

Instrument datasheet

ClampOn DSP PIG Detector

1 General		Note
1.1	Model name	ClampOn DSP PIG Detector
1.2	Service description	Non-invasive non-intrusive topside pig detector
1.3	Part number	922-22x98-100 (acoustic detection) 1 922-22x98-101 (magnetic detection)
1.4	Explosion protection principle employed	Flameproof enclosure, Ex d
1.5	Serial number	YY-MM-XXXXX 2

2 Physical		
2.1	Dimensions (ø × h)	112 mm × 132 mm [4.4 in × 5.2 in]
2.2	Enclosure material	Stainless steel 316L
2.3	Enclosure protective coating	None, not certified with any type of coatings
2.4	Weight (instrument only, excluding cable)	4 kg [8.8 lb]
2.5	Weight (with mounting bracket)	4.5 kg [9.9 lb]
2.6	Equipment marking	Stainless steel 316 marking plate (with tag number and client information if applicable)
2.7	Cable entry configuration	2 off M25 × 1.5 ISO metric: one entry fitted with Ex blanking element, one entry fitted with Ex cable gland 3, 4
2.8	Cable gland	Hawke 501/453/UNIV B M25 3, 4
2.9	Cable length and type	10 meter [32.8 feet] RFOU(c) S2/S6/S102, 8×2×0.75 mm ² grey 3, 4, 14



3 Environmental		Note
3.1	Maximum installation altitude	2 000 meters [6 562 feet]
3.2	Ingress protection	IP66/IP68 (1 meter [3.3 feet] for 24 hours) per IEC 60529
3.3	NEMA enclosure type	Type 4X
3.4	Ambient temperature	See Compliance section

4 Operation		Note
4.1	Rated voltage range, U_{dc}	12 V to 28 V, 24 V_{nom} (instrument equipped with inverse polarity and transient protection)
4.2	Power consumption (at V_{nom})	1.2 W
4.3	Electronics platform/generation	ClampOn DSP II
4.4	Manner of operation	Real-time measurement
4.5	Unit of measurement	Raw value
4.6	Technology (for pig detection)	Passive ultrasonic using piezoelectric transducer and magnetic sensor for magnetic pig detection
4.7	Technology (for vibration measurement)	3-axis MEMS accelerometer 5
4.8	Processing	Digital signal processing (DSP) in instrument
4.9	Calibration	Instrument is factory calibrated
4.10	Design life	25 years
4.11	Detection mode	Acoustic, magnetic, combined acoustic and/or magnetic 1, 7, 8
4.12	Detection direction	Bidirectional
4.13	Detection algorithm (acoustic)	Fixed over Background (FoB) with trigger level, fallback level, trigger time minimum and trigger time maximum. All parameters are configurable 7, 8
4.14	Detection algorithm (magnetic)	Trigger level in magnetic raw value 1, 7, 8
4.15	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
4.16	Detectable magnetic flux density	0.015 mT (0.15 G) to 1.8 mT (18 G) at detection point 1
4.17	Repeatability	Better than 1 %
4.18	Flow conditions	Oil, water, gas, multiphase
4.19	Pipe material	All steel alloys 9

5 Signal		
5.1	Signal types (galvanically isolated)	RS-485, 4-20 mA, relays and reset
5.2	RS-485 (half duplex) protocol	Modbus RTU (default) or proprietary DSP 7
5.3	RS-485 bit rate	2.4 kbps to 115.2 kbps (9.6 kbps default) 7
5.4	4-20 mA (passive, 4-wire)	Configurable raw value range up to 5 000 000. Default 0 to 500 000. 15 mA alarm level when a pig is detected 7, 8
5.5	Relay 1 (for local alarm)	Solid-state SPST, 250 mA rating, programmed NO in listening mode (closed in alarm mode) 7, 8
5.6	Relay 2 (for remote alarm, VFC)	Solid-state SPST, 250 mA rating, programmed NO in listening mode (closed in alarm mode) 7, 8
5.7	Reset	Manual reset by remote switch. Can also be programmed with automatic reset (duration configurable). When reset, all alarms on 4-20 mA and relays are reset to listening mode 7, 8

