

# TORPEE-MAG

## Full Pipe Electromagnetic Averaging Insertion Flow Meter



The TORPEE-MAG is a hot tap full profile electromagnetic averaging insertion flow meter. Multiple electrodes placed across the entire sensor body at **equal area**, measure and report the average flow rate over the full diameter of pipe. The specific design of the multi-electrode sensor compensates for variable flow profiles, including swirl and turbulent condition. The combination of the TORPEE-MAG and the TMC-20 stationary converter (with its two 4-20 mA outputs and its two contact closure outputs) creates a powerful full pipe flow meter and data reporting system.

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.

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, reducing drastically installation costs.

The TORPEE-MAG fits in confined spaces, can be submerged and offers complete accessibility. It can be removed in pipes under pressure for easy inspection, cleaning, calibration or verification. It is particularly cost-effective for retrofit applications.

The TORPEE-MAG comes in 2 different sizes in order to be used with 1.5" or 2" ball valves. The 1.5" TORPEE-MAG is available for pipe sizes ranging from DN100 up to DN1500. The 2" TORPEE-MAG is available for pipe sizes ranging from DN1000 up to DN2500. For larger pipe sizes, please contact FLOW-TRONIC.

## Technical Specifications

### TORPEE-MAG Sensor

#### Velocity Measurement

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

#### Application

TORPEE-MAG 1.5" From DN100 to DN1525 (inner  $\varnothing$ )  
TORPEE-MAG 2" From DN1000 to DN2500 (inner  $\varnothing$ )

#### Materials

Sensor body	316 stainless steel, fiberglass derivate, carbon
Insertion hardware	316 stainless steel
Compression seal	Silicone rubber (EPDM)
Sensor electrodes	Graphite

#### Operating conditions

Fluid	Drinking water or raw water
Min. conductivity	5 $\mu\text{mho/cm}$ (12.7 $\mu\text{mho/in}$ )
Flow direction	Forward flow (backward flow detection possible)
Operating press.	Max. 17 bar
Operating temp.	-20°C to +70°C (-4°F to +158°F)
Fluid temp. limits	-10°C (not freezing) to +60°C at 17 bar (14°F to 140°F)
Protection rate	IP68 (sensor is submersible)

#### Certifications

CE, BS 6920

#### Options & accessories

Pressure Quick Connect  
NSF61 certified layer  
Installation tool for insertion and retrieval of TORPEE-MAG sensor  
Caliper to measure the internal pipe size



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## Installation pictures



## Technical Specifications

### **TMC-20 Converter**

#### **Enclosure**

Material	Black painted aluminum die casting
Protection rate	IP67
Dimensions	167 x 114 x 200 mm (W x D x H) (6.57" x 4.48" x 7.87")
Weight	2.3 kg (4.4 lb)

#### **General Attributes**

Programming	USB port for connection to PC
Serial interface	Modbus over RS485 or Hart (opt.)
Display	Graphic display 128x64 pixels back light, 3 programming keys
Data logger	MicroSD Memory Card 4 to 32 Gb
Data storage	Values storing system in case of power failure
Full scale value	$\pm 0$ to 10 m/s ( $\pm 0$ ft to 32.8 ft/s)
Galvanic isolation	All the inputs/outputs are galvanically isolated from power supply up to 250 V
Bidirectional	YES
Diagnostic function	YES
Empty pipe detection	YES
CE certification	YES

#### **Outputs/Inputs**

Pulse/Alarm output	2 digital outputs, 1250Hz, 100mA, 30Vdc
Analog output	2 Analog outputs 0/4 to 20/22 mA
Digital input	1 programmable function (totalizer reset)
Serial output	Modbus RTU or HART protocol (optional)

#### **Measurements Tolerance**

Flow rate (volume)	$\pm 0.05\%$ r.v.
Out 4-20 mA	$\pm 0.08\%$ r.v.
Frequency out	$\pm 0.08\%$ r.v.

#### **Power Supply**

AC	100 to 240 VAC at 44/66 Hz
DC	12 to 48 VDC

AC or DC must be specified at order

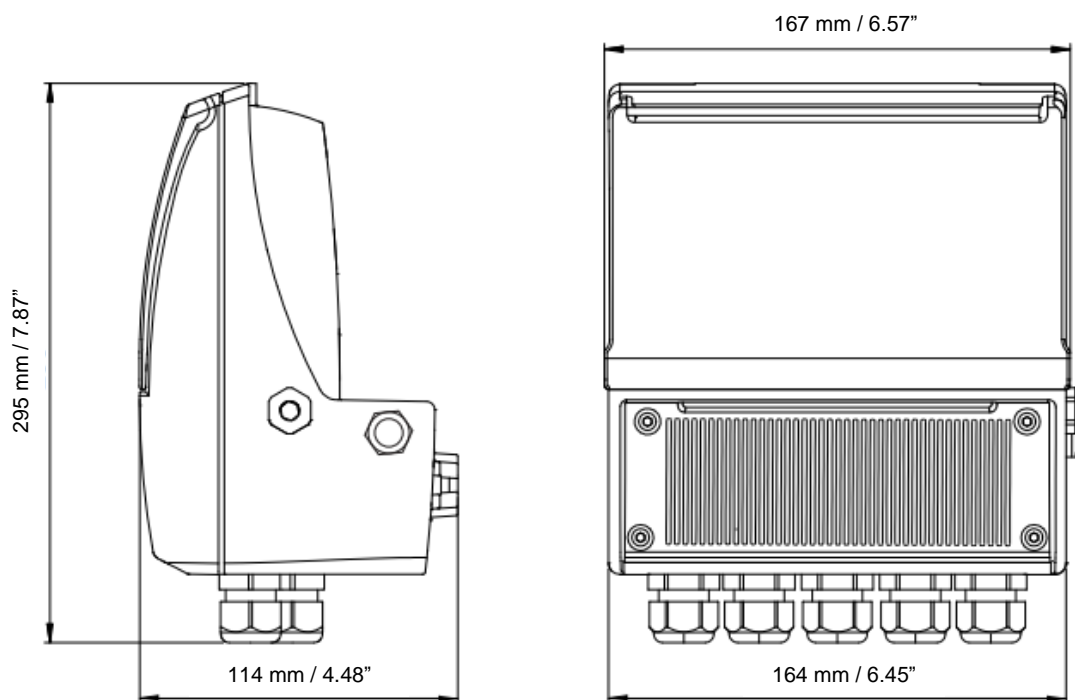
#### **Ambient Conditions**

Operating temp.	-20°C to +60°C (-4°F to +140°F)
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Specifications are subject to change without notice  
Updated: October 2020

Dimensions of the TMC-20 Converter:

**COMPACT VERSION**



**SEPARATE (WALL) VERSION**

