

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 **BAS00ATEX7096 – Issue 8**  
Number:

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: **A Range of Z-Series Shunt Zener Diode Safety Barriers**

5 Manufacturer: **Pepperl + Fuchs GmbH**

6 Address: **Lilienthalstrasse 200, 68307 Mannheim, Germany**

7 This re-issued certificate extends EC Type Examination Certificate No. BAS00ATEX7096 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 60079-0: 2012 + A11: 2013 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 (I) GD [Ex ia Ga] IIC (-20°C ≤ T<sub>a</sub> ≤ +60°C)  
[Ex ia Da] IIIC (-20°C ≤ T<sub>a</sub> ≤ +60°C)

⊕ I (M1) [Ex ia Ma] I (-20°C ≤ T<sub>a</sub> ≤ +60°C)

SGS Baseefa Customer Reference No. **0808**

Project File No. **18/0292**

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R S SINCLAIR  
TECHNICAL MANAGER

On behalf of SGS Baseefa Limited

D BREARLEY  
Certification  
Manager

13

## Schedule

14

Certificate Number BAS00ATEX7096 – Issue 8

### 15 Description of Product

The Range of Z-Series Shunt Zener Diode Safety Barriers is 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 barriers covering polarised – positive and negative, non-polarised and non-polarised star connected barriers. The barriers incorporate user replaceable fuses.

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

The barriers are asymmetrical and have light blue hazardous area terminals. Whilst the barriers have user replaceable fuses they also incorporate encapsulated non replaceable fuses for the protection of safety components.

#### Input Parameters

Single Channel Barriers - Input Terminals 7 & 8

Dual Channel Barriers - Input Terminals 5, 6, 7 & 8

$$U_m = 250V$$

#### Output Parameters

Single Channel Barriers – Terminals 1 & 2

Dual Channel Barriers – Terminals 1, 2 & 3

$$U_o = \text{See Ch.1 below}$$

$$I_o = \text{See Ch.1 below}$$

$$P_o = \text{See Ch.1 below}$$

Dual Channel – Terminals 2, 3 & 4

$$U_o = \text{See Ch.2 below}$$

$$I_o = \text{See Ch.2 below}$$

$$P_o = \text{See Ch.2 below}$$

Barrier	Channels	Polarity	Ext. Fuse	Int. Fuse	U <sub>o</sub> (V)	CLR (Ω)	I <sub>o</sub> (A)	P <sub>o</sub> (W)	FOS IIC
Z715.F	Ch.1	Pos.	63mA	100mA	14.7	98	0.150	0.55	9.8
Z815.F	Ch.1	Neg.	63mA	100mA	14.7	98	0.150	0.55	9.8
Z728.F	Ch.1	Pos.	50mA	80mA	28	300.86	0.093	0.65	1.93
Z828.F	Ch.1	Neg.	50mA	80mA	28	300.86	0.093	0.65	1.93
Z728.H.F	Ch.1	Pos.	50mA	80mA	28	235.2	0.120	0.83	1.50
Z828.H.F	Ch.1	Neg.	50mA	80mA	28	235.2	0.120	0.83	1.50
Z765.F	Ch.1	Pos.	63mA	100mA	14.7	98	0.150	0.55	9.8
	Ch.2	Pos.	63mA	100mA	14.7	98	0.150	0.55	9.8
	Combined				14.7	49	0.300	1.10	4.9
Z865.F	Ch.1	Neg.	63mA	100mA	14.7	98	0.150	0.55	9.8
	Ch.2	Neg.	63mA	100mA	14.7	98	0.150	0.55	9.8
	Combined				14.7	49	0.300	1.10	4.9
Z779.F	Ch.1	Pos.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Ch.2	Pos.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Combined	Not Permitted for Group IIC			28	150.43	0.186	1.30	-

