



Mining And Surface Certification (Pty) Ltd

2015/021934/07



Certificate Number: MASC MS/17-0887
Issue: 6 August 2021
Expire: 23 July 2024
Page: 1 of 13

IA – CERTIFICATE

(Supplement 2: Reviewed by MASC as per ARP 0108)

IN TERMS OF REGULATION 21.17.2 OF THE MINERALS ACT (INCORPORATION THE MINE HEALTH AND SAFETY ACT) AND REGULATION 9 (1) OF THE ELECTRICAL MACHINERY REGULATIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT

Ex – Type Examination

Certificate number:

Equipment:

Serial No:

MASC MS/17-0887

Z-Series Shunt Zener Diode Safety Barriers
(See “Conditions of Certification”)

Requested by:

Address:

Pepperl+Fuchs (Pty) Ltd

1st fl Zerwick Forum

8 Glen Eagle Office Park

Cnr Monument Rd and Braambos St

Glen Erasmia, Kempton Park 1619

South Africa

Manufacturer:

Address:

Pepperl+Fuchs SE

Lilienthalstrasse 200

68307 Mannheim

Germany

DESCRIPTION:

The Z Series Shunt Zener Diode Safety Barriers are designed to restrict the transfer of energy, from unspecified safe area equipment to intrinsically safe circuits, the limitation of voltage and current. The range consists of single, double, triple and quadruple channel barriers covering polarized – positive and negative, non-polarized, non-polarized-star connected barriers and diode return barriers.

The barriers consist of electronic components on a single printed circuit board encapsulated within a moulded plastic enclosure which incorporates two or four terminals with separate earth terminal at both the hazardous and non-hazardous area ends and an integral spring mounted foot, designed for a DIN rail.

The barriers are asymmetrical and have light blue hazardous area terminals.

Input Parameters

Single Channel - Terminals 7 & 8
Dual Channel - Terminals 5, 6, 7 & 8
Triple Channel - Terminals 5, 6, 7 & 8
Quad Channel - Terminals 5, 6, 7 & 8 w.r.t. GND

U_m = 250V

/ . Output...

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Output Parameters

Terminals 1, 2, 3 & 4

Configuration Legend

Config. Description

- A1 Channel 1 output with respect to earth
- A2 Channel 2 output with respect to earth
- A3 Channel 3 output with respect to earth
- A4 Channel 4 output with respect to earth
- B Any two channels in parallel with respect to earth
- B1 Any three channels in parallel with respect to earth
- C Any two channels in series with NO earth return
- C1 Any two channels in parallel connected in series with the third channel with NO earth return.

Z700 Series Positive Polarity Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z705	A1	250	4.94	9.8	504	0.62	9.92
Z710	A1	100	9.56	49	195	0.47	25.64
Z710.CL	A1	100	9.56	49	195	0.47	25.64
Z713	A1	160	15.75	21.8	723	2.84	1.50
Z715	A1	100	14.7	98	150	0.55	9.80
Z715.CL	A1	100	14.7	98	150	0.55	9.80
Z715.1k	A1	100	14.7	980	15	0.06	98.0
Z722	A1	50	22	147	150	0.82	2.24
Z722.CL	A1	50	22	147	150	0.82	2.24
Z728	A1	50	28	301	93	0.65	1.93
Z728.CL	A1	50	28	301	93	0.65	1.93
Z728.H	A1	80	28	235	120	0.83	1.50
Z731	A1	50	28	300	93	0.65	1.93
	A2	400	7.2	4.9	1470	2.64	3.40
	B		28	4.8	1570	2.95	3.18
Z755	A1	250	4.94	9.8	504	0.62	9.92
	A2	250	4.94	9.8	504	0.62	9.92
	B		4.94	4.9	1008	1.25	4.96
	C		6.14	19.6	314	0.49	15.92
Z757	A1	200	7.14	9.8	729	1.30	6.85
	A2	200	7.14	9.8	729	1.30	6.85
	B		7.14	4.9	1457	2.60	3.43
	C		8.34	19.6	426	0.89	11.73
Z763	A1	100	11.6	31.35	370	1.07	13.51
	A2	100	1.6	31.35	51	0.02	98.03
	B		13.2	15.67	422	0.70	6.44
Z764	A1	50	11.6	980	12	0.03	416
	A2	50	11.6	980	12	0.03	416
	B		11.6	490	24	0.06	208
	C		12.8	1960	6.6	0.03	510
Z765	A1	100	14.7	98	150	0.55	9.80
	A2	100	14.7	98	150	0.55	9.80
	B		14.7	49	300	1.10	4.90
	C		15.9	196	81.2	0.33	13.05

