1 # EC-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

3 EC-Type Examination Certificate Number : **BAS01ATEX7161**

4 Equipment or Protective System: **MTL5073 TEMPERATURE CONVERTER**

5 Manufacturer: **MEASUREMENT TECHNOLOGY LIMITED**

6 Address: **Luton, Bedfordshire, LU1 3JJ**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 The Electrical Equipment Certification Service, notified body number 600 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report N°

01(C)0220 dated 18 December 2001 (held on EECS 0703/02/299)

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014: 1997 + Amds 1 & 2 **EN 50020: 1994**

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "**X**" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following:-

Ex II (1) GD [EEx ia] IIC ($-20°C \leq T_a \leq +60°C$)

File No: EECS 0703/02/336

This certificate is granted subject to the general conditions of the Electrical Equipment Certification Service. It does not necessarily indicate that the apparatus may be used in particular industries or circumstances.

HSE Health & Safety Executive

Electrical Equipment Certification Service
Health and Safety Executive
Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom
Tel: +44(0)1298 28000 Fax: +44(0)1298 28244
internet: www.baseefa.com e-mail: baseefa.info.eecs@hsl.gov.uk

pp I M CLEARE
DIRECTOR
29 April 2002

Re-issued 5 July 2002 to correct drawing numbers and issue numbers.

13 **Schedule**

14 **EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161**

15 **Description of Equipment or Protective System**

An **MTL5073 Temperature Converter** is designed to restrict the transfer of energy from unspecified safe area apparatus to either thermocouples or RTDs by the limitation of voltage and current. A transformer and an opto-isolator provide galvanic isolation between the hazardous and non hazardous circuitry.

The apparatus comprises of an isolating transformer, an opto-isolator and a detection circuit protected by zener diodes/resistance combinations to provide voltage and current limitation. A jack-socket is provided for the connection of a suitably certified data terminal for programming the apparatus. 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 the hazardous and non-hazardous connections.

CON 4, Pins 10, 11, 12 and CON 5, Pins 13 &14

$U_m = 250V$

The circuit connected to the safe area terminals CON 4 and CON 5 is designed to operate from a d.c. supply voltage of up to 35V.

CON 1 pins 1, 2, 3 and CON 2 pins 4, 5, 6

$U_o = 6.6V$
$I_o = 76mA$
$P_o = 0.13W$
$C_i = 0$
$L_i = 0$

CON 1 pin 3 wrt pin 1

$U_o = 1.1V$
$I_o = 7mA$
$P_o = 2mW$
$C_i = 0$
$L_i = 0$

CON 6 (Jack-socket)

$U_o = 7.2V$
$I_o = 14.6mA$
$P_o = 26mW$
$C_i = 0$
$L_i = 0$

The output from CON 6 and CON 1/CON 2 are considered to be separate Intrinsically Safe Supplies.

13 Schedule

14 EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161

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

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR L/R RATIO (μH/ohm)
Connectors CON 1 and CON 2			
IIC	22	6.42	288
IIB	500	25.6	1057
IIA	1000	53.0	2228
Connector CON 6 (Jack-socket)			
IIC	13.5	153	1295
IIB	240	591	2028
IIA	1000	1000	2028

Equipment referred to in this certificate having the same type number as items in BASEEFA Certificate No Ex 96D2234 may be used as a direct substitute in a system provided that the cable parameters used are within the limits shown on this certificate.

VARIATION 0.1

To permit changes to the safe area circuit, an alternative transformer, and an increase in the fuse ratings of the MTL5073, to form a Three Port Isolated Temperature Converter Type MTL5074. The circuit components are mounted on a different four layer printed circuit board, but within the same enclosure and using the same polarised plugs and sockets for the hazardous and non-hazardous area connections. A jack-socket is provided for the connection of a suitably certified data terminal for programming the apparatus.

The MTL5074 Three Port Isolated Temperature Converter is designed for connection to either thermocouples or two, three or four wire RTDs which may be situated within a hazardous area. An optional Cold Junction Compensation Plug may be fitted to CON 1, which alters the internal connections and affects the output parameters. In the MTL5074 Converter, the safe area signal circuit is isolated from the power supply circuit.

CON 4, Pins 10, 11, 12 and CON 5, Pins 13 &14

$U_m = 250V$

The circuit connected to the safe area terminals on CON 4 and CON 5 is designed to operate from a d.c. supply voltage of up to 35V.

13 **Schedule**

14 **EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161**

The hazardous area circuit may be considered as one of the following circuits, each having different output parameters at CON 1 and CON 2 depending upon the installation. For simplicity the load parameters at CON 1 and CON 2 are identical for each circuit option.

a) CON 1 and CON 2 (pins 1 to 6 forming part of the same intrinsically safe circuit)

$U_o = 6.6V$
$I_o = 76$ mA
$P_o = 130mW$
$C_i = 0$
$L_i = 0$

b) CON 1 pin 3, pin 2 and pin 1 (with or without the Cold Junction Compensation Plug fitted)

$U_o = 6.6V$
$I_o = 10mA$
$P_o = 17mW$
$C_i = 0$
$L_i = 0$

c) CON 1 pin 3 wrt pin 1 ONLY (WITHOUT the Cold Junction Compensation Plug fitted)

$U_o = 1.1V$
$I_o = 7mA$
$P_o = 2mW$
$C_i = 0$
$L_i = 0$

Each circuit shares common output and load parameters at CON 6 which may be considered as a separate intrinsically safe circuit in each case.

