42-650</b>	d32	25	60 - 650 l/h
<b>857/25/D72114-x-43-1000</b>	d32	25	100 -1000 l/h
<b>857/25/D72114-x-44-1600</b>	d32	25	150 -1600 l/h

↑  
**Tipo de ligações (2 uniões)**  
**X = 1** PVC (standard)  
**X = 6** Ferro fundido  
**X = 7** Aço inox 1.4571

## Série 10A1197A - Rotâmetros metálicos

**Tubo de medida** . . . . . borosilicato  
**"O" ring** . . . . . BUNA N  
**Flutuador** . . . . . aço inox 316  
**Corpo** . . . . . aço inox 304  
**Escala** . . . . . 10 - 100% do caudal máximo  
**Ligações** . . . . . rosca BSP  
**Acessório de ligação** . . . . . aço inox 316 Ti



Ligações (BSP)	Capacidade		Tubo	Flutuador
	Água (l/h)	Ar (Nm <sup>3</sup> /h)		
1/2"	110	3,25	FP-1/2-17-G-10/80	1/2-GSVT-45
	136	4,0	FP-1/2-21-G-10/80	1/2-GSVT-45
	148	4,3	FP-1/2-17-G-10/80	1/2-GSVT-44
	158	4,7	FP-1/2-17-G-10/80	1/2-GSVT-48
	184	5,5	FP-1/2-27-G-10/80	1/2-GSVT-45
	201	6,0	FP-1/2-21-G-10/80	1/2-GSVT-48
	254	7,5	FP-1/2-27-G-10/80	1/2-GSVT-44
	270	8,0	FP-1/2-27-G-10/80	1/2-GSVT-48
3/4"	445	13,2	FP-3/4-21-G-10/80	3/4-GSVT-54
	613	18,3	FP-3/4-27-G-10/80	3/4-GSVT-54
	715	21,3	FP-3/4-21-G-10/80	3/4-GSVT-53
	874	26,0	FP-3/4-27-G-10/80	3/4-GSVT-56
	987	29,5	FP-3/4-27-G-10/80	3/4-GSVT-53
1"	1067	31,8	FP-1-27-G-10/80	1-GSVT-64
	1210	35,9	FP-1-27-G-10/80	1-GSVT-65
	1498	44,3	FP-1-35-G-10/80	1-GSVT-64
	1703	50,8	FP-1-35-G-10/80	1-GSVT-65
	2134	64,0	FP-1-35-G-10/80	1-GSVT-63
	2497	74,0	FP-1-35-G-10/80	1-GSVT-66



## Série 10A6131 - Rotâmetros metálicos

### Materiais de construção

**Tubo** . . . . . borosilicato  
**Flutuadores** . . . . . vidro negro, inox ou safira  
**Acessórios de ligação** . . . . . aço inox 316  
**Válvula de agulha** . . . . . aço inox com empanques em teflon  
**Válvula de retenção** . . . . . esfera de nylon  
**Corpo** . . . . . aço inox 304  
**"O" rings** . . . . . viton A

### Características técnicas

**Ligações** . . . . . rosca 1/4 NPT fêmea por trás  
**Montagem** . . . . . em linha  
**Escala** . . . . . em percentagem  
**Temperatura** . . . . . máximo 120°C  
**Pressão** . . . . . máximo 18 bar



Água		Ar		Tubo	Flutuador
(cm <sup>3</sup> /min.)	(l/h)	(Ncm <sup>3</sup> /min)	(N l/h)		
4,6	0,28	380	23	<b>FP-1/8-08-P-3/37</b>	<b>BG-18</b>
8,5	0,5	560	34	<b>FP-1/8-08-P-3/37</b>	<b>SA-18</b>
20	1,2	900	54	<b>FP-1/8-08-P-3/37</b>	<b>SS-18</b>
29	1,7	1600	95	<b>FP-1/8-20-P-3/37</b>	<b>BG-18</b>
48	2,9	2000	120	<b>FP-1/8-20-P-3/37</b>	<b>SA-18</b>
90	5,4	3200	190	<b>FP-1/8-20-P-3/37</b>	<b>SS-18</b>
135	8	6500	380	<b>FP-1/8-15-P-3/37</b>	<b>CD-14</b>
200	12	9500	560	<b>FP-1/4-20-P-3/37</b>	<b>CD-14</b>
400	24	13000	800	<b>FP-1/4-15-P-3/37</b>	<b>SS-14</b>
450	27	18600	1100	<b>FP-1/4-41-G-3/37</b>	<b>CD-14</b>
580	34	19000	1150	<b>FP-1/4-20-P-3/37</b>	<b>SS-14</b>
1250	75	40000	2300	<b>FP-1/4-41-G-3/37</b>	<b>SS-14</b>

## Série 3021 - Caudalímetros de plástico (transmissores de caudal)

Caudais volumétricos são medidos com exactidão e precisão.

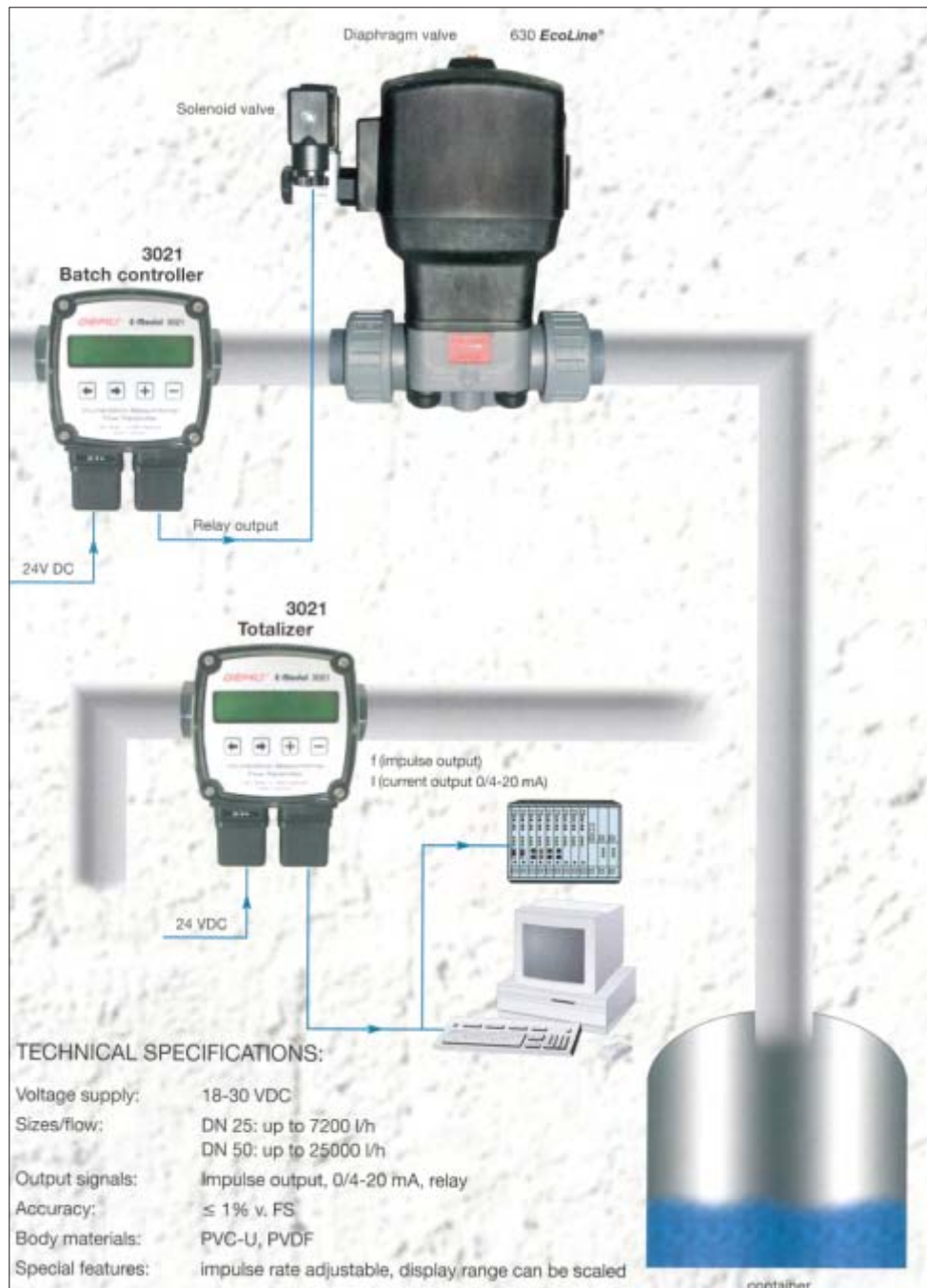
O display permite um controle directo da medição no próprio local de instalação.

Simple instalação e operação.

Grandes caudais até 25 m<sup>3</sup>/h.

Ligação eléctrica simples através de ficha DIN.

Os caudalímetros de turbina da série 3021 permitem uma totalização integrada ou funções de doseamento.



## Série 3021 - Caudalímetros de plástico (transmissores de caudal)

**Aplicação** . . . . . líquidos inertes e corrosivos ( $\leq 120$  cst)

**Partes internas** . . . . . não metálicas

**Materiais**

da caixa . . . . . ABS

dos componentes em contacto com o fluído . . . . . PVDF

do veio e rolamentos . . . . . cerâmico

do corpo . . . . . PVC ou PVDF

das sedes . . . . . FPM (Viton)

**Pressão operação** . . . . . máximo 10 bar a 20°C

**Temperatura operação**

PVC . . . . . -10/60°C

PVDF . . . . . -10/80°C

**Temperatura ambiente** . . . . . -10/60°C

**Precisão** . . . . . 1% F.E.

**Repetibilidade** . . . . . 0,5% F.E.

**Perda de carga** . . . . . 0,1 bar para 3600 l/h

**Saída** . . . . . 4/20 mA

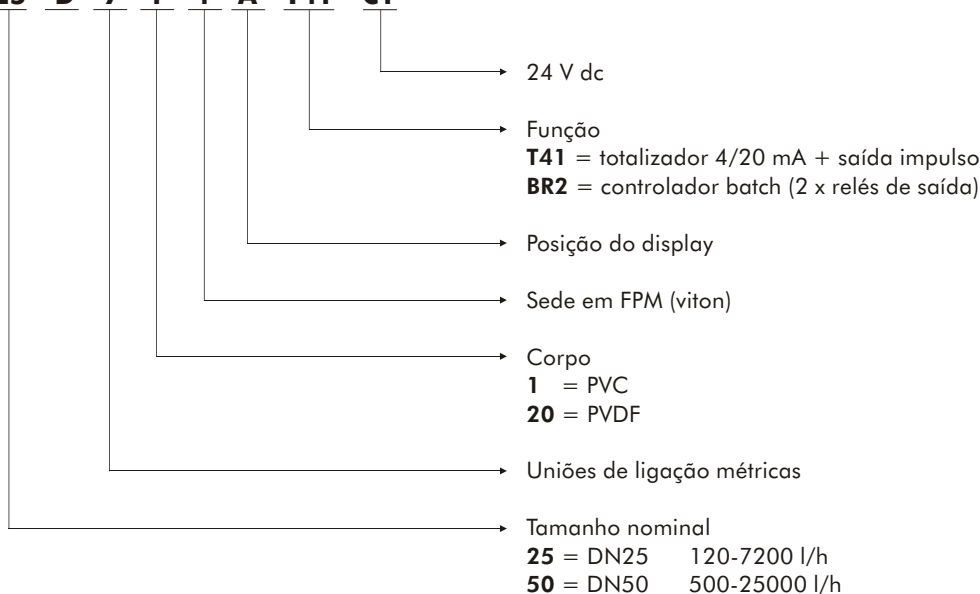
**Alimentação** . . . . . 18-30 V dc

**Protecção** . . . . . IP65

**Indicação** . . . . . LCD em m<sup>3</sup>/h ou l/min



**Modelo: 3021 - 25 - D - 7 - 1 - 4 - A - T41 - C1**



As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.

## Caudalímetro ultrasónico para canal aberto

### INDICADOR

**MODELO** ..... OCFM

#### Display

- Digital iluminado de 2 linhas
- Para caudal instantâneo e totalização

**Alimentação** ..... 230 V ac ou 24 V dc

**Alimentação para transmissão** ..... 24 V dc

**Precisão** ..... 0,05% FS

**Saída** ..... 4-20 mA para caudal

**Relés** ..... 6 relés para alarme e totalização

**Montagem** ..... paredel

**Protecção** ..... IP65



### TRANSMISSOR

**MODELO** ..... LU05-5061

**Gama** ..... 5 cm / 1,2 m

**Alimentação** ..... 12-28 V dc

**Saída** ..... 4-20 mA

**Precisão** ..... 0,2%

#### Gama de temperatura

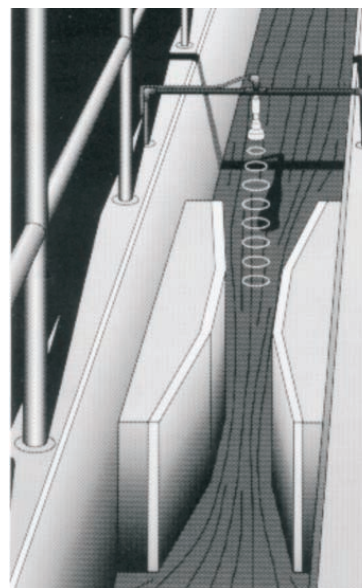
-20/+60°C (compensação automática)

**Materiais de construção** ..... Polipropileno/PVDF

**Resolução** ..... 1 mm

**Calibração** ..... alvo reflectido

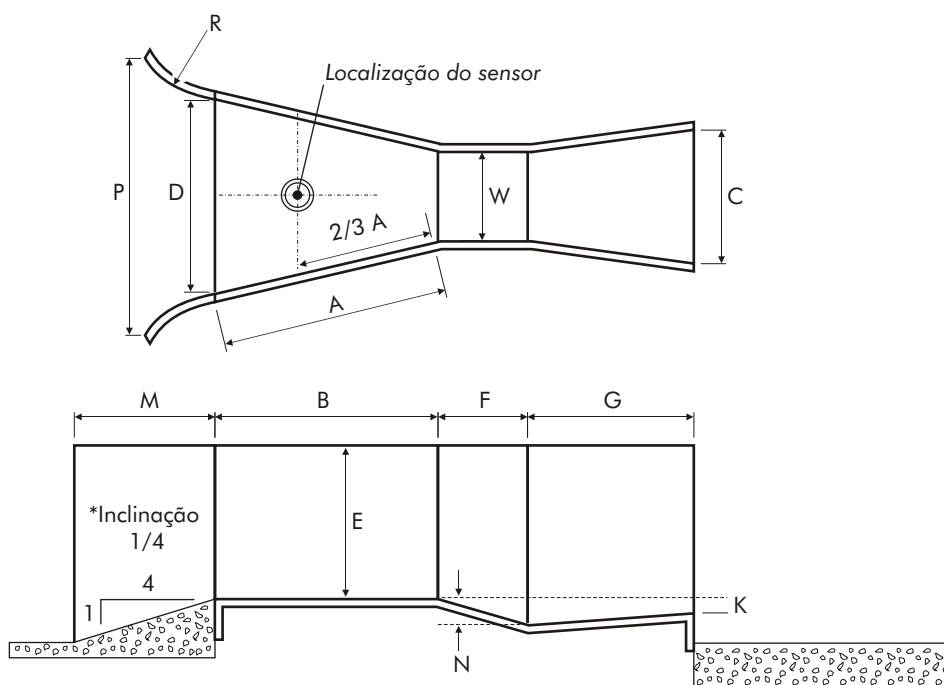
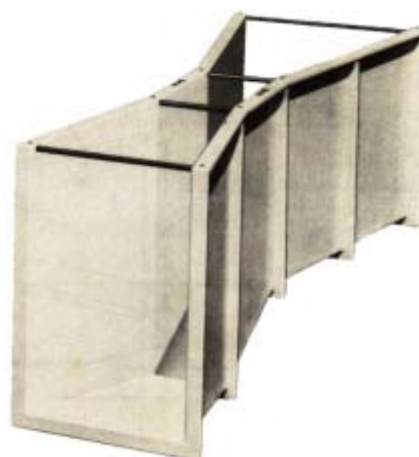
**Protecção** ..... IP67





# CANAL PARSHALL

## de construção reforçada em polipropileno



\* Não aplicável a 1" e 2"

Tipo	Caudal m <sup>3</sup> /h		Dimensões em milímetros													
	mínimo	máximo	W	C	D	P	E	N	K	A	L	M	B	F	G	R
1"	0,51	15	25	93	167	167	229	29	19	363	737	100	357	76	204	-
2"	1	30	51	135	213	213	253	43	22	415	872	100	405	114	253	-
3"	3	190	76	178	259	768	610	57	25	467	1219	305	457	152	305	406
6"	5	400	152	397	397	902	610	114	76	621	1830	305	610	305	610	406
9"	9	900	228	381	575	1080	762	114	76	879	1931	305	864	305	457	406
12"	11	1650	305	610	845	1492	914	229	76	1372	3248	381	1343	610	914	508

## Série DUFX - Caudalímetro ultrasónico portátil - por efeito Doppler

Este caudalímetro portátil mede velocidades de líquidos com pelo menos 100 ppm de sólidos em suspensão ou bolhas de ar.

### CARACTERÍSTICAS

**Modelo:** DUFX1-D1

**Gama de medida** . . . . . 0,1... 9m/s

**Tubagens** . . . . . metálicas ou plásticas a partir DN 25

**Gama de temperatura:** . . . . . 40°C/+82°C

**Alimentação** . . . . . pilhas AA - autonomia 30 horas

**Sonda:** . . . . . única com 2 metros de cabo

### Indicação:

- Da velocidade
- Potência do sinal
- Unidade de medida
- Estado das pilhas



## Série 903 - Caudalímetro ultrasónico portátil

Baseado no princípio de deslocamento na frequência, portátil, para líquidos carregados ou limpos, fornecido em mala de transporte.

### CARACTERÍSTICAS

**Modelo:** 903-BIAN-NG

**Gama de medida** ..... 0,15 ... 6,1 m/s

**Tubagens** ..... metálicas ou plásticas 25 ... 3050 mm

**Gama de temperatura** ..... -40°C/+121°C

#### Alimentação:

230 V/50Hz e bateria incorporado que permite até 8 horas de funcionamento

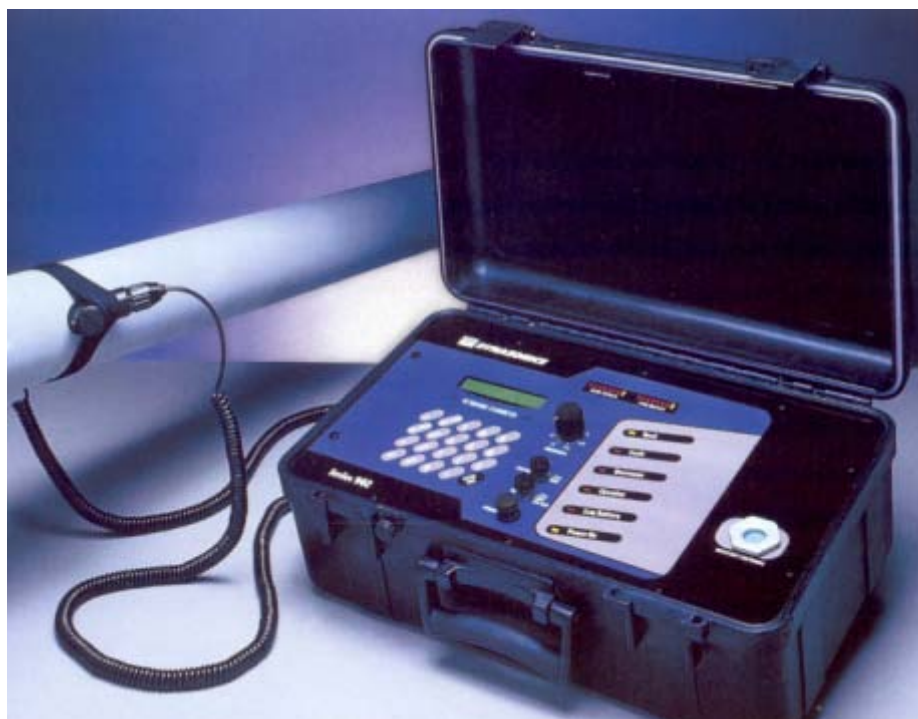
#### Indicação

Display com 2 linhas de caracteres;

6 dígitos por caudal instantâneo m/s; L/min.; m<sup>3</sup>/h

6 dígitos para totalização: L; m<sup>3</sup>

**Linearidade** ..... 2% do fim de escala



# Série DTFXD - Caudalímetro ultrasónico

Baseado na medida do tempo de trânsito para funcionar com líquidos limpos.

## CARACTERÍSTICAS

**Modelo:** DTFXD2-B13-NN

**Gama de medida** . . . . . -12/+12 m/s

**Tubagens** . . . . . metálicas ou plásticas 50 ... 2540 mm

**Gama de temperatura** . . . . . 40°C/+121°C

**Alimentação** . . . . . 230 V/50Hz

### Indicação - display

com 2 linhas de caracteres para caudal instantâneo e totalização

**Sinal de saída** . . . . . 4-20 mA (800 ); 2 relés para alames ou impulsos

**Precisão** . . . . . 0,5% (com calibração no campo)

**Sensibilidade** . . . . . 0,0003 m/s (permite detectar fugas)

### Opções:

Datalogger para 200.000 eventos.

Software ULTRALINK para tratamentos dos dados em ambiente Windows.





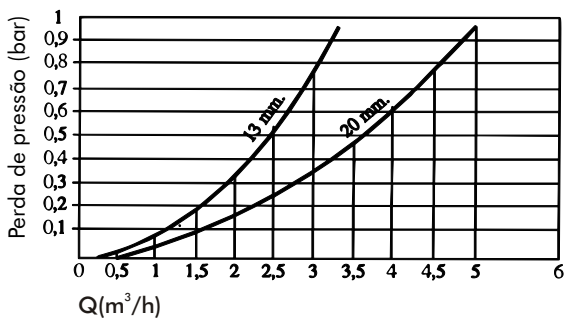
## Série CD S/D - Contador de água de turbina com emissor de impulsos

### CARACTERÍSTICAS TÉCNICAS

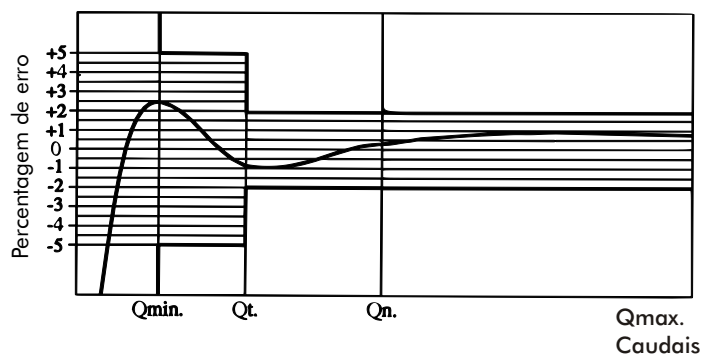
- Contador de jacto único
- Quadrante seco
- Corpo em latão
- Uso com água fria ou quente até 90°C
- O mecanismo pode rodar 360º para facilitar a leitura
- Prestações hidráulicas segundo classe B das normas da UE
- Protecção contra campos magnéticos externos
- Dispositivo contra geada e choques hidráulicos
- Leitura directa em tambores numerados
- Impulsos: 1 impulso = 1; 10; 100; 1000 litros
- Cabo: 3 Fios Comprimento=150 cm
- Tensão máxima: 24V
- Intensidade: 0,04A
- Potência máxima: 1W - 1VA



### PERDAS CARGA



### CURVA DE ERRO



Diâmetro		Caudal m <sup>3</sup> /h		Precisão Q mín. (L/h)		Pressão máx. bar	Leitura (L)	
Poleg.	mm	Nominal	Máximo	+/- 2%	+ 5%		mín.	máx.
1/2	15	1,5	3	120	30	16	0,05	10 <sup>5</sup>
3/4"	20	2,5	5	200	50	16	0,05	10 <sup>5</sup>

Impulso standard 1 impulso / 1 litro

Acessório opcional **Totalizador electrónico mod. 7110DIN**



## Série RMM - Contador de água de turbina com emissor de impulsos

### CARACTERÍSTICAS TÉCNICAS

- Contador de jacto múltiplo
- Quadrante seco
- Corpo em latão forjado
- Uso com água fria ou quente até 90°C
- Prestações hidráulicas segundo classe B das normas da UE
- Pressão nominal: PN16
- Ligações rosçadas
- Protecção contra campos magnéticos externos
- Leitura directa em tambores numerados
- Impulsos: 1 impulso = 1; 10; 100; 1000 litros
- Cabo: 3 Fios Comprimento=150 cm
- Tensão máxima: 24V
- Intensidade: 0,04A
- Potência máxima: 1W - 1VA



### CÁLCULO DE PERDA DE CARGA

1/2"	$\Delta P = 0,08 \times Q^2$	
3/4"	$\Delta P = 0,03 \times Q^2$	( $\Delta P$ : Bar / $Q = m^3/h$ )
1"	$\Delta P = 0,0150 \times Q^2$	
1 1/4"	$\Delta P = 0,0073 \times Q^2$	
1 1/2"	$\Delta P = 0,0016 \times Q^2$	
2"	$\Delta P = 0,0095 \times Q^2$	

### MODELOS DE STOCK

Diâmetro		Caudal m <sup>3</sup> /h		Precisão Q mín. (L/h)		Litros /impulso	Leitura (L)	
Poleg.	mm	Nominal	Máximo	+/- 2%	+ 5%		mín.	máx.
1/2	15	1,5	3	120	30	1	0,05	10 <sup>5</sup>
3/4	20	2,5	5	150	50	1	0,05	10 <sup>5</sup>
1	25	3,5	7	280	70	1	0,05	10 <sup>5</sup>
1 1/4	30	5	10	400	100	10	0,05	10 <sup>5</sup>
1 1/2	40	10	20	800	200	10	0,05	10 <sup>5</sup>
2	50	15	30	3000	450	10	0,05	10 <sup>5</sup>

Accessório opcional **Totalizador electrónico mod. 7110DIN**



## Série WP-TYRBOT - Contador Woltman com emissor de impulsos

### CARACTERÍSTICAS TÉCNICAS

- Turbina axial com transmissão magnética
- Quadrante seco
- Caudais de arranque muito baixos
- Corpo em GG25 com pintura epóxica
- Ligações flangeadas PN16
- O mecanismo pode rodar 360° para facilitar a leitura
- Prestações hidráulicas, segundo classe B das normas da UE
- Leitura directa em tambores numerados
- Cabo: 3 Fios Comprimento=150 cm
- Tensão máxima: 24V
- Intensidade: 0,04A
- Potência máxima: 1W - 1VA



### CÁLCULO DE PERDA DE CARGA

<b>DN 50 :</b>	$\Delta P = 0,0826 \times Q^2$	
<b>DN 65 :</b>	$\Delta P = 0,0250 \times Q^2$	
<b>DN 80 :</b>	$\Delta P = 0,0066 \times Q^2$	
<b>DN100 :</b>	$\Delta P = 0,0250 \times Q^2$	( $\Delta P$ : mBar / $Q = m^3/h$ )
<b>DN125 :</b>	$\Delta P = 0,0100 \times Q^2$	
<b>DN150 :</b>	$\Delta P = 0,0010 \times Q^2$	
<b>DN200 :</b>	$\Delta P = 0,0002 \times Q^2$	

Diâmetro		Caudal m <sup>3</sup> /h		Precisão Q mín. (m <sup>3</sup> /h) - 2%	Impulsos / m <sup>3</sup>
Poleg.	mm	Nominal	Máximo		
2	50	15	30	0,45	0,1 -1
2 1/2	65	25	50	0,75	0,1 -1
3	80	40	80	1,2	0,1 -1
4	100	60	120	1,8	0,1 -1
5	125	100	200	3	0,1 -1
6	150	150	300	4,5	1 -10
8	200	250	500	7,5	1 -10

Accessório opcional **Totalizador electrónico mod. 7110DIN**



## Série FS-100E-A - Interruptor de caudal

### Vantagens

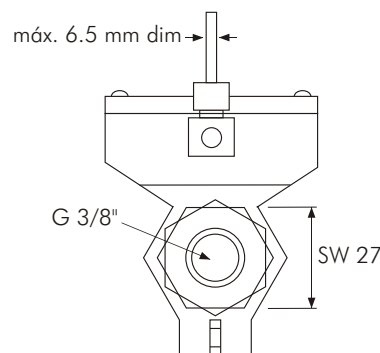
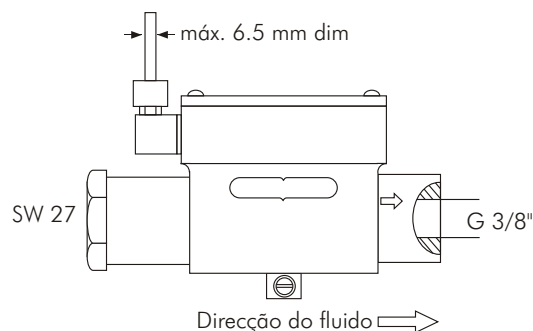
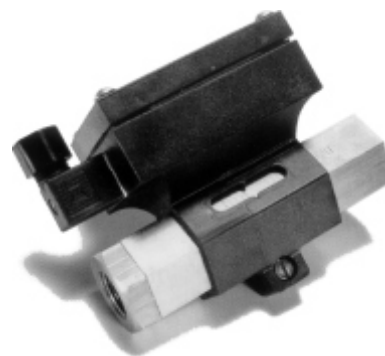
A queda de pressão não é afectada quando se muda o set-point.

Possui uma escala no corpo onde se pode ajustar o set-point movendo a caixa de junção.

### Especificações

<b>Material das partes molhadas</b>	..... latão
<b>Gama de ajuste</b>	..... 1,0 ... 16 l/min
<b>Caudal máximo</b>	..... 55 l/min (relativo à água a 20°C)
<b>Pressão de operação</b>	..... máx. 50 bar
<b>Queda de pressão</b>	..... 0,3 bar
<b>Temperatura de operação</b>	..... máx. 90°C
<b>Posição de montagem</b>	..... em qualquer posição
<b>Repetibilidade</b>	..... +/- 1%
<b>Precisão de ajuste</b>	..... +/- 10%
<b>Histeresis</b>	..... máx. 20%
<b>Ligação eléctrica</b>	..... ficha, c/ bussin M12x1 (dim. máx. cabo 6,5 mm)
<b>Função do interruptor</b>	..... NA/NF (relação c/ aumento do caudal)
<b>Poder de corte</b>	..... 40VA, 2A, 220Vac

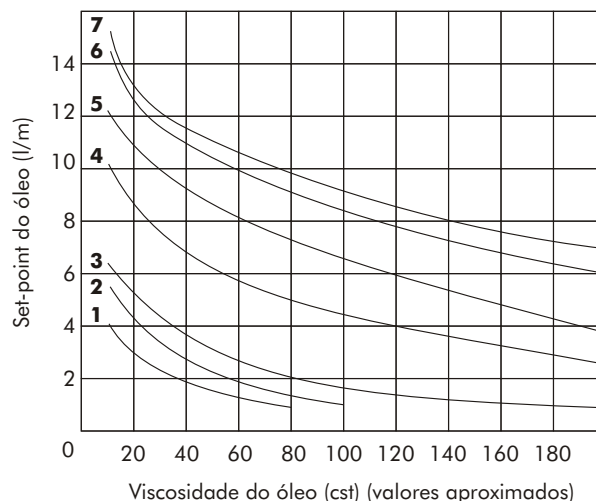
Ligação ao processo	Part Number
G 3/8"	020-0315
G 3/8"	020-0315



## Diagrama de viscosidade

### Curva do FS-100E-A ajustado para água

- |               |               |
|---------------|---------------|
| 1. 3.5 l/min  | 5. 12.1 l/min |
| 2. 5.0 l/min  | 6. 14.6 l/min |
| 3. 6.0 l/min  | 7. 17.2 l/min |
| 4. 10.0 l/min |               |





## Série FS-550E - Interruptor de caudal

### Vantagens

Para monitorização de caudal/não caudal em ambas as direcções.  
Possibilidade de ajustar o tamanho da pá à tubagem (1 1/2" a 4").  
Utilizável em altas pressões.

### Aplicações

Água, óleos e gases.

### Especificações (todas as pressões relativas a água a 20°C)

**Caudal máximo** ..... desde 42 até 182 l/min.

**Pressão de operação** ..... máx. 55 bar

**Pressão de teste** ..... 82 bar

**Queda de pressão** ..... 0,2 bar

#### Gama de temperatura

**cabo** ..... -20/80°C

**caixa de junção** ..... -20/150°C

**Tipo de contacto** ..... SPDT

**Poder de corte** ..... máx. 20VA; 0,5A; 250V ac

**Tipo de montagem** ..... vertical, ligação eléctrica para cima

**Repetibilidade** ..... +/- 5%

**Precisão de ajuste** ..... +/- 25%

**Histeresis** ..... máx. 50%

**Ligação ao processo** ..... roscada R1"

#### Ligações eléctricas

**cabo** ..... PVC 3x0,34 mm<sup>2</sup>, comprimento 1 m

**caixa** ..... terminais

**Protecção** ..... IP65

#### Materiais

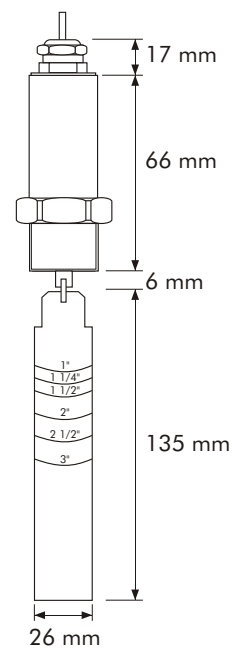
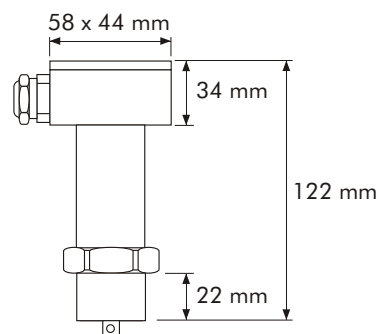
**caixa** ..... latão ou aço inox

**pá e mola** ..... aço inox

**outras partes molhadas** ..... teflon, cerâmica



020-3499



Tipo de ligação eléctrica	Material da caixa	Part Number
cabo	latão	<b>020-3493</b>
cabo	aço inox	<b>020-3495</b>
caixa de junção	latão	<b>020-3497</b>
caixa de junção	aço inox	<b>020-3499</b>

## Elementos primários para medição de caudal

### PLACAS DE ORIFÍCIO

- Segundo normas DIN 1952; UNI 1559; 1605; API; ISO ou AGA-ASME
- Tuberias
- Tubos Venturi

### SONDA DE CAUDAL

- Baseado no princípio de Pitot, com perdas de carga muito pequenas.
- Inserção na tubagem por picagem.
- Sonda equipada com tomas e válvulas de isolamento.

### POTES DE CONDENSADOS

- Recomenda-se o seu uso nas medições de caudal em vapor





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# Série LU60 - Controlador/indicador de nível ultrasónico (10m)

## VANTAGENS

- Proporciona uma medição de nível sem contacto com o produto até 10 metros, com uma indicação avançada, linearização do tanque e 5 relés.
- Indicação de nível em distância ou unidades volumétricas.
- Saída repetitiva 4-20 mA para integração com PLC.

## Especificações - CONTROLADOR

**Indicação** . . . . . 2 linhas LCD, 16 dígitos

### Unidades de indicação:

**de volume** . . . . . litros/galões

**de distância** . . . . . centímetros/polegadas

**Memória** . . . . . não volátil

**Alimentação** . . . . . 240 V ac

**Sinal de saída** . . . . . 4-20 mA (2 fios)

**Calibração** . . . . . digital, por botões

**Linearização** . . . . . 2-16 pontos

**Tipo contactos** . . . . . 5xSPDT (250 V ac - 10A)

**Temperatura electrónica** . . . . . -40/60°C

**Protecção** . . . . . NEMA 4X/IP65

**Material caixa** . . . . . policarbonato

### Especificações - SENSOR

**Gama** . . . . . 15 cm / 10 m

**Precisão** . . . . . +/- 0,25%

**Resolução** . . . . . 3 mm

**Feixe** . . . . . 8° cónico

**Temperatura processo** . . . . . -40/60°C

**Compensação temperatura** . . . . . automática

**Temperatura electrónica** . . . . . -4/60°C

**Pressão** . . . . . 2 bar (25°C)

**Cabo** . . . . . comprimento máx. 48 m

### Materiais

**da caixa** . . . . . PP

**da sonda** . . . . . KYNAR PVDF

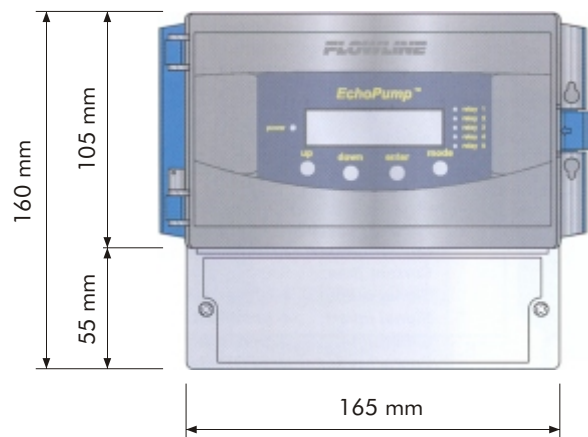
**do empanque da rosca** . . . . . viton

**Ligação ao processo** . . . . . G2"

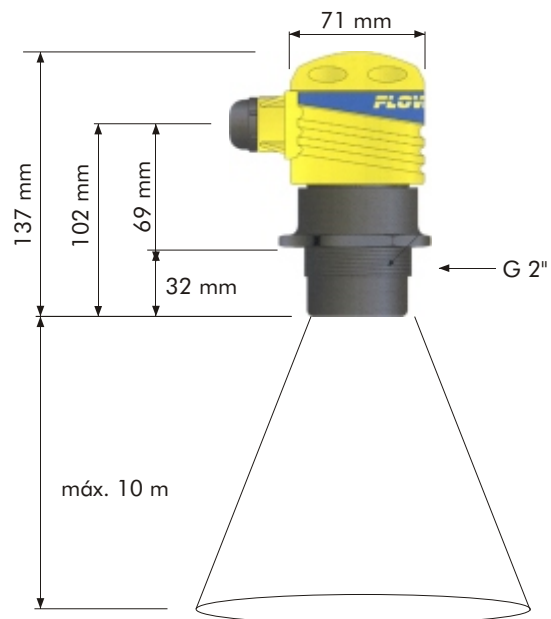
**Ligação eléctrica** . . . . . 1/2" NPT", com bucin



Controlador - vista de frente



Transmissor de nível (sensor)



Modelo	Gama	Lig. processo
LU60-1061	15 cm / 10 m	G 2"



**IP65** **CE**

## Série LU05 - Nível ultrasónico para tanques pequenos (1,2m)

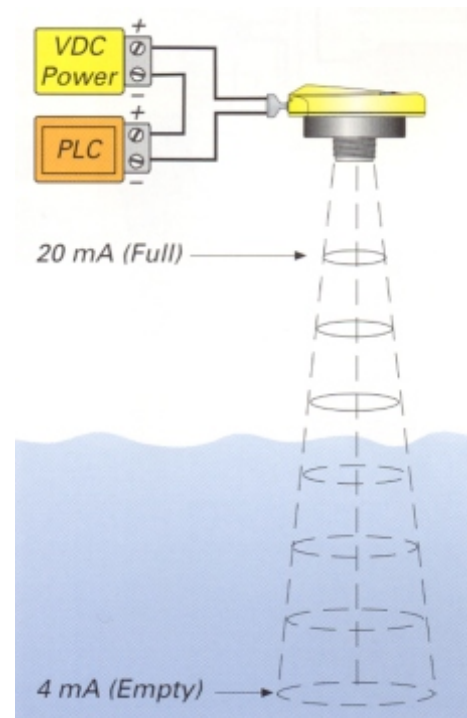
### VANTAGENS

- Com a tecnologia de não contacto com o produto este transmissor é o modelo correcto para as aplicações gerais.
- A sua dimensão permite a aplicação em tanques de tamanho pequeno.
- Com uma construção robusta e feito em materiais resistentes à corrosão é a solução perfeita para a medição de nível.

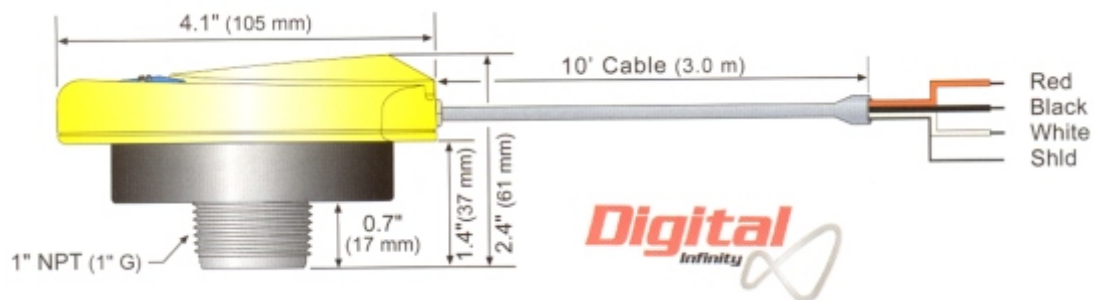
<b>Montagem</b> .....	no topo
<b>Saída</b> .....	4-20mA (2 fios)
<b>Precisão</b> .....	3 mm
<b>Resolução</b> .....	0,5 mm
<b>Gama de temperatura</b> .....	-20/60°C
<b>Compensação da temperatura</b> .....	automática
<b>Pressão</b> .....	2 bar (25°C)
<b>Materiais</b>	
<b>caixa</b> .....	PC/ABS FR
<b>sonda</b> .....	PVDF Kynar
<b>cabo</b> .....	polipropileno (3m)
<b>empanque da rosca</b> .....	viton
<b>Alimentação</b> .....	12-28 V dc
<b>Memória</b> .....	não volátil
<b>Calibração</b> .....	por alvo reflectivo
<b>Protecção</b> .....	IP67



**IP67**



Modelo	Gama	Lig. processo
LU05-5061	5 cm / 1,2 m	G 1"



## Série LU11-12-13-14

### Nível ultrasónico para tanques médios e grandes (3m - 5m - 8m 10m)

#### VANTAGENS

- Com a tecnologia de não contacto com o produto este transmissor é o modelo correcto para as aplicações gerais.
- A sua dimensão permite a aplicação em tanques de tamanho médio e grande.
- Com uma construção robusta e feito em materiais resistentes à corrosão é a solução perfeita para a medição de nível.

**Montagem** ..... no topo

**Saída** ..... 4-20mA (2 fios)

**Precisão** ..... +/- 0,2%

#### Resolução

**LU11, LU12 e LU13** ..... 1mm

**LU14** ..... 2mm

**Gama de temperatura** ..... 20/60°C

**Compensação da temperatura** ..... automática

**Pressão** ..... 2 bar (25°C)

#### Materiais

**caixa** ..... PC/ABS FR

**sonda** ..... PVDF Kynar

**cabo** ..... polipropileno (3m)

**empanque da rosca** ..... viton

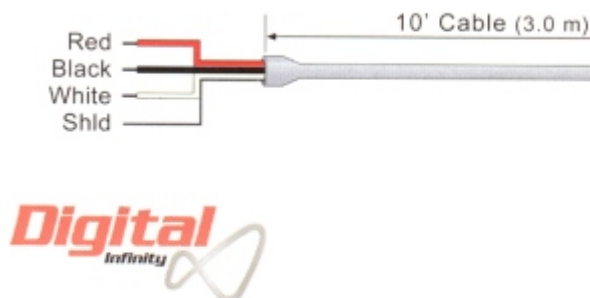
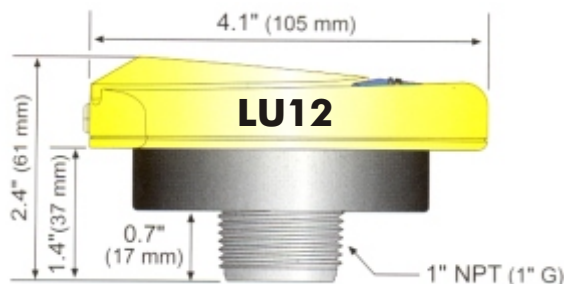
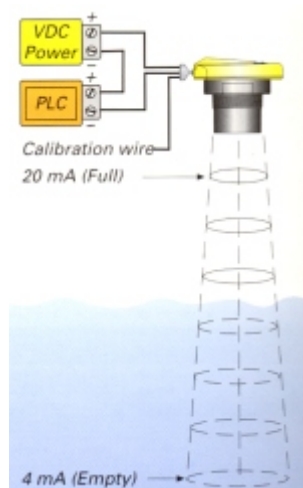
**Alimentação** ..... 14-28 V dc

**Memória** ..... não volátil

**Calibração** ..... por alvo reflectivo

**Protecção** ..... IP67

Modelo	Gama	Lig. processo
LU12-5061	10 cm / 3 m	G 1"
LU11-5061	10 cm / 5 m	G 2"
LU13-5061	20 cm / 8 m	G 2"
LU14-5061	33 cm / 10 m	G 2"



## Série LA15 - Nível ultrasónico para tanques pequenos (1,8m)

### ● VANTAGENS

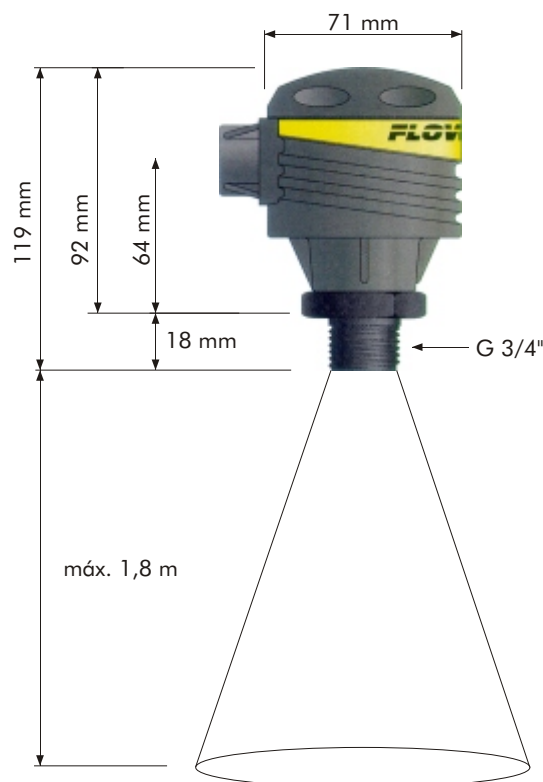
- Com a tecnologia de não contacto com o produto este transmissor (de baixo preço) é a escolha excelente para todas as aplicações.
- O seu desenho compacto permite a aplicação em tanques pequenos.
- Preciso e económico é a escolha perfeita para a medição de nível.
- Também disponível na série CRICKET até 3 metros com uma baixa frequência (2 kHz) através de um tubo guia de 1/2", é a solução ideal para os casos de líquidos com espuma. A ligação ao processo é de G 1".



Montagem	no topo
Saída	4-20mA (2 fios)
Precisão	+/- 0,25%
Resolução	+/- 3 mm
Gama de temperatura	-40/60°C
Compensação da temperatura	automática
Pressão	2 bar (25°C)

### Materiais

caixa	polipropileno
sonda	PVDF
empanque da rosca	viton
Ligação eléctrica	1/2" NPT, com bucim
Frequência	83 kHz
Pulsação	2 por segundo
Feixe	16° cónico
Indicação LED	estado alimentação
Alimentação	12-36 V dc
Protecção	IP65



Modelo	Gama	Lig. processo
LA15-5061	9 cm / 1,8 m	G 3/4"



**IP65**





## Série LA20 - Nível ultrasónico para tanques pequenos (3,6m)

### VANTAGENS

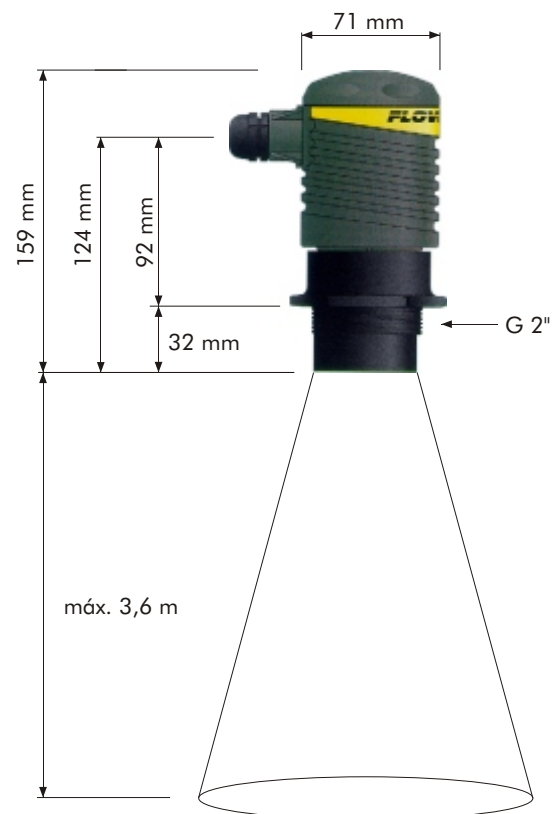
- Com a tecnologia de não contacto com o produto este transmissor é o modelo correcto para as aplicações gerais.
- A sua dimensão permite a aplicação em tanques de tamanho pequeno.
- Com uma construção robusta e feito em materiais resistentes à corrosão é a solução perfeita para a medição de nível.



<b>Montagem</b> .....	no topo
<b>Saída</b> .....	4-20mA (2 fios)
<b>Precisão</b> .....	+/- 0,25%
<b>Resolução</b> .....	+/- 3 mm
<b>Gama de temperatura</b> .....	-40/60°C
<b>Compensação da temperatura</b> .....	automática
<b>Pressão</b> .....	2 bar (25°C)

### Materiais

<b>caixa</b> .....	polipropileno
<b>sonda</b> .....	PVDF
<b>empanque da rosca</b> .....	viton
<b>Ligação eléctrica</b> .....	1/2" NPT, com bucim
<b>Frequência</b> .....	50 kHz
<b>Pulsação</b> .....	2 por segundo
<b>Feixe</b> .....	8° cónico
<b>Alimentação</b> .....	12-36 V dc
<b>Indicação LED</b> .....	estado alimentação
<b>Protecção</b> .....	IP65



Modelo	Gama	Lig. processo
LA20-5061	15 cm / 3,6 m	G 2"



## Série LU20 - Nível ultrasónico para tanques médios (5,4m)

### VANTAGENS

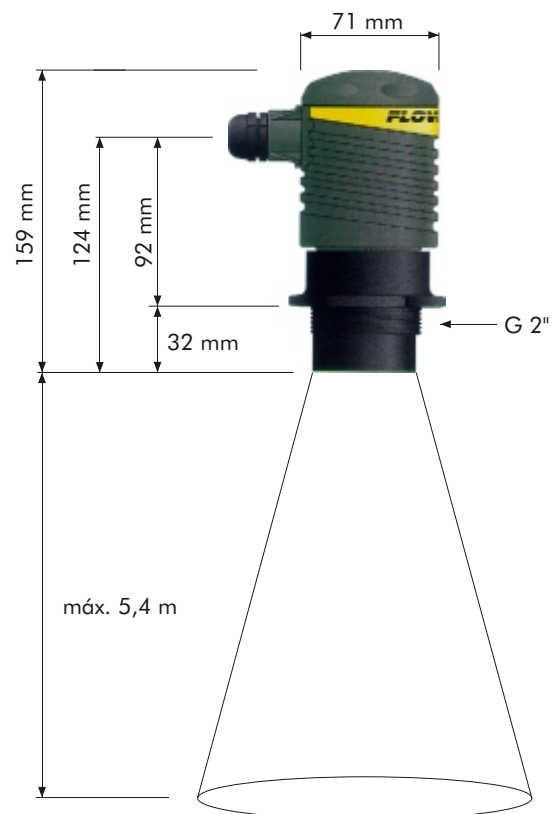
- Com a tecnologia de não contacto com o produto este transmissor é o modelo correcto para as aplicações gerais.
- A sua dimensão permite a aplicação em tanques de tamanho médio.
- Com uma construção robusta e feito em materiais resistentes à corrosão é a solução perfeita para a medição de nível.
- Possui indicação de nível, digital, em centímetros.
- Também disponível na versão **IS=intrinsecamente seguro** aprovado para utilização na classe I, grupos A, B, C e D; classe II, grupos E, F e G; classe III, T3C.

Montagem .....	no topo
Saída .....	4-20mA (2 fios)
Precisão .....	+/- 0,25%
Resolução .....	+/- 3 mm
Gama de temperatura .....	-40/60°C
Compensação da temperatura .....	automática
Pressão .....	2 bar (25°C)

### Materiais

caixa .....	polipropileno
sonda .....	PVDF
empanque da rosca .....	viton
Ligação eléctrica .....	1/2" NPT, com bucim
Frequência .....	50 kHz
Pulsação .....	2 por segundo
Feixe .....	8° cónico
Alimentação .....	12-36 V dc
Indicador .....	LCD, 4 dígitos, em centímetros
Memória .....	não volátil
Calibração .....	por botões
Protecção .....	IP65

Modelo	Gama	Lig. processo
LU20-5061	15 cm / 5,4 m	G 2"



## Série LU30 - Nível ultrasónico para tanques médios (7,4 m)

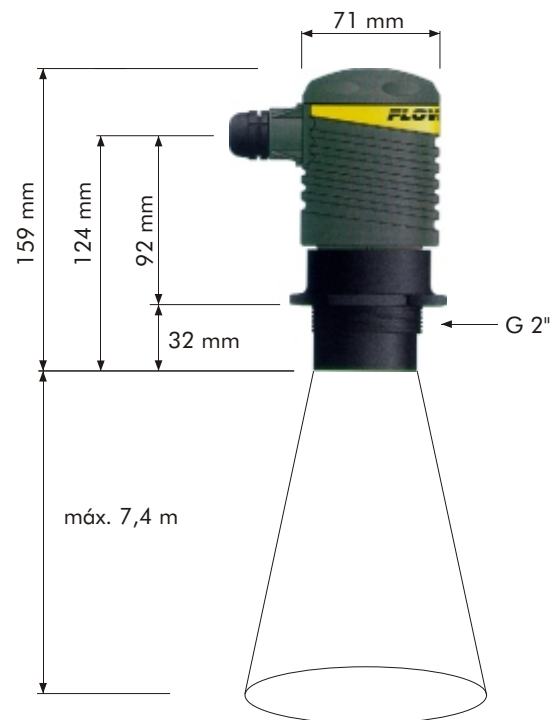
### VANTAGENS

- A tecnologia de não contacto com o fluido permite a utilização deste transmissor de nível em praticamente todas as aplicações.
- Possui indicação do nível do tipo digital em centímetros e um relé para controlo de bombas, válvulas, alarme enchimento ou vazamento automático.
- A calibração é extremamente simples através de botões.
- Também disponível na versão **sanitária**, para as indústrias alimentares, bebidas, biotecnologia e farmacêutica, com temperatura de limpeza (**CIP**= limpeza no lugar) até **100°C**.

