CABLE ENTRIES AND LINE BUSHINGS

- Applicable under extreme and harsh conditions
- Made out of Marine brass & Stainless steel
- Wide temperature range -60 °C to +180 °C

The cable gland, made of different metallic materials, is used for inserting permanent cables and leads into electrical equipment with the increased safety "e" and flameproof "d" type of explosion protection. The cable glands conform to the protection class IP 66/68.They are suitable for use in Zone 1,2 for Gas Groups IIA,IIB and IIC as well as for use in zones 21 and 22 for Dust Groups IIIA,IIIB and IIIC. When this cable gland is used, the instructions given in the type examination certificate/operating instructions must be observed.

Explosion protection

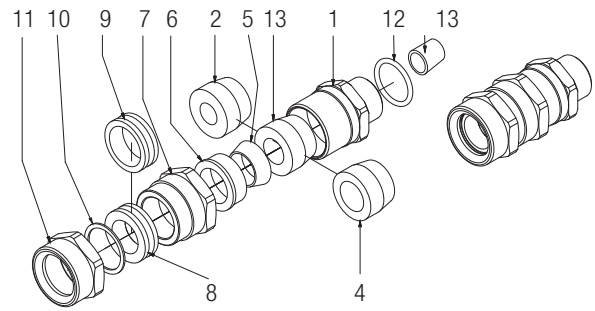
Marking ATEX	Ⓔx II 2G Ex d / Ex e / Ex ia IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	INERIS 09 ATEX 0028 X
Marking IECEx	Ex d / Ex e / Ex ia IIC Gb Ex tb IIIC Db
Certification	IECEx INE 13.0017 X
Ambient temperature	-40 °C to +90 °C (Rubber ring EPDM-60) -60 °C to +180 °C (Rubber ring Silicone)
Other approvals	Inmetro, EAC TR CU, RINA, RMRS, KC

Technical data

Protection class	IP 66 or IP 66/68
Material	Nickel plated brass or Stainless Steel AISI 316L
Entry thread size	Metric (ISO-pitch 1.5 mm) NPT (ANSI/ASME 31.20.1) Whitworth (UNI ISO-228)

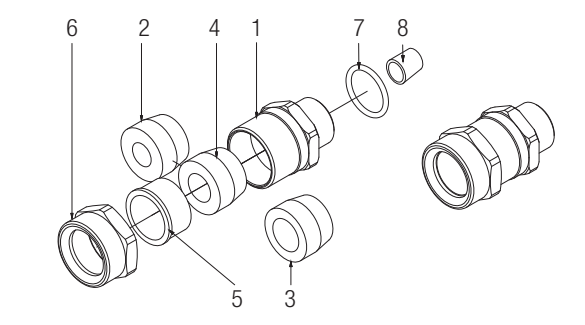
For further details and ordering numbers please see
BARTEC FEAM catalogue http://www.feam-ex.com/en/products
or BARTEC NASP catalogue http://www.nuovaasp.net/cable-glands/

PAP Dimensional



1 Body
2-3-4 Inner sealing ring for armoured cable
5 Armoured clamping cone
6 Armoured clamping ring for armoured cable
7 Gland barrel
8-9 Outer saling ring
10 Anti rubbing washer
11 Gland nut
12 O-ring (only for metrical)
13 *Chamber for sealing ("R" version only)

PNA Dimensional



1 Body
2-3-4 Inner sealing ring for not armoured cable
5 Armour clamping cone
6 Gland nut
7 O-ring (only for metrical)
8 *Chamber for sealing („R" version only)

Ex Cable glands & Accessories

	Version	Ambient temperature	Protection degree	Ex protection	Material	Applications
ARMOURED CABLES	PAPD 	-40 °C ÷ +90 °C (Rubber rings EPDM-60) -60 °C ÷ +180 °C (Rubber rings SILICON)	IP66/68	II 2 G Ex d / Exe / Exia IIC Gb II 2 D Ex tb IIIC Db	Brass Nickel plated brass Stainles Steel AISI 316L	- for steel wire armoured cables (swa) - for steel tape armoured cables - for lead inner sheath cables - double compression - under armour and overall of armour cable Option: Sealing with resin - barrier type "R"
	PAP 	-40 °C ÷ +90 °C (Rubber rings EPDM-60) -60 °C ÷ +180 °C (Rubber rings SILICON)	IP66/68	II 2 G Ex d / Exe / Exia IIC Gb II 2 D Ex tb IIIC Db	Brass Nickel plated brass Stainles Steel AISI 316L	- for steel wire armoured cables (swa) - for steel tape armoured cables - for lead inner sheath cables - double compression - under armour and overall of armour cable Option: Sealing with resin - barrier type „R"
	PA 	-40 °C ÷ +90 °C (Rubber rings EPDM-60) -60 °C ÷ +180 °C (Rubber rings SILICON)	IP66/68	II 2 G Ex d / Exe / Exia IIC Gb II 2 D Ex tb IIIC Db	Brass Nickel plated brass Stainles Steel AISI 316L	- for steel wire armoured cables (swa) - for steel tape armoured cables - for lead inner sheath cables - double compression - under armour and overall of armour cable Option: Sealing with resin - barrier type „R"
UNARMOURED CABLES	PNA 	-40 °C ÷ +90 °C (Rubber rings EPDM-60) -60 °C ÷ +180 °C (Rubber rings SILICON)	IP66/68	II 2 G Ex d / Exe / Exia IIC Gb II 2 D Ex tb IIIC Db	Brass Nickel plated brass Stainles Steel AISI 316L	- for unarmoured cables only - single compression type suitable for indoor and outdoor use - single compression - on cable (inner sealing) Option: Sealing with resin - barrier type "R"
	PNAF 	-40 °C ÷ +90 °C (Rubber rings EPDM-60) -60 °C ÷ +180 °C (Rubber rings SILICON)	IP66/68	II 2 G Ex d / Exe / Exia IIC Gb II 2 D Ex tb IIIC Db	Brass Nickel plated brass Stainles Steel AISI 316L	- for unarmoured cables only - suitable for flexible conduit connection (threaded cap uni iso 228) - single compression - on cable (inner sealing) Option: Sealing with resin - barrier type "R"
ACCESSORIES	Plugs 	-60 °C ÷ +130 °C	IP66	II 2 G Ex d IIC Gb II 2 G Ex e IIC Gb II 2 D Ex t IIIC Db	"Nickel plated brass Stainles Steel AISI 316L Aluminium light alloy Galvanized steel"	Sealing of unused cable entries in Ex equipment
	Breather Drains 	-60 °C ÷ +130 °C (Silicone)	IP66	II 2 G Ex d IIC Gb II 2 G Ex e IIC Gb II 2 D Ex t IIIC Db	Stainles Steel AISI 316L	Provides breathing to minimise condensation effect, togehter with draining moisture within the equipment
	Adapters/ Reducers 	-60 °C ÷ +130 °C (Silicone/EPDM/NYLON)	IP66	II 2 G Ex d IIC Gb II 2 G Ex e IIC Gb II 2 D Ex t IIIC Db	"Brass Nickel plated brass Stainles Steel AISI 316L Galvanized steel"	"Explosion proof reducers and adaptors are used to connect various equipment and matching different thread types and sizes: - enclosures - lighting fixtures - junction and pulling boxes - etc…"
	DL-NW-PTD-ET 	Locknuts Shoruds Silicone sealant Gaskets Earth tags	Are preffered items used in securing cable glands to the gland plate especially to plastic junction boxes For all tipe of glands application where additional protection is required Is provided for submission of barrier cable glands type-R Are used to mantain the ip rating across the interface between the equipment and relevant cable gland Are used to ensure earth continuity and grounding of cable armour		

Technical data subject to change without notice.

Cable gland

- Zones 1/21 and 2/22
- IP66/IP68
- Ex “e“ or Ex “i“

The cable gland made of polyamide is used for inserting permanent cables and leads into electrical equipment with the increased safety “e“ type of explosion protection. The cable glands conform to the protection class IP 66/68. For intrinsically safe circuits the cable entries are available with a blue cap nut. When this cable gland is used, the instructions given in the type examination certificate/operating instructions must be observed.

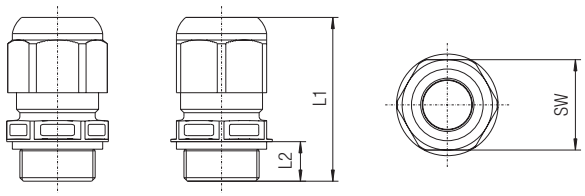
Explosion protection

Marking ATEX	Ⓔx II 2G Ex e II C Ⓔx II 2D Ex tb IIIC Db IP 68
Certification	PTB 13 ATEX 1015 X
Marking IECEx	Ex e II C Ex tb IIIC Db IP 68
Certification	IECEx PTB 13.0034 X
Operating temperature	-40 °C to +75 °C

Technical data

Material	Polyamid, self-extinguishing
Seals	EPDM
Colour	RAL 9005, black RAL 5015, blue
Protection class	IP 66/IP 68 EN/IEC 60529

Dimensions



Ordering information Cable gland Ex e, black

Thread size	Cable range (Ø)	Across flat (AF)	Thread length (L2)	Length in mm (L1)	Unit	Order no.
M12 x 1.5	3 - 6	16	15	35 - 45	50	03-6062-0137
M16 x 1.5	4.5 - 9	20	9	31 - 37	50	03-6062-0126
M20 x 1.5	7 - 13	24	10	36 - 45	50	03-6062-0127
M25 x 1.5	7 - 12	29	10	38 - 47	50	03-6062-0128
M25 x 1.5	10 - 17	29	10	38 - 47	50	03-6062-0136
M32 x 1.5	13 - 21	36	12	42 - 51	25	03-6062-0129
M40 x 1.5	17 - 28	46	12	52 - 65	10	03-6062-0130
M50 x 1.5	23 - 35	55	14	59 - 72	5	03-6062-0125
M63 x 1.5	31 - 48	68	15	64 - 78	1	03-6062-0131

Cable glands Ex e black, with long connection thread on request.

Ordering information Cable gland Ex i, with blue cap nut

Thread size	Cable range (Ø)	Across flat (AF)	Thread length (L2)	Length in mm (L1)	Unit	Order no.
M12 x 1.5	3 - 6	16	15	35 - 45	50	03-6065-0074
M16 x 1.5	4.5 - 9	20	9	31 - 37	50	03-6065-0066
M20 x 1.5	7 - 13	24	10	36 - 45	50	03-6065-0067
M25 x 1.5	7 - 12	29	10	38 - 47	50	03-6065-0068
M25 x 1.5	10 - 17	29	10	38 - 47	50	03-6065-0073
M32 x 1.5	13 - 21	36	12	42 - 51	25	03-6065-0069
M40 x 1.5	17 - 28	46	12	52 - 65	10	03-6065-0070
M50 x 1.5	23 - 35	55	14	59 - 72	5	03-6065-0071
M63 x 1.5	31 - 48	68	15	64 - 78	1	03-6065-0072

Technical data subject to change without notice.

Screw plugs

Screw plugs for closing unused boreholes in enclosures for the hazardous area in accordance with EN 60079-0 and EN 60079-7. For assembly purposes the outer shape and internal recess of the screw plug head are hexagonal.

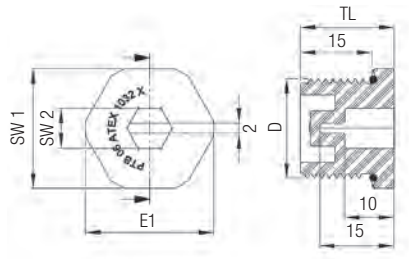
Explosion protection

Marking ATEX	Ⓔx II 2G Ex eb IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	PTB 06 ATEX 1032 X BVS 11 ATEX E073 X

Technical data

Protection class	IP 68
Material	Body: Polyamide O-ring: EPDM
Operating temperature	-40 °C to +75 °C
Colour	Black

Dimensions



Ordering information

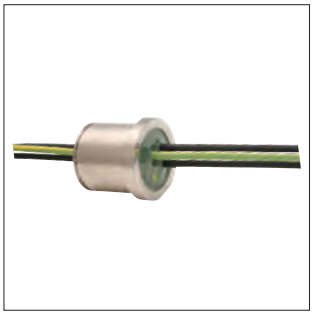
D (mm)	SW* 1 (mm)	SW* 2 (mm)	E1 (mm)	TL (mm)	Nm	Order no.
M12 x 1.5	16	6	18	19	2	03-5210-0092
M16 x 1.5	20	8	22	19	2	03-5210-0085
M20 x 1.5	24	8	26	19	2	03-5210-0089
M25 x 1.5	29	8	31	20	5	03-5210-0090
M32 x 1.5	36	8	39	20	5	03-5210-0091
M40 x 1.5	46	8	50	20	10	03-5210-0086
M50 x 1.5	55	8	60	20	10	03-5210-0087
M63 x 1.5	68	8	73	20	10	03-5210-0088

*SW = Across flat

Technical data subject to change without notice.

Line bushings

multi-core
with threaded sleeve



multi-core
with cylindrica sleeve

4-pole or 6-pole
with terminals

- Space-saving construction as many single cores are gathered in one single sleeve thus requiring only one cable entry hole.
- Motor mains and thermoprotection cables can be exited in **one** common sleeve.
- Numbered cores simplify connections and eliminate the usual “Ring out“ in larger control systems.
- Coaxial and Ethernet bushings are similarly available.
- On the Ex d side, the cores are connected directly to the electrical load, intermediate terminals are no longer necessary.
- Small dimensions allow a rated insulation voltage of up to 3 kV.
- Blue cores for Ex i low power circuits.
- Permanent heat-resistance of the cores up to +110 °C.

A line bushing is a component for the electrical connection between a flameproof “d“ enclosure and an increased safety “e“ terminal box. The bushing consists of a threaded or non-threaded metal sleeve encapsulating one or more cores providing a flameproof barrier. The lengths of these leads vary according to their applications. The depth of engagement of the threaded sleeves and the joint length of the cylindrical sleeve in the wall of the “d“ enclosure must correspond to the EN 60079-0 and EN 60079-1 standards. After installation the bushing must be protected against rotation and accidental loosening. Recommendations are given under “Accessories“. Our standard bushings come with threaded sleeves from M10 to M42 or with cylindrical sleeves. They are equipped with cores with a 0.2 to 120 mm^2 csa. and approved for nominal voltages between 250 V and 3 000 V. See also table “Electrical data“. For the connection of intrinsically safe circuits in the “d“ area with the terminal strip in the connection compartment we provide **line bushings with blue cores for “i“ low power circuits.**

Another product of our line-bushing range is the **bushing with terminals**. Combining Ex d line bushing with an Ex e terminal we designed an element which is hardly any bigger than a normal line bushing. This bushing plus terminals reduces the size of the terminal box and, at the same time, the installation costs. The bushings plus terminals are rated for 690 V and 1 000 V and certified. We supply them with 2 to 6 poles and threaded sleeves from M 24 to M 42.

