

Appendix for ATEX Certified EX Units Instruction Manual



**Sierra Instruments' Model 640S-ATEX
and 780S-ATEX Flow Transmitters**

Part Number: IM-ATEX, Rev. G February 2026

GLOBAL SUPPORT LOCATIONS: WE ARE HERE TO HELP!

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IMPORTANT CUSTOMER NOTICE- OXYGEN SERVICE

Sierra Instruments, Inc. is not liable for any damage or personal injury, whatsoever, resulting from the use of Sierra Instruments standard mass flow meters for oxygen gas. You are responsible for determining if this mass flow meter is appropriate for your oxygen application. You are responsible for cleaning the mass flow meter to the degree required for your oxygen flow application.

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This is a certified ATEX document. Changes must be approved by the Sierra Instrument's "ATEX Authorized Person"

1. Labeling

Sierra Instruments Model 640S-ATEX and 780S-ATEX Flow Transmitters that have the following label attached have been certified in compliance with the directive 2014/34/EU.

SIERRA INSTRUMENTS, INC.	20 Ryan Ranch Rd, Suite 109, Monterey CA, USA 93940 www.sierrainstruments.com 831-373-0200
Serial No	Year of Mfr
Model No	
 II 2G Ex db IIB+H2 T6...T2 Gb / II 2D Ex tb IIIC T85 °C...T226°C Db	
KEMA 06ATEX0105X	SEE MANUAL  2809
Ambient temp: -20°C TO 50°C	
Electrical cable entries: 2x3/4" NPT - Housing Rating IP66	
WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT	

KEMA ATEX official label from Sierra Instruments, Inc.

The following information is provided as part of the labeling of the transmitter:

- Name and address of the manufacturer: Sierra Instruments, Inc., 20 Ryan Ranch Road, Suite 109, Monterey, CA 93940, USA, Ph. 831-373-0200, www.sierrainstruments.com
- The serial number of the device
- Year of construction
- Model Number
- CE Mark
- Marking for explosion protection: II 2G Ex db IIB+H2 T6...T2 Gb / II 2D Ex tb IIIC T85 °C...T226°C Db (Suitable for Use in Zone 1 Gas and Dust applications)
- ATEX certificate: KEMA 06ATEX0105X
- Cable entry threads information (3/4" NPT) and housing IP rating

2. Type Approval Standards

The Sierra Instruments Ex approved flow meters have an EU Type examination certificate issued by DEKRA Certification B.V. and have been approved to the following standards:

EN IEC 60079-0 : 2018
EN 60079-1 : 2014
EN 60079-31 : 2014

3. Zone, Gas Group, Category and Temperature class

The Sierra Instruments 640S-ATEX and 780S-ATEX have been certified: II 2G Ex db IIB+H2 T6...T2 Gb / II 2D Ex tb IIIC T85 °C...T226°C Db (Tamb. -20°C to +50°C)
This means that the units can be installed in locations with the following conditions.

3.1. Area Classification

Zone 1	Area in which an explosive gas atmosphere is likely to occur in normal operation occasionally
Zone 2	Area in which an explosive gas atmosphere is not likely to occur in normal operation and if it does occur, is likely to do so only infrequently and will exist for a short period only
Zone 21	Place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally
Zone 22	Place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does, will persist for a short period only

3.2. Gas Grouping

Group IIA	Propane
Group IIB	Ethylene
Group IIC	Hydrogen and Acetylene

3.3. Equipment Category

2G: Suitable for use in zone 1 and 2 (gas atmosphere)

2D: Suitable for use in zone 21 and 22 (dust atmosphere)

3.4. Temperature Classification

Local Probe (E2)		
Temperature Class	Maximum Surface Temperature T	Maximum Process Temperature
T6	85 °C	41 °C
T5	100 °C	56 °C
T4	135 °C	65 °C

Remote Probe (E3)		
Temperature Class	Maximum Surface Temperature T	Maximum Process Temperature
T6	85 °C	41 °C
T5	100 °C	56 °C
T4	135 °C	91 °C
T3	200 °C	156 °C
T2	226 °C	177 °C

3.5. Ambient Temperature Range

Ambient temperature range -20°C to +50°C

4. Safe Use of ATEX Approved Equipment

4.1. Notes on Safe Use of the ATEX Approved Equipment

Approved usage of the meter is restricted to fluids compatible with the wetted materials of the flow meter and within the restrictions on temperature and pressure as defined in the product manual.

