

ELECTROMAGNETIC FLOWMETER

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We Measure



ELECTROMAGNETIC FLOWMETER

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TECHNICAL SPECIFICATIONS

Measuring Range	0.05 m/s ... 15 m/s
Measurement Field	Conductive Liquids
Body Material	ST37 Black Steel + Corrosion Resistant Paint
Sensor Material	SS316L Ops: SS304, HastelloyC, HastelloyB, Titanium, Tantalum, Platinum
Inner Coating	Teflon (PTFE) or Hard Rubber (Rubber)
Precision	0.5% or 0.25% (Türkak Accredited)
Temperature	-10°C ... +60°C Rubber / -20°C ... + 150°C Teflon
Moisture	%5-%95
Measurable Min.Conductivity	20 μ S / cm Water 5 μ S / cm Other Liquids
Connection	Flange Connection, Ops: Clamb Connection
Pressure	4MPa, 1.6MPa, 1.0MPa
Feed	85-265 VAC 50 Hz or 24VDC, Opt. Battery operated
Ground	Grounding Electrode Included
Exit	Pulse / Frequency / 4-20Ma / RS485 Modbus / 2 X Transistor Alarm (Programmable) / Opt. HART
Indicator	3x16 Backlit LCD Displaying Instant or Total Flow
Alarms	Empty Pipe, Sensor Error, Over Limit
Reporting	Daily, Weekly, Monthly and Annual total flow (negative / positive / net)
Sampling Rate	It can be selected from 0.2sec to 100 seconds.



Turkak Accredited
Calibration Opportunity

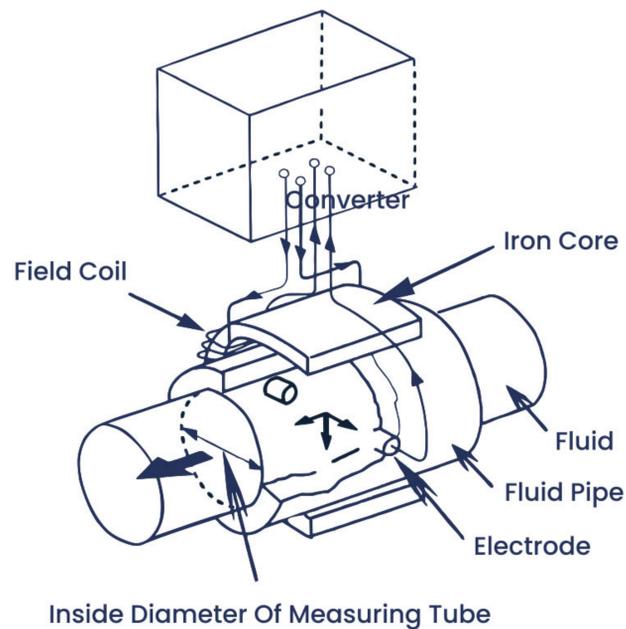


Ip68 Metal Record
Conforms to ISO Standards

ELECTROMAGNETIC FLOWMETER

$$E = D \cdot V \cdot B$$

- E** E: Induced electromotive force
- D** D: Inner diameter of measuring tube
- V** V: Flow velocity
- B** B: Magnetic flux density



