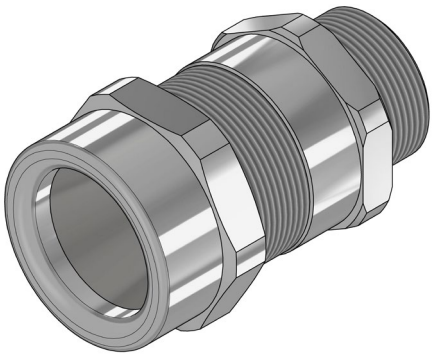


Note on instructions

These instructions are for qualified personnel, in accordance with national Legislation, relevant Standards and, where applicable, in accordance with EN/IEC 60079-17 Standard (electrical apparatus for explosive gas atmospheres). Cable-glands of P** series must be installed according to EN/IEC60079-14 standards, by authorized and specialized personnel. If using different from as prescribed to the above standards, the IECEx or ATEX certificate of conformity is invalidated. The user must verify the compatibility between the type of protection, materials of this apparatus and the environmental conditions, chemical and physical characteristics of gases, vapors, dust of the installation site. Users must be aware of risks caused by electricity. The coupling system to the enclosure must not compromise the enclosure's protection degree. The cable-glands shall be mounted with the enclosures according to the instructions below and so that the type of protection of the enclosures on which they are mounted is not altered.

Explosion protection

ATEX

Protection type

Ⓔx II 2G Ex db/eb/ia IIC Gb

Ⓔx II 2D Ex tb IIIC Db IP66 or IP66/68

Certification

INERIS 09ATEX0028X

Protection type

Ⓔx II 3G Ex nR IIC Gc

Ⓔx II 3D Ex tc IIIC Dc IP66 or IP66/68

Certification

INERIS 23ATEX3004X

Notified body number

0722

IECEx

Protection type

Ex db/eb/ia IIC Gb
Ex tb IIIC Db IP66 or IP66/68

Certification

IECEx INE 11.0017X

For other certifications please consider the product data sheet.

Approved for zones

1 and 2
21 and 22

Technical data

Degree of Protection

according to standard IEC60529-2001-02:
IP66 (with/without gasket)
IP66/68 (gasket needed).

Materials

In cable glands production are used the following materials.

Body and other metallic parts:

- Aluminium alloy Anticorodal 6082 UNI 9006/4 (Mg+Zr+Ti) <7,5%.
- Stainless steel AISI 303-304-316-316L.
- Carbon steel.
- Brass OT58 UNI EN12164 or UNI EN12165 (others on request).

Treatments, only for brass and carbon steel: nickel or zinc plating.

Sealing rings:

- EP157 (EPDM black) hardness: 55÷60 Shore, operating temperature: -40/+90 °C.
- SIL960 (Silicone red) hardness 60 Shore, operating temperature: -60/+100 °C.

Accessories

Cable gland could be supplied with the following accessories:
DL (locknut): for secure gland into position, in applications into unthreaded holes.
NW (flat washer): for additional IP protection.
SW (serrated washer): to prevent locknut loosening.
PTD (shroud): for additional corrosion protection.
ET (earth tag): for external bonding.

Specific conditions of use

▶ The temperature of the enclosure wall, at the connection point of the cable gland, shall not exceed:
• +90°C for cable entry with seal in EPDM60.
• +100°C for cable entry with seal in SILICONE60.
▶ The minimum temperature for use is -40°C for sealing rings in Black EPDM60 and -60°C for sealing rings in Red SILICONE60.
▶ The user shall use cables with thermal stability in accordance with the temperature of the sealing ring.
▶ The clamping of the cables must be realized outside of the enclosure, nearby to the enclosure on which the cable glands are installed.
▶ To guarantee the IPX8, the cable entry shall be fitted on enclosure which satisfies an immersion test under 10 meters of water for 6 hours.
▶ These glands are intended for use with effectively filled circular and compact cables. When it is not sure about the compactness characteristics of the cable, it is recommended to use barrier cable glands.
▶ During the installation is necessary to consider the COLD FLOW effects.

