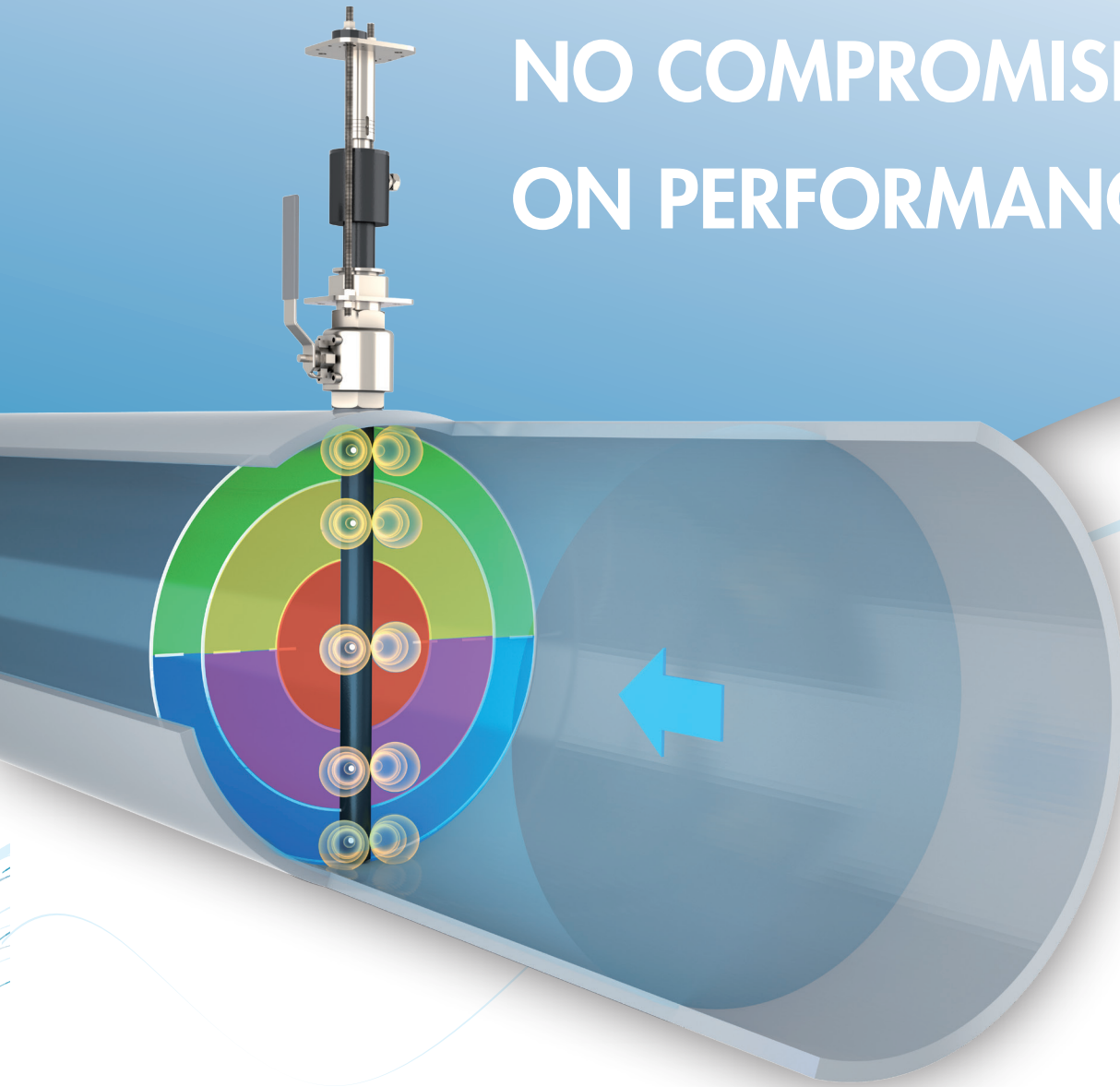


TORPEE-MAG

FULL PIPE ELECTROMAGNETIC AVERAGING INSERTION FLOW
METER

NO COMPROMISE
ON PERFORMANCE !



FLOW-TRONIC

TORPEE-MAG

FULL PIPE ELECTROMAGNETIC AVERAGING INSERTION
FLOW METER

How does it work?

The TORPEE-MAG is a hot tap full profile electromagnetic **insertion flow meter**. The measurement method is based on Faraday's Law of Electromagnetic Induction: when a conductive liquid moves through a magnetic field, it produces a voltage. The voltage is directly proportional to the velocity of the conductive medium.

The TORPEE-MAG has multiple electrode pairs placed along the axis of the sensor at **equal area** of the pipe. The velocity measurements are averaged together providing the average velocity across the pipe. Flow is calculated by multiplying the average velocity by the cross-sectional area of the pipe.

The specific design of the multi-electrode sensor compensates for **variable flow profiles**, including swirl and turbulent conditions achieving a much higher precision than single-point flowmeters.

