



OBAC

Ósrodek Badań, Atestacji i Certyfikacji Sp. z o.o.
44-121 Gliwice, ul. Łabędzka 21

(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment, components and protective systems intended for use in potentially explosive atmospheres. Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014.

(3) EU type examination certificate No: **OBAC 19 ATEX 0291X**

(4) Product: **Intrinsically safe Zenera barriers type JBB (MM) * and PB 9474 ETG**

(5) Manufacturer: **MM Group, s.r.o.**

(6) Address: **Podolkovická 1437/21, Prostřední Suchá, 735 64 Havířov**

(7) This equipment, component or protective system and any of its approved version is specified in this certificate and in documents listed in p. 19.

(8) The Institute for Research and Certification „OBAC” Ltd., notified body No.1461 in accordance with Article 17 of the European Council Directive 2014/34/EU of February 26, 2014, certifies that this equipment, component or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment, component or protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. OBAC/19/ATEX/0291.

(9) Compliance with the Safety Requirements has been assured by conformity with:

PN-EN IEC 60079-0:2018-09
(EN IEC 60079-0:2018)

PN-EN 60079-11:2012
(EN 60079-11:2012)

PN-EN 50303:2004
(EN 50303:2000)

(10) If the sign „X” is placed after the certificate number, it indicates that the product concerned is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-type examination certificate relates only to the design, evaluation and tests of the specified equipment, component or protective system according to the Directive 2014/34/EU. The certificate does not apply to further requirements of the Directive relating to the manufacture and placing on the market of this equipment, component or protective system.

(12) The marking of the equipment, component or protective system must include the following:

Ex I (M1) [Ex ia Ma] I or **Ex II (1)G [Ex ia Ga] IIC**
(for barriers of groups 2, 2b, 3, 3a, 4, 4a, 5+9)

Gliwice, 11 December 2019.



by proxy of Certification
Body Manager

Zbigniew Tarnawski M.Sc.



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(13)

SCHEDULE

(14)

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Ex I (M1) [Ex ia Ma] I or Ex II (1)G [Ex ia Ga] IIB
(for barriers of groups 1, 1a, 2a)

Ex I M1 Ex ia I Ma or Ex II 1G Ex ia IIC T4 Ga
(for barriers JBB (MM) 9474 ET, JBB (MM) 9474 ETG)

Ex I M1 Ex ia I Ma or Ex II 1G Ex ia IIC T5 Ga
(for barriers PB 9474 ETG)

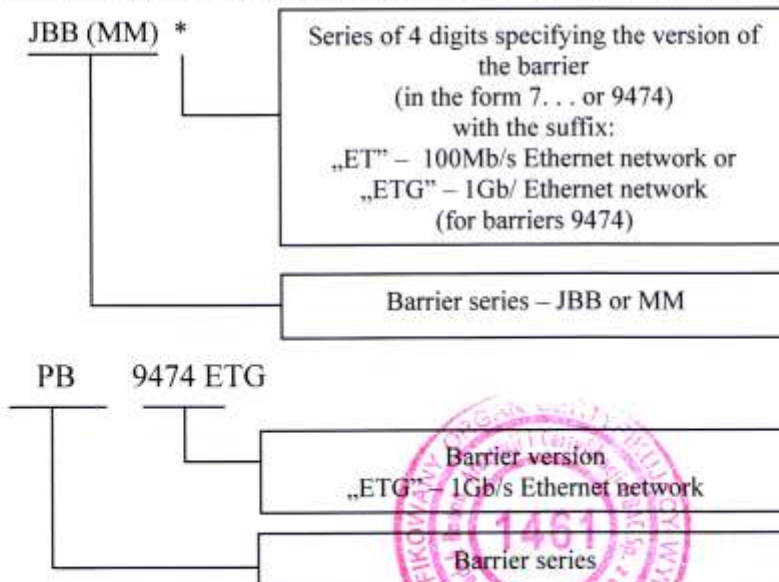
(15) Ex Product description:

Intrinsically safe Zenera barriers type JBB (MM) * and PB 9474 ETG are intended for protection of electrical circuits of devices installed in explosion hazard areas. The barriers constitute an interface between not intrinsically safe and intrinsically safe circuits that may be located in potentially hazardous areas.

Intrinsically safe Zenera barriers type JBB (MM) * and PB 9474 ETG have plastic enclosure with protection degree min. IP20, equipped with terminals allowing for connection of external circuits, as well as with a mount for installation on DIN rail.

