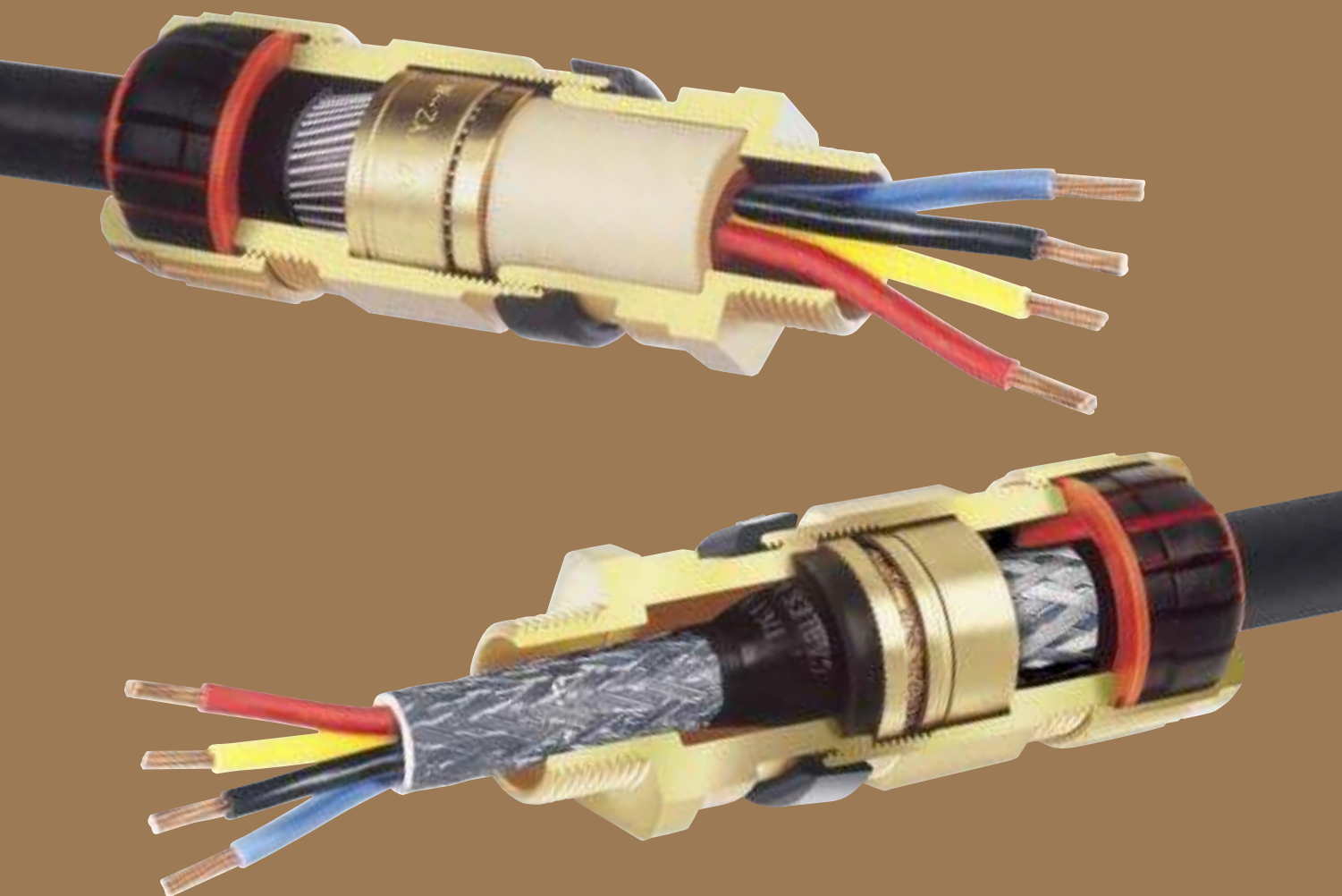




Cable Glands for Worldwide Applications

Featuring the New ATEX range



HAWKE
International



A QUALITY COMPANY ALWAYS DEMANDS THE BEST

For those who demand quality, reliability and above all, safety, Hawke products are the obvious choice.

Smarter Products

Hawke International is a member of the worldwide Hubbell Group of Companies and is a well established leading manufacturer of electrical equipment for Hazardous (Classified) locations and hostile environments, with an innovative range of cable connection, termination and barrier products.

Sustained safety and reliability under extreme conditions are Hawke's primary goals. The company also promise ease of installation and low lifetime cost of ownership - due to superior design, long life materials and precision manufacturing.

Worldwide

Located in Manchester, UK, Hawke International has subsidiary companies in Houston, USA and Singapore, along with direct representation in Brazil, the Middle East and Canada. Hawke International is supported worldwide by the Hubbell Group as well as by a network of agents and distributors.

Product Development

A commitment to the development of innovative features which improve the safety, versatility, reliability and ease of use of our products.

First Choice

Used on Offshore and Onshore oil and gas exploration and production facilities. Hawke's products are the 'First Choice' for the world's major oil and gas companies.

A Quality Company

Hawke International's products are designed and manufactured under a quality system not only complying with ISO 9001 but also with the latest international standards. Rigorous and regular in-house testing ensures that every product manufactured meets the highest quality standards.



Hawke International

"Leading the way in the design of Smarter Products"

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Flameproof/Increased Safety
and Industrial

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Flameproof/Increased Safety
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Cable Gland Type	Colour Code/ Page	Application/Cable Type	Sealing/ Ingress Protection	Material	Certification	Certificate Number	Protection Concept
 501/421	11	Indoor/outdoor Non-armoured cable	Outer cable sheath seal IP66/67/68 Deluge	Brass Stainless Steel		Certificate No. BAS 01 ATEX 2070X. For Os - F. Certificate No. BAS 01 ATEX 2294X. For G - J. CSA No. I015065. For Os - F. Cepel No. Ex - 059/2001X. For Os - F. GOST No. POCC GB.ГБ 05. B00428. Os - F. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 501/423	12	Indoor/outdoor Non-armoured cable	Two outer cable sheath seals IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2071X. For Os - F. Certificate No. BAS 01 ATEX 2295X. For G - J. CSA No. I015065. For Os - F. Cepel No. Ex - 060/2001X. For Os - F. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 501/453/Universal	13	Indoor/outdoor Armoured/braided cable with inner and outer sheath	Inner (diaphragm) and outer cable sheath seals IP66/67/68 Deluge	Brass Stainless Steel		Certificate No. BAS 01 ATEX 2078X. For Os - F. Certificate No. BAS 01 ATEX 2296X. For G - J. CSA No. I015065. For Os - F. Cepel No. Ex - 063/2001X. For Os - F. GOST No. POCC GB.ГБ 05. B00428. Os - F. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 501/453/RAC	14	Indoor/outdoor Armoured/braided cable with inner and outer sheath	Inner and outer cable sheath seals IP66/67/68 (Deluge option)	Brass Stainless Steel		Certificate No. BAS 01 ATEX 2072X. For Os - F. Certificate No. BAS 01 ATEX 2296X. For G - J. CSA No. I015065. For Os - F. Cepel No. Ex - 062/2001X. For Os - F. GOST No. POCC GB.ГБ 05. B00428. Os - F. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 501/453/RAC/L	15	Indoor/outdoor Armoured/braided cable with inner lead sheath and outer sheath	Inner lead sheath seal/electrical bond and outer cable sheath seal IP66/67/68 (Deluge option)	Brass		Certificate No. BAS 01 ATEX 2072X. For Os - F. Certificate No. BAS 01 ATEX 2296X. For G - J. CSA No. I015065. For Os - F. Cepel No. Ex - 062/2001X. For Os - F. GOST No. POCC GB.ГБ 05. B00428. Os - F.	Flameproof and Increased Safety
 PSG 553/RAC	16	Indoor/outdoor Armoured/braided cable with inner (optional) and outer sheath	Individual conductor seal and outer cable sheath seal IP66/67/68 (Deluge option)	Brass		Certificate No. BAS 01 ATEX 2074X.	Flameproof and Increased Safety
 ICG 623	17	Indoor/outdoor Non-armoured cable	Inner (compound) and outer cable sheath seals IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2079X. CSA No. I024328. Cepel No. Ex - 064/2001X. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 ICG 653/Universal	18	Indoor/outdoor Armoured/braided cable with inner (optional) and outer sheath	Inner (compound) and outer cable sheath seals IP66/67/68 Deluge	Brass Stainless Steel		Certificate No. BAS 01 ATEX 2080X. CSA No. I024328. Cepel No. Ex - 065/2001X. GOST No. POCC GB. ГБ05. B00428. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety

Cable Gland Selection Chart

Cable Gland Type	Colour Code/ Page	Application/Cable Type	Sealing/ Ingress Protection	Material	Certification	Certificate Number	Protection Concept
 ICG 653/UNIV/L	19	Indoor/outdoor Armoured/braided cable with inner lead sheath and outer sheath	Inner lead sheath seal/electrical bond and outer cable sheath seal IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2080X. CSA No. 1024328. Cepel No. Ex - 065/2001X. GOST No. POCC GB. ГБ05. B00428.	Flameproof and Increased Safety
 501/414	20	Indoor/outdoor Non-armoured cable, conduit system	Outer cable sheath seal IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2076X. CSA No. 1015065.	Flameproof and Increased Safety
 SB 474	21	Indoor/outdoor Individual conductors, conduit system	Individual conductor seal IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2077X.	Flameproof and Increased Safety
 CSB 656	22	Indoor/outdoor Individual conductors, conduit system	Individual conductor (compound) seal IP66/67/68 Deluge	Brass		Certificate No. BAS 01 ATEX 2082X. CSA No. 1024328. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety
 Oversize G, H & J	23	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 Increased Safety Cable Glands	24	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 I21	27	Indoor/outdoor Non-armoured cable	Outer cable sheath seal IP66/67/68 Deluge	Brass	—	—	Industrial
 I23	28	Indoor/outdoor Non-armoured cable	Two outer cable sheath seals IP66/67/68 Deluge	Brass	—	—	Industrial

Cable Gland Selection Chart

Cable Gland Type	Colour Code/ Page	Application/Cable Type	Sealing/ Ingress Protection	Material	Certification	Certificate Number	Protection Concept
 I50/RAC	29	Dry Indoor/outdoor Armoured/braided cable with inner (optional) and outer sheath	————	Brass	————	————	Industrial
 I51/RAC	30	Indoor/outdoor Armoured/braided cable with inner (optional) and outer sheath	Outer cable sheath seal IP66 (Deluge option)	Brass	————	————	Industrial
 I53/RAC	31	Indoor/outdoor Armoured/braided cable with inner and outer cable sheath	Inner (diaphragm) and outer cable sheath seal IP66/67 (Deluge option)	Brass	————	————	Industrial
 I53/RAC/L	32	Indoor/outdoor Armoured/braided cable with inner lead sheath and outer sheath	Inner lead sheath seal/electrical bond and outer cable sheath seal IP66/67/68 (Deluge option)	Brass	————	————	Industrial
 I14	33	Indoor/outdoor Non-armoured cable, conduit system	Outer cable sheath seal IP66/67/68 Deluge	Brass	————	————	Industrial
 710	37	Indoor/outdoor Non-armoured cable	Inner (compound) and outer cable jacket seals IP66/67/68 NEMA 4X & Deluge	Brass with Nickel Plated Entry	 	UL File No. E84940.	Explosion Proof
 711 and 713	38	Indoor/outdoor Type MCHL and Teck cables	Inner (compound) and outer cable jacket seals IP66/67/68 NEMA 4X & Deluge	Brass with Nickel Plated Entry	 	UL File No. E84940.	Explosion Proof
 753	39	Indoor/outdoor Armoured Marine Shipboard cable	Inner (compound) and outer cable jacket seals IP66/67/68 NEMA 4X & Deluge	Brass with Nickel Plated Entry and Stainless Steel	 	UL File No. E84941.	Explosion Proof

Cable Gland Selection Chart

Cable Gland Type	Colour Code/ Page	Application/Cable Type	Sealing/ Ingress Protection	Material	Certification	Certificate Number	Protection Concept
 755	40	Indoor/outdoor Steel Wire Armoured cable with inner (option) and outer jacket	Inner (compound) and outer cable jacket seals IP66/67/68 NEMA 4X & Deluge	Brass with Nickel Plated Entry	 	UL File No. E84940.	Explosion Proof
 153/X	41	Indoor/outdoor Armoured marine shipboard jacketed or non-jacketed cable	Inner and outer cable jacket seals IP66/67/68 NEMA 4X & (Deluge option)	Brass with Nickel Plated Entry	 	UL File No. E218332.	General Purpose
 701	42	Indoor/outdoor Type MC and Teck cables	Outer cable jacket seal IP66/67/68 NEMA 4X & Deluge	Brass with Nickel Plated Entry	 	UL File No. E165706.	General Purpose
 Accessories	44-47	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 Accessories	44-47	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 Accessories	44-47	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 Accessories	44-47	PLEASE REFER TO INDIVIDUAL DATA SHEETS FOR DETAILS					
 Adaptors and Reducers	48	Indoor/outdoor	—	Brass	  	Certificate No. BAS 01 ATEX 2249X. (Female thread metric only) Certificate No. BAS 01 ATEX 2241U. (Component approval only) Certificate No. BAS 01 ATEX 2242X. (EEEx II only). Cepel No. Ex - 035/2001. GOST No. POCC GB.ГБ 05. B00471. AUS-Exd IIC/Exe II.	Flameproof and Increased Safety