The equipment shall not be used in hazardous areas where electrostatic charging mechanisms stronger than manual rubbing may be expected.

4.2. Mounting, Commissioning, and Operation

The device has been designed to operate safely in accordance with the current technical and safety regulations of the EU. If installed incorrectly or used for applications for which it is not intended, it is possible that application related changes may arise. For this reason, the instrument must be installed, connected, operated, and maintained according to the instructions in this and the specific product operating manual.

Persons handling/installing or commissioning this equipment must be authorized and suitably qualified. The manual must be read, understood, and the instructions must be followed. Modifications and repairs to the device are only permissible when they are expressly approved in this manual.

4.3. Explosive Hazardous Area

If the device is to be installed in an explosive hazardous area, then the specifications in the certificate as well as all national and local regulations must be observed.

The instrument can be delivered with the certificate ATEX, FM, or CSA. The certificate type can be identified from the eighth group of letters on the model code stamped on the nameplate. For example:

NA : Not suitable for hazardous areas
AT : II 2G Ex db IIB+H2 T6...T2 Gb
 : II 2D Ex tb IIIC T85°C...T226°C Db
FM : Explosion proof for Class I, Division 1, Groups B, C, D
CS : Explosion proof for Class I, Division 1, Groups B, C, D

This manual addition only applies to ATEX units.

The unit is supplied without cable glands for the power and signal. It is the users responsibility to select suitable cable glands that meet or exceed the required EX approval according to EN IEC 60079-0 and EN 60079-1 and/or EN 60079-31 and that are suitable for the signal and power cable used. For a process temperature of +65 °C cable glands and cable shall be suitable for at least +90 °C. The connection on the electronics housing for the cable glands is 3/4" NPTF according to the NPT requirements of ANSI/ASME B1.20.1. Any unused openings shall be closed with suitable blind plugs with a minimum IP66 rating that meet or exceed the required EX approval according to EN IEC 60079-0 and EN 60079-1 and/or EN 60079-31. Installation standard EN 60079-14 shall be followed for the selection of cable glands and blind plugs.

NOTE: Please insure that when you mount these cable glands they are made-up wrench tight. At least 3 1/2 turns of the thread must be engaged inside of the electronics enclosure.

4.4. Specific Conditions of Use

- Flameproof joints are not intended to be repaired.
- To minimize the risk of electrostatic charge, provisions shall be made for adequate grounding and equipment shall be installed in such a manner so that accidental discharge shall not occur.
- The cable glands are for fixed installations only. The user shall ensure adequate clamping of the cables.

4.5. Particular Recommendations: Closing the Cover

- The safety is guaranteed as long as the cover is correctly screwed and clamped.
- The indication « WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT» must be strictly respected before any operation on the instrument.

5. Remote Electronics

Sierra Thermal flow transmitters with E3 in the model code have remote electronics. They have a cable with Ex glands between the sensor and the electronics. The E3 remote electronics cable must not exceed +90 °C maximum service temperature. With these models it is not possible or allowed to disconnect the cable from the sensor side. It is possible to disconnect the cable and re-mount it using the electronics' side.

Please observe the following: Ensure that the power to meter has been disconnected before you open the Ex d housing. Then open the terminal housing (short dome on the housing) This dome is sealed with a set-screw in the edge of the dome. Unscrew the set-screw and screw the dome from the housing. Record the color of the wires to terminals 16 thru 20. Disconnect the sensor wires (See diagram below).

