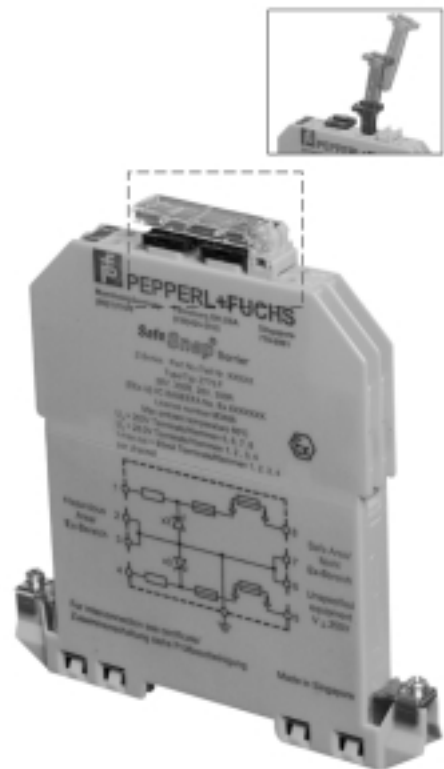


7. The following points have to be clarified if special field devices are used.

- If the field device is a 4-20 mA transmitter: What load in Ohms can be connected to the transmitter so that it can attain 20 mA as before?
- If the field device is a current / pressure converter: What load can be connected to the controller card so that it can attain 20 mA as before?
- If the field device is a transmitter: How high is the load in the safe area? (Typically, resistances of up to 250 Ohm are used in the controller.).

NEW: In the near future, a barrier will be available with a replaceable back-up fuse.

The introduction of a replaceable back-up fuse ahead of the integrated fuse provides protection against faults which could occur during the commissioning of the system. It is always arranged that the outer fuse will respond before the inner, inaccessible fuse. The fuses used are specially intended for use on barriers.



Type Channels		Max. Series resistance	U_{in} at 10 μ A	U_{in} max	Fuse rating	External fuse	Fuse supplied by LITTLEFUSE
		Ohm	V	V	mA	mA	
Z715.F	1	106	13	13.6	100	63	217,063
Z728.F	1	327	27	28	80	50	217,05
Z728.H.F	1	250	27	28	80	50	217,05
Z765.F	2	106	13	13.6	100	63	217,063
		106	13	13.6	100	63	
Z779.F	2	327	27	28	80	50	217,05
		327	27	28	80	50	
Z779.H.F	2	250	27	28	80	50	217,05
		250	27	28	80	50	
Z787.F	2	327	27	28	80	50	217,05
		36 + 0.9V	27	28	80	50	
Z787.H.F	2	250	27	28	80	50	217,05
		25 + 0.9V	27	28	80	50	
Z960.F	2	64	6.5	9.5	80	50	217,05
		64	6.5	9.5	80	50	
Z961.F	2	106	6.5	8.1	160	100	217.1
		106	6.5	8.1	160	100	
Z966.F	2	166	10	11.7	100	63	217.063
		166	10	11.7	100	63	

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Type			Nominal data		See circuit diagram No.	Circuit diagram	
+ ve	- ve	a.c.	V	Ω		Hazardous area connections	Safe area connections
Z705	Z805	-	5	10	1), 2) 3)	1)	8 7
-	-	Z905	5	10			
Z710	Z810	-	10	50			
-	-	Z910	10	50			
Z710.CL	Z810.CL	-	10	50	1), 2)		
Z715	Z815	-	15	100	1), 2) 3)	2)	8 7
-	-	Z915	15	100			
Z715.CL	Z815.CL	-	15	100			
Z715.1K	Z815.1K	-	15	1k			
-	-	Z915.1K	15	1k	1), 2)		
Z722	Z822	-	22	150	1), 2) 3)	3)	8 7
Z722.CL	Z822.CL	-	22	150			
Z728	Z828	-	28	300			
Z728.CL	Z828.CL	-	28	300			
-	-	Z928	28	300	3)		
Z755	Z855	-	5	10	4), 5)		
-	-	Z955	5	10	6)		
Z757	Z857	-	7	10	4), 5)	4)	8 7 6 5
-	-	Z961	7	10			
-	-	Z961	9	100	6)	5)	8 7 6 5
-	-	Z961.H	9	100			
-	-	Z961.H	9	360	6)		
-	-	Z961.H	9	360	6)		
Z764	Z864	-	12	1k	4), 5)	6)	8 7 6 5
-	-	Z964	12	1k			
-	-	Z964	12	1k	6)		
-	-	Z964	12	1k	6)		
Z765	Z865	-	15	100	4), 5)	7)	8 7 6 5
-	-	Z966	15	100			
-	-	Z966	12	150	6)		
-	-	Z966.H	12	150			
-	-	Z966.H	12	75	6)		
-	-	Z966.H	12	75			
Z772	Z872	-	22	150	4), 5)		
-	-	Z966.H	22	150			

All diodes are turned 180° for the -VE- version.