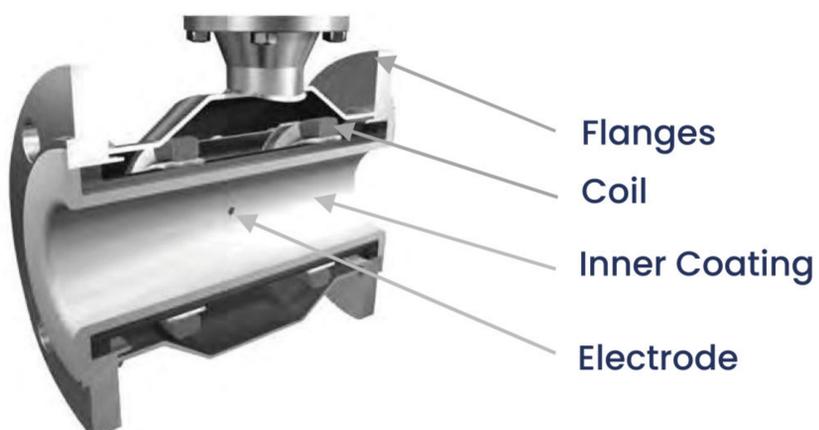
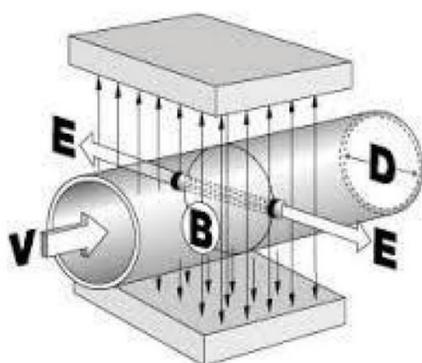
Electromagnetic flowmeters work according to Faraday's Induction Law. An electrically conductive fluid passes through the magnetic field in an electrically isolated pipe. A pair of coils is used to generate the magnetic field and electric current is passed through these coils. A voltage proportional to the flow rate of the liquid is generated between the electrodes.

The resulting voltage (v) varies depending on the flow rate (Q), the

geometric correction factor (k), also known as the body coefficient, the magnetic field size (B) and the flowmeter inside diameter (D).

Magnetic field, inner diameter and body coefficient are constant values.

As a result; $Q = v \cdot (k \cdot D \cdot B) = v \cdot K$ there is a linear relationship between the flow rate and the generated voltage. The voltage signals sensed with the electrodes are processed by a signal converter.



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ENELSAN ETRANS-M ELECTROMAGNETIC INDUCTIVE FLOWMETER

- ▶ Measuring stability and low energy consumption with programmable low frequency square wave magnetic field stimulation.
- ▶ High integration and accuracy management with the use of 16-bit microprocessors.
- ▶ High resistance to noise and reliable measurement by digital processing.
- ▶ Low EMI switching power supply with wide supply voltage range, high efficiency and low temperature rise.
- ▶ User-friendly operating frontend.
- ▶ High-resolution backlit LCD display operating between -20 to +80 °C.
- ▶ Straight and reverse direction (back) flow readability.
- ▶ Design for counting and invoicing (billing) with three independent digit totalizers (straight, reverse and net flat totals).
- ▶ Support up to 2 km distance with 14400 bps communication.
- ▶ Eliminating the sharp electrical noise in the flow signal and ensuring stability in indicators and outputs by using "change rate limiting technology".
- ▶ Keeping calibration, synchronization or filling processes under control by enabling totalizer starting and stopping function by a remote alarm contact.
- ▶ Self-examination function.
- ▶ Compact or remote (wall-mount type) design selection.
- ▶ IP68 protection class for piping and electronics.
- ▶ IP67 protection class for converter (transmitter) unit.
- ▶ Programming language for both English and Turkish.



WHAT DO WE PROVIDE WITH DOMESTIC PRODUCTION IN ELECTROMAGNETIC FLOWMETER?

- ▶ Measurement stability has been significantly increased.
- ▶ The measurement response rate is greatly increased, even with low conductivity and high density.
- ▶ Electrode material safety has been increased to the highest level.
- ▶ Lead times have been decreased with the DN15-DN2200 production facility.
- ▶ LCD display resolution has been increased.
- ▶ Product electronics has been revised to make it better, more stable, more robust.
- ▶ Technical support capacity has been increased and failure support and resolution times have been shortened.
- ▶ With our new calibration facility, TURKAK accredited services have been provided on a wide scale from DN15 to DN2200.



