

1 **EU - TYPE EXAMINATION CERTIFICATE**

2 **Safety Device, Controlling Device or Regulating Device intended for use outside a potentially explosive atmosphere but required for or contributing to the safe functioning of Equipment and Protective Systems with respect to the risks of explosion**
Directive 2014/34/EU

3 EU - Type Examination Certificate Number: **BAS01ATEX7217 – Issue 10**

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **MTL7700 Series Shunt Zener Diode Barriers (IIC)**

5 Manufacturer: **Eaton Electric Limited**

6 Address: **Great Marlings, Butterfield, Luton, Bedfordshire, LU2 8DL**

7 This re-issued certificate extends EC Type Examination Certificate No. BAS01ATEX7217 to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 The original certificate was issued by The Electrical Equipment Certification Service, Notified Body Number 0600, which retains responsibility for its original documentation. SGS Baseefa, Notified Body Number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, is responsible only for the additional work relating to this re-issued certificate and any other supplementary certificate it has issued.

The examination and test results are recorded in confidential Report No. **See Certificate History**

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

EN IEC 60079-0: 2018 EN 60079-11: 2012

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 product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

⊕ II (1) GD [Ex ia Ga] IIC (-20°C ≤ T_a ≤ +60°C)
[Ex ia Da] IIIC (-20°C ≤ T_a ≤ +60°C)

SGS Baseefa Customer Reference No. **0703**

Project File No. **18/0369**

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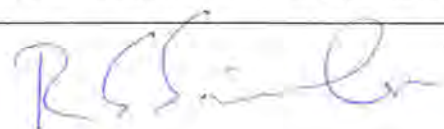
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R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13

Schedule

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Certificate Number BAS01ATEX7217 – Issue 10

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Description of Product

The MTL7700 Series Shunt Zener Diode Barriers are designed to restrict the transfer of energy, from unspecified safe area equipment to intrinsically safe circuits, by limitation of voltage and current. The range consists of single, dual, triple and quad channel barriers covering polarised (positive and negative) and non-polarised (ac) barriers and diode return barriers. Certain versions of the barriers may have the non-hazardous supply provided by a power bus, where adjacent barriers are connected together via a power bus terminal (link).

The barriers consist of electronic components on a single printed circuit board encapsulated within a moulded plastic enclosure which incorporates one or two pairs of sockets at each end of the barrier. Circuits are connected to the socket via plugs which incorporate a screw terminal. When fitted with the screw terminals the enclosure meets the requirements of IP20. The barrier is connected to earth via a spring mounted foot on to a DIN rail or alternatively a single high integrity screw terminal. The barriers are asymmetrical and have a blue label defining the hazardous area terminals. Barriers may be fitted adjacent to each other on the DIN rail.

The certificate also covers the MTL774* Series Switch / Proximity Input Barriers. These barriers are designed to restrict the transfer of energy from unspecified safe area equipment to intrinsically safe circuits by limitation of voltage and current and provide isolation by using relay and open collector solid state interfaces. The range consists of single and dual channel barriers of similar construction to the other MTL7700 Series barriers with either relay or open collector solid state interfaces.

For all versions of the MTL7700 Shunt Zener Barriers: - Input Parameters

Single Channel - Terminal 1 wrt 2 (including DIN Rail Foot)

Dual Channel - Terminal 1 & 2 wrt to DIN Rail Foot

Triple Channel - Terminals 1, 2 & 5 wrt to DIN Rail Foot

Quad Channel - Terminals 1, 2, 5 & 6 wrt DIN Rail Foot

$$U_m = 250V$$

Output Parameters

Single Channel 1 - Terminal 3 wrt 4 (including DIN Rail Foot)

Dual, Triple & Quad Channel 1 - Terminal 3 wrt to DIN Rail Foot

$$U_o = \text{See a or a1 below}$$

$$I_o = \text{See a or a1 below}$$

$$P_o = \text{See a or a1 below}$$

Dual, Triple, & Quad Channel 2 - Terminal 4 wrt to DIN Rail Foot

$$U_o = \text{See a2 below}$$

$$I_o = \text{See a2 below}$$

$$P_o = \text{See a2 below}$$

Triple & Quad Channel 3 - Terminal 7 wrt to DIN Rail Foot

$$U_o = \text{See a3 below}$$

$$I_o = \text{See a3 below}$$

$$P_o = \text{See a3 below}$$

Quad Channel 4 - Terminal 8 wrt to DIN Rail Foot

U_o = See a4 below
I_o = See a4 below
P_o = See a4 below

Type	Description	DC/AC		U _o (V)	R _{min} (Ω)	I _o (mA)	P _o (W)	C _i (μF)
MTL7706	28V, 300R	+(PB)	a	28	300	93	0.65	-
MTL7707	28V, 300R	+(PB)	a1	28	300	93	0.65	-
	Diode		a2	28	† (see note 4)			-
			b	28	300	93	0.65	-
MTL7710	10V, 50R	+/-	a	10	50	200	0.50	-
MTL7710P	10V, 33.3R	+	a	10	33.3	300	0.75	-
MTL7715	15V, 100R	+/-	a	15	100	150	0.56	-
MTL7715P	15V, 50R	+/-	a	15	51.5	291	1.09	-
MTL7722	22V, 150R	+/-	a	22	150	147	0.81	-
MTL7728	28V, 300R	+/-/ac	a	28	300	93	0.65	-
MTL7728P	28V, 237R	+/-	a	28	234.6	119	0.83	-
MTL7751	1V, 10R	ac	a1	1	10	100	0.025	-
	1V, 10R		a2	1	10	100	0.025	-
			b	1	5	200	0.05	-
			c	2	20	100	0.05	-
MTL7755	3V, 10R	ac	a1	3	10	300	0.225	-
	3V, 10R		a2	3	10	300	0.225	-
			b	3	5	600	0.45	-
			c	6	20	300	0.45	-
MTL7756	3V, 10R	ac	a1	3	10	300	0.225	-
	3V, 10R		a2	3	10	300	0.225	-
	3V, 10R		a3	3	10	300	0.225	-
			b1	3	5	600	0.45	-
			b2	3	3.3	900	0.675	-
			c1	6	20	300	0.45	-
			c2	6	15	400	0.60	-
MTL7758	7.5V, 10R	+/-	a1	7.5	10	750	1.40	-
	7.5V, 10R		a2	7.5	10	750	1.40	-
			b	7.5	5	1,500	2.80	-
MTL7760	10V, 50R	ac*	a1	10	50	200	0.5	-
	10V, 50R		a2	10	50	200	0.5	-
			b	10	25	400	1.00	-
MTL7761	9V, 90R	ac	a1	9	90	100	0.225	-
	9V, 90R		a2	9	90	100	0.225	-
			b	9	45	200	0.45	-
			c	18	180	100	0.45	-
MTL7761P	9V, 350R	ac	a1	9	351.5	26	0.058	-
	9V, 350R		a2	9	351.5	26	0.058	-
			b	9	175.5	52	0.115	-
			c	18	702.9	26	0.115	-
MTL7764	12V, 1K	+/-	a1	12	1,000	12	0.036	-
	12V, 1K		a2	12	1,000	12	0.036	-
			b	12	500	24	0.072	-
MTL7764	12V, 1K	ac	a1	12	1,000	12	0.036	-
	12V, 1K		a2	12	1,000	12	0.036	-
			b	12	500	24	0.072	-
			c	24	2,000	12	0.072	-

