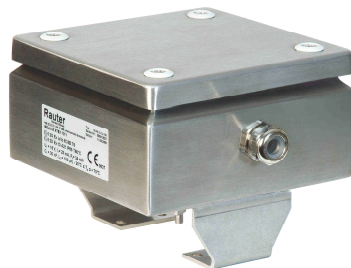
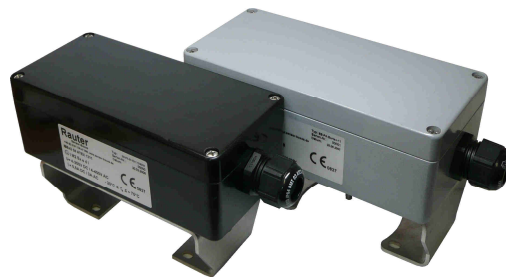


Documentation

about
Ex eb db ... 4 - 250 V AC/DC limit switch boxes
with
Bartec switches
for
pneumatic rotary and linear actuators
acc. to
guidline 2014/34/EU, IExU 07 ATEX 1155

 II 2G Ex eb db IIC T6 Gb  II 2D Ex tb IIIC T 80°C Db



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1. Objectives and practical use

The positions of industrial valves represent an important piece of information for the course of action of a production. These valves are e.g. actuated with pneumatic rotary and linear actuators at which the end position of the valve like “open” or “closed” is reported back to a control system. This is done via a mounted limit switch box which is placed at/above the actuator. Use of the above mentioned limit switch boxes can be found in endangered explosive areas as in the chemicals industry, equipment group II, category 2G, zones 1, 2 or 2D, zones 21, 22. See images 1, 4 +5. Another possibility also can be found the low temperature limit switch box, images 2+3, in explosive areas in extremely cold zones.





Image 1-5: Polyester- and aluminium limit switch boxes for rotary actuators, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, 160x75x55mm/175x80x57mm, IP 65, low temperature limit switch boxes for rotary and linear actuators, $-55^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, 175x80x57mm, IP 65. Stainless steel limit switch boxes for rotary and linear actuators $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, 150x150x80mm, IP 65.

2. Technical specification

2.1 technical specification limit switch boxes, $- 20^{\circ}\text{C} \leq T_a \leq + 70^{\circ}\text{C}$ and $- 55^{\circ}\text{C} \leq T_a \leq + 70^{\circ}\text{C}$

Table 1: Technical specification of the limit switch boxes with Bartec limit switches

Term / Identifier:	Technical specification:																
Material and dimensions of the housing	<p>Polyester housing black: 160x75x55mm 122x120x90mm 160x160x90mm 220x120x90mm</p> <p>Aluminium housing grey: 175x80x57mm 122x120x90mm 160x160x90mm 220x120x90mm</p> <p>Stainless steel housing: 150x150x80mm</p>																
Connection to bracket	F05-slot																
Connection to rotary actuator	acc. to VDI/VDE 3845, hole spacing 80x30mm or 130x30mm																
Connection to linear actuator	acc. to Namur IEC 534																
Protection class	IP 65																
ATEX identification	 II 2G Ex eb db IIC T6 Gb  II 2D Ex tb IIIC T 80°C Db																
Temperature class	T6																
Temperature range:	$- 20^{\circ}\text{C} \leq T_a \leq + 70^{\circ}\text{C}$ $- 55^{\circ}\text{C} \leq T_a \leq + 70^{\circ}\text{C}$																
Limit switch data:	<table> <tr> <td>at AC:</td> <td>rated voltage $U_n = 400\text{ V}$, rated current $I_n = 3\text{ A}$ (ohmic load)</td> </tr> <tr> <td>at AC:</td> <td>rated voltage $U_n = 400\text{ V}$, rated current $I_n = 2\text{ A}$ (inductive load)</td> </tr> <tr> <td>at AC:</td> <td>rated voltage $U_n = 250\text{ V}$, rated current $I_n = 5\text{ A}$ (ohmic load)</td> </tr> <tr> <td>at AC:</td> <td>rated voltage $U_n = 250\text{ V}$, rated current $I_n = 3\text{ A}$ (inductive load)</td> </tr> <tr> <td>at DC:</td> <td>rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,4\text{ A}$ (ohmic load)</td> </tr> <tr> <td>at DC:</td> <td>rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,03\text{ A}$ (inductive load)</td> </tr> <tr> <td>at AC/DC:</td> <td>rated voltage $U_n = 30\text{ V}$, rated current $I_n = 7\text{ A}$ (ohmic load)</td> </tr> <tr> <td>at AC/DC:</td> <td>rated voltage $U_n = 30\text{ V}$, rated current $I_n = 5\text{ A}$ (inductive load)</td> </tr> </table>	at AC:	rated voltage $U_n = 400\text{ V}$, rated current $I_n = 3\text{ A}$ (ohmic load)	at AC:	rated voltage $U_n = 400\text{ V}$, rated current $I_n = 2\text{ A}$ (inductive load)	at AC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 5\text{ A}$ (ohmic load)	at AC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 3\text{ A}$ (inductive load)	at DC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,4\text{ A}$ (ohmic load)	at DC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,03\text{ A}$ (inductive load)	at AC/DC:	rated voltage $U_n = 30\text{ V}$, rated current $I_n = 7\text{ A}$ (ohmic load)	at AC/DC:	rated voltage $U_n = 30\text{ V}$, rated current $I_n = 5\text{ A}$ (inductive load)
at AC:	rated voltage $U_n = 400\text{ V}$, rated current $I_n = 3\text{ A}$ (ohmic load)																
at AC:	rated voltage $U_n = 400\text{ V}$, rated current $I_n = 2\text{ A}$ (inductive load)																
at AC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 5\text{ A}$ (ohmic load)																
at AC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 3\text{ A}$ (inductive load)																
at DC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,4\text{ A}$ (ohmic load)																
at DC:	rated voltage $U_n = 250\text{ V}$, rated current $I_n = 0,03\text{ A}$ (inductive load)																
at AC/DC:	rated voltage $U_n = 30\text{ V}$, rated current $I_n = 7\text{ A}$ (ohmic load)																
at AC/DC:	rated voltage $U_n = 30\text{ V}$, rated current $I_n = 5\text{ A}$ (inductive load)																
Cable glands	M16x1,5mm/M20x1,5 mm, range, $\varnothing 9\text{-}4\text{mm}$, $\varnothing 13\text{-}6\text{mm}$,																
Clamps	max. 2,5 mm ²																
Weight without bracket or mounting set	Polyester box 160x75x55mm = 660g Polyester box 122x120x90mm = 1100g Polyester box 160x160x90mm = 1650g Polyester box 220x120x90mm = 1650g Aluminium box 175x80x57mm = 815g Aluminium box 122x120x90mm = 1055g Aluminium box 160x160x90mm = 2100g Aluminium box 220x120x90mm = 2100g Stainless steel box 150x150x80mm with stainless steel mounting plate and mounting set = 3400g Stainless steel box 150x150x80mm without stainless steel bracket/stainless steel mounting plate = 1800g																
Switching range	0° up to 90° or up to 180°																

3. Connection of the limit switches and adjusting the switching contacts and mounting the cover stainless steel housing

During the cable glands, limit switches will be connected acc. to operating Instructions, page 14-18, acc. to image 6, limit switches will be connected. The wiring diagram is always fixed in the housing. Both aluminium switching contacts are adjustable. With the hexagon socket screw M4, SW 2mm in the switching contacts tighten.

