

October 2016

REVF and REVN series: the correct use of cable glands for conduit pipe coupling

In plant systems often coexist the needs for connections to end users, both directly with cable glands with simple or double seal, and with cable glands for connection to rigid or flexible conduit pipe for mechanical protection to non-armoured cable or **to armoured cable exclusively with seal on the outer sheath**.

While we already discussed in the previous newsletters of the cable glands with simple or double seal, we didn't make exhaustive examples of the mounting needs of cable glands for coupling with conduit pipe.

The cable glands suitable for this purpose are divided into two categories such as:

- **REVF** series, *with threaded female swivel entry*;
- **REVN** series, *with threaded male swivel entry*.

They are suitable for use in hazardous areas with danger of explosion to enable direct insertion of non-armoured cables or **armoured cable exclusively with seal on the outer sheath** (inserted into rigid or flexible conduit) into explosion-proof junction boxes, lighting fixtures, plugs and sockets, etc. They are provided with one sealing ring which tightens the incoming cable ensuring the 'Ex d' way of protection and the IP 66/67.

The peculiarities of these cable glands, unlike what the competition places on the market, can be summarized briefly in:

- Ease of assembly, thanks to the particular way of coupling, which allows an easy closing of the thread between the pipe and cable gland, without having to implement complicated operations and without the need of a three-pieces union. In fact, our cable glands easily incorporate a swivel joint that ease these operations and eliminates the need to adopt a three-pieces union.
- The innovation of **REVF and REVN** series cable glands is a **further key action point** respect to the previous FGF, FGN series, to allow the tightening of external threaded bushing with a hexagonal key. In fact, in the previous series of cable glands, the tightening of the external threaded bushing was only possible through the use of an adjustable pipe tongs. This operation, if not carried out by specialized personnel, could ruin, scratch, engrave or change the form of the ring, compromising the durability and tightness. Cortem, thanks to this technology, has eliminated this risk and, at the same time, it allows to tighten with the right force the cable to the conduit pipe, without any permanent deformation.

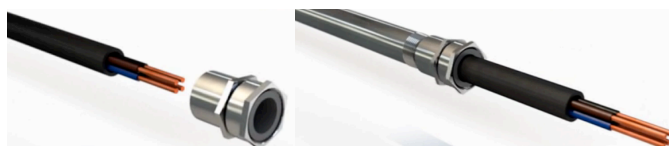
1. The correct installation of REVF, REVN series cable glands

First of all, since this type of cable glands has been designed specifically to allow a coupling able to ensure a complete mechanical protection to the cable, the installer must properly position the rigid tube perfectly in axis with the threaded entry on the Ex d junction box.

Continue with the insertion of the cable inside the rigid tube, recalling that, for explosion-proof equipment, are not allowed tubes with internal ridges such as, for example, welded and not rectified tubes (a suitable type of pipe is the "Freez-moon" in accordance with UNI 7683 standard). This type of pipe, which is rectified or without welding, guarantees the integrity of the cable in the phases of insertion. Particular attention may be further made in the cutting phase of the rigid tube, in order to remove any possible presence of ridges on its cutting top.



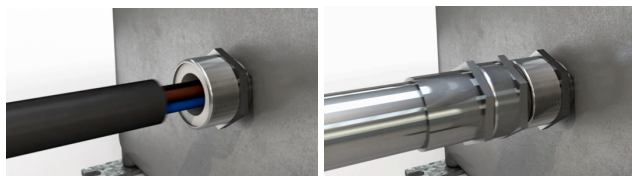
Proceed, therefore, inserting the end part of the cable gland on the rigid tube.



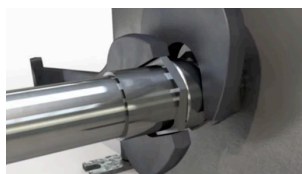
Next, tighten the cable gland body on the junction box/lighting fixture, having previously introduced the special seal, if the thread is metric ISO M, to ensure the IP degree of protection.



Proceed screwing the terminal part of the cable gland with the rigid tube aligned with the coupling axis or on the flexible tube if provided as an alternative to the rigid tube.



Now just bring the rotatable end to the cable gland body and continue with the full tightening.



2. The typical system installations

Type 1: fixed installation on dynamic machines such as motors, generators, motor-operated valves or other rotating machines. In this category fall the electric motors, generators, turbines, the actuators for motorized valves and all equipment that have a process function and which generate vibrations during their operation.

Type 2: fixed or mobile installation on static machines (without generation of vibration). In this category fall power and light panels, the local control columns, the lighting fixtures, heat exchangers, local control panels, the heat-tracing systems, measuring and control instruments, the monitoring stations of the case and all equipment that have a management function and process but that do not generate vibrations during their operation.

In all these systems, it's necessary the use of cable glands which can guarantee the explosion-protection, the degree of mechanical protection from the penetration of solid bodies and liquids and the protection from damaged electrical cables or instrumental.

