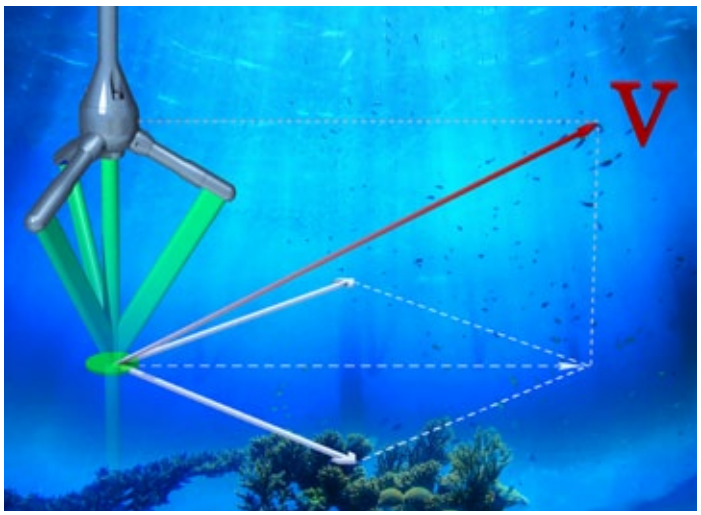
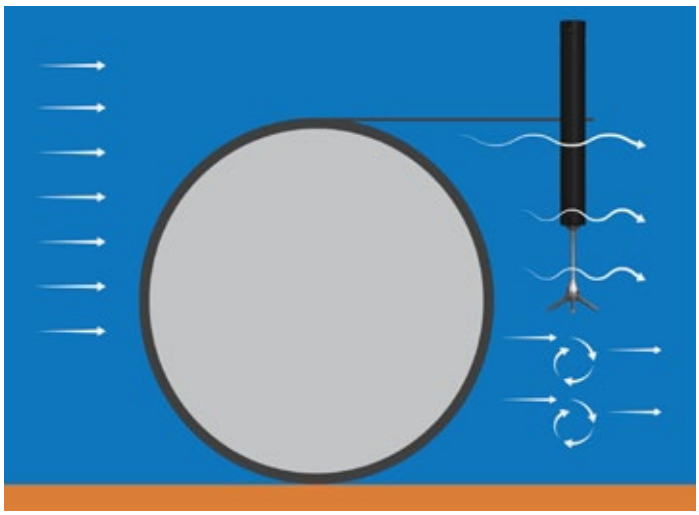
Vector
3D Acoustic Velocimeter

The Vector is a high-resolution acoustic velocimeter used to measure 3D water velocity in a wide variety of applications in the ocean. Leading oceanographers, coastal engineers, and hydraulic engineers all over the world commonly use the Vector to measure the 3D water velocity at high frequency as well as in applications where a distinct and small sampling volume is required.



The measurement technology used is coherent Doppler processing, which is characterized by accurate and nonintrusive velocity data at rates as high as 64 Hz with no appreciable zero offset.



The Vector is used in a wide range of applications, among these: studies of surf-zone dynamics and bottom boundary layer flows, wave orbital studies, combined wave and current monitoring or turbulence studies.