SOME CRITERIA FOR CONFIGURATION

Diameter Determination: The optimum operating flow range of the device is 1-3 m/s. The maximum measuring flow range is ± 12 m/s. If a new line will be installed, the flow meter selection rules are;

Optimum flow-diameter correlation $\Rightarrow 2,825 \times 10^{-3} \times D^2 < Q < 8,475 \times 10^{-3} \times D^2$

Maximum flowrate vs diameter correlation $\Rightarrow 0,0339 \times D^2 < Q_{\max}$

D: Inner Diameter (mm) Q_{\max} : Maximum Flow (m³/h)

Liner Material: The inner coating is selected according to the process temperature, process and fluid type. Teflon liner should be preferred for hygienic applications. Teflon has high resistance to chemical content and temperature up to 180 ° C. Thanks to this feature, CIP/SIP (“on-site cleaning and sterilization applications”) can be used safely. For processes with a maximum process temperature of 80 ° C, hard rubber coating can be preferred.

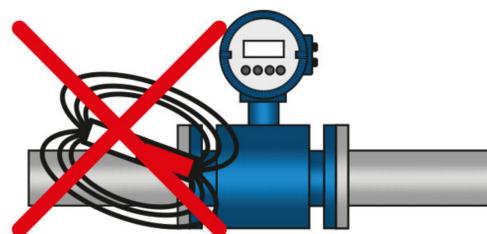
Electrode Selection: Stainless steel electrodes are used in water and domestic wastewater applications. Select the appropriate electrode according to the properties of the fluid.

Pressure Class: The pressure class of the device is determined by the maximum process pressure. The process pressure should be specified when the device is ordered.

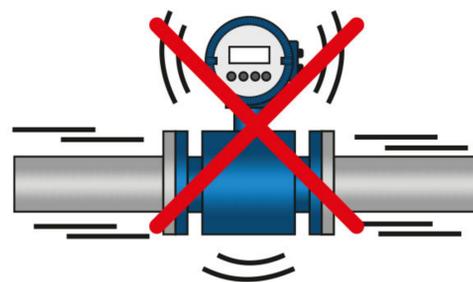
Design: The signal transducer of the device, the monitor can be (compact) or remote display. If flow rate info will be controlled on screen or the device is not easily accessible, remote model should be preferred. Preferring a remote model at higher environmental temperatures will be a better choice to protect the signal converter. It is important to consider that the compact model will be more economical while deciding on model.

Connection Type: Standard connection is flanged type. It is possible to use flanges in accordance with DIN, ANSI and JIS standards. However, in some processes including food and pharmaceutical industry, clamp or sleeve connection is much more preferable.

Power Supply: The power supply of the flowmeter can be selected as 85-265 V AC, 16-30 V DC, by default. In addition, solar panel integration is possible in areas away from the power grid or in ecological applications.



Avoid Magnetic Field



Avoid Vibration

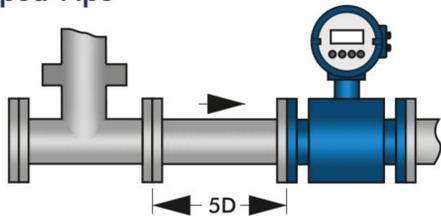
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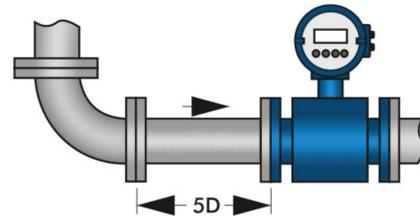