Marking

Intrinsically safe Zenera barriers type **JBB (MM) *** and **PB 9474 ETG**





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Rated data:

Supply voltage

max 250V

Ambient temperature

$-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$

$-20^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$

(for barriers JBB (MM) 9474 ET,

JBB (MM) 9474 ETG, PB 9474 ETG)

Degree of protection

min IP20

Intrinsic safety parameters:

Series JBB (MM) 702.

$U_m = 250\text{V}$

Type	Group	U_o [V]	I_o [mA]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 7029+	1	31,4	184	171	See below – items 1, 2, 3, 4, 5 in accordance with the Group	
JBB (MM) 7129+	1	31,4	184	171		
JBB (MM) 7029-	1	31,4	184	171		
JBB (MM) 7129-	1	31,4	184	171		
JBB (MM) 7028+	2	28	93	304		
JBB (MM) 7128+	2	28	93	304		
JBB (MM) 7028-	2	28	93	304		
JBB (MM) 7128-	2	28	93	304		
JBB (MM) 7027+	3	15,8	149	106		
JBB (MM) 7127+	3	15,8	149	106		
JBB (MM) 7027-	3	15,8	149	106		
JBB (MM) 7127-	3	15,8	149	106		
JBB (MM) 7026+	4	9,9	198	50		
JBB (MM) 7126+	4	9,9	198	50		
JBB (MM) 7026-	4	9,9	198	50		
JBB (MM) 7126-	4	9,9	198	50		
JBB (MM) 7025+	5	3	298	10,1		
JBB (MM) 7125+	5	3	298	10,1		
JBB (MM) 7025-	5	3	298	10,1		
JBB (MM) 7125-	5	3	298	10,1		

C_i, L_i – negligible



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Series JBB (MM) 704., 714.

$U_m = 250V$

Type	Group	U_o [V]	I_o [mA]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 7049+	1	31,4	184	171	See below – items 1, 2, 3, 4, 5 in accordance with the Group	
JBB (MM) 7149+	1	31,4	184	171		
JBB (MM) 7049-	1	31,4	184	171		
JBB (MM) 7149-	1	31,4	184	171		
JBB (MM) 7048+	2	28	93	304		
JBB (MM) 7148+	2	28	93	304		
JBB (MM) 7048-	2	28	93	304		
JBB (MM) 7148-	2	28	93	304		
JBB (MM) 7047+	3	15,8	149	106		
JBB (MM) 7147+	3	15,8	149	106		
JBB (MM) 7047-	3	15,8	149	106		
JBB (MM) 7147-	3	15,8	149	106		
JBB (MM) 7046+	4	9,9	198	50		
JBB (MM) 7146+	4	9,9	198	50		
JBB (MM) 7046-	4	9,9	198	50		
JBB (MM) 7146-	4	9,9	198	50		
JBB (MM) 7045+	5	3	298	10,1		
JBB (MM) 7145+	5	3	298	10,1		
JBB (MM) 7045-	5	3	298	10,1		
JBB (MM) 7145-	5	3	298	10,1		

C_i, L_i – negligible





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Series JBB (MM) 708.+ , 718.+

$U_m = 250V$

Type	Group	U_o [V]	I_o [mA]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 7089+	1	31,4	184	171	See below – items 1, 2, 2a, 3, 4 in accordance with the Group	
JBB (MM) 7189+	1	31,4	184	171		
JBB (MM) 7088+	2a	28	120	233		
JBB (MM) 7188+	2a	28	120	233		
JBB (MM) 7087+	2	28	93	304		
JBB (MM) 7187+	2	28	93	304		
JBB (MM) 7086+	3	15,8	149	106		
JBB (MM) 7186+	3	15,8	149	106		
JBB (MM) 7085+	4	9,9	198	50		
JBB (MM) 7185+	4	9,9	198	50		

C_i, L_i – negligible

Series JBB (MM) 705.+ , 715.+

$U_m = 250V$

Type	Group	U_o [V]	I_o [mA]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 7058	6	14	46	304	See below – items 5, 6, 7 in accordance with the Group	
JBB (MM) 7158	6	14	46	304		
JBB (MM) 7057	7	7,9	74	106		
JBB (MM) 7157	7	7,9	74	106		
JBB (MM) 7055	5	3	298	10,1		
JBB (MM) 7155	5	3	298	10,1		

C_i, L_i – negligible





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Series JBB (MM) 707., 717., 727.