Barrier	Channels	Polarity	Ext. Fuse	Int. Fuse	U <sub>o</sub> (V)	CLR (Ω)	I <sub>o</sub> (A)	P <sub>o</sub> (W)	FOS IIC
Z879.F	Ch.1	Neg.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Ch.2	Neg.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Combined	Not Permitted for Group IIC			28	150.43	0.186	1.30	-
Z779.H.F	Ch.1	Pos.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Ch.2	Pos.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Combined	Not Permitted for Group IIC			28	117.75	0.238	1.67	-
Z879.H.F	Ch.1	Neg.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Ch.2	Neg.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Combined	Not Permitted for Group IIC			28	117.75	0.238	1.67	-
Z787.F	Ch.1	Pos.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Ch.2	Pos.	50mA	80mA	28	Diode Return - See Note below			
	Combined				28	300.86	0.093	0.65	1.93
Z887.F	Ch.1	Neg.	50mA	80mA	28	300.86	0.093	0.65	1.93
	Ch.2	Neg.	50mA	80mA	28	Diode Return - See Note below			
	Combined				28	300.86	0.093	0.65	1.93
Z787.H.F	Ch.1	Pos.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Ch.2	Pos.	50mA	80mA	28	Diode Return - See Note below			
	Combined				28	235.2	0.120	0.83	1.50
Z887.H.F	Ch.1	Neg.	50mA	80mA	28	235.2	0.120	0.83	1.50
	Ch.2	Neg.	50mA	80mA	28	Diode Return - See Note below			
	Combined				28	235.2	0.120	0.83	1.50
Z960.F	Ch.1	AC Star	50mA	80mA	9.94	49	0.203	0.51	24.63
	Ch.2	AC Star	50mA	80mA	9.94	49	0.203	0.51	24.63
	Combined				9.94	24.5	0.406	1.02	12.31
Z961.F	Ch.1	AC	100mA	160mA	8.7	98	0.089	0.192	56.17
	Ch.2	AC	100mA	160mA	8.7	98	0.089	0.192	56.17
	Combined				17.4	49	0.178 @ 8.7V	0.384	4.15
Z966.F	Ch.1	AC	63mA	100mA	12	147	0.082	0.24	60.97
	Ch.2	AC	63mA	100mA	12	147	0.082	0.24	60.97
	Combined				24	73.5	0.164 @ 12V	0.49	1.59

Notes:

- Zener Barriers Types Z787.F, Z787.H.F, Z887.F & Z887.H.F 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:

Barrier(s)	Ch.	Group IIC			Groups IIB & IIIC			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)
Z715.F & Z815.F	Ch.1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	16.9	20.74	846
Z728.F & Z828.F	Ch.1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.4	53.95	716
Z728.H.F & Z828.H.F	Ch.1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.4	32.40	560
Z765.F & Z865.F	Ch.1	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	16.9	20.74	846
	Ch.2	0.62	1.58	64	3.86	6.32	257	14.9	12.64	515	16.9	20.74	846
	Combined	0.62	0.39	32	3.86	1.58	128	14.9	3.16	257	16.9	5.18	423
Z779.F & Z879.F	Ch.1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.4	53.95	716
	Ch.2	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.4	53.95	716
	Combined	Not Permitted for Grp. IIC			0.65	4.11	109	2.15	8.22	218	3.4	13.48	358
Z779.H.F & Z879.H.F	Ch.1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.4	32.40	560
	Ch.2	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.4	32.40	560
	Combined	Not Permitted for Grp. IIC			0.65	2.46	85	2.15	4.93	170	3.4	8.10	280
Z787.F & Z887.F	Ch.1	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.4	53.95	716
	Ch.2	0.083	1,000	852	0.65	1,000	1,703	2.15	1,000	2,409	3.4	1,000	3,086
	Combined	0.083	4.11	54	0.65	16.44	218	2.15	32.88	436	3.4	53.95	716
Z787.H.F & Z887.H.F	Ch.1	0.083	2.46	42	0.65	9.87	170	2.15	19.75	341	3.4	32.40	560
	Ch.2	0.083	1,000	852	0.65	1,000	1,703	2.15	1,000	2,409	3.4	1,000	3,086
	Combined	0.083	2.46	54	0.65	9.87	170	2.15	19.75	341	3.4	32.40	560
Z960.F	Ch.1	3.0	0.86	70	20.0	3.45	282	100.0	6.90	564	83.0	11.32	925
	Ch.2	3.0	0.86	70	20.0	3.45	282	100.0	6.90	564	83.0	11.32	925
	Combined	3.0	0.21	35	20.0	0.86	141	100.0	1.72	282	83.0	2.83	462
Z961.F	Ch.1	5.9	4.48	184	50.0	17.95	736	1,000	35.91	1,473	450	58.91	2,416
	Ch.2	5.9	4.48	184	50.0	17.95	736	1,000	35.91	1,473	450	58.91	2,416
	Combined	0.346	1.12	92	2.02	4.48	368	8.40	8.97	736	10.4	14.72	1,208
Z966.F	Ch.1	1.41	5.28	145	9.00	21.15	580	36.0	42.30	1,161	35.0	69.40	1,905
	Ch.2	1.41	5.28	145	9.00	21.15	580	36.0	42.30	1,161	35.0	69.40	1,905
	Combined	0.125	1.32	72	0.93	5.28	290	3.35	10.57	580	4.6	17.35	952