<b>Montagem</b> .....	no topo
<b>Saída</b> .....	4-20mA (3 fios)
<b>Precisão</b> .....	+/- 0,25%
<b>Resolução</b> .....	+/- 3 mm
<b>Gama de temperatura</b> .....	-20/60°C
<b>Compensação da temperatura</b> .....	automática
<b>Pressão</b> .....	2 bar (25°C)

### Materiais

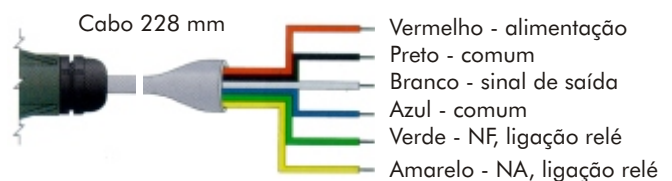
<b>caixa</b> .....	polipropileno
<b>sonda</b> .....	PVDF
<b>empanque da rosca</b> .....	viton
<b>Ligação eléctrica</b> .....	1/2" NPT, com bucim
<b>Protecção</b> .....	IP65
<b>Frequência</b> .....	50 kHz
<b>Pulsação</b> .....	8 por segundo
<b>Feixe</b> .....	8° cónico
<b>Alimentação</b> .....	14-36 V dc
<b>Consumo</b> .....	200 mA
<b>Indicador</b> .....	LCD, 4 dígitos, em centímetros
<b>Memória</b> .....	não volátil
<b>Calibração</b> .....	por botões
<b>Relé saída</b> .....	1 SPDT, 250 V ac, 10A
<b>Indicação relé</b> .....	estado On/Off



Modelo	Gama	Lig. processo
LU30-5063	15 cm / 7,4 m	G 2"



**IP65**



## Série IND - Indicadores (opcionais) para níveis ultrasónicos



## INDICADORES

Indicadores Modelo do nível	DIGITAIS			RAMPA LUMINOSA (gráfico de barras)	
	Sem alarmes	2 alarmes	4 alarmes	Sem alarmes	2 alarmes
<b>LA-15</b> <b>LA-20</b> <b>LU-20</b> o indicador fornece a alimentação para o transmissor	DIGINORM 65P	DPL-700-214	DIGINORM 65PR4	NS1M-2	NS1M-R-2
<b>LU30</b> <b>LU50</b>	usar TIS-800-13 c/ 2 alarmes opção mais económica	TIS-800-013	DIGINORM 65PR4	NS1M-2	NS1M-R-2

## FONTE DE ALIMENTAÇÃO

Só para os modelos LU30 e LU50

Modelo ..... **DIN 700**

Alimentação ..... 200 a 250 Vac, 50/60 Hz

Potência ..... 18 W

Saída ..... 24 V dc nominal a 500 mA

Indicação de saída ..... LED vermelho

DIN 700





## Série ATM/N

### Transmissores contínuos de NÍVEL (submersíveis) sensor piezo-resistivo

#### Materiais

do <b>diafragma</b> .....	aço inox 1.4435 (316L)
da <b>ligação ao processo</b> .....	aço inox 1.4435 (316L)
da <b>caixa</b> .....	aço inox 1.4435 (316L)
da <b>sede</b> .....	viton

**Elemento de medida** ..... piezo-resistivo

#### Alimentação

9/33Vdc (4/20mA 2 fios)

15/30 V dc (0/10Vdc 3 fios)

#### Precisão

standard..... 0,5% FE

opções..... 0,25% FE. ; 0,1% FE

#### Gama temperaturas compensada fluido

standard..... -5/50°C..... -25/50°C

opcional..... temperatura especial

#### Gama temperaturas cabos

material **cabo PUR** ..... fluido máx. 50°C

material **cabo PE** ..... fluido máx. 50°C

material **cabo TEFLON** ..... fluido máx. 80°C

**Execuções** ..... versão fechada (fig.1) ou aberta (fig.2)

**Cabos** ..... **PUR, PE** ou **TEFLON**

Com tubo de compensação de pressão (medindo a altura manométrica e fazendo a compensação com a pressão atmosférica).

**Protecção contra trovoadas** ... de acordo c/ IEC61000-4-5 (opção)

**De acordo com** ..... a norma da CE directiva 89/336/EEC

**Protecção** ..... IP68

**Calibração** ... disponível para todas as unidades de pressão comuns, mH<sub>2</sub>O, etc.

#### APLICAÇÕES TÍPICAS:

- Poços
- Furos
- Reservatórios
- Depósitos
- Tanques
- Rios, lagos
- Tratamento de águas residuais
- etc.

#### FLUIDOS:

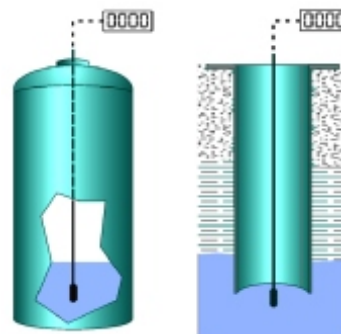
- Água
- Água do mar
- Gasóleo
- Gasolina
- Fuel
- Óleos
- Vinho
- Cerveja
- Produtos Químicos
- Fluidos Agressivos
- etc.



Fig. 1  
versão fechada



Fig. 2  
versão aberta



# Série ATM/N

## Transmissores contínuos de NÍVEL (submersíveis) sensor piezoresistivo

Standard	A (mm)	B (mm)	Peso (gr)
sem contra peso	108	104	160
com contra peso	195	191	420
<b>Com protecção contra trovoadas</b>			
sem contra peso	157	153	200
com contra peso	244	240	460

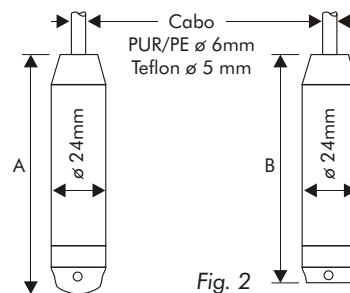
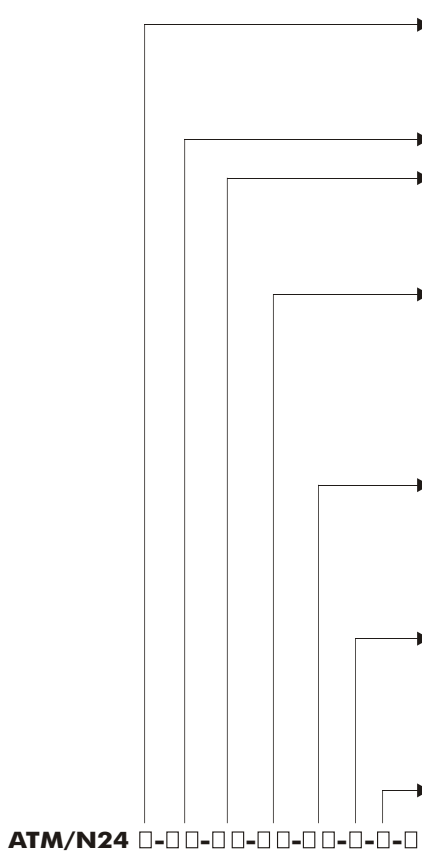


Fig. 1  
versão fechada

Fig. 2  
versão aberta



**TIPO DE PRESSÃO** Código

pressão relativa	<b>1</b>
pressão absoluta	<b>2</b>

**GAMAS DE PRESSÃO** (disponível em mH<sub>2</sub>O) Código

**EXECUÇÃO**

Versão fechada (figura 1)	<b>55</b>
Versão aberta (figura 2)	<b>56</b>

**LIGAÇÃO ELÉCTRICA**

cabo <b>PE</b> (indique o comp. do cabo)	<b>13</b>
cabo <b>PUR</b> (indique o comp. do cabo)	<b>15</b>
cabo <b>TEFLON</b> (indique o comp. do cabo)	<b>21</b>
Ligador opcional (fig.3)	<b>99</b>

**SINAL DE SAÍDA**

4-20 mA	<b>05</b>
4-20 mA, prot. contra trovoadas	<b>08</b>
0-10 V dc	<b>47</b>

**PRECISÃO**

+/- 0,5% FS	<b>0</b>
+/- 0,25% FS	<b>1</b>
+/- 0,1% FS	<b>2</b>

**GAMA TEMPERATURAS**

Compensada	fluido	
-5/50°C	-25/50°C	<b>4</b>
Temperatura especial		<b>9</b>

**OPÇÕES**

contra peso (1.4435)	<b>B</b>
versão água salgada	<b>-</b>
execução em titânio	<b>K</b>
Electrónica com <b>Gel</b> para situações de alta humidade	<b>C</b>

**Código**

<b>XX</b>	50 ..<99 mbar
<b>00</b>	0 ... 100 mbar (1 mCA)
<b>01</b>	0 ... 160 mbar
<b>02</b>	0 ... 250 mbar
<b>03</b>	0 ... 400 mbar
<b>04</b>	0 ... 600 mbar
<b>05</b>	0 ... 1.0 bar
<b>06</b>	0 ... 1.6 bar
<b>07</b>	0 ... 2.5 bar
<b>08</b>	0 ... 4.0 bar
<b>09</b>	0 ... 6.0 bar
<b>10</b>	0 ... 10 bar
<b>11</b>	0 ... 16 bar
<b>12</b>	0 ... 25 bar (250 mCA)
<b>99</b>	Calibração especial



Fig.3 versão com ligador opcional

**Notas:**

- a) Em caso de encomenda indique gama, tipo do fluido e densidade do mesmo, comprimento e tipo do cabo pretendido.
- b) Para fluidos tais como o fuel ou diesel é aconselhável utilizar cabo de teflon e modelo EX.
- c) Para Indústria Alimentar com certificado BAM ou água potável utilizar o cabo PE (polietileno).
- d) Nas aplicações onde existe a possibilidade dos pequenos furos da versão fechada serem obstruídos devido a impurezas ou lamas deve ser usada a versão aberta.

As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.

## Série ATM/N/T

### Transmissores contínuos de NÍVEL (*submersíveis*) sensor piezoresistivo, com medição de temperatura

#### Materiais

do **diafragma** . . . . . aço inox 1.4435 (316L)

da **ligação ao processo** . . . . . aço inox 1.4435 (316L)

da **caixa** . . . . . aço inox 1.4435 (316L)

da **sede** . . . . . viton

**Elemento de medida de nível** . . . . . piezoresistivo

**Elemento de medida de temperatura** . . . . . Pt100

#### Alimentação

9/33Vdc (4/20mA 2 fios)

15/30 V dc (0/10Vdc 3 fios)

**Saídas** . . . . . 2 analógicas para pressão e temperatura

#### Precisão

standard. . . . . 0,5% FE

opções. . . . . 0,25% F.E. ; 0,1% FE

#### Gama temperaturas compensada fluido

standard . . . . . -5/50°C . . . . . -25/50°C

opcional. . . . . temperatura especial

#### Gama temperaturas cabos

material **cabo PUR** . . . . . fluido máx. 50°C

material **cabo PE** . . . . . fluido máx. 50°C

material **cabo TEFLON** . . . . . fluido máx. 80°C

**Execuções** . . . . . versão fechada (fig. 1) ou aberta (fig. 2)

**Cabos** . . . . . **PUR, PE** ou **TEFLON** (com 6 fios)

Com tubo de compensação de pressão (medindo a altura manométrica e fazendo a compensação com a pressão atmosférica).

**Protecção contra trovoadas** . . . de acordo c/ IEC61000-4-5 (opção)

**De acordo com** . . . . . a norma da CE directiva 89/336/EEC

**Protecção** . . . . . IP68

**Calibração** . . . disponível para todas as unidades de pressão comuns, mH<sub>2</sub>O, etc.

#### APLICAÇÕES TÍPICAS:

- Poços
- Furos
- Reservatórios
- Depósitos
- Tanques
- Rios, lagos
- Tratamento de águas residuais
- etc.

#### FLUIDOS:

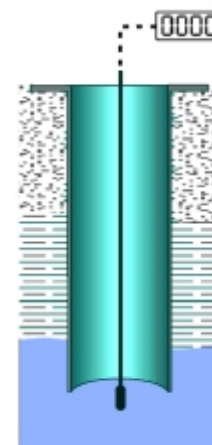
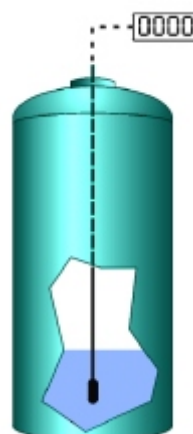
- Água
- Água do mar
- Gasóleo
- Gasolina
- Fuel
- Óleos
- Vinho
- Cerveja
- Produtos Químicos
- Fluidos Agressivos
- etc.



Fig. 1  
versão fechada



Fig. 2  
versão aberta







## Série ATM/NC

### Transmissores contínuos de NÍVEL (submersíveis), para fluidos CORROSIVOS, sensor piezoresistivo

#### Materiais

do **diafragma** ..... aço inox 1.4435 (316L)

da **caixa** ..... **PVDF**

da **sede** ..... viton

**Elemento de medida** ..... piezoresistivo

#### Alimentação

9/33Vdc (4/20mA 2 fios)

15/30 V dc (0/10Vdc 3 fios)

#### Precisão

$\leq \pm 0,5\%$  F.S.  $\leq \pm 1,0\%$  F.S.  $\leq \pm 2,0\%$  F.S.

(dependendo da gama de pressões e temperaturas)

#### Gama temperaturas compensada fluido

standard ..... 0/50°C ..... 0/80°C

opcional ..... -25/85°C ..... -25/85°C

#### Gama temperatura cabo

material **cabo TEFLON** ..... **fluido** máx. 80°C

**Execução** ..... standard

**Cabo** ..... **TEFLON**

Com tubo de compensação de pressão (medindo a altura manométrica e fazendo a compensação com a pressão atmosférica).

**Protecção contra trovoadas** ... de acordo c/ IEC61000-4-5 (opção)

**De acordo com** ..... a norma da CE directiva 89/336/EEC

**Protecção** ..... IP68

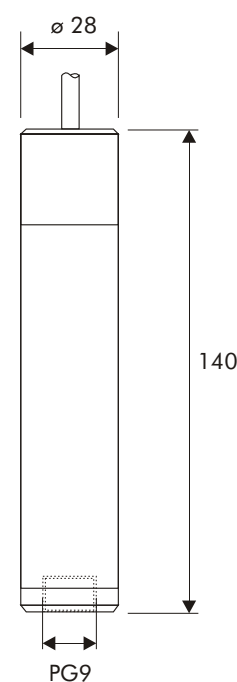
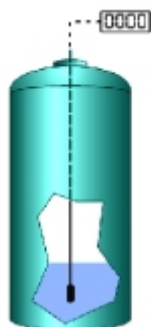
**Calibração** ... disponível para todas as unidades de pressão comuns, mH<sub>2</sub>O, etc.

#### APLICAÇÕES TÍPICAS:

- Depósitos
- Tanques
- Tratamento de águas residuais
- etc.

#### FLUIDOS:

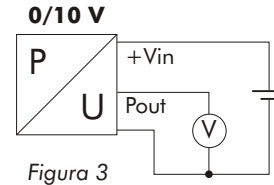
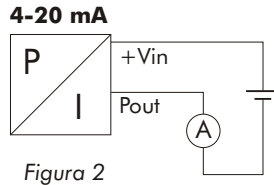
- Produtos Químicos
- Fluidos Agressivos
- etc.



Série ATM/NC

Transmissores contínuos de NÍVEL (submersíveis), para fluidos CORROSIVOS, sensor piezoresistivo

DIAGRAMA DO CIRCUITO



TIPO DE PRESSÃO		Código
pressão relativa		1
pressão absoluta		2
<b>GAMAS DE PRESSÃO</b> (disponível em mH <sub>2</sub> O, etc.)		
<b>EXECUÇÃO</b>		
aberta, diafragma titânio		90
aberta, diafragma com fole teflon		91
<b>LIGAÇÃO ELÉCTRICA</b>		
cabo <b>TEFLON</b> (indique o comp. do cabo)		21
<b>SINAL DE SAÍDA</b>		
4-20 mA		05
0-10 V dc		47
<b>PRECISÃO</b>		
< +/-0,5% F.S. < +/-1,0%F.S. < +/-2,0%F.S. X		
(dependendo da gama de pressões e versões)		
<b>GAMA TEMPERATURAS</b>		
Compensada	fluido	
-5/50°C	-25/50°C	4
Temperatura especial		9

Código	
00	0 ... 100 mbar (1 mCA)
01	0 ... 160 mbar
02	0 ... 250 mbar
03	0 ... 400 mbar
04	0 ... 600 mbar
05	0 ... 1.0 bar
06	0 ... 1.6 bar
07	0 ... 2.5 bar
08	0 ... 4.0 bar
09	0 ... 6.0 bar
10	0 ... 10 bar
11	0 ... 16 bar
12	0 ... 25 bar (250 mCA)
99	Calibração especial

ATM/NC 30 □□□□□□□□□□

**CONSTRUÇÃO DO MODELO**

Notas:

- a) Em caso de encomenda indique tipo do fluido e densidade do mesmo, comprimento e tipo do cabo pretendido.
- b) Para fluidos tais como o fuel ou diesel é aconselhável utilizar cabo de teflon e modelo EX.
- c) Para Indústria Alimentar com certificado BAM utilizar o cabo PE (polietileno).

As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.

## Série ATM/NC/Ex

### Transmissores contínuos de NÍVEL (submersíveis), para fluidos CORROSIVOS, sensor piezoresistivo intrinsecamente seguros

#### Materiais

do **diafragma** . . . . . aço inox 1.4435 (316L)

da **caixa** . . . . . **PVDF**

da **sede** . . . . . viton

**Elemento de medida** . . . . . piezoresistivo

**Tipo de protecção** . . . . . intrinsecamente seguros II 1G EEx ia IIB T4...T6

**Alimentação** . . . . . 10/30 Vdc (4/20 mA 2 fios)

#### Precisão

≤ +/-0,5% F.S.    ≤ +/-1,0%F.S.    ≤ +/-2,0%F.S.

(dependendo da gama de pressões e temperaturas)

#### Classe temperaturas

**T6**

**T4**

temperatura ambiente (Ta) . . . . . -5 /50°C . . . . . -5/50°C

temperatura processo . . . . . temperatura especial

#### Gama temperatura do cabo

material **cabo TEFLON** . . . . . **fluido** máx. 80°C

**Execuções** . . . . . standard

**Cabo** . . . . . **TEFLON**

Com tubo de compensação de pressão (medindo a altura manométrica e fazendo a compensação com a pressão atmosférica).

**Protecção contra trovoadas** . . . . . de acordo c/ IEC61000-4-5 (opção)

**De acordo com** . . . . . a norma da CE directiva 89/336/EEC

**Protecção** . . . . . IP68

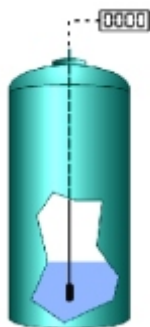
**Calibração** . . . . . disponível para todas as unidades de pressão comuns, mH<sub>2</sub>O, etc.

#### APLICAÇÕES TÍPICAS:

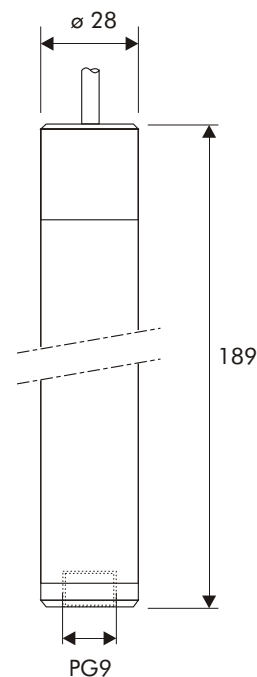
- Depósitos
- Tanques
- Tratamento de águas residuais
- etc.

#### FLUIDOS:

- Produtos Químicos
- Fluidos Agressivos
- etc.



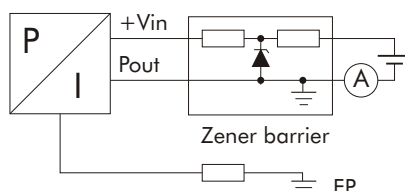
II 1G EEx ia IIB T4...T6



## Série ATM/NC/Ex

Transmissores contínuos de NÍVEL (submersíveis), para fluidos CORROSIVOS, sensor piezoresistivo intrinsecamente seguros

DIAGRAMA DO CIRCUITO



TIPO DE PRESSÃO	Código
pressão relativa	1
pressão absoluta	2
<b>GAMAS DE PRESSÃO</b> (disponível em mH <sub>2</sub> O, etc.)	
<b>EXECUÇÃO</b>	
aberta, diafragma titânio	90
aberta, diafragma com fole teflon	91
<b>LIGAÇÃO ELÉCTRICA</b>	
cabo <b>TEFLON Azul</b> (indique comp. do cabo)	22
<b>SINAL DE SAÍDA</b>	
4-20 mA	05
<b>PRECISÃO</b>	
< +/-0,5% F.S. < +/-1,0%F.S. < +/-2,0%F.S. <b>X</b>	
(dependendo da gama de pressões e versões)	
<b>CLASSE TEMPERATURAS</b>	
<b>T6</b> (T <sub>a</sub> : -5/50°C)	0
<b>T4</b> (T <sub>a</sub> : -5/50°C)	1
<b>OPÇÕES</b>	
cheio de óleo especial (Aeosol)	
para <b>Indústria Alimentar</b>	<b>G</b>

Código	Descrição
00	0 ... 100 mbar (1 mCA)
01	0 ... 160 mbar
02	0 ... 250 mbar
03	0 ... 400 mbar
04	0 ... 600 mbar
05	0 ... 1.0 bar
06	0 ... 1.6 bar
07	0 ... 2.5 bar
08	0 ... 4.0 bar
09	0 ... 6.0 bar
10	0 ... 10 bar
11	0 ... 16 bar
12	0 ... 25 bar (250 mCA)
99	Calibração especial

**ATM/NC/Ex 36** □-□-□-□-□-□-□-□-□-□

**CONSTRUÇÃO DO MODELO**

**Notas:**

- a) Em caso de encomenda indique tipo do fluido e densidade do mesmo, comprimento e tipo do cabo pretendido.
- b) Para fluidos tais como o **fuel ou diesel** é aconselhável utilizar cabo de **teflon** e modelo **EX**.

As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.



## Série DL/N

### DATALOGER de NÍVEL (submersível), sensor piezoresistivo

**Modelo 64** . . . . . sem indicação local

**Modelo 66** . . . . . com indicação local

#### Materiais

do **diafragma** . . . . . aço inox 1.4435 (316L)

da **ligação ao processo** . . . . . aço inox 1.4435 (316L)

da **caixa** . . . . . aço inox 1.4435 (316L)

da **sede** . . . . . viton

**Elemento de medida** . . . . . piezoresistivo

**Intervalos de medição** . . . . . programáveis desde 2 seg. a 24 horas

**Memória** . . . . . não volátil para 130 000 medições  
(mais de 10 anos de capacidade de memória para 1 medição por hora)

**Bateria** . . . . . longa duração, vida útil até 10 anos

**Transferência** . . . . . de dados para computador Laptop/Handheld

#### Precisão

standard. . . . .  $\pm 0,25\%$  F.E., para gamas de pressão  $\leq 500$  mbar

opções. . . . .  $\pm 0,1\%$  F.E., para gamas de pressão  $> 500$  mbar

**Gama temperatura** . . . . .  $-5/70^\circ\text{C}$

#### Gama temperaturas dos cabos

material **cabo PUR** . . . . . **fluido** máx.  $50^\circ\text{C}$

material **cabo PE** . . . . . **fluido** máx.  $50^\circ\text{C}$

material **cabo TEFLON** . . . . . **fluido** máx.  $80^\circ\text{C}$

**Execuções**. . . . . ver página 29

**Cabos** . . . . . **PUR, PE** ou **TEFLON**

Com tubo de compensação de pressão (medindo a altura manométrica e fazendo a compensação com a pressão atmosférica).

**Calibração** . . . disponível para todas as unidades de pressão comuns,  $\text{mH}_2\text{O}$ , etc.

## Dataloger

**Variável de medida**. . . . . pressão

**Resolução**. . . . . pressão  $< 0,01$  F.E.

**Relógio de tempo real** . . . . . de quartzo com data, começo com 1ª medição programada

**Memória de dados** . . . . . 130 000 valores de medição, memória não volátil, dados mantidos em memória mesmo sem bateria, cada valor de medição é correlacionado com hora e data.

**Interface** . . . . . RS232C (V24, 3 fios)

**Alimentação** . . . . . bateria lithium 3,6V/1,9Ah/tam. AA

#### CONFIGURAÇÃO E TRANSFERÊNCIA DE DADOS

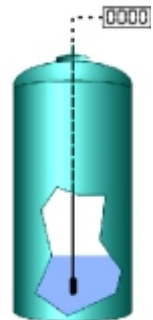
**Sistema requerido** . . . . . IBM compatível Laptop ou PC, Windows 95/98/NT ou portátil com Windows CE 2.0M

**Software** . . . . . disponível em português



#### APLICAÇÕES TÍPICAS:

- Poços
- Furos
- Reservatórios
- Depósitos
- Tanques
- Rios, lagos
- Tratamento de águas residuais
- etc.



#### FLUIDOS:

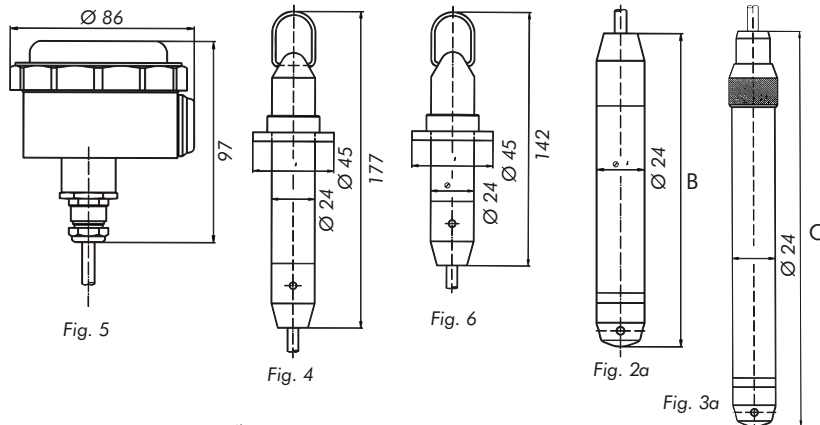
- Água
- Água do mar
- Gasóleo
- Gasolina
- Fuel
- Óleos
- Vinho
- Cerveja
- Produtos Químicos
- Fluidos Agressivos
- etc.



**Série DL/N**  
**DATALOGER de NÍVEL (submersível),**  
**sensor piezoresistivo**

Versão	Frente	Fig.	Comp.	Peso (g)	Comp.*	Peso (g)
Absoluta	fechada	1a	A=225	260		
	aberta	1b	A=251	260		
Relativa	fechada	2a	B=157	195	B=244	425
	aberta	2b	B=153	195	B=240	425
	fechada	3a	C=263,5	300		
	aberta	3b	C=259,5	300		

\* com contra peso



TIPO DE PRESSÃO	Código
pressão relativa	<b>1</b>
pressão absoluta	<b>2</b>

GAMAS DE PRESSÃO	Código
sem cabo, fechada fig. 1a	<b>51</b>
sem cabo, aberta fig. 1b	<b>52</b>
com cabo, caixa campo (ABS) fechada fig. 2a/5	<b>53</b>
com cabo, caixa campo (ABS) aberta fig. 2b/5	<b>54</b>
com cabo e caixa para x-tubo, fechada fig. 2a/4	<b>57</b>
com cabo e caixa para x-tubo, aberta fig. 2b/4	<b>58</b>
com cabo e caixa para x-tubo (roscado) fechado Fig. 3a/6	<b>72</b>
com cabo e caixa para x-tubo (roscado) fechado Fig. 3a/6	<b>73</b>

LIGAÇÃO ELÉCTRICA	Código
Ligador Lumberg RSF4, 4 pinos	<b>07</b>
Ligador DSUB, 9 pinos	<b>49</b>

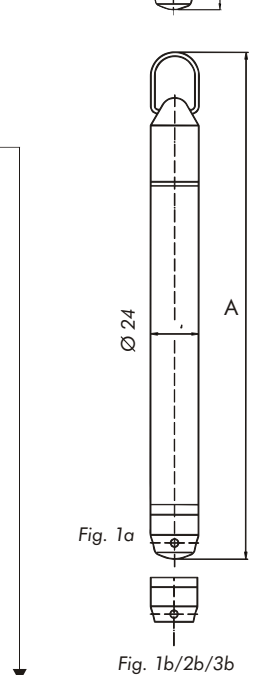
CABO	Código
cabo <b>PE</b> (indique o comp. do cabo)	<b>13</b>
cabo <b>PUR</b> (indique o comp. do cabo)	<b>15</b>
cabo <b>TEFLON</b> (indique o comp. do cabo)	<b>21</b>

INTERFACE	Código
RS232C	<b>61</b>

PRECISÃO	Código
± 0,25% F.E. , p/ gamas pressão ≤ 500 mbar	<b>1</b>
± 0,1% F.E. , p/ gamas pressão > 500 mbar	<b>2</b>

GAMA TEMPERATURAS	Código
-5/70°C	<b>4</b>

OPÇÕES	Código
contra peso (1.4435)	<b>B</b>
contra peso (titânio)	<b>N</b>
execução em titânio	<b>K</b>
Cabo transferência de dados para PC	<b>C</b>
Programa PC para configuração Dataloger	<b>P</b>
Com indicação local mod. DL/N( . . . )66	<b>66</b>



Código	Descrição
<b>00</b>	0...100 mbar (1 mCA)
<b>01</b>	0...160 mbar
<b>02</b>	0...250 mbar
<b>03</b>	0...400 mbar
<b>04</b>	0...600 mbar
<b>05</b>	0...1.0 bar
<b>06</b>	0...1.6 bar
<b>07</b>	0...2.5 bar
<b>08</b>	0...4.0 bar
<b>09</b>	0...6.0 bar
<b>10</b>	0...10 bar
<b>11</b>	0...16 bar
<b>12</b>	0...25 bar (250 mCA)
<b>99</b>	Calibração especial

**DL/N(1.4435)64**  
**DL/N(TITAN)64** □-□-□-□-□-□-□-□-□-□-□  
**DL/N ( . . . ) 66** mod. com indicação local

Notas:  
a) Em caso de encomenda indique tipo do fluido e densidade do mesmo, comprimento e tipo do cabo pretendido.  
b) Para fluidos tais como o fuel ou diesel é aconselhável utilizar cabo de teflon e modelo EX.  
c) Para Indústria Alimentar c/ certificado BAM utilizar o cabo PE (polietileno).  
d) Nas aplicações onde existe a possibilidade dos pequenos furos da versão fechada serem obstruídos devido a impurezas ou lamas deve ser usada a versão aberta.

As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.

# Série 2000-SAN - Transmissores de nível inteligentes com indicação local

Transmissores de pressão / nível para a indústria:  
Química, Farmacêutica, Alimentar, Pasta e Papel, e outras.

- Construção** todo em aço inox
- caixa** ..... AISI304
- partes molhadas** ..... AISI316
- Alimentação** ..... 12 ... 40 V dc
- Saída** ..... 4 - 20 mA / 2 fios - Protocolo Hart® (opção)
- Precisão** ..... 0,1 %
- Programação** ..... através de três botões ou consola de programação (sem pressão de teste)
- Indicador local** ..... possibilidade de indicação da temperatura de processo
- Zero e gama** ..... ajustáveis
- Aprovação** ..... EEx ia IIC T4 (opcional  $\text{Ex}$ )
- Compensação da temperatura** ..... total
- Ligações ao processo** ..... além das apresentadas existem cerca de 40 tipos de ligações diferentes
- Protecção** ..... IP66
- Temperatura processo** ..... -20/100°C (130°C < 30 min.)



Código F

Modelo	Ligação processo	Temperatura máx. (°C)
<b>2000-SAN-Gama-F-S ou I-EX-H-G</b>	Flange DN40-DN50-DN80	-20/100

→ Versões especiais (ex.: Hasteloy, alta temperatura, vácuo, etc.)

→ **H Protocolo Hart®**

→ **EX** só para intrinsecamente seguro - **EEx ia IIC T4**  $\text{Ex}$

→ **S** para standard ou **I** para modelo com indicador digital local, caixa transparente (12 unidades de engenharia, podendo ser mostrado o indicador em mH<sub>2</sub>O; bar; psi; "H<sub>2</sub>O)

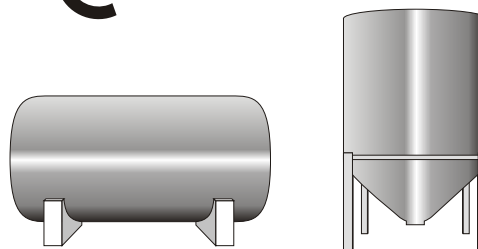
Gamas disponíveis	Pressão máx. (bar)
<b>1</b> 0/0,04 a 0/0,4 bar	6,4
<b>2</b> 0/0,1 a 0/1,2 bar	10,5
<b>3</b> 0/1 a 0/10 bar	30
<b>4</b> 0/5 a 0/30 bar	60
<b>5</b> 0/20 a 0/60 bar	120

### Observações:

Possibilidade de indicação da temperatura do processo no display.

O transmissor pode ser utilizado como simulador de corrente 4-20 mA e simulador de pressões.


Possibilidade de introdução da densidade específica de cada fluido, se diferente de 1g/cm<sup>3</sup>.



Algoritmo de correcção para tanques não standard disponível em todas as versões.

## Série 8000-SAN - Transmissores de nível

Transmissores de nível para a indústria:  
Química, Farmacêutica, Alimentar, Pasta e Papel, e outras.

**Construção** todo em aço inox  
**caixa** ..... AISI 304  
**partes molhadas** ..... AISI 316  
**Sensor** ..... piezoresistivo  
**Alimentação** ..... 13 ... 40 V dc  
**Saída** ..... 4-20 mA  
**Precisão** ..... 0,2% (gama ajustada)  
**Indicador local** ..... opcional  
**Zero e gama** ..... ajustáveis  
**Aprovação** ..... EEx ia IIC T4 (opcional )  
**Compensação de temperatura** ..... total



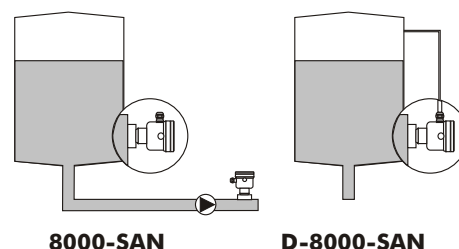
Modelo	Ligação	Ligação processo
8000-SAN-Gama-M-S ou I-EX-V	DN25 - DIN11851 (Gamas E,F,G)	Milkcoupling
8000-SAN-Gama-M-S ou I-EX-V	DN40 - DIN11851	Milkcoupling
8000-SAN-Gama-M-S ou I-EX-V	DN50 - DIN11851	Milkcoupling
8000-SAN-Gama-W-S ou I-EX-V	diâm. 62 mm	Sanitária - soldada
8000-SAN-Gama-W-S ou I-EX-V	diâm. 85 mm	Sanitária - soldada
8000-SAN-Gama-L-S ou I-EX-V	1" ou 1 1/2" (Gamas E,F,G)	Tri-clamp
8000-SAN-Gama-L-S ou I-EX-V	2" ou 3" (Gamas B,C,D)	Tri-clamp
8000-SAN-Gama-F-S ou I-EX-V	DN40 / DN50 / DN80	Flangeado

→ **V** só para para gamas de vácuo (exemplo: -1/+1 Bar), pode ser fornecido com câmara de referência para pressão absoluta

→ **EX** só para intrinsecamente seguro - **EEx ia II T4** 

→ **S** para standard ou **I** para modelo com indicador digital local

Gamas disponíveis	B	C	D	E	F	G
	0-0,08 ... 0,4 Bar	0-0,4 ... 0,7 Bar	0-0,7 ... 1,5 Bar	0-1 ... 4 Bar	0-2,5 ... 10 Bar	0-7,5 ... 16 Bar
	Pressão máxima 6,4 Bar	Pressão máxima 6,4 Bar	Pressão máxima 10,5 Bar	Pressão máxima 16 Bar	Pressão máxima 30 Bar	Pressão máxima 60 Bar



8000-SAN

D-8000-SAN

### Modelo

**D-8000-SAN** Transmissor de **pressão diferencial** (apenas ar na toma negativa)

**8000-SAN-Gama-W-S-HT** Transmissor para **alta temperatura** até 180°C



## Série CER 8000

# Transmissores de nível para ambientes **AGRESSIVOS** Fluidos **CORROSIVOS**

Transmissores de nível especialmente desenvolvidos para aplicações em **fluidos corrosivos e/ou ambientes agressivos**.

Opcionalmente podem também ser fornecidos com a **caixa revestida a PTFE**.

### Construção

**Partes molhadas** ..... PTFE; PVDF; PVC  
**caixa** ..... aço inox (AISI 304)

**Sensor** ..... cerâmico

**Alimentação** ..... 15... 40 V dc

**Saída** ..... 4-20 mA/2 fios

**Precisão** ..... 0,2 % gama ajustável

**Indicador local** ..... opcional

**Zero e gama** ..... ajustáveis

**Aprovação** ..... EEx ia IIC T4 (opcional  $\text{Ex}$ )

**Ligações flange** ..... DN25 - DN 80



Modelo	Ligação processo	Material partes molhadas	Temperatura máxima	Pressão máx. (bar)
<b>CER-8000-Gama- F -S ou I - EX -V -G</b>	Flange DN25-DN40-DN50	PVC	60°C	1,6
<b>CER-8000-Gama- F -S ou I - EX -V -G</b>	Flange DN80	PVC	60°C	1,6
<b>CER-8000-Gama- F -S ou I - EX -V -G</b>	Flange DN25-DN40-DN50	PTFE	60°C	1,6
<b>CER-8000-Gama- F -S ou I - EX -V -G</b>	Flange DN80	PTFE	60°C	1,6

→ partes molhadas ( **G** + tipo de material)

→ **V** só para gamas de vácuo (exemplo: -1/+1 Bar), pode ser fornecido com câmara de referência para pressão absoluta

→ **EX** só para intrinsecamente seguro - **EEx ia IIC T4**  $\text{Ex}$

→ **S** para standard ou **I** para modelo com indicador digital local

### Gamas disponíveis

<b>F</b>	0/0,1 a 0,4 Bar
<b>E</b>	0/0,2 a 0,8 Bar
<b>D</b>	0/0,8 a 1,6 Bar
<b>C</b>	0/1,6 a 4 Bar
<b>B</b>	0/2,5 a 10 Bar

## Série FKK - Transmissores de pressão diferencial

Utiliza um sensor capacitivo de silicone para serviço com líquidos, gases ou vapor.

### Construção

Caixa . . . . .	liga de alumínio revestimento epóxico
Partes molhadas . . . . .	AISI 316L
"O" ring do sensor . . . . .	viton (PTFE opcional)
Alimentação . . . . .	10,5/45V dc
Saída . . . . .	4-20 mA / 2 fios + Protocolo Hart®
Precisão . . . . .	0,1%
Fluido de enchimento . . . . .	óleo de silicone
Indicador local . . . . .	opcional
Zero e span . . . . .	ajustáveis
Aprovação . . . . .	EEx ia IIC T4 (opcional)
Ligação ao processo . . . . .	1/4" NPTF
Protecção. . . . .	IP67
Temperatura ambiente . . . . .	-40/85°C
Temperatura do processo . . . . .	-40/100°C



### FKK-4/20 mA + HART Protocol

MODELOS	OPÇÕES
Indicador local	4 1/2 Dígitos 0-100%
Acessório montagem 2"	Aço carbono ou AISI 316
Manifold de 3 vias	AISI 316
Intrinsecamente seguro	EEx ia IIC T4/T5
Modem	Hart
Diafragma	Hasteloy C
Flanges ovais	para ligação ao processo 1/2" NPTF

MODELOS	GAMA (16:1 turndown)
FKK X 12 V	0-6 até 0-60 mBar
FKK X 33 V	0-20 até 0-320 mBar
FKK X 35 V	0-80 mBar até 0-1.3 bar
FKK X 36 V	0-0,312 bar até 0-5 bar
FKK X 37 V	0-1,25 bar até 0-20 bar

MODELOS	Pressão estática (bar)	limite do span (mbar)		Gama limite (mBar)
		mínimo	máximo	
FKK X 12	-1 a +32	(6)	(60)	(±60)
FKK X 33	-1 a + 140	(20)	(320)	(±320)
FKK X 35	-1 a + 140	(80)	(1300)	(±1300)
FKK X 36	-1 a + 140	(312)	(5000)	(±5000)
FKK X 37	-1 a + 140	(1250)	(20000)	(±20000)

## Série SOBA - Interruptores de nível de boia da série ECOLÓGICA

### ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

### APLICAÇÕES

- Estações de bombagem
- Instalações de tratamento de águas
- Aplicações industriais
- Detecção de alarmes de nível

### CARACTERÍSTICAS TÉCNICAS

**Modo de operação** . . . . . omnidireccional

**Pressão máxima** . . . . . 5 bar (50 mCA)

**Protecção** . . . . . IP68

**Cabo standard**

**Material** . . . . . **NEOPRENE**

**Dimensão** . . . . . 3x1mm2

**Comprimentos** . . . . 5 a 10 metros (outros tamanhos opcionais)

**Densidade do fluido** . . . . . 0,70 até 1,15

**Temperatura máxima** . . . . . 85°C

**Caixa bi-cónica** . . . . . copolymer polypropylene

**Cor da caixa** . . . . . verde/branco

**Poder de corte** . . . . . 16 (6)A (16A resistive 6A indutive)

**Tensão alimentação** 12, 24, 48 Vac/Vdc ou 250Vac-50/60Hz

**Interruptor reversível** . . . . . prata/contactos níquel

**Equipados com:**

#### CONTRA-PESO ECOLÓGICO COM "CLIP"

Equipado com "Clip" para uma instalação instantânea em todos os cabos de diâmetro de 7,5 a 9 mm. Ajustável no cabo, permitindo uma maior estabilidade e aplicações em fluidos de densidades muito variáveis

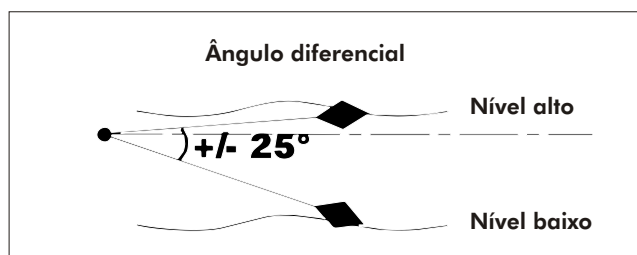
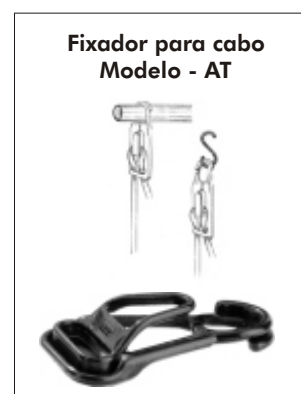
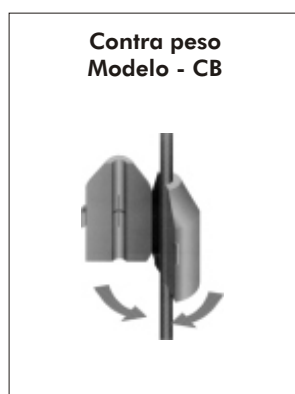
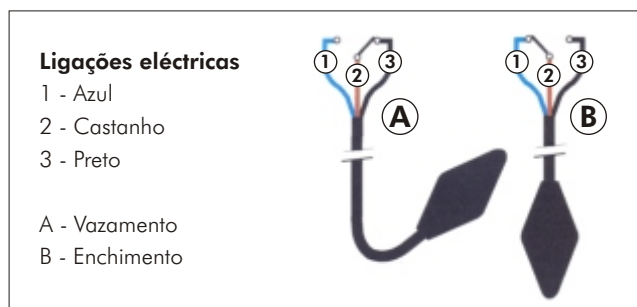
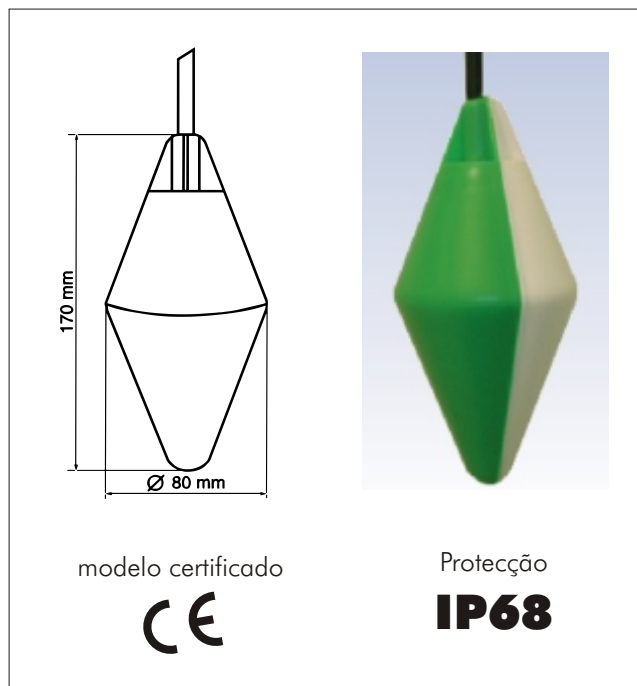
#### Modelo - CB

**Material** . . . . . polipropileno

**Peso** . . . . . 275 gr

#### FIXAÇÃO PARA O CABO Modelo - AT

Acessório aconselhável para todos os aparelhos em suspensão afim de evitar a deterioração dos cabos eléctricos.



# Série SOBA HYPALON - Interruptores de nível de boia da série ECOLÓGICA

## ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

**Hypalon** - Para aplicações difíceis onde os produtos são agressivos tais como, ácidos e outros produtos químicos possuímos os boiadores de nível inteiramente revestidos em hypalon vulcanizado sob pressão e com cabo também em **hypalon**. Pode ser fornecida uma tabela de resistência química do hypalon a diversos fluidos.

## APLICAÇÕES

- Bases e ácidos
- Produtos com óleos
- Misturas agressivas

## CARACTERÍSTICAS TÉCNICAS

**Modo de operação** . . . . . omnidireccional

**Pressão máxima** . . . . . 5,5 bar (55 mCA)

**Protecção** . . . . . IP68

**Cabo standard**

**Material** . . . . . **HYPALON**

**Dimensão** . . . . . 3x1 mm<sup>2</sup>

**Comprimentos** . . . **5 a 10 metros** (outros tamanhos opcionais)

**Densidade do fluido** . . . . . 0,80 até 1,10

**Temperatura máxima** . . . . . 95°C

**Caixa bi-cónica** . . . . . copolymer polypropylene + Hypalon

**Cor da caixa** . . . . . preto

**Poder de corte** . . . . . 16 (6)A (16A resistive 6A indutive)

**Tensão alimentação** 12, 24, 48 Vac/Vdc ou 250Vac-50/60Hz

**Interruptor reversível** . . . . . prata/contactos níquel

**Equipados com:**

### CONTRA-PESO ECOLÓGICO COM "CLIP"

Equipado com "Clip" para uma instalação instantânea em todos os cabos de diâmetro de 7,5 a 9 mm. Ajustável no cabo, permitindo uma maior estabilidade e aplicações em fluidos de densidades muito variáveis

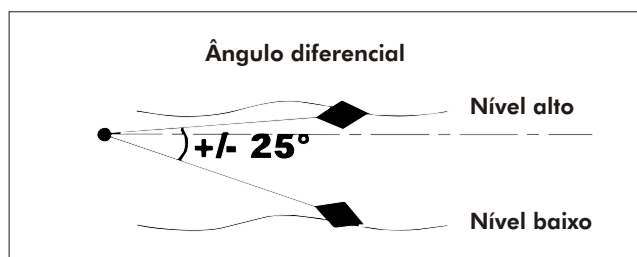
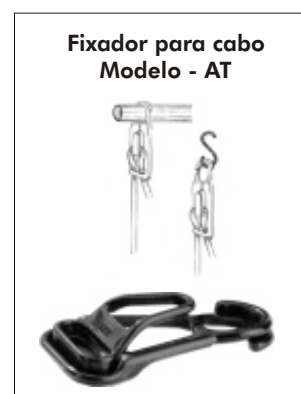
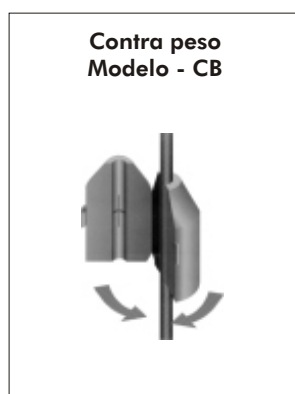
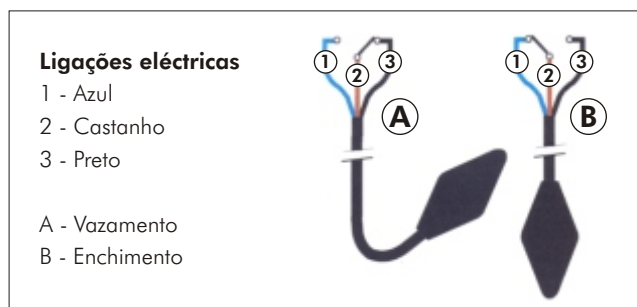
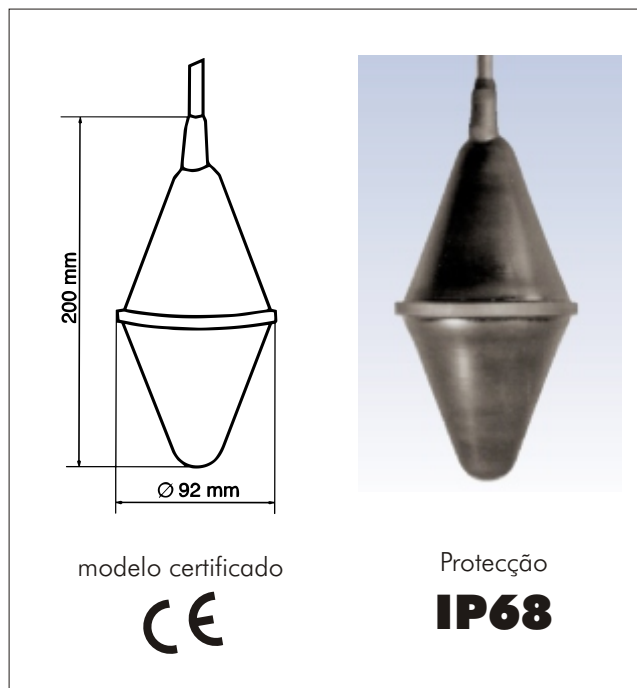
### Modelo - CB

**Material** . . . . . polipropileno

**Peso** . . . . . 275 gr

### FIXAÇÃO PARA O CABO Modelo - AT

Acessório aconselhável para todos os aparelhos em suspensão afim de evitar a deterioração dos cabos eléctricos.





# Série BIP STOP VR - Interruptores de nível de boia da série ECOLÓGICA

## ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

## APLICAÇÕES

Regulação de pequenas bombas

## CARACTERÍSTICAS TÉCNICAS

**Modo de operação** . . . . . omnidireccional

**Pressão máxima** . . . . . 5 bar (50 mCA)

**Protecção** . . . . . IP68

**Cabo standard**

**Material** . . . . . **NEOPRENE** ou **HYPALON**

**Dimensão** . . . . . 3x1mm2

**Comprimentos** . . . 3, 5, 10 e 20 m (outros tamanhos opcionais)

**Densidade do fluido** . . . . . 0,60 até 1,15

**Temperatura máxima**

85°C com cabo neoprene

95°C com cabo hypalon

**Caixa bi-cónica** . . . . . copolymer polypropylene

**Cor da caixa** . . . . . amarela

**Poder de corte** . . . . . 20(8)A (20A resistive 8A indutive)

**Tensão alimentação** . . . . . 250Vac-50/60Hz

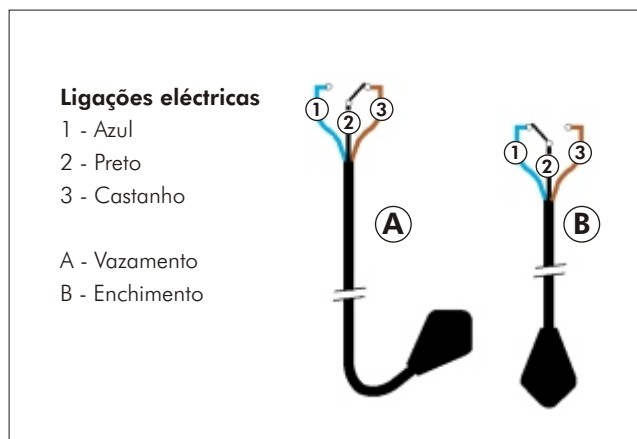
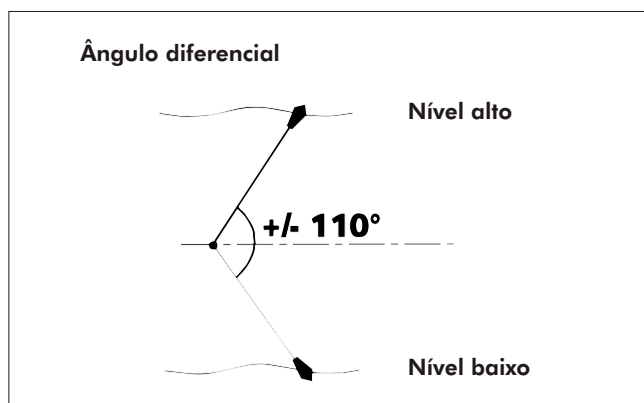
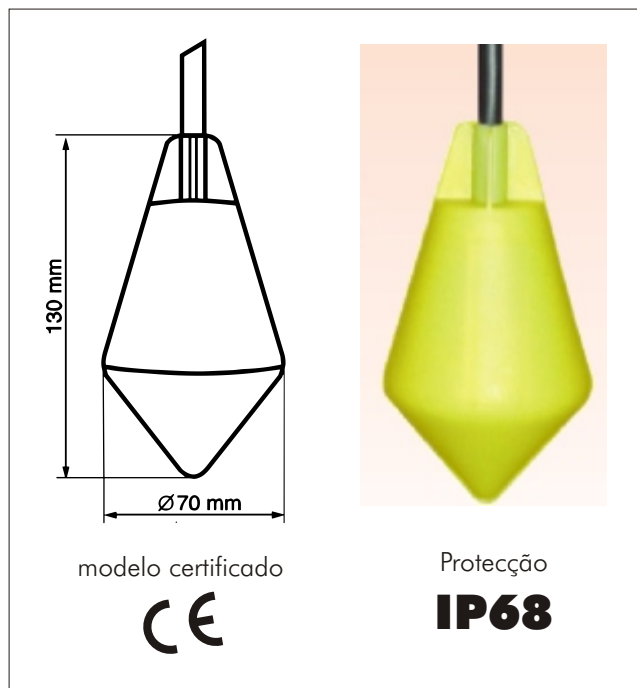
**Interruptor reversível** . . . . . prata/contactos óxido de cádmio

**Contra pesos disponíveis (opcionais)**

**Resina** . . . . . 175 e 250 gr

**Plástico** . . . . . 200 gr

**Clip** . . . . . 275 gr



# Série SOBA SMALL - Interruptores de nível de boia da série ECOLÓGICA

## ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

## APLICAÇÕES

Estações de bombagem individuais ou colectivas.