Cable Gland Selection Chart

Hawke Cable Glands

Flameproof/Increased Safety
and Industrial

Hawke Cable Glands

Hazardous Area Cable Glands

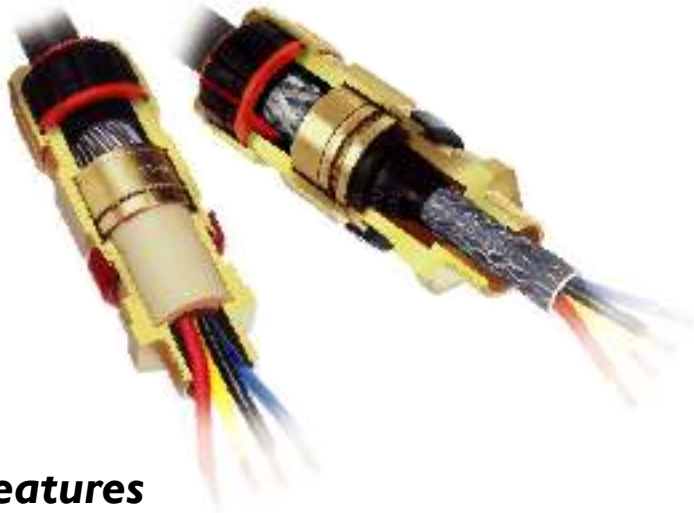
Hazardous Area Cable Glands





Hazardous Area Cable Glands

Flameproof and Increased Safety



Features

- **Unique Rear Sealing System**

This arrangement offers IP66, IP67, IP68 (30 metres for 7 days), NEMA 4X and Deluge (DTS01) Ingress Protection. The seal is manufactured from a silicone material, has LSFZH properties, is ozone and oil resistant and is suitable for use at both high and low temperatures. The Rear Sealing System covers the entire range of cable diameters without the need for special seals and the cable acceptance range is stamped on the backnut for ease of inspection. The backnut can be hand tightened, with only one further spanner turn required to ensure IP66, IP67, IP68 and NEMA 4X.

- **Unique Inspectable Compound Chamber**

The revolutionary Hawke compound chamber has been designed with inspectability in mind. The pre-lubricated compound chamber can be removed once the compound has fully cured, allowing full inspection of the flameproof seal. If required minor surface voids can be repaired in situ. This unique patented compound chamber now forms the compound as well as providing a flameproof seal, resulting in reduced piece parts, as there is no longer a requirement to separate the seal from the compound chamber.

- **Zero Cable Damage**

The unique Hawke diaphragm sealing system does not damage cable with 'Cold Flow' characteristics. The diaphragm type seal is the only elastomeric seal to comply fully with EN 60079-14 and IEC 60079-14 and is therefore suitable on cables which would otherwise require barrier style cable glands.

The Hawke diaphragm seal is also unique in that it is the only flameproof elastomeric seal that can be visually inspected in operation - A real benefit to ATEX inspectors.

- **The Original Reversible Armour Clamp**

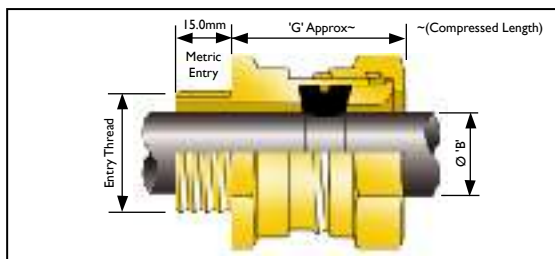
The original RAC clamping system was invented by Hawke over 10 years ago and is a well established proven performer in all conditions. Simply by reversing the clamping ring, the cable gland can adjust to accommodate all types of cable armour or braid. Unlike many of our competitors the correct clamping orientation is marked clearly with a 'W', 'Z' or 'X' and backed up by the presence of a groove in the component. Hawke's RAC clamping system is also fully inspectable when positioned on the cable.

- **Inspectable Deluge Seal**

Hawke's inspectable deluge seal offers IP66 and IP67 sealing and is certified as 'deluge proof' by ITS in accordance with DTS01. Indeed Hawke's deluge seal is so good that it exceeds the expectations of the offshore industry by not only preventing ingress into the equipment, but also into the cable gland, which could potentially corrode the cable armour.



Hazardous Area Cable Glands



Cable Gland Type

501/421

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Outer Sheath 'B'						
	Metric	NPT* Std./Option	Standard Seal		Alternative Seal (S)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
2K	M16	-	3.0	8.0	-	-	27	19.0	21.2
Os	M20 ²	½"	3.0	8.0	-	-	32.8	24.0	27.7
O	M20 ²	½"	7.5	11.9	-	-	32.8	24.0	27.7
A	M20	¾"/½"	11.0	14.3	8.5	13.4	32.8	30.0	34.6
B	M25	1"/¾"	13.0	20.2	9.5	15.4	33.8	36.0	41.6
C	M32	1¼"/1"	19.0	26.5	15.5	21.2	35.2	46.0	53.1
C2	M40	1½"/1¼"	25.0	32.5	22.0	28.0	36.5	55.0	63.5
D	M50	2"/1½"	31.5	44.4/42.3 ¹	27.5	34.8	47.9	65.0	75.1
E	M63	2½"/2"	42.5	56.3/54.3 ¹	39.0	46.5	46.2	80.0	92.4
F	M75	3"/2½"	54.5	68.2/65.3 ¹	48.5	58.3	48	95.0	109.6
G	M80	3½"	67.0	73.0	-	-	41	106.4	123.0
H	M90	3½"	67.0	77.6	-	-	41	115.0	132.8
J	M100	4"	75.0	91.6	-	-	41	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable outer sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Assembly instruction data sheet No. A.I. 307. For sizes Os to J.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/421 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

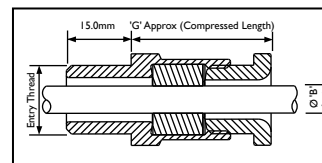
Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 501/421/C/M32
501/421/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. 501/421/C/M32/S
501/421/C/1 1/4" NPT/S



2K Size Cable Gland Design

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables.
- See technical section of the catalogue for installation rules and regulations.

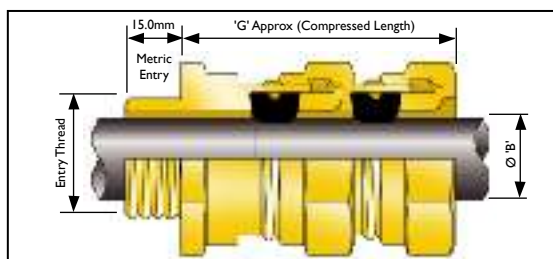
Features

- Provides a cable retention seal onto the cables outer sheath.
 - When used in increased safety applications, this cable gland may be used with braided cable where the braid and the cables outer sheath pass into the enclosure.
- The braid must be suitably terminated inside the enclosure.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2070X. For Os - F.
- Baseefa Certificate No. BAS 01 ATEX 2294X. For G - J.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +100°C as standard.
- Alternative Certification Options Available.
 -   Exd IIC/Exe II.
 -   BR-Exd IIC/Exe II.
 -   GOST R-Exd IICU/Exe IIU.
 -  AUS-Exd IIC/Exe II.

