Recording Current Meter 9 LW/IW

For use in the Sea and in freshwater
Standard Data Storage and Real Time output via cable
Optional RS232 Output
RCM 9 LW Light Weight: depth rating 300m
RCM 9 IW Intermediate Water: depth rating 2000m

Standard Parameters: • Current Speed and Direction • Temperature • Signal Strength • Instrument Tilt
Optional Parameters: • Conductivity • Pressure/Instrument Depth • Turbidity • Oxygen

NB! New and Improved Conductivity Sensor and Pressure Sensor available!

Features: • No Offset • Low noise • Burst mode • Forward Ping algorithm improves accuracy • No moving parts
• Insensitive to fouling • Easy installation and handling • Easy functional verification using our external Test Unit

Deployment: • Fixed bottom frame mooring • In-line string mooring • Buoy deployment • Direct Reading using a small boat • Long term/short term deployment

Instruments with Doppler shift technology are superior for use in shallow water due to insensitivity to fouling
### General Specifications, RCM 9 LW / RCM 9 IW

<table>
<thead>
<tr>
<th>No of channels</th>
<th>is selectable from 2 to 10 channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch. 1 Reference</td>
<td>is a fixed reading to check the RCM’s performance and to identify individual instruments</td>
</tr>
<tr>
<td>Ch. 2 and 3 Current Speed and Direction</td>
<td>Speed Sensor Type: Doppler Current Sensor 4220/3820</td>
</tr>
<tr>
<td></td>
<td>Range: 0 to 300cm/s</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.3cm/s</td>
</tr>
<tr>
<td></td>
<td>Absolute Accuracy: ± 0.15cm/s</td>
</tr>
<tr>
<td></td>
<td>Relative Accuracy: ± 1% of reading</td>
</tr>
<tr>
<td></td>
<td>Statistic precision: 0.45cm/s (standard deviation)</td>
</tr>
<tr>
<td></td>
<td>Direction Sensor: Magnetic compass, Hall effect type</td>
</tr>
<tr>
<td></td>
<td>Resolution 0.35°</td>
</tr>
<tr>
<td></td>
<td>Accuracy ± 5° for 0 to 15° tilt ± 7.5° for 15 to 35° tilt</td>
</tr>
<tr>
<td></td>
<td>Acoustic Frequency: 2MHz</td>
</tr>
<tr>
<td></td>
<td>Power: 25W in 1ms pulses</td>
</tr>
<tr>
<td></td>
<td>Beam Angle: ± 1° (main lobe)</td>
</tr>
<tr>
<td></td>
<td>Installation Distance: Minimum 0.5m from bottom (to the DCS Head) Minimum 0.75m from surface</td>
</tr>
<tr>
<td>Ch. 4 Temperature</td>
<td>Sensor Type: Thermistor (Fenwall GB32JM19)</td>
</tr>
<tr>
<td></td>
<td>Resolution: 0.1% of selected range</td>
</tr>
<tr>
<td></td>
<td>Accuracy: ± 0.05°C</td>
</tr>
<tr>
<td></td>
<td>Response Time (63%): 12 seconds</td>
</tr>
<tr>
<td>Selectable Ranges:</td>
<td>Wide: -0.6°C to 32.8°C</td>
</tr>
<tr>
<td></td>
<td>Low: -2.7° to 21.7°C</td>
</tr>
<tr>
<td></td>
<td>High: +9.8° to 36.6°C</td>
</tr>
<tr>
<td></td>
<td>Arctic: -3.0°C to 5.9°C</td>
</tr>
<tr>
<td>Ch. 9 and Ch. 10\textsuperscript{3} Signal Strength and Instrument Tilt</td>
<td>External Triggering: A positive 5V pulse to the electrical terminal, output pin, will trigger one measurement cycle</td>
</tr>
<tr>
<td>Recording Interval:</td>
<td>1, 2, 5, 10, 20, 30, 60, and 120min</td>
</tr>
<tr>
<td>Continuous: (4x no of ch. +2s) and Remote start only</td>
<td></td>
</tr>
<tr>
<td>Recording System:</td>
<td>Data Storage Unit 2990 or 2990E</td>
</tr>
<tr>
<td>Data Storage in EEPROM</td>
<td></td>
</tr>
<tr>
<td>Storage Capacity:</td>
<td>DSU 2990: 9000 records (7 ch) (2 months at 10 minutes interval)</td>
</tr>
<tr>
<td></td>
<td>DSU 2990E: 36100 records (7 ch) (8 months at 10 minutes interval)</td>
</tr>
<tr>
<td>Battery:</td>
<td>Alkaline 3614: 9V, 15Ah (nominal 12.5Ah) 20W down to 6V at 4°C</td>
</tr>
<tr>
<td></td>
<td>or Lithium 3677: 7.2V 30Ah</td>
</tr>
<tr>
<td>Average Current Consumption (mA):</td>
<td>0.50 + (50 divided by the recording interval in minutes)</td>
</tr>
<tr>
<td>Warranty:</td>
<td>Two years against faulty materials and workmanship. For subsurface cables: contact factory</td>
</tr>
</tbody>
</table>