INSTALLATION RULES

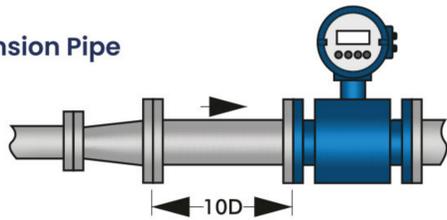
T Shaped Pipe



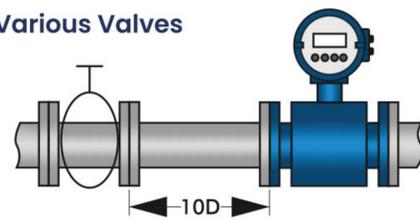
90° Elbow



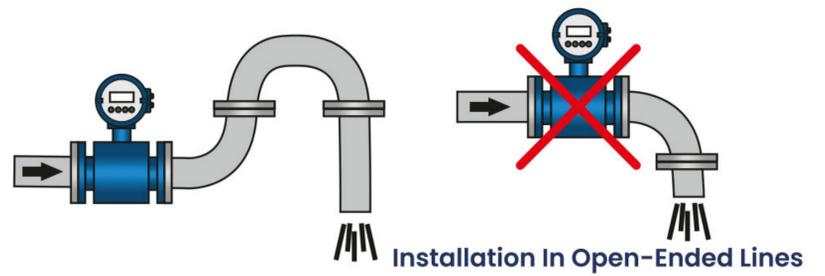
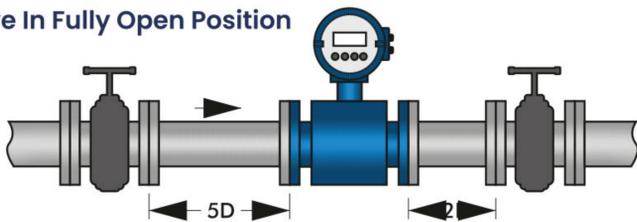
Expansion Pipe



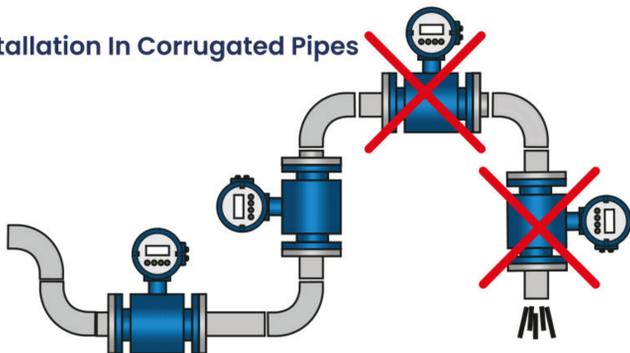
Various Valves



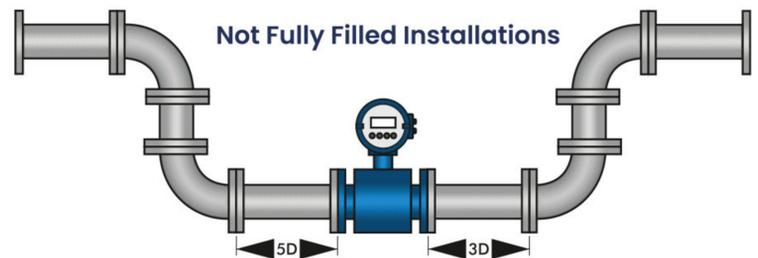
Valve In Fully Open Position



Installation In Corrugated Pipes



Not Fully Filled Installations



ELECTROMAGNETIC FLOWMETER SELECTION CODE TABLE

	Product Type	ETRANS-M	Electromagnetic Flowmeter
	Diameter	xxx	E.G 100 = Dn100
	Indicator Type	-	Compact Type
		SPRT	Remote Type
	Electrode Selection	-	SS316L
		PT	Platinum
		HB	Hastelloy B
		TA	Tantalum
		HC	Hastelloy C
		Ti	Titanium
	Inner Coating	PTFE	Teflon
		Rubber	Hard Rubber / Ebonite
	Pressure Class	-	Standard (According to the values in the pressure flow chart.)
		Pn10	10 Bar
		Pn16	16 Bar
		Pn25	25 Bar
		Pn40	40 Bar
		Pn100	100 Bar
	Protection Class	-	IP67 Compact Type
		-	IP68 Remote Type
	Supply	24VDC	24V DC Supply
		-	220V AC Supply
	Optional Outlet	HART	HART Exit