## CARACTERÍSTICAS TÉCNICAS

**Modo de operação** ..... omnidireccional

**Pressão máxima** ..... 5 bar (50 mCA)

**Protecção** ..... IP68

**Cabo standard**

**Material** ..... **NEOPRENE** ou **HYPALON**

**Dimensão** ..... 3x1mm<sup>2</sup>

**Comprimentos** ..... 5, 6, 10, 13, 15, 20 e 25 metros

(para outros comprimentos consulte-nos)

**Densidade do fluido** ..... 0,60 até 1,25

**Temperatura máxima**

85°C com cabo neoprene

95°C com cabo hypalon

**Caixa bi-cónica** ..... copolymer polypropylene

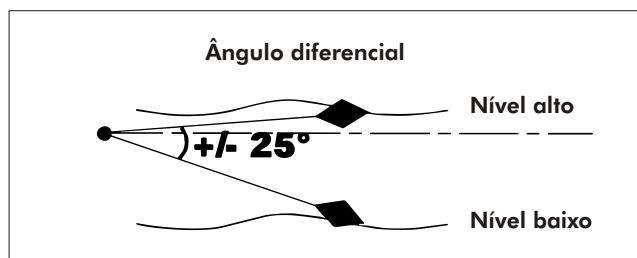
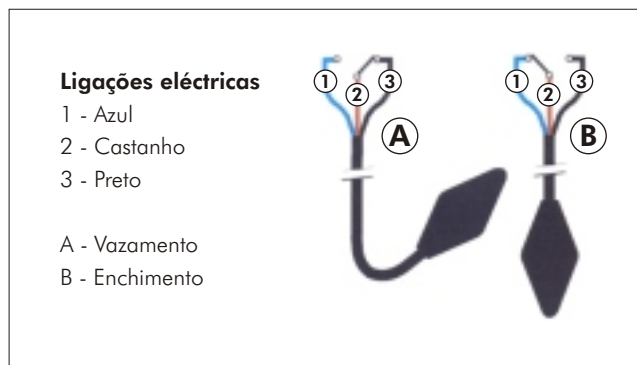
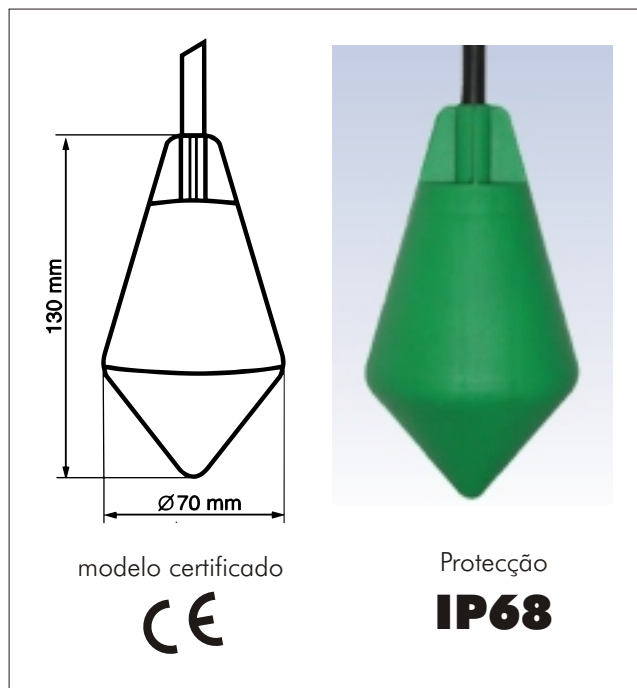
**Cor da caixa** ..... verde

**Poder de corte** ..... 16 (6) A (16A resistive 6A indutive)

**Tensão alimentação** 12, 24, 48 Vac / Vdc ou 250Vac-50/60Hz

**Interruptor reversível** ..... prata/contactos de níquel

**Contra peso - Resina** ..... 250 gr



## Série AT 120 VR - Interruptores de nível de boia da série ECOLÓGICA

### ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

### APLICAÇÕES

Todo o tipo de bombas para regulação de nível em líquidos movimentados com um só interruptor.

### CARACTERÍSTICAS TÉCNICAS

**Modo de operação** ..... omnidireccional

**Pressão máxima** ..... 5 bar (50 mCA)

**Protecção** ..... IP68

**Cabo standard**

**Material** ..... NEOPRENE ou HYPALON

**Dimensão** ..... 3x1mm<sup>2</sup>

**Comprimentos** ..... 1, 3, 5, 10, 20 metros

(para outros comprimentos consulte-nos)

**Densidade do fluido** ..... 0,70 até 1,15

**Temperatura máxima**

85°C com cabo neoprene

95°C com cabo hypalon

**Caixa bi-cónica** ..... copolymer polypropylene

**Cor da caixa** ..... vermelho

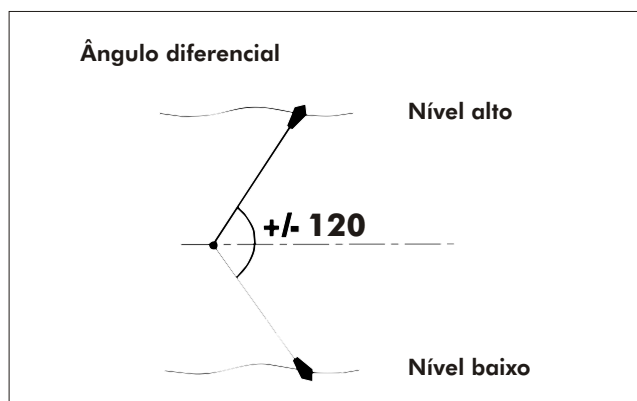
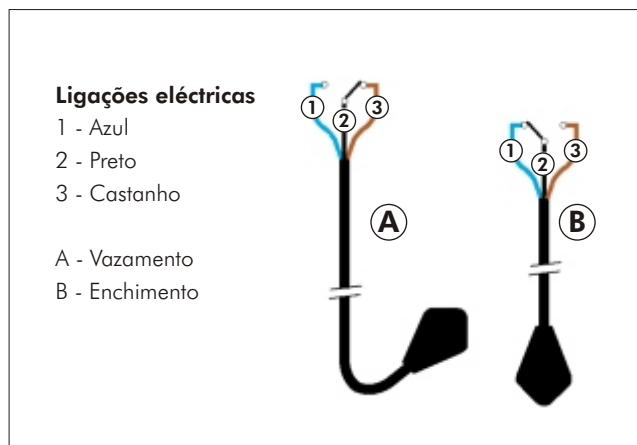
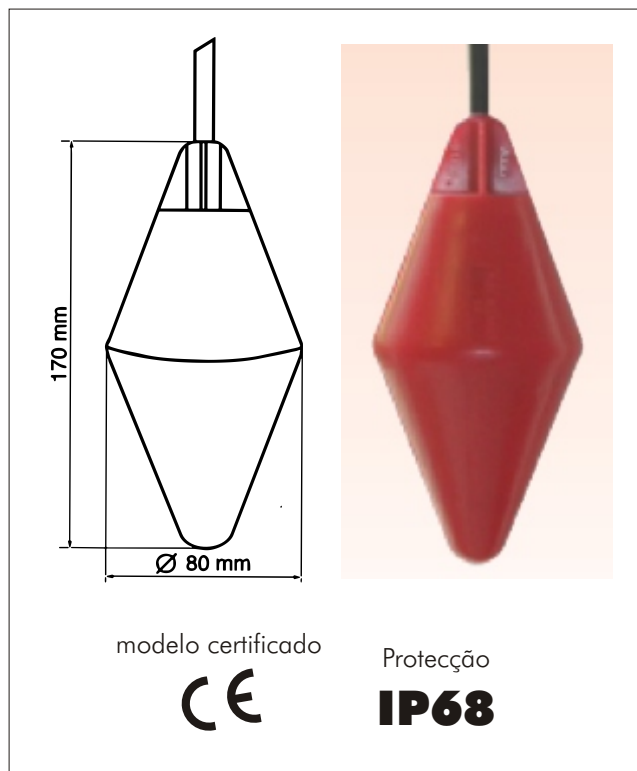
**Poder de corte** ..... 20 (8) A (20A resistive 8A indutive)

**Tensão alimentação** ..... 250Vac-50/60Hz

**Interruptor reversível** ..... prata/óxido de cádmio

**Contra peso - Resina** ..... 250 gr

Contra peso 275 gr



# Série ATS 165 VR - Interruptores de nível de boia da série ECOLÓGICA

## ECOLÓGICOS

Os diversos modelos de boiadores de nível existentes no mercado, utilizam normalmente o mercúrio que não é permitido em termos ecológicos.

Os boiadores de nível da nova linha especial "EC"-ECOLÓGICA, em que está excluído o referido metal.

## APLICAÇÕES

Regulação de nível em líquidos viscosos com um só interruptor.

## CARACTERÍSTICAS TÉCNICAS

**Modo de operação** ..... omnidireccional

**Pressão máxima** ..... 5 bar (50 mCA)

**Protecção** ..... IP68

**Cabo standard**

**Material** ..... NEOPRENE ou HYPALON

**Dimensão** ..... 3x1mm<sup>2</sup>

**Comprimentos** ..... 3, 5, 10 e 20 metros

(para outros comprimentos consulte-nos)

**Densidade do fluido** ..... 0,70 até 1,10

**Temperatura máxima**

85°C com cabo neoprene

95°C com cabo hypalon

**Caixa bi-cónica** ..... copolymer polypropylene

**Cor da caixa** ..... vermelho/amarelo

**Poder de corte** ..... 16 (6) A (16A resistive 6A indutive)

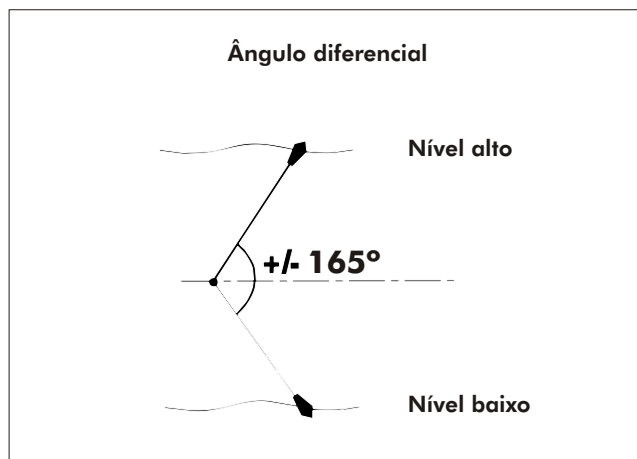
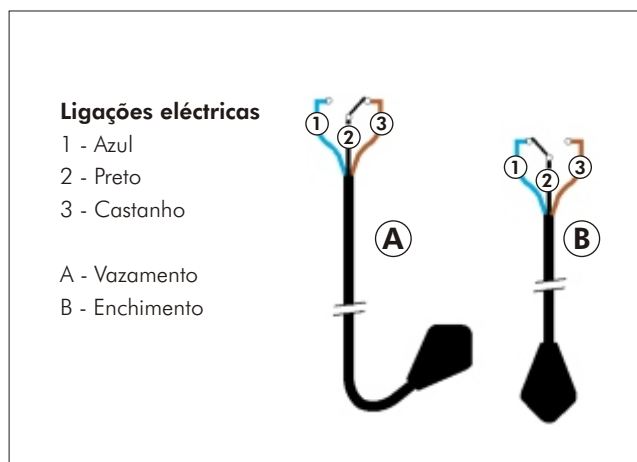
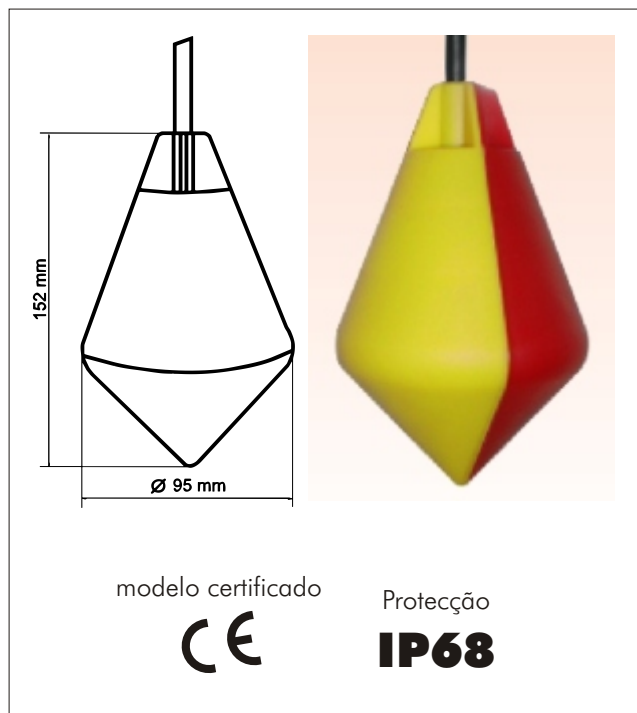
**Tensão alimentação** . . . 12, 24, 48 Vac / Vdc, 250Vac-50/60Hz

**Interruptor reversível** ..... prata/contactos níquel

**Contra peso disponíveis (opcionais)**

**Resina** ..... 250 gr

**Clip** ..... 275 gr





## Série AT - Reguladores de nível electrónicos por eléctrodos

### APLICAÇÃO

A série **AT** é utilizada no controlo de nível em: tanques, poços, reservatórios, etc.

Esta vasta gama de aparelhos de regulação automática electrónica por sondas de nível para líquidos condutores, é essencialmente destinada ao arranque e paragem de bombas submersíveis ou outras; encerramento de circuitos eléctricos (ex. electroválvulas); protecções de falta de água; reenchimento automático, etc.

Consoante os modelos e aplicações pretendidas, são utilizadas três ou mais sondas, que podem estar afastadas do dispositivo de comando até o máximo de 1000 metros.

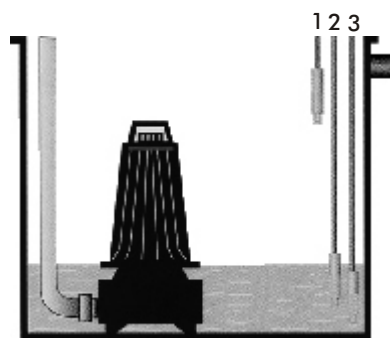


### MODELOS DISPONÍVEIS

● **Modelo de alta sensibilidade: AT 10 B** até 70 kOhm, usado no controlo de líquidos de pouca condutibilidade, por exemplo: águas pluviais. **Número máximo de sondas 3.**

● **Modelo de sensibilidade regulável: AT 50 A** até 100 kOhm, garantem maior segurança no controlo de líquidos com condutibilidade variada. O ajuste de sensibilidade é feito através de um potenciómetro. **Número máximo de sondas 3.**

● **Modelo de sensibilidade média: AT 100 A** de 0 a 10 kOhm, permite várias aplicações com um só aparelho, por exemplo: regulação de 2 bombas e alarme de máximo ou mínimo. **Número máximo de sondas 7.**



- 1 - Sonda de nível máximo
- 2 - Sonda de nível mínimo
- 3 - Sonda comum

### Tensão de alimentação

**AT 10 B; AT 100 A** ..... 230Vac  
**AT 50A** (possibilidade de selecção) ..... 12/24 Vcc/220 Vac

**Montagem** ..... calha DIN

**Tempo de resposta** ..... 100 ms

**Corrente nas sondas** ..... 1mA

### Tensão nas sondas

**AT 10 B; AT 50 A** ..... 10V  
**AT 100 A** ..... 24V

**Poder de corte nos contactos** ..... 5A - 240V

**Material das sondas** ..... aço inox AISI 316

**Cabo das sondas** ..... PVC 1x1,5 mm<sup>2</sup>

### Consumo

**AT 10 B** ..... 3 VA  
**AT 50 A** ..... 5 VA  
**AT 100 A** ..... 10 VA

**Temperatura de funcionamento** ..... -10/55°C

Modelo	Máximo Nº de sondas	Descrição
<b>AT 10 B</b>		1 comum
<b>AT 50 A</b>	<b>3</b>	1 nível baixo 1 nível alto
<b>AT 100 A</b>	<b>7</b>	2 comuns 1 nível baixo 1 nível alto 1 On/Off 1 alarme baixo 1 alarme alto

# Série P4 - Controlador de nível por eléctrodos

O controlador ideal para o controle de dois níveis ou alarme de nível alto ou baixo com uma simples unidade.

Apropriado para uma grande variedade de líquidos, condutivos, exemplo: água, ácidos, alcalinos, leite, bebidas, detergentes, vinho, etc.

Instalação simples e de baixo custo.

Opcional intrinsecamente seguro.



## Características técnicas

**MODELO** . . . . . **P4**

**Caixa** . . . . . polypropileno

**Montagem** . . . . . base 11 pinos DIN

### Alimentação

230V 50/60Hz

24V, 48V ou 110V 40/60Hz (opcional)

**Consumo** . . . . . 6 VA máx.

**Entrada** . . . . . até 2 níveis de eléctrodos + terra

**Temperatura ambiente** . . . . . -10/60°C

### Sensibilidade

100 até 18.000 ohms ajustável (aprox. 0 até 10 no mostrador).

Opcional até 500.000 ohms para água muito pura.

**Sensibilidade diferencial** . . . . . melhor do que 5% da sensibilidade ajustada

**Saída relé** . . . . . DPDT contacto livre 250V ac, 4A resistivo

### Indicação

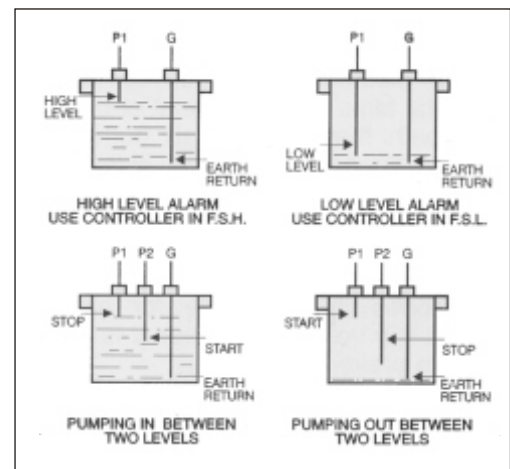
LED vermelho (relé energizado)

LED's verde (fail safe e estado da alimentação)

### Distâncias entre controlador e eléctrodos

100 metros nominal mas distâncias maiores são passíveis para líquidos com alta condutividade.

## Aplicações típicas



## Série HPE - Porta-eléctrodos de nível

### DESCRIÇÃO

Porta-eléctrodos de nível para líquidos condutores, possuindo a grande vantagem de os eléctrodos poderem ser adquiridos pelo cliente visto ser apenas um simples varão de aço.

**MODELO.** . . . . . **HPE7/P**

**Caixa** . . . . . polypropileno

**Temperatura máxima** . . . . . 120°C

**Pressão** . . . . . 300 psi (21 bar a 20°C)

**Ligação ao processo** . . . . . rosca de 3/4" BSPM

### Eléctrodos:

varão de aço inox DN 8 mm. Comprimento máx. 3000 mm .  
Para comprimentos superiores aconselha-se a utilização de suportes intermédios a fim de evitar as possíveis turbulências.

Normalmente o varão não é de nosso fornecimento, todavia caso pretenda poderemos fornecer o porta eléctrodo com o respectivo eléctrodo até 3000 mm.



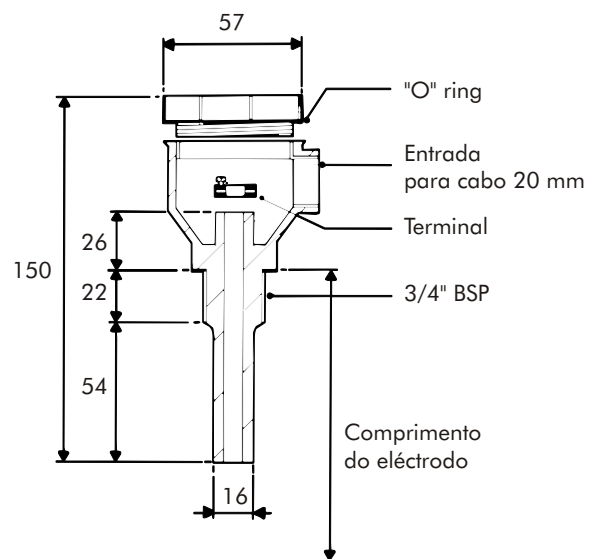
Eléctrodo

**HPE7/P**



### NOTA:

Possuímos também uma vasta gama de porta electrodos do **tipo múltiplo ou intrinsecamente seguros.**



## Série "S" - Interruptor de nível vibratório para líquidos

### Construção

**caixa** ..... aço inox 304  
**sonda** ..... aço inox 316L

### Alimentação

20 - 255V ac  
 12 - 55V dc

### Saída

**2 fios** ..... ac ou dc  
**3 fios** ..... PNP/NPN

### Temperatura

**Ambiente** ..... 40°C/70°C  
**Processo** ..... -40°C/120°C

**Pressão máxima** ..... -1 até 40 bar

**Viscosidade máxima** ..... 10 000 mm<sup>2</sup>/s (cSt)

**Comprimento de inserção** ... 47mm, 100 mm ... 3 metros

**Protecção** ..... IP 67

**Ligação ao processo** ..... G1" (1" BSP standard)

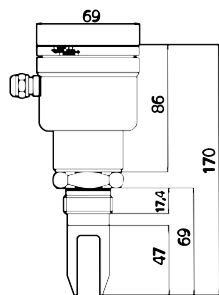
outras ver construção de modelos

**Indicação do interruptor** ..... por LED

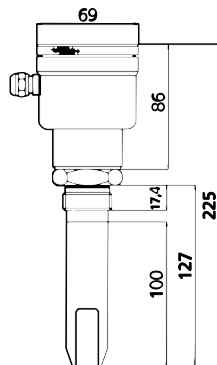


### DIMENSÕES

Versão curta (47 mm)

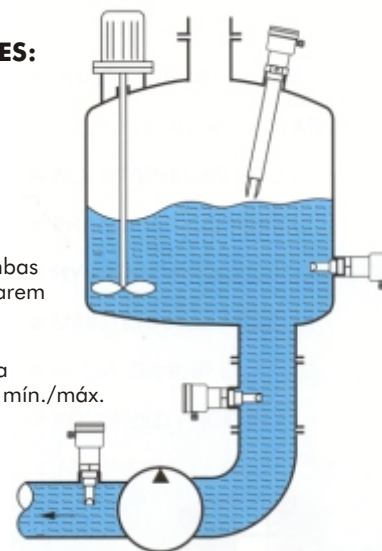


Versão standard (100 mm)



### EXEMPLOS DE APLICAÇÕES:

- Nível máximo em tanques
- Nível mínimo em tanques
- Protecção de bombas para não trabalharem em vazio
- Versão longa para detecção de nível mín./máx.



VSS - [ ] - [ ] - [ ] - [ ]

Ligações ao processo	Cód.	Comprim. inserção	Cód.	Saída	Cód.	Opções	Cód.
1" BSP (standard)	<b>S</b>	Pequeno (47 mm)	<b>47</b>	2 - fios ac	<b>1</b>	Altamente polido Ra<0,5 m	<b>P</b>
1" NPT	<b>N</b>	Standard (100 mm)	<b>100</b>	3 - fios PNP/NPN	<b>3</b>	Revestido Halar (ECTFE)	<b>E</b>
Milk coupling DN40 (DIN11851)	<b>M40</b>	0,2 até 3 metros	<b>0,2...3</b>	2 - fios dc	<b>6</b>	Intrinsecamente seguro Eex ia Ilc T4-T6	<b>IS</b>
Milk coupling DN50	<b>M50</b>			2 - fios Ex	<b>8</b>		
Tri clamp (1 1/2" ou 2")*	<b>L2"</b>						
Flange (especifique tamanho)**	<b>F</b>						
Ligações especiais	<b>X</b>						



# Série "C" - Interruptor de nível vibratório compacto para líquidos

## Construção

**caixa** ..... aço inox 316  
**sonda** ..... aço inox 316L

## Alimentação

20 - 255V ac  
 12 - 55V dc

## Saída

**2 fios** ..... ac ou dc  
**3 fios** ..... PNP/NPN

## Temperatura

**Ambiente** ..... 40°C/70°C  
**Processo** ..... -40°C/120°C

**Pressão máxima** ..... -1 até 40 bar

**Viscosidade máxima** ..... 10 000 mm<sup>2</sup>/s (cSt)

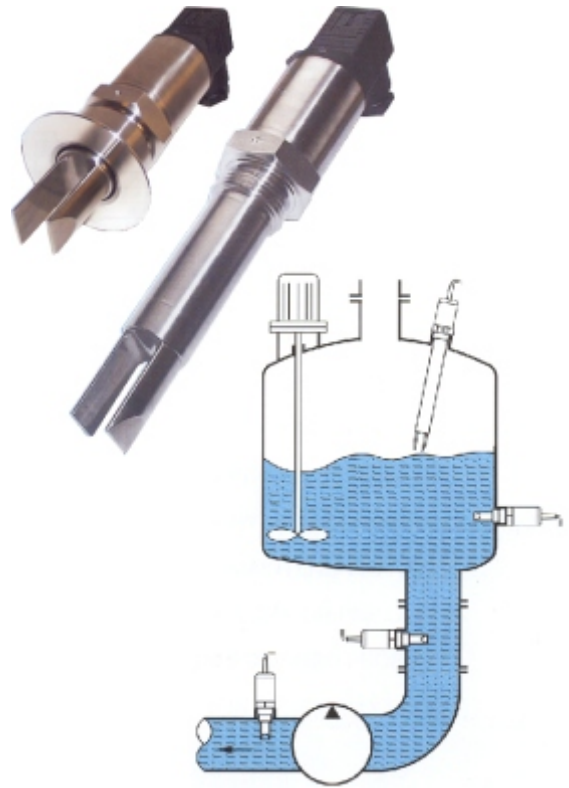
**Comprimento de inserção** ... 47mm, 100mm ... 3 metros

## Protecção

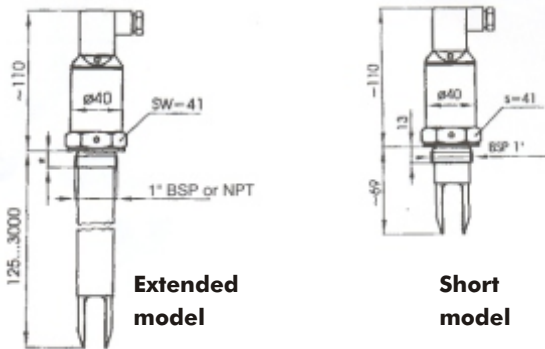
**IP65** (ficha)  
**IP68** (cabo)

**Ligação ao processo** ..... G1" (1" BSP standard)  
 outras ver construção

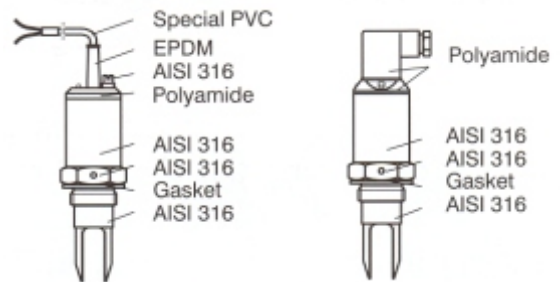
**Indicação do interruptor** ..... por LED



## DIMENSÕES



## MATERIAIS



VSC - [ ] - [ ] - [ ] - [ ]

Ligações ao processo	Cód.	Comprim. inserção	Cód.	Saída	Cód.	Opções	Cód.
1" BSP (standard)	<b>S</b>	Pequeno (47 mm)	<b>47</b>	2 - fios ac com ficha (IP65)	<b>1</b>	Altamente polido Ra<0,5 m	<b>P</b>
1" NPT	<b>N</b>	Standard ( 100 mm)	<b>100</b>	2 - fios ac com cabo (IP68)	<b>2</b>	Revestido Halar (ECTFE)	<b>E</b>
Milk coupling DN40 (DIN11851)	<b>M40</b>	0,2 até 3 metros	<b>0,2...3</b>	3 - fios PNP/NPN com ficha	<b>3</b>	Intrinsecamente seguro Eex ia Ilc T4-T6	<b>IS</b>
Milk coupling DN50	<b>M50</b>			3 - fios PNP/NPN com cabo	<b>4</b>	Conversor Exi tipo JDT-131	
Tri clamp (1 1/2" ou 2")*	<b>L2"</b>			2 - fios dc com ficha	<b>6</b>	montagem: DIN rail	<b>CE</b>
Flange (especifique tamanho)**	<b>F</b>			2 - fios dc com cabo	<b>7</b>	Nipple soldar 1" BSP diâmetro 65 mm	<b>C</b>
Ligações especiais	<b>X</b>			2 - fios Ex com ficha	<b>8</b>	Nipple ajustável G 1 1/2"	
				2 - fios Ex com cabo	<b>9</b>	para extensões (pressão máx. 6 bar)	<b>N</b>

## Série LZ10 - Interruptor de nível do tipo vibratório

### VANTAGENS

- Interruptor de nível simples e prático para nível alto ou baixo totalmente construído em plástico para ambientes corrosivos.
- É uma escolha excelente para aplicações com líquidos, nomeadamente hidróxido de sódio, salmouras, soluções de sulfato de cobre assim como para sólidos leves incluindo grãos.
- Com a solução de uma alta protecção IP68 pode ser submersível o que traduz-se na possibilidade de montagem através das paredes dos tanques ou mesmo dentro dos tanques.
- Também disponível com saída FET ou com caixa de terminais da série "SWITCH PRO".

**Vibração - frequência** ..... 400 Hz

**Montagem** ..... através da parede dos tanques ou dentro dos tanques, uma vez que é submersível

**Construção** ..... plástica para ambientes corrosivos

**Sensor** ..... construção PP/Ryton, comprimento 57 mm

**Precisão** ..... +/- 1 mm (em água)

**Repetibilidade** ..... +/- 0,5 mm (em água)

**Alimentação** ..... 12-36 V dc

**Relé de saída** ..... 60 V dc / V ac, 1A, 25 mA

### Estado do interruptor

**seleccionável** ..... normalmente aberto ou fechado

**Gamas de temperatura** ..... -40/90°C

**Pressão máxima** ..... 10 bar (25°C)

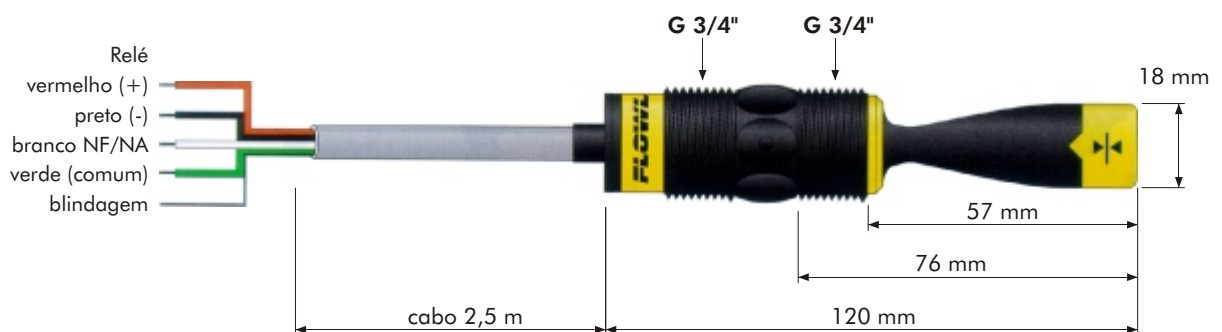
**Cabo** ..... 2,5 metros (4 fios)

**Protecção** ..... IP 68



SWITCH PRO

MODELO	Ligação ao processo
LZ10-1425	2 x G 3/4"



## Série LP50

### Interruptor de nível do tipo rádio frequência sem contacto com o fluido

#### ● VANTAGENS

- Interruptor nível simples e prático sem contacto com o fluido, para alarme alto e baixo.
- É uma excelente escolha para líquidos limpos e condutivos tais como: água deionizada, ácido nítrico ou ácido hidrófluórico.
- Rápida e fácil instalação nas paredes exteriores de tanques de plástico ou fibra de vidro.
- Detecção de líquido em depósitos não metálicos até 25,4mm (1") de espessura.
- Saída por relé com a possibilidade de escolha do contacto (NA ou NF).
- Também disponível na versão intrinsecamente seguro aprovado para utilização na: classe I, grupos A, B, C e D; classe II, grupo E, F e G; classe III.

**Montagem** . . . . . exterior sem contacto com o fluido nas paredes dos tanques através de acessório de montagem em PE (por colagem com adesivo ou soldadura térmica).

**Construção** . . . . . plástica para ambientes corrosivos

**Caixa** . . . . . polysulfone

**Precisão** . . . . . +/- 1 mm (em água)

**Repetibilidade** . . . . . +/- 0,5 mm (em água)

**Gama condutividade** . . . . . > 100µΩ

**Gama dialéctrica** . . . . . > 100 constants

**Compatibilidade dos tanques** . . . . . plástico ou fibra de vidro

**Espessura do tanque** . . . . . máx 25,4 mm (1")

**Alimentação** . . . . . 12-36 V dc

**Relé de saída** . . . . . 60 V dc / V ac, 1A

**Consumo do relé** . . . . . 25 mA

**Estado do relé** . . . . . seleccionável (NA ou NF)

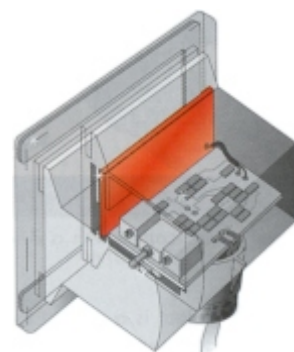
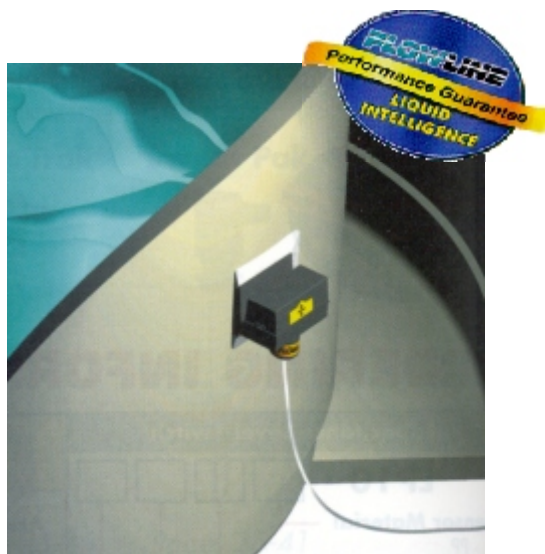
**Indicador de calibração** . . . . . LED

**Gamas de temperatura** . . . . . -40/90°C

**Protecção** . . . . . NEMA 4X (IP65)

**Ligação eléctrica** . . . . . 1/2" NPT

**Cabo** . . . . . 2,5 metros (4 fios)



**IP65**

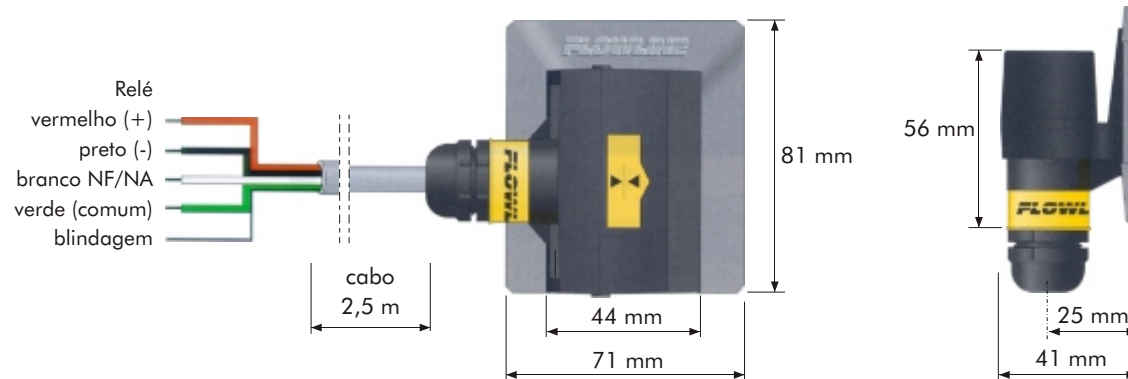


**MODELO**

**Montagem**

**LP50-6005**

nas paredes exteriores dos tanques



# Série LA16 - Interruptor nível ultrasónico para tanques pequenos (1,8m)

## VANTAGENS

- Com a tecnologia de não contacto com o produto este interruptor de nível (**de baixo preço**) é a escolha excelente para todas as aplicações.
- O seu desenho compacto permite a aplicação em tanques pequenos.
- Preciso e económico é a escolha perfeita para o controlo de nível.
- O RICORELAY é especialmente destinado a aplicações em fluidos sujos, corrosivos, etc. com set-points ajustáveis pelo utilizador.

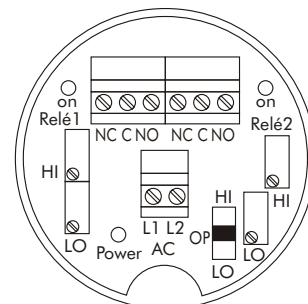
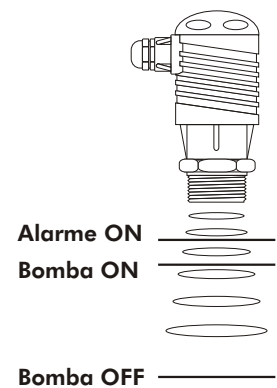


- Montagem** ..... no topo
- Relés** ..... 2xSPDT (250V ac, 10A)
- Set-points** ..... 2 por relé (ajuste por potenciómetro)
- Precisão** ..... +/- 0,25%
- Histeresis** ..... ajustável em toda a gama
- Resolução** ..... +/- 3 mm
- Gama de temperatura** ..... -40/60°C
- Compensação da temperatura** ..... automática
- Pressão** ..... 2 bar (25°C)
- Materiais**
- caixa ..... polipropileno (PP)
- sonda ..... PVDF
- empanque da rosca ..... viton
- Ligação eléctrica** ..... 1/2" NPT, com buçim
- Frequência** ..... 83 kHz
- Pulsação** ..... 3 por segundo
- Feixe** ..... 8° cónico
- Indicação LED** ..... estado alimentação, relé e falha
- Alimentação** ..... 18-30 V dc
- Protecção** ..... IP65

### ALARMES ALTO E BAIXO



### ENCHIMENTO AUTOMÁTICO E ALARME ALTO



Modelo	Gama	Ligação ao processo
LA16-5861	9 cm / 1,8 m	G 3/4"



## Série 34000

### Indicadores de nível magnéticos

**Material da câmara** ..... aço inox 316L

**Material do flutuador** ..... aço, inox 316L

**Material do rail de indicação** ..... Makrolon,  
temperatura máxima 150°C

**Pressão máxima de operação** ..... 50 bar g

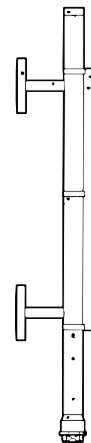
**Densidade mínima** ..... 0,6 g/cm<sup>3</sup>

**Temperatura máxima de operação** ..... 350°C

**Ligação ao processo** ..... flangeado DN15 até 32 PN40  
de acordo com DIN 2527 ou ISO PN 50

**Certificado de material** . . . de acordo c/ EN10204-3.1B

**Modelo 34000**



## Série 26410

### Indicadores de nível magnéticos de alta pressão (PN 100/400)

**Partes molhadas** ..... DIN 1.4435 (AISI 316L)

**Material do rail de indicação** ..... Makrolon

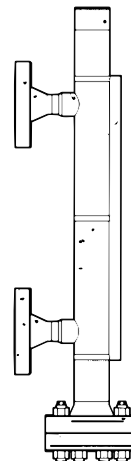
**Pressão de operação** ..... PN 100/400

**Densidade mínima** ..... 0,6 g/cm<sup>3</sup>

**Temperatura máxima de operação** ..... 400°C

**Ligação ao processo** ..... roscada, soldada ou flangeada

**Modelo 26410**



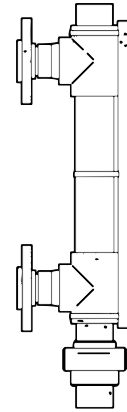
## Indicação remota/transmissores

Opcionalmente podem ser fornecidos transmissores para montagem directa nos indicadores com **SINAL DE SAÍDA 4-20 mA**.

## Série 25XXX - Indicadores de nível magnéticos, plásticos

**Partes molhadas** ..... Polipropileno, PVC ou PVDF  
**Material do rail de indicação** ..... Makrolon  
**Pressão de operação** ..... PN 2,5 ou PN 10  
**Densidade mínima** ..... 0,75 g/cm<sup>3</sup>  
**Temperatura máxima de operação** ..... 60 / 140°C  
**Ligações** ..... roscadas ou flangeadas

**Modelo básico 25XXX**

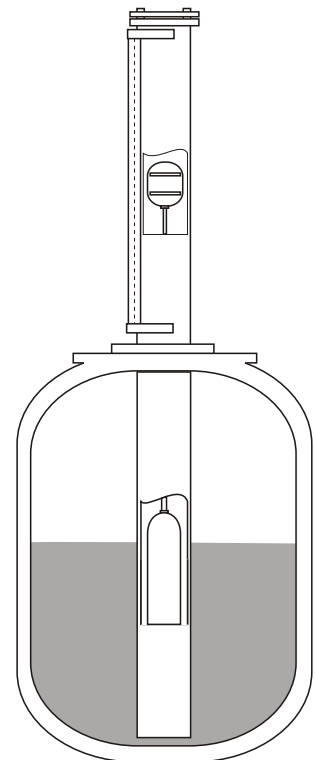


**Nota:** Outras unidades disponíveis construídas em PTFE/PFA

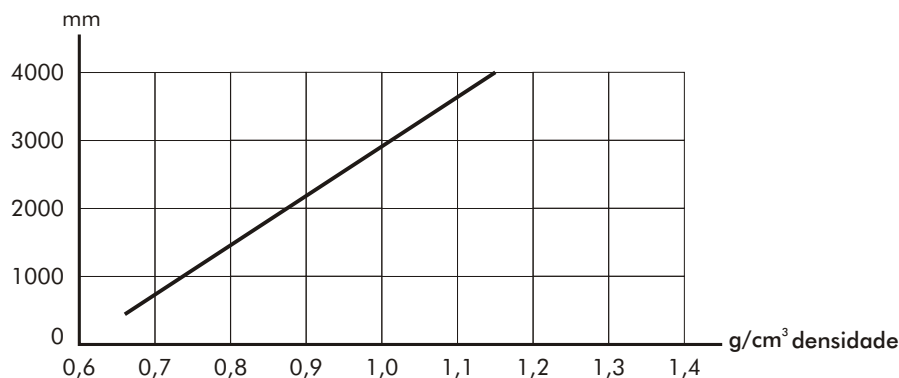
## Série 23XXX - Indicadores de nível magnéticos, montagem de TOPO

**Partes molhadas** ..... aço inox 1.4435 (AISI 316L) ou plástico  
**Material do rail de indicação** ..... Makrolon  
**Pressão de operação** ..... PN 2,5 até PN 16  
**Densidade mínima** ..... conforme gráfico  
**Temperatura máxima de operação** ..... 60 / 400°C  
**Ligações** ..... Flangeada DIN 2576 / PN 10 / DN 50 - DN 125

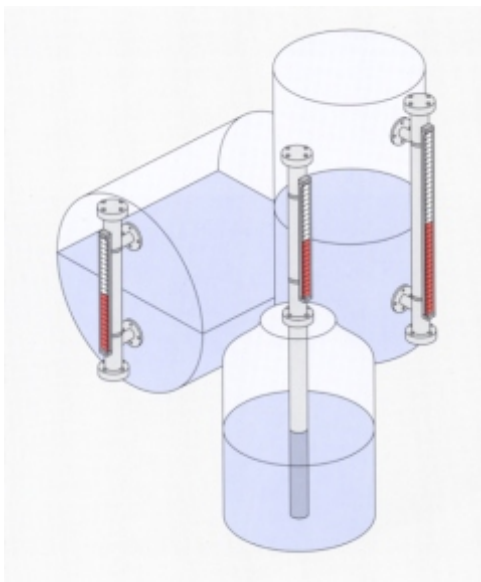
**Modelo básico 23XXX**



comprimento do tubo de extensão



## Características gerais dos indicadores de nível magnéticos



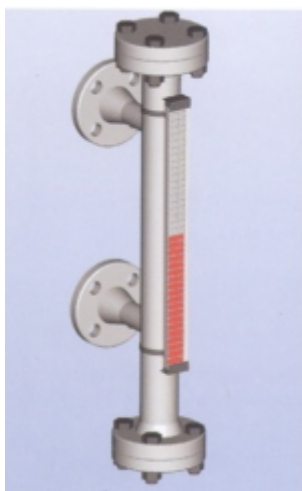
Os indicadores de nível podem ser montados de diversas formas.



Uma das soluções para aplicações **petroquímicas**

### Diferentes tipos de execução

Execução - A



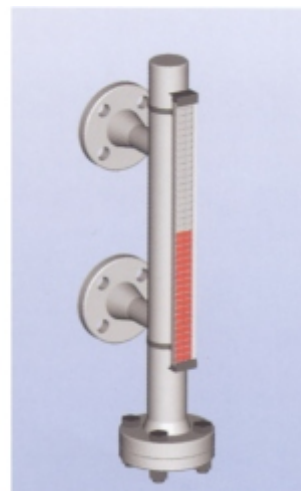
Execução - B



Execução - K

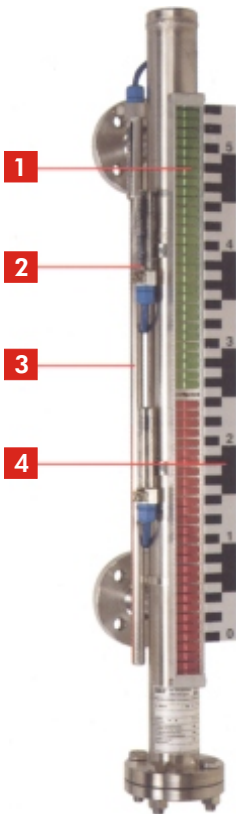


Execução - O

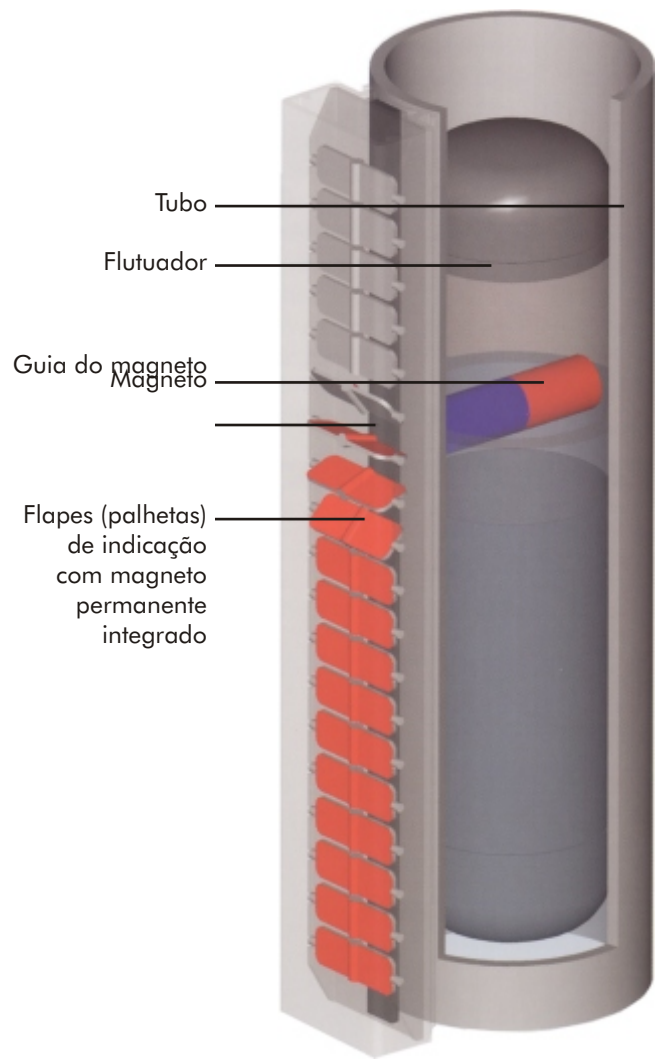


## Características gerais dos indicadores de nível magnéticos

**Railes de indicação**  
com flapes (palhetas)  
de diferentes cores



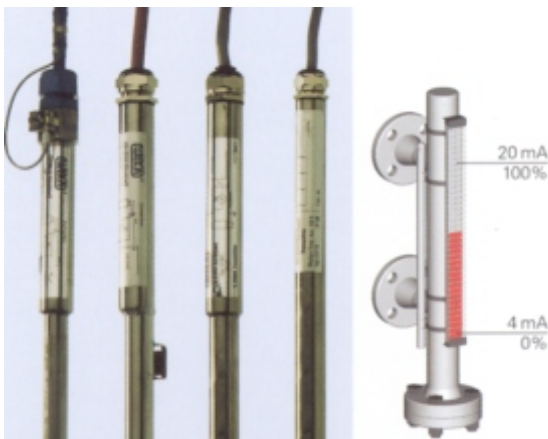
**Réguas de medida**  
Opcionais caso o  
cliente necessite  
de indicação em  
centímetros



### 2 Interruptores magnéticos com várias versões



### 3 Transmissores que fazem dos indicadores visuais um transmissor de nível



Diferentes tipos de **flutuadores**  
para diferentes tipos de aplicações







**SISTIMETRA**  
Porto

Rua Particular de São Gemil, 85  
São Gemil - Águas Santas - Maia  
4425-164 ÁGUAS SANTAS MAI  
telef. 229 774 470 - telefax 229 724 551  
e-mail [sistimetra@sistimetra.pt](mailto:sistimetra@sistimetra.pt) - [www.sistimetra.pt](http://www.sistimetra.pt)



**CONTIMETRA**  
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e-mail [contimetra@contimetra.com](mailto:contimetra@contimetra.com) - [www.contimetra.com](http://www.contimetra.com)

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## Série A

### válvulas normalmente fechadas ou abertas desde 3/8" até 3"

Aplicação: água, água quente e vapor

Ligações G	Orifício mm	Factores caudal m <sup>3</sup> /h		Pressão diferencial admissível (bar)			Temperatura máx. admissível do fluido °C	Material da sede	MODELO VÁLVULA
		kv	Qmax	Mín.	Máximo				
					DC	AC			
<b>Normalmente FECHADAS, para ÁGUA</b>									
3/8"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7321BBG3TN00</b>
1/2"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7321BBG4TN00</b>
3/4"	20	8.40	8.40	0.1	20	20	90	NBR	<b>7321BBG53N00</b>
1"	25	9.60	9.60	0.1	20	20	90	NBR	<b>7321BBG64N00</b>
1 1/4"	35	25.20	25.20	0.1	10	10	90	NBR	<b>7321BBG78N00</b>
1 1/2"	40	30,00	30,00	0.1	10	10	90	NBR	<b>7321BBG88N00</b>
2"	50	37.20	37.20	0.1	10	10	90	NBR	<b>7321BBG99N00</b>
<b>Normalmente FECHADAS, para ÁGUA, comando manual</b>									
3/8"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7321BBG3TNM0</b>
1/2"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7321BBG4TNM0</b>
3/4"	20	8.40	8.40	0.1	20	20	90	NBR	<b>7321BBG53NM0</b>
1"	25	9.60	9.60	0.1	20	20	90	NBR	<b>7321BBG64NM0</b>
1 1/4"	35	25.20	25.20	0.1	10	10	90	NBR	<b>7321BBG78NM0</b>
1 1/2"	40	30,00	30,00	0.1	10	10	90	NBR	<b>7321BBG88NM0</b>
2"	50	37.20	37.20	0.1	10	10	90	NBR	<b>7321BBG99NM0</b>
<b>Normalmente FECHADAS, para ÁGUA, comando manual e de velocidade</b>									
3/4"	20	8.40	8.40	0.1	10	10	90	NBR	<b>7321BBG53NM1</b>
1"	25	9.60	9.60	0.1	10	10	90	NBR	<b>7321BBG64NM1</b>
1 1/4"	35	25.20	25.20	0.1	5	5	90	NBR	<b>7321BBG78NM1</b>
1 1/2"	40	30.00	30.00	0.1	5	5	90	NBR	<b>7321BBG88NM1</b>
2"	50	37.20	37.20	0.1	5	5	90	NBR	<b>7321BBG99NM1</b>
2 1/2"	65	63.00	63.00	0.5	10	10	90	NBR	<b>7321BBGCBNM1</b>
3"	75	83.00	83.00	0.5	10	10	90	NBR	<b>7321BBGDCNM1</b>
<b>Normalmente FECHADAS, para ÁGUA QUENTE E VAPOR</b>									
3/8"	13	3.00	3.00	0.1	20	20	140	EPDM	<b>7321BBG3TE00</b>
1/2"	13	3.00	3.00	0.1	20	20	140	EPDM	<b>7321BBG4TE00</b>
3/4"	20	8.40	8.40	0.1	20	20	140	EPDM	<b>7321BBG53E00</b>
1"	25	9,60	9,60	0.1	20	20	140	EPDM	<b>7321BBG64E00</b>
1 1/4"	35	25.20	25.20	0.1	10	10	140	EPDM	<b>7321BBG78E00</b>
1 1/2"	40	30.00	30.00	0.1	10	10	140	EPDM	<b>7321BBG88E00</b>
2"	50	37.20	37.20	0.1	10	10	140	EPDM	<b>7321BBG99E00</b>
<b>Normalmente ABERTAS, para ÁGUA</b>									
3/8"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7322BBG3TN00</b>
1/2"	13	3.00	3.00	0.1	20	20	90	NBR	<b>7322BBG4TN00</b>
3/4"	20	8.40	8.40	0.1	20	20	90	NBR	<b>7322BBG53N00</b>
1"	25	9.60	9.60	0.1	20	20	90	NBR	<b>7322BBG64N00</b>
1 1/4"	35	25.20	25.20	0.1	10	10	90	NBR	<b>7322BBG78N00</b>
1 1/2"	40	30.00	30.00	0.1	10	10	90	NBR	<b>7322BBG88N00</b>
2"	50	37.20	37.20	0.1	10	10	90	NBR	<b>7322BBG99N00</b>

## Série A - ESPECIFICAÇÕES TÉCNICAS

### DESCRIÇÃO GERAL

As válvulas da **série A** são operadas por diafragma e requerem para funcionar uma pressão diferencial mínima.

### APLICAÇÕES

As válvulas da **série A** são utilizadas em aplicações gerais com altos caudais e fluidos como: água, água quente e vapor, desde que os fluidos sejam compatíveis com os materiais de construção.

**Aplicações típicas** podem encontrar-se em: sistemas de distribuição de águas, irrigação, máquinas de lavar, máquinas de lavar carros, autoclaves, sistemas de arrefecimento de máquinas, etc.