CON 6 (Jack-socket)

$U_o = 8.3V$ $U_i = 11.2V$
$I_o = 15mA$ $I_i = 12mA$
$P_o = 26mW$ $P_i = 280mW$
$C_i = 0$
$L_i = 0$

The output from CON 1/CON 2 and CON 6 are considered to be separate intrinsically safe supplies.

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

13 **Schedule**

14 **EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161**

GROUP	CAPACITANCE	INDUCTANCE	OR	L/R RATIO
	(μF)	(mH)		(μH/ohm)
CON 1 and CON 2				
IIC	22	6.42		288
IIB	500	25.6		1057
IIA	1000	53.0		2228
CON 6 (Jack-socket)				
IIC	0.24	48		261
IIB	1.49	178		1015
IIA	5.87	363		1385

VARIATION 0.2

To permit the connection of MTL5000 Ring Terminal assemblies in place of the safe and hazardous area screw terminals. The enclosure remains IP20 whether or not the Ring Terminal is fitted. The following MTL5000 Ring Terminals may be connected to the MTL5073 and MTL5074. Blanking covers may be removed if necessary.

Hazardous Area Terminal	MTL5073 pins	1, 3, 4, 5
	HAZ-CJC-RT	1, 2, 3, 4
Safe Area Terminal	MTL5073 pins	11, 12
	SAF-RT-11-12	7, 8

Hazardous Area Terminal	MTL5074 pins	1, 3, 4, 5
	HAZ-CJC-RT	1, 2, 3, 4
Safe Area Terminal	MTL5074 pins	11, 12
	SAF-RT-11-12	7, 8

Ring terminal HAZ-CJC-RT is fitted with a Cold Junction Compensation component.

16 **Report No**

01(C)0220

17 **Special Conditions For Safe Use**

None.

13 Schedule

14 EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161

18 Essential Health and Safety Requirements

ESSENTIAL HEALTH & SAFETY REQUIREMENTS not covered by standards listed in Section 9		
Clause	**Subject**	**Compliance**
1.1.3	Changes in characteristics of materials and combinations thereof	Report No 01(C)0220 Clause 5.1.1.3
1.2.2	Components for incorporation or replacement	Report No 01(C)0220 Clause 5.1.2.2
1.2.5	Additional means of protection	Report No 01(C)0220 Clause 5.1.2.5
1.2.7	Protection against other hazards	Report No 01(C)0220 Clause 5.1.2.7
1.4.2	Withstanding attack by aggressive substances	Report No 01(C)0220 Clause 5.1.4.2

19 DRAWINGS

Number	Sheet	Issue	Date	Description
CI5073-1	2	3	12.01	MTL5073 Parts List
CI5073-1	3	1	05.96	MTL5073 Circuit Diagram
CI5073-1	4	3	12.01	MTL5073 Component Layout
CI5073-1	5	2	12.01	MTL5073 General Assembly
CI5073-1	6	2	12.01	MTL5073 Internal Construction
CI5073-1	7	2	06.96	MTL5073 PCB Track Layout
CI5073-1	8	1	05.96	MTL5073 Transformer Winding Details
*CI 4000-1	1	2	11.92	I.S. Transformer
*CI 4000-1	2	2	11.92	I.S. Transformer

Drawings marked * are associated with and are held on BASEEFA Certificate BAS01ATEX7163

Drawing associated with Variation 0.1

Number	Sheet	Issue	Date	Description
CI5074	1	1	02.97	MTL5074 Parts List
CI5074	2	1	02.97	MTL5074 Circuit Diagram
CI5074	3	3	12.01	MTL5074 Component Layout
CI5074	4	2	12.01	MTL5074 General Assembly
CI5074	5	2	04.97	MTL5074 PCB Track Layout
CI5074	6	2	12.01	MTL5074 Transformer Winding Details
**CI 5000-1	1	2	11.95	I.S. Transformer TFR301
**CI 5000-1	2	2	02.96	I.S. Transformer TFR301

Drawings marked ** are associated with and are held on BASEEFA Certificate BAS01ATEX7157

13 **Schedule**

14 **EC-TYPE EXAMINATION CERTIFICATE N° BAS01ATEX7161**

Drawing associated with Variation 0.2

Number	Sheet	Issue	Date	Description
***CI5000-12	1 to 4	1	02.02	MTL5000 Ring Terminal

Drawing marked *** is associated with and held on BASEEFA Certificate BAS01ATEX7144

BASEEFA List Keywords
2ISOLBAR