We give here below some examples of application plant, *recalling that the designer must made the correct choice observing the provisions of paragraph 10.6.2 of IEC/EN 60079-14 into force.*

a) Typical example of a connection to rotary electric machine, horizontal pump driven by an electric motor (**Type 1**), with connection to the terminal strip located laterally to the engine.

Ex d method of protection:

1=three-pieces union; 2=sealing fittings; 3=flexible tube; 4= coupling; 5=rigid tube; 6=electrical cable

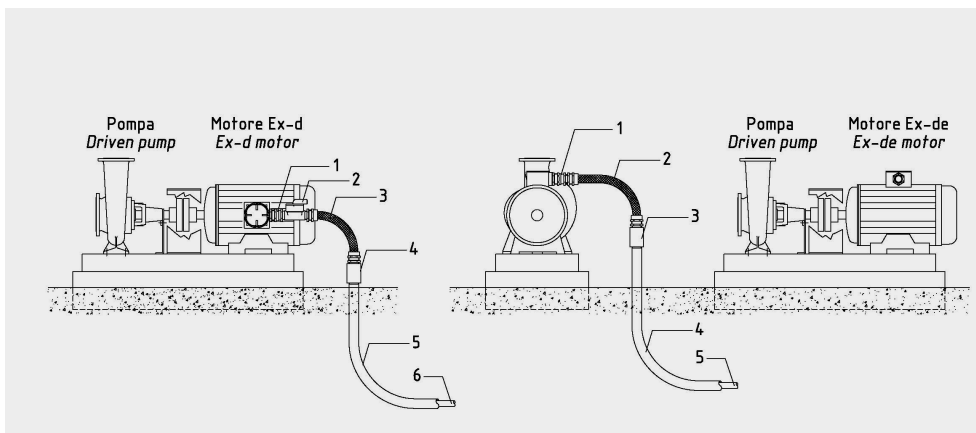
Ex de method of protection:

1= **REVN** cable gland; 2= flexible tube; 3= coupling; 4= rigid tube; 5= electrical cable
(electrical cable must conform to the specifications required by paragraph 9.3.2 of IEC/EN 60079-14:2013-11)

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To be sure to be safe.



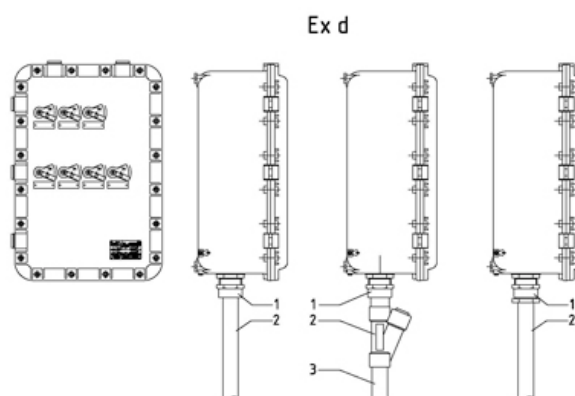
b) Typical example of fixed or mobile installation on stationary machine, local panel (**Type 2**) with terminal block connection

Ex d method of protection:

1= **REVN** cable gland; 2=electrical cable (*electrical cable must conform to the specifications required by paragraph 9.3.2 of IEC/EN 60079-14:2013-11*)

1= three-pieces union; 2= sealing fitting; 3= electrical cable

1= barrier cable gland; 2= electrical cable



Ex de method of protection:

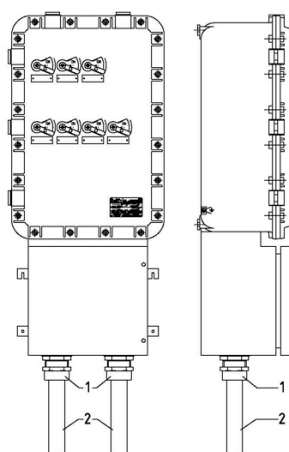
1= **REVN** cable gland; 2= electrical cable

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Ex de



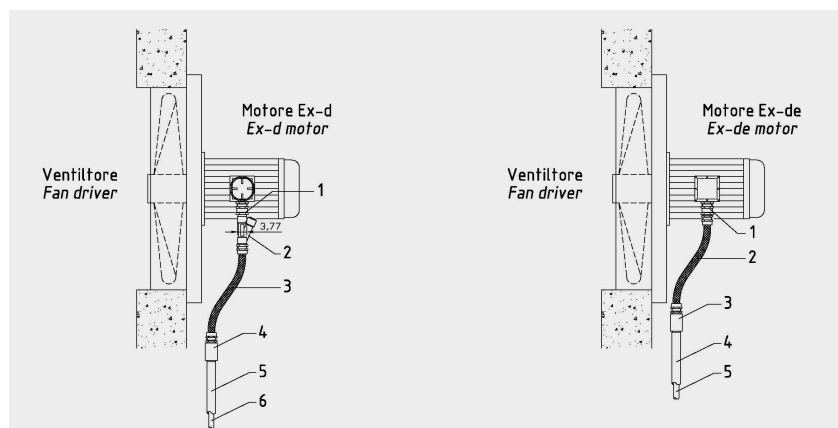
c) Typical example of a connection to a rotary electric machine, fan/extractor, activated by electric motor (**Type 1**), with connection to the terminal board located laterally to the engine