501/421 Cable Gland



Cable Gland Type

501/423

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Outer Sheath 'B'						
	Metric	NPT* Std./Option	Standard Seal		Alternative Seal (S)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
Os	M20 ²	½"	3.0	8.0	-	-	52.3	24.0	27.7
O	M20 ²	½"	7.5	11.9	-	-	52.3	24.0	27.7
A	M20	¾"/½"	11.0	14.3	8.5	13.4	51.5	30.0	34.6
B	M25	1"/¾"	13.0	20.2	9.5	15.4	54.7	36.0	41.6
C	M32	1¼"/1"	19.0	26.5	15.5	21.2	55.9	46.0	53.1
C2	M40	1½"/1¼"	25.0	32.5	22.0	28.0	58.1	55.0	63.5
D	M50	2"/1½"	31.5	44.4/42.3 ¹	27.5	34.8	74.3	65.0	75.1
E	M63	2½"/2"	42.5	56.3/54.3 ¹	39.0	46.5	73.2	80.0	92.4
F	M75	3"/2½"	54.5	68.2/65.3 ¹	48.5	58.3	75	95.0	109.6
G	M80	3½"	67.0	73.0	-	-	68	106.4	123.0
H	M90	3½"	67.0	77.6	-	-	68	115.0	132.8
I	M100	4"	75.0	91.6	-	-	68	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable outer sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Assembly instruction data sheet No. A.I. 306. For sizes Os to J.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/423 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 501/423/C/M32
501/423/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. 501/423/C/M32/S
501/423/C/1 1/4" NPT/S

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables.
- May be used on cables incorporating inner and outer cable sheaths.
- See technical section of catalogue for installation rules and regulations.

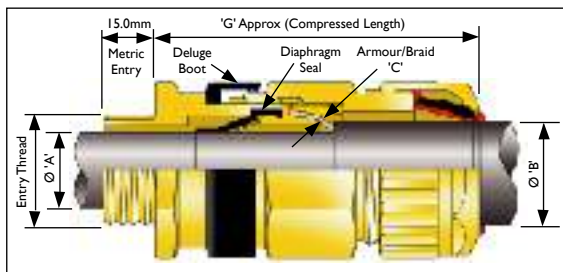
Features

- Provides a cable retention seal onto the cables outer sheath at two independent sealing points.
- When used in increased safety applications, this cable gland may be used with braided cable where the braid and the cables outer sheath pass into the enclosure. The braid must be suitably terminated inside the enclosure.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2071X. For Os - F.
- Baseefa Certificate No. BAS 01 ATEX 2295X. For G - J.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS. Additional deluge protection seal also available.
- Operating temperature range -60°C to +100°C as standard.
- Alternative Certification Options Available.
 -   Exd IIC/Exe II.
 -   BR-Exd IIC/Exe II.
 -  AUS-Exd IIC/Exe II.

501/423 Cable Gland



Cable Gland Type 501/453/Universal

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details						'G'	Hexagon Dimensions	
			Inner Sheath 'A'		Outer Sheath 'B'		'C' Armour/Braid			Across Flats	Across Corners
	Metric	NPT* Std./Option	Min.	Max.	Min.	Max.	Orientation 1	Orientation 2			
Os	M20 ²	½"	3.0	8.1	5.5	12.0	0.9/1.25	0/0.7	64.4	24.0	27.7
O	M20 ²	½"	7.5	11.9	9.5	16.0	0.9/1.25	0/0.7	64.4	24.0	27.7
A	M20	¾"/½"	9.4	14.3	12.5	20.5	0.9/1.25	0/0.7	65.4	30.0	34.6
B	M25	1"/¾"	12.1	20.2	16.9	26.0	1.25/1.6	0/0.7	71	36.0	41.6
C	M32	1¼"/1"	17.6	26.5	22.0	33.0	1.6/2.0	0/0.7	76	46.0	53.1
C2	M40	1½"/1¼"	23.1	32.5	28.0	41.0	1.6/2.0	0/0.7	78.1	55.0	63.5
D	M50	2"/1½"	28.9	44.4/42.3 ¹	36.0	52.6	1.8/2.5	0/1.0	93.1	65.0	75.1
E	M63	2½"/2"	39.9	56.3/54.3 ¹	46.0	65.3	1.8/2.5	0/1.0	99	80.0	92.4
F	M75	3"/2½"	50.5	68.2/65.3 ¹	57.0	78.0	1.8/2.5	0/1.0	101.9	95.0	109.6

Larger cable glands available in 501/453 design. See page 23.

G	M80	3 1/2"	67.0	73.0	75.0	89.5	#	#	90.6	106.4	123.0
H	M90	3 1/2"	67.0	77.6	75.0	89.5	#	#	90.6	115.0	132.8
J	M100	4"	75.0	91.6	88.0	104.5	#	#	90.6	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres

(except* where dimensions are in inches).

Dedicated armour clamping rings are fitted. Please specify armour type and size.

Assembly instruction data sheet No. A.I. 300.

For sizes Os to F.

Assembly instruction data sheet No. A.I. 329.

For sizes G to J.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/453/Universal cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 501/453/UNIV/C/M32
501/453/UNIV/C/1 1/4" NPT

Cable Gland with Alternative
Clamping Ring (AR)

e.g. 501/453/UNIV/C/M32/AR
501/453/UNIV/C/1 1/4" NPT/AR

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.

For particular use with :-

Cables that exhibit "Cold Flow" characteristics.

- See technical section of catalogue for installation rules and regulations.

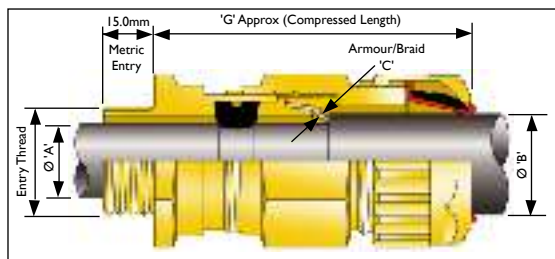
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Provides a diaphragm seal on the cables inner sheath which will not damage cable that has "Cold Flow" characteristics.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour/braid.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2078X. For Os - F.
- Baseefa Certificate No. BAS 01 ATEX 2296X. For G - J.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1. IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.

-   Exd IIC/Exe II.
-   BR-Exd IIC/Exe II.
-   R-Exd IICU/Exe IIU.
-  AUS-Exd IIC/Exe II.



Cable Gland Type

501/453/RAC

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details								'G'	Hexagon Dimensions	
			Inner Sheath 'A'				Outer Sheath 'B'		'C' Armour/Braid				
	Standard Seal		Alternative Seal (S)		Orientation 1	Orientation 2							
	Metric	NPT* Std./Option	Min.	Max.			Min.	Max.	Min.	Max.			
Os	M20 ²	1/2"	3.0	8.0	-	-	5.5	12.0	0.9/1.25	0/0.7	65.1	24.0	27.7
O	M20 ²	1/2"	7.5	11.9	-	-	9.5	16.0	0.9/1.25	0/0.7	65.1	24.0	27.7
A	M20	3/4"/1/2"	11.0	14.3	8.5	13.4	12.5	20.5	0.9/1.25	0/0.7	66.1	30.0	34.6
B	M25	1"/3/4"	13.0	20.2	9.5	15.4	16.9	26.0	1.25/1.6	0/0.7	71.4	36.0	41.6
C	M32	1 1/4"/1"	19.0	26.5	15.5	21.2	22.0	33.0	1.6/2.0	0/0.7	75.2	46.0	53.1
C2	M40	1 1/2"/1 1/4"	25.0	32.5	22.0	28.0	28.0	41.0	1.6/2.0	0/0.7	77.1	55.0	63.5
D	M50	2"/1 1/2"	31.5	44.4/42.3 ¹	27.5	34.8	36.0	52.6	1.8/2.5	0/1.0	90.3	65.0	75.1
E	M63	2 1/2"/2"	42.5	56.3/54.3 ¹	39.0	46.5	46.0	65.3	1.8/2.5	0/1.0	96.7	80.0	92.4
F	M75	3"/2 1/2"	54.5	68.2/65.3 ¹	48.5	58.3	57.0	78.0	1.8/2.5	0/1.0	96	95.0	109.6

Larger cable glands available in 501/453 design. See page 23.

