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Karandikar Laboratories



F 08 CE Rev. 02

- 1) **Ex EQUIPMENT TYPE EXAMINATION REPORT**
- 2) TE Report Number: **KLPL/Ex/23-008** Issue no.00 **Dated: 17.01.2023**
- 3) **Ex Equipment:** **MTL5546Y Single Channel Isolating Driver, 4/20mA for Smart I/P Converters**
- 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-23/003 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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Atul Marathe

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Technical Manager

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Dated: 17.01.2023

SCHEDULE



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12) Details of Type Examination Reports Issued: -

TE Report No.	Issue No.	Report No.	Date	Reason for Issue
KLPL/Ex/23-008	00	KLPL/Ex/MTL-23/003	17.01.2023	Original issue

13) Description of equipment

The MTL5546Y Single Channel Isolating Driver, 4-20mA for Smart I/P Converters accepts a 4/20mA signal from a controller located in the non-hazardous area to drive a load in the hazardous area. It permits bi directional transmission of digital signals to and from an operator station or hand-held communicator. The apparatus restricts the transfer of energy from unspecified non-hazardous area apparatus to an intrinsically safe circuit by limitation of voltage and current. Three transformers provide galvanic isolation between the hazardous and non-hazardous area circuitry. The apparatus comprises a power transformer, two current transformers, zener diodes and current limiting 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. The MTL5546Y has the Line Fault Detection (LFD) facility disabled.

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
MTL5546Y	Single Channel Isolating Driver, 4/20mA for Smart I/P Converters	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 MTL4546/MTL4546Y/MTL5546 &MTL5546Y	CI4546-1 (I)	3	10.08	1 of 7
CIRCUIT DIAGRAM FOR MTL4546/MTL4546Y/MTL5546 &MTL5546Y	CI4546-1 (I)	6	10.12	2 of 7
MTL4546/MTL4546Y/MTL5546 &MTL5546Y Track Layout	CI4546-1 (I)	3	06.07	3 of 7
MTL4546/MTL4546Y/MTL5546 &MTL5546Y COMPONENT LAYOUT	CI4546-1 (I)	6	10.12	4 of 7
PCB DETAIL FOR TPL300 AND TPL302	CI4546-1 (I)	2	01.07	5 of 7
PCB DETAIL FOR TPL301	CI4546-1 (I)	2	01.07	6 of 7

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New 5500 outline	CI5500-100 (I)	3	01.13	1 of 1
MTL5546Y SIDE LABEL	CI5546Y-701	2	06.22	1 of 1
PARTS LIST FOR MTL5546Y	CI4546-3 (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:

MTL5546Y Single Channel Isolating Driver, 4/20mA for Smart I/P Converters 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 11 to 14

$U_m = 253V$ r.m.s.

The circuit connected to non-hazardous area terminals 11 to 14 are designed to operate from a d.c. supply voltage up to 35 V.

Hazardous Area Terminals 2 w.r.t. 1

$U_o = 28 V$, $I_o = 93 mA$, $P_o = 0.65 W$, $C_i = 0$, $L_i = 0$

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 ($\mu H/ohm$)
IIC	0.083	4.2	56
IIB**	0.65	12.6	210
IIA	2.15	33.6	444
I	3.76	53.7	668

**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 L_i of the external circuit (excluding the cable) is $< 1\%$ of the L_o value or

The total C_i of the external circuit (excluding the cable) is $< 1\%$ of the C_o value.

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





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

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

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu\text{F}$ 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 CI 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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