Ex d method of protection:

1= three-pieces union; 2=sealing fitting; 3=flexible tube; 4=coupling; 5=rigid tube; 6=electrical cable

Ex de method of protection:

1= **REVN** cable gland; 2= sealing fitting; 3= flexible tube; 4= coupling; 5= rigid tube; 6= electrical cable (*electrical cable must conform to the specifications required by paragraph 9.3.2 of IEC/EN 60079-14:2013-11*)



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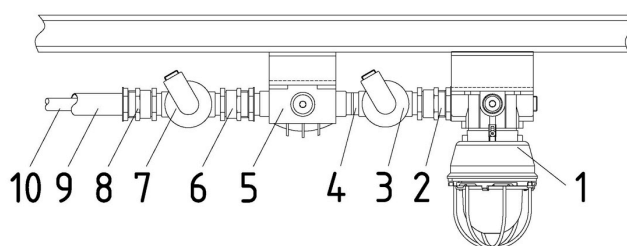


To be sure to be safe.

d) Typical example of installation on fixed or mobile installation on the stationary machine, lighting fixture (**Type 2**), with terminal block connection

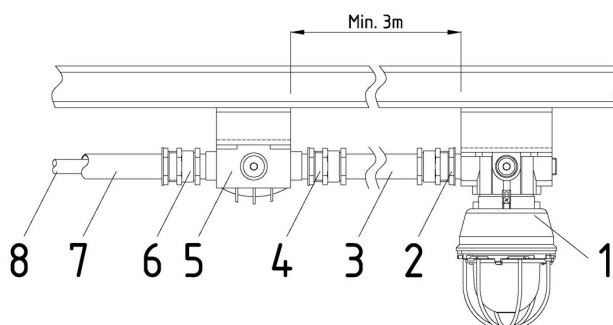
Ex d method of protection:

1= lighting fixture; 2= three-pieces union; 3= sealing fitting; 4= nipple; 5= Ex d junction box; 6= three-pieces union; 7= sealing fitting; 8= three-pieces union; 9=rigid tube; 10= electrical cable



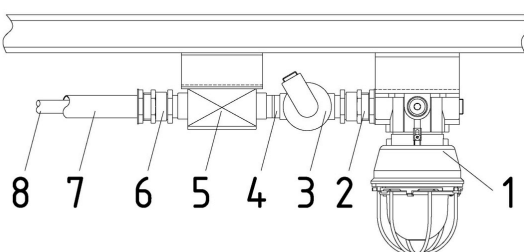
Ex d method of protection:

1=lighting fixtures; 2= **REVN** cable gland; 3=rigid tube; 4= **REVN** cable gland; 5= Ex d junction box; 6= three-pieces union; 7= rigid tube; 8= electrical cable (*electrical cable must conform to the specifications required by paragraph 9.3.2 of IEC/EN 60079-14:2013-11 and the distance between the lighting fixture and the junction box must be greater than 3 meters*)



Ex de method of protection:

1= lighting fixture; 2= three-pieces union; 3= sealing fitting; 4= nipple; 5= Ex e junction box; 6= **REVN** cable gland; 7=electrical cable



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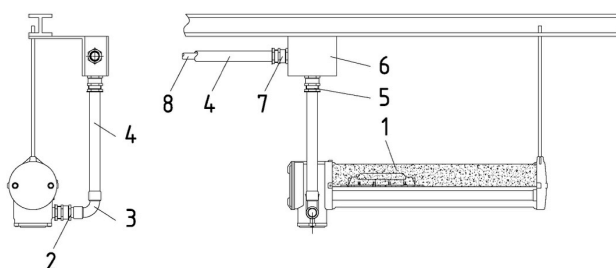


To be sure to be safe.

e) Typical example of installation on fixed or mobile installation on the stationary machine, lighting fixture (**Type 2**), with terminal block connection

Ex de method of protection:

1= lighting fixture; 2= **REVN** cable gland; 3= 90° elbow; 4= rigid tube; 5= three-pieces union; 6= Ex e junction box; 7= **REVN** cable gland; 8= electrical cable



f) Typical example of installation on fixed or mobile installation on the stationary machine, socket outlet (**Type 2**), with terminal block connection

Ex d method of protection:

1= FM socket outlet; 2= three-pieces union; 3= sealing fitting; 4= rigid tube; 5= electrical cable

1= FM socket outlet; 2= **REVN** cable gland; 3= electrical cable ((*electrical cable must conform to the specifications required by paragraph 9.3.2 of IEC/EN 60079-14:2013-11*)).