Safety precautions

All universally valid rules and other binding directives relating to workplace safety, accident prevention and environmental protection must be adhered to.

Standards conformed to

Please see Declarations of Conformity and IECEx certificate.

Handling

Transport and Storage. The cable-glands are supplied in carton packs or over pallets having various dimensions depending on quantity supplied. In storage case, pack must be protected:

- From rain.
- From humidity.

Handling. For handling there are not requested particular abilities of assigned staff, therefore it is recommended to carry out such operation observing the common rules of accident-prevention.

Safety Precautions Before Use. In the event of installation in places where the formation of stray electric currents can be present (i.e.: outskirts of electrical railway networks, great systems of welding, electrical systems with high currents and radio frequencies, etc.), it is right to take adequate precautions to avoid consequences.

As a general rule, whichever intervention on the electrical or mechanical parts or on the system, must be preceded from the interruption of the electrical supply system.
Unpacking. It is advisable to dispose of immediately the parts of packaging that could be dangerous to people (nails, tapes, plastic bags, etc.).

Safety disposing of packaging material. All packaging materials are recyclable, they can be disposed of according to law in force.

Maintenance and cleaning

Safety precautions. Inspections and maintenance on the enclosures must be carried out only by expert staff, whose training has included all the necessary instructions on the installation modalities, on the relevant laws and standards and on the general principles of the classification of the hazardous areas. For use in environments where combustible dust may be present, the user must carry on regular cleaning of the apparatus to prevent build-up of dust to surface (thickness < 5mm). The clamping of the cables, for the cable entries must be realized outside of the enclosure, nearby to the enclosure on which the cable glands are installed. Before carrying out which-ever maintenance operation, disconnect the electrical system.

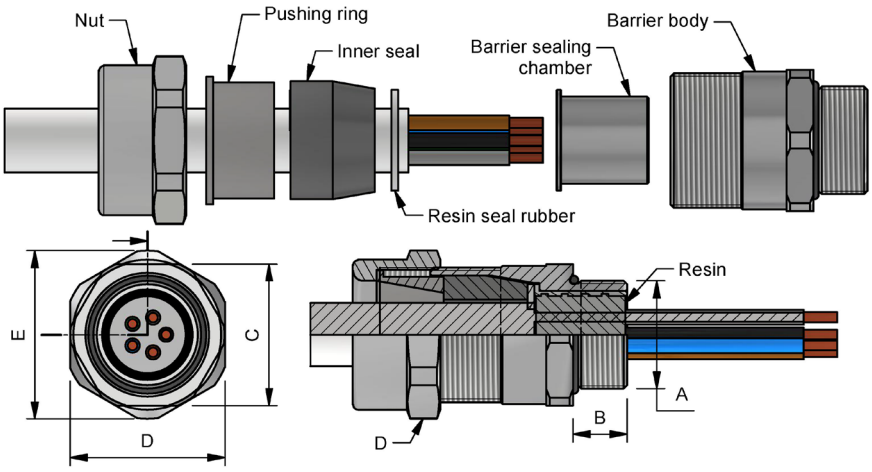
Ordinary maintenance and cleaning. For cleaning use water moistened cloth or whichever other product that does not damage the parts of the product. Don't let the water (or whichever other product used) drip inside of the joints or of the electrical apparatus.

Decommissioning of the product

Uninstallation. Must be carried out only by expert staff, whose training has included all the necessary instructions on the uninstallation modalities, on the relevant laws and standards and on the general principles of the classification of the hazardous areas.

Scrapping. It is recommended to contact authorized companies only for the scraping, according to laws and current standards.