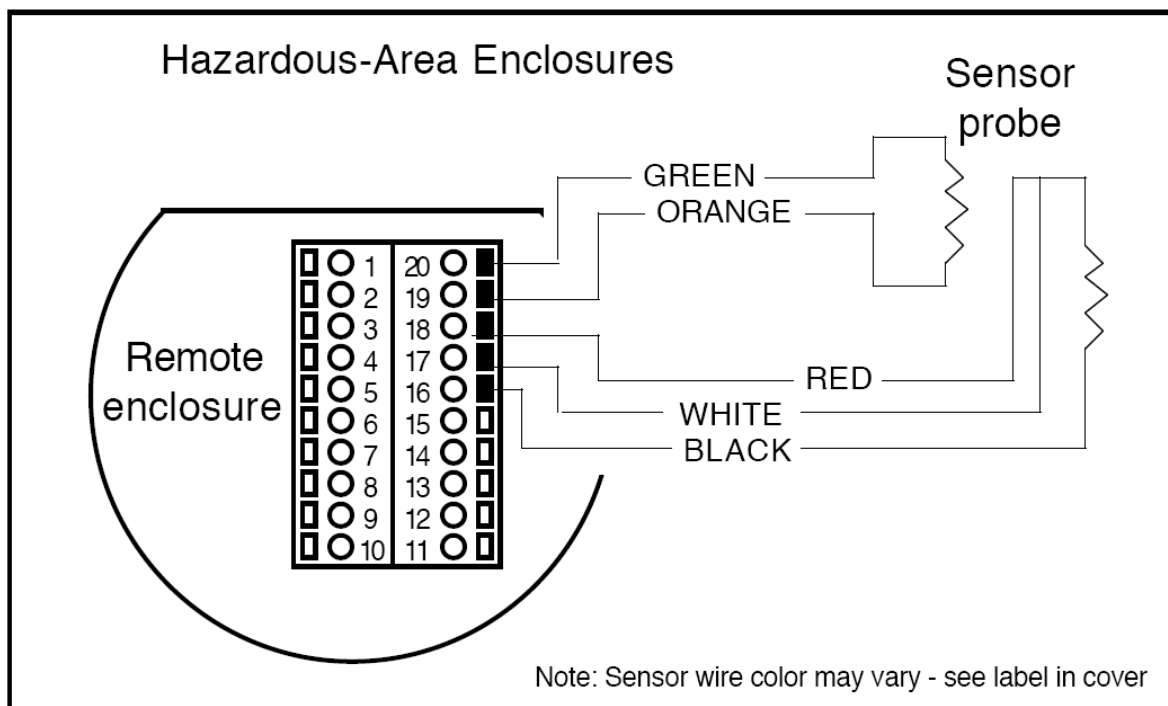


Fig 2 Wiring diagram remote probe (E3 option)

Unscrew the cable gland and remove the wire from the electronics housing.

To re-install the cable, insert the cable in the cable gland. Then connect the wires to terminals 16 – 20, ensuring that they are connected identically to what they were before you removed the cable.

Assemble the cable gland according to the cable gland manufacturers' instructions (See enclosed), close the housing, tighten the set-screw, and power the system up.

NOTE: The unit has some built in electronic wire length compensation. It is possible to shorten the cable or to extend it up to +/- 25% of the cable length. Use only Sierra cable PN 23-0221.

6. Maintenance

6.1. External Maintenance

The Sierra flow meters can be externally maintained with a dry clean cloth.

6.2. Sensor Maintenance

The sensor can be maintained by switches off the power, removing the probe from the process and cleaning the probe with a solvent compatible with 316SS. After cleaning the probe clean and dry the sensor with compressed air before you insert it back it the process. It is not recommended to us any Ultrasonic Bath cleaning.

6.3. Internal Maintenance

Please make sure that the internals of the unit always stay dry and clean. There are no User maintainable components inside the electronic compartment

7. Earthing

The Sierra Instruments units must be connected to a good quality earth. The units are provided with internal and external earthing terminals.

7.1. External Earthing

The external earthing connection is located on the boss on the outside of the housing and consist of an 316SS screw (10-24" UNC-2B thread), seal spring washer and cable shoe/crimp lug suited for maximum 3 mm OD Ground cable connection.

When using the external earth terminal the provided or similar cable shoe/crimp lug with a seal spring washer must be used to ensure that the cable lug is secured against loosening and twisting.

7.2. Internal Earthing

The internal earthing connection is located in the terminal housing and consist of an 316SS screw (10-24" UNC-2B thread), seal spring washer and cable shoe/crimp lug suited for maximum 3 mm OD Ground cable connection.