$U_m = 250V$

Type	Group	U_o [V]	I_o [mA]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 7279	1a	31,4	92	342	See below – items 1a, 2, 2b, 3a, 4a in accordance with the Group	
JBB (MM) 7278	2	28	93	304		
JBB (MM) 7078	2b	28	47	608		
JBB (MM) 7178	2b	28	47	608		
JBB (MM) 7077	3a	15,8	75	212		
JBB (MM) 7177	3a	15,8	75	212		
JBB (MM) 7076	4a	9,9	99	100		
JBB (MM) 7176	4a	9,9	99	100		

C_i, L_i – negligible

Series JBB (MM) 9474 ET, JBB (MM) 9474 ETG

Type	Group	$U_i^*)$ [V]	U_o [V]	I_o [mA]	P_o [W]	R_o [Ω]	L_o [mH]	C_o [μF]
JBB (MM) 9474 ET	8	6,51	6	2240	2,04	11,4	See below – items 8, 9 in accordance with the Group	
JBB (MM) 9474 ETG	9	6,51	6	4480	4,08	11,4		

*) or $U_m=250V$ (marking as for groups 8, 9)

C_i, L_i – negligible

Series PB 9474 ETG

Type	Group	U_i, U_o [V]	I_i, I_o [mA]	P_i, P_o [W]	L_o [mH]	C_o [μF]
PB 9474 ETG	9	6	4480	4,08	See below – item 9 in accordance with the Group	

C_i, L_i – negligible





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Summary of parameters L_o , C_o :

1) Group 1

For the I group of devices

L_o [mH]	6,1	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005
C_o [μF]	0,32	0,38	0,47	0,59	0,79	0,99	1,2	1,7	2,2	2,7

For the IIA group of devices

L_o [mH]	3,4	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C_o [μF]	0,23	0,28	0,36	0,46	0,63	0,8	1,0	1,4	1,62

For the IIB group of devices

L_o [mH]	0,21	0,2	0,1	0,05	0,02	0,001
C_o [μF]	0,46	0,46	0,48	0,49	0,497	0,497

1a) Group 1a

For the I group of devices

L_o [mH]	34	20	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005
C_o [μF]	0,4	0,41	0,45	0,53	0,63	0,83	1,0	1,3	1,7	2,2	2,7

For the IIA group of devices

L_o [mH]	23	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C_o [μF]	0,29	0,34	0,41	0,5	0,67	0,83	1,0	1,4	1,62

For the IIB group of devices

L_o [mH]	12	5	2	1	0,5	0,2	0,1
C_o [μF]	0,16	0,18	0,23	0,29	0,37	0,49	0,497

2) Group 2

For the I group of devices

L_o [mH]	35	20	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C_o [μF]	0,46	0,59	0,65	0,76	0,97	1,2	1,5	2,0	2,5	3,2	3,4

For the IIA group of devices

L_o [mH]	24	20	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005
C_o [μF]	0,41	0,43	0,5	0,6	0,77	0,95	1,2	1,6	2,0	2,15



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For the IIB group of devices

L _o [mH]	14	2	1	0,5	0,2	0,1
C _o [μF]	0,25	0,29	0,35	0,43	0,57	0,65

For the IIC group of devices

L _o [mH]	1,1	1	0,5	0,2
C _o [μF]	0,051	0,052	0,068	0,083

2a) Group 2a

For the I group of devices

L _o [mH]	20	10	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	0,53	0,56	0,63	0,74	0,95	1,2	1,5	2,0	2,5	3,2	3,4

For the IIA group of devices

L _o [mH]	13	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005
C _o [μF]	0,4	0,41	0,48	0,58	0,76	0,94	1,2	1,6	2,0	2,15

For the IIB group of devices

L _o [mH]	7,3	2	1	0,5	0,2	0,1
C _o [μF]	0,22	0,27	0,33	0,42	0,56	0,65

2b) Group 2b

For the I group of devices

L _o [mH]	100	50	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	0,48	0,63	0,68	0,79	0,99	1,2	1,5	2,0	2,5	3,2	3,4

For the IIA group of devices

L _o [mH]	100	50	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005
C _o [μF]	0,32	0,47	0,53	0,62	0,79	0,97	1,2	1,6	2,0	2,15

For the IIB group of devices

L _o [mH]	68	50	2	1	0,5	0,2	0,1
C _o [μF]	0,23	0,29	0,32	0,38	0,45	0,59	0,65

For the IIC group of devices

L _o [mH]	12	2	1	0,5	0,2	0,1
C _o [μF]	0,042	0,051	0,063	0,077	0,083	0,083





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3) Group 3

For the I group of devices

L _o [mH]	16	10	5	2	1	0,5	0,2	0,02	0,01	0,005	0,002
C _o [μF]	1,4	1,9	2,5	3,4	4,3	5,3	5,6	6,2	7,3	9,1	13