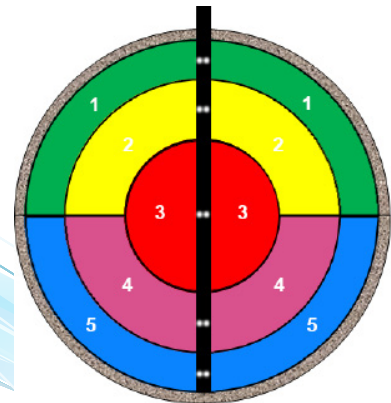
The TORPEE-MAG can be installed **without shutting down**, emptying or cutting the pipe (hot tap installation). It does not require welding flanges and installation can be done in pressurized pipelines up to 17 bar (245 PSI). **Cost of installation is largely reduced** by eliminating the need for heavy equipment (cranes, etc.) or extensive manpower. The TORPEE-MAG is the most economical flow metering solution for medium and large pipe sensor sizes.

The TORPEE-MAG fits in confined spaces, can be submerged and offers complete accessibility. It can be removed from pipes under pressure for **easy inspection, cleaning, calibration or verification** and reinstalled without process interruption. It is particularly cost-effective for retrofit applications.

The maximum number of coils and electrodes will depend on the pipe inside diameter: the bigger the pipe diameter, the more electrodes will be placed along the sensor.



Electrodes repartition on equal areas



(Area 1 = 2 = 3 = 4 = 5)



Technical specifications

TORPEE-MAG 1", 1.5" or 2" and converter

General

Size	1" from DN90 to DN325 (from 3.54" to 12.82") (inner Ø) – 2 to 5 electrodes 1.5" from DN100 to DN1525 (from 3.94" to 60.04") (inner Ø) – 2 to 5 electrodes 2" from DN500 to DN2500 (from 38.42" to 100.40") (inner Ø) – 5 to 7 electrodes
Weight	Depending on size of sensor
Materials	Robust sensor body: 316 stainless steel, fiberglass derivate, carbon, NSF-61, ACS certified epoxy coating available as an option Insertion hardware: 316 stainless steel Compression seal: EPDM Sensor electrodes: graphite
Cable lengths	Available from 10 m to 200 m (33 to 656 ft)
Protection	IP68/NEMA 6P (sensor is submersible)
Certifications	CE, BS 6920
Process connection	Min. 27 mm clear diameter for 1" TORPEE-MAG Min. 36 mm clear diameter for 1.5" TORPEE-MAG Min. 48 mm clear diameter for 2" TORPEE-MAG
Sensor length	Depending on inner pipe Ø and connection accessories
Connection to sensor	Separate (converter connected with cable to sensor)
Calibration	Calibration ISO 17025 or COFRAC traceable
Warranty	2 years

Velocity Measurement

Method	Electromagnetic
Range	0 m/s to 6 m/s (0 to +19.68 ft/s) (bidirectional) (max. velocity possible depending from pipe Ø and sensor type)
Accuracy	±0.5% of reading value from 0.25 to 6 m/s (0.82 to 19.68 ft/s) ± zero stability ±0.8% of reading value from 0.02 to 0.25 m/s (0.06 to 0.82 ft/s) ± zero stability
Zero stability	±1 mm/s (0.003 ft/s)
Repeatability	0.2% of reading value
Linearity	0.2% of reading value

Operating conditions

Fluid	Drinking water or raw water
Min. conductivity	5 µmho/cm
Flow direction	Forward flow and bidirectional as an option
Operating pressure	Max. 17 bar (245 PSI) with option for high pressure 30 bar (425 PSI)
Fluid temperature limits	-10°C (not freezing) to +60°C (14°F to 140°F) at 17 bar (245 PSI)

Converter information

Mounting	Separate
Protection	IP67/NEMA 6 or IP68 (optional)
Display	White on blue backlit LCD 128 x 64 pixels 2 programmable displays: Real-time display: indicates flow & velocity; Totalizer display: user selectable units
Outputs	2x 4-20 mA: galvanically isolated Pulse/Alarm: Two programmable functions (pulses/alarms) Pulse output for flow rate or external totalizer Alarm output for forward or backward flow detection, min./max. flow Outputs are isolated and protected transistor switch capable of sinking < 250 mA at < 35 V
Communication	Modbus protocol over RS485 interface or HART protocol (optional)
Power supply	AC: 90 to 265 VAC at 45-66 Hz (20W/25VA) or DC: 12 to 48 VDC or alkaline batteries

Applications

Municipal Water

- Raw water intake
- Plant process
 - Chemical Pacing
 - Filter Balancing
 - Plant Balancing
 - Backwashing
- Plant process
 - Billing
 - Storage Management
 - Pump Station Management
- Water Loss Management
 - District Metering
 - Minimum Night Flow Monitoring
 - PRV flow based modulation

Retrofit Applications

- Replacement of unsatisfactory flow meters such as pitot tube, propeller, single point velocity meter, differential pressure meter, full bore mag meters...

Industrial Applications

- Cooling/chilled Water
- Power Plants

Other Applications

- Raw river
- Non-ragging effluent
- Large diameter pipework



Main benefits

- Cost effective due to reduced costs of installation
- Accurate
- Easy to install
- Robust construction (no moving parts, carbon fiber reinforced body)
- No site calibration needed (compared to Single Point Insertion flow meters where a calibration is needed)
- No flow interruption
- Accurate at low flow rates
- Insertion and removal under pressure (hot tapping)
- Ideal solution for retrofit applications



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