---

### Individual specifications, RCM 9 LW (DCS 4220 Head)

- **Depth Capacity:** 300m
- **Dimensions:** H: 595mm OD: 128mm
- **Weight:** Net (in air)/(in water) Gross
  - With frame 4044: 10.3 kg/4.1 kg 20.0 kg
  - With frame 3824A: 14.8 kg/7.0 kg
- **Packing:** Woodybox: 900x350x330mm
- **External Materials:** POM, Titanium, Stainless acid proof Steel, Durotong DT322 polyurethane
- **Accessories Included:**
  - Alkaline Battery 3614
  - Data Storage Unit DSU 2990
  - Data Reading Program 5059
- **Optional Accessories:**
  - Recommended Spares
    - In-line mooring frame 4044\textsuperscript{2}/3824A
    - DCS Test Unit 3731
    - PDC-4/RS-232 Converter 3818
    - Maintenance Kit 3813B
    - Tools kit 3986
  - Bottom mooring frame 3438R

---

### Individual specifications, RCM 9 IW (DCS 3820 Head)

- **Depth Capacity:** 2000m
- **Dimensions:** H: 595mm OD: 128mm
- **Weight (in air):** Net Gross 23.2 kg 32.7 kg
- **Packing:** Plywood case: 890x270x240mm
- **External Materials:** Stainless acid proof steel, Titanium, OSNISIL, Durotong DT322 polyurethane
- **Accessories Included:**
  - Alkaline Battery 3614
  - Data Storage Unit DSU 2990
  - Mooring frame 3824A with Sensor
  - Protecting Ring 966278
  - Data Reading Program 5059
- **Optional Accessories:**
  - Recommended Spares
    - Base Brackets 3627 (2) for Frame
    - Additional Protecting Rods 3783
    - Vane Plate 3681
    - DCS Test Unit 3731
    - PDC-4/RS-232 Converter 3818
    - Maintenance Kit 3813B
    - Tools kit 3986
  - Bottom mooring frame 3438R

---

1) RCM 9 LW: Available on request/RCM 9 IW: Standard
2) We recommend you to use the lowest available channel number
3) In-line Mooring Frame 4044: breaking strength 800 kg
The RCM 9 LW (Light Weight) and RCM 9 IW (Intermediate Water) version utilize the well-known Doppler Shift principle as basis for its measurements.

Four transducers transmit short pulses (pings) of acoustic energy along narrow beams. The same transducers receive backscattered signals from scatterers that are present in the beams, which are used for calculation of the current speed and direction.

The scattering particles are normally plankton, gas bubbles, organisms and particles stemming from man-made activity.

**RCM 9 LW/IW**

**Standard Sensors**
- Current Speed and Direction Sensor
- Water Temperature Sensor
- Signal Strength
- Instrument Tilt

**Optional Sensors**
- Conductivity Sensor (new, improved)
- Pressure Sensor (new, improved)
- Turbidity Sensor
- Oxygen Optode
- Temperature Sensor (high accuracy)

Refer Brochure B143 for sensor specifications

Note: If application requires breaking strength of more than 800 kg, mount the RCM9 LW in in-line mooring frame 3824A. Remember to change the handles.
Applications

The most common way to use the RCM 9 is in an in-line mooring configuration. As it operates under a tilt up to 35° from vertical, it has a variety of in-line mooring applications by use of surface buoy or sub surface buoy. The instrument is installed in a mooring frame that allows easy installation and removal of the instrument without disassembly of the mooring line.

Direct Reading is conveniently done due to its compact design, low drag force and easy handling. The instrument can be lowered into the sea from a small boat using a simple winch. In this application a small vane plate should be fastened to the instrument to avoid spin during operation. Data can be stored internally and read after retrieval or be read in real time on deck by use of the profiling cable.

RCM 9 can also be used in a bottom frame mooring (non-magnetic).

Data Reading Program

Data Reading Program 5059 is a software program that may be used to download DSU 2990 data to a Personal Computer (requires 5059 DSU-Reader). The program is based on the latest software technology and is designed for use with Windows 95, Windows 98 and Windows NT, 2000 and XP.

In addition to enable downloading and exporting of DSU data, it may also be used for data analysis. The 5059 includes extensive charting and analysis facilities, and the resulting analysis graphs may be exported to programs such as Microsoft Word and Excel.