1) **Ex EQUIPMENT TYPE EXAMINATION REPORT**

2) TE Report Number: **KLPL/Ex/23-009 Issue no.00** **Dated: 17.01.2023**

3) **Ex Equipment:** **MTL5501-SR Failsafe Switch/Proximity Detector Interface**

4) **Manufacturer:** **MTL Instruments Private Limited,**
#3, Old Mahabalipuram Road, Shollinganallur, Chennai – 600119, INDIA.

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/MTL-23/004 **Dated: 17.01.2023**

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 ia Ma] I (-20°C ≤ Ta ≤ +60°C)
[Ex ia Ga] IIC (-20°C ≤ Ta ≤ +60°C)
[Ex ia Da] IIIC (-20°C ≤ Ta ≤ +60°C)

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SCHEDULE

12) **Details of Type Examination Reports Issued: -**

TE Report No.	Issue No.	Report No.	Date	Reason for Issue
KLPL/Ex/23-009	00	KLPL/Ex/MTL-23/004	17.01.2023	Original issue

13) **Description of equipment**

The MTL5501-SR Failsafe Switch / Proximity Detector Interface is designed to provide an interface between unspecified non-hazardous area apparatus and an intrinsically safe circuit in the hazardous area. The apparatus is intended to provide a galvanically isolated fail-safe, safe-area output whilst monitoring a fail-safe proximity switch detector located in the hazardous area. Line Fault Detection (LFD) in the apparatus is provided by volt-free relay contact output on the non-hazardous area side of the apparatus. Two transformers and a relay provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises two isolating transformers, an Opto-isolator, fuses, zener diodes and resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. LED indication is provided for power-on, the output status and line fault detection.

The MTL5501-SR models are designed to be DIN rail mounted instead of being mounted on a backplane and has its non-hazardous area connections via plug and sockets connections on the top and side of the enclosure instead of via the backplane connector on the bottom of the apparatus. The apparatus connections on the backplane connector on the MTL5501-SR models are disconnected on the common PCB by the removal of links by the manufacturer.

The degree of ingress protection of IP 20 as per IS/IEC 60529: 2001 is achieved by enclosure.

14) **Model Designation:**

Model No.	Product	Rating
MTL5501-SR	Failsafe Switch / Proximity Detector Interface	Refer Point 17 below

15) **Drawings & Documents**

Drawing Title	Document Number	Rev. No.	Date MM.YY	No. of Pages
MTL4500 and MTL5500 Conformal Coating	CI4500-6 (I)	1	12.10	1 of 1
PARTS LIST FOR THE MTL4501-SR AND MTL5501-SR	CI4501-1 (I)	2	04.14	1 of 6
CIRCUIT DIAGRAM FOR MTL4501-SR/MTL5501-SR	CI4501-1 (I)	1	03.08	2 of 6

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MTL4501-SR/MTL5501-SR TRACK LAYOUT	CI4501-1 (I)	1	05.08	3 of 6
MTL4501-SR/MTL5501-SR COMPONENT LAYOUT	CI4501-1 (I)	2	01.13	4 of 6
PCB Detail for TPL308	CI4501-1 (I)	1	04.08	5 of 6
New 5500 outline	CI5500-100 (I)	3	01.13	1 of 1
MTL5501-SR SIDE LABEL	CI5501-SR-701	1	01.23	1 of 1
PARTS LIST FOR MTLS501-SR	CI4501-3 (I)	1	12.22	1 to 3

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.*

16) **Temperature Class:**

MTL5501-SR Failsafe Switch / Proximity Detector Interface is an associated apparatus which will be placed in a non-Hazardous area and does not require a temperature class.

17) **Electrical Rating:**

Non-Hazardous Area Terminals 7, 8, 10, 11, 13 & 14

Um = 253V r.m.s.

The circuit connected to non-hazardous area terminals 13 & 14 is designed to operate from a d.c. supply voltage of upto 35 V.

The non-hazardous area terminals 10 & 11 are connected to relay contacts which can switch up to 253Vr.m.s, 2A r.m.s and maximum 100V A.

Hazardous Area Terminals 1 w.r.t. 2

Uo = 9.7 V, Io = 30 mA, Po = 0.07 W, Ci = 0, Li = 0

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load connected must not exceed the following values:

TABLE 1

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	L/R RATIO (µH/ohm)
IIC	3.5	39	475
IIB**	24	145	1829
IIA	170	299	3093
I	320	501	6414

**Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

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Note:

The above load parameters apply when one of the two conditions below is given:

The total Li of the external circuit (excluding the cable) is < 1% of the Lo, value or

The total Ci of the external circuit (excluding the cable) is < 1% of the Co, value.

The above parameters are reduced to 50% when both of the two conditions below are given:

The total Li of the external circuit (excluding the cable) is ≥ 1 % of the Lo, value and

The total Ci of the external circuit (excluding the cable) is ≥ 1 % of the Co value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 µF for Groups IIB, IIA & I and 600nF for Group IIC.

18) **Specific conditions of use:** Nil

19) **Routine test:**

Routine test is to be carried out on each infallible switching transformer, it shall comply the dielectric test of Cl 11.2 IS/IEC 60079-11: 2011

At 1500 Vac between the primary and secondary windings.

At 500 Vac between all the windings and the core or screen.

During these tests, there shall be no breakdown of the insulation between windings.

END OF DOCUMENT

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