This document may only be reproduced in full.
 This certificate is not transferable and remains the property of the issuing body.
 This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z700 Series Positive Polarity Shunt Zener Diode Barriers								
Barrier	Config.	Fuse (mA)	U _o (V)	R _{min} (Ω)	I _o (mA)	P _o (W)	FOS IIC	
Z772	A1	50	22	147	150	0.82	2.24	
	A2	50	22	147	150	0.82	2.24	
	B	Not Permitted for Grp. IIC		22	73.5	300	1.64	-
	C		24.4	294	83	0.51	3.02	
Z778	A1	50	28	607	46	0.32	3.91	
	A2	50	28	607	46	0.32	3.91	
	B		28	303.5	93	0.65	1.93	
	C		30.4	1215.2	25.1	0.20	5.85	
Z779	A1	50	28	301	93	0.65	1.93	
	A2	50	28	301	93	0.65	1.93	
	B	Not Permitted for Grp. IIC		28	150.5	186	1.30	-
	C		30.4	601.7	50.52	0.39	2.90	
Z779.H	A1	80	28	235	120	0.83	1.50	
	A2	80	28	235	120	0.83	1.50	
	B	Not Permitted for Grp. IIC		28	117.5	238	1.67	-
	C		30.4	470.4	65	0.50	2.26	
Z786	A1	50	28	Diode Return* - See Note Below				
	A2	50	28	Diode Return* - See Note Below				
	B		28	Diode Return* - See Note Below				
Z787	A1	50	28	301	93	0.65	1.93	
	A2	50	28	Diode Return* - See Note Below				
	B		28	301	93	0.65	1.93	
	C		30.4	322.6	94.24	0.72	1.55	
Z787.H	A1	80	28	235	120	0.83	1.50	
	A2	80	28	Diode Return* - See Note Below				
	B		28	235	120	0.83	1.50	
	C	Not Permitted for Grp. IIC		30.4	249.9	122	0.93	-
Z788	A1	50	28	301	93	0.65	1.93	
	A2	50	9.56	49	195	0.47	25.64	
	B		28	42	288	0.87	16.38	
	C		29.2	349.9	83.5	0.61	1.94	
Z788.R	A1	50	28	301	93	0.65	1.93	
	A2	50	9.56	49	195	0.47	25.64	
	B		28	42	288	0.87	16.38	
	C		29.2	349.9	83.5	0.61	1.94	
Z788.H	A1	80	28	235	120	0.83	1.50	
	A2	80	9.56	49	195	0.47	25.64	
	B		28	40	314	1.00	10.73	
	C		29.2	284.2	103	0.75	1.57	
Z788.R.H	A1	80	28	235	120	0.83	1.50	
	A2	80	9.56	49	195	0.47	25.64	
	B		28	40	314	1.00	10.73	
	C		29.2	284.2	103	0.75	1.57	
Z789	A1	50	28	613.8	45.6	0.32	3.94	
	A2	50	28	613.8	45.6	0.32	3.94	
	A3	50	28	Diode Return* - See Note Below				
	A4	50	28	Diode Return* - See Note Below				
	B		28	306.9	91.2	0.64	1.97	

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z700 Series Positive Polarity Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z796	A1	50	26.6	314	85	0.56	2.38
	A2	50	20.5	407	50	0.26	8.54
	B		26.6	177	135	0.82	1.93
	C		29	720.3	40.3	0.30	4.09
Z796.L	A1	50	26.0	314	83	0.54	2.59
	A2	50	20.0	407	49	0.25	9.46
	B		26.0	177	132	0.77	2.10
	C		28.4	720.3	39.3	0.28	4.38
Z040	A1	100	5.88	42.14	140	0.206	35.71
	A2	100	5.88	42.14	140	0.206	35.71
	B	2 × 100	5.88	21.07	280	0.412	17.85
	C	100	7.08	84.28	84.1	0.149	59.45
Z041	A1	80	8.61	1980	4.4	0.0094	1136
	A2	80	8.61	1980	4.4	0.0094	1136
	B	2 × 80	8.61	990	8.7	0.0188	574
	C	80	9.81	3960	2.5	0.0062	2000
Z042	A1	100	5.88	198	30	0.044	166
	A2	100	5.88	198	30	0.044	166
	B	2 × 100	5.88	99	60	0.088	83
	C	100	7.08	396	18	0.032	277

Z800 Series Negative Polarity Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z805	A1	250	4.94	9.8	504	0.62	9.92
Z810	A1	100	9.56	49	195	0.47	25.64
Z810.CL	A1	100	9.56	49	195	0.47	25.64
Z813	A1	160	15.75	21.8	723	2.84	1.50
Z815	A1	100	14.7	98	150	0.55	9.80
Z815.CL	A1	100	14.7	98	150	0.55	9.80
Z815.1k	A1	100	14.7	980	15	0.06	98.0
Z822	A1	50	22	147	150	0.82	2.24
Z822.CL	A1	50	22	147	150	0.82	2.24
Z828	A1	50	28	301	93	0.65	1.93
Z828.CL	A1	50	28	301	93	0.65	1.93
Z828.H	A1	80	28	235	120	0.83	1.50
Z855	A1	250	4.94	9.8	504	0.62	9.92
	A2	250	4.94	9.8	504	0.62	9.92
	B		4.94	4.9	1008	1.25	4.96
	C		6.14	19.6	314	0.49	15.92
Z857	A1	200	7.14	9.8	729	1.30	6.85
	B2	200	7.14	9.8	729	1.30	6.85
	B		7.14	4.9	1457	2.60	3.43
	C		8.34	19.6	426	0.89	11.73
Z864	A1	50	11.6	980	12	0.03	416
	A2	50	11.6	980	12	0.03	416
	B		11.6	490	24	0.06	208
	C		12.8	1960	6.6	0.03	510