Zener barriers - Operating instructions

How to select the correct barrier

see Note 2	Ex-characteristics for [EEx ia] IIC							Max. end-to-end resistance	U _{in} bei 10 µA	U _{in} max	Fuse rating
	U _z (V)	R _{min} (Ω)	I _k (mA)	P _{max} (W)	C _{max} (µF)	L _{max} (mH)	L/R Ratio	Ω	V	V	mA
	4.94	9.8	504	0.62	1800	0.15	60	18.18	0.9 (1 µA)	4.8	250
	4.98	9.8	499	0.61	1800	0.15	60	18.18	0.9 (1 µA)	4.7	250
	9.56	49	195	0.47	3	0.95	75	55	6.5	8.9	100
	9.94	49	203	0.50	3	0.95	75	55	6.5	9.3	100
	9.56	49	195	0.47	3	0.95	75	62 +2V	6.5	8.9	100
	14.7	98	150	0.55	0.75	1.5	65	106	13.0	13.6	100
	15.0	98	153	0.57	0.75	1.5	65	106	13.0	14.0	100
	14.7	98	150	0.55	0.75	1.5	65	113 +2V	13.0	13.6	100
	14.7	980	15	0.06	0.75	150	590	1024	13.0	13.6	100
	15	980	15	0.06	0.75	150	590	1024	13.0	14.0	100
	22	147	150	0.83	0.26	1.5	43	166	19.0	20.1	50
	22	147	150	0.83	0.26	1.5	43	181 +2V	19.0	20.1	50
	28	301	93	0.65	0.13	4.2	55	327	27.0	28.0	50
	28	301	93	0.65	0.13	4.2	55	342 +2V	27.0	28.0	50
	28	301	93	0.65	0.13	4.2	55	327	26.0	27.6	50
A1	4.94	9.8	504	0.62	1800	0.15	60	18.18	0.9 (1µA)	4.8	250
A2	4.94	9.8	504	0.62	1800	0.15	60	18.18	0.9 (1µA)	4.8	250
B	4.94	4.9	1008	1.24	1800	0.037	23	–	–	–	–
A1	4.89	9.8	499	0.61	1800	0.15	60	18.18	0.9 (1µA)	4.7	250
A2	4.89	9.8	499	0.61	1800	0.15	60	18.18	0.9 (1µA)	4.7	250
B	4.89	4.9	998	1.22	1800	0.037	23	–	–	–	–
C	9.78	19.6	499	1.22	3	0.15	30	–	–	–	–
A1	7.2	9.8	729	1.3	14	0.7	29	15.5	6.0	6.9	200
A2	7.2	9.8	729	1.3	14	0.7	29	15.5	6.0	6.9	200
B	7.2	4.9	1458	2.6	14	0.17	11	–	–	–	–
A1	8.7	98	89	0.19	5	4.5	173	106	6.5	8.1	100
A2	8.7	98	89	0.19	5	4.5	173	106	6.5	8.1	100
B	8.7	49	178	0.39	5	1.2	68	–	–	–	–
C	17.4	196	89	0.39	0.5	4.5	86	–	–	–	–
A1	8.7	352.8	25	0.05	5	54.5	589	380	6.5	8.1	50
A2	8.7	352.8	25	0.05	5	54.5	589	380	6.5	8.1	50
B	17.35	176.4	50	0.1	0.46	14.35	238	–	–	–	–
A1	11.6	980	12	0.03	1.6	230	910	1033	10.0	11.0	50
A2	11.6	98	12	0.03	1.6	230	910	1033	10.0	11.0	50
B	11.6	490	24	0.06	1.6	60	350	–	–	–	–
A1	12	980	12	0.04	1.6	230	910	1033	10.0	11.7	50
A2	12	980	12	0.04	1.6	230	910	1033	10.0	11.7	50
B	12	490	24	0.08	1.6	60	350	–	–	–	–
C	24	1960	12	0.08	0.2	230	460	–	–	–	–
A1	14.7	98	150	0.55	0.75	1.5	65	106	13.0	13.6	100
A2	14.7	98	150	0.55	0.75	1.5	65	106	13.0	13.6	100
B	14.7	49	300	1.1	0.75	0.35	23	–	–	–	–
A1	12	147	82	0.24	1.6	5.2	143	166	10.0	11.7	50
A2	12	147	82	0.24	1.6	5.2	143	166	10.0	11.7	50
B	12	73.5	164	0.48	1.6	1.	53	–	–	–	–
C	24	294	82	0.48	0.2	5.2	71	–	–	–	–
A1	12	73.5	163	0.49	1.5	1.34	72	82	10.0	11.7	100
A2	12	73.5	163	0.49	1.5	1.34	72	82	10.0	11.7	100
B	24	36.5	327	0.98	0.18	0.312	30	–	–	–	–
A1	22	147	150	0.83	0.26	1.5	43	166	19.0	20.1	50
A2	22	147	150	0.83	0.26	1.5	43	166	19.0	20.1	50
B	22	73.5	300	1.66	no approval for IIC			–	–	–	–