Necessary turn the cover locking pins from the stainless steel housing correctly into the housing lock!

Metal parts included the bracket/mounting set have to be grounded on the metal housing has to be connected to the equipotential bonding.

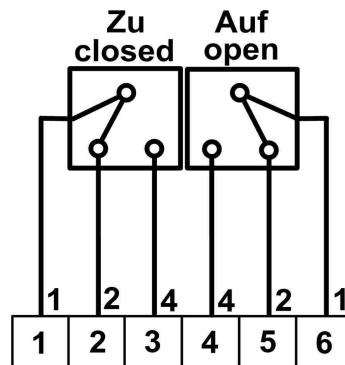


Image 6: Wiring diagram of the limit switches (changer)

3.1 Subplementary connection of solenoid valve

At the aluminium housing 122x120x90mm and 220x120x90mm are the possibility with subplementary clamps and cable glands to connect a solenoid valve.

The max. rating voltage 400V and the max. rating current 7A (ohmic load) and 5 A (inductive load) at $- 55^{\circ}\text{C} \leq T_a \leq + 70^{\circ}\text{C}$ do not overshoot at the clamps for connection of the solenoid valve.

4. Components and parts lists

4.1 Components and parts lists limit switch boxes, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$,

Table 2: Components and parts lists of the limit switch boxes with Bartec limit switches

Term / Identifier:	Part-No:	Material	Technical specification:
Polyester housing black with closed top, screws and sealing	PE-160L PE-122L PE-160L1 PE-220L	PE PE PE PE	160x75x55mm, Bartec-type: 07-5185-1600/7555 122x120x90mm, Bartec-type: 07-5185-1221/2090 160x160x90mm, Bartec-type: 07-5185-1601/6012 220x120x90mm, Bartec-type: 07-5185-2201/2090
Aluminium housing grey with closed top, screws and sealing	AL-175L AL-122L AL-160L AL-220L	AL-Si 12 AL-Si 12 AL-Si-12 AL-Si-12	175x80x57mm, Bartec-type: 07-5180-1750/8057 122x122x90mm, Bartec-type: 07-5180-1221/2090 160x160x90mm, Bartec-type: 07-5180-1601/6090 220x120x90mm, Bartec-type: 07-5180-2201/2090
Stainless steel housing with closed top, screws and sealing	VA-150	AISI 304 option: AISI 316Ti	150x150x80mm, Rittal type: 1521010
Cable gland black	KL	PA CR/NBR	M20x1,5mm, M16x1,5mm, Ø13-6mm, Ø9-4mm Lapp-Typ: Skintop MS-M- and MSR-M-ATEX
2-pole and 3-pole clamps	V	Duroplast	2,5mm ² , grey Bartec-type: 03-6062-0127 and 03-6062-0126
Clamps	DK 3 N	Thermo- plast	2,5mm ² , grey Phoenix-Contact-type: UK 3 N
Ground plates: PE-122L, -160L1, -220L und AL-122L, -160L, -220L, SB-PL-1	PL-122L,- 220L, -160L	1.4301	106x105x1,5mm and 207x107x1,5mm, 125x79x1,5mm
Screws, lock washers for ground plate, 4x	B-Sch, B-F	V2A	M6x10mm, Ø6mm
Welleaufn. PE-160L u. AL-175L	WA-1	AL	Ø64x13mm, Z.-Nr.: 0029
O-Ring	O-1-WA	NBR 70	Ø62x3mm
Aluminium shaft bearing body: AL-122L, AL-160L, AL-220L	WA-2	AL	Ø74x9mm, Z.-Nr.: 0030
Shafts for housings	WO	1.4305	Ø12x64/77mm, Z.-Nr.: 005/0016
O-Ring for shaft	O-WE	NBR 70	Ø9x1,5mm
Washer for shaft, 2x	U	POM	Ø18/Ø12x1,2mm
Lock washer for shaft, 2x	S	V2A	DIN 6799-9
2x Switching cam with 1x M4	Sch	AL	Z.-Nr.: 0017a
Mounting parts with screws for limit switches	B	PA or AL/V2A	25x20x5mm 2x M3x32mm
Cablebinder	K	Neylon	99x2,5mm
Wiring diagram/ limit switch label	Sch-S	PVC	30x30mm and 8x4 mm
Data plated	Typ	3M7872EC	70x32mm
Bartec limit switches: changer, closing switch and opening switch	EBS	Thermoplast, silver or gold plated	34x25x11mm, single pole switch 46x25x16mm, double pole switch Bartec type: 07-15.1-.../..., see details page 8-10
Isolating jacketing for limit switch cable	IS	PVC	Bürklin type: 6,0x0,6-PVC, DIN 40628, Sil (F163.900), Ø6mmx0,6mm, heat resisting: -60°C up to +200°C
Brackets	MB	1.4301	70x130x45/55mm, f. actuators acc. to VDI/DE 3845
Aluminium or stainless steel plate for mounting set linear actuators acc. to Namur IEC 534	SB-AB	Al	135x80x10mm, Z.-Nr.: 061

4.2 Components and parts lists low temperature limit switch boxes, - 55°C ≤ T_a ≤ + 70°C

Table 3: Components and parts lists of the low temperature limit switch boxes with Bartec limit switches

