

10.014 HYDROGRAPHIC ECHO-SOUNDER

Approval Date: 20 May 1998

Reviewed on : 23 October 2007

Version: 1

Purpose

The hydrographic echo-sounder is to measure depth in reservoirs and rivers and make the readings available to a data collection system.

Conditions & Requirements

- The hydrographic echo-sounder shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The echo-sounder shall be easy to operate and maintain.
- The echo-sounder shall be supplied with the accessories as needed for effective deployment.
- All materials on the echo-sounder exterior shall be non-corrosive.
- The echo-sounder shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations.
- The echo-sounder shall have an expected technical lifetime of not less than 10 years.
- Operating and maintenance manuals related to the type and model of the echo-sounder, shall be part of the delivery.
- Actual water depth shall be digitally presented, and recorded by an integrated chart recorder.
- The sounding data shall be transmitted by serial communication to the controlling PC.
- Power will be supplied by standard car batteries, either one or two in series, depending on the voltage requirements of the echo-sounder.
- Power consumption shall be moderate.
- Depth readings shall be visualised on a LCD display.
- The displayed value shall not depend on supply voltage.
- The indicated range shall be distance to the bottom, in meters. Hence, the echo-sounder should suppress multiple echoes and echoes from the water surface (backward sensitivity).
- The echo-sounder shall have adjustment facilities for draft, speed of sound, sensitivity, recording range, time dependent gain control and grey scale.
- The echo-sounder shall have illumination on the chart recorder and on the digital display.
- An integrated digitiser shall convert the depth readings into numerical data.
- The echo-sounder shall have a good performance in sediment laden waters.

Specifications

depth ranges	selectable up to 200 m (0 to 10, 20, 50, 100, 200 m) or equivalent
minimum depth	0.3 m below transducer
acoustic frequency	approximately 200 kHz
transducer beam width	10 degrees or less
output power	250 W pulse
transducer cable length	8 m
alarm	low depth indication

Optionally, a second frequency may be included for firm bottom detection.

acoustic frequency	12 to 45 kHz
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transducer beam width	30 degrees or less
transducer cable length	8 m
accuracy	0.25% of indicated depth
speed of sound adjustment	1400 to 1550 m/s in steps of 1 m/s
measuring rate	5 readings/second
digitiser resolution	0.01 m
gating	bottom tracking, and adjustable gate width
display	LCD with good daylight visibility
interface	RS232 for output of depth information and input of annotation.
data format	NMEA-0183
update interval	1 second

recording method	electrical (classic), thermal or jet paper
resolution	1 dot/cm water depth or better
depth scale	metric graduation pre-printed or printed automatically
recording width	20 cm
paper length	15 m
time scale	regular graduation pre-printed or printed automatically
recording speed	adjustable: off, 5 to 60 mm/min
fix marker	under software control from PC, switch and contact
annotation	free text from PC, and annotation of scales and ranges.

The automatic annotation function should support generation and annotation of scale lines and the recording of essential settings on the chart paper. At least one annotation block shall be visible in the recording window

power supply	11 to 15 VDC or 22 to 30 VDC
ingress protection	the enclosure, connectors and cables should be splash proof
operating temperature	0 to 50°C
humidity	95%

Accessories

- tool set
- standard spares
- bar check device with graduated chain
- staff gauges

Consumables

- rolls of recording paper
- pens, styli, ink cartridges (instrument dependent)

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