Cable gland components



Threads table and Coding

Type (PNABN): PNAB | 3 | 03N | ON

Code	Material
ON	Nickel Plated Brass
AL	Aluminium
XX	Stainless Steel
OT	Brass

Cable Gland Size	Admitted Thread Size		
	Reduced	Nominal	Oversize
0	-	00	01
1	-	01	02
2	-	02	03
3	-	03	04
4	-	04	05
5	-	05	06
6	-	06	07
7	-	07	08
8	-	08	09
9	-	10	-

Thread Size	Thread Type				
	N	K	G	M	P
	ANSI/ASME B1.20.1 NPT	EN10226-2 Gk only for Atex	ISO 228-1 Gas	ISO 262 M x p	PG DIN 40430
00	3/8"	3/8"	3/8"	M16x1,5	11
01	1/2"	1/2"	1/2"	M20x1,5	13,5
02	3/4"	3/4"	3/4"	M25x1,5	21
03	1"	1"	1"	M32x1,5	29
04	1"1/4	1"1/4	1"1/4	M40x1,5	36
05	1"1/2	1"1/2	1"1/2	M50x1,5	42
06	2"	2"	2"	M60x1,5	48
07	2"1/2	2"1/2	2"1/2	M75x1,5	-
08	3"	3"	3"	M90x1,5	-
09	3"1/2	3"1/2	3"1/2	M100x1,5	-
10	4"	4"	4"	M115x1,5	-

Selection table

Size	Entry thread				Internal seal			External Seal	Armour thickness		C Min (mm)	D min (mm)	E Min (mm)	Tightening torque C and D (Nm)
	NPT ASA B1.20.1		M x p ISO262		Code	Ø Min (mm)	Ø Max (mm)	Ø max (mm)	Cone 1 (mm)	Cone 2 (mm)				
	A (inch)	B (mm)	A (mm)	B (mm)										
00	3/8”	19	16	16	GI0007E	4	7	10	0.3/1.3	-	24	24	26	25
0	3/8”	19	16	16	GI0007	4	7	10	0.3/0.7	0.8/1.6	24	24	26	25
					GI0010	7	10	15						
1	1/2”	19	20	16	GI1008	5.5	8	15	0.3/0.7	0.8/1.6	30	32	34	33
					GI1105	8	10.5	19						
					GI1013	10.5	13							
2	3/4”	20	25	16	GI2013	10.5	13	20	0.3/0.7	0.8/1.6	34	36	38	61
					GI2155	13	15.5	24						
					GI2018	15.5	18							
3	1”	22	32	16	GI3018	15	18	26	0.3/0.7	0.8/1.6	42	46	50	86
					GI3021	18	21	31						
					GI3024	21	24							
4	1”1/4	22	40	16	GI4024	21	24	32	0.3/0.9	1.0/2.5	49	51	52	110
					GI4027	24	27	37						
					GI4030	27	30	40						
5	1”1/2	22	50	18	GI5027	24	27	37	0.3/0.9	1.0/2.5	57	59	60	125
					GI5030	27	30	43						
					GI5033	30	33	47						
					GI5036	33	36							
6	2”	22	63	18	GI6039	36	39	48	0.3/0.9	1.0/2.5	67	69	70	250
					GI6042	39	42	53						
					GI6045	42	45	56						
7	2”1/2	29	75	18	GI7045	42	45	58	0.3/0.9	1.0/2.5	82	84	85	250
					GI7048	45	48	64						
					GI7051	48	51	67						
					GI7054	51	54							
8	3”	29	90	18	GI8056	52	56	72	0.3/0.9	1.0/3.2	102	102	102	320
					GI8059	56	59	78						
					GI8062	59	62	81						
					GI8065	62	65							
					GI8068	65	68							
9	4”	29	115	23	GI9074	68	74	88	0.3/0.9	1.0/2.5	126	126	126	320
					GI8080	74	80	96						
					GI8086	80	86	104						
					GI8092	86	92							
Standard threads table, for alternative threads see relative table.														