Term/Identifier	Article-No.	Material	Comments
Aluminium empty housing with closed cover and 4x screw	AL-175L-T AL-122L-T AL-160L-T AL-220L-T	AL-Si 12 AL-Si 12 AL-Si-12 AL-Si-12	175x80x57mm, Bartec type: 07-5180-1750/8057 122x122x90mm, Bartec type: 07-5180-1221/2090 160x160x90mm, Bartec type: 07-1580-1601/6090 220x120x90mm, Bartec type: 07-5180-2201/2090 all cover sealings are heat resisting : -55°C up to +100°C
Cable glands	KL-T-Ms-T	Messing plated	M20x1,5mm, M16x1,5mm with LSR packet seal, Ø13-7mm, Ø10-4,5mm Pflitsch type: U 28. UNI Ex e, -60°C up to +180°C
Cable glands	KL-T-VA-T	A2 (=1.4305)	M20x1,5mm, M16x1,5mm with LSR packet seal, Ø13-7mm, Ø10-4,5mm Pflitsch type: U 28. UNI Ex e, -60°C up to +180°C
Clamps	V	Plastic	2,5mm ² , grey Bartec type: 07-9702-0220/1 und 07-9702-0320/1, heat resisting: -55°C up to +120°C
Ground plates: AL-122L, -160L, -220L	PL-122L,-220L, -160L	A2 (=1.4301)	106x105x1,5mm and 207x107x1,5mm
Screws, lock washers for ground plate, 4x	B-Sch, B-F	A2	M6x10mm, Ø6mm
Aluminium shaft bearing body: AL-175L	WA-1	AL	Ø64x13mm, Z-No 0029
O-Ring	O-1-WA-T	Silikon	Ø57x2mm and Ø62x3mm, heat resisting: -55°C up to +200°C
Aluminium shaft bearing body: AL-122L, AL-160L, AL-220L	WA-2	AL	Ø74x9mm, Z.-No 0030
Shafts for housing	WO	A2 (=1.4305)	Ø12x64/77mm, Z.-No 005/0016
O-Ring for shaft	O-WE	NBR 70	Ø9x1,5mm, heat resistant: -55°C up to +200°C
Washer for shaft, 2x	U	POM	Ø18/Ø12x1,2mm
Lock washer for shaft, 2x	S	A2	DIN 6799-9
2x Switching cam with 1x M4	Sch	AL	Z.-No 0017a
Mounting parts with screws for limit switches	B	PA or AL/VA2	25x20x5mm, 2x M3x32mm
Wiring diagram/ limit switch label	Sch-S	PVC	30x30mm and 8x4 mm
Stainless steel data plate, fixed with groove pin	Typ-T	A2 (=1.4301)	65x35x0,5mm, heat resisting: -55°C up to +100°C
Bartec limit switches: changer, closing switch and opening switch	EBS	Silver or gold plated	34x25x11mm, single pole switch 46x25x16mm, double pole switch Bartec type: 07-15.1-.../..., see details page 8-10
Isolating jacketing for limit switch cable	IS-T	Silikon	Bürklin type: 6,0x0,6-PVC, DIN 40628, Sil (F163.900), Ø6mmx0,6mm, heat resisting: -60°C bis +200°C
Brackets	MB	A2 (=1.4301)	70x130x45/55mm, for actuator acc. to VDI/VDE 3845
Aluminium plate for the mounting set for linear actuators acc. to Namur IEC 534	SB-AB	Al	135x80x10mm, Z.-No.: 061

5. Appendix

5.1 Images limit switch boxes

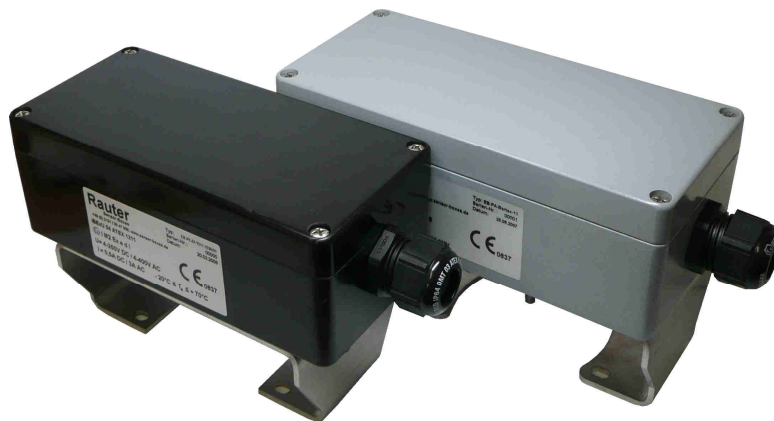


Image 7: Polyester- and aluminium limit switch boxes for rotary actuators, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, 160x75x55mm/175x80x57mm, IP 65

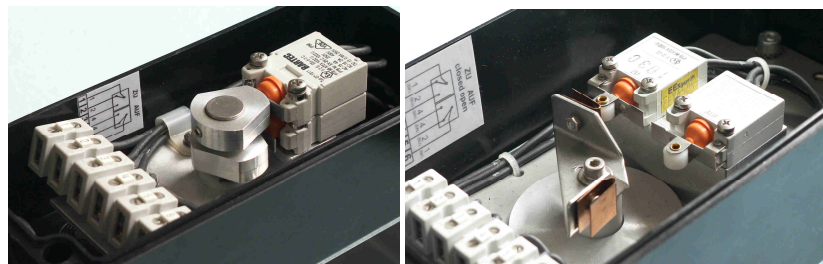


Image 8+9: Inner views polyester limit switch boxes, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$ with different Bartec limit switches and different switching contacts/cam, IP 65

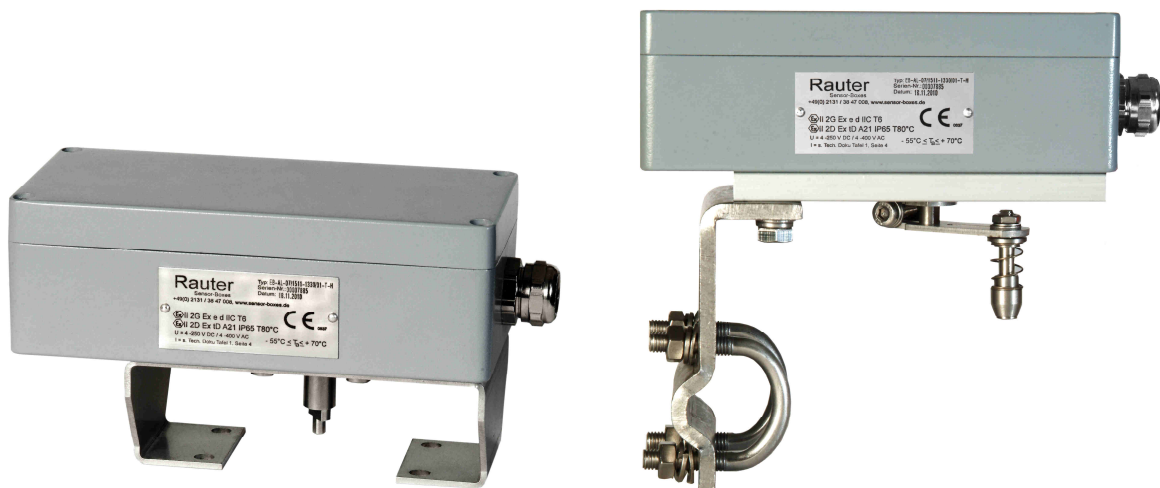


Image 10+11: Low temperature limit switch boxes, 175x80x57mm for rotary and linear actuators in aluminium housing, $-55^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, IP 65