All line bushings have been tested and certified for their use in hazardous areas according to the European standards EN 60079-0, EN 60079-1 and EN 60079-7 concerning electrical operating equipment for explosion-endangered areas for above-ground (II) and underground (I) according to ATEX. BARTEC has furthermore obtained several foreign admissions for these line bushings. When the 2014/34/EU guideline comes into force on 20. April 2016, explosion protected operating equipment must be properly Installed in accordance with EN 60079-14. Among other things, section 10.4.2 requires that **cast, pressure-proof cable insertions according to EN 60079-1 are used for** operating equipment with an internal ignition source for the explosion subgroup IIC and operating equipment with an enclosure volume greater than 2 dm^3 in zone 1. BARTEC offers a wide range of products with EU type test certification.

Line bushings in the Ex e terminal box

Connection side of the line bushings with terminals

Line bushing

Explosion protection

Marking ATEX	Ⓔx II 2G Ex db IIC Gb Ⓔx I M2 Ex db I Mb
Certification	EPS 13 ATEX 1619 U
Marking IECEx	Ex db IIC Gb Ex db I Mb
Certification	IECEx EPS 13.0045 U
Other approvals	INMETRO, UL, CSA, NEPSI, GOST, FM
Standard product printing	ATEX and IECEx marking. Other international imprints obtainable on request. Please specify in plain text.
Working temperature	-60 °C to +110 °C depending on the lead used and static test pressure (temperature ranges apply to the “fixed installation” of leads)
Other approvals and certificates, see www.bartec.de	

Standard versions*

Cores depending on the working temperature and voltage	HO7G-K radiation cross-linked polyolefin copolymer NSGAFÖU
max. number of cores	50 cores
Cross-section	0.25 mm² to 120 mm² AWG24 to AWG1
Sleeve size	metric: M16 x 1.5 to M42 x 1.5 non-threaded: Ø 22 mm to Ø 36 mm
Sleeve material	Metal, bare, varnished or galvanised
Rated voltage	690 V/1 000 V/3 000 V
Rated currents	see following table based on VDE 0298-04

***** all other versions on request
Please use the customer requirements form at the end of the chapter!

Line bushing with terminals

Explosion protection

Marking ATEX	Ⓔx II 2G Ex db eb IIC Gb Ⓔx I M2 Ex db eb I Mb
Certification	EPS 14 ATEX 1644 U
Marking IECEx	Ex db eb IIC Gb Ex db eb I Mb
Certification	IECEx EPS 14.0020 U
Working temperature	-60 °C to +110 °C depending on the design, terminals and lead (temperature ranges apply to the “permanent installation“ of the leads)
Ambient temperature of limit switches	depending on the design and the cores/leads
Other approvals and certificates, see www.bartec.de	

Standard versions*

Cores depending on the working temperature and voltage	HO7G-K radiation cross-linked polyolefin copolymer NSGAFÖU
Number of terminals	4 or 6 (depending on the cross-section)
Cross-section	0.75 mm²/1.5 mm²/2.5 mm²/4 mm²/6 mm²
Sleeve size	metric: M16 x 1.5 to M42 x 1.5 non-threaded: Ø 22 mm to Ø 36 mm
Sleeve material	Metall, blank, lackiert oder galvanisiert
Nominal voltage	690 V/1 000 V
Rated currents	see following table based on VDE 0298-04

***** all other versions on request
Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.

Ordering information

Sleeve type	Code no.	Nominal voltage	Code no.
threaded, metric	0	690 V	1
pluggable, length of crack 12.5 mm	5	1 000 V	3
pluggable, length of crack 25 mm	6	3 000 V	4

Conductor, cross-section mm²	Code no.
Special diameter	A
0.25	C
0.35	D
0.5	E
0.75	F
1	G
1.5	H
2.5	J
4	K
6	L
10	M
16	N
25	P
35	Q
50	R
70	S
95	T
120	U
Mixed cores	Z

Sleeve size	Code no.
M 10 x 1	0
M 16 x 1	1
M 24 x 1.5 Ø ≥ 22 mm	2
M33 x 1.5 Ø ≥ 32 mm	3
M36 x 1.5	4
M38 x 1.5 Ø ≥ 36 mm	5
M42 x 1.5	6
M12 x 1.5	C
M16 x 1.5	D
M20 x 1.5	E
M25 x 1.5	F

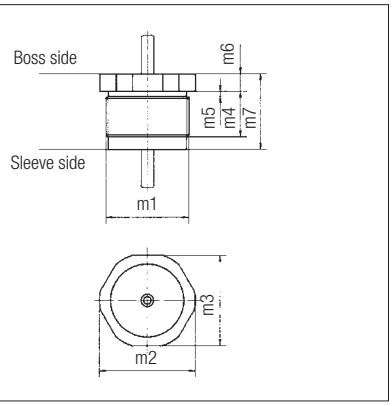
Complete order no.* 07-91 ☐☐ - ☐☐☐☐ /G
Please insert code number.

Number of cores z. B. 02 = 2 cores; 21 = 21 cores; etc. 1 ... 50 cores
Core length: as ordered Core identification: printed numbers

* Standard product printing: ATEX and IECEx marking.
Other international imprints obtainable on request. Please specify in plain text.

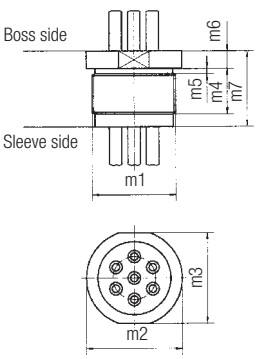
Technical data subject to change without notice.

Dimensions mm



m1	m2	m3	m4	m5	m6
M10 x 1	Ø 13.5	12	16	1.5	5
M12 x 1.5	Ø 16.5	15	17	2.0	5
M16 x 1	Ø 21	19	17	1.5	5
M16 x 1.5	Ø 21	19	17	2.0	5
M24 x 1.5	Ø 29	27	19	2.0	5
M25 x 1.5	Ø 29	27	19	2.0	5
M42 x 1.5	Ø 48	46	25	2.0	7

Dimensions mm



m1	m2	m3	m4	m5	m6
M33 x 1.5	Ø 38	36	18	2.0	7
M36 x 1.5	Ø 42	40	25	2.0	7

Ordering information - cores

Number of cores	Conductor cross section (mm²) [2]	rated current (A) for continuous operation (reference values) [1] Max. permissible operating temperature at the conductor is 110 °C Max. current carrying capacity based on VDE 0298-4	Thread size	Dimensions m7 (mm)	Order no. Indicate core length on both boss and sleeve side in plain text.
1	0.5	7 A	M10 x 1	25	07-910 ☐ -E010
1	0.5		M12 x 1.5	25	07-910 ☐ -E01C
9	0.5		M16 x 1	25	07-910 ☐ -E091
9	0.5		M16 x 1.5	25	07-910 ☐ -E09D
19	0.5		M24 x 1.5	26	07-910 ☐ -E192
19	0.5		M25 x 1.5	26	07-910 ☐ -E19F
16	0.5		M33 x 1.5	30	07-910 ☐ -E163
20	0.5		M36 x 1.5	35	07-910 ☐ -E204
30	0.5		M38 x 1.5	36	07-910 ☐ -E305
40	0.5		M42 x 1.5	35	07-910 ☐ -E406

Enter code number 1 = 690 V
3 = 1000 V

[1] When determining the maximum current carrying capacity of the connection cores, the self-heating rate and the enclosure heating at the installation site at the max. permissible ambient temperature must be taken as a basis.

Other equipment options and special sleeves on request.

It is essential to submit a customer requirements form which has been filled in correctly and completely.
The form can be found in the catalogue at the end of the chapter.

Technical data subject to change without notice.

Ordering information - cores

Number of cores	Conducto cross section (mm²)	Rated current (A) for continuous operation (reference values) [2] Max. permissible operating temperature at the conductor is +110 °C Max. current carrying capacity based on VDE 0298-4	Thread size	Dimensions m 7 (mm)	Order no. Indicate core length on both boss and sleeve side in plain text.
1	0.75	15 A	M10 x 1	25	07-910 ☐ -F010
1	0.75		M12 x 1.5	25	07-910 ☐ -F01C
4	0.75		M16 x 1	25	07-910 ☐ -F041
4	0.75		M16 x 1.5	25	07-910 ☐ -F04D
11	0.75		M24 x 1.5	26	07-910 ☐ -F112
11	0.75		M25 x 1.5	26	07-910 ☐ -F11F
12	0.75		M33 x 1.5	30	07-910 ☐ -F123
15	0.75		M36 x 1.5	35	07-910 ☐ -F154
24	0.75		M38 x 1.5	36	07-910 ☐ -F245
25	0.75		M42 x 1.5	35	07-910 ☐ -F256
1	1.5	24 A	M10 x 1	25	07-910 ☐ -H010
1	1.5		M12 x 1.5	25	07-910 ☐ -H01C
3	1,5		M16 x 1	25	07-910 ☐ -H031
3	1.5		M16 x 1.5	25	07-910 ☐ -H03D
8	1,5		M24 x 1.5	26	07-910 ☐ -H082
8	1.5		M25 x 1.5	26	07-910 ☐ -H08F
12	1,5		M33 x 1.5	30	07-910 ☐ -H123
15	1.5		M36 x 1.5	35	07-910 ☐ -H154
24	1.5		M38 x 1.5	36	07-910 ☐ -H245
25	1.5		M42 x 1.5	35	07-910 ☐ -H256
3	2.5	32 A	M16 x 1	25	07-910 ☐ -J031
3	2.5		M16 x 1.5	25	07-910 ☐ -J03D
6	2.5		M24 x 1.5	26	07-910 ☐ -J062
6	2.5		M25 x 1.5	26	07-910 ☐ -J06F
8	2.5		M33 x 1.5	30	07-910 ☐ -J083
10	2.5		M36 x 1.5	35	07-910 ☐ -J104
10	2.5		M38 x 1.5	36	07-910 ☐ -J105
14	2.5		M42 x 1.5	35	07-910 ☐ -J146
1	4	42 A	M16 x 1	25	07-910 ☐ -K011
1	4		M16 x 1.5	25	07-910 ☐ -K01D
3	4		M24 x 1.5	26	07-910 ☐ -K032
3	4		M25 x 1.5	26	07-910 ☐ -K03F
6	4		M33 x 1.5	30	07-910 ☐ -K063
8	4		M36 x 1.5	35	07-910 ☐ -K084
8	4		M38 x 1.5	36	07-910 ☐ -K085
12	4		M42 x 1.5	35	07-910 ☐ -K126
1	6	54 A	M16 x 1	25	07-910 ☐ -L011
1	6		M16 x 1.5	25	07-910 ☐ -L01D
2	6		M24 x 1.5	26	07-910 ☐ -L022
2	6		M25 x 1.5	26	07-910 ☐ -L02F
6	6		M33 x 1.5	30	07-910 ☐ -L063
6	6		M36 x 1.5	35	07-910 ☐ -L064
6	6		M38 x 1.5	36	07-910 ☐ -L065
8	6		M42 x 1.5	35	07-910 ☐ -L086
1	10	73 A	M16 x 1.5	25	07-910 ☐ -M011
1	10		M16 x 1.5	25	07-910 ☐ -M01D
1	10		M24 x 1.5	26	07-910 ☐ -M012
3	10		M33 x 1.5	30	07-910 ☐ -M033
6	10		M36 x 1.5	35	07-910 ☐ -M064
6	10		M38 x 1.5	36	07-910 ☐ -M065
8	10		M42 x 1.5	35	07-910 ☐ -M086
1	16	98 A	M25 x 1.5	26	07-910 ☐ -N01F
3	16		M33 x 1.5	30	07-910 ☐ -N033
3	16		M36 x 1.5	35	07-910 ☐ -N034
6	16		M38 x 1.5	36	07-910 ☐ -N035
6	16		M42 x 1.5	35	07-910 ☐ -N066
1	25	129 A	M24 x 1.5	26	07-910 ☐ -P012
1	25		M25 x 1.5	26	07-910 ☐ -P01F
1	35	158 A	M24 x 1.5	26	07-910 ☐ -Q012
1	35		M25 x 1.5	26	07-910 ☐ -Q01F
1	50	198 A	M24 x 1.5	26	07-910 ☐ -R012
1	50		M25 x 1.5	26	07-910 ☐ -R01F
1	70	245 A	M33 x 1.5	50	07-910 ☐ -S013
1	70		M36 x 1.5	50	07-910 ☐ -S014

[1] When determining the maximum current carrying capacity of the connection cores, the self-heating rate and the enclosure heating at the installation site at the max. permissible ambient temperature must be taken as a basis.

Other equipment options and special sleeves on request. It is essential to submit a customer requirements form which has been filled in correctly and completely. The form can be found in the catalogue at the end of the chapter.

Enter code number	1 = 690 V 3 = 1000 V

Technical data subject to change without notice.