When using the internal earth terminal the provided or similar cable shoe/crimp lug with a seal spring washer must be used to ensure that the cable lug is secured against loosening and twisting.

8. Warning

The electronics for EX unit contain special Ex dedicated electronics. No customer modifications are available and are strictly forbidden. Any modification or adjustment to the electronics can be performed at the factory only.

9. Returning Equipment to Factory

9.1. Factory Calibration – All Models

Sierra Instruments maintains a fully-equipped calibration laboratory. All measuring and test equipment used in the calibration of Sierra transducers are traceable to NIST Standards. Sierra is ISO-9001 registered and conforms to the requirements of ANSI/NC SL-Z540 and ISO/IEC Guide 25.

9.2. Instructions for Returning Your Instrument for Service

The following information will help you return your instrument to Sierra Instruments' Factory Service Center and will ensure that your order is processed promptly. Prices may vary depending on the flow range, type of gas and operating pressure of your unit. To request detailed pricing, contact your local Sierra Instruments distributor or contact one of our offices directly.

Please follow these easy steps to return your instrument for factory service:

1. To obtain a Return Materials Authorization (RMA) number from the Sierra Instruments to <http://www.sierrainstruments.com/rma/new.php> to create a Sierra Account.
2. Once you have created an account, click on the Submit New RMA tab and fill in the RMA form and follow the instructions. You will receive an email confirmation once you have submitted your RMA.
3. Print a copy of the RMA (that now includes RMA #) and send a copy of the RMA form along with your meter back to the factory.

If you require service beyond calibration, but do not know which service(s) will be required, describe the symptoms as accurately as possible on the RMA form.

Pack your instrument carefully. Use the original packaging and foam or bubble wrap (packing peanuts NOT recommended) and include a copy of the RMA form (complete with Sierra supplied RMA number) with the unit(s).

Ship the unit(s) to the following address:

Sierra Instruments, Inc.
Attention: Factory Service Center
20 Ryan Ranch Road, Suite 109
Monterey, CA 93940 USA
RE: RMA# (your number)

10. Addendum: Installation Instructions Cable Gland

Manufacturer:

Peppers Cable Gland Ltd
Stanhope Road
Camberley
Surrey
GU15 3BT
UK

Used Cable Glands on Sierra E3 units:

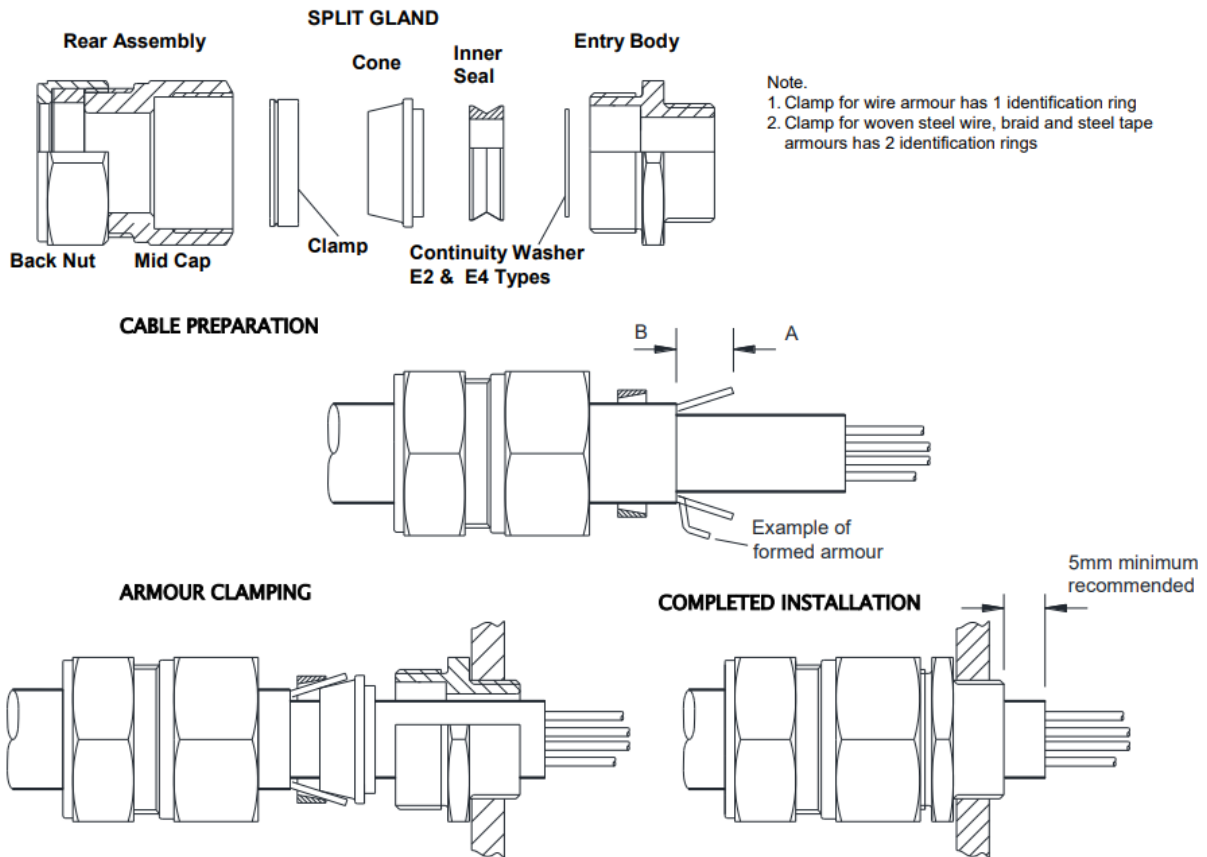
E3WFR/16/050 (With Silicon Seals) (Sierra Reference 30-0701)