Type	Description	DC/AC		U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	C_i (μ F)
MTL7765	15V, 100R	ac*	a1	15	100	150	0.56	-
	15V, 100R		a2	15	100	150	0.56	-
			b	15	50	300	1.125	-
MTL7766	12V, 150R	ac	a1	12	150	80	0.24	-
	12V, 150R		a2	12	150	80	0.24	-
			b	12	75	160	0.48	-
			c	24	300	80	0.48	-
MTL7766P	12V, 75R	ac	a1	12	76.4	157	0.471	-
	12V, 75R		a2	12	76.4	157	0.471	-
			b	12	38.2	314	0.942	-
			c	24	152.9	157	0.942	-
MTL7767	15V, 100R	+/-	a1	15	100	150	0.56	-
	15V, 100R		a2	15	100	150	0.56	-
			b	15	50	300	1.125	-
MTL7768	22V, 149.6R	+	a1	22	149.6	147	0.81	-
	22V, 149.6R		a2	22	149.6	147	0.81	-
			b	22	74.8	294	1.62	-
MTL7772	22V, 301.4R	ac	a	22V	301.4	73	0.40	-
MTL7778	28V, 600R	ac*	a1	28	600	47	0.33	-
	28V, 600R		a2	28	600	47	0.33	-
			b	28	300	93	0.654	-
MTL7779	28V, 300R	+/-	a1	28	300	93	0.65	-
	28V, 300R		a2	28	300	93	0.65	-
			b	Not permitted ‡ (see note 3)				-
MTL7787	28V, 300R	+/- (PB)	a1	28	300	93	0.65	-
	28V (Diode)		a2	28	† (see note 4)			-
			b	28	300	93	0.65	-
MTL7787P	28V, 237R	+/- (PB)	a1	28	234.6	119	0.835	-
	28V (Diode)		a2	28	† (see note 4)			-
			b	28	234.6	119	0.835	-
MTL7788	28V, 300R	+/- (PB)	a1	28	300	93	0.65	-
	10V, 50R		a2	10	50	200	0.5	-
			b	28	42.85	294@12.57V	0.92	-
MTL7788R	28V, 300R	+/- (PB)	a1	28	300	93	0.65	-
	10V, 50R		a2	10	50	200	0.5	-
			b	28	42.85	294@12.57V	0.92	-
MTL7789	28V, 600R	+/- (PB)	a1	28	600	46.5	0.33	-
	Diode		a2	28	† (see note 4)			-
	28V, 600R		a3	28	600	46.5	0.33	-
	Diode		a4	28	† (see note 4)			-
			b3	28	300	93	0.65	-
			c	28	600	46.5	0.33	-
MTL7796	26V, 300R	+/-	a1	26	300	87	0.56	-
	20V, 390R		a2	20	390	51	0.26	-
			b	26	169.56	138@23.4V	0.81	-

Reference to data in the standard shows that with the maximum supply current and voltage as defined in the above table, such a value has a factor of safety of at least 1.5 for Group IIC.

Notes:

1. +/- - Shunt zener diode barriers may be of positive or negative polarity dependant on the configuration of the zener diodes. The certification label will detail the exact type.
 - ac - non-polarised barriers
 - ac* - non-polarised star connected
 - Diode - diode return barrier
 - (PB) - shunt zener diode barriers may have the non-hazardous supply provided by a power bus. Adjacent barriers are connected together via a bus power terminals
2. Circuit configuration for output parameters
 - a - Single channel
 - a1 - First channel of a dual/triple/quad channel barrier
 - a2 - Second channel of a dual/triple/quad channel barrier
 - a3 - Third channel of a triple/quad channel barrier
 - a4 - Fourth channel of a quad channel barrier
 - b - Both channels of a dual channel barrier connected in parallel, with respect to earth.
 - b1 - Two channels of a triple channel barrier connected in parallel, with respect to earth.
 - b2 - Three channels of a triple channel barrier connected in parallel, with respect to earth.
 - b3 - Four channels of a four channel barrier connected in parallel, with respect to earth.
 - c - Both channels of a dual channel barrier interconnected, with no earth return.
 - c1 - Two channels of a triple channel barrier interconnected, with no earth return.
 - c2 - Three channels of a triple channel barrier interconnected, with no earth return (this assumes two of the channels are in parallel).
3. The intrinsically safe terminals of two channels of any MTL7700 Series dual barrier which are marked ‡, must not be interconnected in Group IIC atmospheres. It is acceptable for these barriers to be interconnected in Group IIB atmospheres.
4. The hazardous area terminals of each of the barrier outputs marked † must be considered at the voltage U_0 . This is considered as the theoretical maximum to which a capacitive load across the hazardous area terminals could become charged by leakage through the series blocking diodes. This voltage does not contribute to the short circuit

Load Parameters

The capacitance or either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values.

Type	ac/ dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7706	+	a	0.083	4.2	54	0.65	12.6	218	2.15	33.6	435
MTL7707	+	a1	0.083	4.2	54	0.65	12.6	218	2.15	33.6	435
		a2	0.083	-	-	0.65	-	-	2.15	-	-
		b	0.083	4.2	54	0.65	12.6	218	2.15	33.6	435
MTL7710	+/-	a	3	0.91	71	20	2.72	284	100	7.25	569
MTL7710P	+	a	3	0.395	42	20	1.58	170	100	3.16	341
MTL7715	+/-	a	0.58	1.45	63	3.55	7.22	252	14	14	505
MTL7715P	+/-	a	0.58	0.33	32	3.55	0.99	130	14	2.64	260
MTL7722	+/-	a	0.165	1.65	44	1.14	7.22	176	4.2	14	353

