Ex EQUIPMENT TYPE EXAMINATION REPORT

1)

2) TE Report Number: **KLPL/Ex/16-014X Issue no.02** **Dated: 23.06.2024**

3) **Ex Equipment:** **Continuous Earth Monitoring system**
Model: CEMS-0313

4) **Manufacturer:** **M/s ESD Control Systems**
Plot No. 41, Venkateswara Enclave,
Suchitra 'x' Roads, Jeedimetla,
Hyderabad-500067, Telangana.

5) This equipment and any acceptable variation thereto are specified in the schedule to this report and the documents therein referred to

6) Karandikar Laboratories Pvt. Ltd. reports that this equipment has been found to comply with requirements of the following standards relating to the design and construction of equipment for explosive gas/dust atmospheres as applicable.

7) This TE Report was issued as verification that a sample, was assessed, tested and found to comply with the IS / IEC standards listed below.
IS/IEC 60079-0: 2017 & IS/IEC 60079-11: 2011

8) The Examination and Test results are recorded in KLPL's confidential
Report No.: KLPL/Ex/ ESD-24/001 **Dated: 23.06.2024**

9) The sign X if placed after the TE report number; it indicates that the equipment is subject to specific conditions of use specified in the schedule to this TE Report.

10) This Report does not indicate compliance with electrical safety and performance requirements other than those expressly included in the above listed standards.

11) The marking of the Equipment shall include the following:

Ex Code:
Ex db [ib] IIC T6 Gb (-10 °C ≤ Ta ≤ +50 °C)

KARANDIKAR LABORATORIES PVT. LTD. BOISAR 401 501.

A. V. Karandikar

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12) Details of Type Examination Reports Issued: -

TE Report No.	Issue No.	Report No.	Date	Reason for Issue
KLPL/Ex/16-014X	00	KLPL/Ex/ESD-16/001	31.01.2016	Original test report.
KLPL/Ex/16-014X	01	KLPL/Ex/ESD-23/003	30.03.2023	Revalidation: No design change, Evaluation as per new standard IS/IEC 60079-0: 2017 and IS/IEC 60079-11:2011
KLPL/Ex/16-014X	02	KLPL/Ex/ESD-24/001	23.06.2024	Addendum: Changing of Gas group from IIB to IIC

13) Description of equipment

The Continuous Earth Monitoring System - CEMS 0313 provides 20 channels of Intrinsically Safe Earth Loop check links. The instrument scans its Channels for 5 sec's and all other 19 Channels are inhibited and thus no interference due to aggregation of number of loop check currents.

The System consists of two parts i.e. Safe Area Unit & Hazardous Area Apparatus

The equipment consist of three parts, 1) The Power Supply 2) The Control and Display Circuit 3) The termination

1) The Power supply is housed in 1.2 mm Thick MS Box with Hinged open able Cover enclosure Wall Mounting with 4 Nos. of Screw fitting in eyelets fitted outside the Box and is to be placed in safe area. It carries the electrical function of Mains Control Network Detection for Over Voltage and Over Current due to faults in secondary currents, in addition to actuate Fuse Protection. It houses Low Voltage Regulators -a) +9 Volts at 15 mA, b) +7.5 Volts at 30 mA, c) +5 Volts at 180 mA. The Electrical Specifications for this power supply is Power Input: 230 Volts Single Phase, suitable for Voltage Range: 210 to 270 Volts, with a Power Burdon of Less than 11 Watts.

2) In the hazardous area, two enclosure the Ex d enclosure housing the control circuit and the Terminal enclosure are placed on a base plate and are connected with each other by a pair of cables. The electrical arrangement is suitable for Zone 1 application for IIC gases. The external fittings on the Ex d enclosure are operating push buttons 3 nos., Buzzer, Placed on the Top of FLP Unit, gives Aural Indication of Faulty Earth Loop of Channel under scanning and the certified Ex d cable glands. The above Ex d enclosure, the buzzer and the Push buttons are certified component, the certificates attached in the documents.

The cable entry into the Ex d enclosure is through certified Ex d cable glands, Cable Entry-1 Top Left Side of FLP Unit with 3/4" FLP Gland, Cable of 1.5 sq.mm. x 4 Core Armoured Flexible Cable.