E3WFR/16/075 (With Silicon Seals) (Sierra Reference 30-0702)

Brief Description: The Peppers E****F* type cable gland is for outdoor use in the appropriate Hazardous Areas with armored cable. They give environmental protection to IP66/67/68 (50 meters for 7 days). The type IE option has an earth stud on the entry body. A termination suitable for EMC protection can be made using armored cables with these glands. Clamp options allow wire armor, braid and steel tape armors. A variant giving electrical continuity to a lead sheath cable is available.

Warning

Please read these instructions carefully. These products should not be used in applications except as detailed here or in our datasheets, unless confirmed in writing by Peppers. Peppers take no responsibility for any damage, injury or other consequential loss caused where products are not installed or used according to these instructions. This leaflet is not intended to advise on the selection of product. Further guidance can be found in the standards listed overleaf or the prevailing code of practice.

STEP-BY-STEP FITTING INSTRUCTIONS (Note: No Back Nut & Outer Sheath Seal in D**F glands)****INSTRUCTIONS**

1. Split gland as shown.
2. Remove the Inner Seal. This must be removed to effectively clamp armor. E2 & E4 types: - remove Continuity Washer.
3. Fit Entry Body, allowing for any installation accessories, and fully engage the thread into the equipment. Hand-tighten, then suitably secure with a wrench.
4. Slide Rear Assembly (and shroud if required) onto cable as shown.
5. Prepare cable as shown in diagram.
 - a. Strip the outer sheath and armor to suit the installation. For lead sheathed cable the lead sheath must pass through the Continuity Washer when installation is complete.
 - b. Expose armor approx. 20mm long and slide the Clamp over the exposed armor. Slide cone on to inner sheath and spread armor over the cone. Where sheath sizes are near minimum, form armor to facilitate clamping as shown. Ensure the Clamp is in the correct orientation. The clamp should be positioned so that the identification ring(s) are away from the cone.
6. Insert cable through Entry Body. Do not re-fit seal or continuity washer. Push cable forward to maintain armor contact.
7. Support the cable to prevent it from twisting. Hand tighten Mid Cap to Entry Body to lock onto armor. When tight, further tighten Mid Cap 1 full turn with wrench. Cable with

- maximum diameter wire armor may require an additional ½ to 1 turn.
8. Loosen off Mid Cap to visually check armor is securely locked. If armor has not clamped repeat the clamping process.
 9. Pull out cable from Entry Body. Re-fit the inner seal (and continuity washer on E2 & E4 Types). Re-insert cable through the seal, (and continuity washer if fitted) and Entry Body. For lead sheath cable the Continuity Washer must be in contact with the lead sheath & must be in front of the seal.
 10. Re-tighten Mid Cap to the entry body. Ensure the seal makes full contact with cable inner sheath and then tighten the Mid Cap by the additional turns detailed in Table 1
 11. Hold Mid Cap with wrench and tighten Back Nut onto cable. Ensure the seal makes full contact with cable outer sheath and then tighten the back nut by the additional turns detailed in Table 1. If fitted, pull shroud over gland assembly.
 12. (E***IEF* / D***IEF options) For Integral Earth cable glands, connect the earth cable to the earth stud.