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z800 Series Negative Polarity Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U _o (V)	R _{min} (Ω)	I _o (mA)	P _o (W)	FOS IIC
Z865	A1	100	14.7	98	150	0.55	9.80
	A2	100	14.7	98	150	0.55	9.80
	B		14.7	49	300	1.10	4.90
	C		15.9	196	81.2	0.33	13.05
Z872	A1	50	22	147	150	0.82	2.24
	A2	50	22	147	150	0.82	2.24
	B	Not Permitted for Grp. IIC	22	73.5	300	1.64	-
	C		24.4	294	83	0.51	3.02
Z878	A1	50	28	607	46	0.32	3.91
	A2	50	28	607	46	0.32	3.91
	B		28	303.5	93	0.65	1.93
	C		30.4	1215.2	25.1	0.20	5.85
Z879	A1	50	28	301	93	0.65	1.93
	A2	50	28	301	93	0.65	1.93
	B	Not Permitted for Grp. IIC	28	150.5	186	1.30	-
	C		30.4	601.7	50.52	0.39	2.9
Z879.H	A1	80	28	235	120	0.83	1.50
	A2	80	28	235	120	0.83	1.50
	B	Not Permitted for Grp. IIC	28	117.5	238	1.67	-
	C		30.4	470.4	65	0.50	2.26
Z886	A1	50	28	Diode Return* - See Note Below			
	A2	50	28	Diode Return* - See Note Below			
	B		28	Diode Return* - See Note Below			
Z887	A1	50	28	301	93	0.65	1.93
	A2	50	28	Diode Return* - See Note Below			
	B		28	301	93	0.65	1.93
	C		30.4	322.6	94.24	0.72	1.55
Z887.H	A1	80	28	235	120	0.83	1.50
	A2	80	28	Diode Return* - See Note Below			
	B		28	235	120	0.83	1.50
	C	Not Permitted for Grp. IIC	30.4	249.9	122	0.93	-
Z888	A1	50	28	301	93	0.65	1.93
	A2	50	9.56	49	195	0.47	25.64
	B		28	42	288	0.87	16.38
	C		29.2	349.9	83.5	0.61	1.94
Z888.R	A1	50	28	301	93	0.65	1.93
	A2	50	9.56	49	195	0.47	25.64
	B		28	42	288	0.87	16.38
	C		29.2	349.9	83.5	0.61	1.94
Z888.H	A1	80	28	235	120	0.83	1.50
	A2	80	9.56	49	195	0.47	25.64
	B		28	40	314	1.00	10.73
	C		29.2	284.2	103	0.75	1.57
Z888.R.H	A1	80	28	235	120	0.83	1.50
	A2	80	9.56	49	195	0.47	25.64
	B		28	40	314	1.00	10.73
	C		29.2	284.2	103	0.75	1.57

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z800 Series Negative Polarity Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z896	A1	50	26.6	314	85	0.56	2.38
	A2	50	20.5	407	50	0.26	8.54
	B		26.6	177	135	0.82	1.93
	C		29	720.3	40.3	0.30	4.09
Z896.L	A1	50	26.0	314	83	0.54	2.59
	A2	50	20.0	407	49	0.25	9.46
	B		26.0	177	132	0.77	2.10
	C		28.4	720.3	39.43	0.28	4.38

Z900 Series Fieldbus Barrier							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z922 (+ / -)	A1	100	+11	50	218	0.60	22.93
	A2	100	-11	50	218	0.60	22.93
	B		22	101	218	1.20	1.54

Z900 Series a.c. Shunt Zener Diode Barriers								
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC	
Z905 (a.c.)	A1	250	4.9	9.8	500	0.62	10.0	
Z910 (a.c.)	A1	100	9.94	49	203	0.50	24.63	
Z915 (a.c.)	A1	100	15	98	153	0.57	8.82	
Z915.1k (a.c.)	A1	100	15	980	15	0.06	90.0	
Z928 (a.c.)	A1	50	28	301	93	0.65	1.93	
Z954 (a.c.)	A1	50	4.5	11.76	383	0.43	13.05	
	A2	50	4.5	11.76	383	0.43	13.05	
	A3	50	4.5	11.76	383	0.43	13.05	
	B			4.5	5.88	765	0.86	6.53
	B1			4.5	3.92	1150	1.29	4.34
	C1			9	17.64	511	1.15	9.8
Z955 (a.c.)	A1	250	4.9	9.8	500	0.62	10.0	
	A2	250	4.9	9.8	500	0.62	10.0	
	B		4.9	4.9	1000	1.24	5.0	
	C			9.8	19.6	500	1.23	10
Z960 (Star)	A1	50	9.94	49	203	0.50	24.63	
	A2	50	9.94	49	203	0.50	24.63	
	B		9.94	24.5	406	1.00	12.31	
	C		9.94	98	102	0.25	49.01	
Z961 (a.c.)	A1	100	8.7	98	89	0.19	56.17	
	A2	100	8.7	98	89	0.19	56.17	
	B		8.7	49	178	0.39	28.08	
	C		17.4	196	89	0.39	8.31	
Z961.H (a.c.)	A1	50	8.7	352.8	25	0.05	200	
	A2	50	8.7	352.8	25	0.05	200	
	B		8.7	176	49	0.11	102	
	C		17.4	705.6	25	0.11	29.6	

