



TEST UNIT 3731 for RCM 9, RCM 11, DCS 3500/3900

A unit for testing the function of the Recording Current Meters RCM 9, RCM 11 and the Doppler Current Sensors, DCS 3500/3900.

Using the acoustic Doppler principle to measure current has many advantages over the mechanical rotor. The simple function-testing, however that could be done before by spinning the rotor, has not yet been possible on the Doppler based type. The Test Unit 3731 is designed to fulfill this purpose for the Aanderaa Doppler Current Sensors 3620/3920 installed on the RCM 9, the 3820 installed on the RCM 11 and the stand-alone sensor DCS 3900.

The test unit consists of a ring with 4 test transducers. They are suspended by mechanical springs, enabling each test transducer to be pressed against the DCS transducers. Each test transducer has a piezoelectric disk at the end facing the DCS transducers.

The test unit is placed over the DCS with each test transducer placed in its outer position. To release the transducers, pull and turn. Then adjust each test transducer so that the surface of the test makes good contact with the DCS transducer. To achieve the best possible contact, moisten the surface of the transducers.

The disks will pick up some of the energy transmitted by the 'ping' from the Doppler Current Sensor. This energy is then used to start the oscillation of a crystal with a resonant frequency slightly different to the acoustic frequency of the DCS. When the DCS is supposed to receive the scattered echo from the 'ping', the crystal is still oscillating and thus transmitting a weak signal back to the DCS via the same piezoelectric disk.

Two of the test transducers have crystals with slightly higher frequency than the frequency transmitted by the

DCS, and the other two, have a slightly lower frequency. The high frequency corresponds to the frequency received when the current is flowing towards the DCS transducer, and the low frequency to a current flowing away.

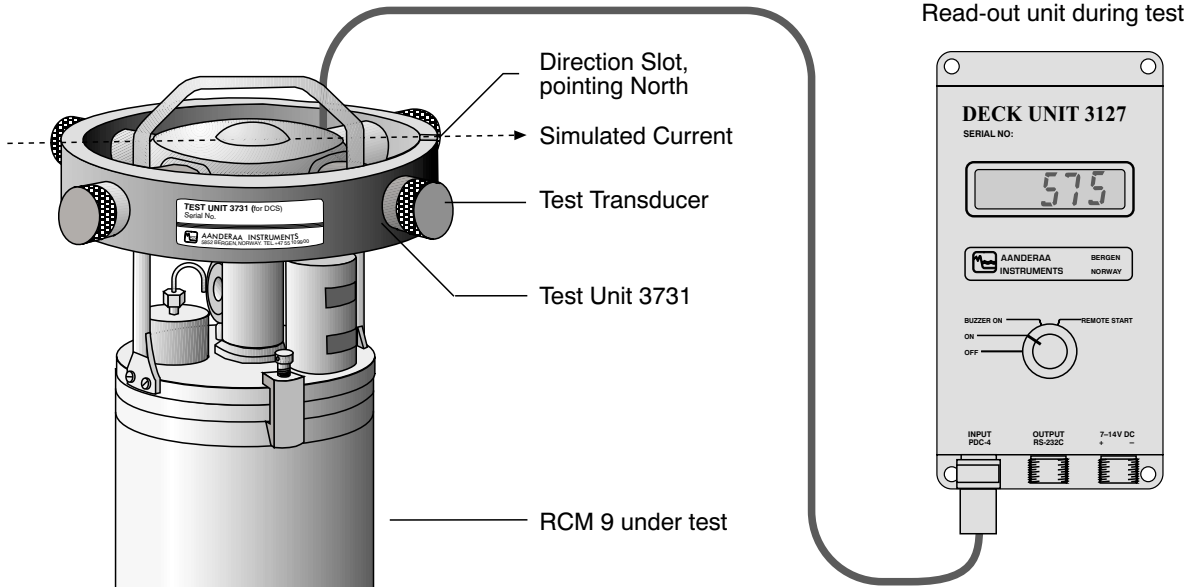
The frequency shift corresponds to a current of about 2 m/s, and since this is applied on both axis the test unit will simulate a current speed of about 2.83 m/s. The direction of the simulated current will be right between the middle of the two low frequency test transducers. This direction is marked by a slot in the ring.

The DCS for 3500 and 3620 should give stable current raw data readings between 540 and 590 and between 950 and 990 for DCS 3820, 3920 and 3900. Multiplying the raw data from the direction channel by 0.3516 gives direction in degrees. This angle should correspond to the direction of the slot in the ring, with respect to Magnetic North.

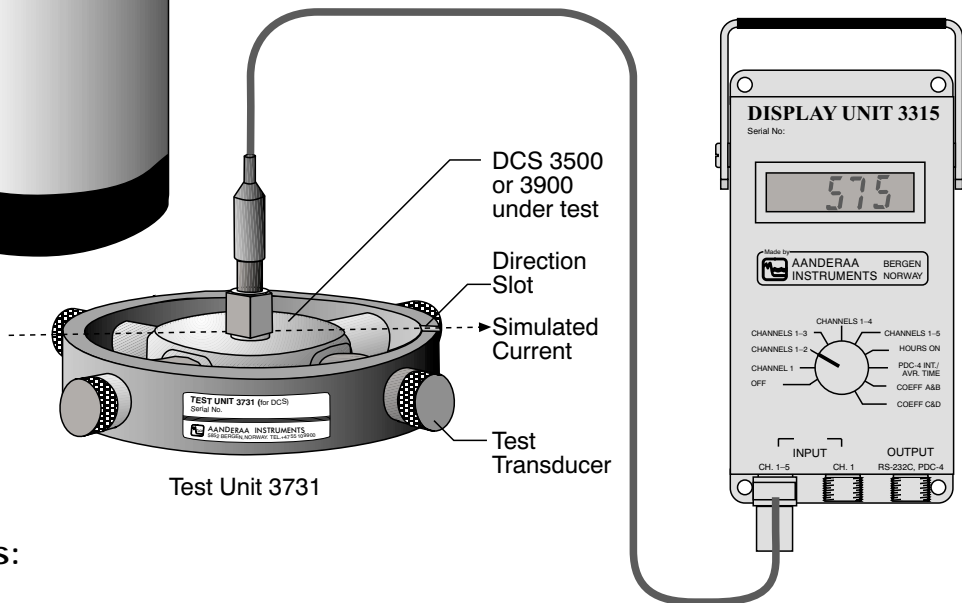
By turning the Test Unit 180 degrees on the DCS, the reading should be repeated but in the opposite direction. By turning the DCS and the test unit together, the direction reading should turn accordingly.

The DCS Test Unit is designed only for checking that the vital parts of the Doppler Current Sensor are working correctly, and not for calibration purposes. The Doppler calculation is fixed and the compass and the tilt sensor are factory calibrated.

By tilting the DCS in any direction the current speed reading should increase (approximately 8% at 30 degrees).



TEST UNIT 3731 used on Doppler Current Sensor DCS 3500/3900



Representative's Stamp

Specifications:

Current Reading

Speed: DCS3500/RCM 9:
Raw data 540 - 590 (264-288 cm/s)
DCS3900/RCM 9Mk II/RCM 11:
Raw data 950 - 990 (279-290 cm/s)

Direction: Raw data reading multiplied by 0.3516 gives direction in degrees. This correspond to the direction of the slot in the ring with respect to Magnetic North

Dimensions: 250mm OD
55mm High

Material: PVC ring with 4 transducers molded in Scotchcast

Weight: 400 grams

Warranty: Two years against faulty materials and workmanship

Latest version is on the Internet

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