Ordering information - cores

Number of cores	Conducto cross section (mm²) [2]	Rated current (A) for continuous operation (reference values) [1] Max. permissible operating temperature at the conductor is +90°C Max. current carrying capacity based on VDE 0298-4	Thread size	Dimensions m 7 [2] (mm)	Order no. Indicate core length on both boss and sleeve side in plain text.
1	1.5	30A	M16 x 1	25	07-9104-H011
1	1.5		M16 x 1.5	25	07-9104-H01D
2	1.5		M24 x 1.5	26	07-9104-H022
2	1.5		M25 x 1.5	26	07-9104-H02F
5	1.5		M33 x 1.5	30	07-9104-H053
6	1.5		M36 x 1.5	35	07-9104-H064
6	1.5		M38 x 1.5	36	07-9104-H065
8	1.5		M42 x 1.5	35	07-9104-H086
1	2.5	41 A	M16 x 1	25	07-9104-J011
1	2.5		M16 x 1.5	25	07-9104-J01D
5	2.5		M33 x 1.5	30	07-9104-J053
6	2.5		M36 x 1.5	35	07-9104-J064
6	2.5		M38 x 1.5	36	07-9104-J065
8	2.5		M42 x 1.5	35	07-9104-J086
1	4	55 A	M24 x 1.5	26	07-9104-K012
1	4		M25 x 1.5	26	07-9104-K01F
3	4		M33 x 1.5	30	07-9104-K033
5	4		M36 x 1.5	35	07-9104-K054
5	4		M38 x 1.5	36	07-9104-K055
6	4		M42 x 1.5	35	07-9104-K066
1	6	70 A	M24 x 1.5	26	07-9104-L012
1	6		M25 x 1.5	26	07-9104-L01F
3	6		M33 x 1.5	30	07-9104-L033
4	6		M36 x 1.5	35	07-9104-L044
4	6		M38 x 1.5	36	07-9104-L045
6	6		M42 x 1.5	35	07-9104-L066
1	10	98 A	M24 x 1.5	26	07-9104-M012
1	10		M25 x 1.5	26	07-9104-M01F
2	10		M33 x 1.5	30	07-9104-M023
3	10		M36 x 1.5	35	07-9104-M034
3	10		M38 x 1.5	36	07-9104-M035
1	16	132 A	M24 x 1.5	26	07-9104-N012
1	16		M25 x 1.5	26	07-9104-N01F
3	16		M42 x 1.5	35	07-9104-N036
1	25	176 A	M24 x 1.5	26	07-9104-P012
1	25		M25 x 1.5	26	07-9104-P01F
1	35	218 A	M33 x 1.5	30	07-9104-Q013
1	35		M38 x 1.5	30	07-9104-Q015
1	50	276 A	M33 x 1.5	50	07-9104-R013

[1] When determining the maximum current carrying capacity of the connection cores, the self-heating rate and the enclosure heating at the installation site at the max. permissible ambient temperature must be taken as a basis.

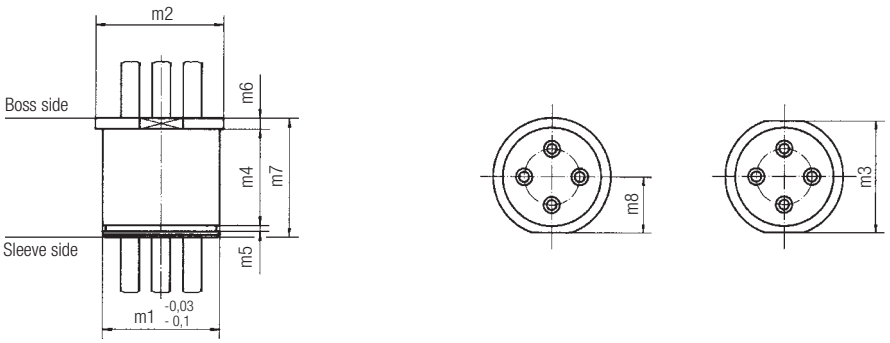
[2] Thread size M25 x 1.5 - Dimensions m 7 = 46 mm

Other equipment options and special sleeves on request.

It is essential to submit a customer requirements form which has been filled in correctly and completely.
The form can be found in the catalogue at the end of the chapter

Technical data subject to change without notice.

Dimensions mm



m1	Joint length L	m2	m3	m4	m5	m6	m8
Ø 22	15 mm	Ø 25	-	16.1	1.3	2	11.1 + 0.2
Ø 22	25 mm	Ø 25	-	26.1	1.3	2	11.1 + 0.2
Ø 32	25 mm	Ø 36	-	26.1	1.6	3	17.1 - 0.2
Ø 36	25 mm	Ø 42	SW 40	28.1	1.85	7	-

Ordering information Cores

Number of cores	Conductor cross section (mm^2)	Rated current (A) for continuous operation (reference values) [1] Max. permissible operating temperature at the conductor is +110°C Max. current carrying capacity based on VDE 0298-4	Sleeve size	Dimensions m7 (mm)	Order no. Joint length L = 15 mm 07-..5.- Joint length L = 25 mm 07-..6.- Indicate the core length on both the boss sleeve sides in plain text
11	0.75	15 A	Ø 22	23	07-915 ☐ -F112
11	0.75		Ø 22	31	07-916 ☐ -F112
12	0.75		Ø 32	32	07-916 ☐ -F123
15	0.75		Ø 36	39	07-916 ☐ -F155
8	1.5	24 A	Ø 22	23	07-915 ☐ -H082
8	1.5		Ø 22	31	07-916 ☐ -H082
12	1.5		Ø 32	32	07-916 ☐ -H123
15	1.5		Ø 36	39	07-916 ☐ -H155
6	2.5	32 A	Ø 22	31	07-916 ☐ -J062
6	2.5		Ø 32	32	07-916 ☐ -J063
10	2.5		Ø 36	39	07-916 ☐ -J105
3	4	42 A	Ø 22	31	07-916 ☐ -K032
6	4		Ø 32	32	07-916 ☐ -K063
8	4		Ø 36	39	07-916 ☐ -K085
2	6	54 A	Ø 22	31	07-916 ☐ -L022
6	6		Ø 32	32	07-916 ☐ -L063
8	6		Ø 36	39	07-916 ☐ -L085
1	10	73 A	Ø 32	32	07-916 ☐ -M013
6	10		Ø 36	39	07-916 ☐ -M065
4	16	98 A	Ø 36	39	07-916 ☐ -N045
1	25	129 A	Ø 36	39	07-916 ☐ -P015
1	35	158 A	Ø 36	39	07-916 ☐ -Q015
1	50	198 A	Ø 36	39	07-916 ☐ -R015

Enter code number 1 = 690 V, 3 = 1000 V

[1] When determining the maximum current-carrying capacity of the connection cores, the self-heating rate and the enclosure heating at the installation site at the max. permissible ambient temperature must be taken as a basis

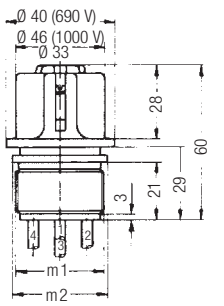
Other equipment options and special sleeves on request.

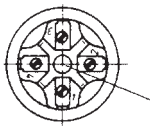
It is essential to submit a customer requirements form which has been filled in correctly and completely.
The form can be found in the catalogue at the end of the chapter.

Note: 1. Cylindrical sleeves with joint length L = 15 mm (type 07-915*) for enclosures with a volume of ≤ 2 litres.
2. Cylindrical sleeves with joint length L = 25 mm (type 07-916*) for enclosures with a volume of > 2 litres.

Technical data subject to change without notice.

Dimensions mm

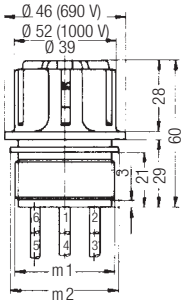


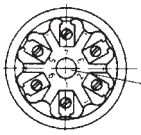


690 V and 1 000 V

m 1	M24 x 1.5	M33 x 1.5	M42 x 1.5
m 2	Ø 30	Ø 36	Ø 44

Dimensions mm





690 V and 1 000 V

m 1	M38 x 1.5	M42 x 1.5	
m 2	Ø 40	Ø 44	

Ordering information Cores

Rated insulation voltage	No. of terminals/ cores	Conductor cross section (mm^2)	Rated current (A) for continuous operation (reference values) [1] Max. permissible operating temperature at the conductor is +110 °C Max. current-carrying capacity based on VDE 0298-4 Table 11, Gap 2	Thread size	Order no. Core length please specify in plain text
690 V	4	0.75	11 A	M24 x 1.5	07-9304-F042
		1.5	17 A	M24 x 1.5	07-9304-H042
		2.5	23 A	M24 x 1.5	07-9304-J042
		4	31 A	M24 x 1.5	07-9304-K042
	4	0.75	11 A	M33 x 1.5	07-9304-F043
		1.5	17 A	M33 x 1.5	07-9304-H043
		2.5	23 A	M33 x 1.5	07-9304-J043
		4	31 A	M33 x 1.5	07-9304-K043
		6	40 A	M33 x 1.5	07-9304-L043
	4	0.75	11 A	M42 x 1.5	07-9304-F046
		1.5	17 A	M42 x 1.5	07-9304-H046
		2.5	23 A	M42 x 1.5	07-9304-J046
		4	31 A	M42 x 1.5	07-9304-K046
		6	40 A	M42 x 1.5	07-9304-L046
	6	0.75	11 A	M38 x 1.5	07-9304-F065
		1.5	17 A	M38 x 1.5	07-9304-H065
		2.5	23 A	M38 x 1.5	07-9304-J065
		4	31 A	M38 x 1.5	07-9304-K065
		6	40 A	M38 x 1.5	07-9304-L065
	6	0.75	11 A	M42 x 1.5	07-9304-F066
		1.5	17 A	M42 x 1.5	07-9304-H066
		2.5	23 A	M42 x 1.5	07-9304-J066
		4	31 A	M42 x 1.5	07-9304-K066
		6	40 A	M42 x 1.5	07-9304-L066
1 000 V	4	1.5	17 A	M33 x 1.5	07-9306-H043
		2.5	23 A	M33 x 1.5	07-9306-J043
		4	31 A	M33 x 1.5	07-9306-K043
		6	40 A	M33 x 1.5	07-9306-L043
	4	1.5	17 A	M42 x 1.5	07-9306-H046
		2.5	23 A	M42 x 1.5	07-9306-J046
		4	31 A	M42 x 1.5	07-9306-K046
		6	40 A	M42 x 1.5	07-9306-L046
	6	1.5	17 A	M38 x 1.5	07-9306-H065
		2.5	23 A	M38 x 1.5	07-9306-J065
		4	31 A	M38 x 1.5	07-9306-K065
	6	1.5	17 A	M42 x 1.5	07-9306-H066
		2.5	23 A	M42 x 1.5	07-9306-J066
		4	31 A	M42 x 1.5	07-9306-K066
		6	40 A	M42 x 1.5	07-9306-L066

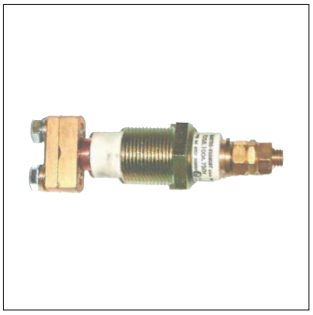
[1] When determining the maximum current-carrying capacity of the connection cores, the self-heating and enclosure heating at the site of installation at the maximum permissible ambient temperature must be assumed. The maximum tightening torque for the terminal screw is 0.8 Nm.

Other equipment options and special sleeves on request.

It is essential to submit a customer requirements form which has been filled in correctly and completely.
The form can be found in the catalogue at the end of the chapter.

Technical data subject to change without notice.

Bushing conductor studs 690, 1000 und 1600 Volt



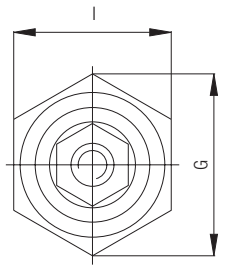
- 16 A to 630 A
- 690 V, 1000 V and 1600 V
- Max. working temperature 130 °C
- Different types of terminals
- Standard thread
  M16 x 1.5 to M42 x 1.5

A bushing conductor stud is a component with which the electrical connection between an enclosure in type of protection Flameproof enclosure „d“ and its connection enclosure in type of protection Increased Safety „e“ is established. The cable bushing includes a threaded metal sleeve, a ceramic insulation, terminals and a stud. Standard threaded sleeves from M16 to M42 are included in the delivery of bushing conductor studs. The diameter of the stud depends on current and the terminal size on the cable diameter. Thanks to different types of terminals, vertical as well as horizontal cable connection is possible. Special terminals are available on request. After installation, the bushing conductor stud needs to be secured by means of a nut or adhesive to prevent self-loosening.

Explosion protection

Marking ATEX	Ex II 2G Ex de IIC Gb Ex I M2 Ex de I Mb
Certification	PTB 04 ATEX 1099 U
Other approvals and certificates, see www.bartec.de	
Temperature range	at the place of installation by rated operation of the electrical apparatus -50 °C to +130 °C The maximum current carrying capacity of the bushing conductor stud and the connecting leads shall be established on the basis of the self-heating rate and the enclosure heating rate at the place of installation starting from the maximum permissible ambient temperature.

Dimensions



Technical data

Protection class	EN 60079-0: 2009; EN 60079-1: 2007	
Material	Insulation	ceramic, C610
	Stud 16 A to 250 A 400 A to 630 A	 CuZn39Pb2 E-Cu
Current	16 A to 630 A	
Voltage	690 V, 1 000 V and 1 600 V	
Connection	1.5 mm^2 to 300 mm^2	
Stud size	4 mm to 20 mm	
Thread size	M16 x 1.5 to M42 x 1.5	

Ordering information

Type	Current	Type of terminal	Thread size
TOS4.16A..-.	16 A	A	M16 x 1,5
TOS5.25A..-.	25 A	A, F, FL, RF, C	M18 x 1,5
TOS6.63A..-.	63 A	A, F, FL, RF, C	M20 x 1,5
TOS8.100A..-.	100 A	F, FL, RF, C	M24 x 1,5
TOS10.160A..-.	160 A	F, FL, RF, R	M27 x 1,5
TOS12.250A..-.	250 A	F, FL, RF, R	M33 x 1,5
TOS16.400A..-.	400 A	F, FL, RF, R	M36 x 1,5
TOS20.630A..-.	630 A	F, FL, RF, R	M42 x 1,5

Example-
Complete order no. TOS8.100A.690V - RF

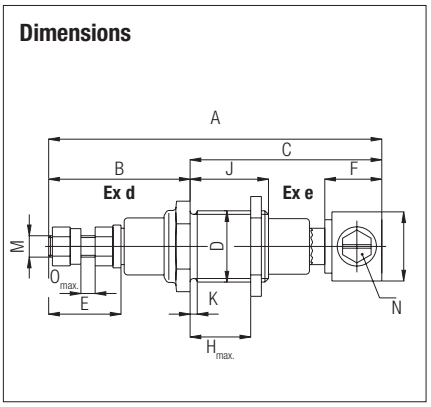
Please insert code number.
Specify voltage in plain text.