### TEMPERATURAS

Temperatura ambiente ..... -10/+50°C  
 Temperatura do fluido admissível ..... até +140°C

### PARTES ELÉCTRICAS

Veja descrição detalhada nas páginas B.9 e B.10

### ESPECIFICAÇÕES DOS MATERIAIS

**Corpo** ..... latão forjado OT58 UNI5705  
**Obturador** ..... aço inox AISI 430 F  
**Mola** ..... aço inox AISI 302  
**Sedes** ..... NBR (Buna-N) ou EPDM  
**Anel** ..... cobre

### INSTALAÇÃO

As válvulas podem ser montadas em qualquer posição. É todavia recomendado instalá-las com a bobina na posição vertical, por cima do corpo.

BOBINA	Classe protecção/ temperatura	Potência (quente)		Modelo	Ligação	Caixa	Temperatura ambiente °C		Fig.
		DC	AC				Min.	Máx.	
32 mm (Std)	<b>F</b>	<b>9W</b>	<b>8W</b>	<b>DZ02 (481865)</b>	<b>p/ Ficha DIN</b>	<b>N1</b>	<b>-40</b>	<b>50</b>	<b>1</b>
	F	9W	8W	DZ03 (482725)	c/ Ficha DIN	N1	-40	50	1
	H	9W	8W	DZ04 (492453)	p/ Ficha DIN	N1	-40	80	1
	H	9W	8W	DZ05 (492726)	c/ Ficha DIN	N1	-40	80	1
	<b>F 50/60Hz</b>	-	<b>9W</b>	<b>DZ06 (483510)</b>	<b>p/ Ficha DIN</b>	<b>N1</b>	<b>-40</b>	<b>50</b>	<b>1</b>
	F 50/60Hz	-	9W	DZ07 (482635)	c/ Ficha DIN	N1	-40	50	1
	EE xm IIT4	9w	8 W	<b>DZ08 (492425)</b>	<b>p/ Ficha DIN</b>	<b>N1</b>	<b>-40</b>	<b>80</b>	<b>1</b>
	<b>H</b>	<b>14W</b>	<b>14W</b>	HZ05 (492670)	C/Cabo 2000 mm	00	-25	40	5
	H	14W	14W	DZ09 (492727)	c/ Ficha DIN	N1	-40	80	1
37 mm	H (EExdm IICT4)	8W	8W	- (495905)	p/ ligação por cabo	-	-40	65	4
50 mm (Std)	F	8W	8W	EZ01 (481000)	terminais roscados	E0	-40	50	2
	H	8W	8W	EZ02 (485100)	terminais roscados	E0	-40	80	2
	F, IP67, Pg11	8W	8W	EZ01 (481000)	terminais roscados	G1	-40	50	3
	F, IP67, Pg13.5	8W	8W	EZ01 (481000)	terminais roscados	G2	-40	50	3



## Série A - SISTEMA PARA ENCOMENDA:

NORMALMENTE UMA VÁLVULA COMPLETA É COMPOSTA POR 4 ELEMENTOS:

A PRÓPRIA **VÁLVULA**, A **CAIXA**, A **BOBINA** E A **FICHA**.

PARA CAIXAS/BOBINAS INTEGRADAS, A REFERÊNCIA DA CAIXA INDICA A PORCA E CHAPA DE IDENTIFICAÇÃO.

**7321BBG3TN00 - N1 - DZ06 - S6** (220-240V 50Hz, 240V 60Hz, 9W) - **486586**

**VÁLVULA**

CAIXA

BOBINA

CÓDIGO VOLTAGEM

FICHA

**PARTE ELÉCTRICA**

### NOTA IMPORTANTE:

**Cada referência, nomeadamente da parte eléctrica pode ser encomendada separadamente, no caso de reposição ou como peças de reserva.**



## COMANDO MANUAL

### ... 00 muda para ... M0 no número de referência

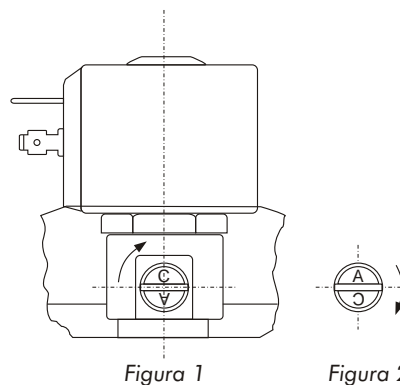
O comando manual é utilizado para operar a válvula sem a bobina estar ligada.

O comando manual consiste num parafuso com ranhura na cabeça para ser operado por chave de parafusos e tem duas posições possíveis:

**Fechado:** a letra "C" fica na posição superior da cabeça do parafuso (figura 1)

**Aberto:** a letra "A" fica na posição superior da cabeça do parafuso (figura 2)

Na posição fechado, a válvula opera normalmente quando a bobina é energizada/desenergizada.



## COMANDO MANUAL MAIS O OPERADOR DE VELOCIDADE DE FECHO

### ... 00 muda para ... M1 no número de referência

O tempo de fecho de certos tipos pode ser alterado através do parafuso de ajuste (figura 3 e 4). Isto é, actuando como um estrangulador na equalização do furo da entrada da válvula (piloto), a velocidade de fecho da válvula é reduzida, o que evita o efeito de golpe de aríete. A gama de regulação é como a seguir indicado:

Figura 3

Parafuso totalmente fechado: válvula sempre aberta

Figura 4

Parafuso totalmente aberto: velocidade de fecho máxima

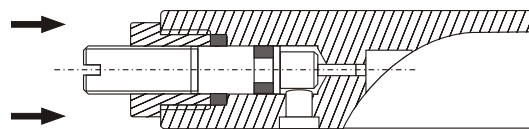


Figura 3 - Parafuso de regulação fechado

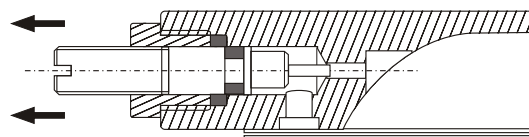
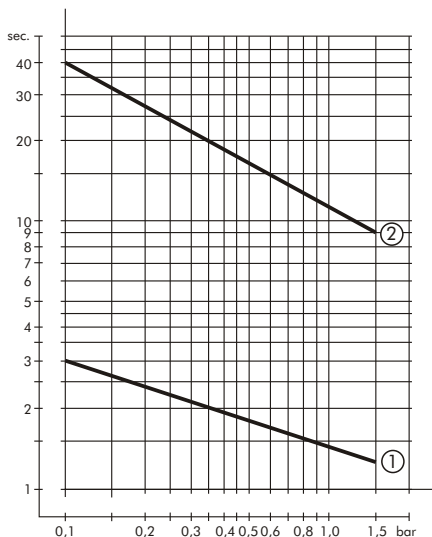


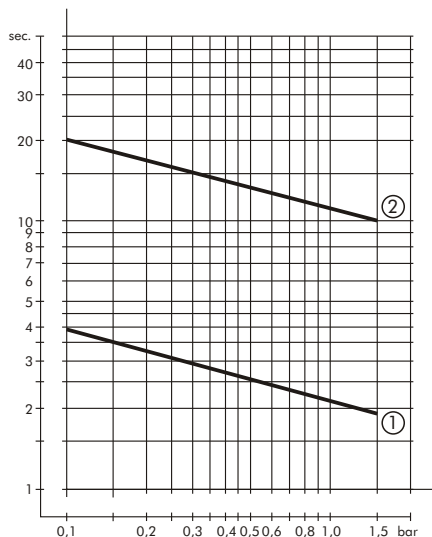
Figura 4 - Parafuso de regulação aberto

## DIAGRAMAS DOS TEMPOS DE FECHO

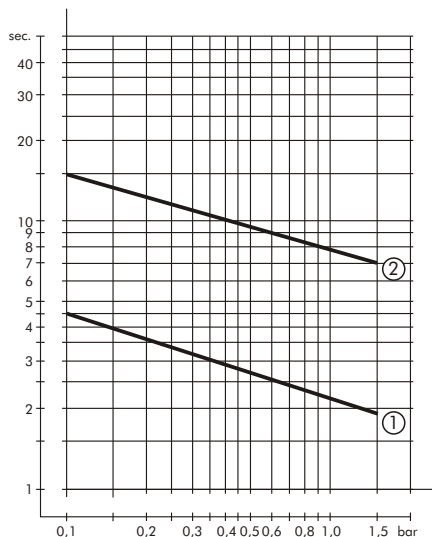
- ① Tempo de fecho com o parafuso de ajuste completamente aberto
- ② Tempo de fecho com o parafuso de ajuste aberto a 1/2 termo.



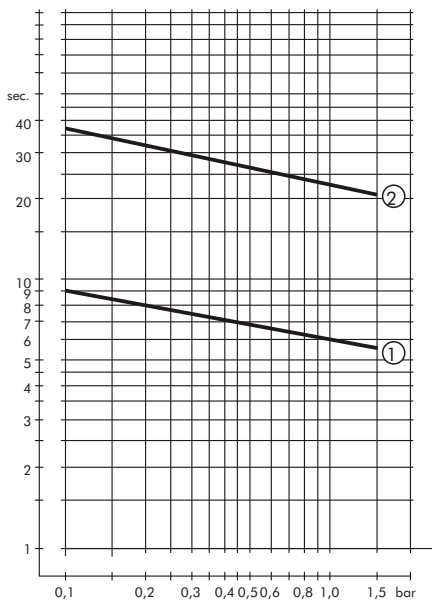
3/4" - 1"



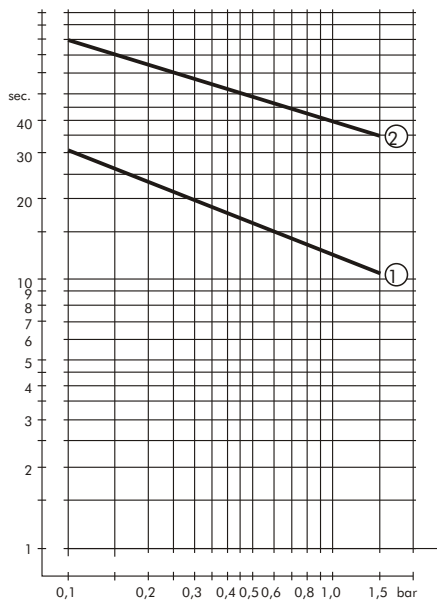
1 1/4" - 1 1/2"



2"



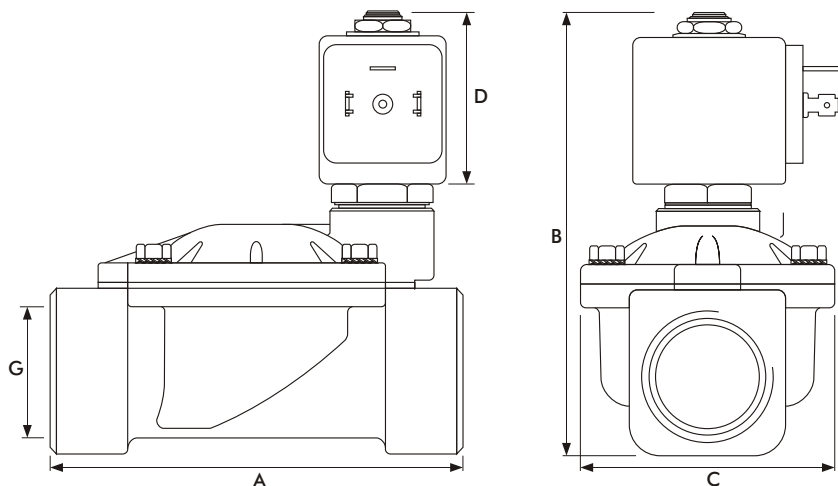
2 1/2"



3"

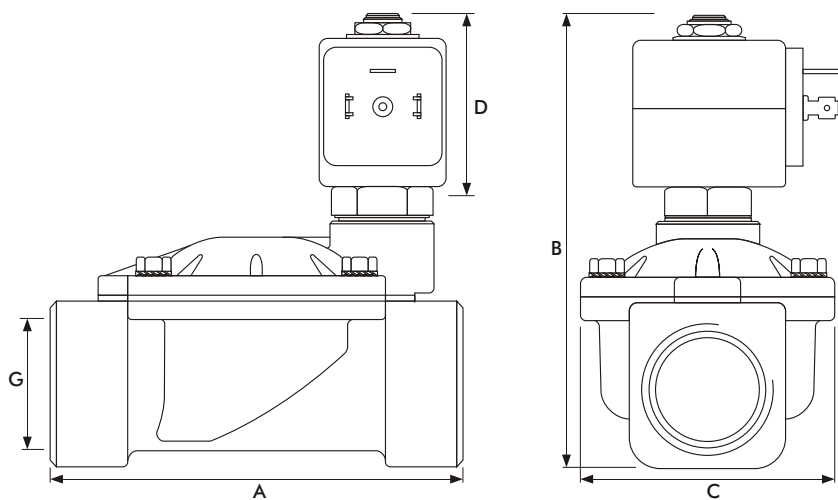
## Dimensões das válvulas NORMALMENTE FECHADAS

Tamanho				
G	A	B	C	D
3/8	69	99,5	40	44
1/2	72	101,5	40	44
3/4	100	107	65	44
1	104	112,5	65	44
1 1/4	145	134	102	44
1 1/2	145	134	102	44
2	145	148	118	44
2 1/2	245	195	184	44
3	250	195	184	44



## Dimensões das válvulas NORMALMENTE ABERTAS

Tamanho				
G	A	B	C	D
3/8	69	110	40	44
1/2	72	112	40	44
3/4	100	117,5	65	44
1	104	123	65	44
1 1/4	145	144,5	102	44
1 1/2	145	144,5	102	44
2	145	158,5	118	44



## DESCRIÇÃO DAS PARTES ELÉCTRICAS

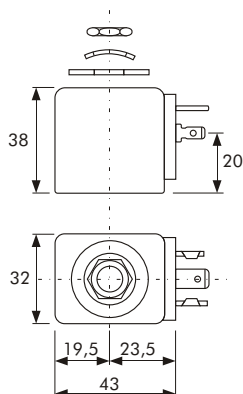


Figura 1

### BOBINA STANDARD (Fig. 1)

**N1-DZ02** (dc 9W, ac 8W)

**N1-DZ06** (ac 9W)

Encapsuladas em material sintético. Ligação para ficha DIN 43650A. Classe de protecção **IP65**.

### BOBINA DE ALTA TEMPERATURA (Fig. 1)

**N1-DZ08** (14W dc, ac) ou

**N1-DZ04** (9W dc, ac)

Encapsulada em material sintético. Ligação para ficha DIN 43650A. Classe de protecção **IP65**.

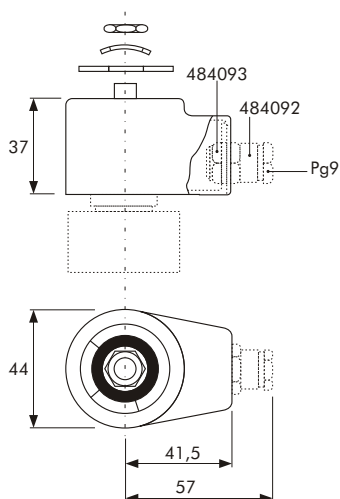


Figura 2

### CAIXA METÁLICA PARA BOBINAS E0 (Fig. 2)

Com bobina standard **EZ01** (8W) ou com bobina de alta temperatura **EZ02** (8W), encapsuladas em material sintético com terminais por parafusos. Terminal terra na sub base da caixa. Classe de protecção **IP10** ou **IP44** quando equipadas com bucin Pg9.

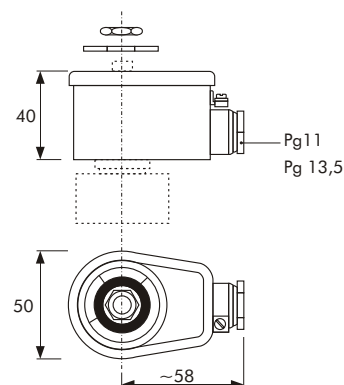


Figura 3

### CAIXA À PROVA DE ÁGUA G1 ou G2 (Fig. 3)

Com bobina standard **EZ01** (8W) encapsulada em material sintético. Caixa possuindo um parafuso de ligação terra. Cabo de ligação com diâmetro exterior 4-11 mm através de bucin de borracha **Pg11(G1)** ou **Pg13,5 (G2)**. Classe de protecção **IP67**.



## DESCRIÇÃO DAS PARTES ELÉCTRICAS

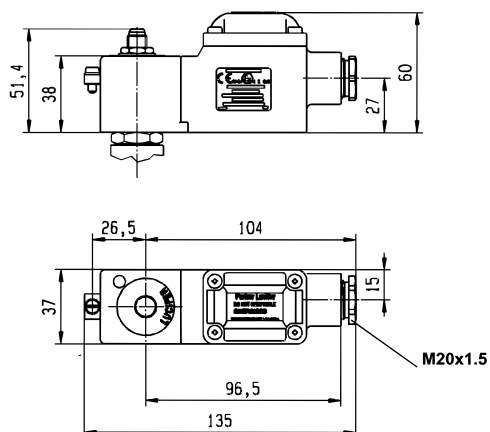


Figura 4

### À PROVA DE EXPLOSÃO EExdm IICT4 (Fig. 4)

Conjunto caixa/bobina **495905**, bobina e circuito magnético encapsulado em material plástico. A caixa é completa e própria para se ligar por cabo através de bucin M20X1.5.

Consumo de potência: 8W dc e 8W ac

Classe de protecção **IP67**.

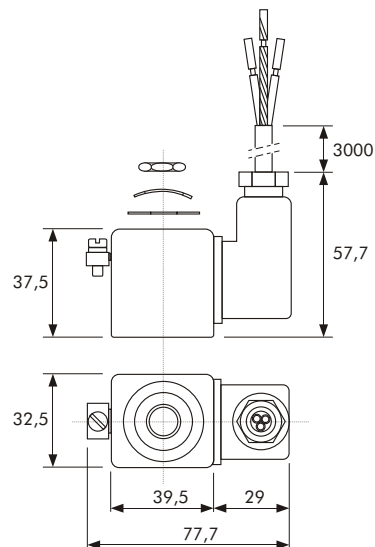


Figura 5

### À PROVA DE EXPLOSÃO EExm II T4 (Fig.5)

Conjunto caixa/bobina **00-HZ05** bobina e circuito magnético encapsulado em material sintético.

A caixa completa é fornecida com um cabo encapsulado (3x0,75mm<sup>2</sup> de secção), o comprimento do cabo é 3000 mm com bucin Pg 11.

Consumo de potência: 8W ac, 9W dc.

Classe de protecção **IP65**.

# Válvulas de borboleta, INFORMAÇÃO GERAL

(Não dispensa a consulta do catálogo específico da respectiva série)

## PRINCIPAIS APLICAÇÕES

- Aquecimento, ventilação e ar condicionado
- Tratamento e distribuição de águas
- Serviço contra incêndios
- Agricultura e rega
- Piscinas
- Construção naval
- Centrais térmicas e hidroeléctricas
- Siderurgia e fabricação de alumínio
- Indústria química e petroquímica
- Indústria de pasta e papel
- Indústria alimentar (cervejas e bebidas)
- Refinarias de açúcar
- Indústria farmacêutica
- Transporte de produtos secos e pulverulentos
- Processo do gás e do petróleo

## PRINCIPAIS PROPRIEDADES

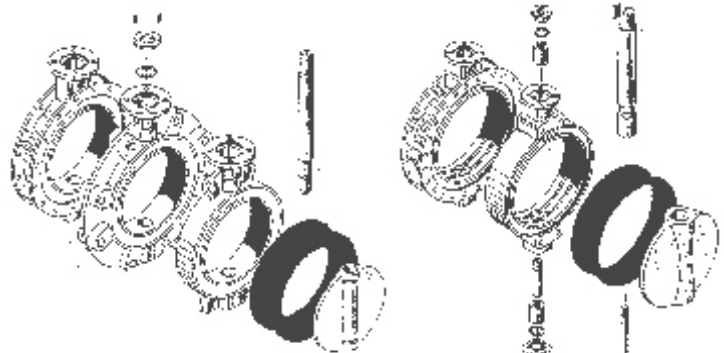
- Dimensões e pesos reduzidos
- Rápida montagem e desmontagem
- Baixos custos de instalação e manutenção
- Reduzida perda de carga
- Facilidade de operação
- Possibilidade de regulação automática
- Estanqueidade total
- Grande rendimento

## FLUIDOS

- Líquidos
- Gases

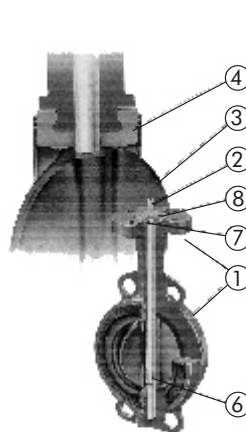
## CARACTERÍSTICAS DISPONÍVEIS

- **Construção do corpo**
  - D1 ... Wafer (DN 40 - 700)
  - D3 ... Lug (DN 50 - 400)
  - D4 ... Flange (DN 150 - 1200)
- **Pressão máxima de serviço** 10/16 bar
- **Normas de flanges**
  - PN6/10/16
  - ANSI cl. 150
- **Gama de temperatura**
  - Standard -20/130°C com vedante em EPDM
  - Máx. -50/250°C de acordo com o material
- **Actuadores**
  - Alavanca manual
  - Desmultiplicador manual
  - Pneumático duplo efeito e simples efeito
  - Eléctrico (motor)

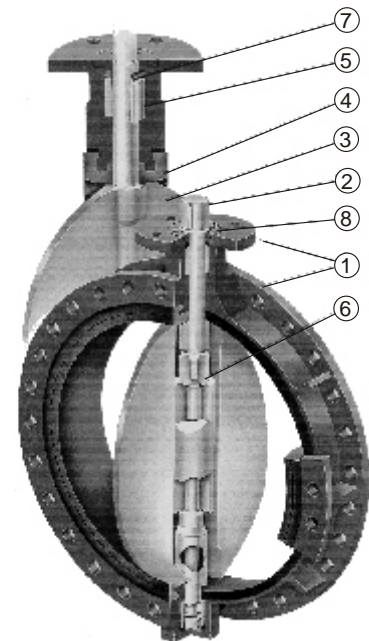


DN 25 - 400

DN 450 - 1200



DN 25 - 400



DN 450 - 1200

## CONSTRUÇÃO

- 1 - Corpo, dimensão face a face de acordo c/ ISO 5752/20 DIN3202/3K1. Flange de topo de acordo com ISO 5211. Extensão do veio para isolamento térmico.
- 2 - Veio com indicador de posição
- 3 - Disco
- 4 - Vedante de substituição com esterias laterais
- 5 - Colar de retenção (Rilsan DN 40-400; Bronze DN 45-1200)
- 6 - Colar quadrado de arrasto do disco
- 7 - Junta tórica para estanquicidade do veio
- 8 - Colar de retenção (protecção "blow out")

# VÁLVULAS DE BORBOLETA

**D1 0100 . 2 3 - 1AR . 4A . 2AR . E**

**1 2 3 4 5 6 7 8**

**CONSTRUA**

**a sua válvula de borboleta DN25 - 1200**

## 1 MODELO

(x) 1 Wafer DN 25 - 700

(x) 3 Corpo Lug DN 50 - 400

(x) 4 Corpo flangeado DN 150 - 1200

(x) = A (para série **AQUARIA**)

(x) = B (para série **BIANCA**)

(x) = D (para série **DESPONIA**)

(x) = DP (para série **DESPONIA PLUS**)

(x) = E (para série **DELARA**)

## 2 DIÂMETRO NOMINAL

0025 DN 25 até

1200 DN 1200

## 3 PRESSÃO DE SERVIÇO

0 2,5 bar

1 6 bar

2 10 bar

3 16 bar (DN 250 - 600 apenas com corpo em GGG40)

## 4 NORMA DE FLANGES

1 PN 6

2 PN10

3 PN16

A ANSI cl.150

## 5 MATERIAL DO CORPO

1AR Ferro fundido GG25 recoberto a Rilsan de 250 $\mu$  DN 25 - 400

1AE Ferro fundido GG25 recoberto a Epoxy de 100 $\mu$  DN 450 - 1200

2AR Fundição nodular GGG40, recoberto a Rilsan de 250 $\mu$  DN 25 - 400

2AE Fundição nodular GGG40, recoberto a Epoxy de 100 $\mu$  DN 450 - 1200

## 6 MATERIAL DO VEIO

4A Aço inox 1.4028 (AISI 420) com 13% crómio

4B Aço inox 1.4401 (AISI 316) muito boa resistência à corrosão, circuitos químicos e alimentares

## 7 MATERIAL DO DISCO (BORBOLETA)

2AR Fundição nodular GGG40, recoberto a Rilsan 250 $\mu$  (-25/90°C)

2AE Fundição nodular GGG40, recoberto a Epoxy de 100 $\mu$  (máx. 130°C)

2AC Fundição nodular GGG40, cromado

4CO Aço inox 1.4408 (AISI 316)

4CP Aço inox 1.4408 (AISI 316) polido

4CH Aço inox 1.4408 (AISI 316) recoberto a Halar (-40/170°C) fuidos corrosivos, tratamento de águas

4DO Uranos B6

5CO Bronze alumínio 1.714, fuidos corrosivos, água do mar

7CO Hasteloy C

## 8 MATERIAL DO VEDANTE

E EPDM -20/90°C standard, água doce, industrial, do mar e quente (PMA=16)

EC EPDM HT -10/130°C água, líquidos da indústria química e alimentar, indústria do açúcar, vapor (PMA=16)

N Nitrilo 0/100°C ar comprimido, água, fuel, gás de cidade, butano, óleo crude, água do mar (PMA=16)

NC Nitrilo carboxílico 0/100°C

RN Borracha natural -20/60°C transporte pneumático de granulados e pós (PMA=16)

B Butilo -30/120°C solventes, ácidos e bases diluidos, alcoóis, água do mar, água fria (PMA=16)

H Hypalon -20/100°C ácidos oxigenados concentrados ou diluidos, hipocloritos, óleos animais ou vegetais (PMA=16)

S Silicone -50/250°C boa resistência a temperaturas altas e baixas, ar ou gás inerte quente e seco

SV Viton -20/160°C Silicone para vapor

SA Silicone para indústria alimentar

V solventes ácidos, bases, hidrocarbonos quentes, oxigénio

(PMA=16 até DN150 PMA=10 até DN300)

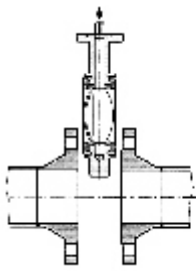
(PMA=Pressão máxima admissível em bar desde DN25 a DN300)

## Informação adicional

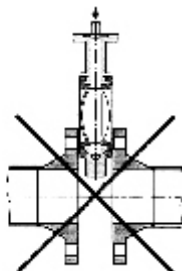
### Série DESPONIA - Válvulas de borboleta

#### INSTALAÇÃO

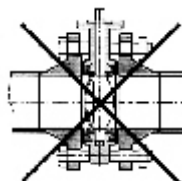
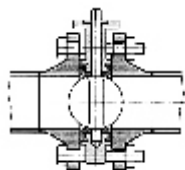
Correcto



incorrecto

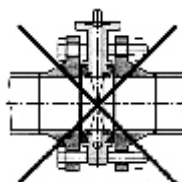
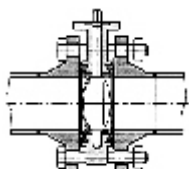


As flanges devem estar separadas para facilitar a instalação da válvula.



O disco deve estar parcialmente aberto.

Com a válvula ligeiramente aberta introduzir os pernos e apertá-los à mão.



Abrir o disco por completo.

Comprovar que a tubagem está alinhada.

Apertar as porcas de maneira cruzada até que as flanges estejam em contacto o corpo da válvula. Apertar tudo bem.

Não utilize juntas ou massas.

Nunca solde as flanges à tubagem estando a válvula instalada.

**CERTIFICADOS DE QUALIDADE.** Podem ser fornecidos a pedido do cliente.

**DIN 50049-2.2/EN10204-2.2**

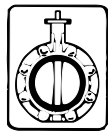
**DIN 50049-3.1B/EN10204-3.1B**

# Série **AQUARIA**

com um óptimo preço e um rendimento eficiente



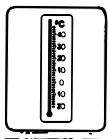
DN 40 - 200



DN 50 - 200



$P_{\text{máx}} = 16 \text{ bar}$



$T = -10 \dots +130^{\circ}\text{C}$



Solicite o catálogo original



## Série AQUARIA - válvulas de borboleta com disco em AÇO INOX

As válvulas **AQUARIA** podem ser fornecidas com actuação **manual**, ou equipadas com actuadores **pneumáticos** de simples ou duplo efeito assim como actuadores **eléctricos**.



	DN	
<b>AQUARIA A1 WAFFER</b>	40	<b>A1 0040.23</b>
	50	<b>A1 0050.23</b>
	65	<b>A1 0065.23</b>
	80	<b>A1 0080.23</b>
	100	<b>A1 0100.23</b>
	125	<b>A1 0125.23</b>
	150	<b>A1 0150.23</b>
	200	<b>A1 0200.23</b>



<b>AQUARIA A3 LUG</b>	50	<b>A3 0050.23</b>
	65	<b>A3 0065.23</b>
	80	<b>A3 0080.23</b>
	100	<b>A3 0100.23</b>
	125	<b>A3 0125.23</b>
	150	<b>A3 0150.23</b>
	200	<b>A3 0200.23</b>



### MODELO BÁSICO

**A10** (diâmetro DN) . **23** - **1AR** . **4A** . **4CO** . **EC** + **HPL**

#### TIPO

1 = WAFFER  
3 = LUG

#### CORPO

1AR = Ferro fundido GG25/Rilsan  
2AR = Fundição nodular GGG40/Rilsan

#### VEIO

4A = Aço inox 1.4021

#### DISCO

4CO = Em aço inox 1.4408 (AISI 316)

#### VEDANTE

EC = EPDM (calor) (-10/130°C)

#### ACTUADOR MANUAL

HPL = Alavanca plástica

#### Nota:

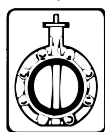
As válvulas AQUARIA podem ser equipadas com termómetro montado no eixo da válvula.

Também estão disponíveis com o vedante em **nitrilo ou viton**.

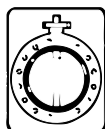
Série **DESPONIA**  
grande variedade de materiais  
para a maioria das aplicações industriais



DN 25 - 700



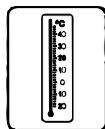
DN 25 - 400



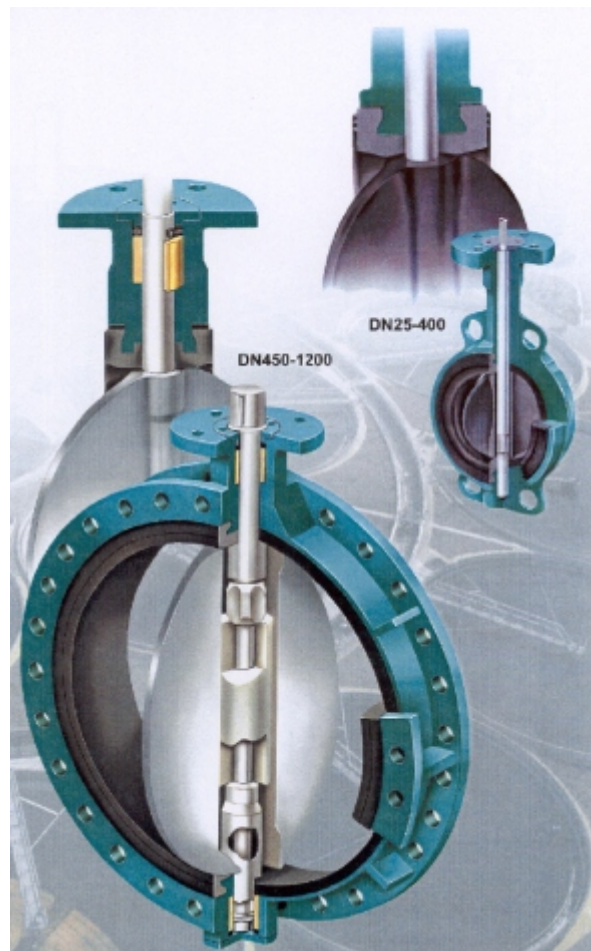
DN 150 - 1200



$P_{\text{máx}} = 16 \text{ bar}$



$T = -30 \dots +210^{\circ}\text{C}$



Solicite o catálogo original

## Série DESPONIA - válvulas de borboleta Actuação por alavanca

(Também podem ser fornecidas com actuação pneumática ou eléctrica)



HLA ou HLP

	DN	
<b>DESPONIA D1 WAFFER</b>	25	D1 0025.33
	32	D1 0032.33
	40	D1 0040.33
	50	D1 0050.33
	65	D1 0065.33
	80	D1 0080.33
	100	D1 0100.33
	125	D1 0125.33
	150	D1 0150.33
	200	D1 0200.33
	250	D1 0250.23
	300	D1 0300.23
	350	D1 0350.23
400	D1 0400.23	
450	D1 0450.23	
500	D1 0500.23	
600	D1 0600.23	
700	D1 0700.23	



<b>DESPONIA D3 LUG</b>	50	D3 0050.33
	65	D3 0065.33
	80	D3 0080.33
	100	D3 0100.33
	125	D3 0125.33
	150	D3 0150.33
	200	D3 0200.33
	250	D3 0250.22
	300	D3 0300.22
	350	D3 0350.22
400	D3 0400.22	



<b>DESPONIA D4 FLANGES</b>	450	D4 0450.22
	500	D4 0500.22
	600	D4 0600.22
	700	D4 0700.22
	800	D4 0800.22
	900	D4 0900.22
	1000	D4 1000.22
1200	D4 1200.22	



### MODELO BÁSICO

D10 (diâmetro DN) . 33 - 2AR . 4A . 2AR . E + HLP

#### TIPO

1 = WAFFER  
3 = LUG  
4 = FLANGES

#### CORPO

2AR = Fundição nodular GGG40  
1AR = Ferro fundido GG25

#### VEIO

4A = Aço inox 1.4028

#### DISCO

2AR = Fundição nodular GGG40 Rilsan  
4CO = Em AÇO INOX, consultar modelo AQUARIA

#### VEDANTE

E = EPDM (-20/90°C)  
EC = EPDM (calor) (-18/130°C)

#### ACTUADOR MANUAL

HLA = Alavanca alumínio  
HLP = Alavanca plástica

**Recobrimento em:** DN25-400 Rilsan, DN450-700 Epoxy

#### Nota:

Para válvulas de modelos diferentes e tamanhos até 1200 mm (48"), ou com construção em materiais diferentes, consulte os nossos serviços técnicos.

## Série DESPONIA - válvulas de borboleta actuação por alavanca para APLICAÇÕES com GÁS

(Também podem ser fornecidas com actuação pneumática ou eléctrica)

**HLA-A**  
(cor **AMARELA**)



**DESPONIA D3  
LUG**



DN		
50	D3	0050.33
65	D3	0065.33
80	D3	0080.33
100	D3	0100.33
125	D3	0125.33
150	D3	0150.33
200	D3	0200.33
250	D3	0250.22
300	D3	0300.22
350	D3	0350.22
400	D3	0400.22



### MODELO BÁSICO

**D30** (diâmetro **DN**) . **33** - **2AR** . **4A** . **4CO** . **N**+ **HLA-A**

**TIPO**  
**3 = LUG**

**CORPO**  
**2AR = Fundição nodular GGG40**  
1AR = Ferro fundido GG25

**VEIO**  
**4A = Aço inox 1.4028**

**DISCO**  
**4CO = Em aço inox 1.4408**

**VEDANTE**  
**N = NITRILO (NBR) 0/100°C**

**ACTUADOR MANUAL**  
**HLA-A = Alavanca alumínio de cor amarela**

NOTA: Também podem ser fornecidas com actuação pneumática ou eléctrica

## Série DESPONIA

### - válvulas de borboleta, **INDÚSTRIA ALIMENTAR**

#### TIPO WAFER

##### Vedante

**NB** . . . . . nitrilo branco (-15/80°C)

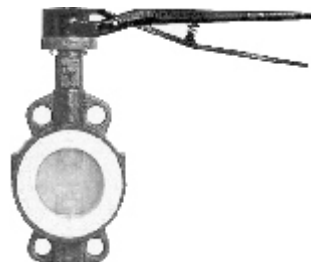
**Corpo 1AR** . . . . . GG25

**Veio 4A** . . . . . 1.4028

##### Disco

**2AR** . . . . . GGG40 Rilsan

**4CO** . . . . . aço inox 1.4408 (AISI 316)



#### VÁLVULA +HLA

com alavanca manual regulável, de alumínio

DN	Modelo	Pressão max.	Flange PN	ISO veio
40	<b>D10040.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA240</b>	16 bar	6/10/16	F07/08
50	<b>D10050.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA240</b>	16 bar	6/10/16	F07/11
65	<b>D10065.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA240</b>	16 bar	6/10/16	F07/11
80	<b>D10080.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA240</b>	16 bar	6/10/16	F07/11
100	<b>D10100.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA240</b>	16 bar	6/10/16	F07/11
125	<b>D10125.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA340</b>	16 bar	6/10/16	F07/14
150	<b>D10150.33-2AR.4A.</b> (disco).(vedante)+ <b>HLA340</b>	16 bar	6/10/16	F07/14
200	<b>D10200.23-2AR.4A.</b> (disco).(vedante)+ <b>HLA340</b>	10 bar	6/10/16	F07/17
250	<b>D10250.23-1AR.4A.</b> (disco).(vedante)+ <b>HLA500</b>	10 bar	10/16	F12/22
300	<b>D10300.23-1AR.4A.</b> (disco).(vedante)+ <b>HLA500</b>	10 bar	6/10/16	F12/22

Série **DESPONIA**  
 grande variedade de materiais  
 para a maioria das aplicações industriais

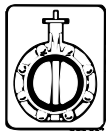


# Série **DESPONIA plus**

para aplicações industriais pesadas (HEAVY DUTY)



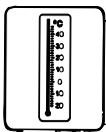
DN 25 - 600



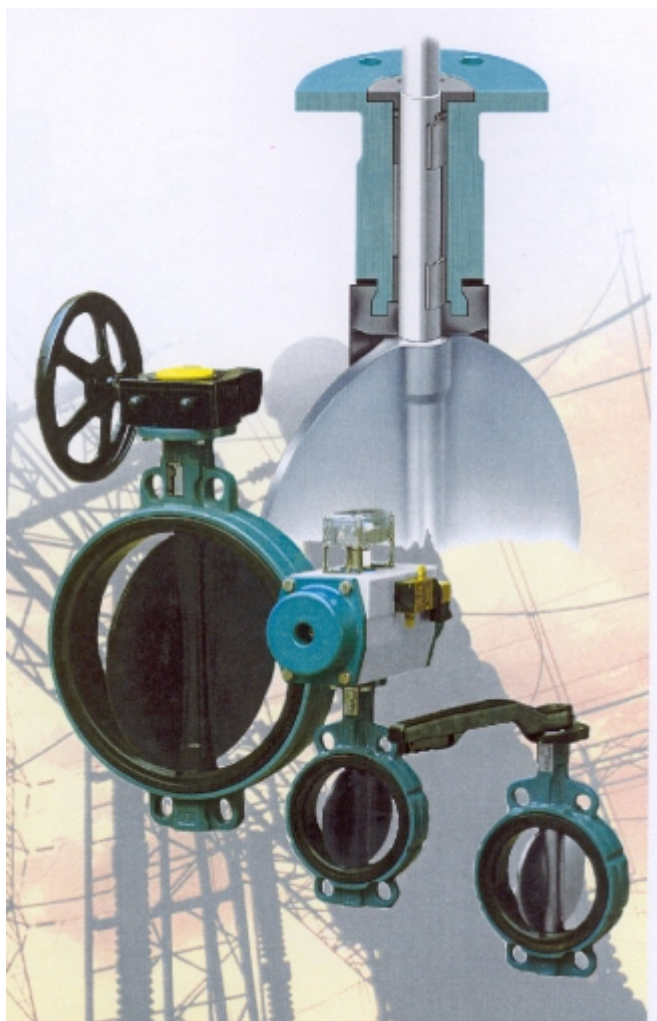
DN 25 - 400



$P_{\text{máx}} = 20 \text{ bar}$



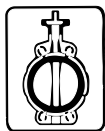
$T = -30 \dots +210^{\circ}\text{C}$



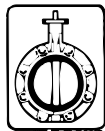
Solicite o catálogo original

# Série **BIANCA**

para aplicações onde a segurança é essencial



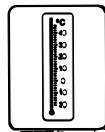
DN 32 - 800



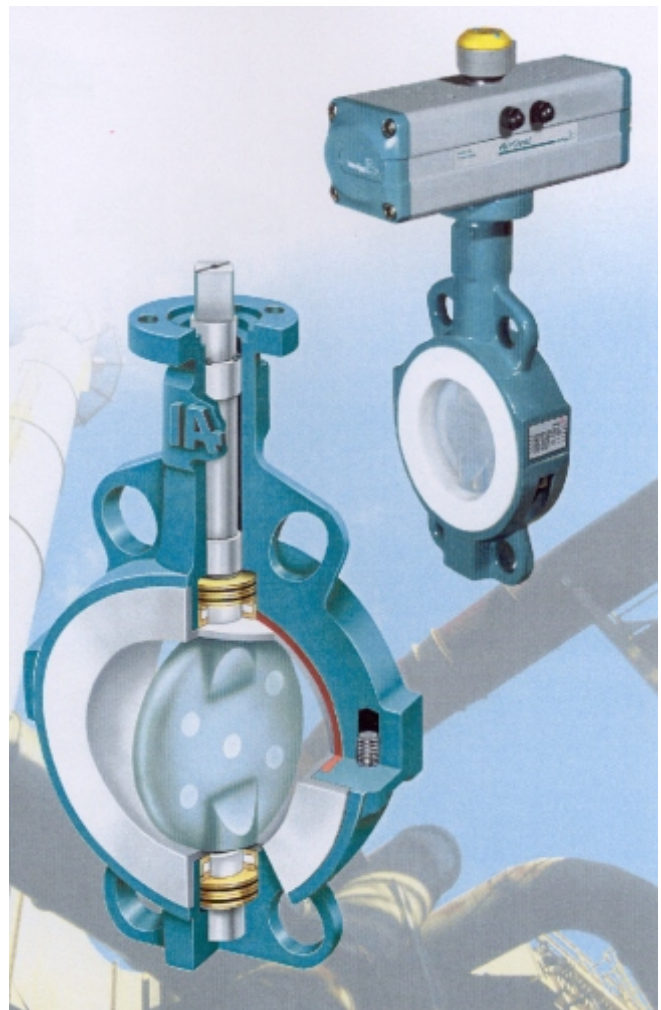
DN 32 - 800



$P_{\text{máx}} = 10 \text{ bar}$



$T = -40 \dots +220^{\circ}\text{C}$



Solicite o catálogo original

## Série BIANCA pharma - válvulas de borboleta, **INDÚSTRIA FARMACÊUTICA**

Desenvolvidas especialmente para evitar a contaminação por bactérias durante o processo de fermentação.

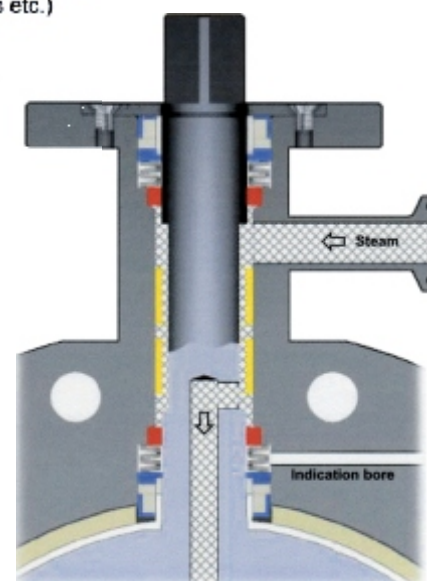
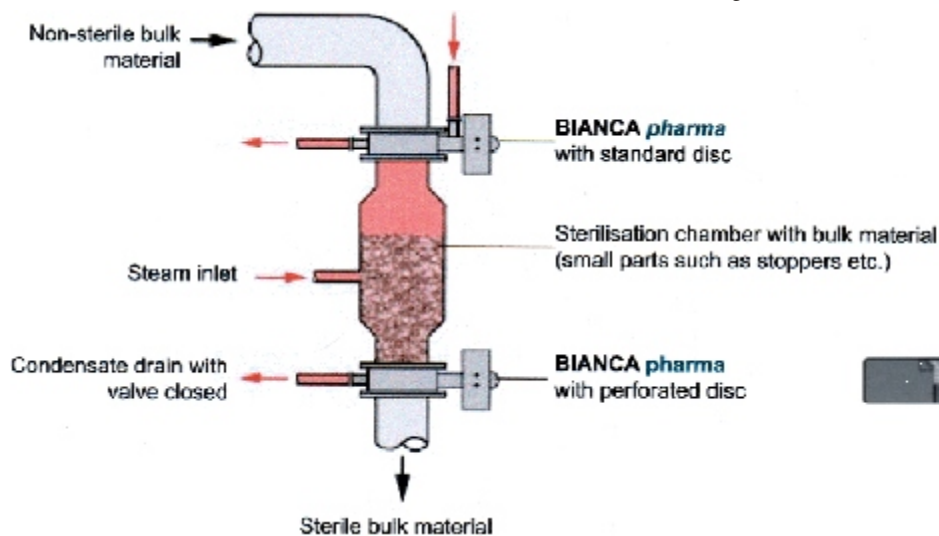
Pode ser esterilizada sobre condições de vapor saturado.

Construídas em material sólido aço inox 1.4435 (AISI316L) com sede do vapor em HNBR (Therban) FDA.

**Solicite-nos o  
respectivo catálogo**



**Sem  
contaminação**



**Nota:** disponíveis com actuação manual eléctrica ou pneumática

# Série BIANCA

## - válvulas de borboleta, **INDÚSTRIA ALIMENTAR E QUÍMICA**

### TIPO WAFER

**Vedante TS** . . . . . PTFE/silicone

**Corpo 2BE** . . . . . fundição nodular  
GGG40.3 recoberto a epoxy

**Disco/Veio** (peça única)

**4G0** . . . . . 1.4435 (AISI316L)

**4GT** . . . . . 1.4435 (AISI316L)

encapsulado **PFA**

**4GF** . . . . . 1.4435 (AISI 316L)

encapsulado **PVDF**

### VÁLVULA + HLG

com alavanca manual regulável, de alumínio

DN	Modelo	Pressão max.	Flange PN	ISO veio
40	<b>B10040.33-2BE</b> .(disco). <b>TS+HLG290</b>	16 bar	10/16	F05/11
65	<b>B10065.33-2BE</b> .(disco). <b>TS+HLG290</b>	16 bar	10/16	F05/11
80	<b>B10080.33-2BE</b> .(disco). <b>TS+HLG290</b>	16 bar	10/16	F05/11
100	<b>B10100.33-2BE</b> .(disco). <b>TS+HLG290</b>	16 bar	10/16	F05/14
125	<b>B10125.33-2BE</b> .(disco). <b>TS+HLG290</b>	16 bar	10/16	F05/14
150	<b>B10150.33-2BE</b> .(disco). <b>TS+HLG450</b>	16 bar	10/16	F07/17
200	<b>B10200.23-2BE</b> .(disco). <b>TS+HLG450</b>	10 bar	10/16	F07/17
250	<b>B10250.23-2BE</b> .(disco). <b>TS+HLG450</b>	10 bar	10/16	F10/22
300	<b>B10300.23-2BE</b> .(disco). <b>TS+HLG450</b>	10 bar	10/16	F10/22

### Nota:

- 1) Também disponíveis com actuação por **volante, actuadores pneumáticos ou eléctricos**.
- 2) Para válvulas de modelos diferentes e tamanhos até 1200 mm (48"), ou com construção em materiais diferentes, consulte os nossos serviços técnicos.

Série **BIANCA**  
para aplicações onde a segurança é essencial

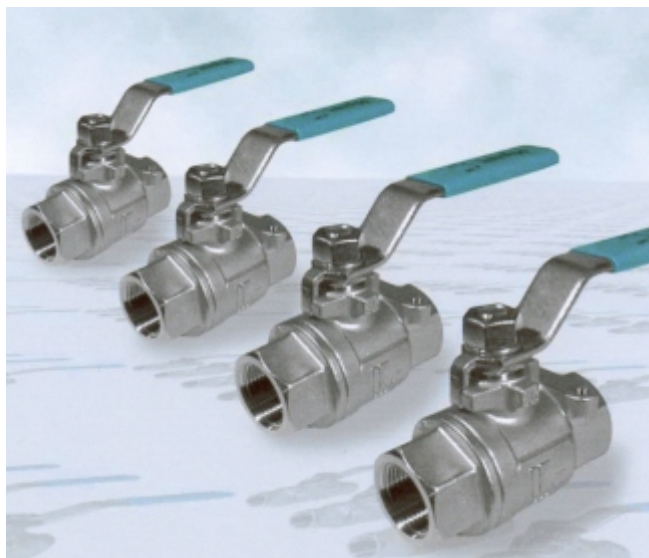


# Válvulas **MACHO ESFÉRICO** em, **AÇO INOX**

## Série **BVH 22 1/4"-3"** corpos em *duas peças*



Solicite o catálogo original



## Série **BVH 23 1/4"-3"** corpos em *três peças*



Solicite o catálogo original





## Séries BVH 22 - 23 - válvulas de macho esférico, ACTUADOR MANUAL

**Corpo** ..... aço inox 1.4408

**Esfera** ..... aço inox 1.4401 (AISI 316)

**Vedante** ..... PTFE

Dados técnicos	DN	Polegadas	P. máx	KV m <sup>3</sup> /h
	10	1/4	63 bar	5
	12	3/8	63 bar	5
	15	1/2	63 bar	10
	20	3/4	63 bar	17
	25	1	63 bar	25
	32	1 1/4	63 bar	48
	40	1 1/2	63 bar	55
	50	2	63 bar	78
	65	2 1/2	63 bar	87
	80	3	63 bar	106
	100	4	63 bar	129



**Roscadas BSP  
2 peças**

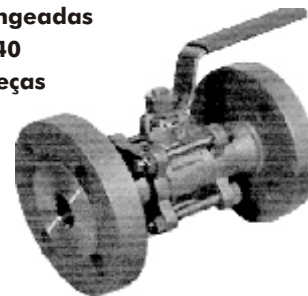


**Roscadas BSP  
3 peças**

Roscadas BSP  
2 peças

DN	Polegadas	Modelo
10	1/4	<b>BVH22FT.014.SST</b>
12	3/8	<b>BVH22FT.038.SST</b>
15	1/2	<b>BVH22FT.012.SST</b>
20	3/4	<b>BVH22FT.034.SST</b>
25	1	<b>BVH22FT.100.SST</b>
32	1 1/4	<b>BVH22FT.114.SST</b>
40	1 1/2	<b>BVH22FT.112.SST</b>
50	2	<b>BVH22FT.200.SST</b>
65	2 1/2	<b>BVH22FT.212.SST</b>
80	3	<b>BVH22FT.300.SST</b>

Flangeadas  
PN40  
3 peças



Roscadas BSP  
3 peças

DN	Polegadas	Modelo
10	1/4	<b>BVH23FT.014.SST</b>
12	3/8	<b>BVH23FT.038.SST</b>
15	1/2	<b>BVH23FT.012.SST</b>
20	3/4	<b>BVH23FT.034.SST</b>
25	1	<b>BVH23FT.100.SST</b>
32	1 1/4	<b>BVH23FT.114.SST</b>
40	1 1/2	<b>BVH23FT.112.SST</b>
50	2	<b>BVH23FT.200.SST</b>
65	2 1/2	<b>BVH23FT.212.SST</b>
80	3	<b>BVH23FT.300.SST</b>
100	4	<b>BVH23FT.400.SST</b>

Flangeadas  
PN40  
3 peças

DN	Polegadas	Modelo
15	1/2	<b>BVH23FF.015.SST</b>
20	3/4	<b>BVH23FF.020.SST</b>
25	1	<b>BVH23FF.025.SST</b>
32	1 1/4	<b>BVH23FF.032.SST</b>
40	1 1/2	<b>BVH23FF.040.SST</b>
50	2	<b>BVH23FF.050.SST</b>
65	2 1/2	<b>BVH23FF.065.SST</b>
80	3	<b>BVH23FF.080.SST</b>
100	4	<b>BVH23FF.100.SST</b>

# Séries **BVA 23**

válvulas de macho esférico com flange superior,  
**EM AÇO INOX**

1/4" - 4"

corpos em  
*três peças*



Solicite o catálogo original

## Série BVA 23 - válvulas de macho esférico, ACTUADOR PNEUMÁTICO

Actuador pneumático . . . . . duplo efeito

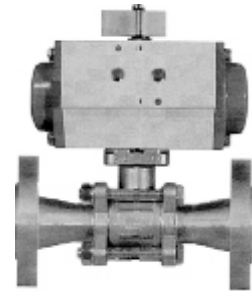
Corpo . . . . . aço inox 1.4408

Esfera . . . . . aço inox 1.4401 (AISI 316)

Vedante . . . . . PTFE



**Roscadas BSP  
3 peças**



**Flangeadas  
PN40  
3 peças**

Dados técnicos	DN	Polegadas	P. máx	KV m <sup>3</sup> /h
	10	1/4	63 bar	5
	12	3/8	63 bar	5
	15	1/2	63 bar	10
	20	3/4	63 bar	17
	25	1	63 bar	25
	32	1 1/4	63 bar	48
	40	1 1/2	63 bar	55
	50	2	63 bar	78
	65	2 1/2	63 bar	87
	80	3	63 bar	106
	100	4	63 bar	129

Roscadas BSP - 3 Peças	DN	Polegadas	Modelo
	10	1/4	<b>BVA23FT.014.SST + IA00DA</b>
	12	3/8	<b>BVA23FT.038.SST + IA00DA</b>
	15	1/2	<b>BVA23FT.012.SST + IA00DA</b>
	20	3/4	<b>BVA23FT.034.SST + IA00DA</b>
	25	1	<b>BVA23FT.100.SST + IA10DA</b>
	32	1 1/4	<b>BVA23FT.114.SST + IA10DA</b>
	40	1 1/2	<b>BVA23FT.112.SST + IA20DA</b>
	50	2	<b>BVA23FT.200.SST + IA20DA</b>
	65	2 1/2	<b>BVA23FT.212.SST + IA25DA</b>
	80	3	<b>BVA23FT.300.SST + IA25DA</b>
	100	4	<b>BVA23FT.400.SST + IA30DA</b>

Flangeadas PN40 - 3 peças	DN	Polegadas	Modelo
	15	1/2	<b>BVA23FF.015.SST + IA00DA</b>
	20	3/4	<b>BVA23FF.020.SST + IA00DA</b>
	25	1	<b>BVA23FF.025.SST + IA10DA</b>
	32	1 1/4	<b>BVA23FF.032.SST + IA10DA</b>
	40	1 1/2	<b>BVA23FF.040.SST + IA20DA</b>
	50	2	<b>BVA23FF.050.SST + IA20DA</b>
	65	2 1/2	<b>BVA23FF.065.SST + IA25DA</b>
	80	3	<b>BVA23FF.080.SST + IA25DA</b>
	100	4	<b>BVA23FF.100.SST + IA30DA</b>

## Série BVA 23 - válvulas de macho esférico, ACTUADOR ELÉCTRICO

Tensão ..... 230V/50Hz 1 PH

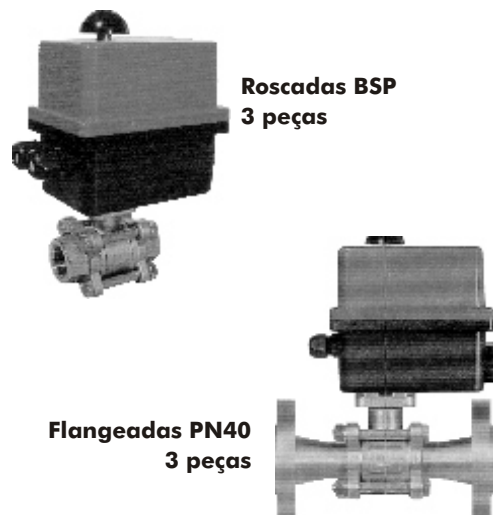
Corpo ..... aço inox 1.4408

Esfera ..... aço inox 1.4401 (AISI 316)

Vedante ..... PTFE

### Dados técnicos

DN	Polegadas	P. máx	KV m <sup>3</sup> /h	Tempo de actuação on/off em segundos
10	1/4	63 bar	5	10
12	3/8	63 bar	5	10
15	1/2	63 bar	10	10
20	3/4	63 bar	17	20
25	1	63 bar	25	20
32	1 1/4	63 bar	48	35
40	1 1/2	63 bar	55	35
50	2	63 bar	78	20
65	2 1/2	63 bar	87	20
80	3	63 bar	106	35
100	4	63 bar	129	35



### Roscadas BSP - 3 Peças

DN	Polegadas	Modelo
10	1/4	<b>BVA23FT.014.SST + ER10</b>
12	3/8	<b>BVA23FT.038.SST + ER10</b>
15	1/2	<b>BVA23FT.012.SST + ER10</b>
20	3/4	<b>BVA23FT.034.SST + ER20</b>
25	1	<b>BVA23FT.100.SST + ER20</b>
32	1 1/4	<b>BVA23FT.114.SST + ER35</b>
40	1 1/2	<b>BVA23FT.112.SST + ER35</b>
50	2	<b>BVA23FT.200.SST + ER45</b>
65	2 1/2	<b>BVA23FT.212.SST + ER60</b>
80	3	<b>BVA23FT.300.SST + ER100</b>
100	4	<b>BVA23FT.400.SST + ER100</b>

### Flangeadas PN40 - 3 peças

DN	Polegadas	Modelo
15	1/2	<b>BVA23FF.015.SST + ER10</b>
20	3/4	<b>BVA23FF.020.SST + ER20</b>
25	1	<b>BVA23FF.025.SST + ER20</b>
32	1 1/4	<b>BVA23FF.032.SST + ER 35</b>
40	1 1/2	<b>BVA23FF.040.SST + ER35</b>
50	2	<b>BVA23FF.050.SST + ER45</b>
65	2 1/2	<b>BVA23FF.065.SST + ER60</b>
80	3	<b>BVA23FF.080.SST + ER100</b>
100	4	<b>BVA23FF.100.SST + ER100</b>

## Série SYC 340-350 - 40 - 50 - 55 - 56 válvulas de macho esférico, ACTUAÇÃO MANUAL, ROSCADAS

**Tipo** ..... passagem total

**Materiais**

**Corpo e esfera** ..... latão cromado

**Vedante (sede)** ..... PTFE (teflon)

**Pressão nominal** ..... PN25

**Ligações** ..... roscadas BSP

**Aplicações** ..... água fria, água quente e ar



**SYC340 e SYC350**  
**Ligações** roscadas  
Fêmea x Fêmea  
**Manípulo**  
vermelho

**Ligações** roscadas  
Fêmea x Fêmea

**SYC40** - manípulo **AZUL**

**SYC50** - manípulo **VERMELHO**

**SYC55** - manípulo **PRETO**  
(de 1/2" até 2")



### Tamanhos

mm polegadas

mm	polegadas
10	3/8"
15	1/2"
20	3/4"
25	1"
8	1/4"
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"



**SYC56**  
**Ligações** roscadas  
Macho x Fêmea  
**Manípulo**  
vermelho

### NOTA:

Consulte os nossos serviços técnicos  
para válvulas de macho esférico em

### AÇO INOX

com actuação manual, pneumática ou eléctrica.