CURRENT AND WAVE MEASUREMENTS IN THE OCEAN, LAKE AND LABORATORY

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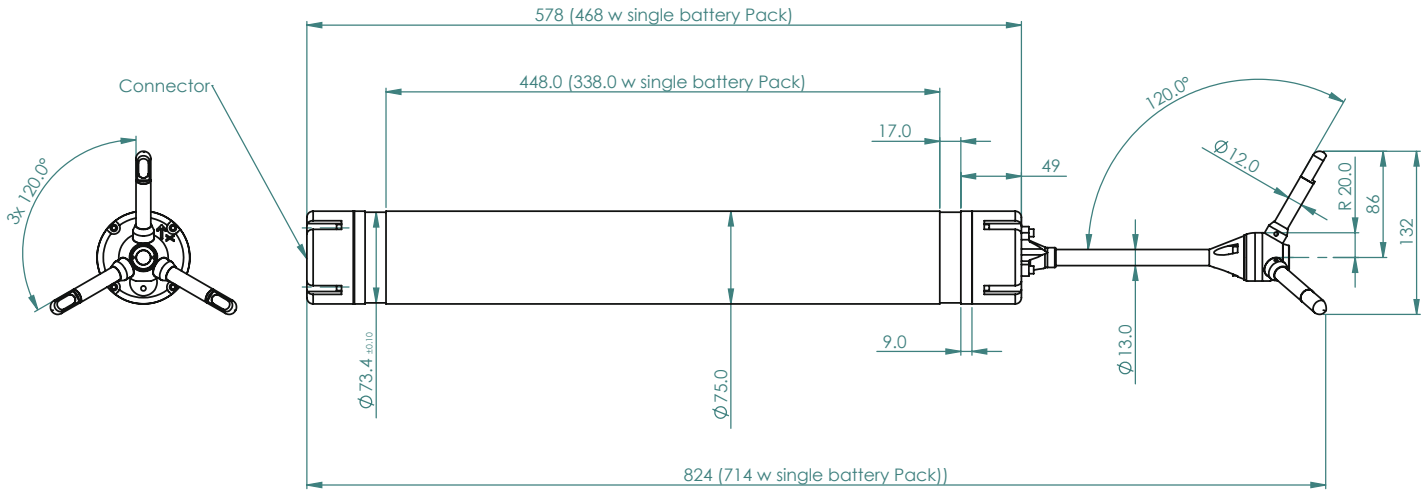
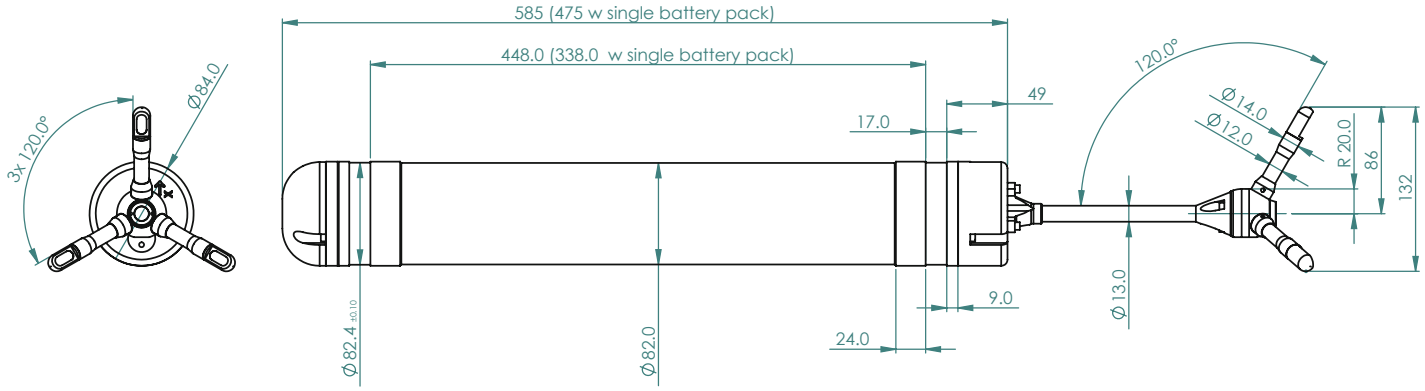
True innovation makes a difference