G	M80	3 1/2"	67.0	73.0	-	-	75.0	89.5	#	#	95.6	106.4	123.0
H	M90	3 1/2"	67.0	77.6	-	-	75.0	89.5	#	#	95.6	115.0	132.8
J	M100	4"	75.0	91.6	-	-	88.0	104.5	#	#	95.6	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Dedicated armour clamping rings are fitted. Please specify armour type and size.

Assembly instruction data sheet No. A.I. 302.

For sizes Os to F.

Assembly instruction data sheet No. A.I. 329.

For sizes G to J.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/453/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium. NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 501/453/RAC/C/M32
501/453/RAC/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. 501/453/RAC/C/M32/S
501/453/RAC/C/1 1/4" NPT/S

Alternative Reversible Armour Clamping Rings (RAC)

SELECTION TABLE		
Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Cable Gland with Alternative Clamping Ring (AR)

e.g. 501/453/RAC/C/M32/AR
501/453/RAC/C/1 1/4" NPT/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.
- See technical section of catalogue for installation rules and regulations.

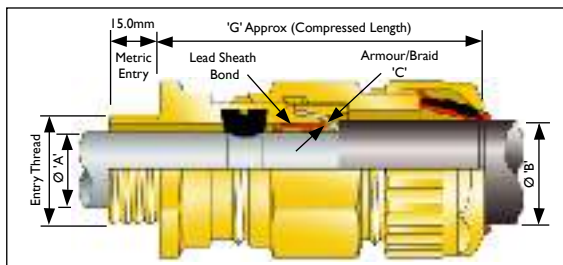
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Provides a seal on the cables inner sheath.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2072X. For Os - F.
- Baseefa Certificate No. BAS 01 ATEX 2296X. For G - J.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1. IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.
-   Exd IIC/Exe II.
-   BR-Exd IIC/Exe II.
-   GOST R-Exd IICU/Exe IIU.
-  AUS-Exd IIC/Exe II.

501/453/RAC Cable Gland



Cable Gland Type

501/453/RAC/L

For Lead Sheath Cables

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details								'G'	Hexagon Dimensions	
			Inner Lead		Sheath 'A'		Outer Sheath 'B'		'C' Armour/Braid				
	Standard (L) Seal+Bond		Alternative (K) Seal+Bond										
	Metric	NPT* Std./Option	Min.	Max.	Min.	Max.	Min.	Max.	Orientation 1	Orientation 2		Across Flats	Across Corners
O	M20 ²	½"	7.5	8.5	-	-	9.5	16.0	0.9/1.25	0/0.7	65.1	24.0	27.7
A	M20	¾"/½"	-	-	8.5	10.8	12.5	20.5	0.9/1.25	0/0.7	66.1	30.0	34.6
B	M25	1"/¾"	13.0	16.7	11.0	15.4	16.9	26.0	1.25/1.6	0/0.7	71.4	36.0	41.6
C	M32	1¼"/1"	19.0	22.5	15.5	21.2	22.0	33.0	1.6/2.0	0/0.7	75.2	46.0	53.1
C2	M40	1½"/1¼"	25.0	28.5	22.0	28.0	28.0	41.0	1.6/2.0	0/0.7	77.1	55.0	63.5
D	M50	2"/1½"	31.5	40.3	27.5	34.8	36.0	52.6	1.8/2.5	0/1.0	90.3	65.0	75.1
E	M63	2½"/2"	42.0	52.0	39.0	46.5	46.0	65.3	1.8/2.5	0/1.0	96.7	80.0	92.4
F	M75	3"/2½"	54.5	63.8	51.0	58.3	57.0	78.0	1.8/2.5	0/1.0	96	95.0	109.6

Larger cable glands available in 501/453/L design. See page 23.

G	M80	3 1/2"	67.0	68.5	-	-	75.0	89.5	#	#	95.6	106.4	123.0
H	M90	3 1/2"	67.0	73.1	-	-	75.0	89.5	#	#	95.6	115.0	132.8
J	M100	4"	75.0	87.1	-	-	88.0	104.5	#	#	95.6	127.0	146.7

²Size O is available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Dedicated armour clamping rings are fitted. Please specify armour type and size.
Assembly instruction data sheet No. A.I. 302 + 336 For sizes O to F.
Assembly instruction data sheet No. A.I. 329 + 336 For sizes G to J.

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/453/RAC/L cable gland is manufactured as standard in brass, stainless steel and aluminium. NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

**Cable Gland Type/Size/Thread/
Standard Inner Seal + Bond**

e.g. 501/453/RAC/C/M32/L
501/453/RAC/C/1 1/4" NPT/L

**Cable Gland with Alternative
Clamping Ring (AR)**

e.g. 501/453/RAC/C/M32/L/AR
501/453/RAC/C/1 1/4" NPT/L/AR

**Cable Gland with Alternative
Inner Seal + Bond**

e.g. 501/453/RAC/C/M32/K
501/453/RAC/C/1 1/4" NPT/K

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables with a lead inner sheath.
- See technical section of catalogue for installation rules and regulations.

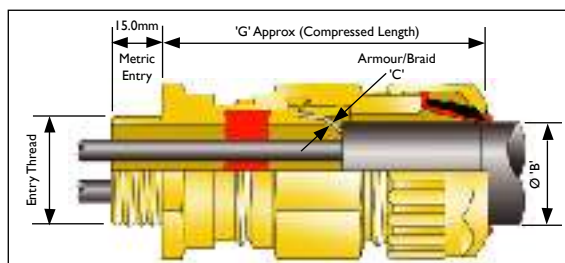
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Provides a seal and an electrical bond on the cables lead inner sheath.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2072X. For O - F.
- Baseefa Certificate No. BAS 01 ATEX 2296X. For G - J.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.

-   Exd IIC/Exe II.
-   BR-Exd IIC/Exe II.
-   R-Exd IICU/Exe IIU.



Cable Gland Type

PSG 553/RAC

ATEX 

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Outer Sheath 'B'		'C' Armour/Braid			Across Flats	Across Corners
	Metric	NPT* Std./ Option							
A	M20	3/4"/1/2"	12.5	20.5	0.9/1.25	0/0.7	61.1	30.0	34.6
B	M25	1"/3/4"	16.9	26.0	1.25/1.6	0/0.7	66.4	36.0	41.6
C	M32	1 1/4"/1"	22.0	33.0	1.6/2.0	0/0.7	70.2	46.0	53.1

CABLE GLAND SIZE FOR CORE SIZE & NUMBER

Maximum No. of Cores	Cores Cross Sectional Area mm ²				
	1.5	2.5	4.0	6.0	10.0
7	A & B	A & B	B & C	C	C
4	-	-	-	B	-
3	-	-	-	-	B

PUNCH TOOL SIZE DETAILS

Punch Ref.	No.1		No.2		No.3
Core C.S.A. mm ²	1.5	2.5	4.0	6.0	10.0

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Assembly instruction data sheet No. A.I. 312.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The PSG 553/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium.
NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. PSG 553/RAC/C/M32
PSG 553/RAC/C/1 1/4" NPT

Punch Tool Ordering Example

e.g. Punch Tool Number 1.