#### 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 1μF for Groups IIB, IIA, IIIC & I, and 600nF for Group IIC.

**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
254-0296C	1 of 1	C	2017-Jul-19	Isolation Plate for Zener Barriers with Replaceable Fuses
266-028BS-04C	1 of 2	C	2018-May-02	Mechanical Details - General Assembly - Z7.., Z8.. & Z9.. Series Zener Barriers with Replaceable Fuses
266-028BS-04C	2 of 2	C	2018-May-02	Mechanical Details – Fuse Holder - Z7.., Z8.. & Z9.. Series Zener Barriers with Replaceable Fuses
266-028BS-10A	1 to 4	A	2018-May-02	Type Label (ATEX & IECEx) Z-Series Shunt Zener Diode Safety Barriers with replaceable fuse

The above drawings are associated and held with IECEx Certificate No. IECEx BAS 18.0033 Iss. 0

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
251-0363A	1 of 1	A	02/02/99	Circuit Diagram (Ref) for Z787.F, Z887.F, Z787.H.F and Z887.H.F
251-0366A	1 of 1	A	12/02/99	Circuit Diagram for Single Channel Positive and Negative Polarity Versions. (with replacement fuse)
251-0367A	1 of 1	A	12/02/99	Circuit Diagram for Dual Channel Positive and Negative Polarity Versions. (with replaceable fuse)
251-0368A	1 of 1	A	12/02/99	Circuit Diagram for 3 Diode, Single Channel, Positive and Negative Polarity Versions. (with replaceable fuse)
251-0369A	1 of 1	A	15/02/99	Circuit Diagram for 3 Diode Dual Channel, Positive and Negative Polarity Versions. (with replaceable fuse)
251-0370A	1 of 1	A	12/02/99	Circuit Diagram for Dual Channel A.C. Versions (with replaceable fuse)
251-0371A	1 of 1	A	05/03/99	Circuit Diagram for Dual Channel 9 Diode A.C. Versions (with replaceable fuses)
252-1267D	1 & 2	D	05/03/04	Parts List for Z787.F & Z887.F
252-1268C	1 & 2	C	05/03/04	Parts List for Z787.H.F & Z887.H.F
252-1269A	1 & 2	A	02/03/99	Parts List for Z728.F & Z828.F
252-1270A	1 & 2	A	02/03/99	Parts List for Z728.H.F & Z828.H.F

Number	Sheet	Issue	Date	Description
252-1271B	1 & 2	B	02/05/00	Parts List for Z779.F and Z879.F
252-1272B	1 & 2	B	02/05/00	Parts List for Z779.H.F and Z879.H.F
252-1273B	1 & 2	B	02/05/00	Parts List for Z961.F
252-1274B	1 & 2	B	02/05/00	Parts List for Z966.F
252-1275A	1 & 2	A	02/03/99	Parts List for Z715.F and Z815.F
252-1276B	1 & 2	B	02/05/00	Parts List for Z765.F and Z865.F
252-1277B	1 & 2	B	27/01/00	Parts List for Z960.F
253-0183D	1 of 1	D	07/06/04	Component Overlay (Ref.) for Z787.F, Z787.H.F (Positive) & Z887.F, Z887.H.F (Negative) Polarity Barriers
253-0184A	1 of 1	A	16/02/99	Component Overlay for Single Channel, Positive and Negative Polarity Versions (with replaceable fuse)
253-0185C	1 of 1	C	07/06/04	Component Overlay for Dual Channel, Positive and Negative Polarity Versions. (with replaceable fuse)
253-0186A	1 of 1	A	16/02/99	Component Overlay for 3 Diode, Single Channel, Positive and Negative Polarity Versions (with replaceable fuse)
253-0187C	1 of 1	C	07/06/04	Component Overlay for 3 Diode Dual Channel, Positive and Negative Polarity Versions (with replaceable fuse)
253-0188C	1 of 1	C	07/06/04	Component Overlay for Dual Channel A.C. Versions (with replaceable fuse)
253-0189E	1 of 1	E	07/06/04	Component Overlay for A.C. Star Connected 9 Diode Barrier (with replaceable fuse)
255-1452E	1 to 4	E	07/06/04	P.C.B Master for the Zener Barrier with Replaceable Fuses
255-1454D	1 to 4	D	07/06/04	P.C.B Master for A.C. Star Connected Zener Barriers with Replaceable Fuses
257-0210B	1 & 2	B	07/06/04	P.C.B. Lacquering Details for Barrier with Replaceable Fuses
257-0211B	1 & 2	B	07/06/04	P.C.B. Lacquering Details for A.C. Star Connected Zener Barrier with Replaceable Fuses