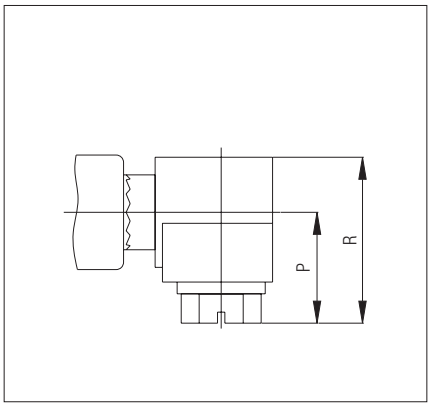
Voltage
690 V, 1000 V
or 1600 V

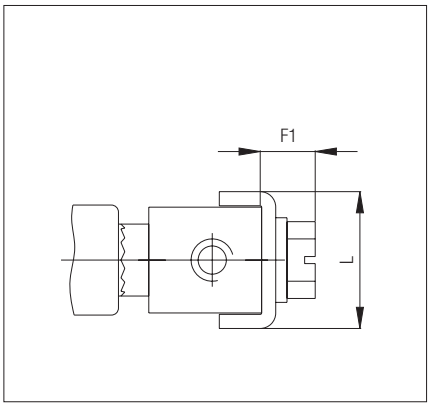
Technical data subject to change without notice.

Type of terminal A from 690 V to 1000 V

Dimensions







Ordering information Type of terminal A to 690 V

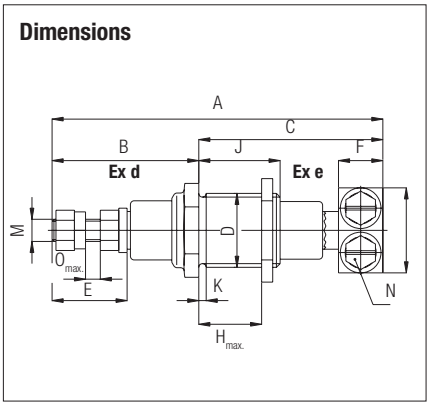
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS4.16.690 V	M16 x 1.5	81.5	33	48.5	13.4	12/5.5	19.6	18	17	22	2	13.4	M4	M4 x 10	4	10.7	15.7	1.5 - 6 mm^2
TOS5.25.690 V	M18 x 1.5	87	36	51	16.5	14/5.5	21.9	18	19	22	2	15.4	M5	M5 x 10	4	11.7	17.7	2.5 - 10 mm^2
TOS6.63A.690 V	M20 x 1.5	93.5	39.5	54	20.3	16/7.6	25.4	18	22	22	2	19.4	M6	M6 x 10	4	15.1	22.6	2.5 - 16 mm^2

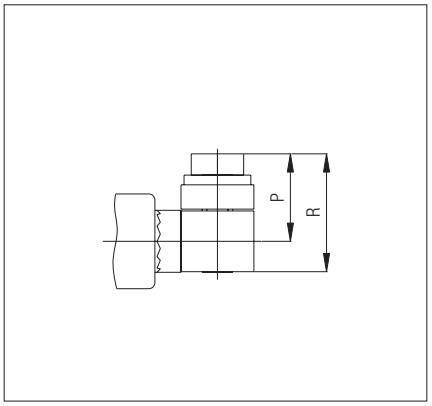
Ordering information Type of terminal A to 1000 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS4.16.690 V	M16 x 1.5	97.5	41	56.5	13.4	12/5.5	19.6	18	17	22	2	13.4	M4	M4 x 10	4	10.7	15.7	1.5 - 6 mm^2
TOS5.25.690 V	M18 x 1.5	103	44	59	16.5	14/5.5	21.9	18	19	22	2	15.4	M5	M5 x 10	4	11.7	17.7	2.5 - 10 mm^2
TOS6.63A.690 V	M20 x 1.5	109.5	47.5	62	20.3	16/7.6	25.4	18	22	22	2	19.4	M6	M6 x 10	4	15.1	22.6	2.5 - 16 mm^2

Type of terminal F from 690 V to 1000 V

Dimensions





Ordering information Type of terminal F to 690 V

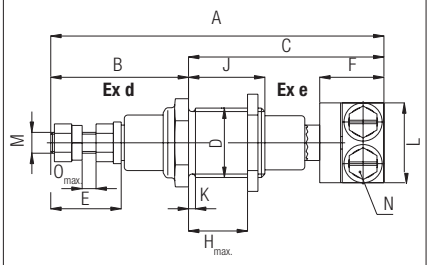
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.690 V	M18 x 1.5	83.5	36	47.5	16.5	10	21.9	18	19	22	2	19	M5	M4 x 12	4	11	15	2.5 - 25 mm^2
TOS6.63A.690 V	M20 x 1.5	89.5	39.5	50	20.3	12	25.4	18	22	22	2	23	M6	M5 x 16	4	14	19.5	2.5 - 25 mm^2
TOS8.100A.690 V	M24 x 1.5	97.5	43.5	54	24.3	15	31.2	18	27	22	2	26	M8	M6 x 25	4	17	29	6 - 50 mm^2
TOS10.160A.690 V	M27 x 1.5	110	50	60	30	20	34.6	18	30	22	2	36	M10	M8 x 30	5	21	35.5	10 - 95 mm^2
TOS12.250A.690 V	M33 x 1.5	122	55.5	66.5	35.5	25	41.6	18	36	22	2	42	M12	M8 x 35	5	24.5	40.5	16 - 185 mm^2
TOS16.400A.690 V	M36 x 1.5	139	65	74	45	30	47.3	18	41	22	2	50	M16	M10 x 40	5	32	47	25 - 300 mm^2
TOS20.630A.690 V	M42 x 1.5	153	75	78	55.1	32	53.1	18	46	22	2	50	M20	M10 x 45	6	34.5	51.5	25 - 300 mm^2

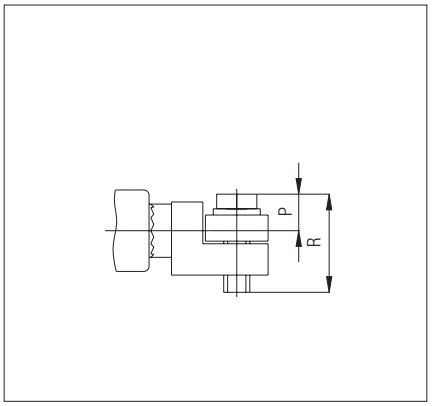
Ordering information Type of terminal F to 1000 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.1000 V	M18 x 1.5	99.5	44	55.5	16.5	10	21.9	18	19	22	2	19	M5	M4 x 12	4	11	15	2.5 - 25 mm²
TOS6.63A.1000 V	M20 x 1.5	105.5	47.5	58	20.3	12	25.4	18	22	22	2	23	M6	M5 x 16	4	14	19.5	2.5 - 25 mm²
TOS8.100A.1000 V	M24 x 1.5	113.5	51.5	62	24.3	15	31.2	18	27	22	2	26	M8	M6 x 25	4	17	29	6 - 50 mm²
TOS10.160A.1000 V	M27 x 1.5	126	57.5	68.5	30	20	34.6	18	30	22	2	36	M10	M8 x 30	5	21	35.5	10 - 95 mm²
TOS12.250A.1000 V	M33 x 1.5	138	63.5	74.5	35.5	25	41.6	18	36	22	2	42	M12	M8 x 35	5	24.5	40.5	16 - 185 mm²
TOS16.400A.1000 V	M36 x 1.5	155	73	82	45	30	47.3	18	41	22	2	50	M16	M10 x 40	5	32	47	25 - 300 mm²
TOS20.630A.1000 V	M42 x 1.5	169	83	86	55.1	32	53.1	18	46	22	2	50	M20	M10 x 45	6	34.5	51.5	25 - 300 mm²

Type of terminal FL from 690 V to 1000 V

Dimensions





Ordering information Type of terminal FL to 690 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.690 V	M18 x 1.5	88.5	36	52.5	16.5	15.5	21.9	18	19	22	2	19	M5	M4 x 12	4	6	14.8	2.5 - 25 mm²
TOS6.63A.690 V	M20 x 1.5	96	39.5	56.5	20.3	18.5	25.4	18	22	22	2	23	M6	M5 x 16	4	6.5	18.8	2.5 - 25 mm²
TOS8.100A.690 V	M24 x 1.5	106.5	43,5	63	24.3	24	31.2	18	27	22	2	26	M8	M6 x 20	4	8	24	6 - 50 mm²
TOS10.160A.690 V	M27 x 1.5	121	50	71	30	31	34.6	18	30	22	2	36	M10	M8 x 30	5	11	35.5	10 - 95 mm²
TOS12.250A.690 V	M33 x 1.5	130	55.5	74.5	35.5	33	41.6	18	36	22	2	42	M12	M8 x 30	5	10	35.5	16 - 185 mm²
TOS16.400A.690 V	M36 x 1.5	151	65	86	45	42	47.3	18	41	22	2	49	M16	M10 x 40	5	12.5	47	25 - 300 mm²
TOS20.630A.690 V	M42 x 1.5	172	75	97	55.1	51	53.1	18	46	22	2	55	M20	M10 x 45	6	10.5	52	25 - 300 mm²

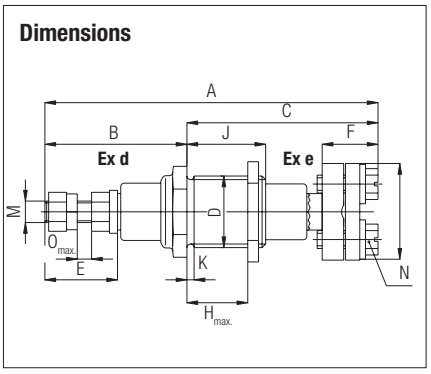
Ordering information Type of terminal FL to 1000 V

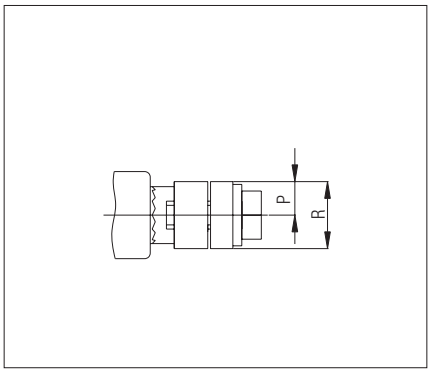
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.1000 V	M18 x 1.5	104.5	44	60.5	16.5	15.5	21.9	18	19	22	2	19	M5	M4 x 12	4	6	14.8	2.5 - 25 mm²
TOS6.63A.1000 V	M20 x 1.5	112	47.5	64.5	20.3	18.5	25.4	18	22	22	2	23	M6	M5 x 16	4	6.5	18.8	2.5 - 25 mm²
TOS8.100A.1000 V	M24 x 1.5	122.5	51.5	71	24.3	24	31.2	18	27	22	2	26	M8	M6 x 20	4	8	24	6 - 50 mm²
TOS10.160A.1000 V	M27 x 1.5	137	57.5	79.5	30	31	34.6	18	30	22	2	36	M10	M8 x 30	5	11	35.5	10 - 95 mm²
TOS12.250A.1000 V	M33 x 1.5	146	63.5	82.5	35.5	33	41.6	18	36	22	2	42	M12	M8 x 30	5	10	35.5	16 - 185 mm²
TOS16.400A.1000 V	M36 x 1.5	167	73	94	45	42	47.3	18	41	22	2	49	M16	M10 x 40	5	12.5	47	25 - 300 mm²
TOS20.630A.1000 V	M42 x 1.5	188	83	105	55.1	51	53.1	18	46	22	2	55	M20	M10 x 45	6	10.5	52	25 - 300 mm²

Technical data subject to change without notice.

Type of terminal RF from 690 V to 1000 V

Dimensions





Ordering information Type of terminal RF to 690 V

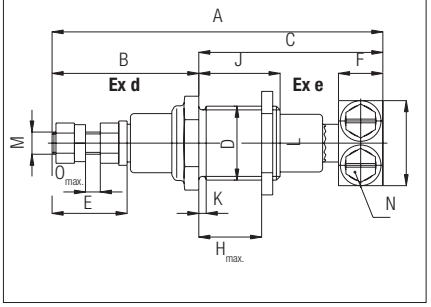
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.690 V	M18 x 1.5	85.5	36	49.5	16.5	12.5	21.9	18	19	22	2	22	M5	M4 x 12	4	5	10	2.5 - 25 mm²
TOS6.63A.690 V	M20 x 1.5	93	39.5	53.5	20.3	15.6	25.4	18	22	22	2	27	M6	M5 x 16	4	6	12	2.5 - 25 mm²
TOS8.100A.690 V	M24 x 1.5	102	43.5	58.5	24.3	19.1	31.2	18	27	22	2	32	M8	M6 x 25	4	7.5	15	6 - 50 mm²
TOS10.160A.690 V	M27 x 1.5	114	50	64	30	24	34.6	18	30	22	2	41	M10	M8 x 30	5	10	20	10 - 95 mm²
TOS12.250A.690 V	M33 x 1.5	125	55.5	69.5	35.5	28	41.6	17	36	22	2	43	M12	M8 x 30	5	12.5	25	16 - 185 mm²
TOS16.400A.690 V	M36 x 1.5	145	65	80	45	36	47.3	17	41	22	2	55	M16	M10 x 40	5	15	30	25 - 300 mm²
TOS20.630A.690 V	M42 x 1.5	161	75	86	55.1	40	53.1	17	46	22	2	61	M20	M10 x 45	5	15	30	25 - 300 mm²

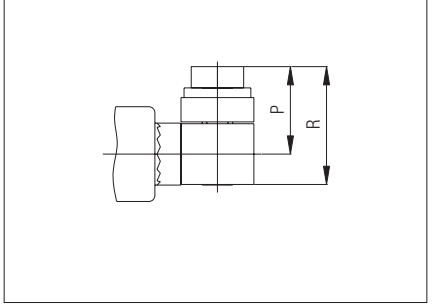
Ordering information Type of terminal RF to 1000 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.1000 V	M18 x 1.5	101.5	44	57.5	16.5	12.5	21.9	18	19	22	2	∅ 22	M5	M4 x 12	4	5	10	2.5 - 25 mm²
TOS6.63A.1000 V	M20 x 1.5	109	47.5	61.5	20.3	15.6	25.4	18	22	22	2	∅ 27	M6	M5 x 16	4	6	12	2.5 - 25 mm²
TOS8.100A.1000 V	M24 x 1.5	118	51.5	66.5	24.3	19.1	31.2	18	27	22	2	∅ 32	M8	M6 x 20	4	7.5	15	6 - 50 mm²
TOS10.160A.1000 V	M27 x 1.5	130	57.5	72.5	30	24	34.6	18	30	22	2	∅ 41	M10	M8 x 30	5	10	20	10 - 95 mm²
TOS12.250A.1000 V	M33 x 1.5	141	63.5	77.5	35.5	28	41.6	17	36	22	2	∅ 43	M12	M8 x 30	5	12.5	25	16 - 185 mm²
TOS16.400A.1000 V	M36 x 1.5	161	73	88	45	36	47.3	17	41	22	2	∅ 55	M16	M10 x 40	5	15	30	25 - 300 mm²
TOS20.630A.1000 V	M42 x 1.5	177.5	83	94.5	55.1	40	53.1	17	46	22	2	∅ 61	M20	M10 x 45	5	15	30	25 - 300 mm²