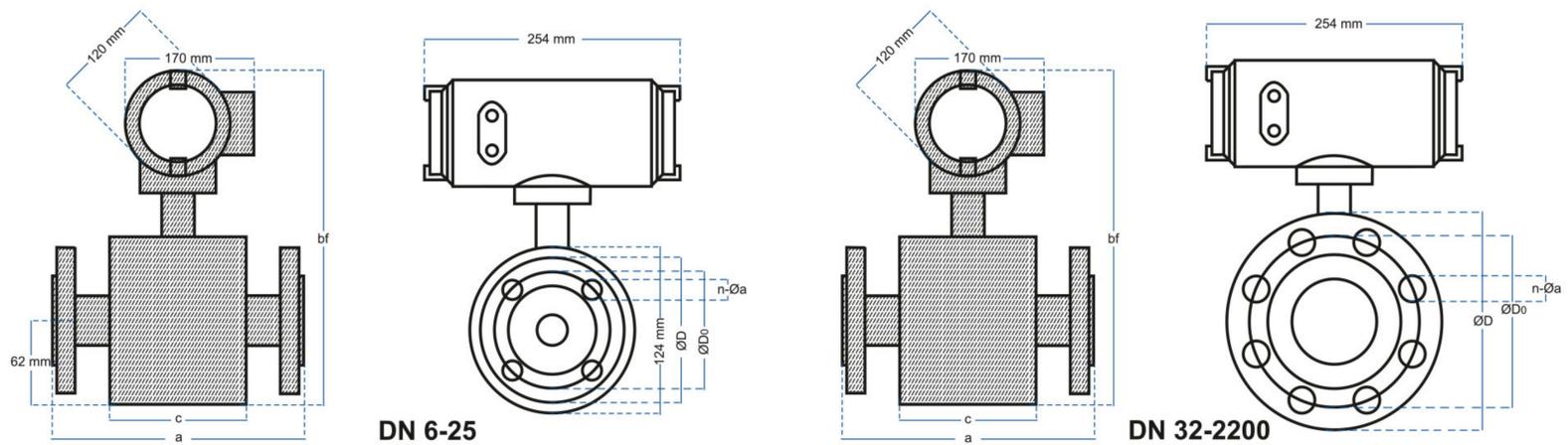
SAMPLE CODE:	ETRANS-M	100	SPRT	HC	PTFE	P40	Ip68	24VDC	HART

Fill in the option table above according to the requested product type.

► Optional Features Selected product. / ETRANS-M-100 PTFE (Standard Product)

