

Direct Reading Electromagnetic Current Meters

Model 802



FEATURES

- High Accuracy
- High Stability
- Low Noise
- Low Power Consumption
- Choice of Sensor Shapes
- Choice of Configurations
- Digital or Analogue Output
- Wide Measurement Range
- Corrosion resistant materials

APPLICATIONS

- Sediment Transport Studies
- Hydraulic Modelling
- Open Channel Current Measurement
- Ship's Log
- ROV/AUV Speed
- Fixed Site Current Measurement

INTRODUCTION

The Model 802 is the latest version of Valeport's successful 800 Series of electromagnetic current meters. Using state of the art electronics design techniques, we have produced a highly accurate, stable, solid state instrument that is greatly reduced in size and power consumption from earlier versions. These improvements, together with a selection of sensor shapes and a versatile range of electronics packages ensure that the Model 802 is the instrument of choice in a variety of applications, from sediment transport studies to modelling flow patterns or real time monitoring of current flow.

Output from the Model 802 is strictly in the format of X and Y velocity components only. If a compass or other additional parameters are required, please refer to the Model 808 data sheet.

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DESCRIPTION

Electromagnetic Current Meters work on Faraday's principle that a conductor (water in this case) moving through a magnetic field (produced by the sensor) generates a voltage (measured by a pair of electrodes). By having 2 orthogonally positioned electrodes, 2 axis flow can be measured by a single sensor.

Each Model 802 system comprises a sensing head, and a set of electronics to produce the magnetic field and measure the resultant voltage. Valeport offers a range of different sensing heads and electronics assemblies to suit different applications. Any of the listed sensors may be fitted to any of the electronics packages to provide a Model 802 system. The standard output of all systems is RS232 of X and Y components of the flow speed, relative to the mounting position of the head. 2 channel analogue outputs are also available as an option.

Heads

Annular Sensor: The 17cm annular sensor measures flow in the open space inside the ring, and therefore has excellent response to off axis flow. It is therefore most suitable for use in applications where off axis flow is expected, or for use in pairs to measure 3 dimensional changes.

Spherical Sensor: Available in either 3.2cm or 5.5cm sizes, the spherical sensors have

reasonable response to tilt and azimuth flow variations, but are hydrodynamically noisier than the other sensors. Spatial resolution requirements determine the choice of sensor size.

Discus Sensor: The discus sensor is available in 3 sizes: 3.2cm, 5.5cm and 11cm diameter. Since the flow is measured on one face of the discus, tilt response is as good as the other sensors, but azimuth response is excellent, with low hydrodynamic noise. These sensors are therefore suited to any applications where two dimensional flow is expected. Again, choice of sensor size depends on spatial resolution required.

Electronics

Control Display Unit: This package consists of an IP67 (10secs at 0.3m) display unit, and 3m signal cable to the sensor of choice. The display has an integral battery compartment making it ideal for field use, or can be powered using external DC for laboratory applications. Features of the display include real time and averaged X & Y velocities and Standard Deviation of X & Y velocities. The user may choose the type of sampling required – fixed time, moving average, or free running, and the length of the average. In addition, the control unit has an optional internal memory,

which can hold up to 999 records of the above information, together with date and time stamp. Recorded data can be viewed on screen or downloaded to PC in ASCII text format.

Integral Underwater Housing: Driving electronics and preamplifiers are contained in a stainless steel underwater housing, with the chosen sensor mounted on a stem protruding from one end. A single connector allows power in (12 to 24vDC) and RS232 signal out at 1Hz update rate. Output signal is in the format X=sn.nnn Y=sn.nnn<cr><lf>, where s indicates the flow direction + or -, and n.nnn signifies the flow speed in m/s. 0-5v analogue output option is available for X & Y channels

Remote Underwater Housing: Exactly as Integral Underwater System, but flow sensor is supplied on a 3m length of signal cable, rather than attached to the electronics housing.

OEM Package: Driving electronics are supplied as OEM parts, for interface to customers' existing systems. Electronics require power in (12 to 24vDC) and give RS232 digital signal out. Sensor is supplied on 3m signal cable, with free end. Again, analogue output is available as an option.

ORDERING AND SPECIFICATIONS

Sensor	Characteristics				
	Accuracy	Depth Rating	Tilt Response	Azimuth Response	Hydrodynamic Noise
17cm Annular	±1% + 5mm/s	1000m	✓✓✓✓✓	✓✓✓✓	✓✓✓✓
11cm Discus	±1% + 5mm/s	5000m	✓✓✓	✓✓✓✓✓	✓✓✓✓✓
5.5cm Discus	±1% + 5mm/s	3000m	✓✓✓	✓✓✓✓✓	✓✓✓✓✓
3.2cm Discus	±1% + 5mm/s	3000m	✓✓✓	✓✓✓✓✓	✓✓✓✓✓
5.5cm Spherical	±1% + 5mm/s	3000m	✓✓✓✓	✓✓✓	✓✓✓
3.2cm Spherical	±1% + 5mm/s	3000m	✓✓✓✓	✓✓✓	✓✓✓

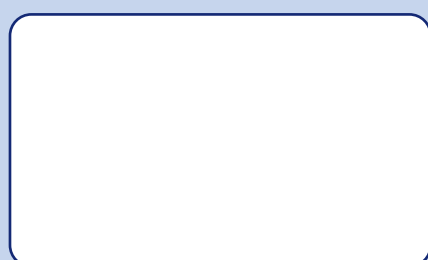
Package	Specification (may vary slightly according to sensor selection)		
	Size	Power Consumption	Depth Rating
Sensor on spar with pre-amp housing and 3m cable to Control Display Unit	CDU: 250 x 170 x 100mm	240mA	IP67 (10s at 0.3m)
Underwater housing with integral sensor on spar, and 3m power in/signal out cable	525mm long x 76mmØ (inc sensor)	130mA	3000m
Underwater housing with remote sensor on spar/pre-amp housing, 3m sensor cable, and 3m power in/signal out cable	350mm long x 76mmØ	130mA	3000m
Sensor on spar with pre-amp, 3m sensor cable to OEM board set with wiring loom.	54mm x 205mm	130mA	N/A

Also Available

2 channel 0-5v analogue output option for any package.

Extra Sensor cable (maximum 50m)
Extra Power in/Signal out cable (maximum 100m)
Alternative Signal ranges (standard ±5m/s for each axis)

For more detailed specification, please refer to additional sheet.



Valeport manufactures a wide range of oceanographic and hydrometric instruments including self-recording and direct reading multi-parameter current meters, CTD probes, electromagnetic current meters, tide gauges, open channel flow meters, optical instruments, water and plankton samplers, winches, sinker weights, connectors and accessories.



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