

Aquadopp® Profiler

A small and light current profiler for coastal measurements

Longer range with 400 kHz!



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 9MB 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 161MB memory and external batteries.

Practical Use

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 a internal recorder, compass, tilt, pressure, temperature, software, cable, etc.

Third Generation Current Profiler

Nortek is proud to be the first company that introduced 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



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

- ✓ Small blanking distances give you data close 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, from 2.4kg 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
- ✓ Online data communication via radio modem
- ✓ Collect directional wave data at 1Hz or 2Hz in between current profiles
- ✓ Inquire for deep water versions

Wave Directional Data

The Aquadopp can be configured to collect 1Hz or 2Hz wave data (p,U,V) interleaved with the mean current profile. The 1Hz or 2Hz data allow you to calculate the wave height, period, and direction, either using Nortek add-on wave software or your own algorithms. The instrument is best suited for wave measurements in areas with long waves ($T_p > 4-5$ s). For other areas or for long-term online measurements, we suggest looking at the AWAC as an alternative.

generation profilers were introduced in 1994, which reduced the size, weight, and price by about 50%. The Aquadopp profiler, introduced in 2002, repeats the feat—a 50% reduction in size, weight, and price while producing the best performance, versatility and functionality yet.

Specifications

Water velocity measurement

| | | | | |
|--------------------------|----------------------------------|--------|--------|--------|
| Acoustic frequency | 0.4MHz | 0.6MHz | 1.0MHz | 2.0MHz |
| Maximum profiling range* | 60-90m | 30-40m | 12-20m | 4-10m |
| Cell size | 2-8m | 1-4m | 0.3-4m | 0.1-2m |
| Minimum blanking | 1m | 0.50m | 0.20m | 0.05m |
| Maximum # cells | 128 | | | |
| Velocity Range | ±10m/s (call for extended range) | | | |
| Accuracy | 1% of measured value ±0.5cm/s | | | |
| Max. Sampling rate | 1Hz | | | |
| 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 Resolution | Same as velocity |
| Dynamic range | 0.45dB |
| | 90dB |

Transducer

| | | | | |
|-----------------|--------|--------|--------|--------|
| Frequency | 0.4MHz | 0.6MHz | 1.0MHz | 2.0MHz |
| Number of beams | 3 | 3 | 3 | 3 |
| Beam width | 3.7° | 3.0° | 3.4° | 1.7° |

Standard sensors

| | |
|---------------------|----------------------------|
| Temperature | Thermistor embedded |
| Range | -4°C to 30°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 | 0-100m (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 5V or 12V |
| Voltage input | 0-5V |
| Resolution | 16 bit A/D |

Serial data communication

| | |
|-----------|---|
| I/O | RS232, RS422. Software supports most commercially available USB-RS232 converters |
| Baud rate | 300-115200 (user setting) |

Internal recording

| | |
|-------------|---------------------------------------|
| Capacity | 9MB, expandable to 33, 89, or 161MB |
| Data record | 32 bytes + 9*Ncells |
| Mode | Stop when full (default) or wrap mode |

Software "AquaPro"

| | |
|------------------|--|
| Operating system | Windows®2000, Windows®XP |
| Functions | Deployment planning, data retrieval, ASCII conversion, online data |

Power

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

Internal batteries

| | |
|--------------------------|------------------------------|
| Type/capacity | 18 AA Alkaline cells/50Wh |
| New battery voltage | 13.5VDC |
| Duration (10-minute avg) | 80 days for 2MHz, 0.5m cells |
| Duration (10-minute avg) | 50 days for 1MHz, 1.0m 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) | MCBH-8-FS |
| Cable | PMCIL-8-MP on 10-m polyurethane |

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 | 300m |

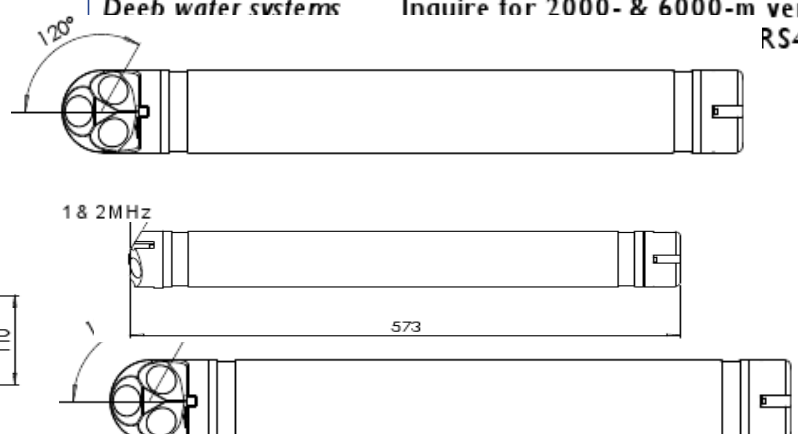
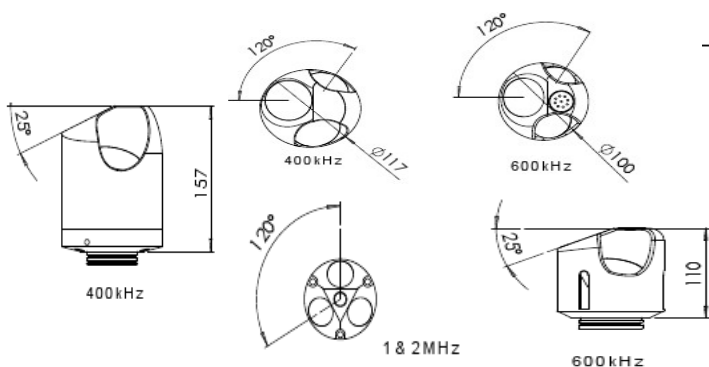
Dimensions

| | |
|---------------|---|
| Weight in air | 2.4kg/2.6kg (0.6MHz)/3.7kg (0.4MHz) with alkaline batteries |
| Length | 550mm |
| Diameter | 75mm |

Options

| | |
|---------------------|--|
| Batteries | Lithium, Li-Io rechargeable |
| External batteries | 540Wh or 1200Wh |
| Bulkhead connectors | Titanium instead of bronze |
| Transducer head | Right angle head for 1 or 2MHz. Inquire for special configurations |
| Deep water systems | Inquire for 2000- & 6000-m versions |

RS422



1 & 2MHz