## 20 Certificate History

Certificate No.	Date	Comments
BAS00ATEX7096	5 June 2000	The release of the prime certificate. The associated test and assessment against the requirements of EN 50014: 1997 + Amendments 1 & 2 and EN 50020: 1994 is documented in Test Report No. 99(C)0210.
BAS00ATEX7096/1	26 March 2001	To permit a minor change to printed circuit board 255-1452 not affecting the original assessment.
BAS00ATEX7096/2	18 December 2001	To permit minor changes to the layout of the certification label and the addition of an alternative place of manufacture.
BAS00ATEX7096/3	23 March 2004	To permit the replacement of one type of diode in the design with an equivalent device.
BAS00ATEX7096/4	16 June 2004	To permit the introduction of modifications to the dual channel barriers using existing PCB's 255-1452D and 255-1454C and existing isolation plate 254-0296A. Also to permit the introduction of a longer slot in PCB's 255-1452E and 255-1454D and the extended isolation plate 254-0296B used on dual channel barriers.
BAS00ATEX7096/5	21 July 2006	To permit alternative enclosure materials to be specified not affecting the original assessment. General Assembly Drawing No. 254-0280A replaced.

Certificate No.	Date	Comments
BAS00ATEX7096 Issue 6	16 December 2009	<p>The certificate incorporates previously issued primary &amp; supplementary certificates into one certificate and confirms the current design meets the requirements of EN 60079-0: 2006, EN 60079-11: 2007 &amp; EN 61241-11: 2006 including the revision of the equipment marking and load parameters in accordance with these standards.</p> <p>All models of the barriers were additionally assessed as Associated Electrical Apparatus to category [Ex ia] I in an ambient temperature range of -20°C to +60°C. The equipment markings were revised to include the group I markings and the load parameters listed in section 15 above revised to include group I parameters.</p> <p>The above assessment is documented in Certification Report No. 08(C)0829.</p> <p>The certificate's listed manufacturer was also changed to: Pepperl + Fuchs GmbH, Lilienthalstrasse 200, 68307 Mannheim, Germany.</p>
BAS00ATEX7096 Issue 7	14 May 2010	<p>This issue of the certificate adds the Group IIB and IIA load parameter figures to the equipment description. This addition does not affect the original assessment.</p>
BAS00ATEX7096 Issue 8	4 June 2018	<p>This issue of the certificate permits: -</p> <ul style="list-style-type: none"> <li>i) Minor mechanical, label and drawing changes not affecting the original assessment. As a result of a drawing change, the information previously on Drawing No. Nr 4-8117 has been incorporated onto Drawing No. 266-028BS-04C and the original drawing removed from the drawing list. Drawing No. 257-5068 is now obsolete and has also been removed from the drawing list.</li> <li>ii) To confirm the current designs of the Z-Series Shunt Zener Diode Safety Barriers have been reviewed against the requirements of EN 60079-0: 2012 + A11: 2013 and EN 60079-11: 2012 in respect of the differences from EN 60079-0: 2006, EN 60079-11: 2007 and EN 61241-11: 2006, and with exception of the markings, none of the differences affect the equipment.</li> </ul> <p>In accordance with the marking requirements of EN 60079-0: 2012 + A11: 2013, all variants of the equipment are now marked: -</p> <p>⊕ II (1) GD [Ex ia Ga] IIC (-20°C ≤ T<sub>a</sub> ≤ +60°C) [Ex ia Da] IIIC (-20°C ≤ T<sub>a</sub> ≤ +60°C)</p> <p>⊕ I (M1) [Ex ia Ma] I (-20°C ≤ T<sub>a</sub> ≤ +60°C)</p> <p>The above test and assessment is detailed in IECEx ExTR No. GB/BAS/ExTR18.0111/00 (held with IECEx Certificate No. IECEx BAS 18.0033 Iss. 0, Project File No. 18/0292).</p>
For drawings applicable to each issue, see original of that issue.		