Karandikar Laboratories

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F 08 CE Rev. 02

1) **Ex EQUIPMENT TYPE EXAMINATION REPORT**

2) TE Report Number: **KLPL/Ex/23-012 Issue no.00** **Dated: 17.01.2023**

3) **Ex Equipment:** **MTL5573 Temperature Convertor**

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-23/007 **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/23-012	00	KLPL/Ex/MTL-23/007	17.01.2023	Original issue

13) **Description of equipment**

The MTL5573 Temperature Converters are designed to restrict the transfer of energy from unspecified non-hazardous area equipment to either thermocouples or RTD's located in the hazardous area by limitation of voltage and current. A transformer and Opto-isolator provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The MTL5573 Temperature Converters are designed for connection to thermocouples or two, three or four wire RTD's situated in the hazardous area. The apparatus converts the low level D.C. signal from the sensor mounted in the hazardous area into a 4/20mA current for driving a load in the non-hazardous area. An optional cold junction compensation (CJC) plug can be fitted to the hazardous area connection which alter the internal connections and affects the output parameters.

The equipment comprises an isolating transformer, an Opto-isolator, duplicated zener diode chains and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board (PCB) and housed in a moulded plastic enclosure.

Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. A jack socket is provided for the connection of a suitably certified data terminal for programming the equipment.

The electronic circuitry is housed in a plastic enclosure, which provides a degree of protection of not less than IP20 in accordance with IS/IEC 60529: 2001.

14) **Model Designation:**

Model No.	Product	Rating
MTL5573	Temperature Convertor	Refer Point 17 below

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15) **Drawings & Documents**

Drawing Title	Document Number	Rev. No.	Date MM.YY	No. of Pages
CIRCUIT DIAGRAM FOR MTL4573/MTL5573	CI4573-1 (I)	2	10.14	1 of 1
MTL4573/MTL5573 PARTS LIST	CI4573-2 (I)	2	10.14	1 to 3
PCB DETAIL FOR TPL301	CI4573-6 (I)	1	10.13	1 of 1
MTL4573/MTL5573 TRACK LAYOUT	CI4573-3 (I)	2	10.14	1 of 1
MTL4573/MTL5573 COMPONENT ASSEMBLY	CI4573-4 (I)	2	10.14	1 of 2
New 5500 outline	CI5500-100 (I)	3	1.13	1 of 1
MTL5573 SIDE LABEL	CI5573-701	1	12.22	1 of 1
MTL5573 PARTS LIST	CI4573-3 (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:**

MTL5573 Temperature Convertor is an associated apparatus which will be placed in a non-Hazardous area and does not require a temperature class.

17) **Electrical Rating:**

Electrical Parameter:

Non-Hazardous Area Terminals 11 to 14

Um = 253V r.m.s.

The apparatus is designed to operate on the above terminals from a d.c. Supply voltage of up to 35V.

Hazardous Area Terminals 1 to 5 (forming part of the same intrinsically safe circuit)

Uo = 6.6 V, Io = 76 mA, Po = 0.13 W, Ci = 0, Li = 0

Hazardous Area Terminals 3 w.r.t. 1 (WITHOUT the Cold Junction Compensation (CJC) plug fitted) Uo = 1.1 V, Io = 7 mA, Po = 2 mW, Ci = 0, Li = 0

Hazardous Area Terminals 3, 2 & 1 (with or without CJC plug fitted)

Uo = 6.6 V, Io = 10 mA, Po = 17 mW, Ci = 0, Li = 0

Programming / Configuration Port (Jack Socket)

Uo = 8 V, Io = 14.6 mA, Po = 26 mW, Ui=9.1 V, Ci = 0, Li = 0

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The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area load connected to hazardous area terminals 1 to 6 and the programming / configuration port must not exceed the following values:

TABLE 1

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	L/R RATIO (µH/ohm)
Hazardous Area Terminals 1 to 6			
IIC	22	6.42	288
IIB**	500	25.6	1057
IIA	1000	53.0	2228
I	1000	77.2	3402
Programming I Configuration Port (Jack Socket)			
IIC	0.367	153	349
IIB**	2.15	591	1355
IIA	8.8	1000	1453
I	12.32	1000	1453

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

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

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19) **Routine test:**

Routine test is to be carried out on each infallible switching transformer, it shall comply the dielectric test of Cls 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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