## Série VEF válvulas de macho esférico, ACTUAÇÃO MANUAL, FLANGEADAS

**Tipo** ..... passagem total

**Materiais**

**Corpo** ..... ferro fundido GG25

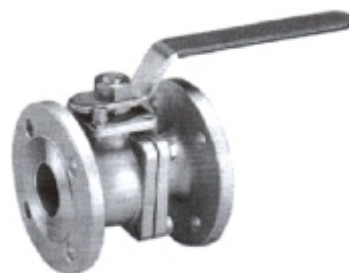
**Esfera** ..... aço inox AISI304

**Vedante (sede)** ..... PTFE (teflon)

**Pressão nominal** ..... PN16

**Ligações** ..... flangeadas F4-F5 DIN 3202

**Aplicações** ..... água fria, água quente e ar



### Tamanhos

mm polegadas

mm	polegadas
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"



## Série RHEA - válvulas de retenção de SIMPLES BATENTE

**Corpo e disco (3IZ)** . . . . . aço galvanizado St 27.2  
**Veio (4G):** . . . . . aço inox AISI 316  
**Instalação** . . . . . horizontal ou vertical  
**Junta tórica** . . . . . NBR



DN	Modelo	Flange PN
40	R1C 040.33 -3IZ.3IZ.E	10/16
50	R1C 050.33- 3IZ.3IZ.E	10/16
65	R1C 065.33 -3IZ.3IZ.E	10/16
80	R1C 080.33- 3IZ.3IZ.E	10/16
100	R1C 100.33- 3IZ.3IZ.E	10/16
125	R1C 125.33- 3IZ.3IZ.E	10/16
150	R1C 150.33- 3IZ.3IZ.E	10/16
200	R1C 200.33- 3IZ.3IZ.E	10/16
250	R1C 250.22- 3IZ.3IZ.E	10
300	R1C 300.22- 3IZ.3IZ.E	10
350	R1C 350.22- 3IZ.3IZ.E	10
400	R1C 400.22- 3IZ.3IZ.E	10
450	R1C 450.22- 3IZ.3IZ.E	10
500	R1C 500.22- 3IZ.3IZ.E	10
600	R1C 600.22- 3IZ.3IZ.E	10

## Série NEPTUNIA - válvulas de retenção de DUPLO BATENTE

**Corpo (1AE)** . . . . . ferro fundido GG25  
 recobrimento epóxico  
**Disco**  
**(5MO)** . . . . . latão  
**(2AE)** . . . . . fundição nodular GGG40  
 recobrimento epóxico  
**Veio (4K)** . . . . . aço inox 316  
**Junta (N)** . . . . . nitrilo



DN	Modelo	Flange PN
40	N1 0040.33-1AE.4K.5MO.-N	10/16
50	N1 0050.33-1AE.4K.5MO.-N	10/16
65	N1 0065.33-1AE.4K.5MO.-N	10/16
80	N1 0080.33-1AE.4K.5MO.-N	10/16
100	N1 0100.33-1 AE.4K.5MO.-N	10/16
125	N1 0125.33-1AE.4K.5MO.-N	10/16
150	N1 0150.33-1AE.4K.5MO.-N	10/16
200	N1 0200.33-1AE.4K.2AE.-N	10/16
250	N1 0250.33-1AE.4K.2AE.-N	10/16
300	N1 0300.33-1AE.4K.2AE.-N	10/16
350	N1 0350.33-1AE.4K.2AE.-N	10/16
400	N1 0400.33-1AE.4K.2AE.-N	10/16

## Série VRW - válvulas de retenção dimensões pequenas

**Tipo** . . . . . wafer  
**Corpo** . . . . . Latão  
**Mola** . . . . . aço austenítico  
**Obturador** . . . . . aço AISI 420  
**Pressão nominal** . . . . . PN16



DN	Modelo
15	VRW015
20	VRW020
25	VRW025
32	VRW032

## Série SYC 130

### válvulas de retenção de mola ROSCADAS

**Corpo** ..... Latão DIN 17660  
**Fecho** ..... borracha NBR - PN12/8  
**Guia** ..... nylon  
**Mola** ..... aço AISI 304  
**Temperatura** ..... 0/80°C  
**Ligações** ..... roscadas F/F



Tamanho	
mm	Polegadas
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"

## Série SYC 155

### válvulas de retenção de batente em METAL, ROSCADAS

**Corpo** ..... Latão DIN 17680  
**Batente** ..... metal  
**Pressão** ..... PN10  
**Temperatura** ..... 0/80°C  
**Ligações** ..... roscadas F/F



Tamanho	
mm	Polegadas
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"

## Série SYC 155/A

### válvulas de retenção de batente em BORRACHA, ROSCADAS

**Corpo** ..... Latão DIN 17660  
**Batente** ..... borracha NBR  
**Pressão nominal** ..... PN10/8  
**Temperatura** ..... 0/80°C  
**Ligações** ..... roscadas F/F



#### Tamanho

mm	Polegadas
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"

## Série VRCF

### válvulas de retenção de CHARNEIRA, FLANGEADAS

**Corpo** ..... ferro fundido GG25  
**Anel da sede do corpo** ..... bronze  
**Anel da sede do disco** ..... EPDM  
**Disco** ..... ferro fundido GG25  
**Pressão de trabalho** ..... PN16  
**Temperatura de trabalho** ..... -10/100°C  
**Protecção externa** ..... resina epóxica azul



#### Tamanho

Série	mm	Polegadas
VRCF	40	1 1/2"
VF530	50	2"
VF530	65	2 1/2"
VF530	80	3"
VF530	100	4"
VF530	125	5"
VF530	150	6"
VF530	200	8"
VRCF	250	10"
VRCF	300	12"

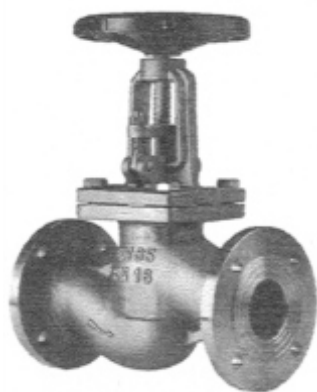
## Série VCF - válvulas de CUNHA, tipo adufa, FLANGEADAS



<b>Corpo</b> .....	ferro fundido GG25
<b>Haste</b> .....	X20Cr13/DIN 17440
<b>Porca da haste</b> .....	CuZn39Pb2/DIN 17660
<b>Sedes</b> .....	EPDM
<b>Junta</b> .....	polyamida
<b>Volante</b> .....	ferro fundido GTS32/DIN 1692
<b>Pressão nominal</b> .....	PN10
<b>Temperatura</b> .....	120°C
<b>Pressão máxima de trabalho</b>	
	1,0 mPa (DN40-150)
	0,6 mPa (DN200)
<b>Ligações flangeadas</b> .....	DIN 3352/DIN 2501
<b>Dimensões entre flanges</b> .....	DIN 3202F

Tamanho	
mm	Polegadas
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"
200	8"
250	10"
300	12"

## Série VGF - válvulas de passagem, tipo GLOBO, FLANGEADAS



<b>Corpo</b> .....	ferro fundido GG25
<b>Haste</b> .....	X20Cr13/DIN 17440
<b>Disco</b> .....	X20Cr13/DIN 17440
<b>Pressão nominal</b> .....	PN16
<b>Temperatura</b> .....	250°C
<b>Ligações flangeadas</b> .....	DIN 2501
<b>Dimensões entre flanges</b> .....	DIN 3202F

Tamanho	
mm	Polegadas
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"
200	8"
250	10"
300	12"

## Série SYC - VF500 - válvulas de COMPORTA, FLANGEADAS

**Corpo** . . . . . ferro fundido GG25  
**Comporta** . . . . . fundição ferro  
**Recobrimento da comporta** . . . . . EPDM  
**Eixo** . . . . . aço inox  
**Volante** . . . . . ferro fundido  
**Pressão de trabalho** . . . . . PN16  
**Temperatura de trabalho** . . . . . -10/90°C  
**Protecção interna e externa** . . . . . resina epóxida azul  
**Tipo** . . . . . passagem directa

Tamanhos	
mm	polegadas
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"
200	8"
250	10"



## Série SYC226 - válvulas redutoras de pressão PN16, ROSCADAS

**Corpo** . . . . . latão  
**Guarnições** . . . . . NBR  
**Sede** . . . . . aço inox 303  
**Regulação** . . . . . de 1,5 a 7 bar, pré-tarada a 3 bar  
**Pressão nominal** . . . . . PN16  
**Temperatura máxima** . . . . . 80°C  
**Ligações** . . . . . roscadas F/F

Tamanhos	
mm	polegadas
15	1/2"
20	3/4"
25	1"



## Série SYC204 - válvulas redutoras de pressão PN40, ROSCADAS

**Corpo** . . . . . latão  
**Guarnições** . . . . . NBR  
**Sede** . . . . . aço inox 303, com câmara de compensação  
**Regulação** . . . . . de 1 a 7 bar, pré-tarada a 3 bar  
**Pressão nominal** . . . . . PN40  
**Temperatura máxima** . . . . . 80°C  
**Ligações** . . . . . roscadas F/F

Tamanhos	
mm	polegadas
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"





## Série SYC205 - filtros oblíquos em "Y", ROSCADOS

**Tipo** ..... passagem total

### Materiais

**Corpo** ..... latão DIN 17660

**Filtro** ..... malha em aço inox 304

**Pressão nominal** ..... PN20

**Temperatura** ..... 0 a 100°C

**Ligações** ..... roscadas BSP fêmea

**Aplicações** ..... água fria e água quente



### Tamanhos

mm	polegadas
8	1/4"
10	3/8"
15	1/2"
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"

## Série FYF - VF510 - filtros oblíquos em "Y", FLANGEADOS

**Tipo** ..... passagem total

### Materiais

**Corpo** ..... ferro fundido GG25

**Filtro** ..... aço inox AISI 304

**Junta** ..... PTFE

**Pressão de trabalho** ..... PN16

**Temperatura de trabalho** ..... -10/65°C

**Ligações** ..... flangeadas

**Aplicações** ..... água fria e água quente

**Protecção interna e externa** ..... resina epóxica



### Tamanhos

Série	Tamanhos	
	mm	polegadas
FYF	15	1/2"
FYF	20	3/4"
FYF	25	1"
FYF	32	1 1/4"
VF510	40	1 1/2"
VF510	50	2"
VF510	65	2 1/2"
VF510	80	3"
VF510	100	4"
VF510	125	5"
VF510	150	6"
VF510	200	8"
VF510	250	10"
VF510	300	12"

## Série SYC972 - purgadores de ar automáticos

Pressão trabalho ..... PN10  
 Temperatura ..... 110°C



Tamanhos	
polegadas	
3/8"	
1/2"	

## Série SYC1400 - juntas de dilatação, ROSCADAS

Temperatura de trabalho ..... -10/115°C  
 Pressão trabalho ..... PN10  
 Pressão de prova ..... PN15  
 Pressão de rotura ..... PN30  
 Factor de envelhecimento ... 0,78/100°C x 12H  
 Corpo ..... EPDM comercial  
 Armação ..... tecido de cordão de nylon  
 Extremos ... uniões de ferro maleável galvanizado



Tamanhos	
mm	polegadas
20	3/4"
25	1"
32	1 1/4"
40	1 1/2"
50	2"

## Série SYC1410 - juntas de dilatação, FLANGEADAS

Temperatura de trabalho ..... -10/115°C  
 Pressão trabalho ..... PN16  
 Pressão de prova ..... PN15  
 Pressão de rotura ..... PN40  
 Factor de envelhecimento ... 0,78/100°C x 12H  
 Corpo ..... EPDM comercial  
 Armação ..... tecido de cordão de nylon  
 Extremos ..... flanges DIN 2576 aço carbono



Tamanhos	
mm	polegadas
32	1 1/4"
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"
200	8"
250	10"
300	12"

## Série SYCF - flanges para válvulas



DIN 2576 Plana



DIN 2633 com Gola

**MATERIAL:** aço carbono

DN	TUBO	
	diâmetro exterior	Polegadas
15	21,3	1/2
20	26,9	3/4
25	33,7	1
32	42,2	1 1/4
40	48,3	1 1/2
50	60,3	2
65	76,1	2 1/2
80	88,9	3
100	114,3	4
125	139,7	5
150	168,3	6
200	219,1	8
250	273,0	10
300	323,9	12
350	355,6	14
400	406,4	16
500	508,0	20

Consulte os nossos serviços técnicos para outros tipos de flanges:

Norma	Tipo	PN
DIN 2502	Plana	16
DIN 2527	Cega	10
DIN 2527	Cega	16
DIN 2566	Galvanizada a quente	10/16
DIN 2566	Negro	10/166
DIN 2573	Plana	6
DIN 2573	Roscada	6
DIN 2576	Plana	10
DIN 2576	Roscada	10
DIN 2576	Roscada	16
DIN 2576	Rega	10
DIN 2576	Rega	16
DIN 2633	Com gola	10
DIN 2633	Com gola	16

## Série SYCJF - juntas sem amianto, para flanges

Juntas para flanges, sem amianto

AFM-38 de 1,5 mm

DIN2576 COM furos

DN
10
15
20
25
32
40
50
65
80
100
125
150
200
250
300

## Série SYCJ - juntas em poliéster, para flanges DIN

### JUNTAS PARA FLANGES

PN6 .....	flange DIN 2573
PN10 .....	flange DIN 2576
PN16 .....	flange DIN 2633
PN25 .....	flange DIN2634
PN40 .....	flange DIN 2635

### VANTAGENS

#### O poliéster mantém as suas propriedades inalteráveis

entre -55°C/150°C.

Temperatura de serviço ..... -40°C/120°C

### APLICAÇÕES

Foram especialmente desenhadas para instalações de:

- Aquecimento e refrigeração
- Águas sanitárias
- Redes de incêndio
- Ar comprimido
- Refrigeração de máquinas industriais e tubagens para condução de fluidos.

### CARACTERÍSTICAS

Juntas para flanges normalizadas.

O poliéster combina as características mais desejáveis dos elastómeros com as dos plásticos flexíveis.

Elevada resistência à deformação à fadiga por flexão, tenacidade excepcional.

Flexibilidade a baixas temperaturas e boa retenção de propriedades.

Capaz de suportar altas pressões e temperaturas até 120°C.

Excelente resistência a produtos químicos, dissolventes, óleos e gasolinas.

As juntas cerram perfeitamente com o aparafusar das flanges e não necessitam de aditivos, nem colas para juntas, etc..

Simplificação na montagem com redução de custos.

Dispõe de uma pega que para além de facilitar a sua colocação, tem um furo que facilita a colocação de etiquetas de identificação.

O desenho exclusivo permite conseguir um centrar exacto da junta nos diferentes tipos de flanges.

**NOVO**  
**a Solução Ideal**



#### Medidas

DN	Polegadas
40	1 1/2"
50	2"
65	2 1/2"
80	3"
100	4"
125	5"
150	6"
200	8"

# Instrumentação Complementar



**SISTIMETRA**  
Porto

Rua Particular de São Gemil, 85  
São Gemil - Águas Santas - Maia  
4425-164 ÁGUAS SANTAS MAI  
telef. 229 774 470 - telefax 229 724 551  
e-mail [sistimetra@sistimetra.pt](mailto:sistimetra@sistimetra.pt) - [www.sistimetra.pt](http://www.sistimetra.pt)



**CONTIMETRA**  
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2790-138 CARNAXIDE  
telef. 214 203 900 - telefax 214 203 901  
e-mail [contimetra@contimetra.com](mailto:contimetra@contimetra.com) - [www.contimetra.com](http://www.contimetra.com)



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# Série TIS - Indicador digital

**Tipo** . . . . . Indicador digital de painel,  
baseado em microprocessador

**Entrada - Universal:**

- mA (0-20 ou 4-20 mA)-mV: 0-60 mV
- V: 0-10V
- PT100: 3 fios
- Termopar: J, K, R, S, T, N, L

**Indicação para entrada linear:**

- Ajustável -1999 / +4000
- Ponto decimal programável

**Alarmes**

- 2 (opcional 0 ou 3)
- Histeresis 0,1% a 10% da gama

**Saída**

- Relé SPDT, 3A / 250V ac / 30V dc
- Alarma 3: relé SPST 2A / 250V ac / 30V dc

**Funções especiais**

- Memorização dos valores de pico
- Filtro digital para display e alarmes
- Reset manual ou automático dos alarmes

**Retransmissão** . . . . . 0-20 ou 4-20 mA

**Alimentação** . . . . . 100-240V ac (24V ac/dc opcional)

**Montagem** . . . . . Em painel

**Protecção frontal** . . . . . IP 65

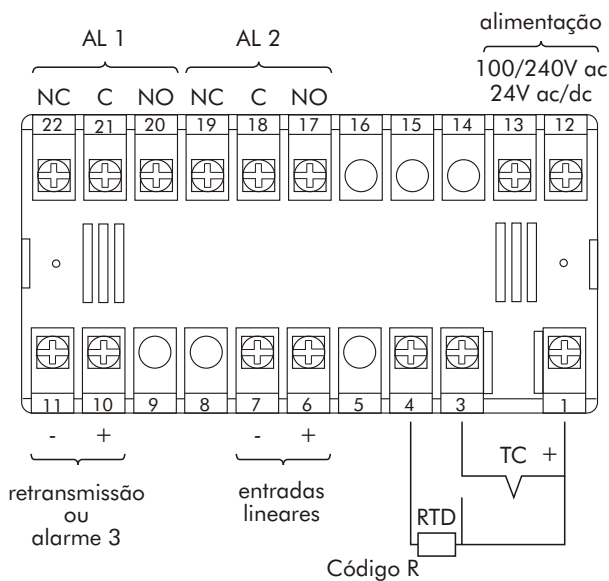
**Precisão** . . . . . 0,1% fim escala

**Temperatura de operação** . . . . . 0 a 50°C

**Dimensões** . . . . . (A x L x P) 48 x 96 x 89 mm



## Identificação dos bornes de ligações



Modelo	Entrada	Alarmes	Retransmissão
<b>TIS - 800- 013</b>	Universal	2	não
<b>TIS - 800- 023</b>	Universal	2	sim
<b>TIS - 800- 033</b>	Universal	3	não

## Série DPL / DPS - Indicador

**Tipo** . . . . . Indicador digital de 4 DIGITOS, baseado em microprocessador, programável via teclas frontais

**Entradas** . . . . . Universal: mA, mV, V, termopar, RTD

**Excitação para transmissores de 2 fios**

- 5, 10, 12 e 24V dc
- 24V dc (DPL) máx. 1,25 W

**Possibilidades de entradas mA, mV e V**

- Display ajustável entre -1999 e 9999
- Extração da raiz quadrada
- Linearização especial até 9 pontos

**Alarmes**

- 2, ajustáveis em toda a gama
- Saída por relé SPST 0,5A / 250V ac

**Funções especiais**

- Memorização dos valores de pico
- Filtro digital
- Retransmissão (opcional)
- Interface RS 485 (opcional)

**Montagem** . . . . . em painel

**Temperatura de operação** . . . . . 0-50°C

**Protecção frontal** . . . . . IP 54

**Precisão** . . . . . 0,1%

**Alimentação** . . . . . 110 - 220V ac ou 24V dc (opcional)

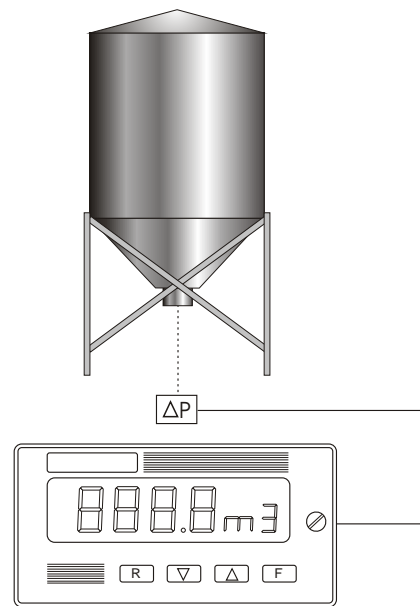
**Dimensões** . . . . . 48 x 94 x 144 mm

**Medida de nível em tanques cujo volume não é proporcional à altura.**

Por medida de pressão na base do tanque é possível linearizar a medida, até 10 segmentos de acordo com a configuração do tanque, de modo a visualizar-seo volume em unidades de engenharia.



### Exemplo de aplicação



Modelo	Entrada	Alarmes	Retransmissão
DPL - 700 - 214	mA/V	2	não
DPS - 391 - 150	Universal	2	sim

# Série DIGINORM 75/105 - Indicador digital/totalizador

**Tipo** . . . . . indicador digital 4 dígitos, programável  
via teclado frontal; Totalizador: 7 dígitos (se incluído)

**Entradas**

- mA, mv, V, PT100 (3 fios),
- termopares (J, K, B, R, S, T, E, N, L),
- potenciómetro, temperatura diferencial (PT 100 2 fios)

**Possibilidades das entradas mA, mv, V,**

- Indicação - ajustável entre -9999 e +9999
- Extração de raiz quadrada
- Linearização especial até 21 pontos

**Alimentação**

230 V ac ou 115 Vac (seleccionável internamente)

**Excitação para transmissores a 2 fios**

22 Vdc ≤ V ≤ 28 Vdc

**Montagem** . . . . . em painel

**Protecção frontal** . . . . . IP65

**Protecção para o modelo 105F** . . . . . IP63



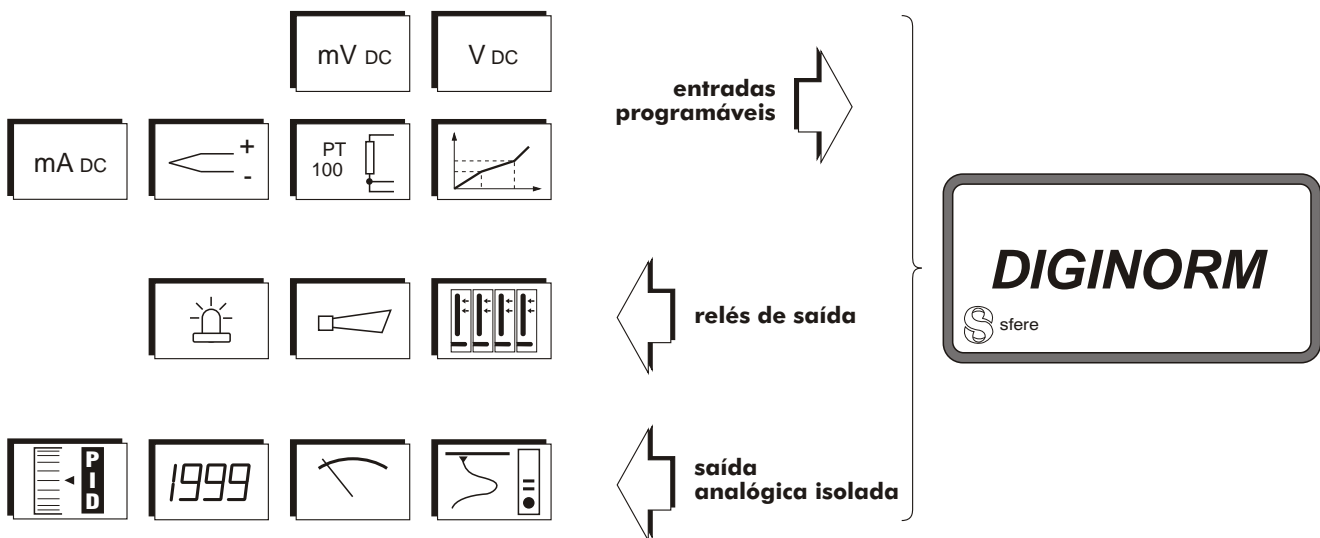
**Alarmes** . . . . . 2 ou 4 ajustáveis em toda a gama (opcional)

**Relés - 8A / 250 Vac**  
(saída dos alarmes ou retransmissão do totalizador)

**Retransmissão** . . . . . 0 - 20 mA ou 4 - 20 mA (opcional)

**Dimensões** . . . . . 96 x 48 x 102 mm

Modelos em stock	Entradas	Totalizador	Alarmes/saída por relés	Retransmissão
<b>75U2</b>	mA	não	não	não
<b>75UR4</b>	mA, mV, V	não	4	não
<b>75MAR</b>	Universal (todas)	não	2	sim
<b>105F</b>	mA	sim	1 relé de retransmissão do totalizador	não



As características técnicas apresentadas neste folheto não dispensam a consulta dos catálogos originais.

## Série NS - Indicador de gráfico de barras

### Tipo

Indicador com gráfico de barras e indicação digital de 3 dígitos, baseado em microprocessador, programável via painel frontal.

### Entrada

- 0/4 - 20 mA ; mV ; V ; Pt100 ; ; termopares

**Excitação para transmissor** . . . . . 26 Vdc max. 50 mA

### Display

- Indicador gráfico de barras (simples ou duplo) de 64 segmentos
- Indicador digital gama ajustável de -199 a 999

**Alarmes** . . . . . 2 programáveis por canal (opcional)

**Saída relés** . . . . . SPDT - 8A/250 Vac

**Saída analógica** . . . . . 0/4-20mA ; 0-10 Vdc

### Alimentação

90 ... 270 V / 20 ... 40 V - 50/60Hz

80 ... 350 V/20 ... 64 Vdc

**Montagem** . . . . . em painel

**Protecção frontal** . . . . . IP50

**Temperatura de funcionamento** . . . . . -5 / +55°C

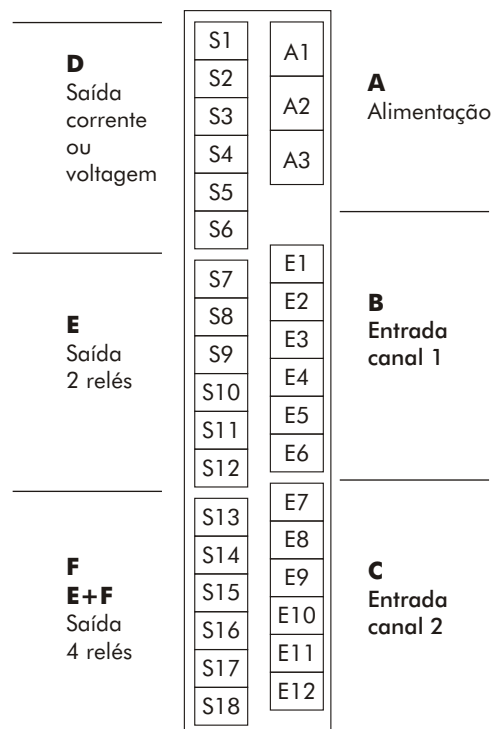
**Consumo** . . . . . 10VA (max)

**Dimensões** . . . . . 144x36x130 mm



Modelos	Alarmes	Saída analógica
<b>NS1M-2</b>	0	Não
<b>NS1M-R-2</b>	2	Não
<b>NS1M-AR-2</b>	2	Sim
<b>NS2M-2</b>	0	Não
<b>NS2M-R-2</b>	2x2	Não
<b>NS2M-AR-2</b>	2x2	2 x Sim

### IDENTIFICAÇÃO DA PLACA DE BORNES





# Série TFS - Controlador programável

**Tipo** . . . . . controlador baseado em microprocessador,  
com entrada universal

## Entrada universal

- mA (0-20 ou 4-20 mA),
- mV (0-60 mV), V (0-10V)
- Pt 100 (3 fios)
- Termopar J, K, T, R, S, N, Bnal)

## Indicação

- Digital 4 dígitos
- Programável -1999 / 3999 nas entradas mA, mV e V

## Controlo

- On/Off, PID, SMART
- Aquecimento / arrefecimento

## Saídas

- Relé SPDT, 4A / 250V AC
- Corrente, 0-20 mA ou 4-20 mA
- Para válvula motorizada, dois relés interligados aberto / fechado, potenciômetro de feedback só para indicação da posição da válvula
- SSR - solid state relay (opcional)
- Interface série RS 485
- Arrefecimento: relé SPST, 2A / 250V AC
- Retransmissão: 0/4-20 mA (opcional)

## Alarmes

- 2, saída por relés SPST, 2A / 250V AC
- 1, para saída servomotor ou arrefecimento

**Montagem** . . . . . Em painel

**Temperatura de operação** . . . . . 0-50°C

**Precisão** . . . . . +/-0,2% fim de escala

**Protecção frontal** . . . . . IP 65

**Alimentação** . . . . . 100-240V AC, 50/60Hz

**Dimensões** . . . . . 48 x 96



Modelos em stock	SAÍDA
<b>TFS-931-113</b>	Relé
<b>TFS-932-123</b>	Servomotor
<b>TFS-937-123</b>	mA

# Série CAP - Conversor de sinais analógicos DC

## Entradas

- CAP PROCESS: corrente ou tensão comutável por jumper
- +/- 1 mA / +/- 150 mA
- +/- 100 mV / +/- 500V
- CAP-RTD: Pt 100

## Saída

- 0-20 mA / 4-20 mA
- 0-10V, +/- 10V ou +/- 20 mA comutável por jumper

**Alimentação** ..... 100-250 V ac

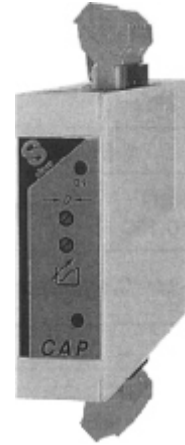
**Resistência de carga** ..... < 750Ω (mA)

**Rigidez dieléctrica** ..... 2 KV - 50 Hz - 1 mn

**Temperatura de serviço** ..... 0 a 50°C

**Montagem** ..... calha DIN

**Protecção** ..... IP20

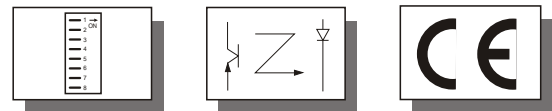
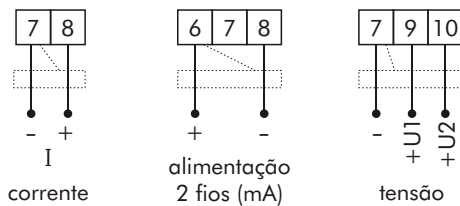


Modelos em stock	Entrada
CAP PROCESS/230v	mA/mV/V
CAP RTD/230v	Pt 100

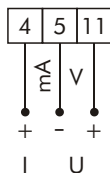
## Nota:

Também disponível com 2 saídas isoladas - CAP PROCESS 1.2

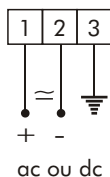
## ENTRADAS



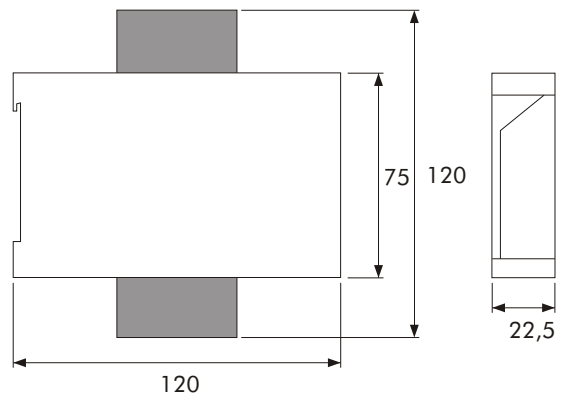
## SAÍDAS



## ALIMENTAÇÃO



## DIMENSÕES



## Série ELIT 93/940 - Isolador galvânico auto-alimentado

### Entrada

- 0-4 mA ou 0-20 mA ou 0-50 mA
- tensão máxima de entrada 16 Vdc

### Saída

- 0-4 mA ou 0-20 mA ou 0-50 mA
- carga máxima 700Ω a 20 mA

Transferência .....1/1

### Número de entradas e saídas

- Elit 93 ..... 1
- Elit 940 ..... 2

Classe de precisão ..... 0,15

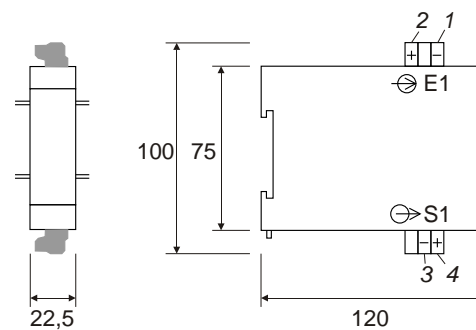
Temperatura de operação ..... 0 a 55°C

Rigidez dielétrica ..... 2 KV / 50 Hz / 1 mm

Montagem ..... calha DIN



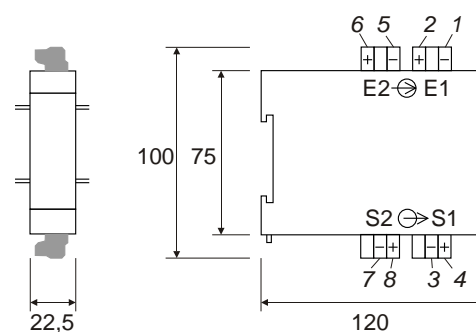
**ELIT 93** Dimensões 75 x 22,5 x 120 mm



Modelo	Número de vias
<b>ELIT 93</b>	1 (simple)
<b>ELIT 940</b>	2 (duplo)



**ELIT 940** Dimensões 75 x 22,5 x 120 mm



O isolador galvânico **ELIT 93** é um transmissor de corrente auto-alimentado, cuja função é proporcionar separação galvânica entre sensores e instrumentos receptores (registadores, controladores, autómatos,...).

O **ELIT 93** resolve o problema de pontos comuns que surgem nos loops de medida, e melhora a rejeição de interferências em cabos eléctricos.

O **ELIT 940** é o conversor duplo que resulta da junção de dois circuitos independentes ELIT 93, numa única caixa.

## Série 7110 DIN - Contador totalizador electrónico

Muito versátil é um contador totalizador LCD de 8 dígitos autoalimentado pela sua própria bateria integral de lítio, possui reset, com dimensões 24x48 DIN.

Indicador LCD de alto contraste com caracteres negros de 7 mm de altura.

Frequência de contagem até 10kHz.

Disparo opcional desde qualquer tensão entre 5 e 24 V ac ou dc utilizando o adaptador 7210 DIN.

Várias possibilidades de montagem disponíveis, em painel frontal ou montagem pela parte posterior.

O painel frontal pode ser selado a IP65/NEMA 4.

Aprovação UL e UL/CSA.



<b>Modelos</b>	<b>Tipo</b>
<b>7110 DIN</b>	Uni-direccional, contagem ascendente
<b>7110 DINAS</b>	Bi-direccional (50 ms/subtrai)

### Especificações técnicas

#### Tensão de alimentação:

Bateria de lítio interna, vida aproximada 10 anos

#### Gama de contagem:

99999999

#### Temperatura de trabalho:

-10 a 60°C

### Aplicações típicas:

Substituição de contadores electromecânicos.

Onde não está disponível alimentação externa.

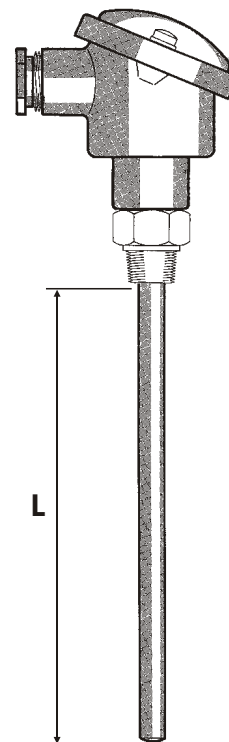
Medições de posição, longitude, rotação e distância.

Contagem de resultados.

# Sonda de temperatura Pt 100, Termopar J/K

Sonda de temperatura com isolamento mineral, haste em aço inox, rosca para ligação ao processo, cabeça de ligações DIN, Tipo B em alumínio.

MODELO	PT100	- 1	- B	- 6	- 100	- 304	- F	- 12	- G	- N	- G 0/100°C
PT100	<b>PT100</b>										
Termopar K . . . . .	<b>TCK</b>										
Termopar J . . . . .	<b>TCJ</b>										
Elemento simples . . . . .	<b>1</b>										
Elemento Duplo . . . . .	<b>2</b>										
Cabeça ligação B . . . . .	<b>B</b>										
Cabo de silicone . . . . .	<b>S</b>										
Diâmetro 6 mm . . . . .	<b>6</b>										
Diâmetro 8 mm . . . . .	<b>8</b>										
Comprimento (mm) . . . . .	<b>XXX</b>										
Material da haste e ligação AISI 304 . . . . .	<b>304</b>										
Material da haste e ligação AISI 306 . . . . .	<b>316</b>										
Ligação fixa . . . . .	<b>F</b>										
Ligação deslizante . . . . .	<b>D</b>										
Ligação 1/4" . . . . .	<b>14</b>										
Ligação 3/8" . . . . .	<b>18</b>										
Ligação 1/2" . . . . .	<b>12</b>										
Ligação 3/4" . . . . .	<b>34</b>										
Rosca GAS . . . . .	<b>G</b>										
Rosca NPT . . . . .	<b>N</b>										
Execução normal . . . . .	<b>N</b>										
Execução perfurada . . . . .	<b>P</b>										
Próprio para conversor . . . . .	<b>P</b>										
Equipada com conversor 24Vdc/4-20mA (gama) . . . . .	<b>C XXXX</b>										



## Modelos disponíveis em STOCK

PT100-1-B-6-100-304-F-12-G-M

PT100-2-B-6-100-304-F-12-G-M

PT100-1-B-6-200-304-F-12-G-M

PT100-1-B-6-200-304-D-12-G-M

PT100-1-B-6-350-304-D-12-G-M

PT100-1-B-6-200-304-D-12-G-M

PT100-1-B-6-300-304-F-12-G-M

Bainha 100 mm 1/2" Gás

Bainha 200 mm 1/2" Gás



## Série MINITRACE 200 / 300 - Registador

**Tipo** ..... analógico

**Entradas** (a defenir quando da encomenda)

- V (0 a 5 V ou 5 a 460 V com divisor de tensão)
- mA (0 a 20 mA ou 4 a 20 mA)
- Termopar (K, J, T, S)
- RTD (PT 100, fios)
- Potenciómetro (7,3 a 363W)

**Tipo de registo** ..... contínuo, tipo ponta de feltro

**Tipo de gráfico** ..... harmónio (ou rolo opcional)

**Largura do papel** ..... 100 ou 150 mm

**Velocidade de registo** ..... 9 seleccionáveis via switch  
12, 20, 40, 60, 120, 400, 600 e 1200 mm/h

**Protecção** ..... IP 41 (caixa)

**Precisão** ..... 0,5%

**Alimentação**

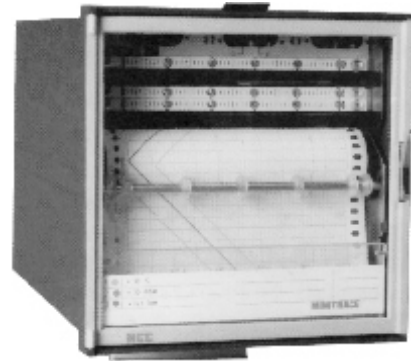
- 110 ou 220 V ac
- 12, 24 e 48 V dc (opcional)

**Alarmes** (opcional)

- 2 ou 4 canal 1 ou 2 canal 1 e 2
- 2 canal 1, 2, 3

**Dimensões**

- 144 x 144 x 200 mm
- ou 192 x 144 x 200 mm



MODELO	Número de canais	Alarmes (Opcional)
<b>200</b>	1, 2	2 ou 4
<b>300</b>	1, 2, 3	2 canal 1, 2, 3

Modelo	Nº de canais	Entrada	Escala	Alimentação	Gráfico
<b>MINITRACE 200/1/4 - 20 mA</b>	1	4 - 20 mA	0-100%	220V/50Hz	Harmónio 100 mm
<b>MINITRACE 200/2/4 - 20 mA</b>	2	4 - 20 mA	0-100%	220V/50Hz	Harmónio 100 mm
<b>MINITRACE 300/3/4 - 20 mA</b>	3	4 - 20 mA	0-100%	220V/50Hz	Harmónio 100 mm

Referência	Consumíveis	Observações
<b>M10173 (CRCC)</b>	Gráfico	Tipo harmónio
<b>B69588 (CRCC)</b>	Caneta vermelha	Pacote de 3
<b>B69589 (CRCC)</b>	Caneta azul	Pacote de 3
<b>B69590 (CRCC)</b>	Caneta violeta	Pacote de 3

## Série MINITRACE 6000 - Registador programável

**Tipo** . . . . . programável servido por microprocessador

**Número de canais** . . . . . 6 ou 12

**Entrada universal, programável para:**

- mv (0-125 mV / 0-65 mV / 0-20 mV / -25 + 25 mV)
- V (0-5 V / 1-5 V / 0-1 V / 0,2-1 V)
- mA (4-20 mA ; 0-20 mA)
- Termopar (K, J, T, S, R, N, B)
- RTD (PT 100 3 fios)
- Potenciómetro (100 W a 10 KW)

**Entradas digitais** . . . . . 4

**Alarmes** . . . . . 12 configuráveis alto ou baixo,  
indicação por led, saída por relé (máximo 6 opcional)

**Tipo de registo**

- Por pontos (6 cores) tipo ponta de feltro
- Numérico

**Tipo de gráfico** . . . . . harmónio (ou rolo opcional)

**Largura do papel** . . . . . 100 ou 150 mm

**Velocidade de registo** . . . . . Programável 1 a 1000 mm/h  
(em passos de 1 mm/h)

**Indicação** . . . . . digital

**Precisão**

- 0,1% (entradas lineares)
- 0,15% (outras)

**Alimentação**

- 115 ou 230 V ac 50/60 Hz
- 18 a 48 V ac e 12 a 72 V dc (opcional)

**Excitação para o transmissor a 2 fios** . . . . . 22 V dc  
(máximo 3 opcional)

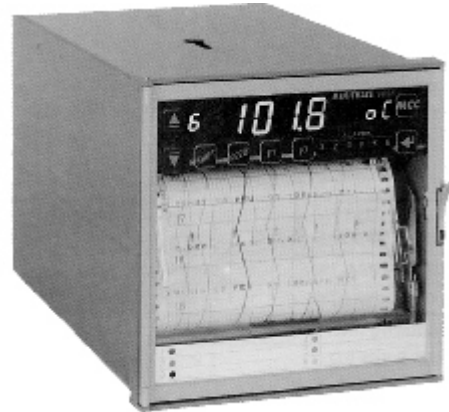
**Comunicação digital** . . . . . RS232 ou RS485 (opcional)

**Temperatura de operação** . . . . . 0 a 50°C

**Dimensões**

- 144 x 144 x 200 mm
- 192 x 144 x 200 mm

**Protecção** . . . . . IP 41 (caixa)



Referência	Consumíveis	Observações
H 20232 (CRCC)	Gráfico	Tipo harmónio
H 90481 (ZZCC)	Cabeça de escrita	-

Modelo	Número de canais	Dimensões	Alimentação	Gráfico
MINITRACE 6100/6	6	144 x 144 x 200	220V/50Hz	Harmónio 100 mm

## Série MINITRACE 4000 - Registador programável

**Tipo** . . . . . programável servido por microprocessador

**Número de canais** . . . . . 4

**Entradas - universal programável para:**

- mv (-25 a +25; +30 a +75; 0-20; 0-65; 0-125)
- V (0-1; 0-5; 0-10)
- mA (0-20 ou 4-20)
- PT 100 (-200 a 650°C e -50 a 200°C)
- Potenciómetro (2 KW a 50 KW)

**Entradas digitais**

- 4 (contacto fechado livre de tensão - estado 1, contacto aberto livre de tensão - estado 0 )
- Tensão inferior a 2 volts - estado 1, superior a 4,5 volts - estado 0

**Alarmes** . . . 8 configuráveis alto ou baixo indicação por led, saída por relé (máx. 6 opcional)

**Tipo de registo**

- Contínuo (4 cores) tipo ponta de feltro
- Numérico (1 cor preto)

**Tipo de gráfico** . . . . . harmónio (ou rolo opcional)

**Largura do papel** . . . . . 100 mm

**Velocidade de registo** . . . . . 1 a 1000 mm/h

**Indicação** . . . . . digital e bargraph

**Precisão**

- 0,1% (entradas lineares)
- 0,15% (outras)

**Alimentação** . . . . . 115/230 V ac 50/60Hz

**Excitação para o transmissor a 2 fios** . . . . . 22 V dc  
(máximo 3 opcional)

**Comunicação digital** . . . . . RS232 ou RS485  
(protocolo MOD BUS) opcional

**Temperatura de operação** . . . . . 0 a 50°C

**Dimensões** . . . . . 144 x 144 x 200 mm

**Proteção frontal** . . . . . IP 54



Modelo	Número de canais	Gráfico
<b>MINITRACE 4101</b>	1	Harmónio 100 mm
<b>MINITRACE 4102</b>	2	Harmónio 100 mm
<b>MINITRACE 4103</b>	3	Harmónio 100 mm
<b>MINITRACE 4104</b>	4	Harmónio 100 mm

Referência	Consumíveis
<b>H 20232</b>	Gráfico
<b>H 20622</b>	Caneta vermelha
<b>H 20623</b>	Caneta azul
<b>H 20624</b>	Caneta violeta
<b>H 20625</b>	Caneta verde
<b>H 20626</b>	Caneta preta (mensagens)

## Série 01-0.4 – Manómetros com caixa em aço inox – DN100

**Classe de precisão** (norma EN 837-1) ..... 1,6%

**Temperatura ambiente** ..... -25/65°C

**Temperatura fluido processo** ..... máx. 65°C

**Proteção** (norma IEC.529) ..... IP67

**Materiais**

**Ligação ao processo** ..... Latão, 1/2" Gas M por baixo

**Mola tubular** ..... bronze fosforoso

**Caixa** ..... aço inox AISI 304, DN100 mm

**Anel** ..... aço inox AISI 304 agrafado

**Janela** ..... vidro temperado

**Movimento** ..... latão OT59

**Quadrante** ..... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio lacado a preto

**Junta de fecho** ..... EPDM

**Tampão de segurança** ..... EPDM

Fabricado em conformidade com o standard **Europeu EN837.1**

**Nota:** Outras unidades e gamas disponíveis.

### Modelo

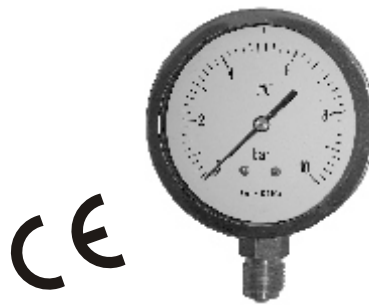
**01-04.2-A-E-2-GAMA-41M**

**01-04.3-A-E-2-GAMA-41M**

### Escalas Manómetros

Escala	bar (1)	kPa	MPa	bar ext. (1) Psi int.	bar ext. kPa int.	bar ext. MPa int.
0 ... 1	■		■	■	■	
0 ... 1,6	■		■	■	■	
0 ... 2,5	■		■	■	■	
0 ... 4	■		■	■	■	
0 ... 6	■		■	■	■	
0 ... 10	■		■	■		■
0 ... 16	■		■	■		■
0 ... 25	■		■	■		■
0 ... 40	■		■	■		■
0 ... 60	■		■	■		■
0 ... 100	■	■	■	■		■
0 ... 160	■	■		■		■
0 ... 250	■	■		■		■
0 ... 300	■					
0 ... 400	■	■		■		■
0 ... 600	■	■		■		■
0 ... 1000	■	■		■		■
0 ... 1600		■				
0 ... 2500		■				

\*Também disponível em Kg/cm<sup>2</sup>



Conforme os requisitos da norma **PED 97/237CE**

**01-04.2 SECOS** podem ser cheios de glicerina

**01-04.3 CHEIOS DE GLICERINA**

### Escalas Manovacúómetros e vacuómetros

Escala	bar	kPa	bar ext. Psi int.*	bar ext. kPa int.
-1 ... 0	■		■	■
-1 ... 0,6	■		■	■
-1 ... 1,5	■		■	■
-1 ... 3	■		■	■
-1 ... 5	■		■	■
-1 ... 9	■		■	■
-1 ... 15	■		■	■
-1 ... 24	■		■	■
-100 ... 0		■		
-100 ... 150		■		
-100 ... 300		■		
-100 ... 500		■		
-100 ... 900		■		
-100 ... 1500		■		
-100 ... 2400		■		

\*unidade de medida de vácuo em: "inHg"

### Escalas Manovacúómetros e vacuómetros

Escala	Psi*	Psi int.* kPa ext.	psi ext.* bar int.	psi ext.* Kg/cm <sup>2</sup> int.
-30 ... 0	■	■	■	■
-30 ... 15	■	■	■	■
-30 ... 30	■	■	■	■
-30 ... 150	■			

\*unidade de medida de vácuo em: "inHg"

### Tripla escala FREON

bar	R12 °C	R22 °C	R502 °C
-1 ... +9	-70 ... +40	-80 ... +20	-70 ... +20
-1 ... +15	-60 ... +60	-60 ... +40	-60 ... +35
-1 ... +24	-50 ... +80	-60 ... +60	-60 ... +55
-1 ... +39	-60 ... +110	-70 ... +80	-60 ... +80

## Série 01-10 – Manómetros com caixa em aço inox – DN63

**Gamas** ..... 0/2,5; 0/4; 0/6; 0/10; 0/16; 0/25 Bar

**Classe de precisão** (norma UNI 8293) ..... 1,6%

**Temperatura ambiente** ..... -25/65°C

**Temperatura fluido processo** ..... máx. 65°C

**Protecção** (norma IEC.529; UNI 8896) ..... IP65

### **Materiais**

**Ligação ao processo** ..... Latão, 1/4" Gas M por baixo

**Mola tubular** ..... bronze fosforoso

**Caixa** ..... aço inox AISI 304, DN63mm

**Anel** ..... aço inox AISI 304

**Janela** ..... plexiglass

**Movimento** ..... latão OT59

**Quadrante** ..... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio anodizado a preto

**Nota: Outras unidades e gamas disponíveis**



### **Modelo**

**01-10.2-A-C-2-GAMA-21M**

**01-10.3-A-C-2-GAMA-21M**

**01-10.2 SECOS** podem ser cheios de glicerina

**01-10.3 CHEIOS DE GLICERINA**



# Série 01-18 – Manómetros todos em aço inox – DN 100

- Gamas**... conforme indicado nas tabelas 1 a 6  
**Classe de precisão** (norma EN 8371)... 1,0%  
**Temperatura ambiente**... -25/65°C  
**Temperatura fluido processo**  
**18.2 seco**... -40/150°C  
**18.3 cheio glicerina**... máx. 65°C  
**Protecção** (norma IEC 529)... IP67  
**Materiais**  
**Ligação ao processo**<sup>(1)</sup>... aço inox AISI 316L- 1/2" Gas M por baixo  
**Mola tubular**... aço inox AISI 316L  
**Caixa**<sup>(2)</sup>... aço inox AISI 304, DN 100mm  
**Anel**... aço inox AISI 304, tipo baioneta  
**Janela**... plexiglass espessura 4mm  
**Movimento**... aço inox  
**Quadrante**... alumínio fundo branco- numeração a preto  
**Ponteiro**... alumínio  
**(opcional com ajuste micrométrico-L02)**

Fabricado em conformidade com o standard **Europeu EN 837.1**

<sup>(1)</sup>Também disponível com outras ligações

<sup>(2)</sup>Também disponível com diâmetro DN150



**01-18.2 SECOS** podem ser cheios de glicerina  
**01-18.3 CHEIOS DE GLICERINA**

Modelo
<b>01-18.2-A-E-2-GAMA-41M</b>
<b>01-18.3-A-E-2-GAMA-41M</b>

## MANÓMETROS Tab.1

Gama	Bar	KPa	Mpa	Bar est. Psi int.	Bar est. Kpa int.	Bar est. Mpa int.
0/0,6 (1)	EG	EG	EG			
0/1	EG	EG	EG			
0/1,6	EG	EG	EG	EG		
0/2,5	EG	EG	EG	EG	EG	
0/4	EG	EG	EG	EG	EG	
0/6	EG	EG	EG	EG	EG	
0/10	EG	EG	EG	EG	EG	EG
0/16	EG	EG	EG	EG	EG	EG
0/25	EG	EG	EG	EG	EG	EG
0/40	EG	EG	EG	EG	EG	EG
0/60	EG	EG	EG	EG	EG	EG
0/100	EG	EG	EG	EG	EG	EG
0/160	EG	EG	EG	EG	EG	EG
0/250	EG	EG	EG	EG	EG	EG
0/300	E					
0/400	EG	EG		EG		EG
0/600	EG	EG		EG		EG
0/1000	EG	EG		EG		EG
0/1600	EG	EG		EG		EG
0/2500	EG					

(1) não disponível para 18.3

## Manómetros e manovacuómetros Tab.4

Gama	Bar	KPa	Bar est. Psi int.*	Bar est. Kpa int.
-1/0	EG		EG	EG
-1/0,6	EG		EG	EG
-1/1,5	EG		EG	EG
-1/3	EG		EG	EG
-1/5	EG		EG	EG
-1/9	EG		EG	EG
-1/15	EG		EG	EG
-1/24	EG		EG	EG
-100/0		EG		
-100/150		EG		
-100/300		EG		
-100/500		EG		
-100/900		EG		
-100/1500		EG		
-100/2400		E		

## MANÓMETROS Tab.2

Gama	Psi	Psi int. Kpa est.	Psi est. Bar int.	Psi est. Kg/cm² int.
0/15	EG	EG	EG	EG
0/30	EG	EG	EG	EG
0/60	EG	EG	EG	EG
0/100	EG	EG	EG	EG
0/160	EG	EG	EG	EG
0/200	EG	EG	EG	EG
0/300	EG	EG	EG	EG
0/400	EG	EG	EG	EG
0/600	EG	EG	EG	EG
0/1000	EG	EG	EG	EG
0/1500	EG	EG	EG	EG
0/2000	EG	EG	EG	EG
0/3000	EG	EG	EG	EG
0/4000	EG	EG	EG	EG
0/5000	EG	EG	EG	EG
0/6000	EG	EG	EG	EG
0/10000	EG	EG	EG	EG
0/15000	EG	EG	EG	EG
0/20000	EG	EG	EG	EG

## Tab.5

Gama	Psi*	Psi int.* Kpa est.	Psi est.* Bar int.	Psi est.* Kg/cm² int.
-30/0	EG	EG	EG	EG
-30/15	EG	EG	EG	EG
-30/30	EG	EG	EG	EG
-30/150	EG	/	EG	/

\*Unidade de medida para vácuo: "inHg"

## RECEPTORES Tab.3

Externa	Interna 0-100 linear	Interna 0-10 quadrática
0,2/1 bar	EG	EG
0,2/1 Kg/cm²	EG	EG
3/15 psi	EG	EG
20/100 Kpa	EG	EG

Unidade de medida para vácuo: "inHg"

## Nota:

E = DN100  
G = DN150

## Tab.6 – NH3

Bar externa	NH3 interna	
-1/5	-70/+9°C	E
-1/9	-70/+25°C	E
-1/15	-70/+40°C	E
-1/24	-70/+56°C	E

## Serie 01-M2

### Manómetros todos em aço inox com contactos eléctricos – DN100

#### Aplicação

Utilizados para o controlo de operações eléctricas em compressores, bombas, prensas, equipamentos pneumáticos e hidráulicos, indústrias químicas, petroquímicas e pasta e papel. O contacto abre e fecha o circuito em função da posição da agulha indicadora e é ajustável em toda a gama.