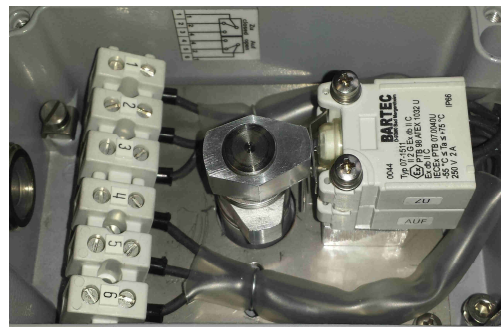
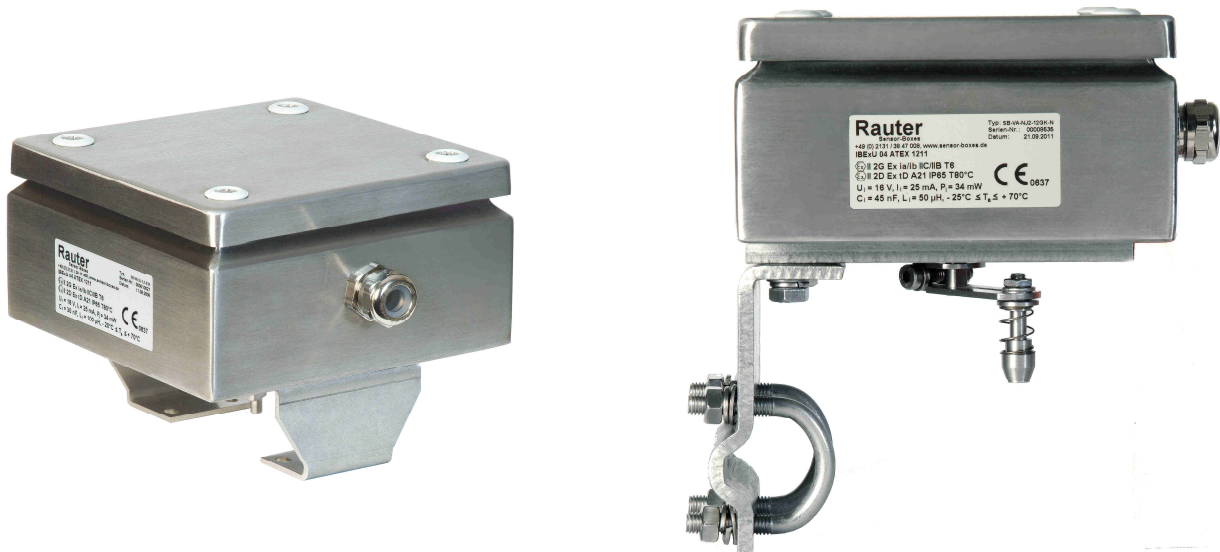


Image 12+13: Inner views low temperature limit switch boxes, $-55^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, with Ex d ... Bartec limit switches



Images 14+15: Stainless steel limit switch boxes for rotary and linear actuators, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, 150x150x80mm, IP 65



Image 16: Inner view stainless steel limit switch boxes, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$, with Ex d ... Bartec limit switches

6. Data sheet limit switches

(Attention: left site insert switch will be used only in our limit switch boxes !!!)

Insert switch/limit switch



Insert switch with connection cores

This switching element can be universally used for switching, controlling and regulating operations within Ex-areas. The insert switch is audited to the latest EC guideline 94/9/EC. Devices equipped with these insert switches have to be approved by a testing authority, the switch itself needs not be retested. The cable cores are cast-in at the back of the switch. Their standard length is 500 mm; other lengths are available on request. To connect the cores we recommend the miniterminals from BARTEC.

Limit switch with connection cable

The limit switches have been developed for Ex-areas where safe and reliable signalling is required, for example on pumps, petrol pumps, as well as in mechanical and high-tech engineering. The switches must be mounted into the respective devices or systems in such a way as to guarantee mechanical protection. No further tests are required. The connection cable is cast-in on the back of the switch. For the connection in Ex-areas BARTEC provides a large variety of terminals and terminal boxes.

Explosion protection

Limit switch

ATEX	II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T80°C, T95°C Db
Certification	EPS 14 ATEX 1 766 X
IECEX	Ex d IIC T6, T5 Gb Ex tb IIIC T80°C, T95°C Db
Certification	IECEX EPS 14.0092 X
Other approvals and certificates, see www.bartec.de	

Insert switch

ATEX	II 2G Ex d IIC Gb I M2 Ex d I Mb
Certification	EPS 14 ATEX 1 765 U
IECEX	Ex db IIC Gb Ex db I Mb
Certification	IECEX EPS 14.0091 U
Other approvals and certificates, see www.bartec.de	

Ambient temperature	-60 °C to +100 °C depending on the type and materials used
Ambient temperature limit switches	T6 to max. +75 °C depending on the rated current
Protection class	IP 66 (IEC/EN 60529)

Technical data

Ex d insert switch/limit switch DIN EN 60947-5-1/DIN EN 60947-1

Electrical data for control switch in accordance with DIN EN 60947-5-1	Rated operating voltage		AC 400 V
	Utilization category		
DIN EN 60947-5-1	AC-15	4 A	250 V
	AC-15	2 A	400 V
	DC-13	0.15 A	250 V
	Isolation voltage		400 V

Ambient temperature +40 °C

AC switching capacity

Rated operating voltage	ohmic load		inductive load $\cos \varphi = 0.6$	
	A	V	A	V
400 V	3 A		2 A	
250 V	5 A		3 A	
30 V	7 A		5 A	

DC switching capacity

Rated operating voltage	ohmic load		inductive load $L/R = 3 \mu s$	
	A	V	A	V
250 V	0.4 A		0.03 A	
30 V	7 A		5 A	