Type	ac/ dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7728	+/- /ac	a	0.083	4.2	54	0.65	12.6	218	2.15	33.6	435
MTL7728P	+/-	a	0.083	2.51	44	0.65	7.53	168	2.15	20.0	340
MTL7751	ac	a1	100	3.55	1422	1000	14.2	5688	1000	28.4	11377
		a2	100	3.55	1422	1000	14.2	5688	1000	28.4	11377
		b	100	0.88	711	1000	3.55	2844	1000	7.1	5688
		c	100	3.55	711	1000	14.2	2844	1000	28.4	5688
MTL7755	ac	a1	100	0.37	158	1000	1.37	632	1000	3.66	1264
		a2	100	0.37	158	1000	1.37	632	1000	3.66	1264
		b	100	0.13	79	1000	0.39	316	1000	1.03	632
		c	40	0.37	79	1000	1.37	316	1000	3.28	632
MTL7756	ac	a1	100	0.37	158	1000	1.37	632	1000	3.66	1264
		a2	100	0.37	158	1000	1.37	632	1000	3.66	1264
		a3	100	0.37	158	1000	1.37	632	1000	3.66	1264
		b1	100	0.13	79	1000	0.39	316	1000	1.03	632
		b2	100	0.06	52	1000	0.19	208	1000	0.49	417
		c1	40	0.37	79	1000	1.37	316	1000	3.28	632
		c2	40	0.23	59	1000	0.70	237	1000	1.86	474
MTL7758	+/-	a1	11.1	0.07	25	174	0.20	101	1000	0.54	202
		a2	11.1	0.07	25	174	0.20	101	1000	0.54	202
		b	11.1	0.02	12	174	0.05	50	1000	0.14	101
MTL7760	ac*	a1	3.0	0.91	71	20	2.72	284	100	7.25	568
		a2	3.0	0.91	71	20	2.72	284	100	7.25	568
		b	3.0	0.20	35	20	0.60	142	100	1.61	284
MTL7761	ac	a1	4.9	3.72	158	40	15	632	500	31	1264
		a2	4.9	3.72	158	40	15	632	500	31	1264
		b	4.9	0.91	79	40	2.72	316	500	7.2	632
		c	0.31	3.72	79	1.78	15	316	7.6	31	632
MTL7761P	ac	a1	4.9	56	617	40	208	2468	500	419	4937
		a2	4.9	56	617	40	208	2468	500	419	4937
		b	4.9	14	308	40	55	1232	500	116	2465
		c	0.31	56	308	1.78	208	1234	7.6	419	2468
MTL7764	+/-	a1	1.41	240	987	9	932	3950	36	1000	7901
		a2	1.41	240	987	9	932	3950	36	1000	7901
		b	1.41	61	493	9	226	1975	36	452	3950
MTL7764	ac	a1	1.41	240	987	9	932	3950	36	1000	7901
		a2	1.41	240	987	9	932	3950	36	1000	7901
		b	1.41	61	493	9	226	1975	36	452	3950
		c	0.125	240	493	0.93	932	1975	3.35	1000	3950
MTL7765	ac*	a1	0.580	1.45	63	3.55	7.22	252	14.0	14.42	505
		a2	0.580	1.45	63	3.55	7.22	252	14.0	14.42	505
		b	0.580	0.32	31	3.55	0.95	126	14.0	2.54	252
MTL7766	ac	a1	1.41	5.8	148	9	23	592	36	48	1185
		a2	1.41	5.8	148	9	23	592	36	48	1185
		b	1.41	1.47	74	9	4.4	296	36	11	592
		c	0.125	5.8	74	0.93	23	296	3.35	48	592
MTL7766P	ac	a1	1.41	1.47	75	9	4.4	301	36	11	603
		a2	1.41	1.47	75	9	4.4	301	36	11	603
		b	1.41	0.34	37	9	1.02	150	36	2.71	301
		c	0.125	1.15	37	0.93	3.44	151	3.35	9.1	302
MTL7767	+/-	a1	0.58	1.45	63	3.55	7.22	252	14	14	505
		a2	0.58	1.45	63	3.55	7.22	252	14	14	505
		b	0.58	0.32	31	3.55	0.95	126	14	2.54	252

Type	ac/ dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7768	+	a1	0.165	1.65	43	1.14	6.58	175	4.20	13.16	351
		a2	0.165	1.65	43	1.14	6.58	175	4.20	13.16	351
		b	0.165	0.41	21	1.14	1.64	87	4.2	3.29	175
MTL7772	ac	a	0.165	6.67	88	1.14	26.6	353	4.2	53.3	707

MTL7778	ac*	a1	0.083	16	108	0.65	62	435	2.15	130	870
		a2	0.083	16	108	0.65	62	435	2.15	130	870
		b	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
MTL7779	+/-	a1	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		a2	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		b	Not permitted								
MTL7787	+/-	a1	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		a2	0.083	-	-	0.65	-	-	2.15	-	-
		b	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
MTL7787P	+/-	a1	0.083	2.51	42	0.65	7.53	170	2.15	20.0	340
		a2	0.083	-	-	0.65	-	-	2.15	-	-
		b	0.083	2.51	42	0.65	7.53	170	2.15	20.0	340
MTL7788	+/-	a1	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		a2	3.0	0.91	71	20	2.72	284	100	7.25	568
		b	0.083	0.33	38	0.65	0.99	154	2.15	2.64	308
MTL7788R	+/-	a1	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		a2	3.0	0.91	71	20	2.72	284	100	7.25	568
		b	0.083	0.33	38	0.65	0.99	154	2.15	2.64	308
MTL7789	+/-	a1	0.083	16	108	0.65	63	435	2.15	133	870
		a2	0.083	-	-	0.65	-	-	2.15	-	-
		a3	0.083	16	108	0.65	63	435	2.15	133	870
		a4	0.083	-	-	0.65	-	-	2.15	-	-
		b3	0.083	4.2	54	0.65	12.6	217	2.15	33.6	435
		c	0.083	16	108	0.65	63	435	2.15	133	870
MTL7796	+/-	a1	0.1	4.91	63	0.77	20	252	2.60	40	504
		a2	0.22	13	138	1.41	51	554	5.50	108	1109
		b	0.1	1.94	44	0.77	8.5	176	2.60	16	352

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

Notes:

- 1) 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.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
 - the total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
 - the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

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

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductance in the circuit and the sum of all C_i plus cable capacitances respectively.

**For all versions of the MTL774x Series Switch / Proximity Barriers: -
Input Parameters**

Single Channel - Terminal 1 wrt 2 (including DIN Rail Foot)

Dual Channel - Terminal 1 & 2 wrt to DIN Rail Foot

$$U_m = 250V$$

Output Parameters

Type	Description	DC/AC		U_o (V)	I_o (mA)	P_o (W)	C_i (μF)
MTL7741	10V, 19mA	+(PB)	b	10	19	0.039	0.135
MTL7742	10V, 19mA	+(PB)	b	10	19	0.039	0.135
MTL7743	10V, 19mA	+(PB)	b4	10	19	0.039	0.135
	10V, 19mA		b4	10	19	0.039	0.135
			b3	10	38	0.078	0.270
MTL7744	10V, 19mA	+(PB)	b4	10	19	0.039	0.135
	10V, 19mA		b4	10	19	0.039	0.135
			b3	10	38	0.078	0.270
MTL7745	10V, 19mA	+(PB)	b	10	19	0.039	0.135

Reference to data in the standard shows that with the maximum supply current and voltage as defined in the above table, such a value has a factor of safety of at least 1.5 for Group IIC.

Notes for Barriers:

1. +(PB) - Positive polarity shunt zener diode barrier which may have the non-hazardous supply provided by a power bus. Adjacent barriers are connected together via a bus power terminals
2. Circuit configuration for output parameters
 - b - Both channels of a dual channel barrier connected in parallel, with respect to earth.
 - b3 - Four channels of a four channel barrier connected in parallel, with respect to earth.
 - b4 - Either pair of channels of a four channel barrier interconnected, with earth return.
(For MTL7743 and MTL7744: CON1, 1 and CON1, 2 of CON4, 1 and CON4, 2).

The MTL7741 (safe area terminals 2, 5, & 6), MTL7743 (safe area terminals 1, 2, 5, & 6) and MTL7745 (safe area terminals 2, 5, & 6) are connected to relay change-over contacts which can switch up to 125V a.c. / 0.5A or 30V d.c. / 1A.

The MTL7742 (safe area terminals 5 & 6) and MTL7744 (safe area terminals 1, 2 & 5, 6) are connected to an opto-isolator which may have an input source of up to 35V and 56mA.

Load Parameters

The capacitance or either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values.

