Physical Technical Testing Institute

Ostrava-Radvanice

(1)

EC-Type Examination Certificate

(2) **Equipment or Protective Systems Intended for use in Potentially Explosive Atmospheres Directive 94/9/EC**

(3) EC-Type Examination Certificate Number:

FTZÚ 07 ATEX 0019 U

(4) Component: **Explosion proof bushings type D...x. or M... x .**

(5) Manufacturer: **GENERI, s.r.o.**

(6) Address: **Uničovská 50, 787 01 Šumperk, ČR**

(7) This Component and any of acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physical Technical Testing Institute, notified body number 1026 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report N°

07/0019 dated 11 February 2008

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

EN 60079-0:2006; EN 60079-1:2004; EN 60079-7:2007;
EN 61241-0:2006; EN 61241-1:2004

(10) The sign „U" placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

(11) This EC-TYPE EXAMINATION CERTIFICATE relates only to design, examination and testing of the specified component in accordance to the directive 94/9/EC. If applicable, further requirements of the Directive apply to the manufacture and supply of this component.

(12) The marking of the component shall include following:

IM2 / II 2GD Ex de tD I/IIC (valid only for type **M.S.x.**)

IM2 / II 2GD Ex d tD I/IIC (valid for all other types)

This EC-Type Examination Certificate is valid till: **28 February 2013**

Responsible person:

Dipl. Ing. Šindler Jaroslav
Head of certification body

PHYSICAL-TECHNICAL TESTING INSTITUTE FYZIKÁLNĚ TECHNICKÝ ZKUŠEBNÍ ÚSTAV FTZÚ Ex AO 210 NB 1026

Date of issue: 18 February 2008

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This certificate is granted subject to the general conditions of the Physical Technical Testing Institute.
This certificate may only be reproduced in its entirety and without any change, schedule included.

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Physical Technical Testing Institute
Ostrava-Radvanice

(13) **Schedule**

(14) **EC-Type Examination Certificate N° FTZÚ 07 ATEX 0019 U**

(15) Description of Component:
Explosion proof bushings are made as Ex component and are intended for installation into flameproof enclosure "d". Bushings represent partial flameproof enclosures Ex d tD I/IIC or Ex de tD I/IIC (only bolt bushings) with cylindrical or screw brass case. Cases can be nickel-coated and together with enclosure wall form appropriate flameproof joint. Bushings are used for connection of electrical or optical circuits in two separated parts of explosion proof apparatus, generally between instrumental part of flameproof enclosure "d" and increased safety "e" terminal part, eventually between two flameproof enclosures "d". Bushings installation has to be in accordance with User's instruction N740067. Operating temperature range **-60°C ≤ T_{serv} ≤ +115°C** is a maximum, the actual range depends on used wires and cables – see Annex No 1.

BUSHING SPECIFICATION:

D . . . x . **explosion proof bushing cylindrical**
M . . . x . **explosion proof bushing screw**

Impedance of coaxial cable: **50, 75** or **95** Ω (only for type **K**)
Optical fibre: **9/125; 50/125; 62,5/125**; **100/125** or **200/300** μm (type **O**)
Flat cable conductors AWG cross-section: **28, 26, 24, 20** or **18** (type **P**)
Bolt screw: **M6, M8, M10** or **M12** (type **S**)
Cond. cross-sections: **0,35; 0,5; 0,75; 1; 1,5; 2,5; 4; 6; 10; 16; 25** or **35** mm^2 (type **V**)

Number of conductors, coaxial or optical cables: **1** to **25** (types **K, O** and **V**)
Number of cores of flat cable: **4** to **48** (type **P**)
Number of bolts: **1** (type **S**)

Type of bushing:
K – with coaxial cables
O – with optical cables
P – with flat cables
S – with screw-bolt
V - with stranded conductors

Bushing dimension:
D24 - cylindrical case ϕ24 f8
D36 - cylindrical case ϕ36 f8
D41 - cylindrical case ϕ41 f8

M24 - screw case M24x1,5-6g
M25 - screw case M25x1,5-6g
M32 - screw case M32x1,5-6g
M33 - screw case M33x1,5-6g
M36 - screw case M36x1,5-6g
M42 - screw case M42x1,5-6g

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(13) **Schedule**

(14) **EC-Type Examination Certificate N° FTZÚ 07 ATEX 0019 U**

(16) Report No. : 07/0019 dated 11.02.2008

(17) Schedule of Limitations: --

(18) Essential Health and Safety Requirements:
Covered by standards mentioned in (9) of this certificate.