**Gamas** ..... desde 0/1 bar até 0/1600 bar  
**Classe de precisão** (norma UNI 8293 – DIN 16085)

**M2.1** seco ..... 1,0%

**M2.3** cheio de óleo de silicone dieléctrico ..... 1,6%

**Temperatura ambiente** ..... -25/65°C

**Temperatura fluido processo** ..... máx. 100°C

**Protecção** (norma IEC 529, UNI 8896)

**M2.1** seco ..... IP55

**M2.3** cheio de glicerina ..... IP65

#### Materiais

**Ligação ao processo** ... aço inox AISI 316L, 1/2" Gas M por baixo

**Mola tubular** ..... aço inox AISI 316L

**Caixa** ..... aço inox AISI 304, DN 100mm

**Anel de fecho** ..... aço inox AISI 304, tipo baioneta

**Janela** ..... plexiglass

**Movimento** ..... aço inox

**Quadrante** ..... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio anodizado a preto

#### Contactos eléctricos

**Tipo duplos** ..... 01D

**Precisão de intervenção** ..... 1,5 vezes a precisão do manómetro

**Histeresis de intervenção** ..... 0,3% do valor máximo da escala

**Potência de ruptura** ..... 10W/18Va

**Máxima tensão/corrente** ..... 250VCA/0,7A (carga resistiva)

**Material dos contactos** ..... Prata – Níquel 80/20%

**Regulação** ... Em toda a escala (270°) por meio de chave removível



#### 01-M2.1 SECOS podem ser cheios

#### 01-M2.3 CHEIOS DE ÓLEO SILICONE DIELÉCTRICO

#### Modelo

01-M2.1-A-E-2-GAMA-41M-01D

01-M2.3-A-E-2-GAMA-41M-01D

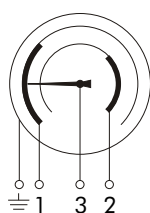
#### CORRENTE DE TRABALHO <sup>(1)</sup>

Volt	CC	CA	Carga inductiva
220	40 mA	45 mA	25 mA
110	80 mA	90 mA	45 mA
48	120 mA	170 mA	70 mA
24	200 mA	350 mA	100 mA

Valores mínimos Vcc: 24 Vcc/20mA

(1) recomendado segundo norma DIN 16085

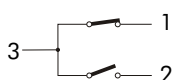
#### Esquema de ligações



1° MINI  
2° MAXI

#### Esquema eléctrico

em estado de repouso



#### Movimento do ponteiro

o movimento do ponteiro no sentido dos ponteiros do relógio provoca:

- Abertura do contacto 1
- Fecho do contacto 2

#### Caixa de ligações

**M2.1** 3 polos pg.11  
**M2.3** 6 polos pg.9

#### Nota:

Consulte os nossos serviços técnicos p/ **contactos indutivos de segurança intrínseca**

## Série 02-18 – Manómetros diferenciais com duplo tubo Bourdon– DN100

### Aplicação:

Manómetros para indicação de pressão diferencial de fluidos gasosos ou líquidos que não apresentem viscosidades elevadas e que não cristalizem. Podem ser utilizados com separadores de diafragma com presença de fluidos de processo corrosivos, de alta temperatura, viscosidade elevada ou cristalizantes. Consulte os nossos serviços técnicos para estes casos.

**Classe de precisão** (norma EN837) ..... 1,6

- para a gama 0/0,4 bar ..... 2,5

**Temperatura ambiente** ..... máx. 65°C

**Temperatura fluido processo** ..... máx. 100°C

- com separadores ..... máx. 65°C

### Protecção

- norma IEC 529, UNI 8896 ..... IP55

- quando cheios de glicerina ..... IP67

### MATERIAIS

**Ligação ao processo** ..... aço inox AISI 316, 1/4" NPT F

**Mola tubular** .... bourdon em AISI 316L do tipo dupla mola tubular

**Caixa** ..... aço inox AISI 304, DN 100mm

**Anel** ..... aço inox AISI 304, tipo baioneta

**Janela** ..... plexiglass

**Movimento** ..... aço inox

**Quadrante** ..... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio com ajuste micrométrico

### GAMAS

Diferencial $\Delta p$ (bar) (1)	Pressão estática ambos os lados ou lado "+" (bar)	Pressão estática lado "-" (bar)
0/0,4	0,72	0,6
0/0,6	1,6	1
0/1	4	1,6
0/1,6	8	2
0/2,5	12,5	3
0/4	16	5
0/6	24	10
0/10	40	16

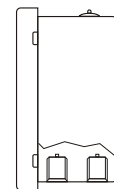
(1) Outras unidades de medida disponíveis a pedido



## 02-18.1

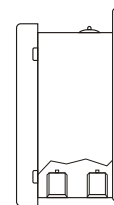
### Tipo A

para montagem local na tubagem, com ligações por baixo



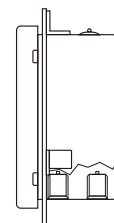
### Tipo C

para montagem em parede, com flange atrás e ligações por baixo



### Tipo F

para montagem em painel, com flange à frente e ligações por baixo



Modelo	Montagem
<b>02-18.1-A-E-2-GAMA-23F</b>	tipo A
<b>02-18.1-C-E-2-GAMA-23F</b>	tipo C
<b>02-18.1-F-E-2-GAMA-23F</b>	tipo F

Cheios de glicerina (R10)

## Série 04-1B0-1BS – Separador de diafragama, ligação roscada

### Aplicação

Construídos para isolar, manómetros, pressostatos, transmissores de pressão electrónicos, de fluidos corrosivos, viscosos ou sedimentarosos ou de altas temperaturas.

**Gamas** ..... -1/0 até 0/40 bar

**Temperatura do processo** ..... -45/150°C  
opcional ..... +20/340°C

**Precisão** (adicionar à precisão do instrumento)

**montagem directa** ..... ± 0,5%

**montagem com capilar** ..... ± 1,0%

### LIGAÇÕES

**ao manómetro** ..... aço inox AISI 316L, 1/2" Gas F

**ao processo** ..... 1/2" Gas M

### NOTA:

Todos os separadores de diafragma são acoplados aos instrumentos e fixados por um ponto de soldadura.

### LÍQUIDOS DE TRANSMISSÃO

Tipo do líquido	Limite da temperatura do fluido de processo
Óleo Silicone "A"	-45/+150°C
Óleo Silicone "B"	-20/+250°C
Óleo Silicone "C"	-20/+340°C
Líquido Fluorado	-60/+150°C
Óleo Alimentar	-20/+200°C

### LIGAÇÃO À DISTÂNCIA

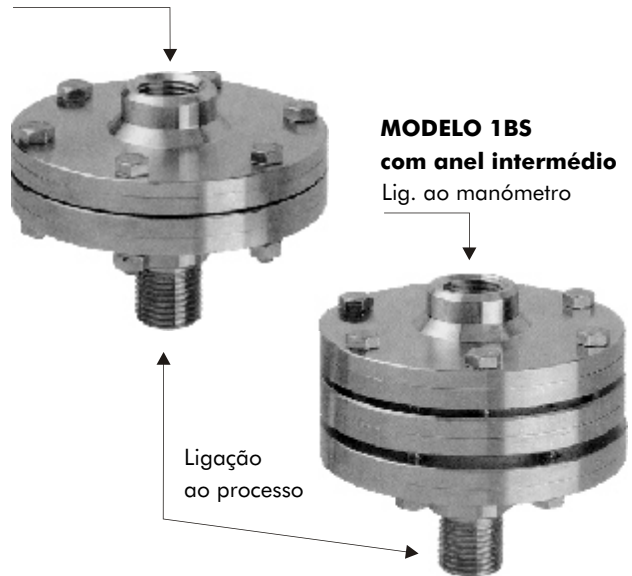
Tipo capilar - comprimento máx. 6 mt.	Código
AISI 304 nu	<b>1</b>
AISI 316 revestido a AISI 304 armado	<b>4</b>
AISI 304 revestido a AISI 304 armado c/ protecção a PVC	<b>5</b>
AISI 304 revestido a AISI 304 armado	<b>9</b>

### Nota:

Construa o modelo para a sua aplicação conforme indicado na página seguinte.

Possuímos uma vasta gama de separadores de diafragma com ligações ao processo roscados e flangeados, consulte os nossos serviços técnicos.

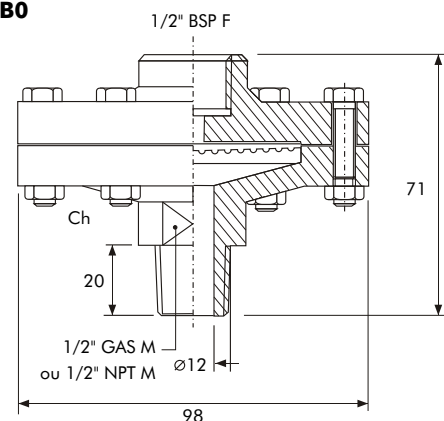
**MODELO 1B0 com diafragma soldado**  
Lig. ao manómetro



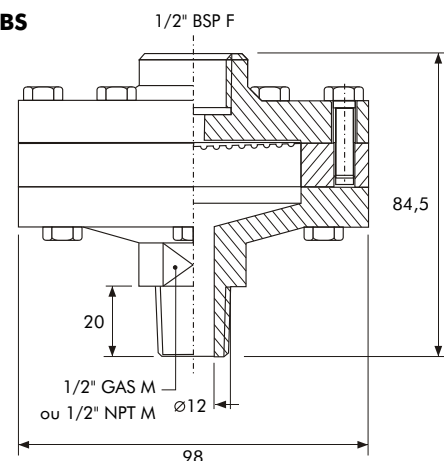
**MODELO 1BS com anel intermédio**  
Lig. ao manómetro

### DIMENSÕES (mm)

#### MODELO 1B0



#### MODELO 1BS



## Série 04-1BO-1BS – Separadores de fluido, ligação roscada

Exemplo	Código	Descrição
<b>04</b> Série	<b>04</b>	
<b>1BO</b> Tipo	<b>1BO</b> <b>1BS</b>	com diafragma soldado com anel intermédio
<b>4</b> Materiais ligação ao processo	<b>4</b>	AISI 316
	<b>N</b>	AISI316+PTFE (máx. 16 Bar) 1/2" Gas
	<b>5</b>	AISI 316L
	<b>3</b>	Aço carbono
	<b>8</b>	Aço carbono+PTFE (máx. 16 Bar) 1/2" Gas
	<b>1</b>	Hasteloy B
	<b>9</b>	Hasteloy C
	<b>6</b>	Monel 400
	<b>P</b>	Titânio
<b>4</b> Material da membrana	<b>4</b>	AISI 316L
	<b>8</b>	AISI 316L + PTFE
	<b>1</b>	Hasteloy B
	<b>9</b>	Hasteloy C
	<b>E</b>	Hasteloy C + PTFE
	<b>6</b>	Monel 400
	<b>B</b>	Tântalo
	<b>C</b>	Tântalo + PTFE
	<b>2</b>	Titânio
<b>41M</b> Ligação ao processo	<b>41M</b> <b>43M</b>	1/2" Gas M 1/2" NPT M
<b>41F</b> Ligação ao instrumento	<b>41F</b>	1/2" Gas F
<b>9</b> Tipo de capilar	<b>1</b> <b>4</b> <b>5</b> <b>9</b>	AISI 304 nu AISI 316 revestido a AISI 304 AISI 304 revestido a AISI 304 protecção PVC AISI 304 revestido a AISI 304
<b>XXXX</b> Comprimento do capilar	<b>xxxx</b>	Indicar o comprimento (em mm)
<b>E10</b> Opcionais	<b>C05</b> <b>E09</b> <b>E10</b> <b>E30</b> <b>F10</b> <b>R15</b> <b>R16</b> <b>R20</b> <b>R21</b> <b>S10</b> <b>S20</b> <b>TOR</b> <b>TS4</b> <b>EPS</b> <b>ETS</b> <b>EPD</b>	Teste de hélio Execução temperatura máxima 250°C Execução temperatura máx. 350°C Execução norma NACE (só membrana com Monel) Ligação ao processo com acabamento interno polido espelho (só para ligação ao processo AISI 316) Líquido de transmissão, Fluorolube Líquido de enchimento, óleo alimentar Adaptador ligação 1/2" Gas M x 1/2" Gas F com válvula de carga Adaptador ligação 1/2" Gas M x 1/4" NPT M com válvula de carga Sem parte inferior em AISI 316 Sem ser montado no instrumento e sem líquido de transmissão Torre de arrefecimento ST 034 Tampão de purga AISI 316 Extra para montagem em pressostatos Extra para montagem em transmissores Extra para montagem em pressostatos diferenciais

Exemplo: **04-1BO-4-4-41M-41F-9-1000mm-E10**



# ACESSÓRIOS PARA MANÓMETROS

## Série 05 - Válvulas de isolamento (LATÃO)

**Material** ..... latão  
**Ligação ao manómetro** ... 1/4 ou 1/2" Gas F  
**Ligação ao processo** ..... 1/4 ou 1/2" Gas M  
**Pressão nominal** ..... 16 bar  
**Temperatura máxima**  
**05-AM404 e 05-AM-406** ..... 120°C  
**05-02F** ..... 180°C

Modelo	Ligações
<b>05-AM404-0-21M-21F</b>	1/4"
<b>05-AM406-0-41M-41F</b>	1/2"
<b>05-02F-0-41M-41F</b>	1/2"



## Série 05 - Válvulas de isolamento (AISI 316)

**Material** ..... aço inox 316  
**Ligação ao manómetro** ..... 1/2" Gas F  
**Ligação ao processo** ..... 1/2" Gas M  
**Pressão estática** ..... máx. 400 bar  
**Temperatura** ..... -30/350°C

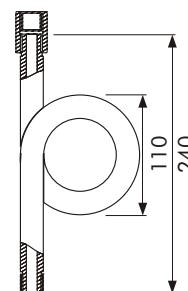
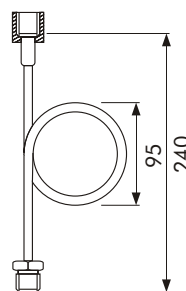
Modelo
<b>05-340-4-41M-41F</b> (2 vias + purga)
<b>05-34F-4-41M-41F</b> 3 vias, com purga e aba DN 40 para manómetros padrão



## Série 05 - Sifões

**Ligações de todos os sifões**  
**Manómetros** ..... 1/2 GAS F    **Processo** ..... 1/2 GAS M

Modelo	Material	PN (bar)	Temp. máx. °C
<b>05-510-0-41M-41F</b>	latão	63	240
<b>05-510-4-41M-41F</b>	aço inox AISI 316	85	450
<b>05-520-E-41M-41F</b>	ASTM A106	150	430
<b>05-530-4-41M-41F</b>	aço inox AISI 316	135	450



## Série 11 - Alicata saca ponteiros para DN 100 e DN150

Modelo
<b>01-EI</b>



## Série 11 - Chapa identificadora de TAG NR.

Modelo	Material
<b>01-T25</b>	aço inox



## Série 06-TB7

### Termómetros bimetálicos, todos em aço inox - DN 63 e DN 100

**Gamas** . . . . . -20/40°C ; 0/60°C ; 0/120°C

**Classe de precisão** . . . . . Classe 2 de acordo c/ DIN 16203

**Temperatura ambiente** . . . . . -25/65°C

**Protecção** (norma IEC529, UNI8896) . . . . . IP65

**Materiais**

**Ligação ao processo** . . . . . aço inox AISI 303, 1/2" gás M

**Tipo de ligação ao processo**

DN63 . . . macho fixo    DN100 . . . macho giratório e deslizante

**Haste** . . . aço inox AISI 304 , S=100 mm, diâmetro DN6 mm

**Elemento de medida** . . . . . espiral bimetálica

**Caixa** . . . . . aço inox AISI 304, DN 63 ou DN 100 mm

**Anel** . . . . . aço inox AISI 304, agrafado

**Janela** . . . . . plexiglass

**Quadrante** . . . . . alumínio fundo branco, numeração a preto

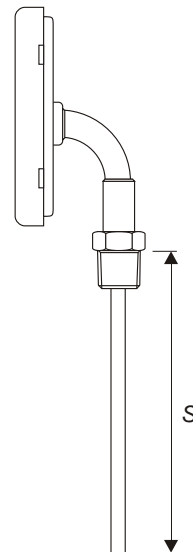
**Ponteiro** . . . . . alumínio anodizado a preto



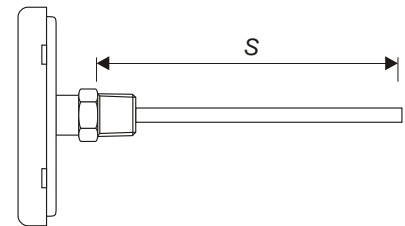
**06-TB7**

Modelo	Caixa	Montagem
06-TB743-C-41M-4-100mm-gama	DN63	horizontal
06-TB749-E-41M-4-100mm-gama	DN100	horizontal
06-TB719-E-41M-4-100mm-gama	DN100	vertical

**TB719**



**TB743  
TB749**



## Série 06-TG8

### Termómetros de gás inerte, todos em aço inox com capilar – DN100

#### Aplicação

Construídos para a indústria alimentar, conserveira, química, petroquímica, etc.

Desenhados para resistir a condições severas de trabalho determinadas pela agressividade dos fluidos de processo e do ambiente.

Ligação entre a caixa e capilar mediante soldadura Argonarque, oferecem uma melhor estanqueidade no caso de serem cheios com líquido amortecedor para utilizações com vibrações.

#### Gamas

Conforme indicado na tabela

#### Gás utilizado

O gás utilizado (nitrogénio ou hélio) não representa nenhum perigo para os processos a medir nem para o ambiente no caso de algum acidente.

Estes termómetros são mais seguros e oferecem melhores prestações, medindo temperaturas entre  $-200^{\circ}\text{C}$  e  $+600^{\circ}\text{C}$  com uma grande velocidade de resposta e precisão.

**Classe de precisão** .....  $\pm 1,0\%$  do F.E. do campo de medição

**Temperatura ambiente** .....  $-25/65^{\circ}\text{C}$

**Protecção (norma IEC529, UNI 8896)** ..... IP55

**Princípio de funcionamento** ..... sistema de expansão de gas inerte

#### MATERIAIS

**Ligação ao processo** ... aço inox AISI316, 1/2" Gas M, giratória e deslizante

**Capilar** ..... aço inox AISI 304 ou AISI 316

**comprimento** ..... máx. 30 metros

**diâmetro** ..... DN 2,5mm (nu)    DN 6,0mm (armado)

**bolbo** ..... aço inox AISI 316

**dimensão** .....  $S = B + 25\text{mm} = 175 + 25 = 200\text{mm}$

**diâmetro** ..... DN 8mm

**Compensação interna** ..... mediante tirante bimetálico

**Elemento elástico** ..... espiral AISI 304

**Movimento** ..... aço inox

**Caixa** ..... aço inox AISI 304,

com flange atrás para montagem em parede ou flange à frente para painel

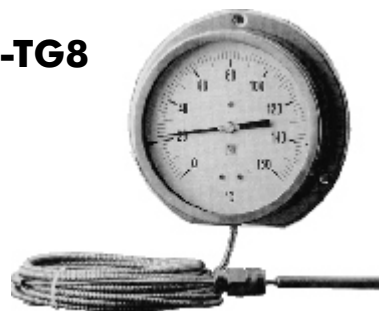
**Anel** ..... aço inox AISI 304, tipo baioneta

**Janela** ..... vidro espessura 4mm

**Quadrante** ..... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio com ajuste micrométrico

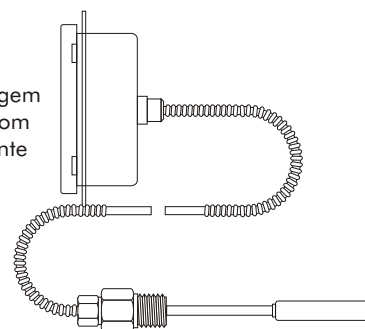
## 06-TG8



#### TIPOS DE MONTAGEM

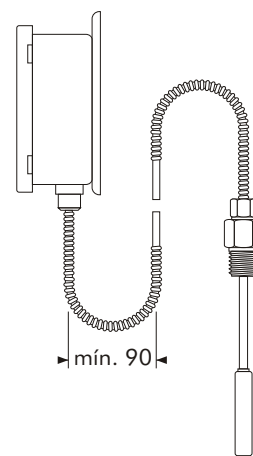
##### TIPO 0

Para montagem em painel com flange à frente



##### TIPO 5

Para montagem em parede com flange atrás



GAMAS °C		
-200/100	●	0/60
-200/50	●	0/80
-120/40	●	0/100
-80/40	●	0/120
-50/50		0/160
-40/80		0/200
-40/60		0/250
-40/40		0/300
-30/50		0/400
■	-20/40	0/500 ■
c/opcional S32	-20/60	0/600 ■
●	-20/80	50/450 ■
c/opcional T03	-20/120	100/500 ■

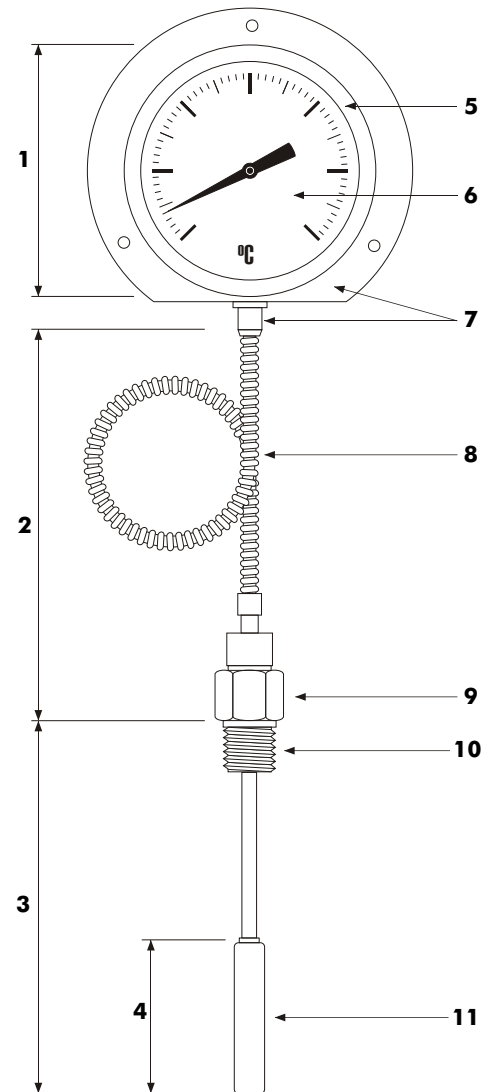
## Série 06-TG8

### Termómetros de gás inerte, todos em aço inox com capilar – DN100

#### Exemplo:

**06-TG8X9-E-41M-2-200(mm)-Gama-XS(tipo de capilar)-XXXX(mm)-BO2-XX(opcionais)**

<b>06</b>	<b>Série</b>
<b>TG8X9</b>	<b>Tipo de termómetro</b>
	<b>Código</b>
<b>TG809</b>	montagem em painel
<b>TG859</b>	montagem em parede
<b>E</b>	<b>Diâmetro nominal</b> 100mm
<b>41M</b>	<b>Ligação ao processo</b> roscada 1/2" Gas M
<b>2</b>	<b>Tipo bolbo</b> revestido AISI 316 (S=200 mm)
<b>200</b>	<b>Comprimento do bolbo</b> S=200mm
<b>Gama</b>	Indique a gama pretendida
<b>XS</b>	<b>Tipo de capilar</b>
	<b>Código</b>
<b>1S</b>	capilar nú em AISI 304
<b>3S</b>	capilar nú em AISI 316
<b>6S</b>	capilar em AISI 304, revestido AISI 304, protecção PVC
<b>8S</b>	capilar em AISI 316, revestido AISI 316
<b>9S</b>	capilar em AISI 304, revestido AISI 304
<b>XXXX</b>	<b>Comprimento capilar</b> em mm
<b>BO2</b>	<b>Bolbo</b> AISI316 DN 8mm
<b>XX</b>	<b>Opcionais</b>
	<b>Código</b>
<b>C40</b>	Caixa e anel em AISI 316
<b>L22</b>	Ponteiro de máxima IP55
<b>P00</b>	Preparado para ser cheio glicerina
<b>P01</b>	Preparado para ser cheio óleo silicone
<b>R10</b>	Cheio de glicerina
<b>R11</b>	Cheio de óleo de silicone
<b>T01</b>	Tropicalização
<b>T03</b>	Extra calibração para escalas $\leq -80^{\circ}\text{C}$
<b>T25</b>	Chapa identificação em inox para Tag nr.
<b>T32</b>	Janela de segurança
<b>C01</b>	Informação de calibração da fábrica
<b>C02</b>	Informação de incertitude
<b>O1D-CH1</b>	Contacto eléctrico com chave IP55 "Maxi-Mini"



- 1- Diâmetro DN100
- 2- Dimensão do capilar "L"
- 3- Dimensão do bolbo "S"
- 4- Parte sensível "B"
- 5- Caixa
- 6- Escala
- 7- Montagem
- 8- Capilar
- 9- Ligação ao processo
- 10- Rosca 1/2" Gas M
- 11- Bolbo

## Série 06-V6 – Termómetros industriais

**Precisão** ..... ± 1,0% F.E.

**Pressão máxima trabalho** . . . . 25 bar (sem bainha)

**Líquido de transmissão**

**colorado** ..... até 160°C

**mercúrio** ..... até 400°C

**Escala** ..... gravada no tubo, vitrificada

**Numeração** ..... impressa no lado da caixa

### MATERIAIS

**Capilar**

**em vidro** ..... líquido colorado

**em prismático** ..... líquido mercúrio

**Bolbo** ..... latão

**diâmetro** ..... DN 11mm

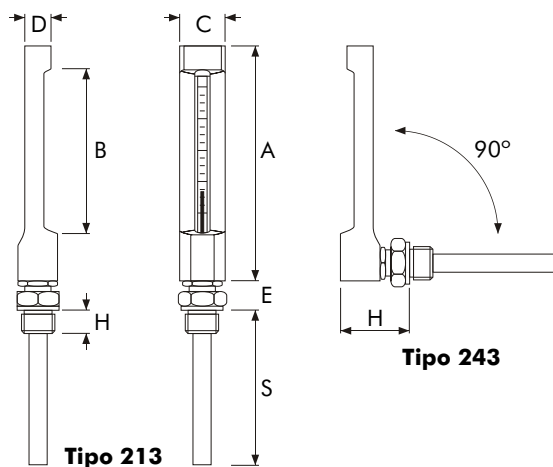
**comprimentos**

S=40mm    S=63mm    S=110mm

S=48mm    S=80mm    S=150mm

**Caixa** ..... alumínio anodizado a cor ouro

**Ligação ao processo** ..... latão 1/2" Gas M



**06-V6**

### Líquido de transmissão

°C	Líquido colorado	Mercúrio
	(A)	(B)
-60/+40	●	
-40/+40	●	
-30/+50	●	●
-10/+50	●	●
-10/+110	●	●
0/+50	●	●
0/+100	●	●
0/+120	●	●
0/+150	●	●
0/+160	●	●
0/+200		●
0/+300		●
0/+400		●

### Escalas de medida e subdivisões das escalas em °C

°C	DN100 (E)	DN150 (G)	DN200 (H)
-60/+40		2	
-40/+40	1	1	1
-30/+50		1	1
-10/+50			1
-10/+110			
0/+50	1		1
0/+100	2	2	1
0/+120	2	2	1
0/+150		2	
0/+160	2	2	2
0/+200	5	5	2
0/+300		5	5
0/+400		5	5

### Dimensões

DN	Código	Lig. processo	A	B	C	D	E	Z	H
100	E	1/2" Gas M	110	70	30	20	20	45	15
150	G	1/2" Gas M	150	100	35	20	20	45	15
200	H	1/2" Gas M	200	150	30	20	20	45	15

### Exemplo:

**06-V6-2X3-X-41M-X-XXXmm-escala**

<b>06</b>	<b>Série</b>
<b>V6</b>	<b>Modelo</b>
<b>2X3</b>	<b>Tipo de ligação</b>
	<b>213</b> = por baixo
	<b>243</b> = por trás
<b>X</b>	<b>Dimensão da caixa</b>
	<b>E</b> = 100mm <b>G</b> = 150mm <b>H</b> = 200mm
<b>41M</b>	<b>Ligação ao processo</b> 1/2" Gas M
<b>X</b>	<b>Líquido de transmissão</b>
	<b>A</b> = líquido colorado (até 160°C)
	<b>B</b> = mercúrio (até 400°C)
<b>XXXmm</b>	<b>Comprimento do bolbo</b> em mm
	S= <b>40</b> mm    S= <b>63</b> mm    S= <b>110</b> mm
	S= <b>48</b> mm    S= <b>80</b> mm    S= <b>150</b> mm
<b>escala</b>	Conforme descritas na tabela correspondente

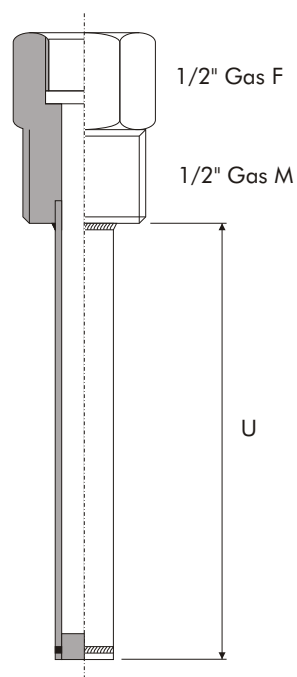
Modelo	Tipo
<b>06-V6</b>	<b>213</b>
<b>06-V6</b>	<b>243</b>



# ACESSÓRIOS PARA TERMÓMETROS

## Série 09-B11 – bainhas para termómetros TB e TG

**Construção** ..... aço inox AISI 316  
**Ligação ao termómetro** ..... 1/2" Gas F  
**Ligação ao processo** ..... 1/2" Gas M  
**Dimensão "U"**  
**TB** ..... 70mm  
**TG** ..... 160mm  
**Diâmetro interno do furo** ..... DN9 mm



**09-B11**

Modelo	"U"	Aplicação Termómetros
09-B11-5-41F-41M-70mm	70 mm	TB
09-B11-5-41F-41M-160mm	160 mm	TG

## Série 08-M28

### Manómetro com transmissão 4-20mA – DN100 (Sensor Cerâmico)

#### MANÓMETROS

Gammas	bar ext.			bar ext.		
	bar	kPa	MPa	psi int.	kPa int.	MPa int.
0 ... 1	•		•	•		•
0 ... 1,6	•		•	•		•
0 ... 2,5	•		•	•		•
0 ... 4	•		•	•		•
0 ... 6	•		•	•		•
0 ... 10	•		•	•		•
0 ... 16	•		•	•		•
0 ... 25	•		•	•		•
0 ... 40	•		•	•		•
0 ... 60	•		•	•		•
0 ... 100	•	•		•		•
0 ... 160	•	•		•		•
0 ... 250	•	•		•		•
0 ... 400	•	•		•		•
0 ... 600	•	•		•		•
0 ... 1000		•				
0 ... 1600		•				
0 ... 2500		•				

Gammas	psi	psi int.	psi ext.	psi ext.
		kPa ext.	bar int.	Kg/cm <sup>2</sup> int.
0 ... 15	•	•	•	•
0 ... 30	•	•	•	•
0 ... 60	•	•	•	•
0 ... 100	•	•	•	•
0 ... 160	•	•	•	•
0 ... 200	•	•	•	•
0 ... 300	•	•	•	•
0 ... 400	•	•	•	•
0 ... 600	•	•	•	•
0 ... 1000	•	•	•	•
0 ... 1500	•	•	•	•
0 ... 2000	•	•	•	•
0 ... 3000	•	•	•	•
0 ... 4000	•	•	•	•
0 ... 5000	•	•	•	•
0 ... 6000	•	•	•	•
0 ... 10000	•	•	•	•

#### VACUÓMETROS e MANOVACUÓMETROS

Gammas	bar ext.		bar ext.	
	bar	kPa	psi int.	kPa int.
-1 ... 0	•		•	•
-1 ... 0,6	•		•	•
-1 ... 1,5	•		•	•
-1 ... 3	•		•	•
-1 ... 5	•		•	•
-1 ... 9	•		•	•
-1 ... 15	•		•	•
-1 ... 24	•		•	•
-100 ... 0		•		
-100 ... 150		•		
-100 ... 300		•		
-100 ... 500		•		
-100 ... 900		•		
-100 ... 1500		•		

Gammas	psi	psi int.	psi ext.	psi ext.
		kPa ext.	bar int.	Kg/cm <sup>2</sup> int.
-30 ... 0	•	•	•	•
-30 ... 15	•	•	•	•
-30 ... 30	•	•	•	•
-30 ... 150	•	•	•	•

#### DUPLO ELEMENTO ELÁSTICO:

Tubo bourdon e sensor cerâmico



Conforme os requisitos da directiva EMC 89/336/CEE-93/68/CEE



#### 08-M28.1 SECOS

#### 08-M28.3 CHEIOS DE ÓLEO DIELECTRICO

#### Modelo

08-M28.1-A-E-C-41M-1-0-7-Gama

08-M28.3-A-E-C-41M-1-0-7-Gama

**Precisão - indicador local** ..... < 0,5%  
**Precisão - transmissor** ..... < 0,25%

#### Temperatura do fluido do processo

**08-M28.1** ..... -25/100°C

**08-M28.3** ..... -10/65°C

**Temperatura compensada** ..... -25/85°C

**Sinal de saída** ..... 4-20mA (2 fios)

**Alimentação** ..... 10/30 Vdc

**Protecção 08-M28.1** ..... IP55

**Protecção 08-M28.3** ..... IP65

#### MATERIAIS

**Sensor do transmissor** ..... cerâmico

**Lig. ao processo** .. aço inox AISI 316L, 1/4", 1/2 BSP ou NPT

**Mola tubular** ..... aço inox AISI 316

**Caixa** ..... aço inox AISI 304, DN100mm

**Anel** ..... aço inox AISI 304, tipo baioneta

**Janela - 08-M28.1** ..... vidro de segurança

**Janela - 08-M28.3** ..... plexiglass, espessura 4 mm

**Movimento** ..... aço inox reforçado

**Quadrante** ... alumínio fundo branco, numeração a preto

**Ponteiro** ..... alumínio com ajuste micrométrico

#### OPÇÕES:

**Separadores de diafragma:** de diversos tipos e materiais para aplicações corrosivas, fluidos cristalizantes e aplicações higiénicas.

## Série DCS

# Transmissores de pressão com INDICAÇÃO e RELÉS (aço inox) (Thin-Film strain gauge)

### IMPORTANTE:

#### 1 Display Control Switch

poderá substituir 1 transmissor+1 pressostato+1 manómetro.

#### PRINCIPAIS CARACTERÍSTICAS

- Ajuste simples dos pontos de interrupção.
- Indicador LCD iluminado (back lit), 4 dígitos.
- Saídas: 4-20 mA; 2 relés 30W (máx. 1A 48V ac/dc.)ajustável
- Indicação e medida de pressão em várias unidades (bar, mBar, Psi, kPa, psi, Kpsi, mH<sub>2</sub>O).
- Indicação de temperatura do sensor.
- Protecção EMC, IEC 61000.
- Alta resistência mecânica.
- Gráfico de barras incluído.

#### CARACTERÍSTICAS TÉCNICAS

##### Materiais

da **caixa** . . . . . aço inox 1.4301

do **sensor** . . . . . aço inox 1.4542

da **sede** . . . . . NBR

**Medição por** . . . . . thin-film strain gauge

**Alimentação** . . . . . 10/30V dc, nominal 24Vdc

**Precisão** . . . . . +/-0,3% FE

**Repetibilidade** . . . . . +/-0,05% FE

##### Gama de temperaturas

de **operação** . . . . . -25°C a 80°C

do **fluido** . . . . . -25°C a 125°C

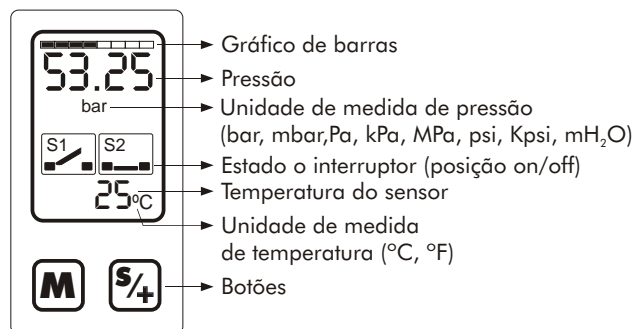
do **display** . . . . . -10°C a 70°C

**Protecção** . . . . . **IP65**

**Cabo** . . . . . PUR de 2 metros e ficha fêmea 8 pinos

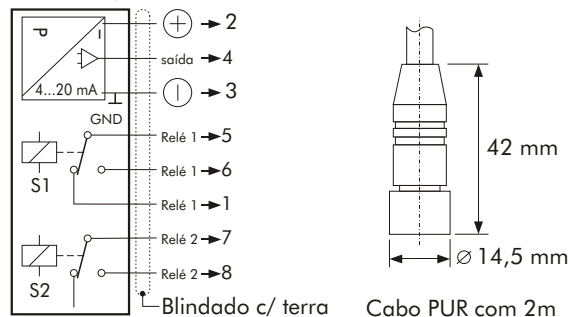


DCS (8864) cat. 6.2.2.4



#### LIGAÇÕES ELÉCTRICAS

4...20 mA / 2 relés



Modelo	Gama (bar)	Pressão máx. trabalho (bar)	Saídas	Ligação ao processo
DCS 2.5 AR	0 ... 2.5 bar	6	4 ... 20 mA / 2 relés	G 1/4" M
DCS 4.0 AR	0 ... 4.0 bar	10	4 ... 20 mA / 2 relés	G 1/4" M
DCS 6.0 AR	0 ... 6.0 bar	15	4 ... 20 mA / 2 relés	G 1/4" M
DCS 10.0 AR	0 ... 10.0 bar	20	4 ... 20 mA / 2 relés	G 1/4" M
DCS 16.0 AR	0 ... 16.0 bar	32	4 ... 20 mA / 2 relés	G 1/4" M
DCS 25.0 AR	0 ... 25.0 bar	80	4 ... 20 mA / 2 relés	G 1/4" M
DCS 40.0 AR	0 ... 40.0 bar	80	4 ... 20 mA / 2 relés	G 1/4" M
DCS 100.0 AR	0 ... 100.0 bar	200	4 ... 20 mA / 2 relés	G 1/4" M
DCS 250.0 AR	0 ... 250.0 bar	500	4 ... 20 mA / 2 relés	G 1/4" M
DCS 400.0 AR	0 ... 400.0 bar	800	4 ... 20 mA / 2 relés	G 1/4" M
DCS CON	Cabo PUR com 2 metros de comprimento e ficha fêmea de 8 pinos			
DCS CON5	Cabo PUR com 5 metros de comprimento e ficha fêmea de 8 pinos			
DCS CON10	Cabo PUR com 10 metros de comprimento e ficha fêmea de 8 pinos			

## Série ECT - Transmissores de pressão (AÇO INOX), sensor cerâmico

Transmissores de pressão para aplicações em **OEM** de **baixo preço** com sensor cerâmico.

### VANTAGENS PRINCIPAIS

Construção compacta, muito económico tipicamente para OEM, boa compatibilidade com os fluidos, vasta gama de aplicações, tais como produção de máquinas, refrigeração, ar condicionado, ventilação, climatização, edifícios inteligentes, protecção EMI, boa estabilidade.



### CARACTERÍSTICAS TÉCNICAS

#### Materiais

da **ligação ao processo** . . . . . aço inox 1.4305

da **caixa** . . . . . aço inox 1.4301

do **sensor** . . . . . cerâmico, Al<sub>2</sub>O<sub>3</sub> (96%)

**Alimentação** . . . . . 9/30 V dc

**Precisão** . . . . . +/-0,3 FE (típico)

#### Gama de temperaturas

de **operação** . . . . . -25/85°C

do **fluido** . . . . . -25/85°C

**Protecção** . . . . . IP65

**ECT** (8472) catálogo 2.3.1.31

Modelo	Gama (bar)	Pressão máx. trabalho (bar)	Sinal de saída	Ligação ao processo
<b>ECT 2.5 A</b>	0 ... 2,5	5	4-20 mA	G 1/4" M
<b>ECT 6.0 A</b>	0 ... 6,0	12	4-20 mA	G 1/4" M
<b>ECT 10.0 A</b>	0 ... 10,0	20	4-20 mA	G 1/4" M
<b>ECT 16.0 A</b>	0 ... 16,0	32	4-20 mA	G 1/4" M
<b>ECT 25.0 A</b>	0 ... 25,0	50	4-20 mA	G 1/4" M
<b>ECT 40.0 A</b>	0 ... 40,0	80	4-20 mA	G 1/4" M

## Série NA - Transmissores de pressão (aço inox) (thin-film strain gauge)

**Transmissores industriais de construção miniatura.  
Equipados com elemento amortecedor integrado.**

### VANTAGENS PRINCIPAIS

Grande estabilidade, construção miniatura, grande resistência mecânica, com filtro EMC, IEC 61000.

O elemento amortecedor integrado é um parafuso M5 com um furo de 0,3 mm, inclinado, para evitar afectar directamente a membrana. Mesmo para fluidos com viscosidade >100cst os tempos de resposta são inferiores a 5 ms.

O efeito de sobrepressões é provocado por exemplo nas manobras rápidas de abrir e fechar válvulas, assim como quando se empregam bombas de engrenagens.

### CARACTERÍSTICAS TÉCNICAS

#### Materiais

da **caixa** ..... aço inox AISI 304

do **sensor** ..... aço inox 1.4542 (AISI 630)

**Medição por** ..... thin-film strain gauge

**Alimentação** ..... 10/34V dc, nominal 24V dc

#### Precisão

modelo **NA** ..... +/- 0,3% FE

modelo **NAR** ..... +/- 0,5% FE

#### Gama temperaturas

de **operação** ..... -25/85°C

do **fluido** ..... -25/125°C

**Protecção** ..... IP65



**NA** (8891) catálogo 2.3.1.12

**NAR** (8891) catálogo 2.3.1.12

*Consulte os nossos serviços técnicos para os  
transmissores inteligentes mod. 8862  
com saída digital RS485*

elemento amortecedor integrado



Modelo	Gama (bar)	Pressão máx. trabalho (bar)	Sinal de saída	Ligação ao processo
<b>NA 2.5 A</b>	0 ... 2,5	6	4-20 mA	G 1/4" M
<b>NA 4.0 A</b>	0 ... 4,0	10	4-20 mA	G 1/4" M
<b>NA 6.0 A</b>	0 ... 6,0	15	4-20 mA	G 1/4" M
<b>NA 10.0 A</b>	0 ... 10,0	20	4-20 mA	G 1/4" M
<b>NA 16.0 A</b>	0 ... 16,0	32	4-20 mA	G 1/4" M
<b>NA 25.0 A</b>	0 ... 25,0	80	4-20 mA	G 1/4" M
<b>NA 40.0 A</b>	0 ... 40,0	80	4-20 mA	G 1/4" M
<b>NA 100.0 A</b>	0 ... 100,0	200	4-20 mA	G 1/4" M
<b>NA 250.0 A</b>	0 ... 250,0	500	4-20 mA	G 1/4" M
<b>NA 400.0 A</b>	0 ... 400,0	800	4-20 mA	G 1/4" M
<b>NA 600.0 A</b>	0 ... 600,0	1000	4-20 mA	G 1/4" M
<b>NAR 9.0 A</b>	-1 ... 9,0	20	4-20 mA	7/16" 20UNFM <sup>1)</sup>
<b>NAR 25.0 A</b>	0 ... 25,0	80	4-20 mA	7/16" 20UNFM <sup>1)</sup>
<b>NAR 34.0 A</b>	0 ... 34,0	80	4-20 mA	7/16" 20UNFM <sup>1)</sup>

1) Aplicação típica em sistemas de refrigeração.



## Série EPT

### Transmissores de pressão (aço inox) (thin-film strain gauge)

Transmissores de pressão  
(Engine Pressure Transmitter) para aplicações extremas

#### VANTAGENS PRINCIPAIS

Grande estabilidade, elevada resistência mecânica, construção miniatura, com filtro EMC, IEC 61000, grande resistência às vibrações 15g (20 ... 2000Hz) resistente a flutuações de pressões e pulsações (possui elemento amortecedor), resistente a temperaturas elevadas de serviço e ambiente, utilização em motores com altas vibrações, certificações para a construção naval.

O elemento amortecedor integrado é um parafuso M5 com um furo de 0,3 mm inclinado, para evitar afectar directamente a membrana. Mesmo para fluidos com viscosidade > 100 cst os tempos de resposta são inferiores a 5 ms.

O efeito de sobrepressões é provocado por exemplo nas manobras rápidas de abrir e fechar válvulas, assim como quando se empregam bombas de engrenagens.

#### CARACTERÍSTICAS TÉCNICAS

##### Materiais

da caixa . . . . . aço inox AISI 304

do sensor . . . . . aço inox 1.4542 (AISI 630)

Medição por . . . . . thin-film strain gauge

Alimentação . . . . . 10/32V dc, nominal 24V dc

Precisão . . . . . +/- 0,35% FE

##### Gama de temperaturas

no sensor . . . . . -25/125°C

no ambiente . . . . . -25/100°C

Protecção . . . . . IP65



**E**ngine  
**P**ressure  
**T**ransmitter

**EPT** (8242) catálogo 2.3.1.8  
**EPTCR** (8242) catálogo 2.3.1.9



elemento amortecedor integrado

Modelo	Gama (bar)	Pressão máx. trabalho (bar)	Sinal de saída	Ligação ao processo
<b>EPT 4.0 A</b>	0 ... 4,0	100	4-20 mA	G 1/4" M
<b>EPT 6.0 A</b>	0 ... 6,0	100	4-20 mA	G 1/4" M
<b>EPT 10.0 A</b>	0 ... 10,0	200	4-20 mA	G 1/4" M
<b>EPT 16.0 A</b>	0 ... 16,0	200	4-20 mA	G 1/4" M
<b>EPT 25.0 A</b>	0 ... 25,0	300	4-20 mA	G 1/4" M
<b>EPT 40.0 A</b>	0 ... 40,0	300	4-20 mA	G 1/4" M
<b>EPT 60.0 A</b>	0 ... 60,0	500	4-20 mA	G 1/4" M
<b>EPTCR 16.A</b>	0 ... 1600,0	4000	4-20 mA	M18x1,5 M
<b>EPTCR 20.A</b>	0 ... 2000,0	4000	4-20 mA	M18x1,5 M

**Nota:** o modelo **EPT** pode ser fornecido até à gama **0 ... 600 bar**, consulte os nossos serviços técnicos.

## Série V6/V8 - Válvulas de fecho em aço inox

### Vantagens

Especialmente concebidas para aplicação com os **transmissores de pressão**.

Possue a grande vantagem de se poder retirar o transmissor, da linha sem ser necessário parar o respectivo processo.

Assim que se desenrosca o transmissor a válvula fecha automaticamente, quando se volta a roscar o transmissor a válvula abre automaticamente.

### Características técnicas

#### Materiais

do **corpo** ..... aço inox 1.4305  
 da **válvula** ..... aço inox 1.4305  
 do **circlip** ..... aço inox 1.4116/1.4122  
 da **mola de pressão** ..... aço inox 1.4310  
 do **"O"ring** ..... viton

#### Gama de temperatura

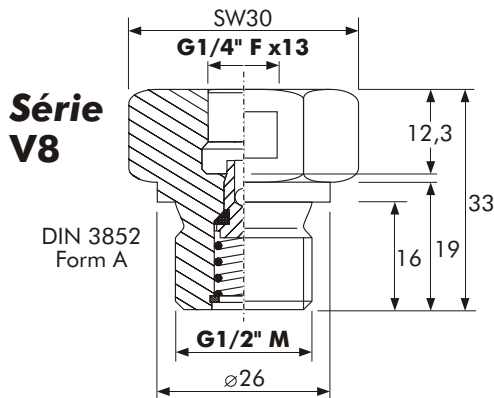
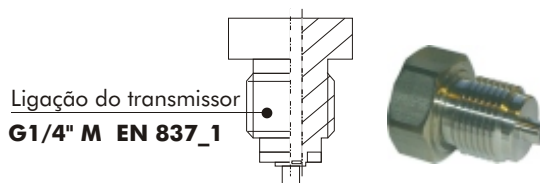
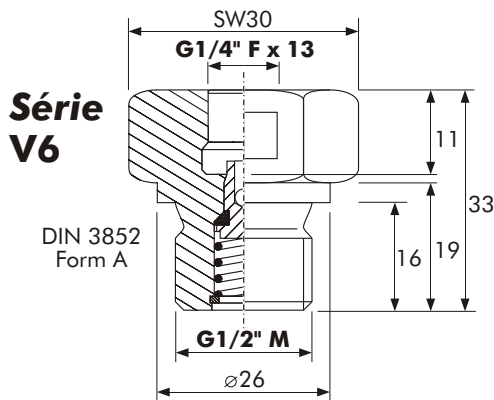
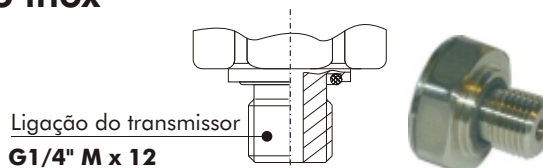
de **trabalho** ..... -25/100°C  
 do **fluido** ..... -25/125°C

**Fluidos** ..... ar; água potável ou do mar;  
 óleos minerais ou pesados; diesel.

**Pressão de trabalho** ..... 60 bar

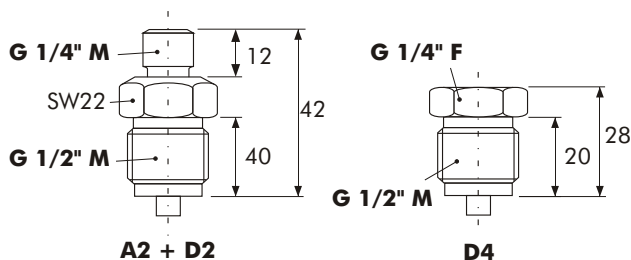
**Ligações** ..... G 1/4" F x G 1/2" M

Modelo	Ligação ao transmissor	Ligação ao processo
V6	G 1/4" F x 13	G 1/2" M
V8	G 1/4" F x 13	G 1/2" M



## Série D + A - Acessórios de ligação (adptadores)

Modelo	Material	Ligações
A2	Latão	G 1/4" M x G 1/2" M
D2	aço inox 1.4435/316L	G 1/4" M x G 1/2" M
D4	aço inox 1.4435/316L	G 1/4" F x G 1/2" M













## Série 903/940 - Pressostatos com sensor de fole

**Precisão** ..... +/- 2% FE  
**Repetibilidade** ..... +/- 0,5% FE  
**Temperatura ambiente** ..... -20/70°C  
**Temperatura do sensor** ..... -40/150°C

**Material do sensor**

**folo** ..... aço inox **316 Ti**  
**corpo** ..... aço inox **316 L**

**Material da caixa** ..... alumínio, c/ revestimento epóxico

**Ligação ao processo** ..... G 1/2" M

**Protecção** ..... **IP65**

**Poder de corte**

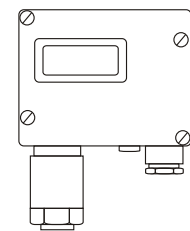
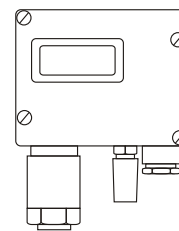
<b>Tipo 903.12...</b>	<b>Tipo 940.23...</b>
ac 380 V 15 (3) A	ac 380 V 15 (3) A
dc 24 V 15 (7,5) A	dc 24 V 6 (2) A
dc 220 V 0,3 (0,1) A	dc 220 V 0,2 (0,02) A



903 catálogo 2.1.1.2



940 catálogo 2.1.1.2

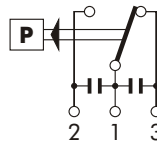


**Aprovações**

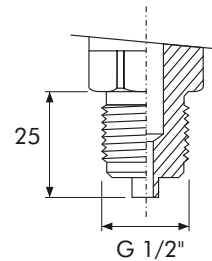
- Det Norske Veritas
- Polski Rejestr Statkow
- Bureau Veritas
- Lloyd's Register of Shipping
- R.I.NA
- American Bureau of Shipping
- Germanischer Lloyd's



**Ligações eléctricas**



**Ligação ao processo**



Modelo	Gama (bar)	Diferencial (bar)	Pressão máx. trabalho (bar)
903.1272.809	-0,9 ... 1,5	0,1 ... 1,3	10
903.1273.802	0,2 ... 1,6	0,1 ... 1,3	10
903.1275.802	0,2 ... 2,5	0,1 ... 1,3	10
903.1276.804	0 ... 4	0,4 ... 3,2	12
903.1277.804	0 ... 6	0,4 ... 3,2	12
903.1278.806	1 ... 10	1,0 ... 7,5	24
903.1279.806	1 ... 16	1,0 ... 7,5	24
903.1280.808	2 ... 25	3,0 ... 18	40
903.1281.808	4 ... 40	3,0 ... 18	40
940.2372.809	-0,9 ... 1,5	0,06 ... 0,2	10
940.2373.802	0,2 ... 1,6	0,06 ... 0,2	10
940.2375.802	0,2 ... 2,5	0,06 ... 0,2	10
940.2376.804	0 ... 4	0,2 ... 0,6	12
940.2377.804	0 ... 6	0,2 ... 0,6	12
940.2378.806	1 ... 10	0,5 ... 1,6	24
940.2379.806	1 ... 16	0,5 ... 1,6	24
940.2380.808	2 ... 25	1,0 ... 4,0	40
940.2381.808	4 ... 40	1,0 ... 4,0	40

## Série HD788-989

### Transmissores de temperatura configuráveis 4-20 mA para sensores PT 100

#### DESCRIÇÃO

Transmissores de temperatura configuráveis 4-20 mA para sensores Pt100.

