

Instrument Datasheet

DSP PIG Detector Ex d

1 General			Note
1.1	Model description	DSP PIG Detector	
1.2	Explosion protection principle	Flameproof enclosure, Ex d	
1.3	Part number	Various depending on model type and mechanical configuration	
1.4	Serial number	YY-MM-XXXX, unique for each unit	1

2 Physical			
2.1	Dimensions (ø x h)	112 mm x 132 mm [4.4 in x 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 (sensor only)	4 kg [8.8 lb]	
2.5	Weight (with mounting bracket)	4.5 kg [9.9 lb]	
2.6	Ambient temperature	See "Approvals & certification"	
2.7	Ingress protection	IP66/IP68 (1 meter for 24 hours), in accordance with IEC 60529	
2.8	NEMA enclosure type	Type 4X	
2.9	Equipment marking	Stainless steel 316 marking plate on top of enclosure showing product name, part number, serial number, certification, and, if applicable tag number and client information	
2.10	Cable entry configuration	2 off M25x1.5 ISO metric: one entry fitted with Ex certified blanking element, one entry fitted with Ex cable gland	2, 3
2.11	Cable gland	Hawke 501/453/UNIV B M25	2, 3
2.12	Cable length and type	10 m, RFOU(c) S2/S6, 8x2x0.75 mm ² , grey	2, 12



3 Electrical			Note
3.1	Power input	12 VDC to 28 VDC (electronics equipped with inverse polarity and transient protection)	
3.2	Power consumption (typical/maximum)	1.2 W @24 VDC/1.2 W @28 VDC	
3.3	Electronics platform/generation	ClampOn DSP II	
3.4	Microprocessor	600 MIPS	
3.5	Non-volatile memory	8 MB	
3.6	Magnetic field sensor type	Solid state	
3.7	Diagnostic features (with software)	Internal self-testing of analogue filters, amplifiers, and flash memory	

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	4
4.4	Processing	DSP in sensor unit	
4.5	Calibration	All sensors are calibrated to a master signal at factory	
4.6	Detection mode	Acoustic, magnetic, combined acoustic and/or magnetic	4, 5, 6
4.7	Detection direction	Bidirectional	
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	5, 6
4.9	Detection algorithm (magnetic)	Trigger level in magnetic raw value	5, 6
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 flux density	0.015 mT (0.15 G) to 1.8 mT (18 G) at detection point	
4.12	Repeatability	Better than 1 %	
4.13	Flow conditions	Oil, water, gas, multiphase	
4.14	Pipe material	All steel alloys	7

5 Signal			
5.1	RS-485 (half duplex) protocol	Modbus RTU or proprietary DSP	5
5.2	RS-485 baud rate	2.4 kbps to 115.2 kbps	5
5.3	4-20 mA (passive, sink), 4-wire	Configurable raw value range up to 5 000 000. Default 0 to 500 000. 15 mA alarm level when pig detected	5, 6
5.4	Relay1 (for local indication)	SPST, programmed NO in operation (NC in alarm mode) by default	5, 6
5.5	Relay2 (for remote indication, VFC)	SPST, programmed NO in operation (NC in alarm mode) by default	5, 6
5.6	Reset	Manual reset by remote push button. Can also be programmed with automatic reset (duration configurable). When reset, all alarms on 4-20 mA and relays return to operation mode	5, 6

6 Installation			
6.1	Mounting	Mounting bracket clamped to pipe by non-invasive, non-intrusive stainless steel clamping bands, or welded to pipe surface. Collar nut secures sensor in mounting bracket	8
6.2	Conductor (stranded) wire cross section	0.25 mm ² to 0.75 mm ² [AWG 24 to AWG 18] with ferrule with plastic sleeve	

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7 Approvals & certification		13
7.1	Hazardous area location approval	Zone 1, 2 for ATEX/IECEX/EAC Ex, and Zone 1, 2 and Division 2 for cUL_{US} (NEC/CEC)
7.2	ATEX marking	Ex II 2 G Ex db IIB T5 Gb $-50\text{ °C} \leq T_{amb} \leq +85\text{ °C}$
7.3	ATEX certificate	DEMKO 13 ATEX 1336551X
7.4	ATEX ambient temperature range	$-50\text{ °C} \leq T_{amb} \leq +85\text{ °C}$
7.5	IECEX marking	Ex db IIB T5 Gb $-50\text{ °C} \leq T_{amb} \leq +85\text{ °C}$
7.6	IECEX certificate	IECEX ULD 13.0010X
7.7	IECEX ambient temperature range	$-50\text{ °C} \leq T_{amb} \leq +85\text{ °C}$
7.8	cUL_{US} marking	Class I, Zone 1, AEx d IIB T5 Ex d IIB T5 Gb
7.9	cUL_{US} file number	E363818
7.10	cUL_{US} ambient temperature range	$-50\text{ °C} \leq T_{amb} \leq +85\text{ °C}$
7.11	EAC Ex marking	1Ex d IIB T4 Gb $-50\text{ °C} \leq T_{amb} \leq +60\text{ °C}$
7.12	EAC Ex certificate	RU C-NO.ГБ05.В.01181
7.13	EAC Ex ambient temperature range	$-50\text{ °C} \leq T_{amb} \leq +60\text{ °C}$
7.14	CE marking in conformance with	2014/34/EU (ATEX Directive) and 2014/30/EU (EMC Directive)

Notes

- Serial number breakdown: yy (year of manufacture), mm (month of manufacture), xxxxx (unique electronics ID).
- Various solutions available.
- For cUL_{US} installations the sensor can be fitted with any type of Ex plug/Ex adaptor/Ex cable gland provided they are suitably rated to maintain the type of protection. In addition all components utilized (cable included) on the sensor must be "UL Listed and Recognized" and listed in the "virtual" catalogue, the Online Certifications Directory.
- 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.
- Factory configurable software parameters. May also be configured in-field by ClampOn authorised personnel.
- Parameters available for configuration by client/end user through RS-485 with "ClampOn PIG Configuration Tool" software.
- Sensor must have metal-to-metal contact with the pipe surface.
- Mounting bracket in stainless steel (standard), carbon steel or duplex. Clamping bands available in stainless steel or Inconel.
- Temperature class is given at maximum ambient temperature (including any external source of heating, typically process temperature, where applicable).
- 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.
- 10 m cable as standard. Sensor supplied with cable pre-terminated in sensor by ClampOn, with flying lead at the other end.
- The sensor may not be marked with all certificates at the same time.