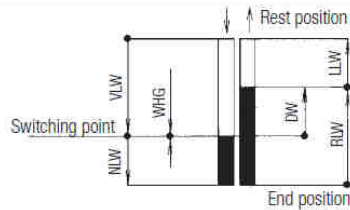
(further electrical data on request)

Tightening torque of fixing screws	0.6 Nm
Rating of gold-coated contacts	Voltage: min. 5 V/max. 30 V Current: min. 4 mA/max. 400 mA the product of voltage and current should not exceed 0.12 VA for alternating current these values have to be interpreted as peak values

Insert switch/limit switch



Contact Travels



Contact travels (in mm)

Pretravel	VLW	max. 0.9
Overtravel	NLW	min. 0.5
Differential value	DW	max. 0.45
Reset travel	RLW	0.9
No-load travel	LLW	0.1 bis 0.45
Repeat accuracy WHG (for repetitive actuation)		± 0.02

Service life

mechanical	>2 x 10 ⁶
electrical	dependent on load
max. switching rate	1000 operations/h

Switching actuation force

Single-break switch	max. 2.0 N
Double-break switch	max. 3.6 N

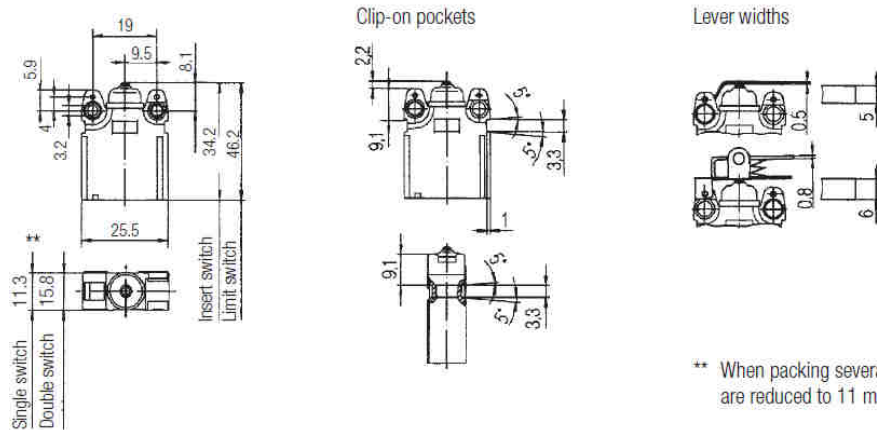
Reset force

Single-break switch	min. 0.4 N
Double-break switch	min. 0.8 N

Operating rate	≥ 10 μm/sec.
----------------	--------------

Contact break distance	2 x ≥ 0.3 mm	
Electrical connection	Insert switch cores 0.75 mm ²	L07G-K/Radox
	Limit switch cable 0.75 mm ²	H05VV-F/A05VV-F/ BETAflam
	other cores and cables on request	
Conductor diameter	2-wire	6.1 ± 0.3 mm
	3-wire	6.6 ± 0.3 mm
	4-wire	6.7 ± 0.3 mm
	6-wire	8.9 ± 0.3 mm
Contact element	snap-action contact element (double-break) as, normally-open, normally-closed, changeover contact as well as N/O + N/C contacts for circuits with equal potentials.	
Contact material	Silver or gold-coated contacts (all contact elements have a standard protective gold-coating as standard)	
Double-break switch (switch options)	simultaneous switch sequence: chamber I and II almost simultaneous	
	defined switch sequence: chamber I switches mechanically safe 0.03 up to 0.3 mm before chamber II	
Weight	Insert switch with 500 mm cores: single-break switch 35 g, double-break switch 70 g	
	Limit switch with 3 m cable: single-break switch 210 g, double-break switch 415 g	
Housing material	plastic (thermoplastics)	
Plunger/additional actuator	stainless steel	

Dimensions in mm



Technical data subject to change without notice.

Insert switch/limit switch



Selection chart Single-break switch

Type of contact	Code no.	Additional actuator*			
		Options	Code no.	Options	Code no.
	10	without additional actuator	00		44
			01		45
			02		46
			03		47
	20		04		48
			21		49
			22		61
			23		62
	30		24		63
			41		64
			42		66
			43	adjusting screw 73	73
	40		44		66
			45		
			46		

Complete order no.**
Please enter code number.
Technical data subject to change without notice.

07-□511-□□□□/□□□

Length of connection cores
5 = 500 mm
Length of connection cable
3 = 3 m
Please specify greater lengths in plain text, code no. 0

() Code for connection cable

* Dimensions for additional actuator are reference values

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

Insert switch with connection cores	1
Limit switch with connection cable	2

	Contact material	Ambient temperature (T _a)
1	Silver	-20 °C to +60 °C
3	Gold	-20 °C to +60 °C
5	Silver	-55 °C to +60 °C
6	Gold	-55 °C to +60 °C
7	Silver	-60 °C to +75 °C
8	Gold	-60 °C to +75 °C

7. Operating instruction cable glands

7.1 Operating instruction 1, cable gland in plastic, $-20^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

Tightening torques: M16x1,5mm = 4 Nm and M20x1,5mm = 7 Nm



Cable gland

BARTEC



Cable gland

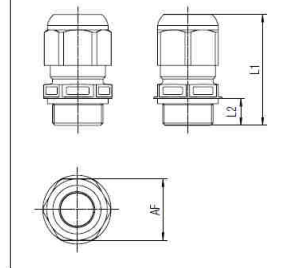
Description

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.

Dimensions



Explosion protection

Ex protection type

Ex II 2G Ex e II
Ex II 2D Ex tD A21 IP 68

Certification

PTB 05 ATEX 1068 X
BVS 11 ATEX E074 X

Operating temperature

-40°C to $+75^{\circ}\text{C}$

Technical data

Material

Polyamid, self-extinguishing

Seals

EPDM

Colour

RAL 9005, black
RAL 5015, blue

Protection class (EN 60529)

IP 66/IP 68

Selection chart

Thread size	Cable range (∅)	Across flat (AF)	Thread length (L2)	Length in mm (L1)	Unit	Order no.
Cable gland Ex e, black						
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.						
Cable gland Ex i, with blue cap nut						
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

03-0331-0492-10/2014-BCS-286071

7.2 Operating instruction 2, cable gland in nickel plated housing,
- 20°C/- 55°C ≤ T_a ≤ + 70°C

Betriebsanleitung · *Operating instructions*



PTB 98 ATEX 3109

U 2. UNI Ex-e

Messing vernickelt

Anwendung:

Die Kabel- und Leitungseinführungen (KLE) U 2. UNI Ex-e, dienen zur Einführung von fest verlegten Kabeln und Leitungen in einen Anschlussraum oder in ein Gehäuse eines explosionsgeschützten elektrischen Betriebsmittels der Gerätegruppe II und der Kategorien 2 G/D und 3 G/D.