For the IIA group of devices

L _o [mH]	12	10	5	2	1	0,5	0,02	0,01	0,005	0,002	0,001
C _o [μF]	1,2	1,3	1,9	2,7	3,4	4,2	4,8	5,7	7,1	10,0	11,6

For the IIB group of devices

L _o [mH]	7,8	5	2	1	0,5	0,05	0,02
C _o [μF]	0,92	1,2	1,9	2,4	2,6	2,8	2,88

For the IIC group of devices

L _o [mH]	1,6	1	0,5	0,05	0,02
C _o [μF]	0,26	0,35	0,39	0,43	0,478

3a) Group 3a

For the I group of devices

L _o [mH]	65	50	20	10	5	2	1	0,5	0,2	0,02	0,01	0,005	0,002	0,001
C _o [μF]	1,1	1,3	2,0	2,4	2,9	3,7	4,5	5,4	5,7	6,3	7,4	9,1	13	13,6

For the IIA group of devices

L _o [mH]	48	20	10	5	2	1	0,5	0,02	0,01	0,005	0,002	0,001
C _o [μF]	0,9	1,5	1,9	2,3	2,9	3,6	4,2	4,8	5,8	7,1	10,0	11,6

For the IIB group of devices

L _o [mH]	32	20	10	5	2	1	0,5	0,05
C _o [μF]	0,69	0,93	1,3	1,6	2,1	2,6	2,7	2,88

For the IIC group of devices

L _o [mH]	6,9	5	2	1	0,05	0,02
C _o [μF]	0,18	0,22	0,34	0,42	0,46	0,478





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4) Group 4

For the I group of devices

L _o [mH]	10	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	3,5	5,3	7,4	9,1	11,0	15,0	19,0	24,0	35,0	51,0	84,0	87,0

For the IIA group of devices

L _o [mH]	7,8	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	2,9	3,8	5,6	7,1	8,9	12,0	15,0	19,0	28,0	40,0	63,0	115,0

For the IIB group of devices

L _o [mH]	5,4	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C _o [μF]	2,2	2,4	3,9	5,0	6,4	8,7	11,0	14,0	20,0	22,0

For the IIC group of devices

L _o [mH]	1,2	1	0,5	0,2	0,1	0,05	0,02	0,01
C _o [μF]	0,56	0,67	0,97	1,4	1,8	2,3	3,1	3,2

4a) Group 4a

For the I group of devices

L _o [mH]	40	20	10	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	2,8	4,2	5,3	6,4	8,1	9,7	12,0	15,0	19,0	24,0	36,0	51,0	84,0	87,0

For the IIA group of devices

L _o [mH]	30	20	10	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	2,3	3,0	4,0	4,9	6,4	7,7	9,3	12,0	15,0	19,0	28,0	40,0	63,0	115,0

For the IIB group of devices

L _o [mH]	20	10	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C _o [μF]	1,7	2,6	3,4	4,5	5,5	6,8	8,9	11,0	14,0	21,0	22,0

For the IIC group of devices

L _o [mH]	4,7	2	1	0,5	0,2	0,1	0,05	0,02
C _o [μF]	0,42	0,7	0,91	1,1	1,5	1,9	2,3	3,2





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5) Group 5

For the I group of devices

L _o [mH]	5,5	5	2	1	0,5	0,2	0,1	0,05	0,02
C _o [µF]	39,0	42,0	69,0	90,0	120,0	170,0	240,0	380,0	1000,0

For the IIA group of devices

L _o [mH]	4,3	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C _o [µF]	32,0	52,0	69,0	89,0	130,0	180,0	280,0	750,0	1000,0

For the IIB group of devices

L _o [mH]	3,1	2	1	0,5	0,2	0,1	0,05	0,02	0,01
C _o [µF]	25,0	34,0	47,0	63,0	91,0	130,0	190,0	430,0	1000,0

For the IIC group of devices

L _o [mH]	0,77	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [µF]	6,0	8,4	13,0	17,0	23,0	37,0	58,0	120,0	1000,0

6) Group 6

For the I group of devices

L _o [mH]	100	50	20	10	5	2	1	0,5	0,2
C _o [µF]	1,8	2,2	2,8	3,3	3,8	4,7	5,5	6,6	8,6