Type	ac/dc		IIC			IIB**			IIA		
			C (μF)	L (mH)	L/R ($\mu H/\Omega$)	C (μF)	L (mH)	L/R ($\mu H/\Omega$)	C (μF)	L (mH)	L/R ($\mu H/\Omega$)
MTL7741	+	b	2.86	96	748	19.86	365	2,992	99.86	696	5,984
MTL7742	+	b	2.86	96	748	19.86	365	2,992	99.86	696	5,984
MTL7743	+	b4	2.86	96	748	19.86	365	2,992	99.86	696	5,984
		b4	2.86	96	748	19.86	365	2,992	99.86	696	5,984
		b3	2.73	25	374	19.73	91	1,496	99.73	193	2,992
MTL7744	+	b4	2.86	96	748	19.86	365	2,992	99.86	696	5,984

Type	ac/dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
			b4	2.86	96	748	19.86	365	2,992	99.86	696
		b3	2.73	25	374	19.73	91	1,496	99.73	193	2,992
MTL7745	+	b	2.86	96	748	19.86	365	2,992	99.86	696	5,984

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

Notes:

- 1) 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.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
 - the total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
 - the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1μ F for Groups IIIC, IIB & IIA and $600n$ F for Group IIC.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductance in the circuit and the sum of all C_i plus cable capacitances respectively.

Variation 7.1

To permit the use of the following load parameters when connecting to an Ex ic system. These parameters give a factor of safety of at least 1 for Gas Group IIC.

For all versions of the MTL7700 Shunt Zener Barriers

The capacitance or either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values.

Type	ac/dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7706	+	a	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
MTL7707	+	a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a2	0.272	-	-	1.65	-	-	6.60	-	-
		b	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
MTL7710	+/-	a	20	2.00	160	450	8.00	640	1000	16	1280
MTL7710P	+	a	20	0.888	94	450	3.55	382	1000	7.11	767
MTL7715	+/-	a	3.0	3.55	142	20.2	14.2	568	100	28.4	1137
MTL7715P	+/-	a	3.0	0.94	73	20.2	3.77	292	100	7.55	585
MTL7722	+/-	a	0.63	3.70	98	3.90	14.8	395	15.0	29.6	791
MTL7728	+/- /ac	a	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
MTL7728P	+/-	a	0.272	5.64	96	1.65	22.5	384	6.60	45.1	768
MTL7751	ac	a1	1000	8	3199	1000	32	12798	1000	64	25598
		a2	1000	8	3199	1000	32	12798	1000	64	25598
		b	1000	2	1599	1000	8	6399	1000	16	12798
		c	1000	8	1599	1000	32	6399	1000	64	12798
MTL7755	ac	a1	1000	0.88	355	1000	3.55	1422	1000	7.11	2844
		a2	1000	0.88	355	1000	3.55	1422	1000	7.11	2844

Type	ac/ dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7756	ac	b	1000	0.22	177	1000	0.88	711	1000	1.77	1422
		c	600	0.88	177	1000	3.55	711	1000	7.11	1422
		a1	1000	0.88	355	1000	3.55	1422	1000	7.11	2844
		a2	1000	0.88	355	1000	3.55	1422	1000	7.11	2844
		a3	1000	0.88	355	1000	3.55	1422	1000	7.11	2844
		b1	1000	0.22	177	1000	0.88	711	1000	1.77	1422
		b2	1000	0.09	118	1000	0.39	474	1000	0.79	948
		c1	600	0.88	177	1000	3.55	711	1000	7.11	1422
MTL7758	+/-	c2	600	0.50	133	1000	2.00	533	1000	4.00	1066
		a1	100	0.13	56	1000	0.56	227	1000	1.13	455
		a2	100	0.13	56	1000	0.56	227	1000	1.13	455
MTL7760	ac*	b	100	0.03	28	1000	0.14	113	1000	0.28	227
		a1	20	2.00	160	450	8.00	640	1000	16	1280
		a2	20	2.00	160	450	8.00	640	1000	16	1280
MTL7761	ac	b	20	0.50	80	450	2.00	320	1000	4.00	640
		a1	40	8.00	355	1000	32	1422	1000	64	2844
		a2	40	8.00	355	1000	32	1422	1000	64	2844
		b	40	2.00	177	1000	8.00	711	1000	16	1422
MTL7761P	ac	c	1.41	8.00	177	9	32	711	36	64	1422
		a1	40	118	1388	1000	473	5554	1000	946	11109
		a2	40	118	1388	1000	473	5554	1000	946	11109
		b	40	29.5	693	1000	118	2773	1000	236	5546
MTL7764	+/-	c	1.41	118	694	9	473	2776	36	946	5553
		a1	8.4	555	2222	100	1000	8888	1000	1000	17777
		a2	8.4	555	2222	100	1000	8888	1000	1000	17777
MTL7764	ac	b	8.4	138	1111	100	555	4444	1000	1000	8888
		a1	8.4	555	2222	100	1000	8888	1000	1000	17777
		a2	8.4	555	2222	100	1000	8888	1000	1000	17777
		b	8.4	138	1111	100	555	4444	1000	1000	8888
MTL7765	ac*	c	0.46	555	1111	2.75	1000	4444	11.0	1000	8888
		a1	3.0	3.55	142	20.2	14.2	568	100	28.44	1137
		a2	3.0	3.55	142	20.2	14.2	568	100	28.44	1137
MTL7766	ac	b	3.0	0.88	71	20.2	3.55	284	100	7.11	568
		a1	8.4	12.5	333	100	50	1333	1000	100	2666
		a2	8.4	12.5	333	100	50	1333	1000	100	2666
		b	8.4	3.12	166	100	12.5	666	1000	25	1333
MTL7766P	ac	c	0.46	12.5	166	2.75	50	666	11.0	100	1333
		a1	8.4	3.24	169	100	12.9	679	1000	25.9	1358
		a2	8.4	3.24	169	100	12.9	679	1000	25.9	1358
		b	8.4	0.81	84	100	3.24	339	1000	6.49	679
MTL7767	+/-	c	0.46	3.24	84	2.75	12.9	339	11.0	25.9	679
		a1	3.0	3.55	142	20.2	14.2	568	100	28.4	1137
		a2	3.0	3.55	142	20.2	14.2	568	100	28.4	1137
MTL7768	+	b	3.0	0.88	71	20.2	3.55	284	100	7.11	568
		a1	0.63	3.7	96	3.9	14.8	393	15.0	29.61	789
		a2	0.63	3.7	96	3.9	14.8	393	15.0	29.61	789
MTL7772	ac	b	0.63	0.92	47	3.9	3.7	195	15.0	7.4	393
		a	0.63	15.01	198	3.9	60.0	794	15.0	120	1590
		a1	0.272	36.2	244	1.65	144	979	6.60	289	1959
MTL7778	ac*	a2	0.272	36.2	244	1.65	144	979	6.60	289	1959
		b	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
MTL7779	+/-	a2	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979