Type of terminal C from 690 V to 1000 V

Dimensions





Ordering information Type of terminal C to 690 V

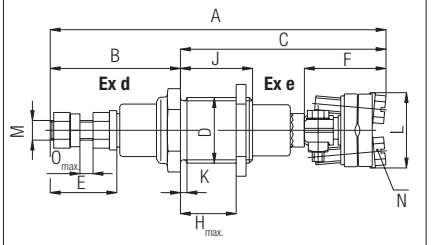
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.690 V	M18 x 1.5	90	36	54	16.5	16.8	21.9	18	19	22	2	17,5	M5	M5 x 20/M4 x 6	4	7	20	2.5 - 25 mm²
TOS6.63A.690 V	M20 x 1.5	98	39.5	58.5	20.1	20.1	25.4	18	22	22	2	21	M6	M5 x 20/M4 x 5	4	7	20	2.5 - 25 mm²
TOS8.100A.690 V	M24 x 1.5	110	43.5	66.5	24.3	26.8	31.2	18	27	22	-	28	M8	M6 x 22/M5 x 10	4	12	26	4 - 35 mm²

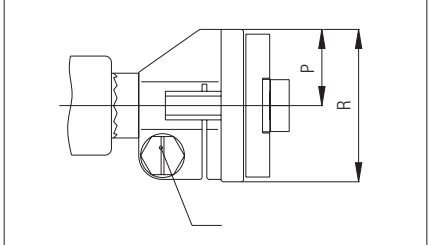
Ordering information Type of terminal C to 1000 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS5.25.1000 V	M18 x 1.5	106	44	62	16.5	16.8	21.9	18	19	22	2	17.5	M5	M5 x 20/M4 x 6	4	7	20	2.5 - 25 mm²
TOS6.63A.1000 V	M20 x 1.5	114	47.5	66.5	20.1	20.1	25.4	18	22	22	2	21	M6	M5 x 20/M4 x 5	4	7	20	2.5 - 25 mm²
TOS8.100A.1000 V	M24 x 1.5	126	51.5	74.5	24.3	26.8	31.2	18	27	22	2	28	M8	M6 x 22/M5 x 10	4	12	26	4 - 35 mm²

Type of terminal R from 690 V to 1000 V

Dimensions





Ordering information Type of terminal R to 690 V

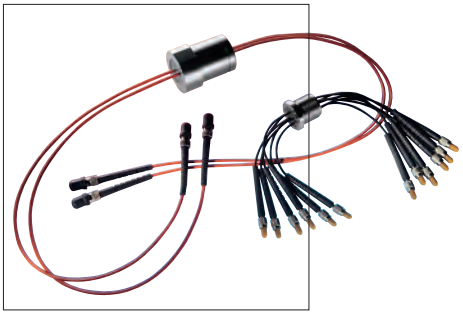
Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS10.160A.690 V	M27 x 1.5	130.5	50	80.5	30	41.5	34.6	18	30	22	2	37	M10	M8 x 30/M6 x 22	5	19.5	39	6-70 or 10-95 mm²
TOS12.250A.690 V	M33 x 1.5	145.5	55.5	92	35.5	48.8	41.6	17	36	22	2	46.6	M12	M10 x 35/M6 x 22	5	23.5	47	10-95 or 16-150 mm²
TOS16.400A.690 V	M36 x 1.5	161.5	65	96.5	45	52.3	47.3	17	41	22	2	51	M16	M10 x 40/M8 x 30	5	26	52	16-150 or 16-300 mm²
TOS20.630A.690 V	M42 x 1.5	175	75	100	55.1	53.3	53.1	17	46	22	2	59	M30	M10 x 45/M8 x 30	5	29.5	59	16 - 300 mm²

Ordering information Type of terminal R to 1000 V

Type	D	A	B	C	E	F/F1	G	$H_{max.}$	I	J	K	L	M	N	$O_{max.}$	P	R	Terminals
TOS10.160A.1000 V	M27 x 1.5	146.5	57.5	89	30	41.5	4.6	18	30	22	2	37	M10	M8 x 30/M6 x 22	5	19.5	39	6-70 or 10-95 mm²
TOS12.250A.1000 V	M33 x 1.5	161.5	63.5	98	35.5	48.8	1.6	17	36	22	2	6.6	M12	M10 x 35/M6 x 22	5	23.5	47	10-95 or 16-150 mm²
TOS16.400A.1000 V	M36 x 1.5	177.5	73	104.5	45	52.3	7.3	17	41	22	2	51	M16	M10 x 40/M8 x 30	5	26	52	16-150 or 16-300 mm²
TOS20.630A.1000 V	M42 x 1.5	191	83	108	55.1	53.3	3.1	17	46	22	2	59	M30	M10 x 45/M8 x 30	5	29.5	59	16-300 mm²

Technical data subject to change without notice.

Optical fibre bushing



- Fast, interference free transmission of data in both directions
- Not affected by electromagnetic interference
- High transmission reliability
- High transmission speed
- Corrosion-free contacts
- Simple plug-in connection (low installation costs)
- Reliable signal transmission even over long distances
- Suitable for use under extreme conditions

The optical fibre bushing is used as an optical fibre cable entry into flameproof enclosures located in hazardous areas. They can also be supplied with plug-in connectors.The optical waveguiders - also known as fibres - are made of glass and resist to mechanical, climatic, chemical and electromagnetic influences. The optical waveguide is most commonly used for carrying signals in the form of electromagnetic waves in the frequency range of visible light.The type and structure of the cable determines its transmission properties.

Explosion protection

Marking ATEX	Ⓔx II 2G Ex db IIC Gb Ⓔx I M2 Ex db I Mb
Certification	EPS 13 ATEX 1619 U
Marking IECEx	Ex db IIC Gb Ex db I Mb
Certification	IECEx PTB 19.0045 U
Working temperature	-20 °C to +105 °C depending on the fibre optic cable used (temperature ranges apply to the fixed installation of leads)
Power limit	Ex d II≤ 35 mW / 5 mW/mm² Ex d I ≤ 150 mW / 20 mW/mm²
Other approvals and certificates, see www.bartec.de	

Standard versions*

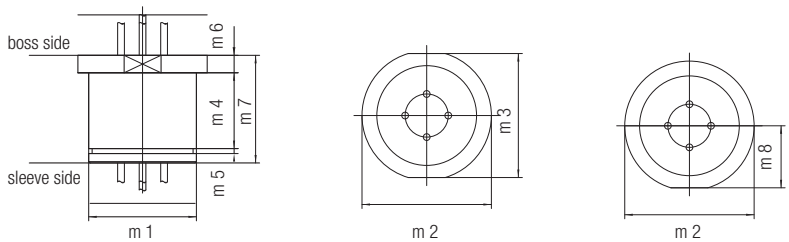
Max. quantity of the fibre-optic cables	47 cores
Sleeve size	metric: M16 x 1.5 to M48 x 1.5 non-threaded: Ø 22 mm to Ø 40 mm
Sleeve material	Metal, bare, varnished or galvanised * all other versions on request. Please use the customer requirements form at the end of the chapter!
Installation instructions	Threaded holes into which threaded bushings are screwed must meet the minimum requirements in EN 60079-0 Section 5.3 These fibre optic line bushings are suitable for installing in electric apparatus marked “d” flame-proof enclosure for the IIA, IIB, and IIC groups.
Note	The bushings must be fastened in the electric apparatus in such a way that they are secured against twisting and self-loosening.

Optical fibre bushing

Dimensions

	m1	m2	m3[1)]	m4	m5	m6	m7	m8
threaded	Ø 22 mm (0,87)	Ø 25 mm (0.98)	-	26.1 (1.03)	1.3 (0.05)	2 (0.08)	31 (1.22)	11.1 (0.44)
	Ø 32 mm (1,26)	Ø 36 mm (1.42)	-	26.1 (1.03)	1.6 (0.06)	3 (0.12)	32 (1.26)	17.1 (0.67)
	Ø 36 mm (1,42)	Ø 42 mm (1.65)	SW 40	28.1 (1.12)	1.85 (0.07)	7 (0.28)	39 (1.54)	-
	Ø 40 mm (1,58)	Ø 48 mm (1.89)	SW 46	28.1 (1.12)	1.85 (0.07)	6.5 (0.26)	40 (1.58)	-

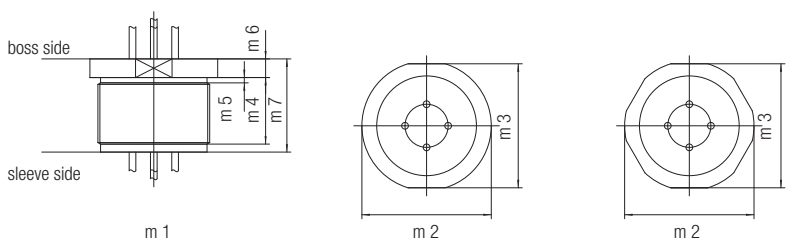
Dimensions threaded



Dimensions

	m1	m2	m3[1)]	m4	m5	m6	m7
metric	M16 x 1[2)]	Ø 21 mm (0.83)	SW 19	17 (0.67)	max. 1.5 (0.06)	5 (0.2)	25 (0.98)
	M16 x 1.5[2)]	Ø 21 mm (0.83)	SW 19	17 (0.67)	max. 2 (0.08)	5 (0.2)	25 (0.98)
	M24 x 1.5[2)]	Ø 29 mm (1.14)	SW 27	19 (0.75)	max. 2 (0.08)	5 (0.2)	26 (1.02)
	M33 x 1.5	Ø 38 mm (1.5)	SW 36	18 (0.71)	max. 2 (0.08)	7 (0.28)	30 (1.18)
	M36 x 1.5	Ø 42 mm (1.65)	SW 40	25 (0.98)	max. 2 (0.08)	7 (0.28)	35 (1.38)
	M42 x 1.5[2)]	Ø 48 mm (1.89)	SW 46	25 (0,.98)	max. 2 (0.08)	7 (0.28)	35 (1.38)

Dimensions metric



[1)] Width across flats
[2)] Boss in non-threaded hexagonal version

Ordering information optical fibre line bushing

Sleeve type	Code no.	Fibre type core/jacket	Code no.	Sleeve size	Code no.
screw-in, metric	0	9/125	1	M16 x 1.5	D
				M24 x 1.5 / Ø 22 mm	2
non-threadead, joint length 12.5 mm	5	50/125	2	M33 x 1.5 / Ø 32 mm	3
				M36 x 1.5	4
non-threaded, joint length 25 mm	6	62.5/125	3	M38 x 1.5 / Ø 36 mm	5
				M42 x 1.5 / Ø 40 mm	6
				M48 x 1.5	7

* other versions on request

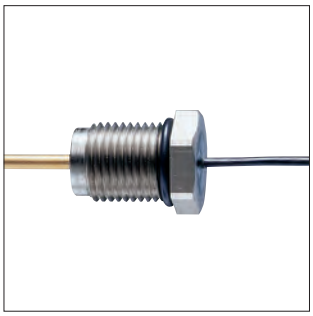
Complete order no.
Please insert correct code.

57-91 ☐ A - ☐ ☐ ☐ ☐

No. of cores

Technical data subject to change without notice.

Electrode line bushing explosion-proof and pressure-sealed



Waste water pumps can be fully submergible units. The pump assembly and motor are often separated from each other by an oil fore-chamber sealed by mechanical seals. Any leaks in the shaft seals need to be registered in order to prevent malfunctions or failure of the motor and to arrange for inspections in good time. BARTEC's electrode line bushings Ex + sealed allow signals to be reliably transmitted through the walls of pressure-proof enclosed operating equipment, even in areas in which an explosion hazard exists. Only electrical circuits certified as intrinsically safe may be connected to the electrode line bushing.

Explosion protection

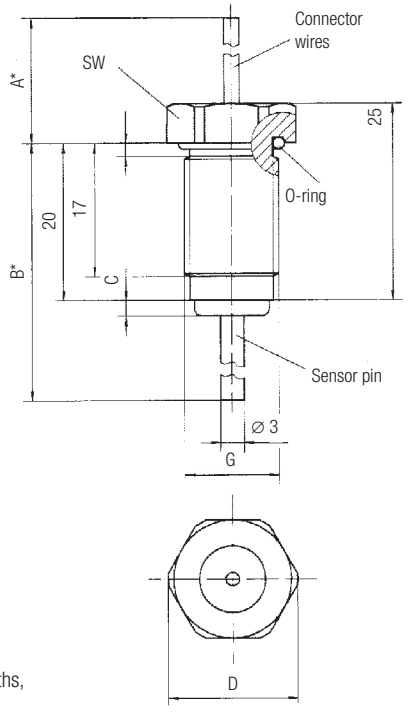
Marking ATEX	Ⓔx II 2G Ex db IIC Gb Ⓔx I M2 Ex db I Mb
Certification	EPS 17 ATEX 1102 U
Marking IECEx	Ex db IIC Gb Ex db I Mb
Certification	IECEx EPS 17.0052 U
Other approvals and certificates, see www.bartec.de	
Working temperature	-20 °C to +70 °C or +110 °C depending on the core wire used

Technical data

Material	Sleeve Brass nickel-plated or stainless steel Gauge Brass or stainless steel Thread M10 x 1; M12 x 1; M16 x 1.5
Pressure on the Ex e side	≤ 6 bar
Rated insulation voltage	≤ 30 V
Rated constant current	< 1 A
Connection method	Cable wires 0.5 to 1.5 mm²

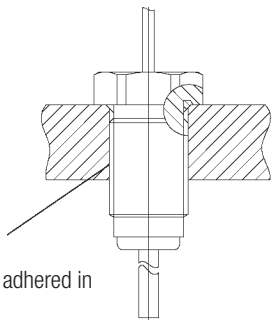
Versions deviating from the basic data are available on request.
Please use the customer requirements form at the end of the chapter!

