

Product datasheet

DSP Leak Monitor TSE.DS2D.SA00.E10

1 General		Note	
1.1	Model name	ClampOn DSP Leak Monitor	
1.2	Service description	Non-invasive non-intrusive topside leak monitor	
1.3	Model number	TSE.DS2D.SA00.E10	
1.4	Explosion protection principles employed	Flameproof enclosure, Ex d Increased safety, Ex e	
1.5	Serial number	YY-MM-XXXXX	1



2 Physical			
2.1	Dimensions (ø × h)	114 mm × 168 mm [4.5 in × 6.6 in]	
2.2	Enclosure material	Stainless steel 316L	
2.3	Enclosure protective coating	None by default	
2.4	Weight (instrument only)	3.2 kg [7.1 lb]	
2.5	Equipment marking	Polyester certification label Stainless steel tag plate where applicable	
2.6	Cable entry configuration	2 off M25 × 1.5 ISO metric fitted with brass Ex blanking element	
2.7	Cable gland	By client	2
2.8	Cable	By client	2

3 Environmental		
3.1	Maximum installation altitude	2 000 meters [6 562 feet]
3.2	Ingress protection	IP66/IP68 (10 meters [32.8 feet] for 7 days) tested to IEC 60529 and UL Type 4X tested to UL 50E
3.3	Ambient temperature	See Compliance section
3.4	Storage and transportation temperature	-20 °C to +40 °C
3.5	Storage and transportation humidity	30 % to 70 % (non-condensing)
3.6	Shock (tested to IEC 60068-2-27)	40 g, 6 ms, 100 shocks in each direction
3.7	Vibration (tested to IEC 60068-2-6)	2 Hz to 13.2 Hz (1.0 mm displacement) and 13.2 Hz to 100 Hz (0.7 g acceleration)

4 Operation			
4.1	Rated voltage range, U_{dc}	18 V to 28 V, $U_{nom} = 24$ V (instrument equipped with reverse polarity and transient protection)	3
4.2	Power consumption, at U_{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	9
4.6	Technology (for leak measurement)	Passive ultrasonic using piezoelectric transducer	
4.7	Technology (for vibration measurement)	3-axis MEMS accelerometer	4
4.8	Processing	Digital signal processing (DSP) in instrument	
4.9	Calibration	Instrument is factory calibrated	
4.10	Design life	30 years	
4.11	Repeatability	Better than 1 %	
4.12	Flow conditions	Oil, water, gas, multiphase	
4.13	Minimum detectable leakage	dP >3 bar [44 psi] in liquid dP >1 bar [15 psi] in gas	5
4.14	Pipe material	All steel alloys	6

5 Signal			
5.1	Signal types (galvanically isolated)	RS-485 and 4-20 mA	
5.2	RS-485 (half duplex) protocol	Modbus RTU (default) or proprietary DSP	8, 9
5.3	RS-485 bit rate	2.4 kbps to 115.2 kbps (19.2 kbps default)	
5.4	4-20 mA	Type 4 fully isolated 4-wire transmitter in accordance with ISA 50.00.01. Configurable raw value range 0 to 5 000 000 (default 0 to 500 000)	8, 9

6 Installation			
6.1	Mounting	Mounting bracket clamped to pipe/valve using stainless steel clamping bands or welded to pipe/valve surface. Collar nut secures instrument in mounting bracket	6, 10
6.2	Terminal block connection data	0.5 mm ² to 2.5 mm ² [AWG 20 to AWG 14] stranded conductor (with ferrule with plastic sleeve) cross section	

Product datasheet

DSP Leak Monitor TSE.DS2D.SA00.E10



7 Compliance		14
7.1	Hazardous area location approval	Zone 1, 2 for ATEX/IECEx installations and Zone 1, 2 or Division 2 for cULus (NEC/CEC) installations
7.2	ATEX certificate	UL 20 ATEX 2422X
7.3	ATEX marking	Ex II 2 G Ex db eb IIB T5...T4 Gb $-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.4	ATEX ambient temperature range	$-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.5	IECEx certificate	IECEx ULD 20.0023X
7.6	IECEx marking	Ex db eb IIB T5...T4 Gb $-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.7	IECEx ambient temperature range	$-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.8	cULus file number	E363818
7.9	cULus marking	Class I Zone 1 AEx db eb IIB T5...T4 Gb Ex db eb IIB T5...T4 Gb $-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.10	cULus ambient temperature range	$-50\text{ }^{\circ}\text{C} \leq T_{\text{amb}} \leq +55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$
7.11	CE marking in conformance with	2014/34/EU (ATEX) 2014/30/EU (EMC) 2011/65/EU and 2015/863/EU (RoHS)
7.12	RCM marking in conformance with	Radiocommunications Act 1992
7.13	EMC generic standards applied	IEC/EN 61000-6-2, IEC/EN 61000-6-4 and IEC 60533
	Conducted emissions	CISPR 16-2-1
	Radiated emissions	CISPR 16-2-3
	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
	Dips and interruptions immunity	IEC/EN 61000-4-11
	Voltage / frequency variations immunity	IEC/EN 61000-4-11
	Conducted LF disturbance immunity	IEC/EN 61000-4-16

Notes

- Serial number breakdown: YY (year of manufacture), MM (month of manufacture), XXXXX (unique electronics ID).
- Various alternatives available. Cable gland and cable by client in accordance with local and/or national Ex installation regulations that apply.
- The instrument must be powered from a safety extra low voltage (SELV) power supply.
- For vibration measurement details, see instrument datasheet addendum. Vibration output is optional and not activated in instrument by default.
- Minimum leak rate is 0.1 l/min [0.026 gal/min], depending on delta pressure (dP) across the leak point.
- Sensor waveguide must have metal-to-metal contact with the pipe surface.
- Factory configurable software parameters via RS-485 interface. May also be configured in-field by ClampOn authorised personnel.
- 4-20 mA only recommended for raw value trending. ClampOn recommends digital (Modbus RTU or DSP) output to enable leak calculation.
- The instruments' UOM is raw value. To calculate leak rate (l/min), send instrument raw value, (live) inlet pressure and valve status to a PC or PAC programmed with fluid type, valve type and inlet ID.
- Mounting bracket available in stainless steel (standard), carbon steel or duplex. Clamping bands available in stainless steel.
- The ambient temperature (T_{amb}) of $-50\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C} \dots +80\text{ }^{\circ}\text{C}$ marked on the instrument refers to the temperature of the immediate surroundings. The instrument will have different T-classes (see Ex certificate) depending on any external source of heating, such as process temperature (T_{pipe}), or direct sunlight. If there is a risk the T_{amb} and T_{pipe} temperature ratings will exceed those listed in the Ex certificate, steps must be taken to mitigate this risk, such as installing a sunshade, insulating the pipe, or moving the instrument to another location.
- See certificate and/or user manual for Specific Conditions of Use.
- Suitable for use in (and additionally marked) Class I Division 2 Groups C, D T5...T4.
- The instrument may not be marked with all certificates at the same time.