Type	ac/ dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
		b	Not permitted								
MTL7787	+/-	a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a2	0.272	-	-	1.65	-	-	6.60	-	-
		b	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
MTL7787P	+/-	a1	0.272	5.64	96	1.65	22.5	384	6.60	45.1	768
		a2	0.272	-	-	1.65	-	-	6.60	-	-
		b	0.272	5.64	96	1.65	22.5	384	6.60	45.1	768
MTL7788	+/-	a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a2	20	2.00	160	450	8.00	640	1000	16	1280
		b	0.272	0.92	86	1.65	3.70	347	6.60	7.40	694
MTL7788R	+/-	a1	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		a2	20	2.00	160	450	8.00	640	1000	16	1280
		b	0.272	0.92	86	1.65	3.70	347	6.60	7.40	694
MTL7789	+/-	a1	0.272	36.9	244	1.65	147	979	6.60	295	1959
		a2	0.272	-	-	1.65	-	-	6.60	-	-
		a3	0.272	36.9	244	1.65	147	979	6.60	295	1959
		a4	0.272	-	-	1.65	-	-	6.60	-	-
		b3	0.272	9.24	122	1.65	36.9	489	6.60	73.9	979
		c	0.272	36.9	244	1.65	147	979	6.60	295	1959
MTL7796	+/-	a1	0.35	10.5	142	2.05	42.2	568	8.5	84.5	1136
		a2	0.90	30.7	312	5.6	123	1248	20	246	2496
		b	0.35	4.20	99	2.05	16.8	396	8.5	33.6	792

** Group IIB parameters also applicable for associated apparatus [Ex ic Dc] IIIC

Notes:

- 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:
 - the total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
 - the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

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

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductance in the circuit and the sum of all C_i plus cable capacitances respectively.

For all versions of the MTL774x Series Switch / Proximity Barriers

When connected to Ex ic circuits, the capacitance or either the inductance or the inductance to resistance ratio (L/R) of the load connected to the output terminals must not exceed the following values.

Type	ac/dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7741	+	b	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
MTL7742	+	b	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
MTL7743	+	b4	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
		b4	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
		b3	19.73	55.4	842	449.7	210	3,368	1,000	413	6,736

Type	ac/dc		IIC			IIB**			IIA		
			C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)	C (μ F)	L (mH)	L/R (μ H/ Ω)
MTL7744	+	b4	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
		b4	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473
		b3	19.73	55.4	842	449.7	210	3,368	1,000	413	6,736
MTL7745	+	b	19.86	221	3,789	449.8	846	6,736	1,000	1,000	13,473

** Group IIB parameters also applicable for associated apparatus [Ex ic Dc] IIIC

Notes:

- 1) 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.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
- the total L_i of the external circuit (excluding the cable) is $\geq 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

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

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductance in the circuit and the sum of all C_i plus cable capacitances respectively.

16 Report Number

See Certificate History

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	Protection against other hazards (LVD type requirements, etc.)
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
CI7710P+ -1* ²	1 of 5	1	14Sep18	MTL7710P+ Shunt Zener diode Safety Barrier Parts List.
CI7710P+ -1* ²	2 of 5	1	14Sep18	MTL7710P+ Shunt Zener diode Safety Barrier Circuit Diagram.
CI7710P+ -1* ²	3 of 5	1	14Sep18	MTL7710P+ PCB Layout Drawings
CI7710P+ -1* ²	4 of 5	1	14Sep18	MTL7710P+ Shunt Zener diode Safety Barrier Component Layout.
CI7710P+ -1* ²	5 of 5	1	14Sep18	MTL7710P+ Shunt Zener diode Safety Barrier Certification Label.
CI7768+ -1* ²	1 of 5	1	14Sep18	MTL7768+ Shunt Zener diode Safety Barrier Parts List.

Number	Sheet	Issue	Date	Description
CI7768+ -1* ²	2 of 5	1	14Sep18	MTL7768+ Shunt Zener diode Safety Barrier Circuit Diagram.
CI7768+ -1* ²	3 of 5	1	14Sep18	MTL7768+ PCB Layout Drawing
CI7768+ -1* ²	4 of 5	1	14Sep18	MTL7768+ Shunt Zener diode Safety Barrier Component Layout.
CI7768+ -1* ²	5 of 5	1	14Sep18	MTL7768+ Shunt Zener diode Safety Barrier Certification Label.
CI7772ac -1* ²	1 of 4	1	14Sep18	MTL7772ac Shunt Zener diode Safety Barrier Parts List.
CI7772ac -1* ²	2 of 4	1	14 Sep18	MTL7772ac Shunt Zener diode Safety Barrier Circuit Diagram.
CI7772ac -1* ²	3 of 4	1	14 Sep18	MTL7772ac Shunt Zener diode Safety Barrier Component Layout.
CI7772ac -1* ²	4 of 4	1	14 Sep18	MTL7772ac Shunt Zener diode Safety Barrier Certification Label.

Drawings marked *² are also associated with IECEx Certificate No. IECEx BAS 04.0025 Iss. 9.

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
CI7700-1* ¹	1 of 4	5	9.02	MTL 7700 Series – Shunt Zener Diode Safety Barriers General Arrangement :- External Details
CI7700-1* ¹	2 of 4	4	4.02	MTL 7700 Series – Shunt Zener Diode Safety Barriers General Arrangement :- Assembly Details
CI7700-1* ¹	3 of 4	3	9.02	MTL 7700 Series – Shunt Zener Diode Safety Barriers General Arrangement :- Component Details
CI7700-1* ¹	4 of 4	3	1.15	MTL7700 Series Barriers, Diode Pulse and Storage Temperature Test
CI7700-2* ¹	1 of 16	3	4.02	MTL7700 Series PCB947 Track Layout
CI7700-2* ²	2 of 16	3	4.02	MTL7700 Series PCB948 Track Layout
CI7700-2* ²	3 of 16	3	4.02	MTL7700 Series PCB949 Track Layout
CI7700-2* ²	4 of 16	2	3.02	MTL7700 Series PCB950 Track Layout
CI7700-2* ²	5 of 16	4	3.02	MTL7700 Series PCB951 Track Layout
CI7700-2* ²	6 of 16	3	3.02	MTL7700 Series PCB952 Track Layout
CI7700-2* ²	7 of 16	3	5.02	MTL7700 Series PCB953 Track Layout
CI7700-2* ²	8 of 16	4	5.02	MTL7700 Series PCB954 Track Layout
CI7700-2* ²	9 of 16	1	2.02	MTL7700 Series PCB955 Track Layout
CI7700-2* ²	10 of 16	2	7.02	MTL7700 Series PCB956 Track Layout
CI7700-2* ²	11 of 16	2	4.10	MTL7700 Series PCB964 Track Layout
CI7700-2* ¹	12 of 16	2	4.02	MTL7700 Series PCB965 Track Layout
CI7700-2* ³	13 of 16	1	4.02	MTL7700 Series PCB966 Track Layout
CI7700-2* ³	15 of 16	2	6.02	MTL7700 Series PCB968 Track Layout
CI7700-2* ³	16 of 16	1	7.02	MTL7700 Series PCB969 Track Layout
CI7706-1* ²	1 of 4	2	4.02	MTL7706+ Parts List
CI7706-1* ²	2 of 4	3	4.10	MTL 7706+ Circuit Diagram
CI7706-1* ²	3 of 4	3	3.10	MTL7706+ Component Layout
CI7706-1* ²	4 of 4	5	7.16	MTL7706+ Certification Label
CI7707-1* ²	1 of 4	1	2.02	MTL7707+ Shunt Diode Safety Barrier Parts List
CI7707-1* ²	2 of 4	1	2.02	MTL7707+ Shunt Diode Safety Barriers Circuit Diagram
CI7707-1* ²	3 of 4	2	10.01	MTL7707+ Shunt Diode Safety Barriers Component Layout
CI7707-1* ²	4 of 4	4	7.16	MTL7707+ Shunt Diode Safety Barrier Certification Label