CABLE SIZES (mm), ARMOR ACCEPTANCE (mm) & ASSEMBLY DATA

Gland Size	Mid Cap Turns- Step 10	Back Nut Turns - Step 11	Inner Sheath		Outer Sheath		Reduced Bore		Armor Acceptance Ranges	
			Min	Max	Min	Max	Min	Max	Wire	Braid & Tape
16	1	1	3.5	8.4	8.4	13.5	4.9	10	0.9	.15 -.34

APPROVALS AND CERTIFICATIONS

Approval	Certification Number	Protection Concept / Type
ATEX (2014/34/EU)	CML 19ATEX1106X	 II 1D 2G Ex db IIC Gb / Ex eb IIC Gb / Ex ta IIIC Da
	CML 19ATEX4109X	 II 3G Ex nR IIC Gc
IECEX	IECEX CML 19.0031X	Ex db IIC Gb / Ex eb IIC Gb / ExnR IIC Gc / Ex ta IIIC Da
CSA - Canada	1356011	Ex d IIC Gb / Ex e IIC Gb / CL I Div 2 Gr ABCD / CL II Gr EFG / CL III Type 4X
CSA - US	2627370	Class II, Division 1, Groups EFG / Class III; Type 4X
		Class I Zone 1 AEx e IIC Gb / Class II, Zone 20 AEx ta IIIC Da IP66 IP68
INMETRO	NCC 13.2186 X	Ex db IIC Gb / Ex eb IIC Gb / Ex nR IIC Gc / Ex ta IIIC Da
EAC	RU C-GB.BH02.B.00693/18	1Ex d IIC Gb X / 1Ex e IIC Gb X / 2Ex nR IIC Gc X / Ex ta IIIC Da X
UKRAINE	CLJ 18.0323 X	II 1D 2G 3G Ex db IIC Gb / Ex eb IIC Gb / Ex nR IIC Gc / Ex ta IIIC Da /
NEPSI	GYJ16.1400X	Ex d IIC / Ex e IIC
CCoE / PESO	P365300/2 & P365300/13	Ex d IIC Gb (Zone 1) / Ex e IIC Gb (Zone 2) / Ex nR IIC Gc (Zone 2)
ABS	20-LD1944057-PDA	Specified ABS Rules – See certificate
Lloyd's Register	10/00056(E2)	Ex db IIC Gb / Ex eb IIC Gb / Ex nR IIC Gc / Ex ta IIIC Da

Russian Maritime	19.00189.278	Ex d IIC Gb / Ex e IIC Gb / Ex ta IIIC Da
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INSTALLATION GUIDANCE

