

Nortek Aquadopp™ Profiler

A new generation acoustic Doppler profilers



The Aquadopp profiler measures the current profile in water using acoustic Doppler technology. It is designed for stationary applications and can be deployed on the bottom, on a mooring rig, on a buoy or on any other fixed structure. It is a complete instrument and includes all the parts required for a self-contained deployment with data stored to an internal data logger. Typical applications include coastal studies, online monitoring and scientific studies in rivers, lakes, and channels.

The Aquadopp profiler uses three acoustic beams slanted at 25° to accurately measure the current profile in a user selectable number of cells. The internal tilt and compass sensors tell the current direction and the high-resolution pressure sensor gives the depth - and the tidal elevation if the system is fixed mounted. The standard 5 MB recorder and internal alkaline batteries are typically sufficient for a 2-4 month deployment. Deployment times can be increased or sampling schemes intensified by expanding to 80 MB memory and external batteries.

What is new?

One quick glance at the Aquadopp profiler tells you that it is a small and practical current profiler that is simple to deploy. It gives you the full current profile and it comes standard with all the trimmings such as an internal recorder, compass, tilt, pressure, temperature, software, cable, etc. There is no compromise on the velocity measurements – we use the industry-standard autocovariance method to assure accurate and unbiased data – and the system retains the classical advantages of acoustic Doppler systems including insensitivity to biofouling and no moving or protruding parts.

Go one step further into the system and you will find a host of new features:

- ✓ Small blanking distances give you data closer to the instrument
- ✓ Small cell sizes even in high flows
- ✓ Compass and tilt that automatically senses up or down orientation (use the profiler either way)
- ✓ Adjustable power output reduces battery consumption in shallow water.
- ✓ All plastic and titanium parts, 2.4 kg in air
- ✓ Flexible transducer design – order special heads at low additional cost
- ✓ Powerful AquaPro WIN32 software for trouble free deployment planning, recording, data retrieval, and ASCII conversion.
- ✓ Firmware download without opening instrument
- ✓ Online data communication via radio modem
- ✓ Collect directional wave data at 1 or 2 Hz in between current profiles.

Third generation current profiler

Nortek is proud to be the first company to introduce a third generation current profiler. The first generation was the original ADCP, a bulky and expensive but revolutionary instrument first introduced in 1982. The second generation profilers were introduced in 1994, which reduced the size, weight, and price by about 50%. The Aquadopp profiler repeats the feat – a 50% reduction in size, weight, and price while producing the best performance, versatility and functionality yet

Wave directional data

The Aquadopp can be configured to collect 1 or 2 Hz wave data (p,U,V) interleaved with the mean current profile. The 1 or 2 Hz data allow you to calculate the wave directional spectra, either using Nortek add-on wave software (inquire!) or your own algorithms.

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Water Velocity Measurement

Acoustic frequency	0.6 MHz	1.0 MHz	2.0 MHz
Maximum profiling range*)	30 – 50 m	12 – 25 m	5 - 12 m
Cell size	1 – 4 m	0.3 – 4 m	0.1 - 2 m
Minimum blanking	0.50 m	0.20 m	0.05 m
Maximum # of cells	128		
Velocity Range	±10 m/s (call for extended range)		
Accuracy	1% of measured value ± 0.5 cm/s		
Max. Sampling rate	1 Hz		
Velocity uncertainty	Consult software program		

*) The Aquadopp profiler measures the current profile in a user specified number of cells from the instrument out to a maximum range that depends on the acoustic scattering conditions. The lower range should be expected with clear water and small cells and the higher range with large cells and acoustically turbid water.

Echo Intensity

Sampling	Same as velocity
Resolution	0.45 dB
Dynamic range	90 dB

Transducer

Frequency	0.6 MHz	1.0 MHz	2.0 MHz
Number of beams	3	3	3
Beam width	3.0°	3.4°	1.7°

Standard sensors

Temperature	Type	Thermistor embedded
	Range	-4°C to 30°C
	Accuracy/resolution	0.1°C/0.01°C
	Time response	15 min
Compass	Type	Flux gate with liquid tilt
	Maximum tilt	30°
	Accuracy/resolution	2°/0.1°
Tilt	Type	Liquid level
	Accuracy/resolution	0.2°/0.1°
	Up or down	Automatic detect
Pressure	Type	Piezoresistive
	Range	0-100 m (standard)
	Accuracy/resolution	0.25%/0.005% of full scale

Analog inputs

Number of channels	2
Voltage supply	Battery voltage. Hardware can be modified to provide 5 V or 12 V.
Voltage input	0-5 V
Resolution	16 bit A/D

Serial Data Communication

I/O	RS232, RS422
Baud rate	300-115,200 (user setting)

Internal Recording

Capacity	5 MB, expandable to 25MB or 81MB
Data record	32 bytes + 9*Ncells
Mode	Stop when full (default) or wrap mode

Software "AquaPro"

Operating system	WIN 32 (WIN 95/98/00, NT 4.0)
Functions	Deployment planning, data retrieval, ASCII conversion, online data collection and graphical display

Power

DC Input	9-16 VDC
Max consumption at 1Hz	0.2-1.5 W
Sleep consumption	0.0013 W
Transmit power	0.3-20 W, 4 adjustable levels

Internal Batteries*)

Type/capacity	18 AA Alkaline cells/50Wh
New battery voltage	13.5 VDC
Duration (10-minute avg.)	120 days for 2MHz, 0.5 m cells
Duration (10-minute avg.)	90 days for 1MHz, 1.0 m cells

*) Exact battery consumption and velocity uncertainty are complex functions of the deployment configuration. Please consult the AquaPro software for more exact predictions.

Materials

Standard	Delrin and polyurethane plastics with titanium screws
Intermediate and deep water models	Titanium and Delrin plastics

Connectors

Bulkhead (Impulse)	LPMBH-8-FS (bronze)
Cable	LPMIL-8-MP on 10-m polyurethane cable

Environmental

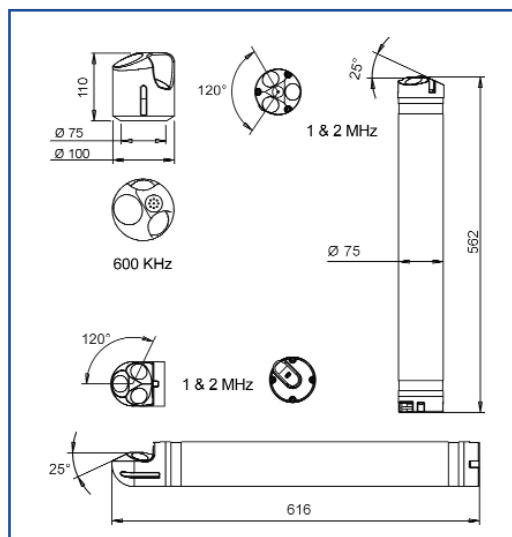
Operating temperature	-5°C to 35°C
Storage temperature	-20°C to 45°C
Shock and vibration	IEC 721 – 3 – 2
Shallow water rating	300 m
Deep water rating	2000 and 6000 m

Dimensions

Weight in air	2.4 kg/2.6 kg (0.6 MHz) with alkaline batteries
Weight in air (deep water)	6-10 kg, depending on model
Length	550 mm
Diameter	75 mm

Options

Batteries	Lithium
External batteries	200 Wh, 540 Wh or 1080 Wh alkaline
Bulkhead connectors	Titanium instead of bronze
Transducer head	Side-looking for 1 or 2 MHz. Inquire for special configurations
Communication	Request special harness for RS422 communication. Inquire for cables >100 m



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