Number	Sheet	Issue	Date	Description
CI7710-1* ²	1 of 4	3	4.02	MTL7710+, MTL7710- Shunt Diode Safety Barrier Parts List
CI7710-1* ²	2 of 4	3	4.02	MTL7710+, MTL7710- Shunt Diode Safety Barriers Circuit Diagram
CI7710-1* ²	3 of 4	3	6.02	MTL7710+, MTL7710- Shunt Diode Safety Barriers Component Layout
CI7710-1* ²	4 of 4	4	7.16	MTL7710+, MTL7710- Shunt Diode Safety Barrier Certification Label
CI7715-1* ²	1 of 4	4	1.15	MTL7715+, MTL7715- Shunt Diode Safety Barriers Parts List
CI7715-1* ²	2 of 4	3	4.02	MTL7715+, MTL7715- Shunt Diode Safety Barriers Circuit Diagram
CI7715-1* ²	3 of 4	3	6.02	MTL7715+, MTL7715- Shunt Diode Safety Barriers Component Layout
CI7715-1* ²	4 of 4	4	7.16	MTL7715+, MTL7715- Shunt Diode Safety Barrier Certification Label
CI7715-2* ²	1 of 4	3	1.15	MTL7715P+, MTL7715P- Shunt Diode Safety Barriers Parts List
CI7715-2* ²	2 of 4	2	4.02	MTL7715P+, MTL7715P- Shunt Diode Safety Barriers Circuit Diagram
CI7715-2* ²	3 of 4	2	6.02	MTL7715P+, MTL7715P- Shunt Diode Safety Barriers Component Layout
CI7715-2* ²	4 of 4	4	7.16	MTL7715P+, MTL7715P- Shunt Diode Safety Barrier Certification Label
CI7722-1* ²	1 of 4	4	10.02	MTL7722+, MTL7722- Shunt Diode Safety Barrier Parts List
CI7722-1* ²	2 of 4	4	10.02	MTL7722+, MTL7722- Shunt Diode Safety Barriers Circuit Diagram
CI7722-1* ²	3 of 4	3	5.02	MTL7722+, MTL7722- Shunt Diode Safety Barriers Component Layout
CI7722-1* ²	4 of 4	4	7.16	MTL7722+, MTL7722- Shunt Diode Safety Barrier Certification Label
CI7728-1* ²	1 of 4	4	5.02	MTL7728+, MTL7728- Shunt Diode Safety Barrier Parts List
CI7728-1* ²	2 of 4	4	5.02	MTL7728+, MTL7728- Shunt Diode Safety Barriers Circuit Diagram
CI7728-1* ²	3 of 4	3	5.02	MTL7728+, MTL7728- Shunt Diode Safety Barriers Component Layout
CI7728-1* ²	4 of 4	4	7.16	MTL7728+, MTL7728- Shunt Diode Safety Barrier Certification Label
CI7728-2* ²	1 of 4	4	5.02	MTL7728ac Shunt Diode Safety Barrier Parts List
CI7728-2* ²	2 of 4	4	5.02	MTL7728ac Shunt Diode Safety Barriers Circuit Diagram
CI7728-2* ²	3 of 4	3	5.02	MTL7728ac Shunt Diode Safety Barriers Component Layout
CI7728-2* ²	4 of 4	4	7.16	MTL7728ac Shunt Diode Safety Barrier Certification Label
CI7728-3* ²	1 of 4	6	1.15	MTL7728P+, MTL7728P- Shunt Diode Safety Barriers Parts List
CI7728-3* ²	2 of 4	4	6.02	MTL7728P+, MTL7728P- Shunt Diode Safety Barriers Circuit Diagram
CI7728-3* ²	3 of 4	3	6.02	MTL7728P+, MTL7728P- Shunt Diode Safety Barriers Component Layout
CI7728-3* ²	4 of 4	4	7.16	MTL7728P+, MTL7728P- Shunt Diode Safety Barrier Certification Label
CI7741-1* ³	1 of 4	2	1.15	MTL7741 Parts List
CI7741-1* ³	2 of 4	1	4.02	MTL7741 Circuit Diagram
CI7741-1* ³	3 of 4	2	7.02	MTL7741 Switch / Proximity Safety Barriers Component Layout
CI7741-1* ³	4 of 4	3	7.16	MTL7741 Switch / Proximity Safety Barrier Certification Label
CI7742-1* ³	1 of 4	2	1.15	MTL7742 Parts List

Number	Sheet	Issue	Date	Description
CI7742-1* ³	2 of 4	2	7.02	MTL7742 Circuit Diagram
CI7742-1* ³	3 of 4	2	7.02	MTL7742 Switch / Proximity Safety Barriers Component Layout
CI7742-1* ³	4 of 4	3	7.16	MTL7742 Switch / Proximity Safety Barrier Certification Label
CI7743-1* ³	1 of 4	3	1.15	MTL7743 Parts List
CI7743-1* ³	2 of 4	1	4.02	MTL7743 Circuit Diagram
CI7743-1* ³	3 of 4	2	7.02	MTL7743 Switch / Proximity Safety Barriers Component Layout
CI7743-1* ³	4 of 4	3	7.16	MTL7743 Switch / Proximity Safety Barrier Certification Label
CI7744-1* ³	1 of 4	3	1.15	MTL7744 Parts List
CI7744-1* ³	2 of 4	2	7.02	MTL7744 Circuit Diagram
CI7744-1* ³	3 of 4	3	7.02	MTL7744 Switch / Proximity Safety Barriers Component Layout
CI7744-1* ³	4 of 4	3	7.16	MTL7744 Switch / Proximity Safety Barrier Certification Label
CI7745-1* ³	1 of 4	2	1.15	MTL7745 Parts List
CI7745-1* ³	2 of 4	1	4.02	MTL7745 Circuit Diagram
CI7745-1* ³	3 of 4	2	7.02	MTL7745 Switch / Proximity Safety Barriers Component Layout
CI7745-1* ³	4 of 4	3	7.16	MTL7745 Switch / Proximity Safety Barrier Certification Label
CI7751-1* ²	1 of 4	1	18 Dec 17	MTL7751AC Shunt Diode Safety Barrier Parts List.
CI7751-1* ²	2 of 4	1	18 Dec 17	MTL7751AC Shunt Diode Safety Barrier Circuit Diagram.
CI7751-1* ²	3 of 4	1	18 Dec 17	MTL7751AC Shunt Diode Safety Barrier Component Layout.
CI7751-1* ²	4 of 4	1	18 Dec 17	MTL7751AC Shunt Diode Safety Barrier Certification Label.
CI7755-1* ²	1 of 4	4	1.15	MTL7755ac Shunt Diode Safety Barrier Parts List
CI7755-1* ²	2 of 4	3	4.02	MTL7755ac Shunt Diode Safety Barrier Circuit Diagram
CI7755-1* ²	3 of 4	4	10.02	MTL7755ac Shunt Diode Safety Barriers Component Layout
CI7755-1* ²	4 of 4	4	7.16	MTL7755ac Shunt Diode Safety Barrier Certification Label
CI7756-1* ²	1 of 4	2	1.15	MTL7756ac Shunt Diode Safety Barrier Parts List
CI7756-1* ²	2 of 4	1	7.01	MTL7756ac Shunt Diode Safety Barrier Circuit Diagram
CI7756-1* ²	3 of 4	2	6.02	MTL7756ac Shunt Diode Safety Barriers Component Layout
CI7756-1* ²	4 of 4	5	7.16	MTL7756ac Shunt Diode Safety Barrier Certification Label
CI7758-1* ²	1 of 4	3	1.15	MTL7758+, MTL7758- Shunt Diode Safety Barriers Parts List
CI7758-1* ²	2 of 4	3	5.02	MTL7758+, MTL7758- Shunt Diode Safety Barriers Circuit Diagram
CI7758-1* ²	3 of 4	3	10.02	MTL7758+, MTL7758- Shunt Diode Safety Barriers Component Layout
CI7758-1* ²	4 of 4	4	7.16	MTL7758+, MTL7758- Shunt Diode Safety Barrier Certification Label
CI7760-1* ²	1 of 4	3	10.02	MTL7760ac, MTL7765ac Shunt Diode Safety Barriers Parts List
CI7760-1* ²	2 of 4	2	6.02	MTL7760ac, MTL7765ac Shunt Diode Safety Barriers Circuit Diagram
CI7760-1* ²	3 of 4	2	4.02	MTL7760ac, MTL7765ac Shunt Diode Safety Barriers Component Layout
CI7760-1* ²	4 of 4	4	7.16	MTL7760ac, MTL7765ac Shunt Diode Safety Barrier Certification Labels
CI7761-1* ²	1 of 4	3	1.15	MTL7761ac Shunt Diode Safety Barriers Parts List