Barrier Cable Glands Features

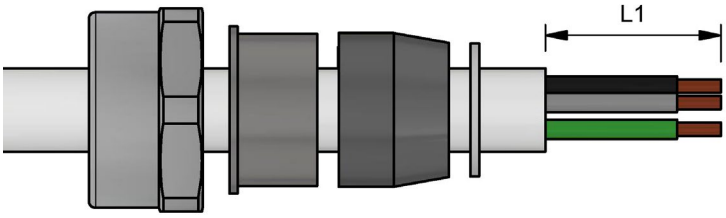
The barrier cable glands type P**B and PN**B are provided with sealing chamber to meet the requirements of cl. 10.6.2 of 60079-14. Is present a cylindrical flameproof joint between the sealing chamber and the body of the cable.
The main features, the maximum number of wires that could be sealed inside chamber and its diameter are listed in table. In any case at least the 20% of the internal section of the chamber must be filled with resin and single wire must be separated from others by resin.
Could be used liquid resin RSN#C.

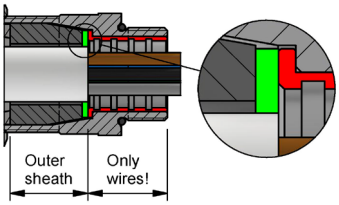
Size	Sealing chamber			
	Ø passage (mm)	Ø wires (mm)		Max wires n°
		Min	Max	
0	10	2	8,5	7
1	13	2	11	11
2	17	2	15	19
3	23	2	20	16
4	29	2	25,5	26
5	35	2	31	5
6	44	2	39	5
7	55	2	49	5
8	69	2	61	5
9	90,5	2	80,5	5

Cable Gland Installation

1

During unpackaging and installation pay attention to avoid impacts and scratches on the outer surface of sealing chamber and to inner surface of cable gland body (Explosion Proof Joint).
Cable preparation. Slide onto cable, sequentially: PTD (if present), nut, pushing ring, inner seal (see selection table) and resin seal rubber. Strip, with convenient tools, the outer sheath of the cable. L1 length is according to the installation needs, considering that will pass through the sealing chamber and enter the enclosure only wires with relative insulation.



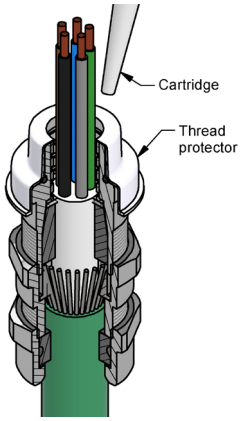


2

Position all cable gland components on the cable, as per final mounting position; ensure that sealing rubber push on outer sheath of the cable and that only wires with relative insulation pass inside sealing chamber. It is not necessary -for the moment- apply the final torque on nuts.

3

Block cable with cable gland in vertical position. Apply on cable gland the special thread protector; this temporary element is necessary to avoid, in case of involuntary over-application of resin, the soil of the body thread with resin. Proceed with resin preparation as per the next chapter and start the application; if necessary, use the silicone cartridge supplied as accessory.



4

<u>WEICON C Epoxy resin application</u>. WEICON C by Weicon is a temperature-resistant and flowable epoxy resin system for the filling of sealing chambers of P..B barrier cable glands made by Bartec FN. The resin is noncorrosive, anti-magnetic and cures practically without shrinkage. For info about temperatures of use please refer to standard cable glands “Instructions for use”. When using this product, the physical, safety related, toxicological and ecological data and regulations indicated in safety data sheet must be observed.

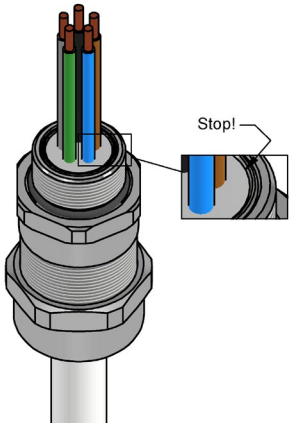
<u>Surface pre-treatment</u>. Before processing the resin ensure that the internal surface of cable gland sealing chamber and the wires of cable must be free of any oil, grease, dirt, rust, oxides paint or other impurities.