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

Z900 Series a.c. Shunt Zener Diode Barriers							
Barrier	Config.	Fuse (mA)	U_o (V)	R_{min} (Ω)	I_o (mA)	P_o (W)	FOS IIC
Z964 (a.c.)	A1	50	12	980	12	0.04	416
	A2	50	12	980	12	0.04	416
	B		12	490	24	0.08	208
	C		24	1960	12	0.08	21.75
Z965 (Star)	A1	50	15	98	153	0.57	8.82
	A2	50	15	98	153	0.57	8.82
	B		15	49	306	1.14	4.41
	C		15	196	76.5	0.29	17.64
Z966 (a.c.)	A1	50	12	147	82	0.24	60.97
	A2	50	12	147	82	0.24	60.97
	B		12	73.5	164	0.48	30.48
	C		24	294	82	0.48	3.18
Z966.H (a.c.)	A1	100	12	73.5	164	0.49	30.48
	A2	100	12	73.5	164	0.49	30.48
	B		12	36.75	328	0.98	15.24
	C		24	147	164	0.98	1.59
Z967 (Star)	A1	50	16.8	117	143	0.60	5.87
	A2	50	16.8	117	143	0.60	5.87
	B		16.8	58	286	1.20	2.93
	C		16.8	234	72	0.30	11.66
Z969 (Special Star)	A1	80	14.24	35.6	400	1.42	4.12
	A2	80	17.6	50.5	349	1.53	2.03
	B		19.24	20.8	749	2.95	1.50
	C		19.24	86.1	224	1.08	2.33
Z972 (Star)	A1	50	22	301	73	0.40	4.61
	A2	50	22	301	73	0.40	4.61
	B		22	151	146	0.80	2.30
	C		22	602	36.5	0.20	9.23
Z978 (Star)	A1	50	28	607	46	0.32	3.91
	A2	50	28	607	46	0.32	3.91
	B		28	304	93	0.65	1.93
	C		28	1214	23	0.16	7.82

Notes: Barriers models marked * have channels with diode returns. The hazardous area terminals for the channels with diode returns should be regarded as 28V voltage sources. The 28V must be considered as the theoretical maximum up to which a capacitive load can be applied to the terminals due to the leakage current of the diode return. This voltage is only used in calculating the load capacitance.

LOAD PARAMETERS

The capacitance and 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:

This document may only be reproduced in full.
 This certificate is not transferable and remains the property of the issuing body.
 This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z700 Series Positive Polarity Shunt Zener Diode Barriers													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z705	A1	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
Z710	A1	3.6	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
Z710.CL	A1	3.6	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
Z713	A1	0.478	0.068	12	2.88	0.27	49	11.6	0.54	99	15.8	0.89	164
Z715	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
Z715.CL	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
Z715.1k	A1	0.62	158.0	644	3.86	632.09	2579	14.9	1264	5159	18.6	2074	8465
Z722	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
Z722.CL	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
Z728	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z728.CL	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z728.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
Z731	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	13.5	0.016	13	240	0.065	53	1000	0.13	107	1000	0.21	176
	B	0.083	0.014	12	0.65	0.057	50	2.15	0.11	101	3.76	0.18	157
Z755	A1	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
	A2	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
	B	100	0.034	28	1000	0.13	114	1000	0.27	228	1000	0.45	374
	C	34	0.36	73	790	1.44	295	1000	2.88	591	1000	4.73	970
Z757	A1	13.5	0.066	27	240	0.26	109	1000	0.53	218	1000	0.87	358
	A2	13.5	0.066	27	240	0.26	109	1000	0.53	218	1000	0.87	358
	B	13.5	0.016	13	240	0.066	54	1000	0.13	109	1000	0.21	179
	C	6.8	0.195	40	66.0	0.783	160	1000	1.56	320	1000	2.57	526
Z763	A1	1.59	0.25	33	10.8	1.03	132	43.0	2.07	265	46	3.40	434
	A2	100	13.66	1741	1000	54.67	6966	1000	109.35	13933	1000	179.41	22859
	B	0.94	0.19	12	5.8	0.79	51	21.0	1.59	102	27	2.62	167
Z764	A1	1.59	246.91	1035	10.8	987.65	4143	43.0	1975	8286	46	3240	13594
	A2	1.59	246.91	1035	10.8	987.65	4143	43.0	1975	8286	46	3240	13594
	B	1.59	61.72	517	10.8	246.91	2071	43.0	493.82	4143	46	810.18	6797
	C	1.06	816	1701	6.8	3264	6805	24.2	6529	13611	30.0	10713	22330
Z765	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
	A2	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
	B	0.62	0.39	32	3.86	1.58	128	14.9	3.16	257	18.6	5.18	423
	C	0.469	5.39	110	2.81	21.57	441	11.3	43.14	882	15.4	70.77	1447
Z772	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
	A2	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
	B	Not Permitted for Group IIC			1.14	1.58	86	4.20	3.16	172	6.0	5.18	283
	C	0.119	5.16	70	0.89	20.64	280	3.20	41.28	561	5.1	67.74	921
Z778	A1	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	A2	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	B	0.083	4.11	55	0.65	16.44	220	2.15	32.88	440	3.76	53.95	722
	C	0.064	56.43	187	0.542	225.7	748	1.76	451.4	1496	2.96	740.7	2454
Z779	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	B	Not Permitted for Group IIC			0.65	4.11	109	2.15	8.22	218	3.76	13.48	358
	C	0.064	13.93	92	0.542	55.72	370	1.76	111.4	740	2.96	182.8	1215
Z779.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	B	Not Permitted for Group IIC			0.65	2.51	85	2.15	5.02	170	3.76	8.23	279
	C	0.064	8.41	72	0.542	33.66	289	1.76	67.32	579	2.96	110.4	950
Z786	A1	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
Z787	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	C	0.064	4.00	49	0.542	16.01	198	1.76	32.03	397	2.96	52.55	651
Z787.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	2.51	42	0.65	9.87	170	2.15	19.75	341	3.76	32.95	559
	C	Not Permitted for Group IIC			0.542	9.55	153	1.76	19.11	307	2.96	31.35	504
Z788	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.42	40	0.65	1.71	160	2.15	3.42	321	3.76	5.62	526
	C	0.073	5.09	58	0.596	20.39	233	1.94	40.79	466	3.35	66.93	766
Z788.R	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.42	40	0.65	1.71	160	2.15	3.42	321	3.76	5.62	526
	C	0.073	5.09	58	0.596	20.39	233	1.94	40.79	466	3.35	66.93	766