Dimensions

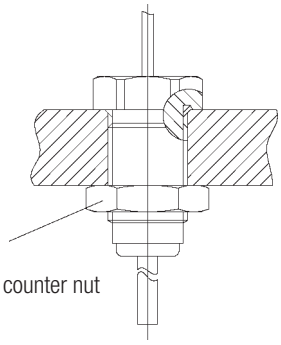


See table for standard lengths, other lengths on request

Example application



Example application



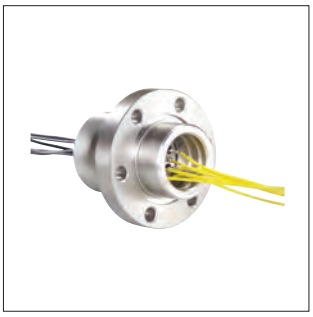
Safety notice

Electrode line bushings that are damaged must be replaced.
The electrode line bushing must be secured against twisting and self-loosening.

Ordering information

Dimensions in mm							Order no.
G	C	D	SW	A	B	O-ring	
M10 x 1	2	14.5	13	500	36	9 x 1.5	37-9405-1230/1000
M12 x 1	2	16.5	15	500	36	10 x 1.5	37-9405-123B/1000
M16 x 1.5	2	21.0	19	500	36	14 x 2	37-9405-123D/1000

Technical data subject to change without notice.



The 07-96..-.. type series II 1G line bushing serves as a gas diffusion-proof isolation element for zone 0 (1G/2G) while simultaneously providing an electric connection for leads:

- between flameproof enclosures
- between flameproof enclosures and enclosures with another approved type of protection Category II 2 G
- flameproof enclosures and protected installations Category II 3 G or
- in the safe area

The core piece of this gas diffusion-proof lead-through is a metal plate in which the stud-type bushings are insulated with glass. The electrical connection on both sides of the lead-through can be set forth with metal duct bolts, cable wires or hose lines as required. This connecting area is, or can additionally be, cast with a poured resin. The connector studs, connecting wires or the hose line of the line bushing II 1G must be connected in enclosures which conform to a type of protection standardised according to DIN EN 60079-0. The lead-through is compliant with the pertinent EN 60079-0, EN 60079-1 and EN 60079-7 and EN 60079-26 standards.

Explosion protection

Marking ATEX	Ⓔx II 1/2 G Ex db + eb/db IIC Ga/Gb Ⓔx II 2 G Ex db IIC Gb Ⓔx II 2 G Ex eb IIC Gb Ⓔx I M 1 Ex db eb I Ma
Certification	CML 13 ATEX 1009 U
Marking IECEx	Ex db + eb/db IIC Ga/Gb Ex db IIC Gb Ex eb IIC Gb Ex db eb I Ma
Certification	IECEx CML 14.0003 U
Other approvals and certificates, see www.bartec.de	
Temperature at rated operation	-55 °C to +150 °C (with potting) -55 °C to +200 °C (without potting) depending on the lead used and type of sealing

Technical data

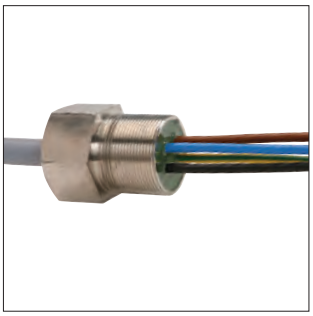
Protection class	IEC 60529/EN 60529 Abhängigkeit von der Ausführung
Material	Sleeve metal Insulator Glass, Ceramic Pour EP resin, PU resin Bushing bolt FeNi alloy steel, Niro steel
Rated insulation voltage	≤ AC 50 V/DC 75 V, 250 V, 690 V, 1 000 V
Rated uninterrupted current	up to 500 A
Type of connection	Core wires 0.25 mm² to 16 mm² Threaded bolts M3 to M30 (max. quantity of connections: 99)
Construction sizes	Thread M10 x 1 to M72 x 2 Flange Ø 10 mm to 250 mm
Pressure	-500 mbar to +400 bar depending on the design

Complete order no. 07-96☐☐-☐☐☐☐/☐☐*

There are many connection options available through core wires or threaded bolts.

***** Technical specifications can be given in the customer requirements form at the end of the chapter.

Technical data subject to change without notice.



- Ex e terminal boxes are dispensed with
- Suitable for cables with 1 to max. 49 cores
- Sleeves metric: M16 x 1.5 to M48 x 1.5
  Sleeves plug-in: ø 22 mm to ø 36 mm
- Compact, space-saving design
- The cores are connected directly to the electrical load at the Ex d side, intermediate terminal positions are dispensed with
- Rated insulation voltage of up to 1000 V for small dimensions
- Permanent heat resistance up to +110 °C

Flameproof Ex d cable entries are elements which allow electrical cables to be introduced into an Ex d enclosure, without danger of explosion. The additional Ex e terminal housing is not required. A main distribution box may by used or the connections can be made outside the Ex-zone. The cable entry consists of a threaded metal sleeve, in which a sheathed cable is anchored and encapsulated. The individual cores are then connected directly inside the flameproof enclosure. The length of cores and cables are customer-tailored. All cables come with standard green-yellow earth leads. The length of engaged thread between the sleeve and the flameproof "d" enclosure must comply with EN 60079-0 and EN 60079-1. The cable entry is normally inserted from the inside of the flameproof enclosure. A special version can be supplied for insertion from the outside, provided that removal is possible with a special tool only. After installation, the cable entry must be protected against turning and loosening, corresponding recommendations can be found under accessories. All cable entries have been tested and certified in accordance with the European standards on electrical equipment for explosive atmospheres EN 60079-0, EN 60079-1. When the 2014/34/EU guideline comes into force on 20. April 2016, explosion protected operating equipment must be properly Installed in accordance with EN 60079-14. Among other things, section 10.4.2 requires that **cast, pressure-proof cable insertions according to EN 60079-1 are used for** operating equipment with an internal ignition source for the explosion sub-group IIC and operating equipment with an enclosure volume greater than 2 dm^3 in Zone 1. BARTEC offers a wide range of products with EU model test certification.

Explosion protection

Cable entry screwable

Marking ATEX	Ⓔx II 2G Ex db IIC T6-T4 Gb Ⓔx II 2D Ex tb IIIC T80°C/T95°C/T100°C Db
Certification	EPS 17 ATEX 1 099 X
Marking IECEx	Ex db IIC T6-T4 Gb Ex tb IIIC T80°C/T95°C/T100°C Db
Certification	IECEx EPS 17.0050 X
Other approvals and certificates, see www.bartec.de	
Ambient temperature	depending on the design and the leads

Cable entry pluggable

Marking ATEX	Ⓔx II 2G Ex db IIC Gb Ⓔx II 2D Ex tb IIIC Db
Certification	EPS 17 ATEX 1 100 U
Marking IECEx	Ex db IIC Gb Ex tb IIIC Db IP 6X
Certification	IECEx EPS 17.0051 U
Other approvals and certificates, see www.bartec.de	
Working temperature	-60 °C to +110 °C depending on the lead used (temperature ranges apply to "fixed installation" of leads)

Standard versions*

Cores depending on the working temperature and voltage	Ölflex® 100, Ölflex® 110 HO7RN-F, Ozoflex-Plus radiation cross-linked polyolefin copolymer NSSHÖU
max. number of cores in shielded cable	threaded: 25 cores non-threaded: 49 cores
Cross-section	0,25 mm^2 to 150 mm^2
Sleeve size	metric: M24 x 1.5 to M48 x 1.5 non-threaded: Ø 22 mm to Ø 36 mm
Sleeve material	Metall, blank, varnished and galvanized
Rated voltage	300 V/500 V/750 V/1 000 V
Rated currents	see following table based on VDE 0298-04

* all other versions on request.
Please use the customer requirements form at the end of the chapter!

Ordering information

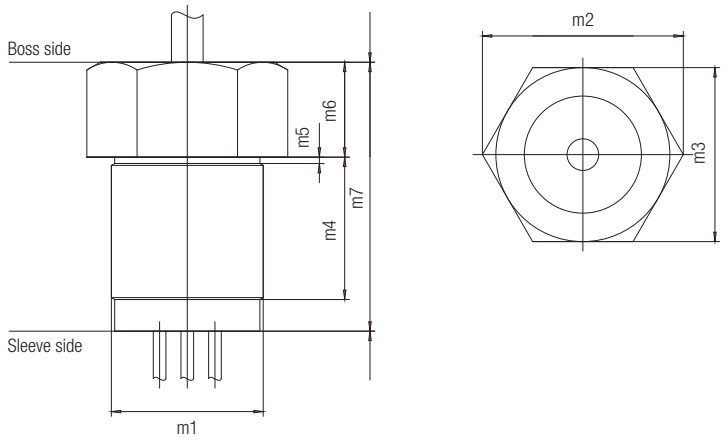
Sleeve type	Code no.	Nominal power	Code no.	Conductors cross section mm²	Code no.	Sleeve size	Code no.
screw-in, metric	0	on order	0	special cross section	A	M24 x 1.5 Ø = 22 mm	2
				0.25	C		
				0.35	D		
		NSSHöu	1	0.5	E		
				0.75	F	M36 x 1.5	4
		HO5GG-F Radox, Betaflam	3	1	G		
				1.5	H		
				2.5	J		
screw-in NPT	1	Ölflex 100 Ölflex 110	5	4	K	M48 x 1.5	7
				6	L		
				10	M		
		H07RN-F bzw. A07RN-F, (Ozoflex-Plus)	6	16	N	Ø = 36 mm	5
				25	P		
				35	Q		
pluggable	6	LiYY/Ölflex-EB	7	50	R		
				70	S	special sizes	9
				95	T		
		ÖLFLEX CY	8	120	U		
				150	V		

Complete order no. 07-92 □□ - □□□□ /G
Please insert correct code.

Technical data subject to change without notice.

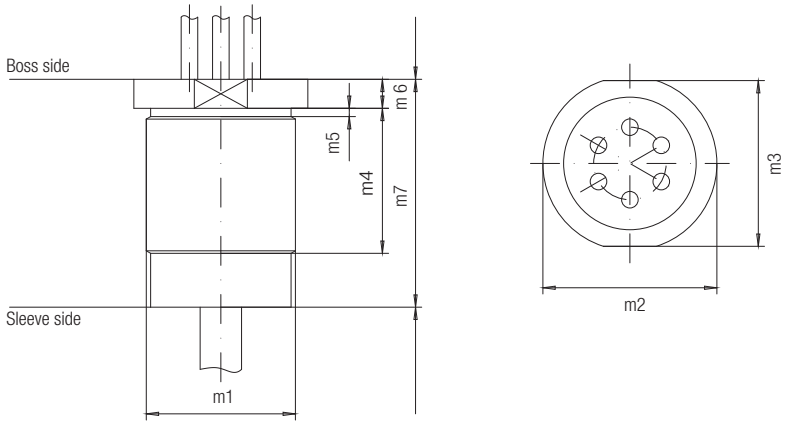
Number of cores e.g. 02 = 2 cores; 21 = 21 cores; etc. 1... 49 shielded cable sleeve side 51... 99 shielded cable boss side
Core length: on request Cable length: on request Core marking: in accordance with current standards Other cables: e.g. shielded or blue cable for intrinsically safe circuits on request. Customer requirements form at the end of the chapter.

Dimensions Shielded cable Boss side



m1	m3	m4	m5	m6	m7
M24 x 1.5	SW 27	20	max. 2.5	26	46
M36 x 1,.5	SW 41	30	max. 2.5	25	55

Dimensions Shielded cable Sleeve side



m1	m2	m3	m4	m5	m6	m7
M24 x 1.5[1]	-	SW 27	30	max. 2.5	5	46
M25 x 1.5[1]	-	SW 27	35	max. 2.5	5	46
M36 x 1.5	ø 42	SW 40	35	max. 2.5	7	55
M48 x 1.5	ø 55	SW 50	35	max. 2.5	10	75

[1] Convenant in hex version

Other fittings and special sleeves on request.

Ordering information

Ex d cable entries 300/500 V - cable, Ölflex 100/110

Number of cores	Conductor cross section mm²	Current carrying capacity (A) in continuous operation (rel.values) [1] Max. permissible operating temperature at the conductor +80 °C. Max. current-carrying capacity based on VDE 0298-4. Table 11, gap 4	Thread size	Order no. please indicate core and cable length in plain text	Shielded cable Sleeve side	Shielded cable Boss side
6	0.75		M24 x 1.5	07-9205-	F062	F562
15	0.75	6 A	M36 x 1.5	07-9205-	F154	F654
25	0.75		M48 x 1.5	07-9205-	F257	-
6	1.5		M24 x 1.5	07-9205-	H062	H562
14	1.5	16 A	M36 x 1.5	07-9205-	H144	H644
25	1.5		M48 x 1.5	07-9205-	H257	-
3	2.5		M24 x 1.5	07-9205-	J032	J532
7	2.5	20 A	M36 x 1.5	07-9205-	J074	J574
18	2.5		M48 x 1.5	07-9205-	J187	-

Ex d cable entries 450/750 V - cable H07RN-F, Ozoflex-Plus

		Max. permissible operating temperature at the conductor +60 °C. Max. current-carrying capacity based on VDE 0298-4. Table 13, gap 8				
5	1.5	16 A	M24 x 1.5	07-9206-	H052	H552
7	1.5		M36 x 1.5	07-9206-	H074	H574
3	2.5		M24 x 1.5	07-9206-	J032	J532
7	2.5	23 A	M36 x 1.5	07-9206-	J074	J574
19	2.5		M48 x 1.5	07-9206-	J197	-
5	4	30 A	M36 x 1.5	07-9206-	K054	K554
5	6	38 A	M36 x 1.5	07-9206-	L054	L554
5	10	54 A	M48 x 1.5	07-9206-	M057	-
5	16	71 A	M48 x 1.5	07-9206-	N057	-

Ex d cable entries 1000 V - cable NSSHÖU

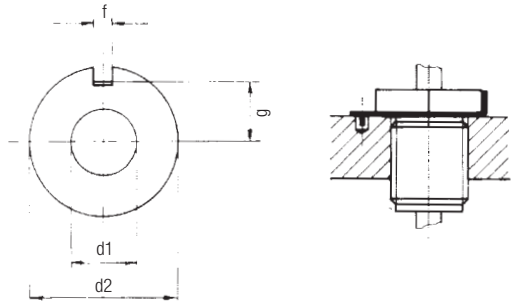
		Max. permissible operating temperature at the conductor +90 °C. Max. current-carrying capacity based on VDE 0298-4. Table 15, gap 21 and 4				
5	1.5	20 A	M24 x 1.5	07-9201-	H052	H552
10	1.5		M36 x 1.5	07-9201-	H104	H604
3	2.5	30 A	M24 x 1.5	07-9201-	J032	J532
7	2.5		M36 x 1.5	07-9201-	J074	J574
19	2.5		M48 x 1.5	07-9201-	J197	-
5	4	41 A	M36 x 1.5	07-9201-	K054	K554
4	6	53 A	M36 x 1.5	07-9201-	L044	L544
5	6		M48 x 1.5	07-9201-	L057	-
5	10	74 A	M48 x 1.5	07-9201-	M057	-
5	16	99 A	M48 x 1.5	07-9201-	N057	-
1	25	176 A	M36 x 1.5	07-9201-	P014	P514
1	35	218 A	M36 x 1.5	07-9201-	Q014	Q514
1	50	276 A	M36 x 1.5	07-9201-	R014	R514
1	70	347 A	M36 x 1.5	07-9201-	S014	S514
1	95	416 A	M48 x 1.5	07-9201-	T017	-
1	120	488 A	M48 x 1.5	07-9201-	U017	-

[1] When determining the maximum current carrying capacity of the cores, their self-heating and enclosure heating on site at maximum ambient temperature must be taken into consideration. Other fittings and special sleeves on request. It is essential to submit a customer requirements form that has been filled in correctly and completely. The form can be found in the catalogue at the end of the chapter.