Issue date 19.9.00

Zener barriers - Operating instructions

How to select the correct barrier

Type			Nominal data		See circuit diagram No.	Circuit diagram	
+ ve	- ve	a.c.	V	Ω		Hazardous area connections	Safe area connections
Z778	Z878	-	28 28	600 600	4), 5)		
Z779	Z879	-	28 28	300 300	4), 5)		
Z779.H	Z879.H		28 28	240 240	4), 5)		
Z796	Z896	-	26.6 20.5	320 415	4), 5)		
Z788 + Z788.H	Z888 + Z888.H	-	28 10 28 10	300 50 240 50	4), 5) 4), 5)		
Z788.R Z788.R.H	Z888.R Z888.R.H		28 10	240 50	7) 4), 5)		
Z786	Z886		28 28	Diode Diode	8)		
Z787	Z887	-	28 28	300 Diode	9)		
Z787.H	Z887.H		28 28	240 Diode	9)		
-	-	Z960	10 10	50 50	10)		
-	-	Z965	15 15	100 100	10)		
-	-	Z967	17 17	120 120	10)		
-	-	Z972	22 22	300 300	10)		
-	-	Z978	28 28	620 620	10)		

19.9.00

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Zener barriers - Operating instructions

How to select the correct barrier

see Note 2	Ex-characteristics for [EEx ia] IIC							Max. end-to-end resistance Ω	U_{in} at 10 μ A V	U_{in} max V	Fuse rating mA
	U_z (V)	R_{min} (Ω)	I_K (mA)	P_{max} (W)	C_{max} (μ F)	L_{max} (mH)	L/R Ratio				
A1	28	607	46	0.32	0.13	16	103	646	27.0	28.0	50
A2	28	607	46	0.32	0.13	16	103	646	27.0	28.0	50
B	28	303.5	92	0.65	0.13	4.2	40	–	–	–	–
A1	28	301	93	0.65	0.13	4.2	55	327	27.0	28.0	50
A2	28	301	93	0.65	0.13	4.2	55	327	27.0	28.0	50
B	28	150.5	186	1.3	no approval for IIC			–	–	–	–
A1	28	235	119	0.83	0.13	2.55	42	250	27.0	28.0	80
A2	28	235	119	0.83	0.13	2.55	42	250	27.0	28.0	80
B	–	–	–	–	no approval for IIC			–	–	–	–
A1	26.6	314	85	0.57	0.15	5	60	340	24.0	25.1	50
A2	20.5	407	50	0.26	0.3	14	132	437	18.0	19.5	50
B	23.9	177.25	135	0.81	0.15	1.9	34	–	–	–	–
A1	28	301	93	0.65	0.13	4.2	55	327	27.0	28.0	50
A2	9.56	49	195	0.47	3.0	0.95	75	64	6.5	9.1	50
A1	28	235	119	0.83	0.13	2.55	42	250	27.0	28.0	80
A2	9.56	49	195	0.47	3	0.95	75	64	6.5	9.1	80
B	28	40.54	314	1	0.13	0.27	27.7	–	–	–	–
B	12.14	42.14	288	0.87	0.13	0.36	25	–	–	–	–
A1	28	235	119	0.83	0.13	2.55	42	250	27.0	28.0	80
A2	9.56	49	195	0.47	3	0.95	75	64	–	9.1	80
B	28	40.54	314	1	0.13	0.27	27.7	–	–	–	–
A1	28	–	–	–	0.13	–	–	36 + 0.9 V	27.0	28.0	50
A2	28	–	–	–	0.13	–	–	36 + 0.9 V	27.0	28.0	50
B	28	–	–	–	0.13	–	–	–	–	–	–
A1	28	301	93	0.65	0.13	4.2	55	327	27.0	28.0	50
A2	28	–	–	–	0.13	–	–	36 + 0.9 V	27.0	28.0	50
B	28	301	93	0.65	0.13	4.2	55	–	–	–	–