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z700 Series Positive Polarity Shunt Zener Diode Barriers													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z788.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.36	34	0.65	1.44	138	2.15	2.88	277	3.76	4.73	455
	C	0.073	3.35	47	0.596	13.40	189	1.94	26.81	379	3.35	43.98	622
Z788.R.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.36	34	0.65	1.44	138	2.15	2.88	277	3.76	4.73	455
	C	0.073	3.35	47	0.596	13.40	189	1.94	26.81	379	3.35	43.98	622
Z789	A1	0.083	17.09	111	0.65	68.39	445	2.15	136.79	890	3.76	224.42	1461
	A2	0.083	17.09	111	0.65	68.39	445	2.15	136.79	890	3.76	224.42	1461
	A3	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	A4	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B (A1+2)	0.083	4.27	55	0.65	17.09	222	2.15	34.19	445	3.76	56.10	730
Z796	A1	0.094	4.92	63	0.73	19.68	252	2.42	39.36	504	4.27	64.59	828
	A2	0.203	14.22	137	1.33	56.88	550	5.12	113.77	1101	7.5	186.66	1807
	B	0.094	1.95	43	0.73	7.80	142	2.42	15.60	284	4.27	25.60	573
	C	0.074	21.89	121	0.605	87.57	487	1.97	175.14	974	3.42	287.34	1598
Z796.L	A1	0.099	5.16	66	0.77	20.64	264	2.60	41.28	528	4.5	67.74	867
	A2	0.22	14.80	144	1.41	59.23	578	5.50	118.46	1157	8.0	194.36	1899
	B	0.099	2.04	45	0.77	8.16	148	2.60	16.32	297	4.5	26.78	603
	C	0.079	22.86	127	0.632	91.47	508	2.07	182.95	1016	3.64	300.16	1667
Z040	A1	43	1.81	173	1000	7.25	693	1000	14.51	1386	1000	23.80	2275
	A2	43	1.81	173	1000	7.25	693	1000	14.51	1386	1000	23.80	2275
	B	43	0.45	86.6	1000	1.81	346	1000	3.62	693	1000	5.95	1137
	C	14.6	5.02	239	268	20.10	956	1000	40.21	1913	1000	65.98	3138
Z041	A1	5.9	1836	3798	50	7346	15194	1000	14692	30388	1000	24104	49856
	A2	5.9	1836	3798	50	7346	15194	1000	14692	30388	1000	24104	49856
	B	5.9	459.13	1899	50	1836	7597	1000	3673	15194	1000	6026	24928
	C	3.2	5688	5852	22	22755	23409	115	45511	46818	190	74666	76811
Z042	A1	43	39.50	814	1000	158.02	3257	1000	316.04	6515	1000	518.51	10689
	A2	43	39.50	814	1000	158.02	3257	1000	316.04	6515	1000	518.51	10689
	B	43	9.87	407	1000	39.50	1628	1000	79.01	3257	1000	129.62	5344
	C	14.6	109.73	1123	268	438.95	4494	1000	877.90	8988	1000	1440	14746

Z800 Series Negative Polarity Shunt Zener Diode Barriers													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z805	A1	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
Z810	A1	3.6	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
Z810.CL	A1	3.6	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
Z813	A1	0.478	0.068	12	2.88	0.27	49	11.6	0.54	99	15.8	0.89	164
Z815	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
Z815.CL	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
Z815.1k	A1	0.62	158.0	644	3.86	632.09	2579	14.9	1264	5159	18.6	2074	8465
Z822	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
Z822.CL	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
Z828	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z828.CL	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z828.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
Z855	A1	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
	A2	100	0.14	57	1000	0.55	228	1000	1.11	456	1000	1.83	749
	B	100	0.034	28	1000	0.13	114	1000	0.27	228	1000	0.45	374
	C	34.0	0.36	73	790	1.44	295	1000	2.88	591	1000	4.73	970
Z857	A1	13.5	0.066	27	240	0.26	109	1000	0.53	218	1000	0.87	358
	A2	13.5	0.066	27	240	0.26	109	1000	0.53	218	1000	0.87	358
	B	13.5	0.016	13	240	0.066	54	1000	0.13	109	1000	0.21	179
	C	6.8	0.195	40	66.0	0.783	160	1000	1.56	320	1000	2.57	526
Z864	A1	1.59	246.91	1035	10.8	987.65	4143	43.0	1975	8286	46	3240	13594
	A2	1.59	246.91	1035	10.8	987.65	4143	43.0	1975	8286	46	3240	13594
	B	1.59	61.72	517	10.8	246.91	2071	43.0	493.82	4143	46	810.18	6797
	C	1.06	816	1701	6.8	3264	6805	24.2	6529	13611	30.0	10713	22330
Z865	A1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
	A2	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	18.6	20.74	846
	B	0.62	0.39	32	3.86	1.58	128	14.9	3.16	257	18.6	5.18	423
	C	0.469	5.39	110	2.81	21.57	441	11.3	43.14	882	15.4	70.77	1447