Application

- Outdoor or Indoor use.
 - For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.
- For particular use with :-**
- a) Cables that are not effectively filled, compact and/or circular, have tape bedding or have hygroscopic fillers.
 - b) Cables that exhibit "Cold Flow" characteristics.
 - c) Enclosures for gas group IIC, under 2 litres in volume and containing an ignition source.
 - d) Enclosures for gas groups IIA or IIB, which are greater than 2 litres in volume and contain an ignition source.
- See technical section of the catalogue for installation rules and regulations.

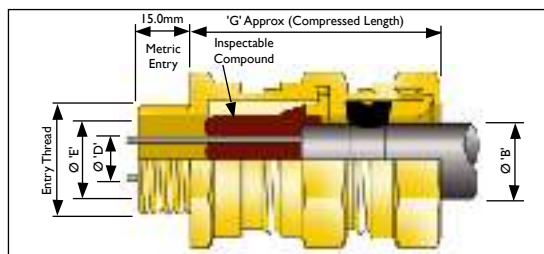
Features

- Provides a barrier seal to the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- The required number of holes for the cores are punched in the seal by means of a special tool to suit the core size.
- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2074X.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- Operating temperature range -60°C to +80°C as standard.

PSG 553/RAC Cable Gland



Cable Gland Type

ICG 623

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details							'G'	Hexagon Dimensions	
			Inner Sheath/ Cores			Outer Sheath 'B'					Across Flats	Across Corners
	Standard Seal					Alternative Seal (S)						
	Metric	NPT* Std./ Option	'D' Max. Over Cores	'E' Max. Inner Sheath	Max. No. Of Cores	Min.	Max.	Min.	Max.			
Os	M20	½"	8.0	8.0	6	3.0	8.0	-	-	57.5	24.0	27.7
O	M20	½"	8.9	10.0	6	7.5	11.9	-	-	57.5	24.0	27.7
A	M20	¾"/½"	11.0	12.5	10	11.0	14.3	8.5	13.4	56.3	30.0	34.6
B	M25	1"/¾"	16.2	18.4	21	13.0	20.2	9.5	15.4	58.9	36.0	41.6
C	M32	1¼"/1"	21.9	24.7	42	19.0	26.5	15.5	21.2	61.7	46.0	53.1
C2	M40	1½"/1¼"	26.3	29.7	60	25.0	32.5	22.0	28.0	62.6	55.0	63.5
D	M50	2"/1½"	37.1	41.7	80	31.5	44.4	27.5	34.8	72.8	65.0	75.1
E	M63	2½"/2"	47.8	53.5	100	42.5	56.3	39.0	46.5	75.7	80.0	92.4
F	M75	3"/2½"	59.0	66.2/65.3 ¹	120	54.5	68.2	48.5	58.3	77.7	95.0	109.6

¹ Smaller value is applicable when selecting reduced NPT entry option.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Two part sealing compound and assembly instructions are supplied with the cable gland.

Assembly instruction data sheet No. A.I. 305.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The ICG 623 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. ICG 623/C/M32
ICG 623/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. ICG 623/C/M32/S
ICG 623/C/1 1/4" NPT/S

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables.

For particular use with :-

- Cables that are not effectively filled, compact and/or circular, have tape bedding or have hygroscopic fillers.
 - Cables that exhibit "Cold Flow" characteristics.
 - Enclosures containing an ignition source in gas group II C areas or containing an ignition source in a Zone I area and exceeding 2 litres in volume.
- See technical section of the catalogue for installation rules and regulations.

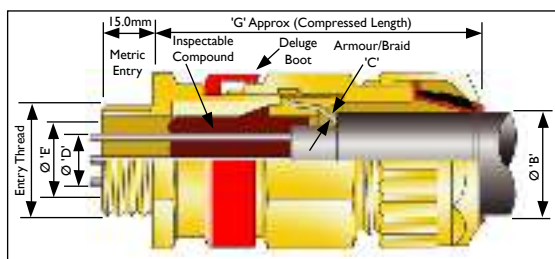
Features

- Provides a barrier seal between the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland compresses and distributes the compound evenly to create a barrier seal at the point of entry into the enclosure.
- The compound chamber may be separated from the cured compound to ensure that the chamber has been effectively filled. If required, external voids can be repaired.
- Provides a cable retention seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2079X.
- Suitable for use in Zone I, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.
 -   Exd IIC/Exe II.
 -   BR-Exd IIC/Exe II.
 -  AUS-Exd IIC/Exe II.

ICG 623 Cable Gland



Cable Gland Type ICG 653/Universal

ATEX

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details							'G'	Hexagon Dimensions	
			Inner Sheath/ Cores			Outer Sheath 'B'		'C' Armour/Braid				
	Metric	NPT* Std./ Option	'D' Max. Over Cores	'E' Max. Inner Sheath	Max. No. Of Cores	Min.	Max.	Orientation 1	Orientation 2		Across Flats	Across Corners
Os	M20	½"	8.9	10.0	6	5.5	12.0	0.9/1.25	0/0.7	72.8	24.0	27.7
O	M20	½"	8.9	10.0	6	9.5	16.0	0.9/1.25	0/0.7	72.8	24.0	27.7
A	M20	¾"/1½"	11.0	12.5	10	12.5	20.5	0.9/1.25	0/0.7	73.8	30.0	34.6
B	M25	1"/¾"	16.2	18.4	21	16.9	26.0	1.25/1.6	0/0.7	78.1	36.0	41.6
C	M32	1¼"/1"	21.9	24.7	42	22.0	33.0	1.6/2.0	0/0.7	83.0	46.0	53.1
C2	M40	1½"/1¼"	26.3	29.7	60	28.0	41.0	1.6/2.0	0/0.7	84.1	55.0	63.5
D	M50	2"/1½"	37.1	41.7	80	36.0	52.6	1.8/2.5	0/1.0	91.3	65.0	75.1
E	M63	2½"/2"	47.8	53.3	100	46.0	65.3	1.8/2.5	0/1.0	101.8	80.0	92.4
F	M75	3"/2½"	59.0	66.2/65.3	120	57.0	78.0	1.8/2.5	0/1.0	101.2	95.0	109.6

* Smaller value is applicable when selecting reduced NPT entry option.

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Two part sealing compound and assembly instructions are supplied with the cable gland.
Assembly instruction data sheet No. A.I. 301.

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The ICG 653/Universal cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. ICG 653/UNIV/C/M32
ICG 653/UNIV/C/1 1/4" NPT

Cable Gland with Alternative Clamping Ring (AR)

e.g. ICG 653/UNIV/C/M32/AR
ICG 653/UNIV/C/1 1/4" NPT/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.

For particular use with :-

- Cables that are not effectively filled, compact and/or circular, have tape bedding or have hygroscopic fillers.
 - Cables that exhibit "Cold Flow" characteristics.
 - Enclosures containing an ignition source in gas group II C areas or containing an ignition source in a Zone I area.
- See technical section of the catalogue for installation rules and regulations.