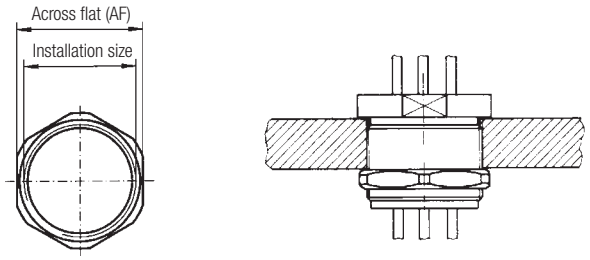
Technical data subject to change without notice.

Line bushings and cable entries must be safe against turning and accidental loosening. The most common fixing methods are shown below.

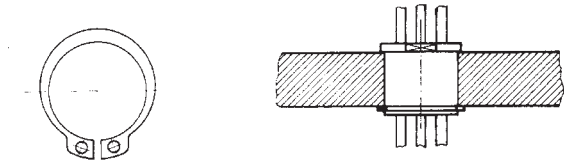
Tab washer



Lock nut



Circlip



Ordering information Accessoires

Tab washers

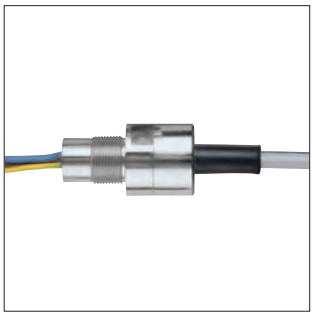
Size	d1	d2	f	g	Thickness	Order no.
M16 x 1.5 (x 1)	17	36	3.5	15	0.75	03-3400-0003
M24 x 1.5	25	45	3.5	18	0.75	03-3400-0005
M33 x 1.5	34	50	4.5	21	0.75	03-3400-0007
M36 x 1.5	37	58	4.5	26	0.75	03-3400-0008
M42 x 1.5	43	58	4.5	26	0.75	03-3400-0009

Lock nuts

Size	Across flat (AF)	Thickness	Order no.
M16 x 1	19	5	03-2000-0001
M16 x 1.5	20	3	03-2090-0120
M20 x 1.5	24	3.4	03-2090-0121
M24 x 1.5	27	5	03-2000-0003
M25 x 1.5	30	3.5	03-2090-0122
M32 x 1.5	35	4.5	03-2090-0123
M33 x 1.5	36	5	03-2000-0005
M36 x 1.5	41	6	03-2000-0006
M40 x 1.5	44	4.5	03-2090-0124
M42 x 1.5	46	6	03-2000-0008
M48 x 1.5	55	6	03-2000-0011

Circlip similar to DIN 471 for plug-in type line bushings	Order no.
ø 22 mm	03-3480-0002
ø 32 mm	03-3480-0003
ø 36 mm	03-3480-0004

Technical data subject to change without notice.



- Economical, due to high packing density
- Space-saving, due to internal thread
- Fast installation with the small flange versions
- Corrosion-resistant due to high-quality sleeve material
- Bushing stems with suitable thermomaterial to ensure unimpaired signals from thermal sensors

Cable entries

Electrical cable entries are components which facilitate the insertion of electric leads into enclosures while providing a secure seal at the point of entry.

Line bushings

The line bushings allow an electrical connection of apparatus in enclosures or the connection of two enclosures. The standard versions are suitable for the application range of 10^{-6} mbar to 63 bar positive pressure depending on the ambient temperature. Depending on the pressure and the medium to be sealed, the bushing / cable entry can be designed for a temperature range of -70 °C to +150 °C. Versions up to 1000 bar are available to suit the temperature at the point of cable entry or bushing and the type of the medium to be sealed. BARTEC cable entries and line bushings in the IP 68 type of protection not only seal the cable sheath, they also protect the inside strands. BARTEC cable entries and line bushings consist in principle of a sleeve into which electric leads and single conductors are embedded in casting resin. Even the standard version of this component series satisfies most of the sealing requirements of modern process technologies. When it is necessary to satisfy higher requirements, versions are available that are better than 10^{-6} mbar absolute and higher than 63 bar, sealed by the cast-in stranded conductors. BARTEC line bushings were tested at up to 2000 bar for resistance to oil.

Technical data

Single-core non-sheated cable

Temperature range	-70 °C to +150 °C
Pressure	up to 200 bar
Vacuum	10^{-6} mbar
Protection class	IP 65 to IP 68
Materials	nickel-plated brass stainless steel 1.4305 or 1.4571 Steel nickel-plated

Cable entries

Temperature range	-70 °C to +150 °C
Pressure	up to 200 bar
Vacuum	10^{-6} mbar
Protection class	IP 65 to IP 68
Materials	nickel-plated brass stainless steel 1.4305 or 1.4571 Steel nickel-plated

Applications

Sealed electric distribution boxes; hydraulic plants; nuclear power plants; climatic chambers; nuclear engineering; pneumatic plants; split cage motors; submersible pumps; drying kilns; impregnation plants; vacuum presses; vacuum furnaces.

- Electrical versions

The standard versions have cables with flexible cores of a 0.5 mm^2 to 35 mm^2 cross section. Larger and smaller cross sections are available on request. Depending on version, fittings, temperature range and core insulation, a voltage range of up to 6 000 V is possible. IP 68 versions used in temperature measurement circuits, the bushing stems are made of material with appropriate thermal characteristics.

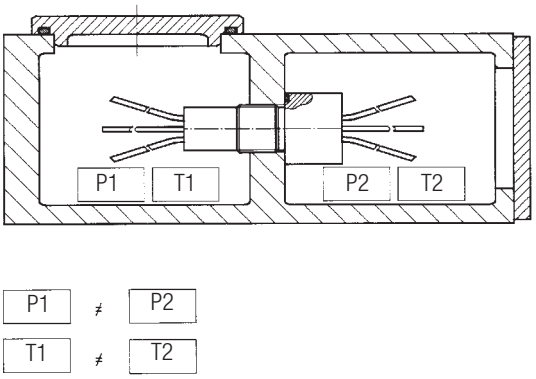
- Versions and dimensions

The standard threaded sleeve can be screwed into thread sizes from M24 x 1.5 to M50 x 1.5. Other dimensions and special threads such as NPT and Witworth pipe threads can be supplied on request. Versions with a plug-in flange can also be supplied. The accommodation of several cables, which may have different core cross sections, in a common sleeve allows compact, dimensioning and economic constructions. Cables with up to 45 cores with cross sections of 0.5 mm^2 can be put in an M50 x 1.5 sleeve. For versions with long cables, the screw-in solution is not the most advantageous. Here the plug-in versions with mounting flange consider-ably facilitate installation. The flange may be made to customer specifications.

- Insulation materials

BARTEC insulates with highly filled expoxy resins. Different formulations are used for the various pressure and temperature ranges. The BARTEC epoxy casting material is charact-erized by its low outgassing. These material have been used most successfully for many years in industrial vacuum engineering. Their maximum baking temperature of +150 °C - depending on the material used - make them an ideal solution for almost all industrial applications. The standard sealing washer is made of VITON. For special application, VITON-FEP-sheathed O-rings can be used. Also available are silicone sealing washers. The versions for higher sealing requirements provide factory-made grooves in the sleeves for the sealing washers.

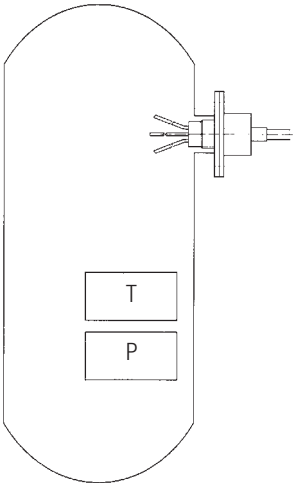
Single-core non-sheated cable



P1 ≠ P2

T1 ≠ T2

Cable entries



Technical data subject to change without notice.

6

Industrial processes often take place in closed containers under increased pressure or even under vacuum conditions. When electric leads are run through, care must be taken to prevent any transfer of mass through the conductor or drops in pressure/vacuum. BARTEC pressure-proof/vacuum-sealed line bushings provide a simple and cost-effective way of dealing with this problem. These line bushings consist essentially of a metallic sleeve which encapsulates and longitudinally seals the electric conductors in cast resin. This means that sealing is not only ensured along the lengths of the conductors but also through the conductor strands themselves. BARTEC pressure-proof/vacuum-sealed line bushings can be designed for working temperatures of -70 °C to +150 °C depending on the application. Depending on the working temperature and ambient medium, it is possible to control pressure levels of 10^{-6} mbar to 200 bar. Depending on the application, it is also possible to use BARTEC line bushings under conditions which deviate from the following technical basic data. They are **not** approved for use in hazardous areas.
Explosion-proof and pressure-sealed version(EPS 13 ATEX 1619 U).

Technical data Basic version

Protection class	up to IP 68 for enclosure
Nominal voltage	see table
Rated conductor cross section	0.25 mm^2 to 35 mm^2
Temperature range	-70 °C to +150 °C
Nominal pressure	63 bar at RT (RT= +25 °C)
Core lengths	on request

Ordering information

Nominal voltage	Code no.	Conductor cross section	Code no.	Number of cores	Code no.	Sleeve sizes	Code no.	Temperature	Code no.	Sleeve material
450/750 V	1	Special cross section	A	1 core	01	M24 x 1.5	2	-25 °C to +100 °C	0	nickel-plated brass
		0.25 mm^2	C	2 core	02					
250 V	2	0.35 mm^2	D			M33 x 1.5	3			nickel-plated steel
		0.5 mm^2	E	10 cores	10					
1 000 V	3	0.75 mm^2	F	11 cores	11	M36 x 1.5	4			
3 000 V*	4	1.00 mm^2	G							
		1.5 mm^2	H	20 cores	20					
60 V	5	2.5 mm^2	J	21 cores	21	M42 x 1.5	6	up to +150 °C	5	Steel 1.4305
		4.0 mm^2	K							
400 V	7	6.0 mm^2	L	etc. up to a max. indicated in column “Max. number of cores“ in the chart “Dimensions“		M50 x 1.5	8			Steel 1.4571
		10.0 mm^2	M							
500 V	8	16.0 mm^2	N							
		25.0 mm^2	P			Special size	9			
Special voltage	9	35.0 mm^2	Q							

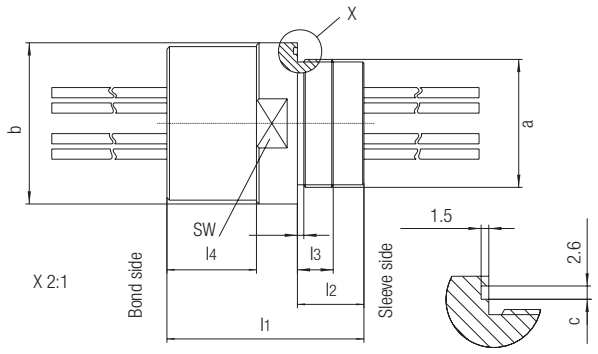
*on request

Complete order no. 37-910 ☐ - ☐☐☐☐ /7 ☐ *
Please insert correct code.

* In conjunction with the customer requirements form at the end of the chapter

Technical data subject to change without notice.

Dimensions

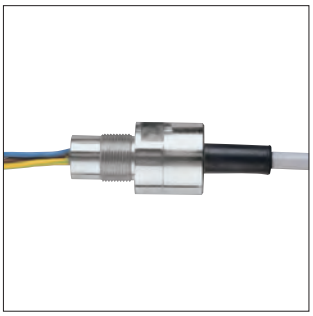


Ordering information

Thread size a	Dimensions in mm							Nominal conductor cross-section	Max. number of conductors
	b	c	l_1	l_2	l_3	l_4	AF		
M24 x 1.5	Ø 36	Ø 28	50	22	17	0	32	0.5	8
								0.75 / 1 / 1.5	6
								2.5	5
								4	1
								6	1
			85	37	17	0	32	10	1
								16	1
M33 x 1.5	Ø 43	Ø 35	50	34	17.5	0	41	0.5	18
								0.75 / 1 / 1.5	8
								2.5	6
								4	5
								6	1
			85	49	17.5	20	41	20	2
								25	1
								35	1
M36 x 1.5	Ø 46	Ø 38	50	34	17.5	0	41	0.5	22
								0.75 / 1 / 1.5	10
								2.5	9
								4	6
			85	49	17.5	20	41	6	6
								10 + (1.5)	3 + (3)
M42 x 1.5	Ø 55	Ø 45	50	34	17.5	0	50	0.5	30
								0.75 / 1 / 1.5	16
								2.5	12
								4	8
								6	8
			85	49	17.5	20	50	10 + (1.5)	3 + (6)
								16 + (1.5)	3 + (3)
								10 + (1.5)	4 + (4)
M50 x 1.5	Ø 63	Ø 54	77	26	14	35	60	0.5	45
								0.75 / 1 / 1.5	30
								2.5	15
								4	13
								6	13
			97	36	14	45	60	10 + (1.5)	3 + (6)
								16 + (1.5)	3 + (6)
								10 + (1.5)	4 + (4)
								16 + (1.5)	4 + (4)
								25 + (1.5)	4 + (4)

Other versions on request. Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.