Der Anschlussraum oder das Gehäuse müssen der Zündschutzart „Erhöhte Sicherheit – Ex-e“ nach den Normen EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 und EN 61421-1:2004 entsprechen. Die KLE sind für Betriebsmittel mit dem Grad der mechanischen Gefahr „hoch“ nach EN 60079-0 geeignet.

Bei der Werkstoffauswahl des Dichteinsatzes ist die Umgebungs-, die Oberflächen- und die Betriebstemperatur an der Einbaustelle zu beachten.

Bei ordnungsgemäßer Montage der KLE kann die Schutzart IP 68 nach IEC 529 oder EN 60529 erreicht werden.

Kennzeichnung:

Die KLE U 2. UNI Ex-e entspricht den Normen EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 und EN 61421-1:2004. Sie sind von der Physikalisch-Technischen Bundesanstalt (PTB) einer EG-Baumusterprüfung nach EG-Richtlinie 94/9/EG unterzogen worden. Sie sind deshalb wie folgt gekennzeichnet:

Kombiniert für Gas und Staub:

⊕ ⊕ II 2 G/D Ex-e II Ex tD A21 IP 68
PTB 98 ATEX 3109 xx C€ 0102

(xx = Anschlussgewindeart und -größe, z. B. M25, Pg 21, NPT 3/4" oder G 1/2")

Kennzeichnung Gas:

⊕ ⊕ II 2G Ex-e II

Kennzeichnung Staub:

⊕ ⊕ II 2D Ex tD A21 IP 68

Kennzeichnung extrem kleiner Bauteile:*

⊕ ⊕ II 2G/II 2D C€ 0102

Weitere Zertifikate:

IECEX – IECEX PTB 10.0009

EAC – RU C-DE.MW06.B.00119

*Kennzeichnung auf Kabelverschraubung

PTB 98 ATEX 3109

U 2. UNI Ex-e

brass nickel-plated

Application:

The cables glands and cable entry systems (CG/CES) U 2. UNI Ex-e are used to insert permanently laid lines and cables into a connection space or housing of an explosion-protected electrical operating material of the appliance group II and categories 2 G/D and 3 G/D.

The connection space or housing must conform to the ignition protective class "Increased safety – Ex-e" in accordance with the standards EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 and EN 61421-1:2004.

The CG/CES are suitable for operating material with the degree of mechanical risk "high" as per EN 60079-0.

In selecting the material for the sealing insert, the ambient, surface and operating temperature at the installation point is to be observed. With proper assembly of the CG/CES, the protective class IP 68 according to IEC 529 or EN 60529 can be attained.

Designation:

The CG/CES U 2. UNI Ex-e conforms with the standards EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 and EN 61421-1:2004. They were subjected to an EC design test in accordance with EC directive 94/9/EC by the Physical-Technical Federal Institute (PTB).

They are therefore designated as follows:

Combinated for gas and dust:

⊕ ⊕ II 2 G/D Ex-e II Ex tD A21 IP 68
PTB 98 ATEX 3109 xx C€ 0102

(xx = connection thread type and size, e. g. M25, Pg 21, NPT 3/4" or G 1/2")

Designation gas:

⊕ ⊕ II 2G Ex-e II

Designation dust:

⊕ ⊕ II 2D Ex tD A21 IP 68

Designation of extremely small components:*

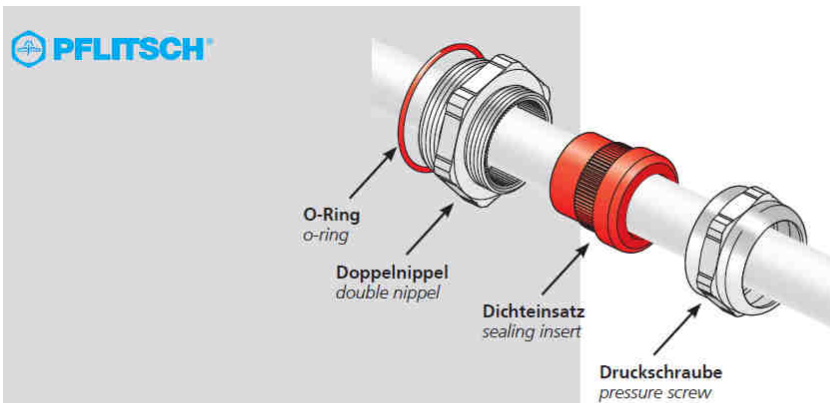
⊕ ⊕ II 2G/II 2D C€ 0102

Further certificates:

IECEX – IECEX PTB 10.0009

EAC – RU C-DE.MW06.B.00119

*Designation on cable gland



Montage

Als Montagewerkzeug kann der PFLITSCH-Steckschlüssel M28 verwendet werden.

Einsatztemperaturbereich:

Material: TPE-V Temperaturbereich: -40 °C bis +135 °C
 TPE Temperaturbereich: -40 °C bis +115 °C
 LSR Temperaturbereich: -60 °C bis +180 °C

Mindestwandstärken

- Beim Einbau in Geräten mit Gewindebohrungen:
 s = 5,0 mm (Kunststoff); 3,0 mm (Metall)
- Beim Einbau in Geräten mit Durchgangsbohrungen:
 s = 2,0 mm (Kunststoff); 1,0 mm (Metall)

Hinweis zur Zugentlastung der Kabelverschraubung:

Die KLE mit der Standard-Druckschraube ist nur für fest verlegte Leitungen und Kabel geeignet. Der Betreiber muss in diesem Fall für geeignete Maßnahmen sorgen, um eine Zugentlastung zu gewähren.

Wichtig:

Dichtringe dürfen nicht mit dem Messer ausgeschnitten werden! Nicht benutzte Gehäusebohrungen sind mit einem Ex-Verschlussstopfen zu verschließen. KLE mit entsprechenden Gewindegrößen sind mit einem geschlossenen Dichteinsatz oder mit einem UNI Ex-e Blind-Dichteinsatz zu verschließen. Nicht benutzte Bohrungen von Mehrfach-Dichteinsätzen sind mit einem Bolzen zu verschließen.

Demontage:

Die Demontage erfolgt in umgekehrter Reihenfolge.

