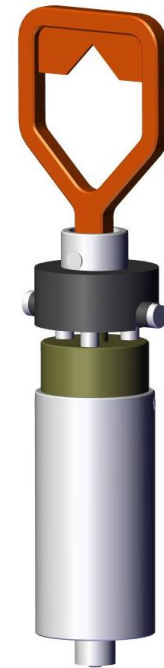


Instrument Datasheet

Subsea DSP PIG Detector

1 General		Note
1.1	Model description	Subsea DSP PIG Detector
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	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	Magnetic field sensor type	Solid state
3.8	Diagnostic features (with software)	Internal self-testing of analogue filters, amplifiers, and flash memory
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
4.3	Technology	Passive ultrasonic and/or magnetic 13
4.4	Processing	DSP in sensor unit
4.5	Calibration	All sensors are calibrated to a master signal at factory
4.6	MTBF calculation	>30 years @+60 °C [+140 °F] 7 >80 years @+30 °C [+86 °F]
4.7	Detection mode	Acoustic, magnetic, combined acoustic and/or magnetic 13, 15
4.8	Detection algorithm (acoustic)	Fixed over Background (FoB) with trigger level, fallback level, trigger time minimum and trigger time maximum. All parameters are configurable 15
4.9	Detection algorithm (magnetic)	Trigger level in magnetic raw value 15
4.10	Operating limits	The pig detector is capable of detecting all types of pig. The pig has to be moving with a minimum velocity of 0.3 m/s [1 ft/s], depending on type of pig, pipe configuration and installation point
4.11	Detectable magnetic field strength	0.15 Gauss to 18 Gauss 16
4.12	Repeatability	Better than 1 %
4.13	Flow conditions	Oil, water, gas, multiphase

5 Signal		
5.1	Signal interface	Low speed, fault tolerant CANbus SIIS Level 2
5.2	Signal protocol	CANopen per CiA 443 profile 14
5.3	Baud rate	50 kbps
5.4	Heart beat	1 000 ms 15

Instrument Datasheet

Subsea DSP PIG Detector



6 Installation			Note
6.1	Mounting	Installed in ClampOn Compact Funnel or ClampOn Compact Flex Funnel	
6.2	Installation torque (typical)	30 N·m [22.1 ft·lb]	
6.3	Retrieval torque (typical)	50 N·m [36.9 ft·lb]	
6.4	Damage torque	>200 N·m [147.5 ft·lb]	
6.5	Locking mechanism	Spring-loaded in funnel	

7 Approvals		
7.1	CE marking in conformance with	2014/30/EU (EMC Directive)
7.2	RCM marking in conformance with	Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2008

Notes

- Serial number breakdown: yy (year of manufacture), mm (month of manufacture), xxxxx (unique electronics ID), CS (Compact Sand).
- 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.
- Metal parts exposed to seawater are made of titanium, grade 2. Material certificates to EN 10204 3.1.
- 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.
- Additional label with client marking where applicable.
- For sensor only. Weight including jumper depends on jumper interface and length.
- 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.
- 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.
- Jumper interface: MK2 M25 (Siemens), 3/8" SAE J1926 (ODI).
- Fill/ventilation port: MK2-2 (Siemens), 3/8" SAE J1926 (ODI).
- 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.
- 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.
- By default, the PIG detector uses acoustic detection, but can also use a magnetic field sensor to measure changes in the magnetic flux density near the sensor. Whenever the magnetic field strength changes by more than a given threshold (configurable), a pig is detected. The PIG detector can be configured to use a combination of triggering in the acoustic and/or magnetic domains before a pig is detected.
- CANbus SIIS Level 2, CANOpen protocol to CiA 443 profile. Communication protocol according to latest revision of ClampOn document 62-321-00032 – *CANOpen Protocol Description – DSPII – SIIS Level 2*.
- Factory configurable software parameters. May also be configured in-field by ClampOn authorised personnel.
- At detection point: Minimum detectable magnetic field strength is 150 milliGauss. Maximum magnetic field strength before saturation is 18 Gauss.