Number	Sheet	Issue	Date	Description
CI7761-1* ²	2 of 4	3	4.02	MTL7761ac Shunt Diode Safety Barriers Circuit Diagram
CI7761-1* ²	3 of 4	3	6.02	MTL7761ac Shunt Diode Safety Barriers Component Layout
CI7761-1* ²	4 of 4	4	7.16	MTL7761ac Shunt Diode Safety Barrier Certification Label
CI7761-2* ²	1 of 4	2	4.02	MTL7761Pac, MTL7764ac, MTL7766ac Shunt Diode Safety Barriers Parts List
CI7761-2* ²	2 of 4	2	4.02	MTL7761Pac, MTL7764ac, MTL7766ac Shunt Diode Safety Barriers Circuit Diagram
CI7761-2* ²	3 of 4	3	6.02	MTL7761Pac, MTL7764ac, MTL7766ac Shunt Diode Safety Barriers Component Layout
CI7761-2* ²	4 of 4	5	9.16	MTL7761Pac, MTL7764ac, MTL7766ac Shunt Diode Safety Barrier Certification Label
CI7764-1* ²	1 of 4	4	6.02	MTL7764+, MTL7764- Shunt Diode Safety Barriers Parts List
CI7764-1* ²	2 of 4	4	6.02	MTL7764+, MTL7764- Shunt Diode Safety Barriers Circuit Diagram
CI7764-1* ²	3 of 4	4	6.02	MTL7764+, MTL7764- Shunt Diode Safety Barriers Component Layout
CI7764-1* ²	4 of 4	4	7.16	MTL7764+, MTL7764- Shunt Diode Safety Barrier Certification Label
CI7766-1* ²	1 of 4	5	1.15	MTL7766Pac Shunt Diode Safety Barrier Parts List
CI7766-1* ²	2 of 4	3	4.02	MTL7766Pac Shunt Diode Safety Barrier Circuit Diagram
CI7766-1* ²	3 of 4	3	6.02	MTL7766Pac Shunt Diode Safety Barrier Component Layout
CI7766-1* ²	4 of 4	4	7.16	MTL7766Pac Shunt Diode Safety Barrier Certification Label
CI7767-1* ²	1 of 4	5	1.15	MTL7767+, MTL7767- Shunt Diode Safety Barriers Parts List
CI7767-1* ²	2 of 4	4	6.02	MTL7767+, MTL7767- Shunt Diode Safety Barriers Circuit Diagram
CI7767-1* ²	3 of 4	4	6.02	MTL7767+, MTL7767- Shunt Diode Safety Barriers Component Layout
CI7767-1* ²	4 of 4	4	7.16	MTL7767+, MTL7767- Shunt Diode Safety Barrier Certification Label
CI7778-1* ²	1 of 4	3	10.02	MTL7778ac Shunt Diode Safety Barrier Parts List
CI7778-1* ²	2 of 4	3	9.02	MTL7778ac Shunt Diode Safety Barrier Circuit Diagram
CI7778-1* ²	3 of 4	3	10.02	MTL7778ac Shunt Diode Safety Barrier Component Layout
CI7778-1* ²	4 of 4	3	7.16	MTL7778ac Shunt Diode Safety Barrier Certification Label
CI7779-1* ²	1 of 4	2	4.02	MTL7779+ & MTL7779- Shunt Diode Safety Barrier Parts List
CI7779-1* ²	2 of 4	2	4.02	MTL7779+ & MTL7779- Shunt Diode Safety Barrier Circuit Diagram
CI7779-1* ²	3 of 4	2	6.02	MTL7779+, MTL7779- Shunt Diode Safety Barriers Component Layout
CI7779-1* ²	4 of 4	4	7.16	MTL7779+, MTL7779- Shunt Diode Safety Barrier Certification Label
CI7787-1* ²	1 of 4	3	4.02	MTL7787+ & MTL7787- Shunt Diode Safety Barrier Parts List
CI7787-1* ²	2 of 4	3	4.02	MTL7787+, MTL7787- Shunt Diode Safety Barriers Circuit Diagram
CI7787-1* ²	3 of 4	3	5.02	MTL7787+, MTL7787- Shunt Diode Safety Barriers Component Layout
CI7787-1* ²	4 of 4	4	7.16	MTL7787+, MTL7787- Shunt Diode Safety Barrier Certification Label
CI7787-2* ²	1 of 4	5	1.15	MTL7787+ & MTL7787P- Shunt Diode Safety Barrier Parts List
CI7787-2* ²	2 of 4	4	4.02	MTL7787P+, MTL7787P- Shunt Diode Safety Barriers Circuit Diagram