Programação bastante simples para gamas de -200 a +650°C.

O modelo HD 988TR2 inclui display local.

#### CARACTERÍSTICAS

**Entrada** ..... Pt100 (100Ω)

**Ligação** ..... 2 ou 3 fios

**Corrente no sensor** ..... < 1 mA

**Gama de leitura** ..... -200°C a +650°C

**Amplitude mínima de leitura** ..... 25°C

#### Precisão

Leituras: -100 a 500°C. .... +/- 0,1°C, +/- 0,1%

Leituras: -200 a 650°C. .... +/- 0,2°C, +/- 0,2%

**Temperatura de trabalho** ..... 0 a 70°C

**Temperatura de armazenamento** ..... -40 a +80°C

**Saída** ..... 4-20 mA

#### Resolução

**HD 788 TR1** ..... 4 μA

**HD 988 TR2**, saída analógica. .... 4 μA

Display ..... 0,1°C até 200°C; 1°C acima de 200°C

**Alimentação** . . . 7 a 30 Vdc (prot. contra inversão de polaridade)

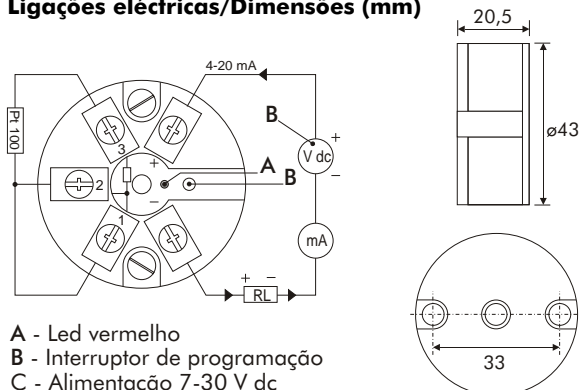
**Resist. de carga** . . .  $R_{Lmax} 770\Omega$  a 24 Vdc;  $R_{Lmax} = (V_{cc}^2)/22-1000$

**Led vermelho:** acende durante a programação e quando a leitura de temperatura está fora da gama programada.



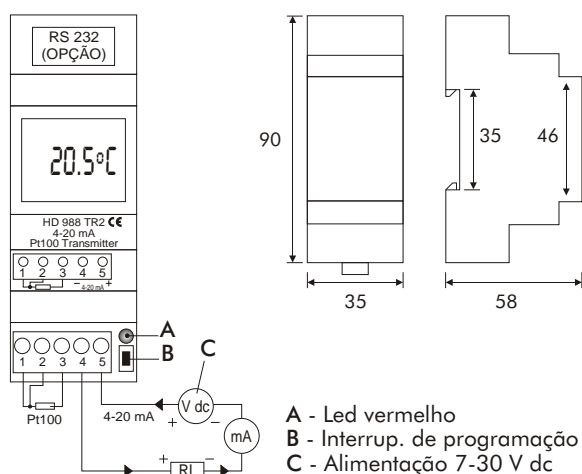
**Modelo HD 788 TR1**  
aplicação em cabeça tipo  
DIN B 43760

#### Ligações eléctricas/Dimensões (mm)



**Modelo HD 988 TR2**  
aplicação em calha  
DIN de 35 mm

#### Ligações eléctricas/Dimensões (mm)



Modelo	Aplicação	Display
<b>HD 788 TR1</b>	Cabeça tipo DIN B	não
<b>HD 988 TR2</b>	Calha DIN 35 mm	sim









**SISTIMETRA**  
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e-mail [sistimetra@sistimetra.pt](mailto:sistimetra@sistimetra.pt) - [www.sistimetra.pt](http://www.sistimetra.pt)



**CONTIMETRA**  
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telef. 214 203 900 - telefax 214 203 901  
e-mail [contimetra@contimetra.com](mailto:contimetra@contimetra.com) - [www.contimetra.com](http://www.contimetra.com)

## Série S500 - Transmissor inteligente para gases explosivos

<b>Tipo</b>	programável, servido por microprocessador
<b>Indicação</b>	digital
<b>Display</b>	alfanumérico tipo matriz de pontos
<b>Gama máxima</b>	0 a 100% LEL
<b>Temperatura de operação</b>	-18 a 66°C
<b>Tensão de alimentação</b>	20 - 35V DC
<b>Alarmes</b>	2 SPST, NO, 125V/0,5A (30V dc/1A)
<b>Saída analógica</b>	4-20 mA (carga máxima 500 W)
<b>Resolução</b>	1%
<b>Precisão</b>	5%
<b>Consumo</b>	2,0W a 2,3W
<b>Protecção</b>	1A (fusível electrónico)
<b>Montagem</b>	Mural
<b>Cabos de alimentação</b>	2 condutores ou 3 condutores blindados no caso de utilização de saída analógica
<b>Tempo de vida do sensor</b>	5/7 anos
<b>Comunicação</b>	RS 485
<b>Número máximo de unidades</b>	100 por loop RS 485
<b>Memorização dos parâmetros</b>	RAM não volátil
<b>Aprovação</b>	ATEX II 2G EEx d IIC T6
<b>Opção: S500-300P</b>	

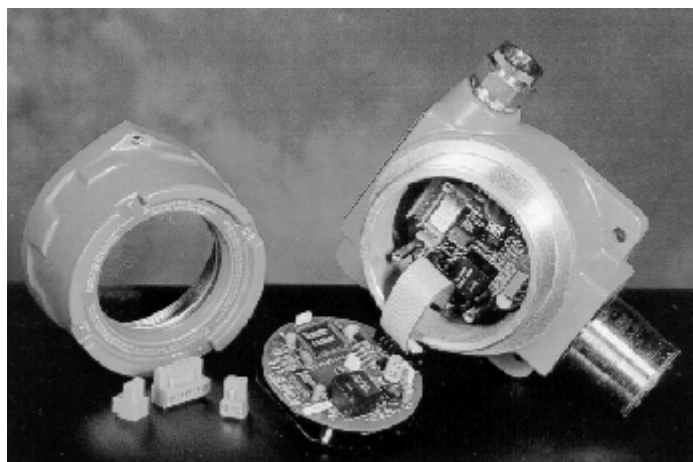
Com sensor resistente a envenenamento (ex.: H<sub>2</sub>S)



### MODELO

S500-NP30

S200-300P



O sensor MONICON S500 é um sensor inteligente de alta qualidade, compacto oferecendo um conjunto de sofisticadas características que asseguram alarmes rápidos e seguros em casos de:

- Concentrações explosivas de gases combustíveis.

## Série C 75000 - Detetor de gases tóxicos e explosivos monocanal

### MONITOR

**Tipo** ..... programável (tipo de gás, gama, alarmes)

#### Indicação

Digital (4 dígitos tipo led)

Display adicional 2 caracteres alfanumérico, p/ indicação de estado

**Tipos de gás** (no ar ambiente)

SO<sub>2</sub>; CO; O<sub>2</sub>; O<sub>3</sub>; NO; NO<sub>2</sub>; HCl; HCN; H<sub>2</sub>; H<sub>2</sub>S; NH<sub>3</sub>; C<sub>2</sub>H<sub>4</sub>O; Cl<sub>2</sub>  
e gases explosivos

**Alarmes** ..... 4 SPDT, 250V / 3A (A1, A2, A3 e avaria)

**Saída analógica** ..... 4-20 mA (carga máxima 500 Ω)

**Alimentação** ..... 230V ac (consumo 6Ω)

**Resolução** ..... 1%

**Precisão** ..... 5%

**Temperatura de operação** ..... -18 a 66°C

**Montagem** ..... mural

**Cabo do sensor** ..... 3 condutores, blindado

**Bateria (opcional) autonomia** ..... 4H (1,2 AH)

**Tensão bateria** ..... 12V

**Dimensões** ..... 160 x 240 x 90 mm



#### Modelo

<b>C 75000</b>	Monitor
<b>CGS500</b>	Sensor de gases explosivos
<b>T100-CO-250 ppm</b>	Sensor de CO, 250 ppm
<b>T100-Cl<sub>2</sub>-5 ppm</b>	Sensor de gás cloro, 5 ppm
<b>T100 - ... - ...</b>	Sensor de gases tóxicos

## Série CGS500 - Sensor de gases explosivos

**Tipo** ..... catalítico

**Gama** ..... 0 a 100% LEL

**Tensão de serviço** ..... 2,00V

**Temperatura de serviço** ..... -40 a 50°C

**Caixa de ligação** ..... 120 x 120 x 80

**Aprovação** ..... ATEX II 2 G EEx d IIC T6



**T100**  
Sensor gases tóxicos

**CGS500**  
Sensor gases explosivos

## Série T100 - Sensor de gases tóxicos

**Tipo** ..... electroquímico de 3 eléctrodos

**Saída analógica** ..... 4-20 mA (carga máxima 500Ω)

**Tempo de vida em serviço** ..... mín. 2 anos (1 ano para NH<sub>3</sub> e O<sub>2</sub>)

**Tempo de vida armazenada** ..... 6 meses

**Temperatura de serviço** ..... -10 a 40°C

**Sensibilidade à posição** ..... nula

**Pressão de serviço** ..... atmosférica +/-10%

**Aprovação** ..... ATEX II 2 G EEx ia IIC T4

### GASES E GAMAS DISPONÍVEIS (SENSOR T100)

Para cobrir uma vasta de gama de aplicações existem disponíveis diversos valores de fim de escala.

A tabela mostra os gases disponíveis, o valor máximo e mínimo de fim de escala, e as escalas standard.

O tempo máximo de resposta T90 é igualmente indicado (em segundos).

Existem disponíveis outras gamas entre os valores mínimo e máximo de fim de escala.

Gás	O <sub>2</sub>	NH <sub>3</sub>	CL <sub>2</sub>	CO	H <sub>2</sub>	HCL	HCN	H <sub>2</sub> S	NO	NO <sub>2</sub>	SO <sub>2</sub>	O <sub>3</sub>	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> (EO)	
Mín. fim de escala (ppm)	5%	50	5	50	50	5	50	5	10	5	5	3	20	
Máx. fim de escala (ppm)	25%	200	250	4%	4%	100	200	1000	1500	200	2000	5	100	
Tempo de resposta T90		100	100	25	30	120	100	30	10	35	15	150	140	
		5%	50	5	50	500	50	50	25	50	10	3	10	
Gamas standard (ppm)		10%	100	10	100	1000	100	100	50	100	25	25	5	25
			25%	25	250	2000		100	500	100	100	100		100

## Série C 45000 - Detector de gases tóxicos e explosivos 4 canais

### MONITOR

**Tipo** ..... programável (tipo de gás, gama, alarmes)

#### Indicação

Digital (4 dígitos tipo led)

Display adicional 2 caracteres alfanumérico, p/ indicação de estado

1 Dígito para indicação do canal visualizado

**Tipos de gás** (no ar ambiente)

SO<sub>2</sub>; CO; O<sub>2</sub>; O<sub>3</sub>; NO; NO<sub>2</sub>; HCl; HCN; H<sub>2</sub>; H<sub>2</sub>S; NH<sub>3</sub>; C<sub>2</sub>H<sub>4</sub>O; Cl<sub>2</sub>  
e gases explosivos

**Alarmes** ..... 9 x SPDT, 250V / 3A

**Saída analógica** ..... 4 x 4-20 mA (carga máxima 500 Ω)

**Alimentação** ..... 230V ac (consumo 6Ω)

**Resolução** ..... 1%

**Precisão** ..... 5%

**Temperatura de operação** ..... -18 a 66°C

**Montagem** ..... mural

**Cabo do sensor** ..... 3 condutores, blindado (por canal)

**Bateria (opcional) autonomia** ..... 2H (1,2 AH)

**Tensão bateria** ..... 12V

**Dimensões** ..... 230 x 300 x 110 mm



#### Modelo

<b>C 45000</b>	Monitor
<b>CGS500-300N-JB</b>	Sensor de gases explosivos
<b>T100-CO-250 ppm</b>	Sensor de CO, 250 ppm
<b>T100-Cl<sub>2</sub>-5 ppm</b>	Sensor de gás cloro, 5 ppm
<b>T100 - ... - ...</b>	Sensor de gases tóxicos

## Série CGS500 - Sensor de gases explosivos

**Tipo** ..... catalítico

**Gama** ..... 0 a 100% LEL

**Tensão de serviço** ..... 2,00V

**Temperatura de serviço** ..... -40 a 50°C

**Caixa de ligação** ..... 120 x 120 x 80

**Aprovação** ..... ATEX II 2 G EEx d IIC T6



**T100**  
Sensor gases tóxicos

**CGS500**  
Sensor gases explosivos

## Série T100 - Sensor de gases tóxicos

**Tipo** ..... electroquímico de 3 eléctrodos

**Saída analógica** ..... 4-20 mA (carga máxima 500Ω)

**Tempo de vida em serviço** ..... mín. 2 anos (1 ano para NH<sub>3</sub> e O<sub>2</sub>)

**Tempo de vida armazenada** ..... 6 meses

**Temperatura de serviço** ..... -10 a 40°C

**Sensibilidade à posição** ..... nula

**Pressão de serviço** ..... atmosférica +/-10%

**Aprovação** ..... ATEX II 2 G EEx ia IIC T4

#### GASES E GAMAS DISPONÍVEIS (SENSOR T100)

Para cobrir uma vasta de gama de aplicações existem disponíveis diversos valores de fim de escala.

A tabela mostra os gases disponíveis, o valor máximo e mínimo de fim de escala, e as escalas standard.

O tempo máximo de resposta T90 é igualmente indicado (em segundos).

Existem disponíveis outras gamas entre os valores mínimo e máximo de fim de escala.

Gás	O <sub>2</sub>	NH <sub>3</sub>	Cl <sub>2</sub>	CO	H <sub>2</sub>	HCL	HCN	H <sub>2</sub> S	NO	NO <sub>2</sub>	SO <sub>2</sub>	O <sub>3</sub>	C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> (EO)
Mín. fim de escala (ppm)	5%	50	5	50	50	5	50	5	10	5	5	3	20
Máx. fim de escala (ppm)	25%	200	250	4%	4%	100	200	1000	1500	200	2000	5	100
Tempo de resposta T90		100	100	25	30	120	100	30	10	35	15	150	140
	5%	50	5	50	500	50	50	25	50	10	10	3	10
Gamas standard (ppm)	10%	100	10	100	1000	100	100	50	100	25	25	5	25
	25%		25	250	2000			100	500	100	100		100



fluid and water technology

# PERISTALTIC PUMPS and DISPENSERS



**CONTIMETRA**  
Lisboa

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2790-138 CARNAXIDE  
telef. 214 203 900 - telefax 214 203 901  
e-mail [contimetra@contimetra.com](mailto:contimetra@contimetra.com)  
[www.contimetra.com](http://www.contimetra.com)



**SISTIMETRA**  
Porto

Rua Particular de São Gemil, 85  
São Gemil - Águas Santas - Maia  
4425-164 ÁGUAS SANTAS MAI  
telef. 229 774 470 - telefax 229 724 551  
e-mail [sistimetra@esoterica.pt](mailto:sistimetra@esoterica.pt) - [www.sistimetra.pt](http://www.sistimetra.pt)



English version 10/03





**POOL SMART pH/RX**

- ⇒ 2 Peristaltic pumps with integral pH and Redox (ORP) meter
- ⇒ Analog controls; 2 Display 3 and 4 digits
- ⇒ On-Off mode
- ⇒ Ph range: 0÷14; Redox range ± 0÷1400 mV
- ⇒ Precision 0,1 pH / 3 mV
- ⇒ Power rating 230 V – 1 phase – 50/60 Hz
- ⇒ Power consumption 10 Watt
- ⇒ Peristaltic hose Silicon or Santoprene®; diameter 4 x 6 mm
- ⇒ Ambient temperature 0÷50 °C
- ⇒ Wall mounting, plastic housing

**DIMENSIONS**

200 H x 250 W x 125 D mm  
Net weight 2 kg



**POOL SMART pH**

- ⇒ Peristaltic pumps with integral pH meter
- ⇒ Analog controls; Display 3 digits
- ⇒ On-Off mode
- ⇒ pH range: 0÷14; Precision 0,1 pH
- ⇒ Power rating 230 V – 1 phase – 50/60 Hz
- ⇒ Power consumption 5 Watt
- ⇒ Peristaltic hose Silicon or Santoprene®; diameter 4 x 6 mm
- ⇒ Ambient temperature 0÷50 °C
- ⇒ Wall mounting, plastic housing

**DIMENSIONS**

171 H x 200 W x 107 D mm  
Net weight 1,2 kg



**POOL SMART RX**

- ⇒ Peristaltic pumps with integral Redox (ORP) meter
- ⇒ Analog controls; Display 4 digits
- ⇒ On-Off mode
- ⇒ ± 0÷1400 mV; Precision 3 mV
- ⇒ Power rating 230 V – 1 phase – 50/60 Hz
- ⇒ Power consumption 5 Watt
- ⇒ Peristaltic hose Silicon or Santoprene®; diameter 4 x 6 mm
- ⇒ Ambient temperature 0÷50 °C
- ⇒ Wall mounting, plastic housing

**DIMENSIONS**

171 H x 200 W x 107 D mm  
Net weight 1,2 kg

Peristaltic pumps are provided with standard accessory kit comprehensive of:

- filter, 4 m hose (PVC flexible) Injection valve • filter • suction/discharge hoses 4x6 mm

**TECHNICAL CHARACTERISTICS**

Model	Max Flow at Max Pressure	
	l/h	bar
Pool Smart Ph	2,4	1,5
Pool Smart Ph	2,4	1,5
Pool Smart Ph/Rx	2,4/2,4	1,5



- Combined electrodes
- Epoxy body
- Max pressure 5 bar
- Max temperature 70°C

pH/RX



In-line electrode holder, PP, connection 1/2"



Buffer solution pH4 and pH7 Redox 465 mV

Both solution for Pool Smart PH/RX

**ADDITIONAL INFORMATIONS**

- ⇒ Optional power supply: 24 V a.c. - 24 V d.c. - 110 V a.c. add to list price + 10%
- ⇒ Level probe fitting: **the pump can be provided with level probe fitting only upon request.**

### UPER NP series


#### Fixed-speed peristaltic dispensers

Fixed-speed non-shrouded peristaltic for mounting inside dishwasher.

- ⇒ Thick-walled peristaltic tubing
- ⇒ Rapid installation and mounting
- ⇒ Protection grade IP40
- ⇒ Compact size
- ⇒ Duty cycle 100%
- ⇒ Tube life 1000 lt min. (compatible liquids)

MODEL	FLOW RATE	DISPLACEMENT
<b>UPER NP 1,2</b>	<b>Fixed 1,2 litres/h. @ 1 bar</b>	<b>1 ml</b>
<b>UPER NP 1,8</b>	<b>Fixed 1,8 litres/h. @ 1 bar</b>	<b>1 ml</b>

**Accessories supplied with pump:**  
Peristaltic hose, polycarbonate front cover, fittings, hose diam.4x6mm, 4m PVC diam. 4x6mm, tube injection fitting with nut and gasket, foot filter.



Typical application:  
**dispensing detergent in small dishwashers or other duties.**

Total pump head / Max working pressure	<b>10 m water column / 100 KPa (1bar - 14.5 psi)</b>
Liquid viscosity	<b>up to 100 mPa.s with standard suction/discharge tube 4x6mm</b>
Power ratings	<b>220-240Vac 50/60Hz 55VA (24-110V optional)</b>
Outline dimens.(LxHxW) / weight	<b>85x65x65mm. - 3.35x2.56x2.56 inches / 250 gr. - 8.82 oz.</b>

### UPER FX series


#### Fixed-speed peristaltic dispensers

Fixed-speed, medium-capacity peristaltic enclosed into IP65 plastic housing.

- ⇒ Plastic housing
- ⇒ Thick-walled peristaltic tubing
- ⇒ Rapid installation and mounting
- ⇒ Compact size, protection grade IP65
- ⇒ 50% - 30min. max working time
- ⇒ Tube life 1000 lt min. (compatible liquids)

MODEL	FLOW RATE	DISPLACEMENT
<b>UPER FX 250</b>	<b>Fixed 15 litres/h @ 1 bar</b>	<b>3 ml</b>
<b>UPER FX 400</b>	<b>Fixed 25 litres/h @ 1 bar</b>	<b>5 ml</b>

**Accessories supplied with pump:**  
Peristaltic tube, polycarbonate front cover, suction fittings for tube diam.8x12mm (FX250), suction fittings for tube diam.8x12mm / 10x14mm (FX400), quick mounting wall bracket and two wall plugs with screws, power cord already mounted. FX pump is supplied without power switch



Total pump head / Max working pressure	<b>20 m water column / 100 KPa (1bar – 14.5 psi)</b>
Liquid viscosity	<b>up to 2500 mPa.s with standard suction/discharge tube 8x12mm</b>
Flow rate reduction	<b>Max 10% from 100 to 1000 injected litres</b>
Fittings	<b>For tubes diam. 8x12mm (FX250) - For tubes diam. 8x12mm and diam.10x14 (FX400)</b>
Power ratings	<b>220-240Vac 50/60Hz 55VA (24 – 110V optional)</b>
Outline dimens.(LxHxW)/weight	<b>106x90x106mm – 4.17x3.54x4.17inches / 650 gr. - 22.9 oz.</b>

### UPER FH series


#### Fixed-speed peristaltic dispensers

Fixed-speed, high-capacity peristaltic enclosed into IP65 plastic housing.

- ⇒ Plastic housing
- ⇒ Thick-walled peristaltic tubing
- ⇒ Rapid installation and mounting
- ⇒ Compact size, protection grade IP65
- ⇒ 50% - 30min. max working time
- ⇒ Tube life 1000 lt min. (compatible liquids)

MODEL	FLOW RATE	DISPLACEMENT
<b>UNIPER FH 900</b>	<b>Fixed 54 litres/h @ 1 bar</b>	<b>7,5 ml</b>
<b>UNIPER FH 1200</b>	<b>Fixed 72 litres/h @ 1 bar</b>	<b>10 ml</b>

**Accessories supplied with pump:**  
Peristaltic tube, polycarbonate front cover, suction fittings for tube diam.8x12mm/10x14mm, quick mounting wall bracket and two wall plugs with screws, power cord already mounted.  
FX pump is supplied without power switch.



Total pump head / Max working pressure	<b>20 m water column / 100 Kpa (1bar – 14.5 psi)</b>
Liquid viscosity	<b>Injection of viscous liquids up to 2500 mPa.s with extension tube diam. 8x12mm</b>
Flow rate reduction	<b>Max 10% from 100 to 1000 injected litres</b>
Fittings	<b>For tubes diam. 8x12mm and 10x14mm</b>
Power ratings	<b>220-240Vac 50/60Hz 55VA (24 – 110V optional)</b>
Outline dimens.(LxHxW)/weight	<b>106x90x130 mm. – 4.17x3.54x5.12 inches / 850 gr. - 29.98 oz.</b>

**VPER LP series**  
Variable-speed peristaltic dispensers

Variable-speed peristaltic dispensers enclosed into IP65 plastic housing.

- ⇒ Compact size, protection IP65
- ⇒ Thick-walled peristaltic tubing
- ⇒ Rapid installation and mounting
- ⇒ Variable rpm speed Flow adjustment
- ⇒ 50% - 30min. max working time
- ⇒ Tube life 1000 lt min. (compatible liquids)



MODEL	FLOW RATE	SPEED RANGE
VPER LP 120	Variable 0,54 ÷7,2 l/h @ 1 bar	Variable 3 ÷40 rpm
VPER LP 180	Variable 0,72 ÷10,8 l/h @ 1 bar	Variable 4 ÷60 rpm
VPER LP 250	Variable 1,1 ÷15 l/h @ 1 bar	Variable 6 ÷84 rpm

**NOTE:** VPER pump is supplied without power switch

**VPER DV series**  
Variable-speed peristaltic with dual power supply

Variable-speed peristaltic dispensers driven by dual power supply (two solenoid valves); enclosed into IP65 plastic housing.

- ⇒ Dual power supply
- ⇒ Thick-walled peristaltic tubing
- ⇒ Compact size, protection IP65
- ⇒ Variable rpm speed Flow adjustment
- ⇒ 50% - 30min. max working time
- ⇒ Tube life 1000 lt min. (compatible liquids)



MODEL	FLOW RATE	SPEED RANGE
VPER DV 120	Variable 0,54 ÷7,2 l/h @ 1 bar	Variable 3 ÷40 rpm
VPER DV 180	Variable 0,72 ÷10,8 l/h @ 1 bar	Variable 4 ÷60 rpm
VPER DV 250	Variable 1,1 ÷15 l/h @ 1 bar	Variable 6 ÷84 rpm

**NOTE:** VPER pump is supplied without power switch

Typical application:  
Peristaltic driven by a dual solenoid valve.

**TECHNICAL CHARACTERISTICS COMMON TO VPER LP / DV SERIES**

Revolution displacement	3 ml
Total pump head / Max working pressure	20 m water column / 100 Kpa (1bar – 14.5 psi)
Liquid viscosity	Injection of viscous liquids up to 2500 mPa.s (100 mPa.s with suction/discharge extension tube diam. 4x6mm, 2500 mPa.s with extension tube diam. 8x12mm)
Flow rate reduction	Max 10% from 100 to 1000 injected litres
Fittings	For tubes diam. 4x6mm (8x12mm optional)
Power ratings	220-240Vac 50/60Hz 55VA (24 – 110V optional)
Outline dimens.(LxHxW)/weight	106x90x106mm – 4.17x3.54x4.17inches / 650 gr – 22.9 oz

**Accessories supplied with pump LP and DV**  
Peristaltic tube, polycarbonate front cover, suction fittings for tube diam. 4x6mm, injection fitting with nut and gasket, foot filter, quick mounting wall bracket and two wall plugs with screws, power cord already mounted.

**VPER HP series**  
Variable-speed peristaltic dispensers 3 bar pressure

Variable-speed peristaltic dispensers suitable to work with 3 bar counter-pressure; enclosed into IP65 plastic housing.

- ⇒ 3 bar working pressure
- ⇒ Thick-walled peristaltic tubing
- ⇒ Compact size, protection IP65
- ⇒ Variable rpm speed Flow adjustment
- ⇒ 50% - 30min. max working time
- ⇒ Tube life 1000 lt min. (compatible liquids)



MODEL	FLOW RATE	SPEED RANGE
VPER HP 30	Variable 0÷1,8 litres/h @ 3 bar	Variable 0÷20 rpm
VPER HP 45	Variable 0÷2,7 litres/h @ 3 bar	Variable 0÷30 rpm

**NOTE:** VPER pump is supplied without power switch

**Accessories supplied with pump:**  
Peristaltic tube, polycarbonate front cover, suction fittings for tube diam. 4x6mm, discharge fitting with internal check valve, internal check valve, foot filter, quick mounting wall bracket and two wall plugs with screws, power cord already mounted (Extension tubes and "T" rinse circuit injection set optional).

Typical application:  
Dishwasher brightener dispensing or other duties suitable for 3 bar pressure

Revolution displacement	1,5 ml
Total pump head / Max working pressure	40 m water column / 300 Kpa (3bar – 43,5 psi)
Liquid viscosity	Injection of viscous liquids up to 2500 mPa.s (100 mPa.s with suction/discharge extension tube diam. 4x6mm, 2500 mPa.s with extension tube diam. 8x12mm)
Flow rate reduction	Max 10% from 100 to 1000 injected litres
Fittings	For tubes diam. 4x6mm
Power ratings	220-240Vac 50/60Hz 55VA (24 – 110V optional)
Outline dimens.(LxHxW)/weight	106x90x106mm – 4.17x3.54x4.17inches / 650 gr – 22.9 oz

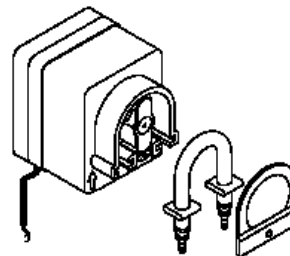
**VPER TB SERIES**  
Peristaltic driven by two microprocessor timers



TD series is the family of peristaltic dispensers with microprocessor timers

- Integrated and flexible timing functions
- Two microprocessor timers
- Variable flow rate
- from 9 to 250 ml per minute
- Suitable for high viscous liquid injection
- Long life tube
- Easy tube replacement
- Power cord equipped
- Quick mounting
- Customized model available
- Compact, reliable and low cost

The usual field of application is that of dispensing detergents and brighteners in single-tub or belt dishwashers, dishwashers with manual initial load and salad washers, and of dispensing liquid detergents and additives in small washing machines. It can also be used for duties where a timed dosing is required.



Pump hose assembly

MODEL	FLOW RATE	SPEED RANGE
VPER TD 120	Variable 0,54 ÷7,2 l/h @1 bar	Variable from 3 to 40 revolutions/min
VPER TD 180	Variable from 0,72 ÷10,8 l/h @ 1 bar	Variable from 4 to 60 revolutions/min
VPER TD 250	Variable from 1,1 ÷15 l/h @ 1 bar	Variable from 6 to 84 revolutions/min

NOTE: VPER pump is supplied without power switch

VPER TB	
Type	Variable-speed peristaltic dispenser with dual timer and dual power supply
Typical application	Timed dispensing of detergent in dishwashers with single or dual solenoid valve
Timer	Two timers settable from 1 to 2805 seconds by a key sequence
Revolution displacement	3 ml
Total pump head	20 m water column
Max working pressure	100 KPa (1bar – 14.5 psi)
Liquid viscosity	Injection of viscous liquids up to 2500 mPa.s (100 mPa.s with suction/discharge extension tube diam. 4x6mm, 2500 mPa.s with extension tube diam. 8x12mm)
Tube Life	1000 litres minimum (for compatible liquids)
Flow rate reduction	Max 10% from 100 to 1000 injected litres
Duty cycle	50% - 30min. max working time
Fittings	For tubes diam. 4x6mm (8x12 mm optional)
Power supply	Double from rinse and/or fill electrovalves
Power ratings	220-240Vac 50/60Hz 55VA (24-110V optional)
Electric connection	Equipped with 3 metres power cord (Rear terminal block instead of power cord option not available)
IP protection grade	IP65
Outline dimens. (LxHxW)	106x90x106mm – 4.17x3.54x4.17inches
Weight	650 gr. – 22.9 oz.
Accessories supplied with pump: Peristaltic tube, polycarbonate front cover, suction fittings for tube diam. 4x6mm, injection fitting with nut and gasket, foot filter, quick mounting wall bracket and two wall plugs with screws, power cord already mounted (Extension tubes optional).	



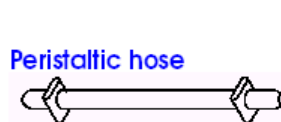
Suction fittings



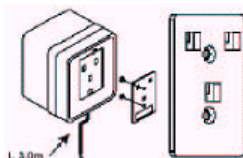
Injection fitting for viscous liquid



Foot filter



Peristaltic hose



Quick wall installation

Quick wall mounting bracket

Extension hose (upon request)





**TPER BD**  
**Battery operated programmable dosing unit for biological active agents**



TPER BD system can now solve any dosing problems relative to drains, chemical treatment of grease traps and dosing of biological active agents.

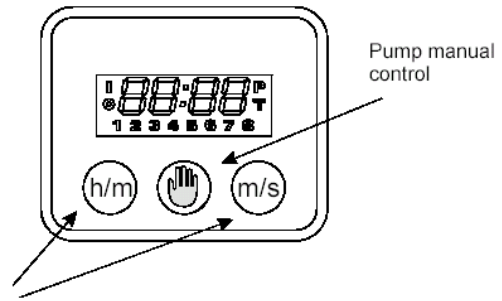
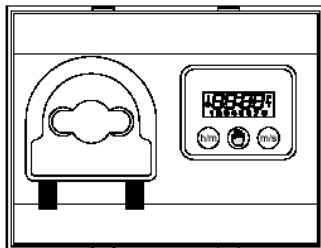
A big advantage of the model is its power supply obtained from six LR20 size batteries. Such a feature makes it possible to install the unit in any location without the need of mains voltage.

Batteries guarantee operation for approx. 6 months before they must be substituted.

- Customized model available
- Compact, reliable and low cost.
- Battery power supply.
- Long time batteries life
- 1 second of minimum insertion time.
- 8 daily programs.

MODEL	FLOW RATE
TPER BD	Fixed 3,6 litres/h @ 1 bar

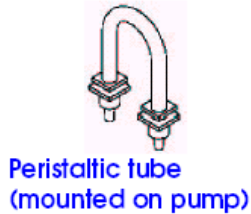
**CONTROL PANEL DISPLAY**



Setting buttons  
h/min. timer and min./sec. programs

TPER BD	
Type	Compact peristaltic dispenser with battery-powered clock for several daily settings
Typical application	Multi-timed dispensing for biological activators
Revolution displacement	1 ml
Timer	Microprocessor timer – 8 daily insertions
Program insertion time	Min. 1sec – Max 23min. 59sec.
Total pump head	10 m water column
Max working pressure	100 KPa (1bar - 14.5 psi)
Liquid viscosity	Injection of viscous liquids up to 100 mPa.s with tubing diam. 4x6mm
Fittings	For tubes diam. 4x6mm
Power ratings	6 alkaline batteries 1,5V LR20
IP protection grade	IP65
Outline dimens. (LxHxW)	145x115x120mm 5.70x4.53x4.72 inches
Weight	500 gr. - 17.63 oz. ( batteries excluded )
Colour	Grey
Accessories supplied	Peristaltic tube, polycarbonate front cover, suction fittings for tube diam. 4x6mm, foot filter and two wall plugs with screws (Extension tubes optional)

**Accessories supplied with the pump:**







fluid and water technology

# SOLENOID DRIVEN DOSING PUMPS



**CONTIMETRA**  
Lisboa

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Portela de Carnaxide  
2790-138 CARNAXIDE  
telef. 214 203 900 - telefax 214 203 901  
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**SISTIMETRA**  
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telef. 229 774 470 - telefax 229 724 551  
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Welcome  
to FWT  
Dosing  
Systems

**FWT (Fluid and Water Technology)** is pleased to introduce its complete range of dosing pumps, controllers and measuring systems.

**FWT is a new established company formed with specialised experts with over twenty years of experience in water treatment and liquid handling systems, dosing and measuring systems.** All the staff has been operating in this field covering all key positions concerning technical and customer service, research and development, trading and production activities. We have teamed up to form FWT not only to offer excellent products but also to grant the best service which is the key factor in our market field.

**FWT offers a wide range of accessories and sensors to guarantee a complete service.** All products are accompanied by single product **Data sheet**. If you are interested to receive our complete catalogue and price list, please contact our International sales department.



**Brief Notes about FWT dosing pumps:**

**AX** series is what can be called “all round” combining great quality at interesting price allowing to choose between the two most common mounting versions: **Wall or Foot mounting**.

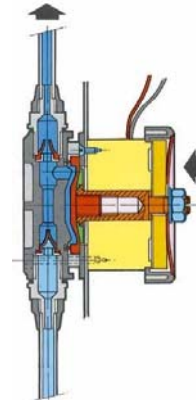
AX series control operations feature two functioning controls versions: **Analog** and **Digital**.

All the products are manufactured according **CE regulation**;

Upon request **CSA /UL** certification can be provided (valid for USA/Canada);

Standard electrical supply: **230V/50 - 60 Hz**;

upon request: **110V/50-60 Hz; 24 Vac e Vdc; 12V dc**.



### PUMPS MAIN FEATURES

Power supply: **230 Vac–1 phase– 50/60 Hz±10%**  
 Reproducibility under standard conditions: **± 5%**  
 Plastic housing and support: **PP reinforced, IP65**  
 Connectors: **4 pole IP66**  
 Upon request: **110 Vac/60 Hz; 12 Vdc; 24 V**  
 Ambient working temperature: **45°C**  
 Voltage working range: **min.207V ÷Max 253 V**  
 Voltage Peak: **Max 270 V**

Pumps are provided with **Standard Accessories Kit**:

- ⇒ **1 - Injection valve;**
- ⇒ **2 m - Discharge Hose (white);**
- ⇒ **2 m - Suction Hose PVC flexible (transparent);**
- ⇒ **1,5 m - Air Bleed Hose PVC flexible (transparent);**
- ⇒ **1 - Foot Valve/Filter**

Pumps are also provided with **Level control** (except C/a models)

LIQUID ENDS MATERIAL		
	Standard Version	Upon request
Pump head	PP	PVC; AISI 316; PTFE
Diaphragm	PTFE	-----
Lip type Valve	Viton ®	Dutral®; NBR
Seals/O-rings	Viton ®	Dutral®; NBR
Injection Fitting	PP	AISI 316; PTFE
Foot Valve/Filter Fitting	PP	AISI 316; PTFE
Suction Hose /Air Bleed hose	PVC	-----
Discharge Hose	PE	-----
Injection No-return Valve (Sleeve)	Viton ®	Dutral®; NBR
<b>Upon request:</b>		
Ball check valve	Glass Pyrex; AISI 316; Ceramic; PTFE	
Viton®(FPM) - Dutral® (EPDM), are registered trademarks of Dupont Elastomers		

TECHNICAL CHARACTERISTICS							
Pump type	Max Flow/Max Pressure		Frequency	Stroke volume	Stroke length	Hose Ø	HRS* Frequency
	l/h	bar	imp/min	ml (cc) / l	mm	mm	imp/min
AX-AXF 01-15	1	15	120	0,14	0,80	4x6	100÷250
AX-AXF 02-10	2	10	120	0,28	0,80	4x6	100÷250
AX-AXF 05-07	5	7	120	0,69	1.00	4x6	100÷250
AX-AXF 05-12	5	12	120	0,69	1.00	4x6	100÷250
AX-AXF 08-10	8	10	120	1,11	1.40	4x6	100÷250
AX-AXF 15-04	15	4	120	2,08	2.20	4x6	100÷250
AX-AXF 20-03	20	3	120	2,77	2.20	4x6	100÷250

\*HRS only for AX C/m model: modifies the frequency rate from 100÷250 strokes per minute, according to actual back pressure.

Technical characteristics HIGH PERFORMANCES AX						High Performance AX feature different housing
	l/h	bar	imp/min	ml / l	mm	
<b>FOOT MOUNTING</b>						 foot mounting
AXF 04-20	4	20	120	0,55	4x6	
AXF 20-05	20	5	160	2,08	4x6	
<b>WALL MOUNTING</b>						
AX 05-20	5	20	160	0,52	4x6	 wall mounting
AX 20-05	20	5	160	2,08	4x6	
AX 30-04	30	4	180	2,80	10x14	
AX 50-03	50	3	180	4,60	10x14	
AX 80-01	80	1	180	7,40	10x14	

## AX SERIES CONTROLS

AX series operations are guaranteed by stroke frequency and stroke length adjustment (only foot mounted):

⇒ **STROKE FREQUENCY ADJUSTMENT**

Two functioning controls versions available: **Analog and Digital** which includes also Digital with integral meter.

⇒ **STROKE LENGTH ADJUSTMENT**

**STANDARD FOR FOOT MOUNTED SERIES.** It varies the single stroke volume displacement. AXF series offers feature the advantage of double flow rate regulation: **pulse frequency** adjustment and **stroke length** allowing accurate dosing operations.

**Available without upon request.**

**Recommended stroke adjustment rate: 20%÷100%**



• **AX-AXF C/a ANALOG controls:** constant/On-Off pumps for those application where a simple pump at low cost is required but keeping maximum reliability. Pump flow rate can adjusting in this percentage of pulse frequency (%); case the frequency will be fixed max 120 imp/min.



• **AX/AXF P/m DIGITAL controls: PROPORTIONAL**

Proportional/Constant pump to external pulses. Divider and Multiplier modes; Constant/On-Off mode.



• **pH;RX;CI;CD/m DIGITAL with INSTRUMENT:**

two units in one enclosure; proportional and On-Off mode.



• **AX-AXF C/m DIGITAL controls:** microprocessor based line; model AX C/m includes HRS system.



- **HRS (High Resolution System)** high tech version allowing two different operating modes: standard frequency adjustment and HRS. HRS mode allows the maximum efficiency condition for the pump at different working pressures. **Flow rate can be set in l/h (according to actual working pressure) with a resolution of 0.1 l/h**  
**HRS BENEFITS: one pump can cover a wide range of flow rates and pressures reducing stock value.**

Please check the page showing HRS performance curves

- **Traditional mode:** AX C/m pumps can also be set according to the traditional mode adjusting percentage of pulse frequency (%); pulse frequency will be max 120 imp/min.

• **AX/AXF P/m DIGITAL controls: MULTIFUNCTIONS**

Proportional/Constant pump to external pulses. Divider and Multiplier modes; Constant/On-Off mode.



**KEY FEATURES COMMON TO ALL AX VERSIONS**

- ⇒ LIP valves: Viton, avail. EPDM, NBR
- ⇒ Plastic housing PP reinforced
- ⇒ IP65 rating
- ⇒ Price effective

- ⇒ Cylinder Viton no-return injection valve
- ⇒ PTFE diaphragm
- ⇒ Air Bleed valve for priming
- ⇒ Stroke adjustment injected volume (foot mounting)

• Available upon request: Glass Pyrex; AISI 316; Ceramic; PTFE

**ANALOG CONTROLS CONSTANT MODE**

**AX C/a**  
Wall mounting



**AX C/a - AXF C/a**

- Constant flow rate – ON-OFF mode
- Strokes frequency adjustment 0÷100%
- Analog controls
- 2 LED display status: power and pulses

**AXF C/a**  
Foot mounting



**AX CL/a - AXF CL/a**

- Constant flow rate – ON-OFF with level control
- Provided with level control and level switch
- Other characteristics as above AX C

**PROPORTIONAL TO EXTERNAL DIGITAL CONTACT**

**AX P/m**  
Wall mounting



**AX P/m - AXF P/m**

- Proportional dosing pump to external digital pulses
- Constant mode ON-OFF
- Digital controls with Microprocessor technology
- Keyboard controls and Display
- 2 LED display status: power and pulses

**AXF P/m**  
Foot mounting



**PROPORTIONAL MODES:**  
Divider 1:n  
Multiplier 1xn

**MICROPROCESSOR TECHNOLOGY CONSTANT MODE – HRS SYSTEM**

**AX C/m**  
Wall mounting



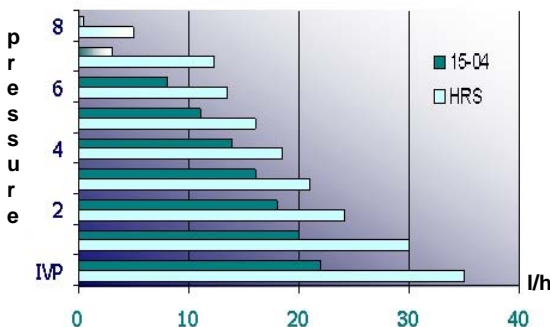
Microprocessor dosing pump with electronic control interface with HRS function controlling the pump output pressure according to the system pressure obtaining the pump max possible flow rate vs. the operating condition. **HRS** increases the flow rate modifying the frequency rate from 100÷250 strokes per minute, according to actual back pressure.

**AXF C/m**  
Foot mounting



**AX C/m - AXF C/m**

- Constant mode with digital flow rate adjustment
- Microprocessor technology
- Strokes frequency adjustment 0÷100%
- Keyboard controls and LCD display
- Provided with level control and level switch



**HRS Characteristics**

The chart reports the values of all available combinations flow rate/pressure with HRS function activated, example with pump type 15 l/h at 4 bar.

**IVP: injection valve back pressure**



**AX MF/m**  
Wall mounting



**MICROPROCESSOR TECHNOLOGY  
MULTIFUNCTIONS MODE**

**AX MF/m - AXF MF/m**

- Multifunction dosing pump with level control
- Microprocessor technology, display and digital controls
- Proportional to external digital pulses: divider 1:n; multiplier 1xn
- Proportional to external analog signal 0/4÷20 mA
- Constant mode with digital adjustment : imp/min; imp/hour; imp/day
- Digital timer, weekly and daily programming
- Sequence strokes/ injection with flow sensor
- Level alarm output contact: NO/NC



**MULTIFUNCTIONS SERIES  
HIGH PERFORMANCE MODELS**

**AXF MF/m**  
Foot mounting



**AX PH/m**  
**AX RX/m**  
**AX CL/m**  
**AX CD/m**



Wall mounting

**DOSING PUMPS WITH INTEGRAL  
PROPORTIONAL CONTROLLER**

- Proportional and ON/OFF control modes
- Delay working time adjustment
- Hysteresis regulation
- Injection frequency adjustment
- Connectors: BNC and 4 pole IP66
- Microprocessor technology, LCD display, digital controls

**AX PH/m**

- ⇒ Dosing pump with integral pH meter
- ⇒ pH measuring range: 0÷14 Ph

**AX RX/m**

- ⇒ Dosing pump with integral redox meter
- ⇒ Rx measuring range: 0÷1000 mV

**AX Cl/m**

- ⇒ Dosing pump with integral Free chlorine controller
- ⇒ Free chlorine measuring range: 0÷10 ppm

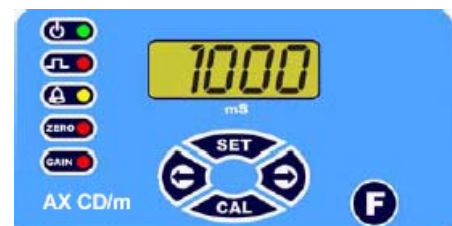
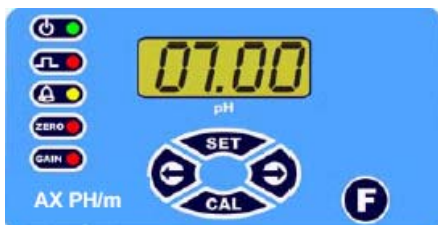
**AX CD/m**

- ⇒ Dosing pump with integral Conductivity meter
- ⇒ Conductivity measuring range: 0÷20 mS

**AX PH/m**  
**AX RX/m**  
**AX CL/m**  
**AX CD/m**

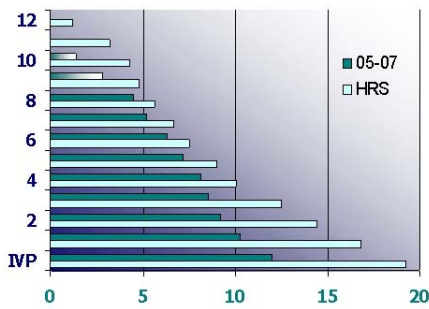
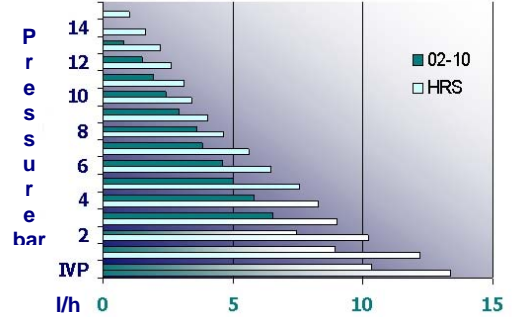
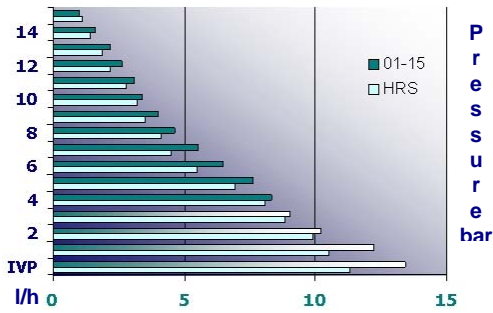


Foot mounting

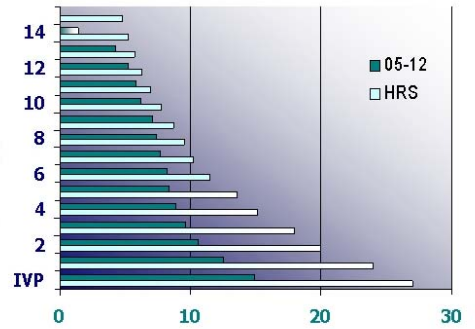




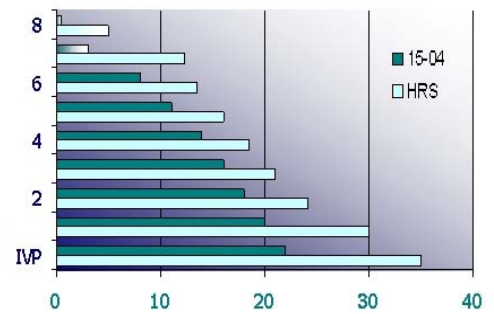
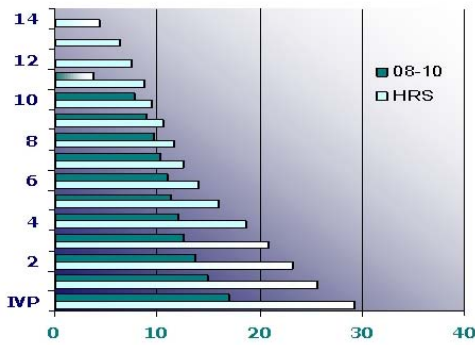
**HRS CURVES**



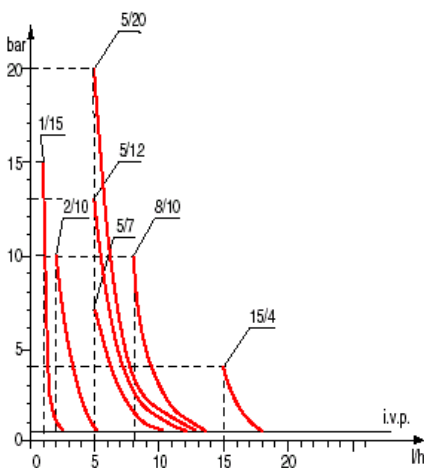
IVP: free discharge with the standard injection valve



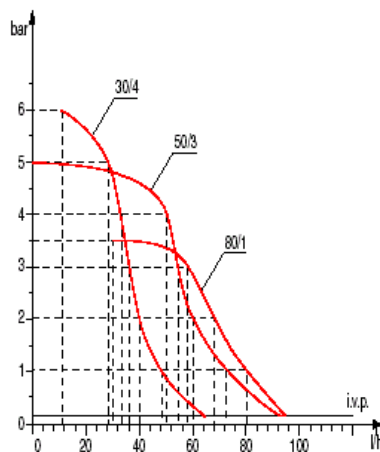
All indicated flow rates are obtained testing the pump with medium hardness water at rated pressure, 1,5 m suction lift, room temperature. The diagrams indicate max metering pump flow variation in relation to the working pressure in the plant; the diagrams also include injection valve losses. IVP



