

Nortek Aquadopp™

Open water Current Meter (3D)



The Aquadopp

The Aquadopp is designed both for real time data collection and self-contained deployments. The instrument uses Doppler technology to achieve accurate and non-intrusive measurements and it comes standard with compass, tilt, pressure, and temperature sensors.

Leading oceanographers and engineers all over the world use the Aquadopp. Typical applications are:

- ✓ Self-contained deployments on mooring lines, bottom frames or fixed structures
- ✓ Permanent monitoring stations in coastal areas or rivers.
- ✓ Real time data collection on buoys, ROVs, offshore platforms, etc.

The Aquadopp is usually configured and controlled from a PC but it can be operated from any third-party controller using the RS-232 or RS-422 interface.

Wave directional spectra

The Aquadopp can be configured to collect wave directional data at the same time as it measures the mean current. At this time Nortek does not provide software for wave directional analyses but the procedure is documented in the Technical note: "Aquadopp and Vector wave measurement near Scripps Pier".

Features

The Aquadopp has several significant advantages when compared to other open water current meters:

- ✓ All plastic and titanium parts stop corrosion
- ✓ Small and light weight (less than 3kg!)
- ✓ No moving parts that can be blocked or sensitive parts that are easily damaged
- ✓ Biological fouling does not affect accuracy
- ✓ Low power consumption for long deployments
- ✓ A variety of sensor heads and the ability to move the sampling volume away from the mounting structure assure undisturbed measurements in all situations

Software

The Aquadopp comes standard with Windows software both for real time data collection and for controlling autonomous deployments. Different views and menus guide you through the process from configuration to data conversion. The software has an on-line help section and requires no special skills. New firmware versions from Nortek can be loaded into the Aquadopp using the standard software, removing the need for opening the canister and replacing components.

In the final analyses, the Aquadopp offers great value through the combined use of advanced Doppler technology and a flexible system design. The warranty is two years on material defects and workmanship.

Diagnostic mode

The diagnostic mode is unique for the Aquadopp. It allows the user to intersperse the average data with periods of rapid sampling (1Hz). Diagnostic data are typically used to analyze the mooring motion or to gather information about surface waves or internal waves.

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Water Velocity Measurement

Range	± 5 m/s (inquire for higher ranges)
Accuracy	1% of measured value ± 0.5 cm/s
Maximum sampling rate (output)	1 s
Internal sampling rate	23 Hz

Measurement area

Measurement cell size (user selectable)	0.75 m
Measurement cell position (user selectable)	0.3 – 5.0 m
Default position (along beam)	0.3 – 1.8 m

Doppler uncertainty (noise)

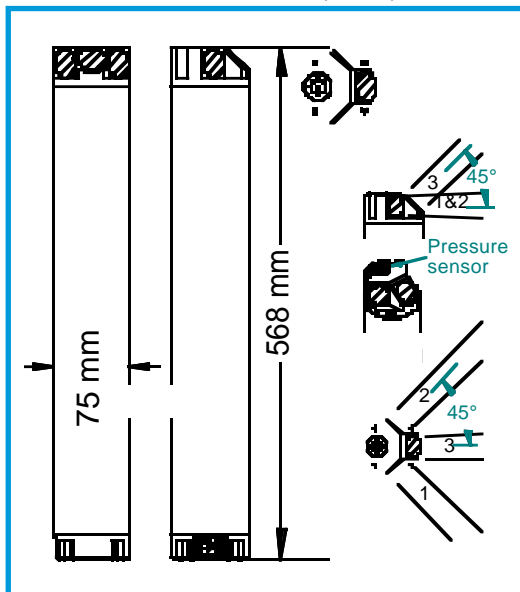
Typical uncertainty for default configurations	0.5 - 1.0 cm/s
Uncertainty in U,V at 1 Hz sampling rate	1.5 cm/s

Echo Intensity

Acoustic frequency	2 MHz
Resolution	0.45 dB
Dynamic range	90 dB

Sensors

Temperature	Thermistor embedded in head
- Range	-4°C to 40°C
- Accuracy/Resolution	0.1°C/0.01°C
- Time response	10 min
Compass	Flux-gate with liquid tilt
- Maximum tilt	30°
- Accuracy/Resolution	2°/0.1°
Tilt	Liquid level
- Accuracy/Resolution	0.2°/0.1°
- Up or down	Automatic detect
Pressure	Piezoresistive
- Range	0-200 m (standard)
- Accuracy/Resolution	0.25% / Better than 0.005% of full scale per sample



Data Communication

I/O	RS-232 or RS-422
Baud rate	300 - 115200
User control	Handled via WIN32 software, ActiveX function calls, or direct commands

Software ("Aquadopp")

Operating system	WIN95, WIN98, NT 4.0
Functions	Deployment planning, start with alarm, data retrieval, ASCII conversion. Online data collection and graphical display. Test modes.

Data Recording

Capacity (standard)	2 MB, expandable to 21MB or 78MB
Data record	40 bytes
Diagnostic record	40 bytes

Power

DC input	9-16 VDC
Peak current	2 amp at 12VDC (user adjustable)
Max consumption at 1 Hz	0.2-1.0 W
Avg. consumption at 0.02 Hz	0.1 W
Avg. consumption at 0.002Hz	0.01 W
Sleep consumption	0.0013 W

Battery capacity	50 Wh
New battery voltage	13.5 VDC
Data collection (alkaline)	6 months at 10-min, ± 1.0 cm/s noise
Data collection (lithium)	12 months at 10-min, ± 1.0 cm/s noise

Connectors

Bulkhead (Impulse)	LPMBH-5-FS (bronze, titanium optional)
Cable	LPMIL-5-MP on 5-m neoprene cable

Materials

Standard model	Delrin and polyurethane plastics with titanium screws
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Environmental

Operating temperature	-5°C to 45°C
Storage temperature	-15°C to 60°C
Shock and vibration	IEC 721 - 3 - 2
Pressure rating	300 m (pressure sensor OK to 1.5*range)

Antifouling paint

May be applied to all surfaces

Dimensions

Cylinder	Diameter: 75mm Length: 550 mm or 450 mm
Weight in air	3.5 kg
Weight in water	Neutral

Options

Acoustic beams	Several different sensor heads available. See separate specification sheet.
Battery	Rechargeable Ni-Mn and Lithium available
Connectors	LPMBH-8-FS with PLPMIL-8-MP on 10-m polyurethane cable for optional RS422 systems.

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