Point	Advice			
1	EN/IEC 60079-10	EN/IEC 60079-14	National Electrical Code (NEC 500 – 505)	Canadian Electrical Code (CSA C22.1)
2	Installation should only be carried out by a competent electrician, skilled in cable gland installation.			
3	Comprehensive details of the compliance standards can be found in the product certificates which are available for download from our website.			
4	NO INSTALLATION SHOULD BE CARRIED OUT UNDER LIVE CONDITIONS.			
5	Threaded entries: the product can be installed directly into threaded entries. Threaded entries should comply with the relevant applicable standards and have a lead-in chamfer to allow for full engagement of the threads. Failure to provide a sufficient lead-in chamfer may lead to ingress sealing issues. For Ex db applications a minimum of 5 fully engaged parallel threads is required. Parallel entry threads will maintain an IP rating of IP64. A Peppers sealing washer should be used to maintain all IP ratings greater than IP64. Any thread sealant used should be non-hardening. Whilst Peppers products with tapered threads, when installed into a threaded entry, have been tested to maintain IP66 without any additional sealant, due to the differing gauging tolerances associated with the use of tapered threads it is recommended to use a non-hardening thread sealant if an IP rating higher than IP64 is required.			
6	Clearance holes: these shall be 0.5mm (+/-0.2mm) larger than the nominal diameter of the external entry thread. The product should be secured with a Peppers locknut and the threads tightened to ensure the cable gland is secure. A Peppers sealing washer should be used to maintain IP ratings. A Peppers serrated washer should be used for additional installation protection.			
7	To maintain the Ingress Protection rating of the product, the entry hole must be perpendicular to the surface of the enclosure. The surface should be sufficiently flat and rigid to support the assembly and make the IP joint. The product incorporates a thread run out according to general machining techniques and will not have a full form thread for the entire length and as such entry threads should have a suitable lead-in chamfer to ensure a seal is maintained. Further guidance can be found in Peppers document CT0012 which can be found on our website. It is the user's/installer's responsibility to ensure that the interface between the enclosure and cable gland is suitably sealed for the required application.			
8	Where a bonding connection to earth is required a Peppers earth tag should be used. Peppers earth tags have been independently tested to comply with the Category B values given in IEC 62444. Further guidance can be found in Peppers document CT0017 which can be found on our website. Peppers earth tags should be fitted over the external entry thread from either inside or outside the enclosure. If fitted internally they must be secured with a Peppers locknut and optionally a Peppers serrated washer.			

9	Peppers external metric entry threads comply with ISO 965-1 and ISO 965-3 with a 6g tolerance fit. Peppers standard metric thread pitch is 1.5mm for threads up to M75 and 2.0mm for size M80 and above. Alternative thread pitches are available upon request. Peppers external NPT threads are in accordance with ASME B1.20.1 with gauging to clause 8.1. All threads comply with the threaded joint requirements of clause 5.3 from IEC 60079-1. Information on other thread types can be found in the product certificates.
10	Once installed do not dismantle except for routine inspection. An inspection should be conducted as per IEC/EN 60079-17. After inspection the gland should be re-assembled as instructed, ensuring the compression nut, mid cap and back nut are correctly tightened to ensure the cable is secure.
11	If required an anti-seize lubricant may be used to aid assembly and routine inspection. The lubricant should comply with the prevailing code of practice and care should be taken to ensure no lubricant comes into contact with the cable gland seals as this may impair performance.

Interpretation of Markings. Markings on the gland carry the following meanings:

Cable Gland Type & Size E-a-b-c-IE-F-R-ddd-eee-nn

a =	<u>Seal Type</u> 1 = Neoprene (black) 2 = Neoprene with Continuity washer 3 = Silicone (white) 4 = Silicone with Continuity Washer	R =	Optional reduced bore outer seal (red silicone)
b =	Armor clamping W = single wire armor X = woven steel wire/tape/braid	ddd =	Gland size
c =	Main component material A = Aluminum B = brass S = stainless steel	eee =	Entry thread type and size
IE =	Integral Earth stud option	nn =	Year of manufacture

SPECIFIC CONDITIONS OF USE

- These glands must not be used with enclosures where the temperature at the point of contact exceeds -35°C to +90°C using neoprene seals or -60°C to +180°C using silicone seals.
- These glands, when installed in accordance with the manufacturer's instructions and with an appropriate enclosure on which they are fixed, are capable of providing an ingress protection of IP66 and IP68 (50 meters 7 days)
- If these cable glands only grip the cable sheath of the cable and do not clamp the cable armor or if they are used to terminate unarmored, braided or screened cables, then they shall only be used for fixed installations, hence the cables shall be effectively clamped to prevent pulling or twisting.
- The threaded entry component threads without interface o-ring seals installed in an explosive dust atmosphere, within threaded entries, shall only be fitted into enclosures that have either:
 - parallel entries that will ensure that a minimum of 5 full threads of contact will be maintained, this is in accordance with clause 5.1.2 of EN 60079-31:2014 / IEC

60079-31: 2013,

- b. tapered entries that will ensure that a minimum of 3 ½ full threads of contact will be maintained, this is in accordance with clause 5.1.2 of EN 60079-31:2014 / IEC 60079-31: 2013