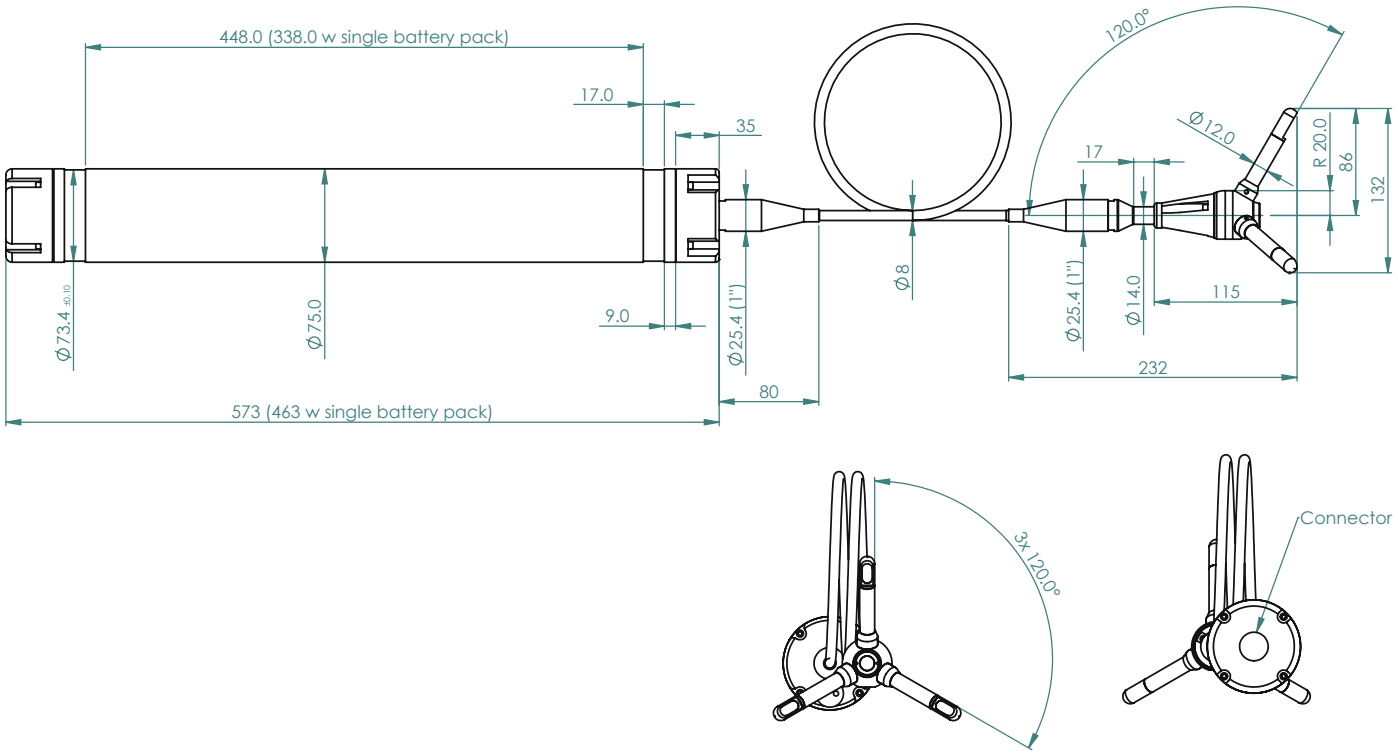
Fixed Stem Standard



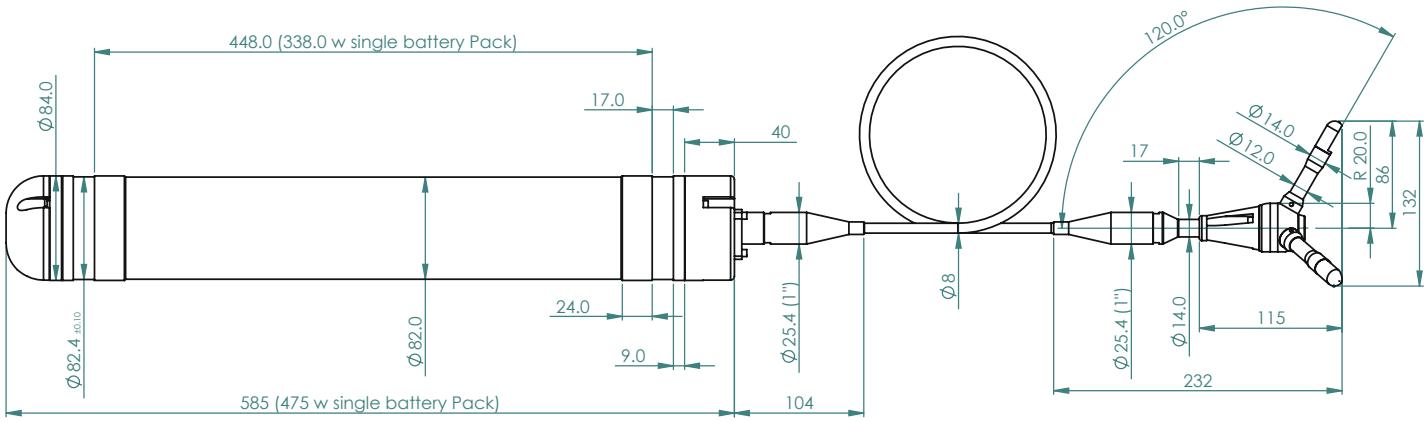
Fixed Stem 4000m

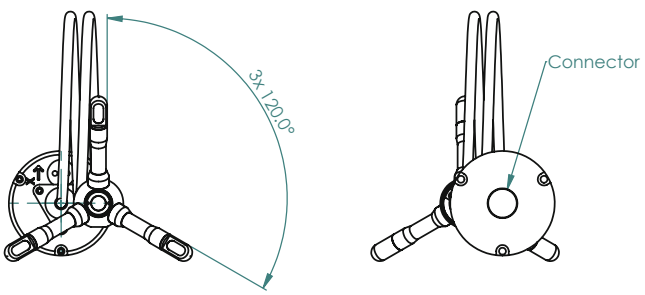


Cable Probe Standard



Cable Probe 4000m





All dimensions in mm.