(19) **LIST OF DOCUMENTATION**

- Drawings for certification G-2-902826/3, G-2-902826/4 a G-2-902826/5 dated 8.11.2007
- Description to drawings G-2-902826/. dated 1.10.2007
- User's instruction N740060 dated 1.12.2007

Responsible person:

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Annex N° 1

to EC-Type Examination Certificate N° FTZÚ 07 ATEX 0019 U

TECHNICAL PARAMETERS:

Coaxial bushing of type D.K.x. or M.K.x.

Nominal impedance: **50 Ω, 75 Ω or 95 Ω** (according to cable type)

Operating temperature range	Type index
-20°C ≤ T_{serv} ≤ +65°C	**K1**
-20°C ≤ T_{serv} ≤ +70°C	**K2**
-30°C ≤ T_{serv} ≤ +100°C	**K3**
-40°C ≤ T_{serv} ≤ +115°C	**K4**
-55°C ≤ T_{serv} ≤ +115°C	**K4**

Optical bushing od type D.O.x. or M.O.x.

Design of optical fibre: **9/125; 50/125; 62,5/125**; **100/140** or **200/300** □**m**

Max. power transmission: **35 mW** or **15mW** (limitation according to EN 60079-28)

Maximal optical intensity: **5 mW/mm²** (limitation according to EN 60079-28)

Service temperature range	Type index
-10°C ≤ T_{serv} ≤ +60°C	**O1**
-20°C ≤ T_{serv} ≤ +70°C	**O2**
-45°C ≤ T_{serv} ≤ +70°C	**O3**
-40°C ≤ T_{serv} ≤ +85°C	**O4**

Flat cable bushing of type D.P.x. or M.P.x.

Number of cores: **4** to **48**

Cross-section of each core: **28 AWG** (0,08 mm²), **26 AWG** (0,14 mm²), **24 AWG** (0,25 mm²)
20 AWG (0,5 mm²) or **18 AWG** (0,75 mm²)

Max. continuous current: **0,65 A** (28 AWG); **1,0 A** (26 AWG); **2,6 A** (24 AWG);
6,0 A (20 AWG); **8,0 A** (18 AWG) – valid for temperature rise 75K

Nominal voltage: **300 V**

Operating temperature range	Type index
-40°C ≤ T_{serv} ≤ +105°C	**P1**
-40°C ≤ T_{serv} ≤ +105°C	**P2**
-40°C ≤ T_{serv} ≤ +105°C	**P3**
-20°C ≤ T_{serv} ≤ +80°C	**P4**
-20°C ≤ T_{serv} ≤ +80°C	**P5**

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Annex N° 1

to EC-Type Examination Certificate N° FTZÚ 07 ATEX 0019 U

Bolt bushing of type D.S.x. or M.S.x.

Bolt case screw specification: **M24x1,5-6g** or **M25x1,5-6g**
Nominal voltage: **1250 V**
Operating temperature range: **-60°C ≤ T_{serv} ≤ +115°C**

Bolt thread size:	M6	M8	M10	M12
Max. continuous current: *	82 A	114 A	170 A	227 A
Nut bolt tightening torque:	4 Nm	8 Nm	13 Nm	20 Nm
Connectable cross-section: • with compression or clamping type of lug ** • with V-terminal clamp **	6 – 25 mm² 6 – 35 mm²	10 – 50 mm² 10 – 70 mm²	16 – 95 mm² 16 – 120 mm²	25 – 150 mm² 16 – 185 mm²

* Valid for temperature rise 40K
** Acceptable connection of conductors to bolts:

- **Compression type straight lug with spring washer and nut**
- **Compression type angle lug (90°) with spring washer and nut**
- **Clamping type lug with spring washer and nut**
- **V-terminal clamp with spring element and clamping plate**

Wire bushing of type D.V.x. or M.V.x.

Nominal current: acc. to **table of technical parameters** (see bellow)
Nominal voltage: **400V, 690V** or **1000V** (acc. to type and cross-section of used wires)

Operating temperature range	Type index	Nominal voltage**
-20°C ≤ T_{serv} ≤ +70°C	V1	400 / 690 V
-40°C ≤ T_{serv} ≤ +90°C	V2	400 / 690 V
-30°C ≤ T_{serv} ≤ +110°C	V3	400 / 690 V
-30°C ≤ T_{serv} ≤ +115°C	V4	400 / 690 V
-40°C ≤ T_{serv} ≤ +115°C	V5	690 / 1000 V
-55°C ≤ T_{serv} ≤ +115°C	V6	690 / 1000 V
-60°C ≤ T_{serv} ≤ +115°C	V7	690 / 1000 V
-60°C ≤ T_{serv} ≤ +115°C	V8	690 / 1000 V

** Lower value means nominal voltage of bushing with wires cross-sections up to 1 mm² incl., higher value means nominal voltage of bushing with wires cross-sections above 1 mm².