Features

- Provides a barrier seal between the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland compresses and distributes the compound evenly to create a barrier seal at the point of entry into the enclosure.
- The compound chamber may be separated from the cured compound to ensure that the chamber has been effectively filled. If required, external voids can be repaired.
- Provides armour clamping, using one clamping arrangement for all armour/braid types.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour/braid.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

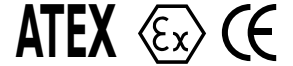
Technical Data

- Flameproof EExd and Increased Safety EExe. II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2080X.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1, IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.

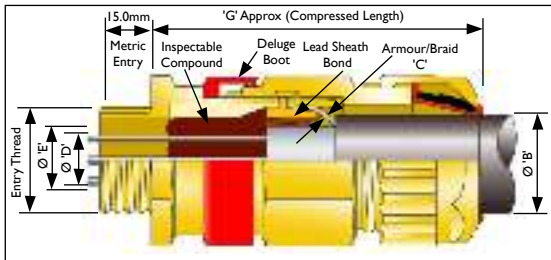
- Exd IIC/Exe II.
- BR-Exd IIC/Exe II.
- R-Exd IICU/Exe IIU.
- AUS-Exd IIC/Exe II.

Cable Gland Type ICG 653/Universal/L

For Lead Sheath Cables



Flameproof and Increased Safety



CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details								'G'	Hexagon Dimensions	
			Inner Sheath/ Cores				Outer Sheath 'B'		'C' Armour/Braid				
	'D' Max. Over Cores	'E'		Max. No. Of Cores									
		Min. Inner Sheath	Max. Inner Sheath		Min.	Max.	Orientation 1	Orientation 2	Across Flats	Across Corners			
Os	M20	1/2"	8.5	4.0	8.5	6	5.5	12.0	0.9/1.25	0/0.7	72.8	24.0	27.7
O	M20	1/2"	8.5	4.0	8.5	6	9.5	16.0	0.9/1.25	0/0.7	72.8	24.0	27.7
A	M20	3/4"/1/2"	10.8	7.4	10.8	10	12.5	20.5	0.9/1.25	0/0.7	73.8	30.0	34.6
B	M25	1 1/4"/1"	16.2	11.0	16.7	21	16.9	26.0	1.25/1.6	0/0.7	78.1	36.0	41.6
C	M32	1 1/4"/1"	21.9	14.0	22.5	42	22.0	33.0	1.6/2.0	0/0.7	83.0	46.0	53.1
C2	M40	1 1/2"/1 1/4"	26.3	21.0	28.5	60	28.0	41.0	1.6/2.0	0/0.7	84.1	55.0	63.5
D	M50	2 1/2"/1 1/2"	37.1	27.0	40.0	80	36.0	52.6	1.8/2.5	0/1.0	91.3	65.0	75.1
E	M63	2 1/2"/2"	47.8	39.0	52.0	100	46.0	65.3	1.8/2.5	0/1.0	101.8	80.0	92.4
F	M75	3 3/8"/2 1/2"	59.0	51.0	63.8	120	57.0	78.0	1.8/2.5	0/1.0	101.2	95.0	109.6

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres

(except* where dimensions are in inches).

Two part sealing compound and assembly instructions are supplied with the cable gland.

Assembly instruction data sheet

No. A.I. 301 + 336.

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The ICG 653/Universal/L cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread/Bond

e.g. ICG 653/UNIV/C/M32/L
ICG 653/UNIV/C/1 1/4" NPT/L

Cable Gland with Alternative Clamping Ring (AR)

e.g. ICG 653/UNIV/C/M32/L/AR
ICG 653/UNIV/C/1 1/4" NPT/L/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables with a lead inner sheath.

For particular use with :-

- Cables that are not effectively filled, compact and/or circular, have tape bedding or have hygroscopic fillers.
 - Cables that exhibit "Cold Flow" characteristics.
 - Enclosures containing an ignition source in gas group II C areas or containing an ignition source in a Zone I area.
- See technical section of the catalogue for installation rules and regulations.

Features

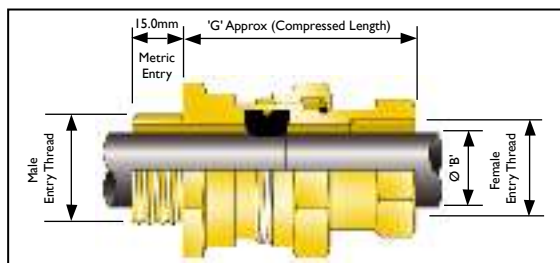
- Provides a barrier seal between the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland compresses and distributes the compound evenly to create a barrier seal at the point of entry into the enclosure.
- The compound chamber may be separated from the cured compound to ensure that the chamber has been effectively filled. If required, external voids can be repaired.
- Provides armour clamping, using one clamping arrangement for all armour/braid types.
- Provides a seal and an electrical bond on the cables lead inner sheath.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour/braid.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Flameproof EExd and Increased Safety EExe. II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2080X.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1. IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.

- Exd IIC/Exe II.
- BR-Exd IIC/Exe II.
- GOST R-Exd IICU/Exe IIU.

ICG 653/Universal/L Cable Gland



Cable Gland Type

501/414

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Male Entry Thread Size		Female Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
					Outer Sheath 'B'						
	Metric	NPT* Std./ Option	Metric	NPT #	Standard Seal		Alternative Seal (S)			Across Flats	Across Corners
					Min.	Max.	Min.	Max.			
A	M20	¾"/½"	M20	-	11.0	14.3	8.5	13.4	63.9	30.0	34.6
B	M25	1"/¾"	M25	-	13.0	20.2	9.5	15.4	52.8	36.0	41.6
C	M32	1¼"/1"	M32	-	19.0	26.5	15.5	21.2	69.5	46.0	53.1
C2	M40	1½"/1¼"	M40	-	25.0	32.5	22.0	28.0	72.3	55.0	63.5
D	M50	2"/1½"	M50	-	31.5	44.4/42.3 ¹	27.5	34.8	92.8	65.0	75.1
E	M63	2½"/2"	M63	-	42.5	56.3/54.3 ¹	39.0	46.5	93.2	80.0	92.4
F	M75	3"/2½"	M75	-	54.5	68.2/65.3 ¹	48.5	58.3	94.9	95.0	109.6

¹ Smaller value is applicable when selecting reduced NPT entry option.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Assembly instruction data sheet No. A.I. 310.

NPT female thread sizes equivalent to those shown in the table for the male thread size are available. Hexagon dimensions as shown may alter.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 501/414 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Male Thread/
Female Thread

e.g. 501/414/C/M32/M32
501/414/C/1 1/4" NPT/M32

Cable Gland with Alternative Seal (S)

e.g. 501/414/C/M32/M32/S
501/414/C/1 1/4" NPT/M32/S

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables installed in conduit.
- See technical section of the catalogue for installation rules and regulations.

