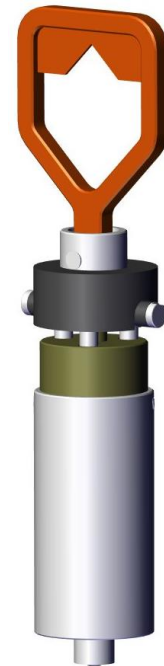


Instrument Datasheet

Subsea SandQ Monitor

1 General		Note
1.1 Model description	Subsea SandQ Monitor	
1.2 Part number	Various depending on model type and mechanical configuration	
1.3 Serial number	YY-MM-XXXX-CS, unique for each unit	1
2 Physical		
2.1 Dimensions (ø x h) (not including handle)	84 mm x 321 mm [3.3 in x 12.6 in]	2
2.2 Handle	Paddle, paddle with V-notch, fishtail, T-bar, hex nut, no handle (non ROV-retrievable)	2
2.3 Jumper type (typical)	Siemens Anguila/Aquatron or ODI	
2.4 Jumper length	According to client specifications	
2.5 Connector type (typical)	Tronic or ODI	
2.6 Enclosure material	Titanium, grade 2/5	3
2.7 Protective coating	ROV handle only	4
2.8 Cathodic protection	None	
2.9 Marking	Standard ClampOn marking label	5
2.10 Weight in air (approximately)	5 kg [11 lb]	6
2.11 Weight in water (estimated)	4.5 kg [9.9 lb]	6
2.12 Operating temperature	-40 °C to +150 °C [-40 °F to +302 °F]	7
2.13 Maximum installation depth	3 113 m [10 213 ft]	
2.14 Maximum test pressure	345 bar [5000 psi]	
2.15 Sealing	EB-weld, O rings	8
2.16 Hose/jumper interface	Siemens or ODI	9
2.17 Fill/ventilation port	Siemens or ODI	10



3 Electrical		Note
3.1 Power input	12 VDC to 30 VDC (electronics equipped with inverse polarity and transient protection)	
3.2 Power consumption (typical/maximum)	1.5 W @24 VDC/1.5 W @30 VDC (per channel)	11
3.3 Electronics platform/CAN gateway	ClampOn DSP II/CAN gateway II	12
3.4 Electronics type	Single electronics or fully redundant	12
3.5 Microprocessor	600 MIPS	
3.6 Non-volatile memory	8 MB	
3.7 Diagnostic features (with software)	Internal self-testing of analogue filters, amplifiers, and flash memory	
3.8 Signal output	CANbus SIIS Level 2	
3.9 Insulation resistance	>1 GΩ @50 VDC for 60 seconds	
3.10 Penetrator	Glass to titanium seal, 8 x single pin	
3.11 Penetrator wire cross-section	Maximum 1.5 mm ² [AWG 16]	

4 Operation		
4.1 Manner of operation	Real-time measurement	
4.2 Unit of measurement	Raw value or g/s	17
4.3 Technology	Passive ultrasonic	
4.4 Processing	DSP in sensor	
4.5 Calibration	All sensors are calibrated to a master signal at factory	
4.6 MTBF calculation	>30 years @+60 °C [+140 °F] >80 years @+30 °C [+86 °F]	7
4.7 Repeatability	Better than 1 %	
4.8 Flow conditions	Oil, water, gas, multiphase	
4.9 Minimum flow velocity	0.5 m/s [1.6 ft/s]	13
4.10 Minimum detectable particle size	Oil: 25 μm, gas: 15 μm	14
4.11 Minimum sand rate	0.01 g/s	14, 17

5 Signal		Note
5.1 Signal interface	Low speed, fault tolerant CANbus	
5.2 Signal protocol	CANopen per CIA 443 profile	15
5.3 Baud rate	50 kbps	
5.4 Heart beat	1 000 ms	16

6 Installation		
6.1 Mounting	Installed in ClampOn Compact Funnel or ClampOn Compact Flex Funnel	
6.2 Installation torque (typical)	30 N·m	
6.3 Retrieval torque (typical)	50 N·m	
6.4 Damage torque	>200 N·m	
6.5 Locking mechanism	Spring-loaded in funnel	

Instrument Datasheet

Subsea SandQ Monitor



Notes

1. Serial number breakdown: yy (year of manufacture), mm (month of manufacture), xxxxx (unique electronics ID), CS (Compact Sand).
2. Overall width and height depends on ROV handle fitted. For configuration shown (with paddle handle), width: 130 mm, height: 485 mm. See also section 2.2.
3. Metal parts exposed to seawater are made of titanium, grade 2. Material certificates to EN 10204 3.1.
4. ROV handle coated according to NORSOK M-501, system 7B, RAL 2004 Orange. Other coatings available upon request. Non ROV-retrievable sensor is fitted with a POM dome head instead of a handle.
5. Additional label with client marking where applicable.
6. For sensor only. Weight including jumper depends on jumper interface and length.
7. Pipe surface temperature can be up to 150 °C as long as the sensor housing receives ambient water cooling. Temperature calculation shall be carried out if applying insulation around the instrument, in order to verify acceptable temperature for the electronics.
8. Electronics housed in nitrogen gas-filled (N₂) 1 atmospheric chamber, sealed by EB-welding and helium leak tested. Oil-filled volume sealed by double O-ring barriers.
9. Jumper interface: MK2 M25 (Siemens), ¼" SAE J1926 (ODI).
10. Fill/ventilation port: MK2-2 (Siemens), ¼" SAE J1926 (ODI).
11. Transient inrush current (0-10 µs): 13 A. Inrush current average 0-1 ms: < 500 mA. Inrush current average 0-500 ms: < 120% of nominal current draw.
12. 1 or 2 channels output depending on electronics type. Electronics ESS tested to ISO 13628-6, Statoil document TR1233, and Total document GS EP SPS 022.
13. Minimum velocity for particle detection depends on flow medium, particle size and pipe configuration.
14. Depends on flow conditions.
15. CANbus SIIIS Level 2, CANOpen protocol to CiA 443 profile. Communication protocol according to latest revision of ClampOn document 62-321-00076 – *Communication User Manual for ClampOn CANopen Instruments* and 62-321-00077 – *Communication Interface Specification for ClampOn CANopen Instruments*.
16. Factory configurable software parameters. May also be configured in-field by ClampOn authorised personnel.
17. For sensors with SandQ+, when this is used to calculate sand rate in the sensor, the sensor must receive live flow data. Otherwise, to calculate sand rate (g/s), send sensor raw value and (live) flow data to a PC or PAC.