ELECTROMAGNETIC FLOWMETER

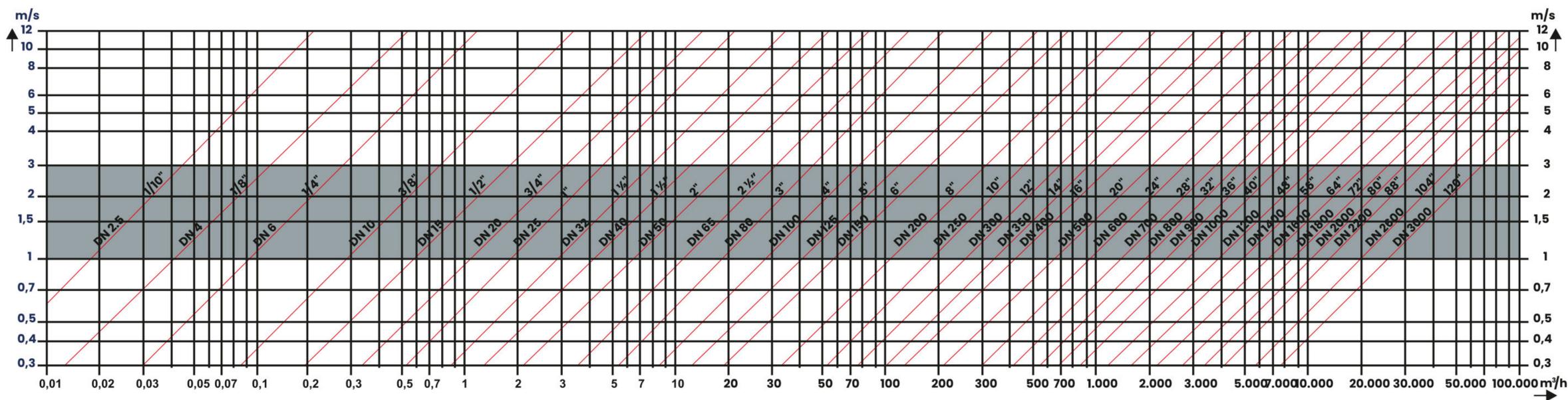
ELECTROMAGNETIC FLOWMETER



CONNECTION DIMENSIONS

DN (mm)	Pressure Class	Device Outer Diameters			Flange Connection Dimensions		
		a	bf	c	D	D0	n x a
10	4.0MPa (40Bar)	150	322	82	90	60	4-Ø14
15		150	322	82	95	65	4-Ø14
20		150	322	78	105	75	4-Ø14
25		150	312	78	115	85	4-Ø14
32		150	327	74	135	100	4-Ø18
40		150	335	74	145	110	4-Ø18
50		200	354	86	160	125	4-Ø18
65		200	366	92	180	145	8-Ø18
80		200	385	92	195	160	8-Ø18
100	1.6MPa (16Bar)	250	406	114	215	180	8-Ø18
125		250	436	114	245	210	8-Ø18
150		300	465	136	280	240	8-Ø23
200	1.0MPa (10Bar)	350	518	156	335	295	8-Ø23
250		400	570	202	390	350	12-Ø23
300		500	620	230	440	400	12-Ø23
350		500	675	278	500	460	16-Ø23
400		600	733	320	565	515	16-Ø25
450		600	782	374	615	565	20-Ø25
500		600	835	388	670	620	20-Ø25
600		600	940	408	780	725	20-Ø30
700		700	1048	520	895	840	24-Ø30
800		800	1160	580	1010	950	24-Ø34
900	900	1260	660	1110	1050	28-Ø34	
1000	1000	1370	720	1220	1160	28-Ø34	
1200	0.6MPa (6Bar)	1200	1585	1130	1405	1340	32-Ø34
1400		1400	1810	1260	1630	1560	36-Ø36
1600		1600	2040	1450	1830	1760	40-Ø36
1800		1800	2250	1640	2045	1970	44-Ø39
2000		2000	2460	1820	2265	2180	48-Ø42
2200		2200	2670	1990	2510	2390	52-Ø45

FLOW / DIA / SPEED CHART



- 1-According to the flow rate information, which diameter products are suitable can be selected.
- 2-According to the speed information, which diameter products are suitable can be selected.
- 3-Flow measurement range can be selected according to the diameter information.
- 4-1-3 m/sec should be considered as the most stable range for measurement.

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INDUSTRIES & APPLICATIONS

Usage areas :

- Water and Wastewater Industry
- Food and Beverage Industry
- Pharmaceutical and Cosmetic Industry
- Chemical Industry
- Paper Industry
- Mining and Energy Industry
- Agriculture
- Machinery Manufacturing Industry
- Mining Industry
- Energy Industry
- Oil Industry

Use Fluids:

- Clean Water / Wastewater
- Industrial Water
- Raw well water
- Urban sewage
- Low corrosive acid, alkali, base, salt solutions
- Organic liquid mixtures
- Paper Pulp
- Liquid mixtures containing solid particles (with conductivity)

Apps:

- Treatment Plants applications
- Wastewater calculation applications
- Clean Water distribution applications
- Sludge measurement applications
- Drinking water calculation applications
- Line leakage and costing applications
- Agriculture and irrigation applications
- Drinking Water filling applications