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6 Installation			
6.1	Mounting	Mounting bracket clamped to pipe by stainless steel clamping bands, or welded to pipe surface. Collar nut secures instrument in mounting bracket	9, 10
6.2	Terminal block connection data	0.5 mm ² to 0.75 mm ² [AWG 20 to AWG 18] conductor (stranded) cross section with ferrule with plastic sleeve	
7 Compliance			15
7.1	Hazardous area location approval	Zone 1, 2 for ATEX/IECEx installations and Zone 1, 2 or Division 2 for cUL _{US} (NEC/CEC) installations	
7.2	ATEX certificate	DEMKO 13 ATEX 1336551X	13
7.3	ATEX marking	Ex II 2 G Ex db IIB T5 Gb -50 °C ≤ T _{amb} ≤ +85 °C	
7.4	ATEX ambient temperature range	-50 °C ≤ T _{amb} ≤ +85 °C	11
7.5	IECEx certificate	IECEx ULD 13.0010X	13
7.6	IECEx marking	Ex db IIB T5 Gb -50 °C ≤ T _{amb} ≤ +85 °C	
7.7	IECEx ambient temperature range	-50 °C ≤ T _{amb} ≤ +85 °C	11
7.8	cUL _{US} file number	E363818	13
7.9	cUL _{US} marking	Class I, Zone 1, AEx d IIB T5 Ex d IIB T5 Gb	12
7.10	cUL _{US} ambient temperature range	-50 °C ≤ T _{amb} ≤ +85 °C	11
7.11	CE marking in conformance with	2014/34/EU (ATEX) 2014/30/EU (EMC)	
7.12	EMC generic standards applied	IEC/EN 61000-6-2 and IEC/EN 61000-6-4	
	Radiated disturbance	CISPR 16-2-3/EN 55016-2-3	
	ESD immunity	IEC/EN 61000-4-2	
	Radiated RF disturbance immunity	IEC/EN 61000-4-3	
	Electric fast transient/burst immunity	IEC/EN 61000-4-4	
	Surge immunity	IEC/EN 61000-4-5	
	Conducted RF disturbance immunity	IEC/EN 61000-4-6	
	Power frequency magnetic field immunity	IEC/EN 61000-4-8	

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- Magnetic PIG detection is optional and requires special add-on electronics during manufacturing.
 - Serial number breakdown: YY (year of manufacture), MM (month of manufacture), XXXXX (unique electronics ID).
 - Various alternatives available.
 - For cUL_{US} installations the instrument can be fitted with any type of plug/adaptor/cable gland provided they are suitably rated to maintain the type of protection. In addition all components utilized (cable included) on the instrument must be UL Listed or UL Recognized.
 - For vibration measurement details, see instrument datasheet addendum. Vibration output is optional and not activated in instrument by default.
 - By default, the pig detector uses acoustic detection, but magnetic detection can also be specified as an option. With magnetic detection, the instrument uses a magnetic field sensor to measure changes in the magnetic flux density near the sensor. Magnetic detection is only available over the RS-485 output.
 - Factory configurable software parameters via RS-485 interface. May also be configured in-field by ClampOn authorised personnel.
 - Parameters available for configuration by client via RS-485 interface with *ClampOn PIG Configuration Tool* software.
 - Instrument waveguide must have metal-to-metal contact with the pipe surface.
 - Mounting bracket available in stainless steel (standard), carbon steel or duplex. Clamping bands available in stainless steel or Inconel.
 - The ambient temperature (T_{amb}) marked on the equipment refers to the temperature of the surroundings, irrespective of any external source of heating, such as process temperature (T_{pipe}), or direct sunlight. The instrument is certified for process temperature ≤ +85 °C. If there is a risk the ambient temperature of the surroundings will exceed T_{amb}, steps must be taken to mitigate this risk, such as installing a sunshade, insulating the pipe, or moving the instrument to another location.
 - Suitable for use in (and additionally marked) Class I, Division 2, Group C T5 as per UL 60079-0 (6th Edition) Clause 29.12.2DV.
 - See certificate and/or installation instructions for Specific Conditions of Use.
 - Supplied with 10 meter cable pre-terminated in instrument by ClampOn, with flying lead at the other end.
 - The instrument may not be marked with all certificates at the same time.