<u>Mixing</u>. Before adding the hardener, the resin must be stirred thoroughly and free of bubbles. Then mix the resin and the hardener thoroughly for at least four minutes at 20°C. To do so, use the included processing spatula or a Mechanical mixer. The component should be stirred until a homogeneous mixture is achieved. The mixing ratio of the two components must be strictly observed, as otherwise, strongly deviating physical values will result. Only mix a batch as large as can be processed within the pot life of 60 minutes. The specified pot life refers to a material batch of 500g and 20°C material temperature. Mixing larger quantities or higher processing temperatures will result in faster curing due to the typical reaction heat of epoxy resins.

Application. For processing, we recommend an ambient temperature of 20°C (68°F) at less than 85% relative humidity. Make sure that the epoxy resin is applied evenly and without air bubbles. After 4h from the application the resin reaches the 35% of the final strength, and the cable gland could be handled.
Final hardness is reached after 24h at 20°C at the latest. At lower temperatures the curing can be accelerated by evenly applying heat up to max. 40°C, e.g. with a heating pack, hot air blower or fan heater. Temperatures below 16°C increase the curing time, until at approx. 5°C and below, almost no reaction will take place at all.

Storage. Expiration date is indicated on resin pot. It's still valid if resin is stored at room temperature (from +18°C to +28°C), in a dry place.

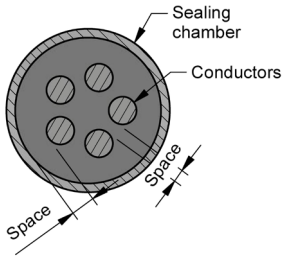
For additional information on Weicon C or instructions in other languages refer to Weicon download center. In any case, all the indications given in the Weicon instructions, contained in each kit, must be strictly followed.



5

Filling the resin inside the sealing chamber up to reach (but not exceed) the top of sealing chamber; move gently the conductors to enable the resin to flow and ensure there are no air bubbles inside. After this, add more resin if necessary. This process also ensures that the resin has come in contact with all the conductors. Keep attention to place the conductors leaving sufficient space for resin between one conductor and the others and between conductors and the walls of the sealing chamber. After 4h from the application the resin reaches 35% of the final strength and the cable gland can be handled. Remove the thread protector and disassemble the cable gland.
Estimated resin amount, for each cable gland size, is according to table below.

Cable gland size	0	1	2	3	4	5	6	7	8	9
Resin amount (g)	4	7	12	21	36	53	86	159	250	533



6

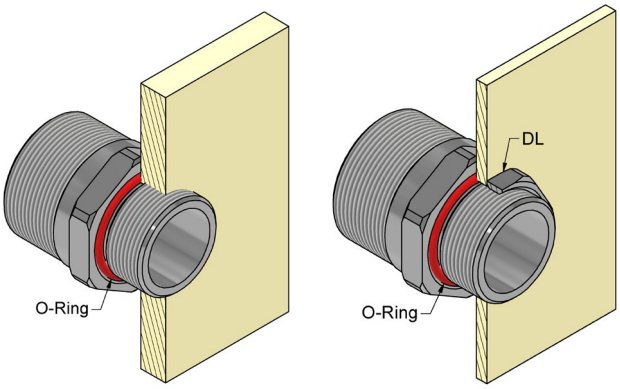
Fit the cable gland body (and accessories if needed) with an appropriate tool, on the enclosure wall, prepared with a suitable hole (tolerances according thread type, see threads table). Meet reference tightening torque.