Instandhaltung:

Die KLE sind in die Kontrollen bei der Inspektion und Wartung der elektrischen Betriebsmittel einzubeziehen.

Assembly

The PFLITSCH socket spanner M28 can be used as a tool

Application temperature range:

Material: TPE-V Temperature range: -40 °C up to +135 °C
 TPE Temperature range: -40 °C up to +115 °C
 LSR Temperature range: -60 °C up to +180 °C

Minimum wall thicknesses

- For installation in devices with threaded holes:
 s = 5.0 mm (plastic); 3.0 mm (metal)
- For installation in devices with throughholes:
 s = 2.0 mm (plastic); 1.0 mm (metal)

Pointer for strain relief of the cable gland:

The CG/CES are only suitable for permanently laid lines and cables. In this case, the operator must adopt appropriate measures to ensure strain relief.

Important:

Sealing rings must not be cut out with a knife! Housing holes that are not used must be sealed with an Ex closure plug. CG/CES with corresponding thread sizes are to be sealed with a closed sealing insert or with a UNI Ex-e blind sealing insert. Non-used holes of multi-sealing inserts are to be sealed with a bolt.

Disassembly:

Disassembly is carried out in the reverse order.

Maintenance:

The CG/CES are to be included in the inspection and maintenance of the electrical operating material.

Anschlussmaße für Durchgangsbohrungen:

Metrisch/metric	M10	M12	M16	M20	M25	M32	M40	M50	M63	M72	M75	M80
d [mm] 0/+ 0,3	10,0	12,0	16,0	20,0	25,0	32,0	40,0	50,0	63,0	72,0	75,0	80,0
Pg	7	9	11	13,5	16	21	29	36	42	48	-	-
d [mm] 0/+ 0,3	12,5	15,5	19,0	20,5	22,5	28,5	37,0	47,0	54,0	59,5	-	-
NPT	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	-	-	-	-	-
d [mm] 0/+ 0,3	17,1	21,3	26,6	33,3	42,0	48,1	60,1	-	-	-	-	-
Zoll/inch	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	-	-	-	-
d [mm] 0/+ 0,3	13,2	16,7	21,0	26,5	33,3	42,0	47,9	59,7	-	-	-	-

Connection dimensions for throughholes:

Anzugsmomente:

Metrisch/metric	M10	M12	M16	M20	M25	M32	M40	M50	M63	M72	M75	M80
Nm	6	6	8	10	10	15	20	20	20	30	40	40
Pg	7	-	9	11/13,5	16	21	29	36/42	48	-	-	-
Nm	6,25	-	3,75	3,75	6,25	7,5	7,5	7,5/10	10	-	-	-

Tightening torques:

7.3 Operating instruction 3, cable gland in stainless steel housing,
- 20°C/- 55°C ≤ T_a ≤ + 70°C

Betriebsanleitung · Operating instructions



PTB 01 ATEX 3104X

U 28. UNI Ex-e

Edelstahl

Anwendung:

Die Kabelverschraubungen (KLE) U 28. UNI Ex-e, dienen zur Einführung von fest verlegten Kabeln und Leitungen in einen Anschlussraum oder in ein Gehäuse eines explosionsgeschützten elektrischen Betriebsmittels der Gerätegruppe II und der Kategorien 2 G/D und 3 G/D. Der Anschlussraum oder das Gehäuse müssen der Zündschutzart „Erhöhte Sicherheit – Ex-e“ nach den Normen EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 und EN 60241-1:2004 entsprechen. Die KLE ist für Betriebsmittel mit dem Grad der mechanischen Gefahr „hoch“ nach EN 60079-0 geeignet. Bei der Werkstoffauswahl des Dichteinsatzes ist die Umgebungs-, die Oberflächen- und die Betriebstemperatur an der Einbaustelle zu beachten. Bei ordnungsgemäßer Montage der KLE kann die Schutzart IP 68 nach IEC 529 oder EN 60529 erreicht werden.

Kennzeichnung:

Die KLE U 28. UNI Ex-e entspricht den Normen EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 und EN 61241-1:2004. Sie sind von der Physikalisch-Technischen Bundesanstalt (PTB) einer EG-Baumusterprüfung nach EG-Richtlinie 94/9/EG unterzogen worden. Sie sind deshalb wie folgt gekennzeichnet:

Kombiniert für Gas und Staub:

⊕ Ex II 2 G/D Ex e II Ex tD A21 IP 68
PTB 01 ATEX 3104X xx C E 0102
(xx = Anschlussgewindeart und -größe, z. B. M25, Pg 21, NPT 3/4" oder G 1/2")

Kennzeichnung Gas:

⊕ Ex II 2G Ex e II

Kennzeichnung Staub:

⊕ Ex II 2D Ex tD A21 IP 68

Kennzeichnung extrem kleiner Bauteile:*

⊕ Ex II 2G/II 2D C E 0102

Weitere Zertifikate:

IECEX – IECEX PTB 10.0006X
EAC – RU C-DE.MLJ06.B.00119

*Kennzeichnung auf Kabelverschraubung

PTB 01 ATEX 3104X

U 28. UNI Ex-e

stainless steel

Application:

The cable glands (CG/CES) U 28. UNI Ex-e are used to insert permanently laid, screened lines and cables into a connection space or housing of an explosion-protected electrical operating material of the appliance group II and categories 2 G/D and 3 G/D. The connection space or housing must conform to the ignition protective class "Increased safety – Ex-e" in accordance with the standards EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006, and EN 61241-1:2004. The CG/CES is suitable for operating material with the degree of mechanical risk "high" as per EN 60079-0. In selecting the material for the sealing insert, the ambient, surface and operating temperature at the installation point is to be observed. With proper assembly of the CG/CES, the protective class IP 68 according to IEC 529 or EN 60529 can be attained.