Industrial processes often take place within closed containers, under increased pressure or even vacuum conditions. It is therefore of utmost importance that no media leakages or pressure/vacuum drops occur when cables are led in. Our BARTEC pressure and vacuum sealed cable entries provide a simple and cost-effective solution to this problem. The cable entries essentially consist of a metal sleeve encapsulating the whole length of the electric conductors within epoxy-resin. This means that sealing is not only guaranteed for the whole length of the conductors but also through the stranded conductors themselves. Depending on their field of application, BARTEC pressure and vacuum sealed cable entries can be used at temperatures of -70 °C to +150 °C. With regard to the actual temperature and surrounding media, pressures of 10^{-6} mbar to 200 bar can be withstood. Our BARTEC cable entries can also be used under conditions that differ from the basic technical data listed below.
They have **not been** approved for use in potentially explosive areas.
Explosion-proof and pressure-sealed versions (on request).

Technical data Basic version

Protection class	up to IP 68 for enclosure
Nominal voltage	see table
Nominal conductor cross section	0.25 mm^2 to 6 mm^2
Temperature range	-70 °C to +150 °C
Nominal pressure	63 bar at RT (RT= +25 °C)
Cable lengths	on request
Core lengths	on request

Ordering information

Nominal voltage	Code no.	Conductor cross section	Code no.	Number of cores	Code no.	Sleeve sizes	Code no.	Temperature	Code no.	Sleeve material
450/750 V	1	Special cross section	A	1 core	01	M24 x 1.5	2	-25 °C to +100 °C	0	nickel-plated brass
250 V	2	0.25 mm^2	C	2 core	02	M33 x 1.5	3			nickel-plated steel
1 000 V	3	0.35 mm^2	D	10 cores	10	M36 x 1.5	4			
3 000 V*	4	0.5 mm^2	E	11 cores	11	M42 x 1.5	6	up to +150 °C	5	Steel 1.4305
60 V	5	0.75 mm^2	F	20 cores	20	M50 x 1.5	8			Steel 1.4571
400 V	7	1.00 mm^2	G	21 cores	21	Special size	9			
500 V	8	1.5 mm^2	H	etc. up to a max. indicated in column “Max. number of cores“ in the chart “Dimensions“						
Special voltage	9	2.5 mm^2	J							
		4.0 mm^2	K							
		6.0 mm^2	L							

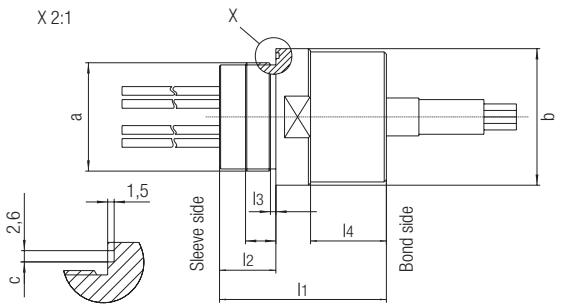
*on request

Complete order no. 37-920 ☐ - ☐☐☐☐ /7 ☐ *
Please insert correct code.

* in conjunction with the customer requirements form at the end of the chapter

Technical data subject to change without notice.

Dimensions



Cable enters on boss side

Ordering information

Tread size a	Dimensions in mm							Nominal conductor cross section	Max. number of cores
	b	c	l_1	l_2	l_3	l_4	SW		
M24 x 1.5	Ø 36	Ø 28	70	22	17	0	32	0.5	8
								0.75 / 1 / 1.5	6
								2.5	3
								4	1
								6	1
M33 x 1.5	Ø 43	Ø 35	83	34	17.5	33	41	0.5	18
								0.75 / 1 / 1.5	8
								2.5	6
								4	5
								6	1
M36 x 1.5	Ø 46	Ø 38	83	34	17.5	33	41	0.5	22
								0.75 / 1 / 1.5	10
								2.5	9
								4	6
								6	6
M42 x 1.5	Ø 55	Ø 45	83	34	17.5	33	50	0.5	30
								0.75 / 1 / 1.5	16
								2.5	12
								4	8
								6	8

Other versions on request. Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.

BARTEC submersible cable entries maintain their seal even under extreme conditions. Major fields of application are submersible pumps for use areas such as:

- water treatment plants
- sewage treatment plants
- sewage disposal
- building sites

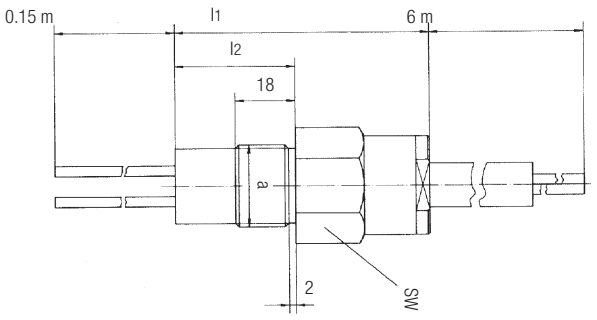
The cable sheath and cores are encapsulated in a special sealing compound. If the cable is damaged, no water can penetrate the cable entries causing a short-circuit. Our BARTEC submersible cable entries are sealed over their whole length. BARTEC submersible cable entries are designed for depths with pressures up to 6 bar. The standard version is threaded, but flanged versions can also be supplied. For these cable entries, BARTEC use as extremely robust NSSHÖU cable resistant to extreme stress such as sewage or chemically agressive waste water. The basic versions have 4 x 1.5 mm^2 or 7 x 2.5 mm^2 cores. For special cables incorporating pilotlines, we offer versions with 7 x 1.5 mm^2 or when used with oil-filled motors, the cables can be provided with FEP-insulated stranded conductors. The standard version has nickel-plated brass threaded sleeves. For special applications, BARTEC offers threaded sleeves of stainless steel types.

Explosion-proof version (on request).

Technical data Basic version

Protection class	IP 68
Pressure seal	up to 6 bar
Temperature resistance	max. +100 °C at encapsulation
Voltage	up to 500 V for NSSHöU
Cable length outside	6 m
Core length inside	0.15 m

Dimensions



Ordering information

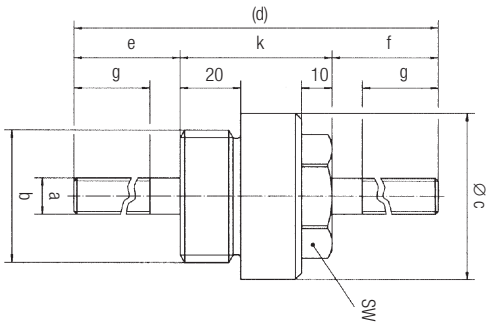
Thread a	Dimensions in mm			Connection number of cores x cross section	Cable	Voltage	Order no.
	l_1	l_2	SW				
M36 x 1.5	85	45	41	7 x 4			on request
				4 x 4	NSSHöU	500 V	37-9208-K044/2000
				7 x 2.5	NSSHöU	500 V	37-9208-J074/2000
				4 x 2.5	NSSHöU	500 V	37-9208-J044/2000
M24 x 1.5	75	35	30	3 x 2.5	NSSHöU	500 V	37-9208-J032/2000
				4 x 1.5	NSSHöU	500 V	37-9208-H042/2000

Other versions on request. Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.

Industrial processes often take place within closed containers, under increased pressure or even vacuum conditions. It is therefore of utmost importance that no media leakages or pressure/vacuum drops occur when electrical power or signals are led through the container wall. Our BARTEC pressure and vacuum sealed stud-type bushings provide a simple and cost-effective solution to this problem. The stud-type bushings essentially consist of a threaded metal sleeve and the stud forming one block by means of a creepage-proof insulation material. The electrical connection can be made by the user himself with conventional connection systems. The seals can withstand pressures from 10 mbar abs. to 63 bar depending on the type used for the installation. Depending on their field of application, BARTEC pressure and vacuum sealed stud-type bushings can be used at temperatures of -70 °C to +150 °C. Our BARTEC stud-type bushings can also be used under conditions that differ from the basic technical data listed below.
They are **not** approved for the use in hazardous areas.

Dimensions



Technical data Basic version

Nominal voltage	up to 1 000 V
Stud thread	M3 to M30
Temperature range	-70 °C to +150 °C
Nominal pressure	up to 63 bar at RT (RT = +25 °C) [1]
Test pressure	80 bar at RT

[1] depending on outer seal

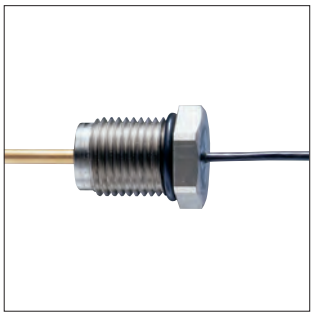
Ordering information

Nominal current			
at +25 °C ambient temperature	100 A	250 A	315 A
Dimensions in mm			
a	M8	M12	M16
b	R 1"	R 1 1/4"	R 1 1/2"
c	41	55	60
d	100	150	160
e	35	50	55
f	30	50	55
g	22	40	40
SW	30	36	36
k	35	50	50
	2	1	4

Complete order no. 37-9119-A019/70E ☐
Please insert correct code.

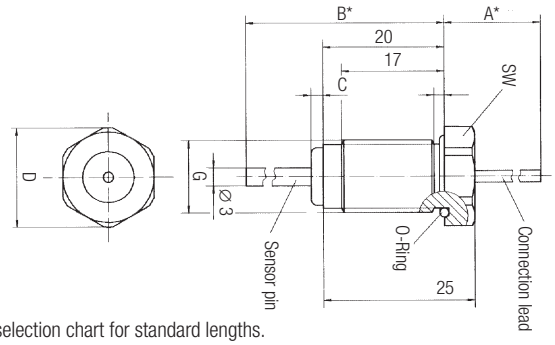
Other versions on request.
Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.



In submersible sewage pumps, motor and pump assembly are often separated by an oil chamber sealed with mechanical seals.To prevent motor malfunctions or breakdowns it is absolutely necessary to detect possible leakages of the shaft seals and to carry out maintenance works in due time. Our BARTEC electrodes help you solve this problem most cost effectively. The electrode essientially consists of a threaded metal sleeve and a metal sensor rod forming one block by means of a creepage-proof insulation material. An appropriate evaluation unit indicates any existing leak or due maintenance in good time. Depending on type and application, BARTEC electrodes can be used for temperatures from -25 °C to +150 °C. They can also be used under conditions that deviate from the following basic technical data.

Dimensions



See selection chart for standard lengths.
Different lengths on request.

Technical data Basic version

Nominal voltage	≤ 30 V
Temperature range	-25 °C bis max. +150 °C depending on the core wire used
Rated uninterrupted current	< 1 A
Materials	Threaded sleeve: Nickel-plated brass or stainless steel Sensor rod: Brass or stainless steel Connection core: 0.5 mm^2 to 1.5 mm^2 Encapsulation: Epoxy resin O-ring: Viton

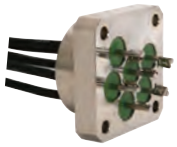
Ordering information

Dimensions in mm							Order no.
G	C	D	SW	A	B	O-ring	
M10 x 1	2	14.5	13	500	36	9 x 1.5	37-9A05-1250/1000
M12 x 1	2	16.5	15	500	36	10 x 1.5	37-9A05-125B/1000
M16 x 1.5	2	21.0	19	500	36	14 x 2	37-9A05-125D/1000

Versions deviating from the basic technical data on request.
Please use the customer requirements form at the end of the chapter!

Technical data subject to change without notice.

Special versions

Illustration	Description
	Stud plate Stud insulated in glass e. g. as pressure-proof motor connection
	Line bushings with flat-pin plug
	Prestressed-glass line bushings electrical

Technical data subject to change without notice.

Customer requirements Cable entries/line bushings

Customer

Company

Street

Postcode/City

Country

Contact person

E-mail

Phone Fax

BARTEC (to be completed by the BARTEC representative)

Sales employee

☐ Offer ☐ Order

Project name/Application number

Customer number

Order value

Deadline Offer

Delivery

Conditions of use

Current A Voltage V

Peak voltage V Frequency Hz

Pressure

Nominal pressure bar ☐ Boss side

Test pressure bar ☐ Sleeve side

Leckage rate mb * l * s^{-1}

Ambient temperature °C

max. permissible heating at the conductor

max. conductor temperature °C

Medium

Boss side

Sleeve side

aggressive components of the medium

Ex area (Zone)

Type of protection

Other points

Installation site sketch

Cable entry/line bushing

Cable description

Boss side ☐ Shielded cable ☐ Core

☐ not shielded ☐ shielded

☐ Shield connected to ground

☐ Shield run through

☐ Shield insulated

Designation lead/core

Length mm

Sleeve side ☐ Shielded cable ☐ Core

☐ not shielded ☐ shielded

☐ Shield connected to ground

☐ Shield run through

☐ Shield insulated

Designation lead/core

Length mm

Number of cores piece

Core cross section mm^2

Bolt bushing

Bolt description

Connection Boss side Sketch

Connection Sleeve side Sketch

Bolt material

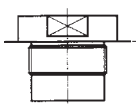
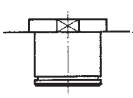
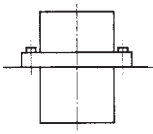
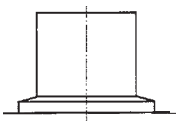
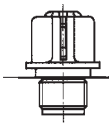
Electrode line bushing

Length of sensor pin

Material of sensor pin

Sketch

Version

Threaded sleeve	Non-threaded sleeve	Non-threaded sleeve with mounting flange	Small flange	Line bushing with terminals
Boss side / Sleeve side					
Quantity	Quantity	Quantity	Quantity	Quantity
Thread name	Sleeve size	Sleeve size	Diameter Ø	Thread name
Thread size	Length of gap	Length of gap	Length of gap	Thread size
Sleeve material	Sleeve material	Sleeve material	Sleeve material	Sleeve material

6