Tightening torque (Nm)	Size 0	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 7	Size 8	Size 9
Metal enclosures	15	15	20	25	30	35	40	50	50	50
Plastic enclosures	5	5	10	15	18	18	20	20	20	20
Locknuts	4	5	6	8	10	10	15	15	15	15

Holes characteristics on **Ex d enclosures**:
Threaded holes where cable gland are installed must match with thread type of cable gland and meet requirements of EN/IEC 60079-1. To prevent corrosion and to ensure low friction screwing in thread must be greased. Use preferably copper paste CFG or silicone grease Loxeal GS9 or Loctite 8104 (or other corrosion protection according to requirements of EN/IEC 60079-14).

Holes characteristics on **Ex e/nR/tb/tc enclosures**:
- Parallel threaded holes. Use O-ring or gasket supplied with cable gland.
- Tapered threaded holes. For Ex tb the wall must be thick enough to engage at least 3,5 full threads. To prevent corrosion and to ensure low friction screwing in thread must be greased. Use preferably copper paste CFG or silicone grease Loxeal GS9 or Loctite 8104.
- Unthreaded holes. Use O-ring or gasket supplied with cable gland and fix it with locknut (during assembly it is recommended to rotate the locknut, not cable gland, to avoid gasket damage). The hole diameter must be according to the table. Holes must be free of burrs. Wall thickness must be min 1,2mm, max 8mm.

Thread	Clearance hole Ø (mm)
M16	16 +0.3/-0.0
M20	20 +0.3/-0.0
M25	25 +0.3/-0.0
M32	32 +0.3/-0.0
M40	40 +0.3/-0.0
M50	50 +0.3/-0.0
M63	63 +0.3/-0.0
M75	75 +0.3/-0.0
M90	90 +0.3/-0.0
M115	115 +0.3/-0.0



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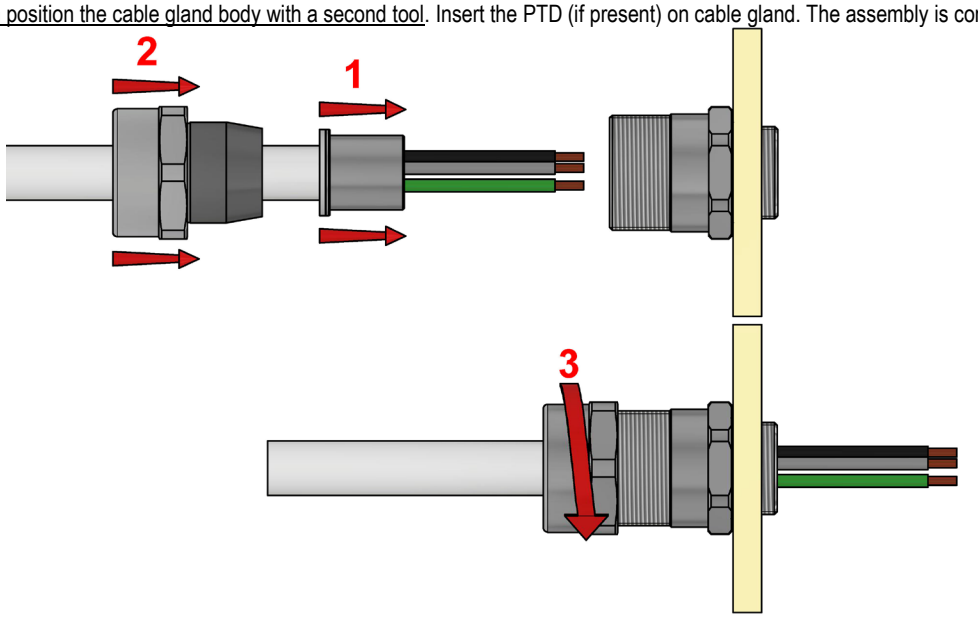
Slide the cable inside the body as also sealing chamber fit into body and -keeping a light pressure on cable- screw the nut with the tool up to complete tight. Be careful to always hold in position the cable gland body with a second tool. Insert the PTD (if present) on cable gland. The assembly is complete.