This document may only be reproduced in full.
 This certificate is not transferable and remains the property of the issuing body.
 This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z800 Series Negative Polarity Shunt Zener Diode Barriers													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z872	A1	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
	A2	0.165	1.58	43	1.14	6.32	172	4.20	12.64	345	6.0	20.74	566
	B	Not Permitted for Group IIC			1.14	1.58	86	4.20	3.16	172	6.0	5.18	283
	C	0.119	5.16	70	0.89	20.64	280	3.20	41.28	561	5.1	67.74	921
Z878	A1	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	A2	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	B	0.083	4.11	55	0.65	16.44	220	2.15	32.88	440	3.76	53.95	722
	C	0.064	56.43	187	0.542	225.7	748	1.76	451.4	1496	2.96	740.7	2454
Z879	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	B	Not Permitted for Group IIC			0.65	4.11	109	2.15	8.22	218	3.76	13.48	358
	C	0.064	13.93	92	0.542	55.72	370	1.76	111.4	740	2.96	182.8	1215
Z879.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	B	Not Permitted for Group IIC			0.65	2.51	85	2.15	5.02	170	3.76	8.23	279
	C	0.064	8.41	72	0.542	33.66	289	1.76	67.32	579	2.96	110.45	950
Z886	A1	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	C	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z887	A1	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	C	0.064	4.00	49	0.542	16.01	198	1.76	32.03	397	2.96	52.5	651
Z887.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	0.083	1000	852	0.65	1000	1703	2.15	1000	2409	3.76	1000	3086
	B	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	C	Not Permitted for Group IIC			0.542	9.55	153	1.76	19.11	307	2.96	31.35	504
Z888	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.42	40	0.65	1.71	160	2.15	3.42	321	3.76	5.62	526
	C	0.073	5.09	58	0.596	20.39	233	1.94	40.79	466	3.35	66.93	765
Z888.R	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.42	40	0.65	1.71	160	2.15	3.42	321	3.76	5.62	526
	C	0.073	5.09	58	0.596	20.39	233	1.94	40.79	466	3.35	66.93	765
Z888.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.36	34	0.65	1.44	138	2.15	2.88	277	3.76	4.73	455
	C	0.073	3.35	47	0.596	13.40	189	1.94	26.81	379	3.35	43.98	622
Z888.R.H	A1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.76	32.40	559
	A2	3.60	0.93	76	26.0	3.74	305	210.0	7.48	610	500	12.27	1000
	B	0.083	0.36	34	0.65	1.44	138	2.15	2.88	277	3.76	4.73	455
	C	0.073	3.35	47	0.596	13.40	189	1.94	26.81	379	3.35	43.98	622
Z896	A1	0.094	4.92	63	0.73	19.68	252	2.42	39.36	504	4.27	64.59	828
	A2	0.203	14.22	137	1.33	56.88	550	5.12	113.77	1101	7.5	186.66	1807
	B	0.094	1.95	43	0.73	7.80	142	2.42	15.60	284	4.27	25.60	573
	C	0.074	21.89	121	0.605	87.57	487	1.97	175.14	974	3.42	287.34	1598
Z896.L	A1	0.099	5.16	66	0.77	20.64	264	2.60	41.28	528	4.5	67.74	867
	A2	0.22	14.80	144	1.41	59.23	578	5.50	118.46	1157	8.0	194.36	1899
	B	0.099	2.04	45	0.77	8.16	148	2.60	16.32	297	4.5	26.78	603
	C	0.079	22.86	127	0.632	91.47	508	2.07	182.95	1016	3.64	300.16	1667

Z900 Fieldbus Barrier													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z922 (+/-)	A1	1.97	0.74	58	13.8	2.99	235	60.0	5.98	470	67.5	9.81	771
	A2	1.97	0.74	58	13.8	2.99	235	60.0	5.98	470	67.5	9.81	771
	B	0.165	0.74	29	1.14	2.99	118	4.20	5.98	237	6.0	9.81	389

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

IA CERTIFICATE NUMBER: MASC MS/17-0887
Z-Series Shunt Zener Diode Safety Barriers