Designation:

The CG/CES U 28. UNI Ex-e conforms with the standards EN 60079-0:2006, EN 60079-7:2007, EN 61241-0:2006 and EN 61241-1:2004. They were subjected to an EC design test in accordance with EC directive 94/9/EC by the Physical-Technical Federal Institute (PTB). They are therefore designated as follows:

Combinated for gas and dust:

⊕ Ex II 2 G/D Ex e II Ex tD A21 IP 68
PTB 01 ATEX 3104X xx C E 0102
(xx = connection thread type and size, e. g. M25, Pg 21, NPT 3/4" or G 1/2")

Designation gas:

⊕ Ex II 2G Ex e II

Designation dust:

⊕ Ex II 2D Ex tD A21 IP 68

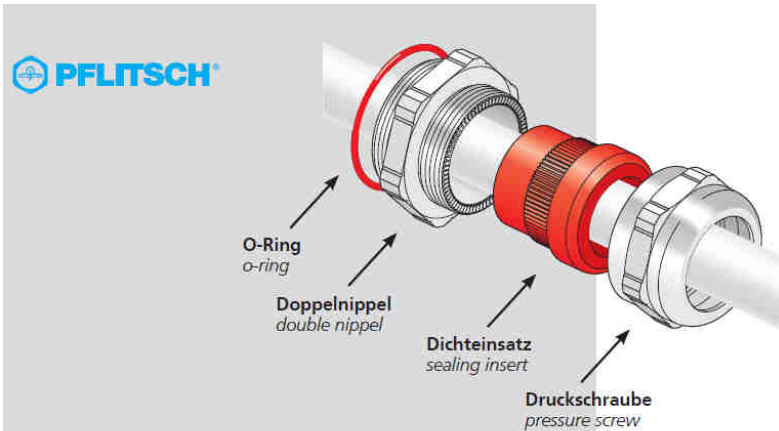
Designation of extremely small components:*

⊕ Ex II 2G/II 2D C E 0102

Further certificates:

IECEX – IECEX PTB 10.0006X
EAC – RU C-DE.MLJ06.B.00119

*Designation on cable gland



Montage

Als Montagewerkzeug kann der PFLITSCH-Steckschlüssel M28 verwendet werden.

Einsatztemperaturbereich:

Material: TPE- V Temperaturbereich: -40 °C bis +135 °C
 TPE Temperaturbereich: -40 °C bis +115 °C
 LSR Temperaturbereich: -60 °C bis +180 °C

Mindestwandstärken

- Beim Einbau in Geräten mit Gewindebohrungen:
 $s = 5,0 \text{ mm}$ (Kunststoff); $3,0 \text{ mm}$ (Metall)
- Beim Einbau in Geräten mit Durchgangsbohrungen:
 $s = 2,0 \text{ mm}$ (Kunststoff); $1,0 \text{ mm}$ (Metall)

Hinweis zur Zugentlastung der Kabelverschraubung:

Die KLE mit der Standard-Druckschraube ist nur für fest verlegte Leitungen und Kabel geeignet. Der Betreiber muss in diesem Fall für geeignete Maßnahmen sorgen, um eine Zugentlastung zu gewähren.

Wichtig:

Dichtringe dürfen nicht mit dem Messer ausgeschnitten werden!
 Nicht benutzte Gehäusebohrungen sind mit einem Ex-Verschlussstopfen zu verschließen. KLE mit entsprechenden Gewindegrößen sind mit einem geschlossenen Dichteinsatz oder mit einem UNI Ex e Blind-Dichteinsatz zu verschließen. Nicht benutzte Bohrungen von Mehrfach-Dichteinsätzen sind mit einem Bolzen zu verschließen.

Demontage:

Die Demontage erfolgt in umgekehrter Reihenfolge.

Instandhaltung:

Die KLE sind in die Kontrollen bei der Inspektion und Wartung der elektrischen Betriebsmittel einzubeziehen.

Anschlussmaße für Durchgangsbohrungen:

Metrisch/metric	M10	M12	M16	M20	M25	M32	M40	M50	M63	M72	M75	M80
d [mm] 0/+ 0,3	10,0	12,0	16,0	20,0	25,0	32,0	40,0	50,0	63,0	72,0	75,0	80,0
Pg	7	9	11	13,5	16	21	29	36	42	48	–	–
d [mm] 0/+ 0,3	12,5	15,5	19,0	20,5	22,5	28,5	37,0	47,0	54,0	59,5	–	–
NPT	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	–	–	–	–	–
d [mm] 0/+ 0,3	17,1	21,3	26,6	33,3	42,0	48,1	60,1	–	–	–	–	–

Anzugsmomente:

Metrisch/metric	M10	M12	M16	M20	M25	M32	M40	M50	M63	M72	M75	M80
Nm	6	6	8	10	10	15	20	20	20	30	40	40
Pg	7	–	9	11/13,5	16	21	29	36/42	48	–	–	–
Nm	6,25	–	3,75	3,75	6,25	7,5	7,5	7,5/10	10	–	–	–

Assembly

The PFLITSCH socket spanner M28 can be used as a tool

Application temperature range:

Material: TPE- V Temperature range: -40 °C up to +135 °C
 TPE Temperature range: -40 °C up to +115 °C
 LSR Temperature range: -60 °C up to +180 °C

Minimum wall thicknesses

- For installation in devices with threaded holes:
 $s = 5.0 \text{ mm}$ (plastic); 3.0 mm (metal)
- For installation in devices with throughholes:
 $s = 2.0 \text{ mm}$ (plastic); 1.0 mm (metal)

Pointer for strain relief of the cable gland:

The CG/ICES are only suitable for permanently laid lines and cables. In this case, the operator must adopt appropriate measures to ensure strain relief.

Important:

Sealing rings must not be cut out with a knife!
 Housing holes that are not used must be sealed with an Ex closure plug. CG/ICES with corresponding thread sizes are to be sealed with a closed sealing insert or with a UNI Ex e blind sealing insert. Non-used holes of multi-sealing inserts are to be sealed with a bolt.

Disassembly:

Disassembly is carried out in the reverse order.

Maintenance:

The CG/ICES are to be included in the inspection and maintenance of the electrical operating material.

Connection dimensions for throughholes:

Metrisch/metric	M10	M12	M16	M20	M25	M32	M40	M50	M63	M72	M75	M80
d [mm] 0/+ 0,3	10,0	12,0	16,0	20,0	25,0	32,0	40,0	50,0	63,0	72,0	75,0	80,0
Pg	7	9	11	13,5	16	21	29	36	42	48	–	–
d [mm] 0/+ 0,3	12,5	15,5	19,0	20,5	22,5	28,5	37,0	47,0	54,0	59,5	–	–
NPT	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	–	–	–	–	–
d [mm] 0/+ 0,3	17,1	21,3	26,6	33,3	42,0	48,1	60,1	–	–	–	–	–

Tightening torques:

8. Applicable standards

- | | |
|--------------------------|--|
| EN 60079-0: 2018 | Explosive atmospheres - Part 0: Equipment - General requirements |
| EN 60079-1: 2014 | Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures „d“ |
| EN 60079-7: 2015 | Explosive atmospheres - Part 7: Equipment protection by increased safety „e“ |
| EN 60079-31: 2014 | Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure „t“ |