A1	28	235	119	0.83	0.13	2.55	42	250	27.0	28.0	80
A2	28	–	–	–	0.13	see Note 1		25 + 0.9 V	27.0	28.0	80
B	28	235	119	0.83	0.13	2.55	42	–	–	–	–
A1	9.94	49	203	0.50	3	0.95	75	64	6.5	9.5	50
A2	9.94	49	203	0.50	3	0.95	75	64	6.5	9.5	50
B	9.94	24.5	406	1.08	3	0.2	27	–	–	–	–
C	9.94	98	102	0.25	3	3.5	143	–	–	–	–
A1	15	98	153	0.57	0.75	1.5	65	115	13.0	14.2	50
A2	15	98	153	0.57	0.75	1.5	65	115	13.0	14.2	50
B	15	49	306	1.15	0.75	0.3	20	–	–	–	–
C	15	196	77	0.29	0.75	6.0	117	–	–	–	–
A1	16.8	117	143	0.60	0.56	1.6	47	136	15.0	16.2	50
A2	16.8	117	143	0.60	0.56	1.6	47	136	15.0	16.2	50
B	16.8	59	286	1.20	0.56	0.26	21	–	–	–	–
C	16.8	235	71	0.30	0.56	6.8	114	–	–	–	–
A1	22	301	73	0.40	0.26	6.6	83	327	19.0	20.9	50
A2	22	301	73	0.40	0.26	6.6	83	327	19.0	20.9	50
B	22	150	146	0.80	0.26	1.5	33	–	–	–	–
C	22	602	37	0.20	0.26	23	166	–	–	–	–
A1	28	607	46	0.32	0.13	16	105	646	26.0	27.6	50
A2	28	607	46	0.32	0.13	16	105	646	26.0	27.6	50
B	28	304	92	0.64	0.13	4.2	39	–	–	–	–
C	28	1215	23	0.16	0.13	64	205	–	–	–	–

Issue date 19.9.00

Zener barriers - Operating instructions

How to select the correct barrier

Type			Nominal data		See circuit diagram No.	Circuit diagram	
+ ve	- ve	a.c.	V	Ω		Hazardous area connections	Safe area connections
-	-	Z954			11)		
Dummy 799							

see Note 2	Ex-characteristics for [EEx ia] IIC							Max. end-to-end resistance Ω	U_{in} at 10 μ A V	U_{in} max V	Fuse rating mA
	U_z (V)	R_{min} (Ω)	I_K (mA)	P_{max} (W)	C_{max} (μ F)	L_{max} (mH)	L/R Ratio				
A1	4.5	11.76	383	0.43	3000	0.25	85	27.27	0.9 (1 μ A)	4.9	50
A2	4.5	11.76	383	0.43	3000	0.25	85	27.27	0.9 (1 μ A)	4.9	50
A3	4.5	11.76	383	0.43	3000	0.25	85	27.27	0.9 (1 μ A)	4.9	50
B	9.0	3.92	1148	1.29	3.2	0.028	19				
C	9.0	17.64	510	1.15	3.2	0.12	24				

Note:

Zener barriers type Z787H and Z887H have channels with diode returns.

The Ex terminals for the channels with diode returns should be regarded as 28 V voltage sources.

The 28 V must be considered as the theoretical maximum up to which a capacitive load can be applied to the Ex terminals due to the leakage current of the diode return. This voltage is only used in calculating the load capacitance.

Remark:

A1, A2 and A3 are separate channels.

B: Two channels in parallel circuit with a ground connection.

C: Two channels in series circuit without a ground return.