Product datasheet
CEM® Corrosion-Erosion Monitor TSE.CE2M.SR00.G10

1	General		Note
1.1	Model name	ClampOn CEM® Corrosion-Erosion Monitor	
1.2	Service description	Non-invasive non-intrusive topside corrosion-erosion monitor	
1.3	Model number	TSE.CE2M.SR00.G10	
1.4	Explosion protection principles employed	Increased safety, Ex e Encapsulation, Ex m Non-incendive, NI	
1.5	Serial number	YY-MM-7XXXX	1

2	Physical		
2.1	Dimensions (w × h × d)	406 mm × 406 mm × 163 mm [16 in × 16 in × 6.4 in]	
2.2	Enclosure material	Stainless steel 316L	
2.3	Enclosure protective coating	None by default	
2.4	Weight	15 kg (±1 kg) [33.1 lb (±2.2 lb)]	
2.5	Equipment marking	Polyester certification label Stainless steel tag plate where applicable	
2.6	Cable entry configuration	32 off ⌀16 clearance holes for transducers. 2 off ⌀20 clearance holes for power/signal. Unused entries fitted with brass Ex blanking elements	2
2.7	Number of EMAT transducers	4 to 32	3
2.8	Cable gland	Brass Ex cable gland for transducers	2
2.9	Cable	By client	2, 4

3	Environmental	
3.1	Maximum installation altitude	2 000 meters [6 562 feet]
3.2	Ingress protection	IP66 tested to IEC 60529 and UL Type 4 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)

4	Operation		
4.1	Rated voltage range, U_{dc}	18 V to 32 V, U_{nom} = 24 V (instrument equipped with reverse polarity and transient protection)	5
4.2	Power consumption, at U_{nom}	6.5 W operational (4.5 W in standby/idle)	
4.3	Electronics platform/generation	CEMAT II	
4.4	Manner of operation	Real-time wall thickness trending using guided waves	6, 9
4.5	Unit of measurement	Remaining wall thickness (mm)	
4.6	Design life	25 years	
4.7	Sensitivity	0.1 %	7
4.8	Wall thickness range	8 mm to 50 mm [0.3 in to 2.0 in] depending on EMAT transducer	8
4.9	Coverage distance	Typical 30 cm to 100 cm [11.8 in to 39.4 in]	8
4.10	Coverage area	Typical 0.3 m² to 1 m² [3.2 ft² to10.8 ft²]	8
4.11	Minimum pipe OD	114 mm [4 inch NPS] with no limitation in maximum pipe diameter	8
4.12	Flow conditions	Any	
4.13	Pipe material	All steel alloys	

5	Signal		
5.1	Signal types	RS-485	
5.2	RS-485 (half duplex) protocol	Modbus RTU	6, 9
5.3	RS-485 bit rate	115.2 kbps	

6	Installation	
6.1	Mounting	To be installed in close vicinity of pipe using the enclosure's mounting lugs
6.2	Terminal block connection data	0.25 mm² to 1.5 mm² [AWG 24 to AWG 16] stranded conductor (with ferrule with plastic sleeve) cross section

7	Compliance		13
7.1	Hazardous area location approval	Zone 1, 2 for ATEX/IECEx installations and Division 2 for $_{c}UL_{us}$ (NEC/CEC) installations	
7.2	ATEX certificate	DEMKO 16 ATEX 1530X	12
7.3	ATEX marking	Ex II 2 G Ex eb mb IIC T6…T3 Gb	
7.4	ATEX ambient temperature range	−40 °C ≤ T_{amb} ≤ +60 °C (head unit) −40 °C ≤ T_{amb} ≤ +180 °C (transducer)	10
7.5	IECEx certificate	IECEx ULD 16.0024X	12
7.6	IECEx marking	Ex eb mb IIC T6…T3 Gb	
7.7	IECEx ambient temperature range	−40 °C ≤ T_{amb} ≤ +60 °C (head unit) −40 °C ≤ T_{amb} ≤ +180 °C (transducer)	10
7.8	$_{c}UL_{us}$ file number	E354507	12
7.9	$_{c}UL_{us}$ marking	Class I Division 2 Groups A, B, C, D, T6…T3	
7.10	$_{c}UL_{us}$ ambient temperature range	−40 °C ≤ T_{amb} ≤ +60 °C (head unit) −40 °C ≤ T_{amb} ≤ +180 °C (transducer)	10
7.11	CE marking in conformance with	2014/34/EU (ATEX) 2014/30/EU (EMC)	
7.12	EMC standards applied	IEC/EN 61000-6-2, IEC/EN 61000-6-4, IEC/EN 61326-1, IEC/EN 60945, 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	
	Conducted LF disturbance immunity	IEC/EN 61000-4-16	

Notes

1. Serial number breakdown: YY (year of manufacture), MM (month of manufacture), 7XXXX (unique electronics ID).
2. Various alternatives available.
3. Two transducer rings with 2 to 16 transducers in each ring. Separation between the rings is from 2 × OD to 5 × OD, depending on system configuration. Transducers are typically mounted equidistantly around the circumference of the pipe. Numbers of transducers and their positions are project dependent.
4. Cable gland and cable for field termination by client in accordance with local and/or national Ex installation regulations that may apply.
5. The instrument must be powered from a safety extra low voltage (SELV) power supply and with an external fuse rated 10 A, 230 V, 1 500 A breaking capacity, supplied or approved by ClampOn.
6. An automation controller (running NI Linux RT) or computer (real or virtual) running ClampOn CEM® Server is required to handle communication with the instrument, data processing, and (if applicable) communication with the client control system. For system configuration a ClampOn CEM® Client software is required. Supported PC operating systems of these applications are Windows 10, Windows 11 or Windows Server 2016 or newer (32 bit and 64 bit).
7. Sensitivity refers to wall thickness change, relative to correctly set baseline wall thickness. The repeatability of single measurements is <1 %.
8. Limitations depend upon pipe geometry and configuration.
9. Communication protocol is Modbus RTU per Modicon PI-MBUS-300, with user defined function codes.
10. The ambient temperature marked on the instrument refers to the temperature of the immediate surroundings, irrespective of any external source of heating, such as process temperature (T_{pipe}), or direct sunlight. If there is a risk the T_{amb} 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.
11. Head unit is T5 classified at listed T_{amb} while the transducers are T6…T3 classified depending on T_{amb}. See certificate and/or user manual for correlation between T_{amb} and temperature class.
12. See certificate and/or user manual for Specific Conditions of Use.
13. The instrument may not be marked with all certificates at the same time.