Number	Sheet	Issue	Date	Description
CI7787-2* ²	3 of 4	3	5.02	MTL7787P+, MTL7787P- Shunt Diode Safety Barriers Component Layout
CI7787-2* ²	4 of 4	4	7.16	MTL7787P+, MTL7787- Shunt Diode Safety Barrier Certification Label
CI7788* ²	1 of 1	1	3.02	MTL7788+, MTL7788-, MTL7788R+, MTL7788R- Salvage Scheme for PCB954 Issue 3
CI7788-1* ²	1 of 4	5	5.02	MTL7788+, MYL7788-, MTL7788R+, MTL7788R- Shunt Diode Safety Barriers Part List
CI7788-1* ²	2 of 4	5	10.02	MTL7788+, MYL7788-, MTL7788R+, MTL7788R- Shunt Diode Safety Barriers Circuit Diagram
CI7788-1* ²	3 of 4	5	10.02	MTL7788+, MYL7788-, MTL7788R+, MTL7788R- Shunt Diode Safety Barriers Component Layout
CI7788-1* ²	4 of 4	4	7.16	MTL7788+, MTL7788-, MTL7788R+ and MTL7788R- Shunt Diode Safety Barrier Certification Label
CI7789-1* ²	1 of 4	1	2.02	MTL7789+, MTL7789- Parts List
CI7789-1* ²	2 of 4	1	2.02	MTL7789+, MTL7789- Shunt Diode Safety Barriers Circuit Diagram
CI7789-1* ²	3 of 4	3	10.02	MTL7789+, MTL7789- Shunt Diode Safety Barriers Component Layout
CI7789-1* ²	4 of 4	4	7.16	MTL7789+, MTL7789- Shunt Diode Safety Barrier Certification Label
CI7796-1* ²	1 of 4	2	4.02	MTL7796+, MTL7796- Shunt Diode Safety Barriers Parts List
CI7796-1* ²	2 of 4	2	4.02	MTL7796+, MTL7796- Shunt Diode Safety Barriers Circuit Diagram
CI7796-1* ²	3 of 4	2	6.02	MTL7796+, MTL7796- Shunt Diode Safety Barriers Component Layout
CI7796-1* ²	4 of 4	4	7.16	MTL7796+, MTL7796- Shunt Diode Safety Barrier Certification Label
SCI-947	1 & 2	4	5.02	Correlation between MTL7700 Barriers and MTL7000 and MTL700 Barriers (IIC)

Drawings marked *¹ are also associated with IECEx Certificate No's IECEx BAS 04.0025 & IECEx BAS 04.0026, and ATEX Certificate No. BAS01ATEX7218.

Drawings marked *² are also associated with IECEx Certificate No. IECEx BAS 04.0025.

Drawings marked *³ are also associated with IECEx Certificate No. IECEx BAS 04.0026.

20 Certificate History

Certificate No.	Date	Comments
BAS01ATEX7217	8 August 2001	The release of the prime certificate. The associated test and assessment against the requirements of EN 50014: 1997 + Amds 1 & 2 and EN 50020: 1994 is documented in Certification Report No. 00(C)1001.
BAS01ATEX7217/1	4 December 2001	To permit the addition of the MTL7715P, MTL7760ac and MTL7765ac Shunt Zener Diode Barriers to the range. The associated test and assessment is documented in Certification Report No. 00(C)1001/1.

Certificate No.	Date	Comments
BAS01ATEX7217/2	28 March 2002	To permit: - i) The addition of the MTL7706+, MTL7707+, MTL7758± and MTL7789± Shunt Zener Diode Barriers to the range. ii) The tolerance of resistors R1 & R2, used on the MTL7760ac and MTL7765ac, to be increased from 2% to 5%. iii) The tolerance of resistor R4, used on the MTL7788 and the MTL7788R, to be increased from 2% to 5%. iv) Minor drawing changes associated with the MTL7787P and the General Arrangement Drawing. The associated test and assessment is documented in Certification Report No. 01(C)1169.
BAS01ATEX7217/3	9 July 2002	To permit: - i) The addition of the MTL7741, MTL7742, MTL7743, MTL7744 & MTL7745 Switch / Proximity Input Barriers and the MTL7778 Shunt Zener Diode Barrier to the range. ii) Minor drawing changes associated with the General Arrangement Drawing. iii) The alternative fuse arrangement to be deleted from the MTL7706, MTL7710, MTL7715, MTL7715P, MTL7722, MTL7728, MTL7728ac, MTL7728P, MTL7755ac, MTL7761ac, MTL7761Pac, MTL7764, MTL7764ac, MTL7766ac, MTL7766Pac, MTL7767, MTL7779, MTL7787, MYL7787P, MTL7778(R) and MTL7796. iv) An alternative PCB arrangement for the MTL7788 and the MTL7788R, and to allow a salvage scheme for existing PCB's. v) To permit minor drawing changes associated with the MTL7758, MTL7761Pac, MTL7787P and the MTL7789. vi) To permit minor mechanical changes to the General Arrangement. The associated test and assessment is documented in Certification Report No. 01(C)1169/1.
BAS01ATEX7217/4	3 September 2002	To permit: - i) An alternative PCB arrangement for the MTL7742 and the MTL7744. ii) The addition of diodes D15 & D16 on the MTL7778ac Shunt Zener Diode Barrier. iii) Minor drawing changes not affecting the original assessment. iv) The addition of alternative enclosure materials.
BAS01ATEX7217/5	29 October 2002	To permit: - i) The use of an alternative enclosure material. ii) Minor mechanical changes to the enclosure iii) Minor drawing changes not affecting the original assessment.

Certificate No.	Date	Comments
BAS01ATEX7217/6	22 April 2010	i) To permit minor circuit and PCB layout changes to the MTL7706 Shunt Zener Diode Barrier model not affecting the original assessment. ii) To confirm the current design of the MTL7706 Shunt Zener Diode Safety Barrier has been reviewed against the requirements of EN 60079-0: 2009 and EN 60079-11: 2007 in respect of the differences from EN 50014: 1997 + Amd. 1 & 2 and EN 50020: 1994 and none of the differences affect this equipment. The marking of the MTL7706 Barrier has been revised in accordance with the requirements of EN 60079-0: 2009 to include the Equipment Protection Level (EPL) marking. The test and assessment of the above is documented in Certification Report No. GB/BAS/ExTR10.0092/00.
BAS01ATEX7217 Issue 7	5 February 2015	This issue of the certificate incorporates previously issued primary & supplementary certificates into one certificate and confirms the current design meets the requirements of EN 60079-0: 2012 & EN 60079-11: 2012 including the revision of the equipment marking in accordance with these standards. This issue of the certificate also permits the use of alternative parameters when connected to an Ex ic system. See Variation 7.1 in certificate schedule for parameters. The test and assessment of the above is documented in Certification Report No. GB/BAS/ExTR14.0350/00.
BAS01ATEX7217 Issue 8	12 October 2016	i) To permit the manufacturer's name to be changed on page 1 of the certificate and on the equipment marking. ii) To confirm the current designs of the MTL7700 Series Shunt Zener Diode Barriers (IIC) have been reviewed against EN 60079-0: 2012 + A11: 2013 in respect of the differences from EN 60079-0: 2012, and none of the differences affect the equipment. The associated assessment is documented in Certification Report No. GB/BAS/ExTR16.0646/00.
BAS01ATEX7217 Issue 9	5 January 2018	To permit the introduction of a new barrier type MTL7751AC. Additionally, Load Parameter Note 2 in Section 15 of the certificate was updated to reflect the full text of EN 60079-11, Section 10.1.5.2.(b)(2). The associated assessment is documented in Certification Report No. GB/BAS/ExTR17.0339/00 (held with IECEx Certificate No. IECEx BAS 04.0025 Iss. 8), Project Number 17/0646.
BAS01ATEX7217 Issue 10	26 September 2018	To confirm that the current design conforms to the requirements of EN IEC 60079-0:2018 and to permit the introduction of three new barrier types MTL7710P+, MTL7768+ and MTL7772AC. The associated assessment is documented in Certification Report No. GB/BAS/ExTR18.0174/00 (held with IECEx Certificate No. IECEx BAS 04.0025 Iss. 9), Project Number 18/0369.
For drawings applicable to each issue, see original of that issue.		