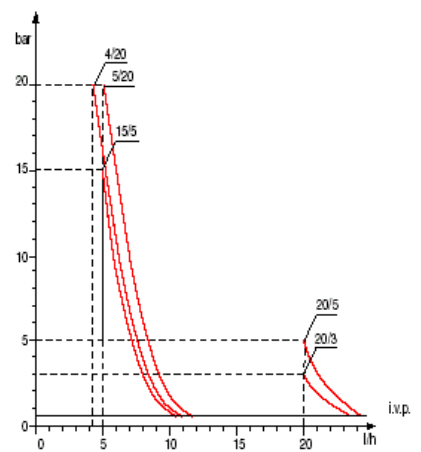
**AX SERIES STD MODE**

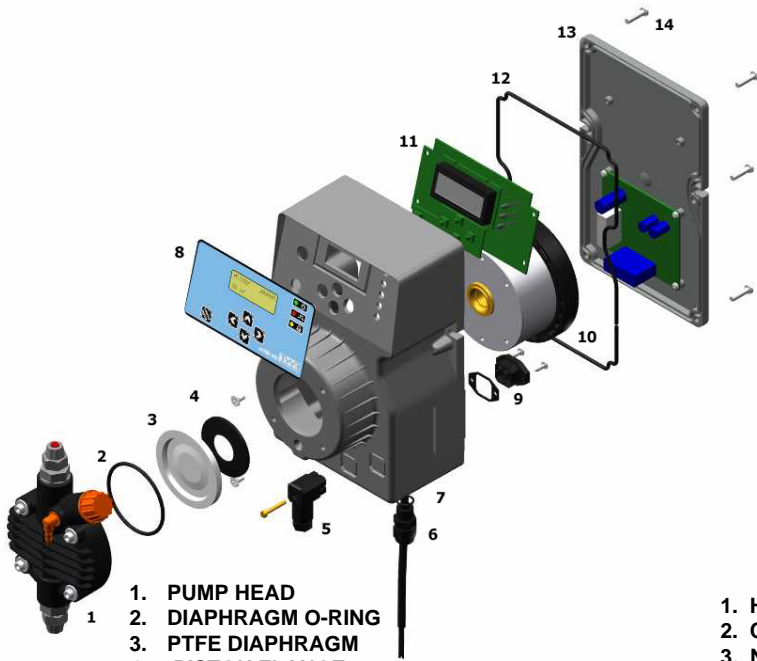


**HIGH PERFORMANCES SERIES HIGH FLOW RATE**

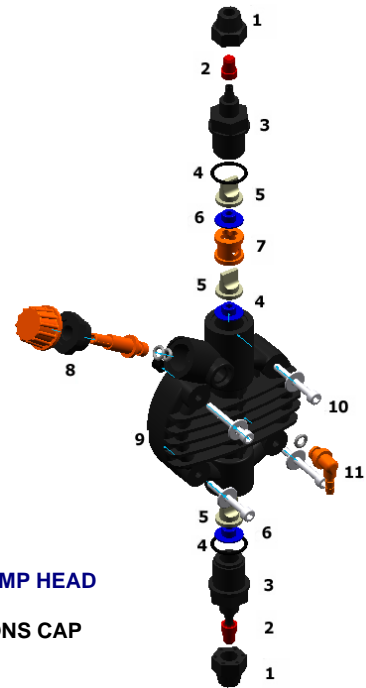


**HIGH PERFORMANCES SERIES**



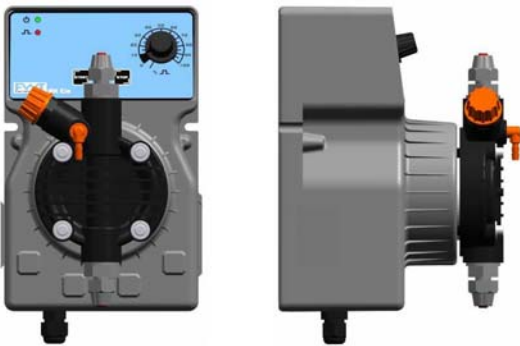


- 1. PUMP HEAD
- 2. DIAPHRAGM O-RING
- 3. PTFE DIAPHRAGM
- 4. PISTON FLANGE
- 5. CONNECTOR female
- 6. POWER CABLE GLAND
- 7. PUMP HOUSING
- 8. CONTROLS FRONT PANEL
- 9. CONNECTOR male
- 10. SOLENOID
- 11. PCB (printed circuit board)
- 12. GASKET
- 13. BACK COVER
- 14. SCREWS



**PUMP HEAD**

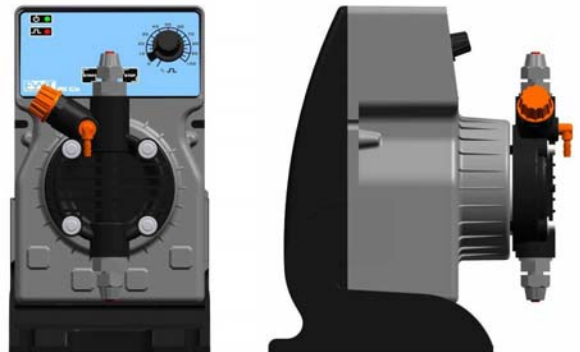
- 1. HOSE NUT
- 2. CONNECTIONS CAP
- 3. NIPPLES
- 4. O-RING
- 5. LIP VALVE (ball on request)
- 6. VALVE SEAT
- 7. AIR BLEED ASSEMBLY
- 8. AIR BLEED KNOB ASSEMBLY
- 9. PUMP HEAD
- 10. PUMP HEAD SCREWS
- 11. AIR BLEED OUTLET



190 height x 120 width x 150 depth

**AX series dimensions**

Net weight  
kg  
2.3 - 2.9



221 height x 127 width x 192 depth

**COMPLETE DOSING AND CONTROL PANELS**



Monitoring dosing and control operations.  
Dimension available according to the components size.  
Pre-assembled panels: add extra price below to total of components selected  
- mm 800 x 600 x 0.8  
- mm 500 x 600 x 0,8

Standard power supply 230VAC

# FWT AX SERIES ACCESSORIES



DOSING TANKS



PULSE WATER METERS



MIXERS

FWT offers also a wide range of accessories and sensors to guarantee a complete service such as: **Safety relief/Anti-syphon valves • Pulsation dampeners • Over voltage protection**

## CONTROLLERS



## PROBE AND SENSORS



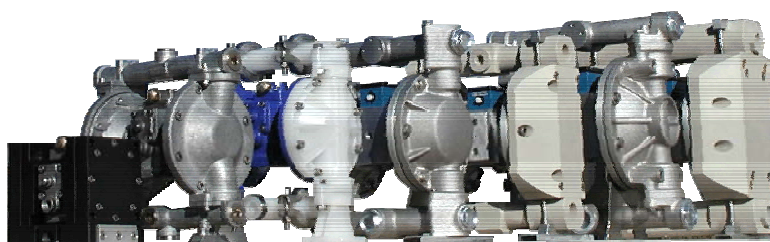
## MOTOR DOSING PUMPS



## PERISTALTIC PUMPS



## AIR OPERATED DOUBLE DIAPHRAGM PUMPS



## CONTIMETRA

Lisboa

**Sede:**

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[www.contimetra.com](http://www.contimetra.com)

**Armazém:**

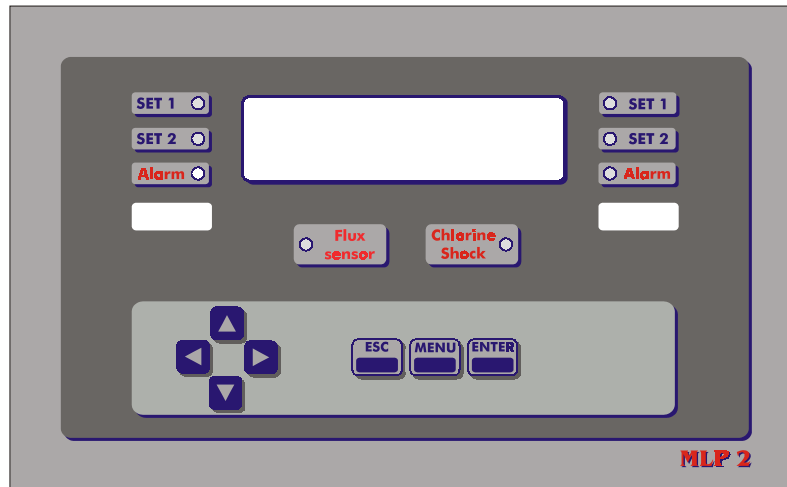
Rua do Proletariado, nº15-B r/c - Portela  
2795-648 CARNAXIDE  
tel. 21 416 11 12

## SISTIMETRA

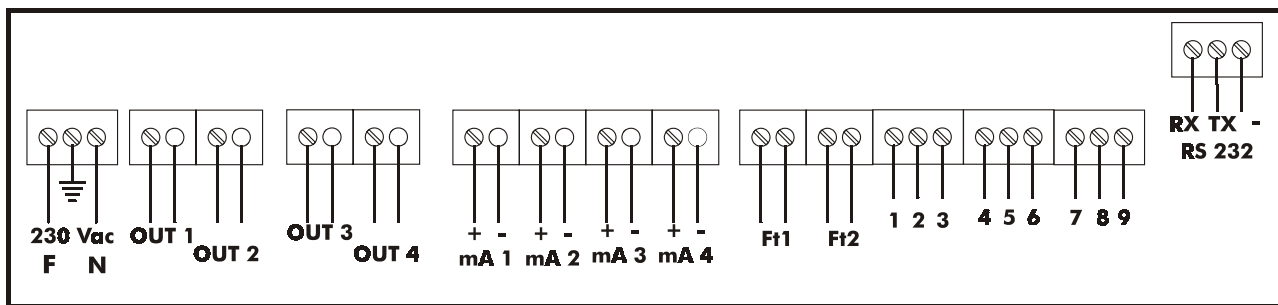
Porto

**Sede e armazém:**

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tel. 22 972 45 50 - fax 22 972 45 51  
e-mail [sistimetra@esoterica.pt](mailto:sistimetra@esoterica.pt)  
[www.sistimetra.pt](http://www.sistimetra.pt)



### Régua de ligações eléctricas



### Ligações

Ligação dos condutores de alimentação aos seguintes bornes N (neutro),  $\oplus$  (terra), F (fase)

Ligação da sonda de temperatura aos bornes 4 (+), 5 (-), 6 (In) (entrada)

Ligação da sonda de proximidade aos bornes 7 (entrada, preto), 8 (+ castanho), 9 (- azul)

Ligação da sonda de cloro aos bornes 3 (- azul), 2 (+ castanho), (seguir instruções da sonda cloro)

Borne de saída do relé de pH1 = out 1

Borne de saída do relé de CL1 = out 2

Borne de saída do relé de CL2 = out 3

Borne de saída do relé de alarme = out 4

Bornes de saída de controlo proporcional para pH (4-20 mA) = mA1

Bornes de saída de controlo proporcional para cloro (4-20 mA) = mA 2

Bornes de saída de retransmissão 4-20 mA, para pH = mA 3

Bornes de saída de retransmissão 4-20 mA, para CL = mA 4



fluid and water technology

# MOTOR DRIVEN DOSING PUMPS



**CONTIMETRA**  
Lisboa

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English version 10/03



• **MAIN TECHNICAL CHARACTERISTICS** •

↳ **Gearbox** in cast aluminium protected with Epoxi paint. The gearbox offers a stroke movement from 0-10 mm (diaphragm series), and 0-20 mm (piston series). The gearbox mechanism is operated by an eccentric cam, which provides a positive displacement delivery stroke, whilst the suction stroke is **spring** assisted. The lubricated gearbox comprises a worm wheel reduction system with all bearing fully supported. The movement of the piston or the diaphragm is based on a precise volumetric displacement, providing accurate stroke reproduction.

↳ **Adjustable capacity** from 0-100% whilst in operation or at rest. Flow rate is adjusted by a micrometer knob which control stroke length (10:1 turndown ratio).

↳ **Maximum suction lift** 4 metres with water.

↳ **Motor and gearbox** coupled by means of a flexible motor coupling, thus increasing transmission life.

*Each pump is individually tested and all units are **CE certified***

**MOTORS CHARACTERISTICS**

- ↳ Standard power supply: 230/400 V, 3 phase, 50/60 Hz +/- 10%.  
Upon request others options: multi-voltages and multi-frequency, isolation class.
- ↳ Conform with IP54 protection.
- ↳ Isolation class F, others available upon request.
- ↳ Standard motors are 0,25 Kw and 0,55Kw 1400 rpm at 50 hz.
- ↳ Motors are TEFC vertically mounted, B14 type, conforming to UNICEL-MEC specifications.
- ↳ Flame proof and explosion proof motors are available on request.
- ↳ Electrical control **servo-motors** or motors provided with **Frequency inverter** can be supplied for proportional dosing in conjunction with 4÷20 mA input signal.



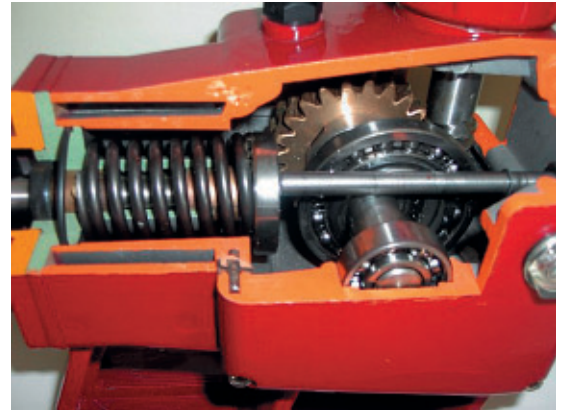
## • Standard power supply •

- ↳ 230/400 V a.c. 3 phase 50 Hz, class F, IP55
- ↳ 275/480 V a.c. 3 phase 60 Hz (\*)

## OTHER POWER SUPPLY AVAILABLE UPON REQUEST

- ↳ 230 V a.c. 1 phase 50 Hz
- ↳ 230 V a.c. 1 phase 60 Hz (\*)
- ↳ 110 V a.c. 1 phase 50 Hz
- ↳ 110 V a.c. 1 phase 60 Hz (\*)
- ↳ d.c. motors

(\*) **NOTE:** at 60 Hz frequency, motor speed and thus stroke rates and flow rates increase by approx. 20%.  
60 Hz frequencies are only available for pumps with 60 and 103 strokes per minute.



## OTHER OPTIONS

- ↳ Servo motor mechanism which accepts 4-20 mA input to remotely control stroke length.
- ↳ Pneumatic servo motor mechanism which accepts 3-15 psi input signal to remotely control stroke length.
- ↳ Tropicalised motors.

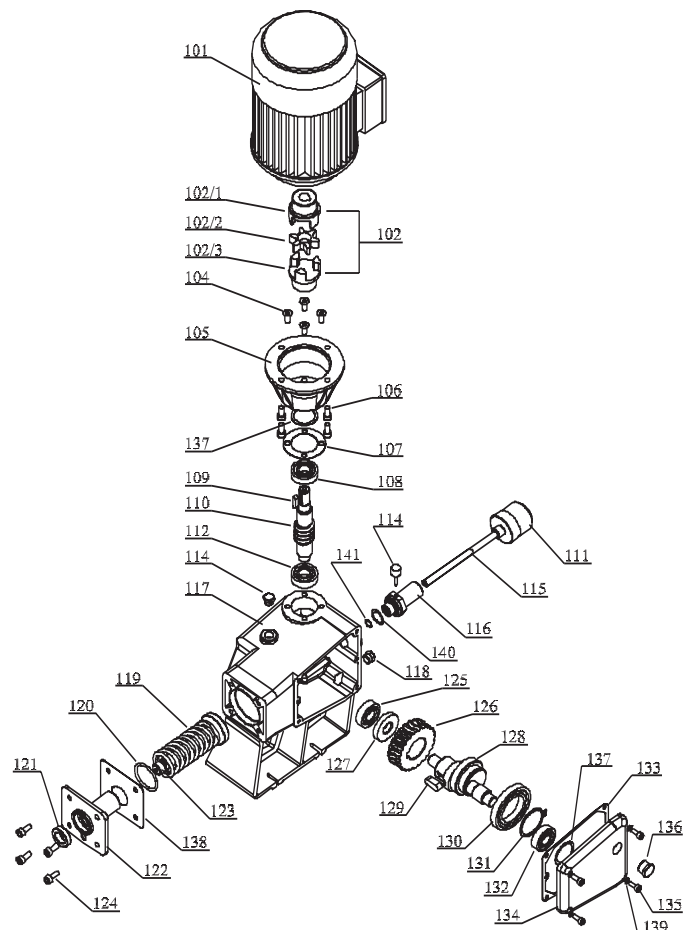
## ACCESSORIES AVAILABLE

FWT also offers as options accessories for good system design to enhance pump performance, such as:

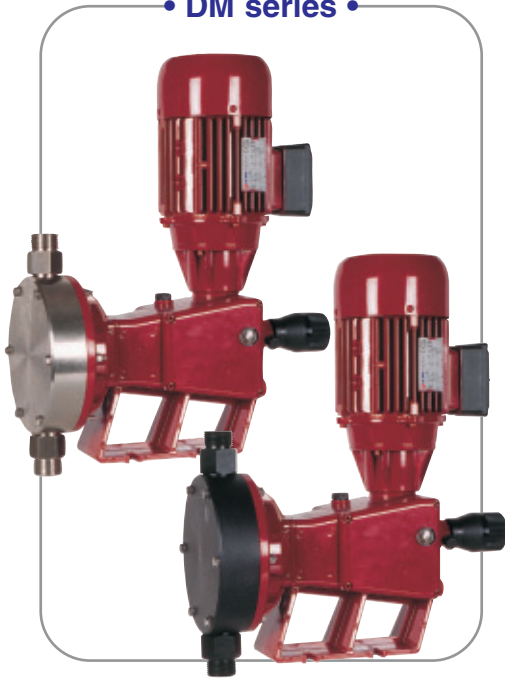
- Relief valves/back pressure valves.
- Safety Valves in AISI (stainless steel) or PVC
- Pulsation Dampeners.
- Injection Valves.
- Foot Valves With Strainers.

## GEAR BOX

Item	DESCRIPTION	Item	DESCRIPTION
101	Motor	119	Push rod spring
102	Motor coupling	120	Push rod support seal
103	Flexible coupling	121	Push rod support oil seal
104	Motor flange screw	122	Lantern head bush
105	Motor flange	123	Push rod
106	Motor screws	124	Lantern head screws
107	Motor flange gasket	125	Shaft ball bearing
108	Worm wheel top bearing	126	Worm gear
109	Key	127	Shim
110	Whorm wheel	128	Eccentric shaft
111	Micrometer screw	129	Key
112	Worm wheel bottom bearing	130	Eccentric shaft ball bearing
113	Oil drain plug	131	Snap ring
114	Adjustment rod grup screw	132	Eccentric shaft ball bearing
115	Adjustment rod	133	Side cover gasket
116	Adjustment rod support	134	Side cover
117	Gear box	135	Side cover screw
118	Oil drain plug	136	Oil level indicator



• **DM series** •



## MAIN FEATURES

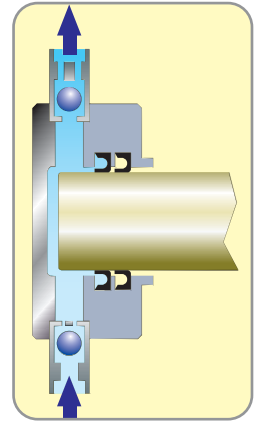
- High precision mechanically-actuated diaphragm pumps.
- High flows.
- Manual piston stroke length adjustment from 0-10mm based on a precise reciprocating movement which provides for exact volumetric displacement for accuracy.
- Different materials available to provide good chemical resistances

### Mechanical diaphragm type pumps are suitable when:

- Zero leakage is essential;
- Pumped liquid is abrasive and contains suspended solids particles.

## PUMP HEAD

- Standard pump head materials are AISI316 and PVC. Other materials are available upon request.
- Check valve assemblies (single or double ball) are design for easy maintenance and access.
- Standard connections are Gas Male/BPSm threads. Flanged connections available as option.



## LIQUID ENDS MATERIALS

Mechanical diaphragm dosing pumps feature two standard liquid end materials:

- **AA CONFIGURATION:** AISI (Stainless Steel) 316 pump head. → **BA CONFIGURATION:** PVC pump head.

Liquid Ends	AA configuration	BA configuration	OTHER MATERIALS AVAILABLE
Pump head	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Ball check	<b>AISI 316</b>	<b>PYREX</b>	PTFE
Valve housing	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Valve seat	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Valve Seals	<b>NBR</b>	<b>VITON®</b>	DUTRAL®
Diaphragm	<b>PTFE/NBR</b>	<b>PTFE/NBR</b>	-----

### USEFUL information selecting of dosing pumps:

Max flow rate, Max working pressure, chemical viscosity, specific gravity (S.G.), temperature, area classification, suspended solids in chemical.

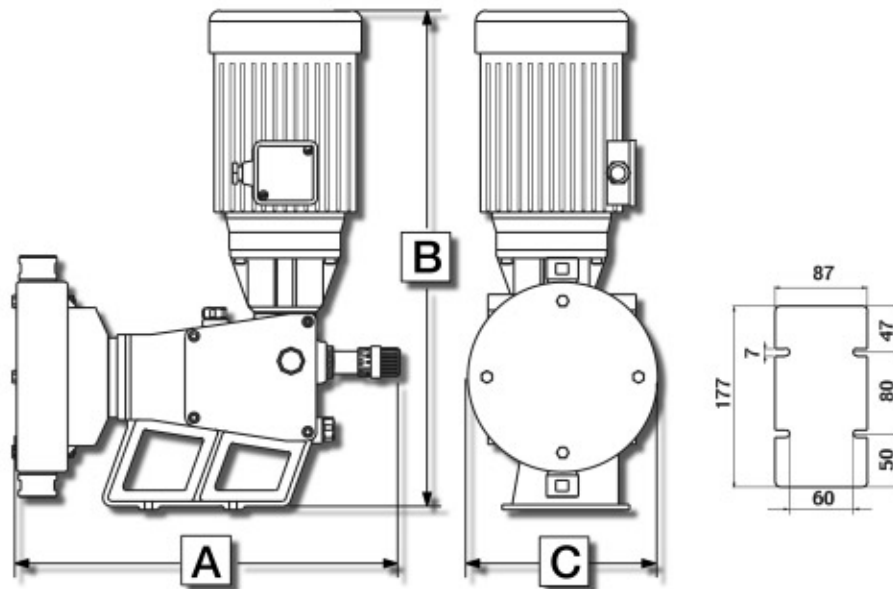
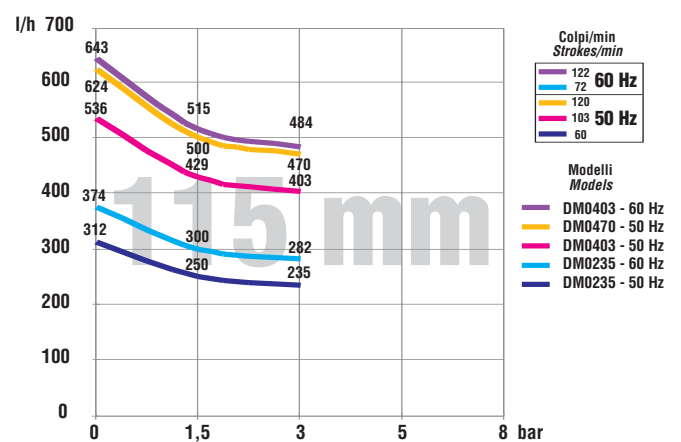
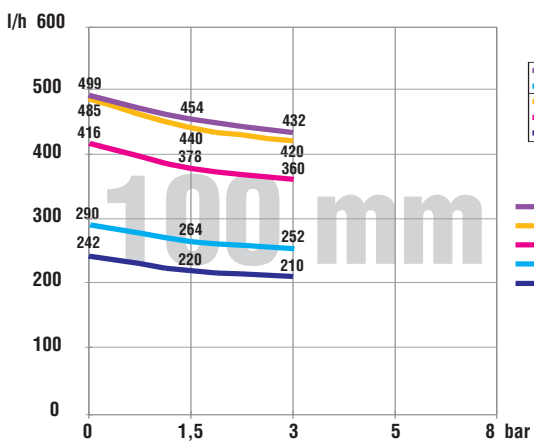
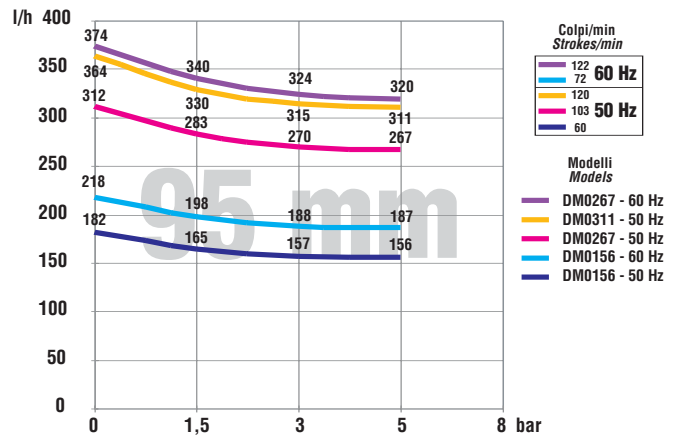
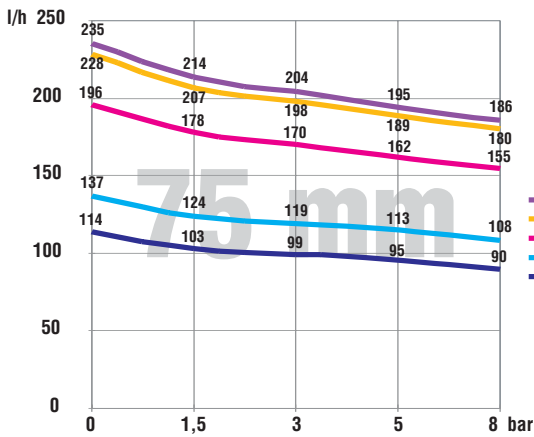
DM SERIES												
Technical characteristics for AA (AISI) and BA (PVC) configuration												
Code	l/h		AISI PVC		kw	Ø Diaphr. mm	Strokes per min.		Strokes lenght mm	Valve type	Connections	<b>IMPORTANT INFORMATION FOR 60 Hz APPLICATIONS</b> Output and stroke/min at 60 Hz ~+ + 20% increase at 60 Hz lower reduction ratio: 60 stroke/min + 20% ~- 72 stroke/min  <b>NOTE: * flow to indicate in the pump code</b> Diaphragm diameter, number of strokes per minute and liquid specification are the parameter needed to select the pump relative flow and pressure requirements.
	50 Hz	60 Hz	bar	psi			50 Hz	60 Hz				
DM0090	90	108	08	116	0,25	75	60	72	10	A <sup>(3)</sup>	3/4" Gm <sup>(1)</sup>	
DM0155	155	186					103	122				
DM0180	180	===					120	===				
DM0156	156	187	05	72	0,25	95	60	72	10	A <sup>(3)</sup>	1" Gm <sup>(1)</sup>	
DM0267	267	320					103	122				
DM0311	311	===					120	===				
DM0210	210	252	03	43	0,25	100	60	72	10	A <sup>(3)</sup>	1" Gm <sup>(1)</sup>	
DM0360	360	432					103	122				
DM0420	420	===					120	===				
DM0235	235	282	03	43	0,25	115	60	72	10	A <sup>(3)</sup>	1" Gm <sup>(1)</sup>	
DM0403	403	484					103	122				
DM0470	470	===					120	===				

• **Gm (1):** Thread gas male BSPm

• **DV(2):** double ball valve • **A(3):** SS 316 single ball valve for AA config. • **P(4):** PVC double ball valve for BA configuration

Motor 0,25 kw, 3 phase or single phase, 1400 ~rpm

**NOTE:** add to the code configuration required, either AA (AISI) or BA (PVC), example: DM0090AA



OVERALL DIMENSIONS (mm)			APROX. NET WEIGHTS (kg)		PACKING WEIGHT (kg)
A	B	C	PVC	AISI	
390÷395	465	170÷195	10÷14	13÷18	2

• **PM series** •



**MAIN FEATURES**

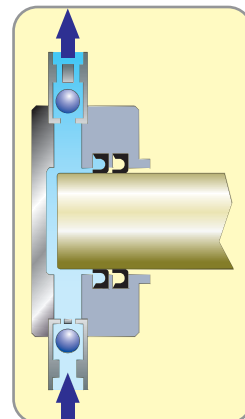
- Piston seals are “lip” type, “V” type in PTFE are also available.
- Jacketed pump heads for either cooling or heating application are available as well as piston glanding arrangements with water washed fitting to continuously flush the piston.

**Piston type dosing pumps are suitable when:**

- High pressure dosing is required;
- Pumped liquid is not abrasive and does not contains suspended solids particles;
- Low stroke pumps especially suitable for dosing high viscosity additives.

**PUMP HEAD**

- Standard pump head materials are SS316 and PVC. Other materials are available upon request.
- Check valve assemblies (single or double ball) are design for easy maintenance and access.
- Standard connections are Gas Male – BPSm threads. Flanged connections available as option.

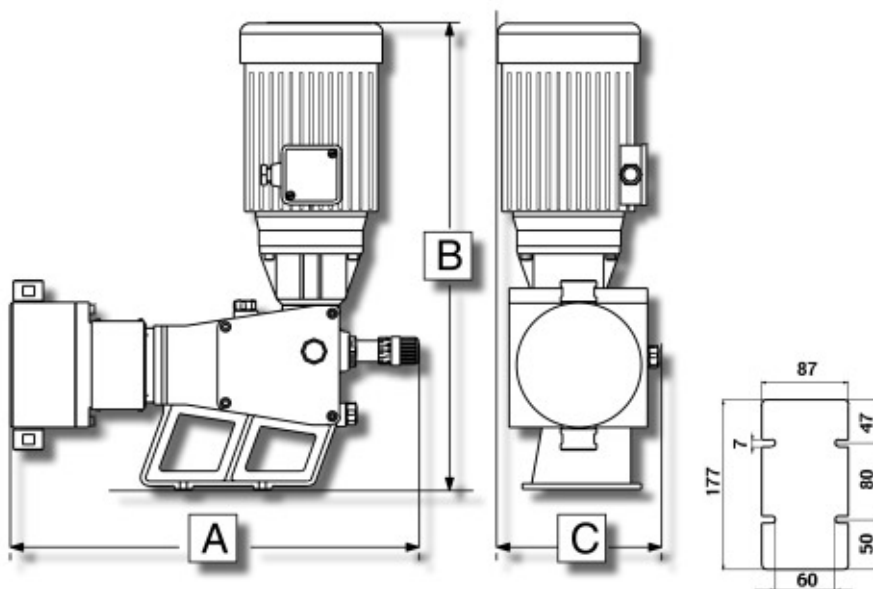


**LIQUID ENDS MATERIALS**

Piston dosing pumps feature two standard wetted-end materials:

→ AA CONFIGURATION: AISI (Stainless Steel) 316 pump head. → BA CONFIGURATION: PVC pump head.

Liquid Ends	AA configuration	BA configuration	OTHER MATERIALS AVAILABLE
Pump head	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Piston	<b>AISI 316</b>	<b>CERAMIC</b>	AISI chrome coat. - AISI 420
Piston gaskets	<b>NBR</b>	<b>VITON®</b>	PTFE-DUTRAL-SILICONE-NBR
Ball check	<b>AISI 316</b>	<b>PYREX</b>	PTFE
Valve housing	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Valve seat	<b>AISI 316</b>	<b>PVC</b>	PP-PTFE-PVDF
Valve seals	<b>NBR</b>	<b>VITON®</b>	DUTRAL®



OVERALL DIMENSIONS (mm)			APROX. NET WEIGHTS (kg)		PACKING WEIGHT (kg)
A	B	C	PVC	AISI	
425÷455	465÷490	167÷200	11÷20	14÷25	2



**USEFUL information selecting of dosing pumps:**

Max flow rate, Max working pressure, chemical viscosity, specific gravity (S.G.), temperature, area classification, suspended solids in chemical.

**IMPORTANT INFORMATION FOR 60 Hz APPLICATIONS**

Output and stroke/min at 60 Hz  $\approx$  + 20% increase  
at 60 Hz lower reduction ratio: 60 stroke/min + 20%  $\approx$  72 stroke/min

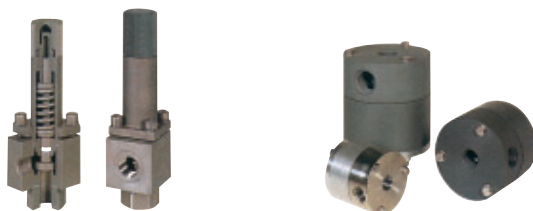
**NOTE: \* flow to indicate in the pump code**

Diaphragm diameter, number of strokes per minute and liquid specification are the parameter needed to select the pump relative flow and pressure requirements.

PM SERIES													
Technical characteristics for AA (AISI) and BA (PVC) configuration													
Code	l/h		AA (AISI)		BA (PVC)		KW	Ø Piston mm	Strokes per min.		Stroke length mm	Valve Type	Connections
	50 Hz	60 Hz	bar	psi	bar	psi			50 Hz	60 Hz			
PM0009	9	11							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0015	15	18	20	290	10	145	0,25	13	103	122	20		
PM0018	18	==							120	==			
PM0014	14	17							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0024	24	29	20	290	10	145	0,25	16	103	122	20		
PM0029	29	==							120	==			
PM0037	37	44							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0064	64	74	20	290	10	145	0,25	26	103	122	20		
PM0073	73	==							120	==			
PM0052	52	62							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0088	88	105	14	203	10	145	0,25	30	103	122	20		
PM0103	103	==							120	==			
PM0089	89	107							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0153	153	182	13	188	10	145	0,25	40	103	122	20		
PM0178	178	==							120	==			
PM0128	128	153							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1/2" Gm <sup>(1)</sup>
PM0220	220	260	8	116	8	116	0,25	48	103	122	20		
PM0256	256	==							120	==			
PM0165	165	198							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1" Gm <sup>(1)</sup>
PM0283	283	336	6	87	6	87	0,25	55	103	122	20		
PM0330	330	==							120	==			
PM0206	206	247							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1" Gm <sup>(1)</sup>
PM0354	354	419	5	72	5	72	0,25	60	103	122	20		
PM0411	411	==							120	==			
PM0251	251	302							60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1" Gm <sup>(1)</sup>
PM0431	431	512	4	58	4	58	0,25	67	103	122	20		
PM0503	503	==							120	==			
PM0504	504	==	8	116	8	116		67	60	72		DV <sup>(2)</sup> A <sup>(3)</sup> P <sup>(4)</sup>	1" Gm <sup>(1)</sup>
PM0770	770	==	6	87	6	87	0,55	83	103	122	20		
PM1027	1027	==	4,5	65	4,5	65		95	120	==			

- **Gm (1):** Thread gas male BSPm
- **DV(2) :** double ball valve
- **A(3) :** SS 316 single ball for AA config.
- **P(4) :** PVC double ball valve for BA config.

**NOTE:** add to the code configuration required, either AA (AISI) or BA (PVC), example: PM0052AA  
Motor 0,25 kw, 3 phase or single phase, 1400 ~rpm



**MOTOR EXTRA CONFIGURATIONS**

Explosion proof protection (0.25 kW)  
 (only 3 phase motor)  
 Tropicalization  
 Additional 3 phases motor power from  
 0.25 kW to 0.37 kW  
 Single phase motor configuration  
 (0.37 kW)  
 Single phase motor configuration  
 (0.55 kW)

**PUMPS SUPPLIED WITHOUT MOTORS  
 SERVOMOTOR**

4 ÷ 20 mA for automatic remote control  
 FREQUENCY INVERTER WITH MOTOR  
 4 - 20 mA input  
 AIR RELIEF or BACK PRESSURE  
 VALVES  
 FOOT VALVES  
 SPRING LOADED INJECTION VALVES

**CONTROLLERS**



**SOLENOID DRIVEN PUMPS**



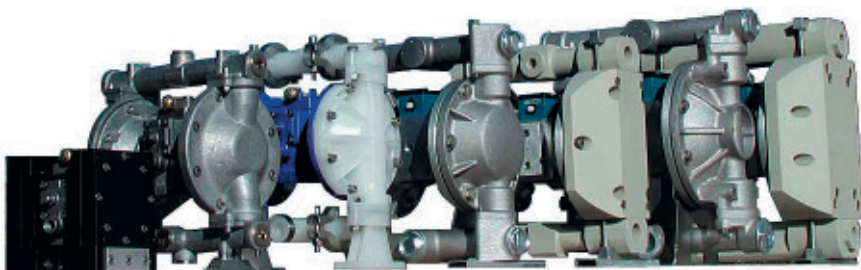
**ACCESSORIES**



**PERISTALTIC PUMPS**



**AIR OPERATED DOUBLE DIAPHRAGM PUMPS**



**CONTIMETRA**  
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# FWMT<sup>®</sup>

fluid and water technology

## MEASURING and CONTROL



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**WELCOME TO FWT MEASURING SYSTEMS**

**FWT (Fluid and Water Technology)** is pleased to introduce its complete range of dosing pumps, controllers and measuring systems of high quality level. Furthermore FWT offers a wide range of accessories and sensors to guarantee a complete service.

**FWT is a new established company formed with specialised experts** with over twenty years of experience in water treatment and liquid handling systems, dosing and measuring systems. We have teamed up to form FWT not only to offer excellent products but also to grant the best service which is the key factor in our market field.

**All products are accompanied by single product Data sheet. If you are interested to receive our complete catalogue and price list, please contact our International sales department.**

**controllers D20 series**

**D20** is a microprocessor based controller series with digital controls and LCD display and cost effective. Whilst, technical characteristics remain exactly the same, **D20** features two enclosure versions: **D20din** for DIN 6 modules mounting and **DR20** for panel mounting. Available on request model DCd20 with plastic enclosures for wall mounting.

**D20din**


Enclosure: **ABS plastic, DIN 6 modules**  
 Wall casing: **Plastic ABS for wall mounting upon request**  
 Dimensions: **106 x 90 x 58 mm**

**DR20**


Enclosure: **Anodised aluminium DIN 437000**  
 Dimensions: **96x96x118 mm**

**TECHNICAL CHARACTERISTICS COMMON TO BOTH VERSIONS**

	<b>CONTROL MODES</b>	
<b>Advanced programming functions:</b>	it allows to program two threshold points to open a working range around setpoint value	
<b>Pulse proportional mode on set point 2:</b>	pulse (timed) proportional output activates a dosing pump with constant mode frequency.	
<b>Proportional output 4÷20 mA:</b>	analog 4÷20 mA output to drive either a chart recorder or dosing pump suitable to accept a mA external signal on set-point 2.	
<b>On-Off via contact free relay output:</b>	Two set points 1 and 2: output will activate a constant / ON-OFF dosing pump with pulse frequency control.	
<b>Response Delay:</b>	It will delay the pump injection for time selectable, thus allowing the right time for the electrode to get polarized. Max 99 seconds.	

	<b>D20 din-PH DR20-PH</b>	<b>D20din-CL DR20-CL</b>	<b>D20 in-RX DR20-RX</b>	<b>D20din - CD DR20-CD</b>		
Resolution:	<b>0÷14.00 pH</b>	<b>0÷10.00 ppm</b>	<b>0÷1999 mV</b>	<b>0÷10.00 mS</b>	<b>0÷1000 uS</b>	<b>0÷100 uS</b>
Hysteresis:	<b>0,01 ph</b>	<b>0,01 ppm</b>	<b>1 mV</b>	<b>10 uS</b>	<b>1 uS</b>	<b>0,1 uS</b>
Input probes:	<b>pH electrode</b>	<b>Amperometric chlorine cell</b>	<b>Rx electrode</b>	<b>CD probe constant K1</b>	<b>CD probe constant K5</b>	<b>CD probe constant K5</b>
Connections:	<b>BNC</b>	<b>wiring clamp</b>	<b>BNC</b>	<b>connections wiring clamp</b>		

Linearity and stability:	<b>0,2%</b>
Power supply:	<b>230 Vac standard; upon request 24 V ~/115V~</b>
Working temperature:	<b>0÷50 °C</b>
Protection rating:	<b>IP54</b>
Front controls panel:	<b>Polycarbonate adhesive</b>

**NOTE:** FWT controllers are **NOT** provided with probes which are available upon request.  
**IMPORTANT:** these units have been designed according FWT probes.  
**FWT declines any responsibility in case the pump is used with other brand probes and sensors.**

**P96** is a high precision microprocessor based controller with digital controls and LCD display. Multifunction programming, high accuracy and reliable measurements, versatile features to control external equipment allow the unit to respond to most of technical requirements. Whilst, technical characteristics remain exactly the same, **P96** features two enclosure versions: **PR96** for DIN panel mounting and **PW96** for wall mounting.

**PR96**



**PW96**



Enclosure: **Anodised aluminium, DIN 437000**  
 Dimensions: **144x72x134 mm**  
 Protection rate: **IP54**

Enclosure: **Plastic ABS**  
 Dimensions: **191,5x176x103 mm**  
 Protection rate: **IP65**

**TECHNICAL CHARACTERISTICS COMMON TO BOTH VERSIONS**

**CONTROL MODES**

**Standard programming functions:**

**Advanced programming functions:**

**Proportional output 4÷20 mA:**

**Proportional output 4÷20 mA:**

**Response Delay:**

Three set-points On/Off with relay output, contact free, will activate a constant / ON-OFF dosing pump with pulse frequency control.  
 it allows to program two threshold points to open a working range around set-point 1 and 2 with Hysteresis regulation. Proportional pulse (timed) proportional output on set-point 3, activates a dosing pump with constant mode frequency.  
 analog 4÷20 mA output to drive a chart recorder  
 analog 4÷20 mA output on set-point 3 to drive dosing pump suitable to accept a mA external signal.  
 It will delay the pump injection for time selectable, thus allowing the right time for the electrode to get polarized. Max 255 seconds

	<b>PR96-PH PW96-PH</b>	<b>PR96-96 CL PW96-CL</b>	<b>PR96 RX PW96-RX</b>	<b>PR96-CD PW96-CD</b>	<b>PR96-CD PW96-CD</b>	<b>PR96-CD PW96-CD</b>	<b>PR96-CD PW96-CD</b>
Resolution:	0÷14.00 pH 0,01 ph	0÷10.00 ppm 0,01 ppm	0÷1999 mV 1 mV	0÷199,9mS 100 uS	0÷19,99mS 10 uS	0÷1999 uS 1 uS	0÷199 uS 0.1 uS
Hysteresis:	± 0,99 pH	± 0,99 ppm	± 100 mV	± 9,9 mS	0,99 mS	99 uS	9,9 uS
Input probes:	pH electrode	Amper. chlorine cell	Rx electrode	probe constant K1	probe constant K1	probe constant K5	probe constant K5
Connections:	BNC	wiring clamp	BNC	wiring clamp			

Linearity and stability:	<b>0,2%</b>
Power supply:	<b>230 Vac standard; upon request 24 V ~/115V~</b>
Working temperature:	<b>0÷50 °C</b>
PR96 Front controls panel:	<b>Polycarbonate adhesive</b>
PW96 Front controls panel:	<b>Transparent clip-on cover/Polycarbonate adhesive</b>

**NOTE:** FWT controllers are **NOT** provided with probes which are available upon request.  
**IMPORTANT:** these units have been designed according FWT probes.  
**FWT declines any responsibility in case the pump is used with other brand probes and sensors.**



**MULTI** is a multifunction measurement and control unit for chemical-physical parameters such as pH, ppm free chlorine, redox and temperature. **MULTI** offers three versions: **MULTI4 PHRXCLT**, **MULTI3 PHRXT**, **MULTI3 PHCLT**.

**MULTI**



Plastic enclosure IP65 for wall mounting installation: dimensions 323x132,5x288,2

**KEY FEATURES**

- Multifunction controller: pH, ppm free chlorine (residual), Redox (ORP), temperature
- Microprocessor and SMD technology
- LCD alpha-numeric back-lit display 2x16
- 5 independent Set-Point with 5 On-Off output contact free (2 for pH, 2 Chlorine, 1 Rx)
- 3 outputs 4-20 mA output for proportional pumps with galvanic isolation
- 3 outputs 4-20 mA for data recorders with galvanic isolation
- Hysteresis setting for On-Off set-points
- Delay setting for each set-point
- Proportional pulse timed output to activate constant mode dosing pump
- High/low alarm setting for each set-point
- Block of relay outputs with proximity switch signal (provided with chlorine cell CLC3)
- Function to control "Shock treatment" via programmable timer (upon request)
- Temperature automatic compensation and reading through temperature probe
- Upon request serial output RS232 for PC remote control

**TECHNICAL CHARACTERISTICS**

	<b>MULTI4 PHRXCLT</b>	<b>MULTI3 PHCL</b>	<b>MULTI3 PHRXT</b>	
Range:	pH 0÷14.00 pH	Free chlorine 0÷10.00 ppm	Rx 0÷1999 mV	Temperature 0÷100 °C
Resolution:	0,01 ph	0,01 ppm	1 mV	0,1 °C
Hysteresis:	0,01 pH	0,01 ppm	1 mV	-
Delay:	99 sec.	99 sec.	99 sec.	-
Calibration:	0,01 pH	0,01 ppm	1 mV	-
Input probes:	pH electrode	amperometric cell	Rx electrode	Temp. probe PST2
Connections:	BNC connector	connections clamp	BNC connector	connections clamp

**Proximity switch** function (provided with chlorine cell CLC3): **it stops all outputs operations in case of no water flow into the cell and/or the system**

Linearity and stability:	<b>0,1%</b>
Power supply:	<b>230 Vac standard; upon request 24 V ~/115V~</b>
Working temperature:	<b>0÷50 °C</b>
Front controls panel:	<b>Polycarbonate adhesive</b>

**NOTE:** FWT controllers are **NOT** provided with probes which are available upon request.

**IMPORTANT:** these units have been designed according FWT probes.

**FWT declines any responsibility in case the pump is used with other brand probes and sensors.**

**EASY** controller series features analog controls and display. **EASY** series is cost effective, easy to program with reliable measurements.

**EASY**



Enclosure / Protection rating:

**ABS plastic / IP65**



Dimensions: **152 x 120 x 138 mm**

**KEY FEATURES**

- **LCD 7-segments**
- **2 independent Set-Point with 2 On-Off output contact free**
- **1 outputs 4-20 mA output for data recorders**
- **Led display status**
- **Analog controls**
- **Plastic enclosure IP65 for wall mounting installation**
- **Temperature manual compensation 0÷100 °C, for pH and CD units**

**CONTROL MODES**

**On-Off via contact free relay output:**

Two set points 1 and 2: output will activate a constant / ON-OFF dosing pump with pulse frequency control.

**Proportional output 4÷20 mA:**

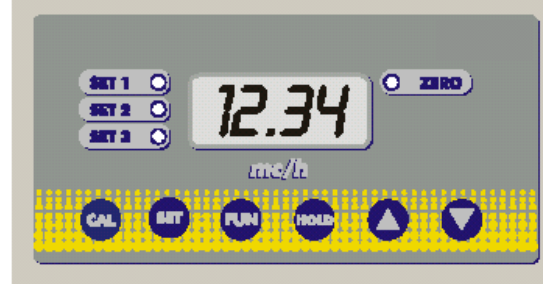
analog 4÷20 mA output to drive either a chart recorder or dosing pump suitable to accept a mA external signal on set-point 2.

	<b>EASY PH</b>	<b>EASY CL</b>	<b>EASY RX</b>	<b>EASY CD</b>	
	<b>0÷14.00 pH</b>	<b>0÷5 ppm</b>	<b>-1400/+1400 mV</b>	<b>0÷20 mS</b>	<b>0÷20000 uS</b>
Resolution:	<b>0,1 ph</b>	<b>0,01 ppm</b>	<b>1 mV</b>	<b>1 mS</b>	<b>10 mS</b>
Input probes:	<b>pH electr.</b>	<b>Chlorine cell</b>	<b>Rx elect.</b>	<b>probe K1</b>	<b>probe K5</b>
Connections:	<b>BNC</b>	<b>wiring clamp</b>	<b>BNC</b>	<b>connections wiring clamp</b>	

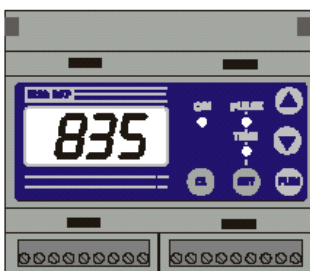
**Linearity and stability:** 0,5%  
**Power supply:** 230 Vac standard; upon request 24 V ~/115V~  
**Working temperature:** 0÷50 °C  
**Front controls panel:** Polycarbonate adhesive

**INSTANT FLOW READERS**

**Instant flow reader P96-MP** and **D20-MP** series expand the work of pulse emitter water meters, allowing to measure the flow rate into a systems and also to drive at the same time constant or proportional dosing pumps or other type of equipments such as solenoid valves or alarms. A key point is that flow reader in conjunction with a water meter replaces, with more features and functions, more expensive equipment. Four versions are available: **PR96** and **DR20** for DIN for panel mounting and **PW96** and **D20C** for wall mounting. Instant flow readers feature the **same technical characteristics** and control modes of P96 and D20 series.



**VOLUMETRIC METERING CONTROLLER**



**Volumetric metering controller P96-VM** and **D20-VM** series works just as a dosing pump for large flow rates and as a totalizer. In conjunction with pulse emitter water meters, the volumetric controller can regulate the exact amount of flow to dispense into a system, tank or basin operating on solenoid valves or dosing pumps and control at the same time alarms output. Four versions are available: **PR96** and **DR20** for DIN for panel mounting and **PW96** and **D20C** for wall mounting. Instant flow readers feature the **same technical characteristics** and control modes of P96 and D20 series.

The **COOL T** is a group of regulation and control equipment that addresses the operation of cooling towers in a practical and economic way. The **COOL T** is capable of:

- automatically monitoring total dissolved solids (through CONDUCTIVITY).
- accurately controls the metering of scale inhibitors and biocide.



**Cool T**  
**CONTROLS DESCRIPTION**

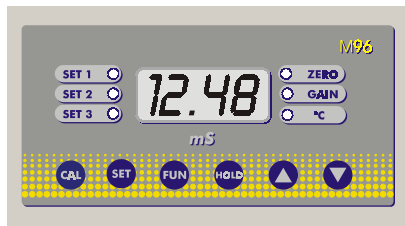
Conductivity meter	Twin channel timer	Biocide dosing pump control
Bleed valve status/manual override		
Inhibitor dosing pump control	Biocide dosing pump	Inhibitor dosing pump

**TECHNICAL CHARACTERISTICS**

Standard power rating: <b>230V/1 phase/ 50-60Hz</b>	Conductivity probe: <b>K=1 (0÷20000 µS) / K=5 (0÷2000 µS)</b>
On request: <b>110 V a.c., 240 V a.c.</b>	Enclosure: <b>ABS with transparent cover</b>
Maximum power consumption: <b>150W</b>	Waterproof protection: <b>IP65</b>
Biocide pump: <b>5 l/h - 5 bar</b>	Dimensions: <b>30 x 30 x 17 cm</b>
Inhibitor pump: <b>10 l/h - 5 bar</b>	Weight: <b>6 kg</b>

**Note:** dosing pumps flow rate performance can reach up to 20 l/h (on request, price accordingly)

**CONDUCTIVITY CONTROL**



Conductivity is monitored by the microprocessor based conductivity meter. The operator sets the conductivity control range by two set points:  
 - set point 1 to the minimum value of conductivity before the alarm is activated.  
 - set point 2 should be adjusted to the maximum conductivity level.

**INHIBITOR DOSING**

CONSTANT/PROPORTIONAL modes dosing pump (standard model is 5 lt/10 bar, other models are available on request) is connected to a water meter monitoring top up water (inhibitor dosing). The inhibitor dosing pump functions selector has two positions  
 • locked: when the timer channel 1 activates the biocide pump, the inhibitor pump is locked off.  
 • unlocked: the inhibitor pump is always active.

**BIOCIDE DOSING**

CONSTANT mode dosing pump (standard model is 5 lt/10 bar, other models are available on request) is controlled by a twin channel timer (daily/weekly).

The twin channel timer has 8 individual settings - daily/weekly: 1 min minimum activation time


**AVAILABLE CONNECTORS AND ACCESSORIES**

- 2 connections for level: biocide/inhibitor).
- 1 output signal 4-20 mA related to conductivity value for track recorder.
- 1 conductivity probe connector.
- 1 temperature compensation probe connector.
- 1 bleed solenoid valve connector.
- 1 pulse water meter connector (inhibitor pump)
- 1 NO/NC contacts to operate alarm for low level.


**Dosing pumps are supplied with standard accessory kit:**

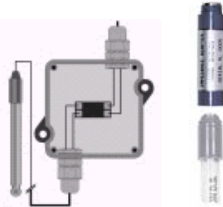
1 Injection No-return sleeve valve; 2 m - Discharge Hose (white); 2 m - Suction Hose PVC flexible (transparent); 1,5 m - Air Bleed Hose PVC flexible (transparent) 1 - Foot Valve/Filter

**Combined pH and Redox electrodes with cables**

	Model	Cable	<ul style="list-style-type: none"> <li>• Combined pH/RX electrodes</li> <li>• Epoxy body</li> <li>• Max pressure 5 bar</li> <li>• Max temperature 70°C</li> <li>• Available on request longer cables to be used with Impedance amplifier unit.</li> </ul>
	<b>EpH 1</b>	1 m	
	<b>EpH 5</b>	5 m	
	<b>EpH 10</b>	10 m	
	<b>ERx 1</b>	1 m	
	<b>ERx 5</b>	5 m	
<b>ERx 10</b>	10 m		


**Combined pH and Redox electrodes without cables**


	Model	<ul style="list-style-type: none"> <li>• DIN Connection</li> <li>• SN6 connector</li> <li>• PG13,5 threading</li> <li>• Combined pH/RX electrodes</li> <li>• Epoxy body</li> <li>• Max pressure 5 bar</li> <li>• Max temperature 70°C</li> </ul>
	<b>EdinpH</b>	
	<b>EdinRx</b>	




Impedance adapter in sealed box for outside installations; it can send the signal up to 100 m distance.

**Amperometric chlorine cells**

	Model	Amperometric system opened cell able to the measure organic and inorganic free chlorine with 0-10 mg/lit reading (ppm).
	<b>CLC1</b>	<ul style="list-style-type: none"> <li>• Self-cleaning cell with glass balls</li> <li>• Range 0÷10 ppm</li> <li>• Max pressure 8 bar</li> <li>• Max temperature 5÷60°C</li> <li>• Flow rate 40-50 l/h</li> </ul>

	Model	Amperometric system opened cell able to the measure organic and inorganic free chlorine with 0-10 mg/lit reading (ppm), with regulation of the water flow in examination, 2 electrodes holders, suitable to host temperature probe and proximity switch.
	<b>CLC3</b>	<ul style="list-style-type: none"> <li>• Self-cleaning cell with glass balls</li> <li>• Range 0÷10 ppm</li> <li>• Flow regulation</li> <li>• 2 electrodes holder, Proximity switch</li> <li>• Max pressure 5 bar - Max temperature 5÷60°C</li> <li>• Flow rate 40-50 l/h</li> </ul>

**Temperature probes with cables**

	Model	Range	Electrodes	Fitting	Connections
	<b>STemp1</b>	0÷100°C	AISI	PTFE	1/2"
	<b>STemp2</b>	0÷100°C	AISI	PVC	1/2"



**Proximity switch**



Model

**SPrex**

- Proximity switch to detect in-coming flow, suitable for amperometric chlorine cell model CLC3

**Conductivity probes with 4 m cables**

Model	Range	Electrodes	Fitting	Connections
<b>Scd K1</b>	0÷20000 uS	AISI	PVC	1/2"
<b>Scd K5</b>	0÷200/0 - 2000 uS	AISI	PVC	1/2"
<b>TGcd K1</b>	0÷20000 uS	GRAPHITE	PVC	1/2"
<b>Tcd K1</b>	0÷20000 uS	AISI	PTFE	1/2"
<b>Tcd K5</b>	0÷200/0 - 2000 uS	AISI	PTFE	1/2"
<b>PCcd K1</b>	0÷20000 uS	AISI	PVC	1/2"
<b>PCcd K5</b>	0÷200/0 - 2000 uS	AISI	PVC	1/2"

**Electrode holders**

Model



**Esub**

Submersible holder, PVC body, length 50 cm

Model



**ECELL**

Off-line holder for 2 electrodes

Model



**ELine**

In-line electrode holder, PP, connection 1/2"

**Buffer solutions**

Model	Description
<b>SPH4</b>	Buffer solution pH 4, bottle of 75 ml
<b>SPH7</b>	Buffer solution pH 7, bottle of 75 ml
<b>SPH9</b>	Buffer solution pH 9, bottle of 75 ml
<b>SRX</b>	Buffer solution 465 mV, bottle of 75 ml
<b>SCD</b>	Buffer solution 1278 uS, bottle of 75 ml

**COMPLETE ASSEMBLED CONTROL PANELS FOR SWIMMING POOL**



**Pool monitors mounted and connected**

Dimension available according to the components size.

Pre-assembled panels: add extra price below to total of components selected

- mm 800 x 600 x 0.8

- mm 500 x 600 x 0,8

Standard power supply 230VAC

TRADE-MARKS ON PANEL CAN BE CUSTOMIZED UPON REQUEST