Z900 Series a.c. Shunt Zener Diode Barriers													
Barrier	Config.	Group IIC			Group IIB			Group IIA			Group I		
		C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)	C (µF)	L (mH)	L/R (µH/Ω)
Z905 (a.c.)	A1	100	0.14	58	1000	0.56	232	1000	1.13	464	1000	1.86	761
Z910 (a.c.)	A1	3.0	0.86	70	20.0	3.45	282	100	6.90	564	180	11.32	925
Z915 (a.c.)	A1	0.58	1.51	61	3.55	6.07	247	14.0	12.15	495	17.8	19.93	813
Z915.1k (a.c.)	A1	0.58	158	619	3.55	632.09	2477	14.0	1264	4955	17.8	2074	8130
Z928 (a.c.)	A1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.76	53.95	716
Z954 (a.c.)	A1	100	0.24	82	1000	0.96	330	1000	1.93	660	1000	3.18	1084
	A2	100	0.24	82	1000	0.96	330	1000	1.93	660	1000	3.18	1084
	A3	100	0.24	82	1000	0.96	330	1000	1.93	660	1000	3.18	1084
	B	100	0.06	41	1000	0.24	165	1000	0.48	330	1000	0.79	542
	B1	100	0.026	27	1000	0.10	110	1000	0.21	220	1000	0.35	361
	C1	4.9	0.13	30	40.0	0.54	123	500	1.09	247	1000	1.79	406
Z955 (a.c.)	A1	100	0.14	58	1000	0.56	232	1000	1.13	464	1000	1.86	761
	A2	100	0.14	58	1000	0.56	232	1000	1.13	464	1000	1.86	761
	B	100	0.035	29	1000	0.14	116	1000	0.28	232	1000	0.46	382
	C	3.3	0.14	29	23	0.568	116	135	1.13	232	268	1.86	381
Z960 (a.c. Star)	A1	3.0	0.86	70	20.0	3.45	282	100	6.90	564	180	11.32	925
	A2	3.0	0.86	70	20.0	3.45	282	100	6.90	564	180	11.32	925
	B	3.0	0.21	35	20.0	0.86	141	100	1.72	282	180	2.83	462
	C	3.0	3.41	141	20.0	13.67	564	100	27.33	1128	180	44.85	1851
Z961 (a.c.)	A1	5.9	4.48	184	50.0	17.95	736	1000	35.91	1473	1000	58.91	2416
	A2	5.9	4.48	184	50.0	17.95	736	1000	35.91	1473	1000	58.91	2416
	B	5.9	1.12	92	50.0	4.48	368	1000	8.97	736	1000	14.72	1208
	C	0.346	4.48	92	2.02	17.95	368	8.40	35.91	736	11.6	58.91	1208
Z961.H (a.c.)	A1	5.9	56.88	662	50.0	227.55	2651	1000	455.11	5303	1000	746.66	8700
	A2	5.9	56.88	662	50.0	227.55	2651	1000	455.11	5303	1000	746.66	8700
	B	5.9	14.80	330	50.0	59.23	1322	1000	118.46	2645	1000	194.36	4340
	C	0.346	56.88	331	2.02	227.55	1325	8.40	455.11	2651	11.6	746.66	4350
Z964 (a.c.)	A1	1.41	246.9	967	9.00	987.65	3871	36.0	1975	7743	38	3240	12703
	A2	1.41	246.9	967	9.00	987.65	3871	36.0	1975	7743	38	3240	12703
	B	1.41	61.0	483	9.00	246.91	1935	36.0	493.82	3871	38	810.18	6351
	C	0.125	246.9	483	0.93	987.65	1935	3.35	1975	3871	5.25	3240	6351
Z965 (a.c. Star)	A1	0.58	1.51	61	3.55	6.07	247	14.0	12.15	495	17.8	19.93	813
	A2	0.58	1.51	61	3.55	6.07	247	14.0	12.15	495	17.8	19.93	813
	B	0.58	0.37	30	3.55	1.51	123	14.0	3.03	247	17.8	4.98	406
	C	0.58	6.07	123	3.55	24.30	495	14.0	48.60	991	17.8	79.74	1626
Z966 (a.c.)	A1	1.41	5.28	145	9.00	21.15	580	36.0	42.30	1161	38	69.40	1905
	A2	1.41	5.28	145	9.00	21.15	580	36.0	42.30	1161	38	69.40	1905
	B	1.41	1.32	72	9.00	5.28	290	36.0	10.57	580	38	17.35	952
	C	0.125	5.28	72	0.93	21.15	290	3.35	42.30	580	5.25	69.40	952
Z966.H (a.c.)	A1	1.41	1.32	72	9.00	5.28	290	36.0	10.57	580	38	17.35	952
	A2	1.41	1.32	72	9.00	5.28	290	36.0	10.57	580	38	17.35	952
	B	1.41	0.33	36	9.0	1.32	145	36.0	2.64	290	38	4.33	476
	C	0.125	1.32	36	0.93	5.28	145	3.35	10.57	290	5.25	17.35	476
Z967 (a.c. Star)	A1	0.39	1.73	58	2.29	6.95	235	9.30	13.90	471	13.16	22.82	773
	A2	0.39	1.73	58	2.29	6.95	235	9.30	13.90	471	13.16	22.82	773
	B	0.39	0.43	29	2.29	1.73	116	9.30	3.47	233	13.16	5.70	383
	C	0.39	6.85	117	2.29	27.43	471	9.30	54.86	943	13.16	90.02	1547
Z969 (a.c. Special Star)	A1	0.68	0.22	24	4.28	0.88	99	16.1	1.77	199	19.64	2.91	327
	A2	0.333	0.29	23	1.93	1.16	92	8.10	2.33	185	11	3.83	304
	B	0.248	0.063	12	1.52	0.25	48	6.03	0.50	96	8.68	0.83	158
	C	0.248	0.70	33	1.52	2.83	132	6.03	5.66	264	8.68	9.30	434
Z972 (a.c. Star)	A1	0.165	6.67	88	1.14	26.68	353	4.20	53.37	707	6.0	87.57	1160
	A2	0.165	6.67	88	1.14	26.68	353	4.20	53.37	707	6.0	87.57	1160
	B	0.165	1.66	44	1.14	6.67	177	4.20	13.34	354	6.0	21.89	582
	C	0.165	26.68	176	1.14	106.75	707	4.20	213.50	1415	6.0	350.28	2321
Z978 (a.c. Star)	A1	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	A2	0.083	16.80	110	0.65	67.21	440	2.15	134.42	880	3.76	220.54	1445
	B	0.083	4.11	55	0.65	16.44	220	2.15	32.88	441	3.76	53.95	723
	C	0.083	67.21	220	0.65	268.85	880	2.15	537.70	1761	3.76	882.16	2890