All values of nominal voltage are valid for fixed installation of bushing wires!

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Annex N° 1

to EC-Type Examination Certificate N° FTZÚ 07 ATEX 0019 U

TECHNICAL PARAMETERS

Cross-section [mm²]	Number of conductors	Bushing dimension	Nominal voltage [V]	Allowable current loading [A] in relation to temperature rising of bushing:			
				30K	45K	60K	75K
0,35	2	D24, M24, M25	400	8	9	10	10,5
	3	D24, M24, M25		7	8	9	9,5
	4	D24, M24, M25		6	7	8	8,5
	7	D36, M32, M33, M36		5	5,5	6	6,5
	12	D36, M32, M33, M36		4	4,5	5	5,5
	19	D41, M42		3,5	4	4,5	5
	21	D41, M42		3,5	4	4,5	5
	25	D41, M42		3	3,5	4	4,5
0,5	2	D24, M24, M25	400	10	11	12	12,5
	3	D24, M24, M25		9	10	11	11,5
	4	D24, M24, M25		7,5	8,5	9,5	10
	7	D36, M32, M33, M36		6	7	8	8,5
	12	D36, M32, M33, M36		5	5,5	6	6,5
	19	D41, M42		4,5	5	5,5	6
	21	D41, M42		4,5	5	5,5	6
	25	D41, M42		4	4,5	5	5,5
0,75	2	D24, M24, M25	400 690*	12,5	14	15,5	16
	3	D24, M24, M25		11	12	13	13,5
	4	D24, M24, M25		9,5	10,5	11,5	12
	7	D36, M32, M33, M36		7,5	8,5	9,5	10
	12	D36, M32, M33, M36		6,5	7	7,5	8
	19	D41, M42		5,5	6	6,5	7
	21	D41, M42		5,5	6	6,5	7
	25	D41, M42		5	5,5	6	6,5
1	2	D24, M24, M25	400 690*	15	17	18,5	19,5
	3	D24, M24, M25		13	14,5	16	16,5
	4	D24, M24, M25		12	13,5	15	15,5
	7	D36, M32, M33, M36		9,5	10,5	11,5	12
	12	D36, M32, M33, M36		7,5	8,5	9,5	10
	19	D41, M42		6,5	7,5	8	8,5
	21	D41, M42		6,5	7,5	8	8,5
	25	D41, M42		6	7	7,5	8
1,5	2	D24, M24, M25	690 1000*	20	22	24	25
	3	D24, M24, M25		16,5	18,5	20,5	21
	4	D24, M24, M25		15,5	17	18,5	19,5
	7	D36, M32, M33, M36		11,5	13	14,5	15
	12	D36, M32, M33, M36		9,5	10,5	11,5	12
	19	D41, M42		8	9	10	10,5
	21	D41, M42		8	9	10	10,5
	25	D41, M42		7,5	8,5	9,5	10
2,5	4	D36, M32, M33, M36	690 1000*	21	23,5	26	27
	7	D36, M32, M33, M36		16	18	20	21
	12	D41, M42		13	14,5	16	17
4	3	D36, M32, M33, M36	690 1000*	30,5	34	37	39
	4	D36, M32, M33, M36		27,5	30,5	33,5	35
	7	D36, M32, M33, M36		21	23,5	26	27
	12	D41, M42		17	19	21	22
6	1	D24, M24, M25	690 1000*	54	60	66	69
	3	D36, M32, M33, M36		39	43	47	49
	4	D36, M32, M33, M36		35	39	43	45
	7	D41, M42		27	30	33	34
10	1	D24, M24, M25	690 1000*	73	82	90	94
	3	D36, M32, M33, M36		54	60	66	69
	4	D41, M42		48	53	58	61
16	1	D24, M24, M25	690 1000*	98	109	120	125
	3	D36, M32, M33, M36		72	80	88	92
	4	D41, M42		64	71	78	82
25	1	D36, M32, M33, M36	690 1000*	135	170	200	225
	3	D41, M42		110	132	154	174
35	1	D36, M32, M33, M36	690 1000*	175	217	255	287
	3	D41, M42		140	169	198	224

*) *Higher voltage is valid only for wires with index type V5 to V8.*

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