Technical Specifications

Water Velocity Measurement	
Range:	±0.01, 0.1, 0.3, 2, 4, 7 m/s (software selectable)
Accuracy:	±0.5% of measured value ±1 mm/s
Sampling rate (output):	1–64 Hz
Internal sampling rate:	100–250 Hz
Sampling Volume	
Distance from probe:	0.15 m
Diameter:	15 mm
Height (user selectable):	5–20 mm
Doppler Uncertainty (noise)	
Typ. uncertainty at 16 Hz:	1% of velocity range
Echo Intensity	
Acoustic frequency:	6 MHz
Resolution:	0.45 dB
Dynamic range:	90 dB
Sensors	
Temperature:	Thermistor embedded in end bell
Range:	–4 °C to 40°C
Accuracy/Resolution:	0.1 °C / 0.01°C
Time response:	10 min
Compass:	Magnetometer
Accuracy/Resolution:	2°/0.1° for tilt < 20°
Tilt:	Liquid level
Accuracy/Resolution:	0.2°/0.1°
Up or down:	Automatic detect
Maximum tilt:	30°
Pressure:	Piezoresistive
Standard Range:	0–20 m, inquire for options
Accuracy/Resolution:	0.5% / Better than 0.005% of full scale
Data Communication	
I/O:	RS 232 or RS 422. Software supports most commercially available USB– RS 232 converters.
Communication Baud rate:	300–115200
Recorder download baud rate:	600/1200 kBaud for both RS232 and RS422
User control:	Handled via Vector Win32® software, ActiveX® function calls, or direct commands.
Analog outputs:	3 channels standard, one for each velocity component or two velocities and pressure. Output range is 0–5 V, scaling is user selectable.
Analog Inputs	
No. of channels:	2
Supply voltage to analog output devices:	Three options selectable through firmware commands: • Battery voltage/500 mA • +5V/250 mA • +12V/100 mA
Software ("Vector")	
Operating system:	Windows®XP, Windows®7
Functions:	Deployment planning, start with alarm, data retrieval, ASCII conversion. Online data collection and graphical display.Test modes
Data Recording	
Capacity (standard):	9 MB, can add 32/176/352MB or 4GB (Prolog)
Data record:	24 bytes at sampling rate + 28 bytes/second
Power	
DC Input:	9–15 VDC
Peak current:	3A
Max consumption:	64 Hz 1.5 W
Typ. consumption, 4Hz:	0.6–1.0 W
Sleep consumption:	0.0003 mW (RS232), 0.005 mW (RS422)
Transmitt power:	2 adjustable levels
Battery capacity:	50 Wh
New battery voltage:	13.5 VDC
Data collection capacity:	Refer to planning section in software
Real time clock	
Accuracy:	± 1min/year
Backup in absence of power:	4 weeks
Connectors	
Bulkhead (Impulse):	MCBH-8-FS
Cable:	PMCIL-8-MP on 10-m polyurethane cable
Materials	
Standard model:	Delrin® housing. Titanium probe and screws
Environmental	
Operating temperature:	–4°C to +40°C
Storage temperature:	–20°C to +60°C
Shock and vibration:	IEC 721-3-2
Pressure rating:	300 m for canister.
Dimensions	
	see drawings on page 2-3
Weight in air:	5.0 kg (standard), 8.3 kg (4000m)
Weight in water:	1.5 kg (standard), 5.1 kg (4000m)
Options	
Acoustic beams:	Probe mounted on fixed stem or on 2-m cable (see drawing)
Batteries:	Lithium or Lithium Ion
External batteries:	Alkaline, Lithium or Lithium Ion (see battery brochure for details)
Pressure sensor:	Specify range.

In most cases, the Vector is deployed as a self contained instrument with internal recorder, or connected to an on-line PC. It can also be operated from any third-party controller using RS 232 or RS 422 communication.

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