/I. Notes...

This document may only be reproduced in full.
 This certificate is not transferable and remains the property of the issuing body.
 This document will not be supported by MASC for certification purposes outside the borders of South Africa.

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 $1\mu\text{F}$ for Group IIB and 600nF for Group IIC.

MARKING:

SGS marking remains applicable. The following MASC Certificate number (IA number) must be additionally applied to the equipment.

IA No: MASC MS/17-0887

COMPLIANCE:

The equipment as described above and in MASC letter 17-0887 is hereby certified "Explosion Protected" [Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I and is suitable for use in hazardous locations as stated below and as tested, assessed and inspected in accordance with the relevant requirements of SANS / IEC Standards:

The evaluation was conducted according to the requirements of:

- i) SANS (IEC) 60079-0 : 2019 "Explosive atmospheres – Part 0: Equipment — General requirements"
- ii) SANS (IEC) 60079-11 : 2012 "Explosive atmospheres – Part 11: Equipment protection by intrinsic safety 'i'"

Location	Zone *0, 1 & 2 Zone *20, 21 & 22	Gas Surface / Mining (As Applicable) Dust (As Applicable)
Hazard Frequency	---	Continuous as could occur under normal operating conditions in hazardous area (*Outputs only)
Environment	Group I Group IIC Group IIIC	Methane and Coal dust (As Applicable) Propane to Hydrogen / Acetylene (As Applicable) Dust (Metallic & non-metallic) (As Applicable)
Service/Ambient Temperature	-20°C to +60°C	

/ . The use...

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.

The use of apparatus in hazardous locations is subject to the following provisions as applicable, which shall be adhered to:

- i. SANS 10086 requirements;
- ii. Any conditions mentioned in the above document;
- iii. Codes of Practice enforced in terms of Regulations 21.17.2 of Minerals Act, by Chief Inspector of Mines;
- iv. Any restrictions and conditions enforced by Chief Inspectors of Mines, Principal Inspector (Group I equipment) of Chief Inspector of Factories (Group II equipment);
- v. Any relevant requirements of the MHS Act or the OHS Act.

CONDITIONS OF MANUFACTURE:

- None

SPECIAL CONDITIONS OF USE (X):

- None

CONDITIONS OF CERTIFICATION:

1. This Certificate remains valid based on a three yearly review covered by an official MASC letter.
2. The apparatus must be additionally marked with the MASC marking details above.
3. This approval only covers the equipment as certified above and does not include any scheduled additions or variations / amendments / new issues to the certificate(s), made after the above date.
4. The equipment does not need to be re-tested when used on the conditions and with such restrictions as prescribed by TÜV and in this approval.
5. The TÜV certification must remain valid.
6. The extent of the requirements in the ARP 0108 (or regulations) and SANS 10108 on the certification of the equipment must remain unchanged.
7. The Ex quality assurance notification/report for the equipment must remain valid.



D.P Visser
TECHNICAL SPECIALIST



N Viljoen
TECHNICAL OFFICER

Mining And Surface Certification

This document is issued based on Mining And Surface Certification's Standard Contract terms and conditions available on request.

While every endeavor is made to ensure that a test / assessment is representative and accurately performed, and that a report is accurate in the quoted results and conclusions drawn from the test / assessment, MASC or its members/employees shall in no way be liable for any error made in carrying out the test / assessment or for any erroneous statement, whether in fact or in opinion, contained in a report issued pursuant to a test / assessment.

MASC takes no responsibility for any non-conformances, exclusions or any results / assessments not in compliance with the standards. By marking the equipment in accordance with the documentation / standard, the manufacturer attests on his own responsibility that the equipment has been constructed in accordance with the applicable requirements of the relevant standards and that the routine verifications and routine tests have been successfully completed and the product complies with the documentation and standard(s).

This document is only for use and application in South Africa. It is issued based on National interpretations and accepted practices.

This document may only be reproduced in full.
This certificate is not transferable and remains the property of the issuing body.
This document will not be supported by MASC for certification purposes outside the borders of South Africa.