L _o [mH]	0,1	0,05	0,02	0,005	0,002
C _o [µF]	11,0	13,0	14,0	16,0	20,0

For the IIA group of devices

L _o [mH]	100	50	20	10	5	2	1	0,5	0,2	0,1	0,05	0,01	0,005	0,002	0,001
C _o [µF]	1,2	1,6	2,1	2,5	3,0	3,7	4,4	5,3	6,9	8,6	9,7	10,0	12,0	16,0	17,0

For the IIB group of devices

L _o [mH]	88	50	20	10	5	2	1	0,5	0,2
C _o [µF]	0,73	1,0	1,4	1,7	2,1	2,7	3,2	3,9	4,6

For the IIC group of devices

L _o [mH]	20	10	5	2	1	0,5	0,2
C _o [µF]	0,18	0,27	0,36	0,47	0,57	0,69	0,73





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7) Group 7

For the I group of devices

L _o [mH]	73	50	20	10	5	2	1	0,5	0,2
C _o [μF]	4,0	5,3	7,4	8,7	10,0	13,0	15,0	18,0	23,0

L _o [mH]	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	29,0	38,0	58,0	90,0	170,0	1000,0

For the IIA group of devices

L _o [mH]	55	50	20	10	5	2	1	0,5	0,2
C _o [μF]	3,2	3,5	5,4	6,6	7,9	9,9	12,0	14,0	19,0

L _o [mH]	0,1	0,05	0,02	0,01	0,005	0,002	0,001
C _o [μF]	23,0	30,0	45,0	68,0	120,0	800,0	1000,0

For the IIB group of devices

L _o [mH]	37	20	10	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	2,4	3,5	4,5	5,5	7,0	8,4	10,0	13,0	17,0	22,0	32,0	47,0	80,0	115,0

For the IIC group of devices

L _o [mH]	8,8	5	2	1	0,5	0,2	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	0,57	0,83	1,2	1,4	1,8	2,3	2,8	3,5	4,8	6,3	8,6	8,8

8) Group 8

For the I group of devices

L _o [mH]	0,16	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	25,0	36,0	57,0	100,0	200,0	630,0	1000,0

For the IIA group of devices

L _o [mH]	0,13	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	22,0	27,0	43,0	79,0	140,0	370,0	1000,0





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For the IIB group of devices

L _o [mH]	0,1	0,05	0,02	0,01	0,005	0,002
C _o [μF]	17,0	30,0	54,0	92,0	200,0	1000,0

For the IIC group of devices

L _o [mH]	0,025	0,02	0,01	0,005	0,002	0,001
C _o [μF]	4,5	5,5	9,0	14,0	31,0	40,0

9) Group 9

For the I group of devices

L _o [mH]	0,056	0,05	0,02	0,01	0,005	0,002
C _o [μF]	39,0	44,0	95,0	190,0	630,0	1000,0

For the IIA group of devices

L _o [mH]	0,046	0,02	0,01	0,005	0,002
C _o [μF]	34,0	71,0	130,0	370,0	1000,0

For the IIB group of devices

L _o [mH]	0,036	0,02	0,01	0,005	0,002
C _o [μF]	27,0	47,0	86,0	200,0	1000,0

For the IIC group of devices

L _o [mH]	0,009	0,005	0,002	0,001
C _o [μF]	7,1	12,0	29,0	40,0

- (16) **Intrinsically safe Zenera barriers type JBB (MM) * and PB 9474 ETG** meet the requirements for devices with explosion proof design and may be used as a devices of group I category M1 or (M1) or group II category 1G or (1)G.





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(17) Special conditions for safe operation:

- Barriers of categories (M1) and (1)G should be installed outside of explosion hazard areas. In case of installation inside an explosion hazard areas, the devices should be protected by a suitable explosion protection.
- Barriers of categories M1 and 1G should be located in additional enclosures, compliant with the requirements of suitable standards series PN-EN 60079 and ensuring compelling IP protection degree (e.g. min. IP54 for Group I).
- Installation of barriers should be performed with the assurance of required distances from external terminals in accordance with item 6.2.1 PN-EN 60079-11.
- Ambient temperature range: $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ or $-20^{\circ}\text{C} \leq T_a \leq +80^{\circ}\text{C}$ (for barriers JBB (MM) 9474 ET, JBB (MM) 9474 ETG, PB 9474 ETG).

(18) The compliance with Safety Requirements has been assured by compliance with standards shown in p.9 of this certificate.

(19) List of agreed documentation:

- Technical conditions. Instruction. „Intrinsically safe Zenera barriers - JBB 7... or MM 7..., MM 9474...”, rev. 1, 20.07.2019.
- Security analysis. RJB 1 „Intrinsically safe Zenera barriers”, rev. 1, 08.07.2019.