Cable Entry-2 & 3: Bottom Side of FLP Unit with 3/4"FLP Glands (2 Nos.) Cable being 1 sq mm x 12 Core Unarmoured Flexible Cable for Ex I signal going into hazardous area.

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Cable Entry-4: This cable entry is used for connecting the External Buzzer to its power supply inside the Ex d enclosure. Here again 3/4" FLP Gland, Cable of 1.5 sq.mm. x 2 Core Armoured Flexible Cable is recommended.

The third enclosure is of S.S material and meets the requirements of IP 54 and houses the terminals blocks on which the hazardous area connections will be terminated:

Intrinsically Safe Connection facility for 20 Channel outputs provided, the terminals used are Ex e certified suitable for handling more than maximum current envisaged.

Cable Entry-1 & 2: On Top Side of J. Box with 3/4" FLP Gland (2Nos.) with a Cable: 1 sq.mm x 12 Core Unarmoured Flexible Cable

Cable Entry-3 & 4: Bottom Side of J. Box with 3/4" FLP Gland (2Nos.) with a Cable: 1 sq.mm x 12 Core Unarmoured Cable

Cable Entry-5 & 6: Bottom Side of J. Box with 1/2" FLP Gland (2 Nos.) with a Cable: 4 sq. mm Multistring PVC Wires

14) Model Designation:

Model No.	Product	Rating
CEMS-0313	Continuous Earth Monitoring system	Refer Point 17

15) Drawings & Documents

Drawing Number	No. of sheets	Rev No.	Date	Title
ESD_313_01.10_DOC_01	2	02	25.01.2024	CEMS-Application and working
ESD_313_01.10_DOC_03	3	02	25.01.2024	CEMS-System Block diagram Illustration
ESD_313_01.10_DOC_13	3	02	25.01.2024	CEMS-Details of Conformal Coating
ESD_313_01.10_DOC_14	2	02	25.01.2024	CEMS-Details of Gasket
ESD_313_01.10_DOC_15	6	02	25.01.2024	CEMS-PCB Layout Diagrams (Gerber Files)
ESD_313_01.10_DOC_16	17	02	25.01.2024	CEMS-Cable / Wiring Charts & Drawings
ESD_313_01.10_DOC_17	7	02	25.01.2024	CEMS-Circuit Diagrams of PCBs
ESD_313_01.10_DOC_18	15	02	25.01.2024	CEMS-BoM of PCBs
ESD_313_01.10_DOC_20	7	02	25.01.2024	CEMS-BoM of Hardware Area Apparatus
ESD_313_01.10_DOC_21	7	02	25.01.2024	CEMS-BoM of Safe Area Unit
ESD_313_01.10_DOC_24	26	02	25.01.2024	CEMS-General Arrangement Drawings
ESD_313_01.10_DOC_25	1	02	25.01.2024	CEMS-Material of Construction

Drawings listed above are finally accepted as accurately representing the product *for which this evaluation report has been prepared. These drawings provide necessary information as required by the above referred standards.*

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16) Temperature Class:

Considering the ambient temperature range of -10°C to +50 °C, the requested temperature class of "T6" is acceptable.

17) Electrical Rating:

Input supply:

Um= 253 Vrms

Output supply:

Uo = 9.02 Vdc, Io = 36 mA, Po = 0.324 W, Lo = 10 mH, Co = 2.2 µF

18) Specific conditions of use: Nil

Conditions of Manufacturer: -

The equipment shall be enclosed in an enclosure appropriately certified by PESO for EPL Gb with gas group IIC.

19) Routine test:

- Dielectric strength test, in accordance with IS/IEC 60079-11 Clause 10.3, conducted on insulation between intrinsic safe circuit and the frame of the equipment at gradual application of test voltage at 500 Vrms for one minute. No evidence of flashover or breakdown shall be observed; the maximum current flowing do not exceed 5.0 mA.
- Dielectric strength test, in accordance with IS/IEC 60079-11 Clause 10.3, conducted on insulation between intrinsic safe circuit and non-intrinsic safe circuit of the equipment at gradual application of test voltage at 1500 Vrms for one minute. No evidence of flashover or breakdown shall be observed, the maximum current flowing do not exceed 5.0 mA.

END OF DOCUMENT

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