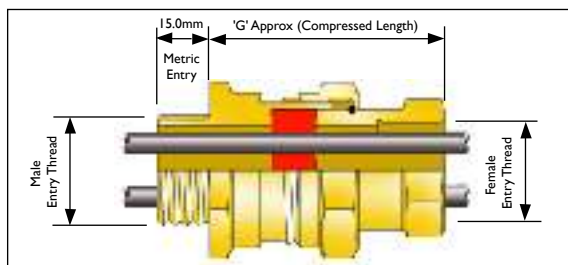
Features

- Provides a cable retention seal onto the cables outer sheath.
- When used in increased safety applications, this cable gland may be used with braided cable where the braid and the cables outer sheath pass into the enclosure. The braid must be suitably terminated into the enclosure.
- Provides female running coupler for cable gland or conduit entry.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2076X.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +100°C as standard.
- Alternative Certification Option Available.
-   Exd IIC/Exe II.

501/414 Cable Gland



Cable Gland Type

SB 474

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Male Entry Thread Size		Female Entry Thread Size		'G'	Hexagon Dimensions	
	Metric	NPT* Std./Option	Metric	NPT #		Across Flats	Across Corners
A	M20	3/4"/1/2"	M20	-	63.9	30.0	34.6
B	M25	1"/3/4"	M25	-	52.8	36.0	41.6
C	M32	1 1/4"/1"	M32	-	69.5	46.0	53.1

CABLE GLAND SIZE FOR CORE SIZE & NUMBER

Maximum No. of Cores	Cores Cross Sectional Area mm ²				
	1.5	2.5	4.0	6.0	10.0
7	A & B	A & B	B & C	C	C
4	-	-	-	B	-
3	-	-	-	-	B

PUNCH TOOL SIZE DETAILS

Punch Ref.	No.1		No.2		No.3
Core C.S.A. mm ²	1.5	2.5	4.0	6.0	10.0

General Information

All Metric entry threads are 1.5mm pitch medium fit.
 All dimensions in millimetres (except* where dimensions are in inches).
 Assembly instruction data sheet No. A.I. 309.
 # NPT female thread sizes equivalent to those shown in the table for the male thread size are available. Hexagon dimensions as shown may alter.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The SB 474 cable gland is manufactured as standard in brass, stainless steel and aluminium.
 NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Male Thread/Female Thread

e.g. SB 474/C/M32/M32
 SB 474/C/1 1/4" NPT/M32

Punch Tool Ordering Example

e.g. Punch Tool Number 1.

Application

- Outdoor or Indoor use.
- For particular use with :-**
 - a) Cables that are not effectively filled, compact and/or circular; have tape bedding or have hygroscopic fillers.
 - b) Cables that exhibit "Cold Flow" characteristics.
 - c) Enclosures for gas group IIC, under 2 litres in volume and containing an ignition
 - d) Enclosures for gas groups IIA or IIB, which are greater than 2 litres in volume and contain an ignition source.
- See technical section of the catalogue for installation rules and regulations.

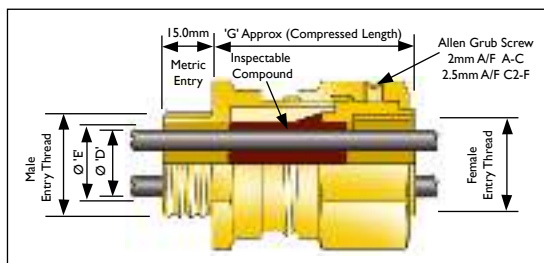
Features

- Provides a barrier seal to the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- The required number of holes for the cores are punched in the seal by means of a special tool to suit the core size.
- DTS01 deluge protection certified by ITS.
- Provides female running coupler for cable gland or conduit entry.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2077X.
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- Operating temperature range -60°C to +80°C as standard.

SB 474 Cable Gland



Cable Gland Type

CSB 656

ATEX  

Flameproof and Increased Safety

CABLE GLAND SELECTION TABLE

Size Ref.	Male Entry Thread Size		Female Entry Thread Size		Inner Sheath/ Cores			'G'	Hexagon Dimensions	
	Metric	NPT* Std./ Option	Metric	NPT #	'D' Max. Over Cores	'E' Max. Inner Sheath	Max. No. Of Cores		Across Flats	Across Corners
A	M20	3/4"/1/2"	M20	-	11.0	12.5	10	53.5	30.0	34.6
B	M25	1"/3/4"	M25	-	16.2	18.4	21	53.5	36.0	41.6
C	M32	1 1/4"/1"	M32	-	21.9	24.7	42	56.0	46.0	53.1
C2	M40	1 1/2"/1 1/4"	M40	-	26.3	29.7	60	56.0	55.0	63.5
D	M50	2"/1 1/2"	M50	-	37.1	41.7	80	61.4	65.0	75.1
E	M63	2 1/2"/2"	M63	-	47.8	53.5	100	63.7	80.0	92.4
F	M75	3"/2 1/2"	M75	-	59.0	66.2	120	65.7	95.0	109.6
G	M80	3 1/2"	M80	-	62.8	74.0	140	67.7	106.4	123.0
H	M90	3 1/2"	M90	-	70.9	83.0	160	67.7	115.0	132.8
J	M100	4"	M100	-	80.3	93.0	180	67.7	127.0	146.7

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Two part sealing compound and assembly instructions are supplied with the cable gland.

Assembly instruction data sheet No. A.I. 311.

NPT female thread sizes equivalent to those shown in the table for the male thread size are available. Hexagon dimensions as shown may alter.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The CSB 656 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Male Thread/Female Thread

e.g. CSB 656/C/M32/M32

CSB 656/C/1 1/4" NPT/M32

Application

- Outdoor or Indoor use.
- For use with conduit incorporating individual insulated conductors or

For particular use with :-

- Cables that are not effectively filled, compact and/or circular, have tape bedding or have hygroscopic fillers.
- Cables that exhibit "Cold Flow" characteristics.
- Enclosures containing an ignition source in gas group II C areas or containing an ignition source in a Zone I area and exceeding 2 litres in volume.

- See technical section of the catalogue for installation rules and regulations.

Features

- Provides a barrier seal between the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable or conduit.
- Seals conductors at entry to enclosure via conduit or enables an existing cable gland to be converted to a barrier type cable gland.
- The device is fitted with a simple compound filled chamber which permits packing around individual insulated conductors.
- Assembly of the cable gland compresses and distributes the compound evenly to create a barrier seal at the point of entry into the enclosure.
- The compound chamber may be separated from the cured compound to ensure that the chamber has been effectively filled. If required, external voids can be repaired.
- Provides female running coupler for cable gland or conduit entry.

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD
- Baseefa Certificate No. BAS 01 ATEX 2082X.
- Suitable for use in Zone I, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1. IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +80°C as standard.
- Alternative Certification Options Available.
-   Exd IIC/Exe II. •  AUS-Exd IIC/Exe II.

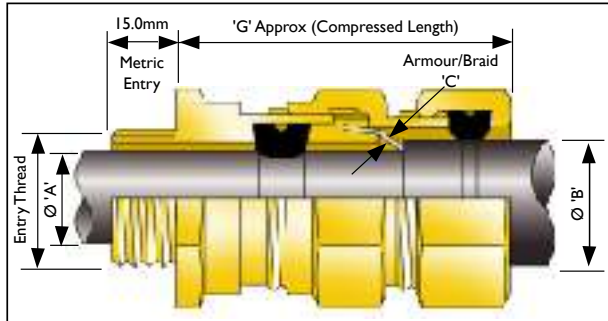
CSB 656 Cable Gland

Oversize, G, H & J Cable Glands

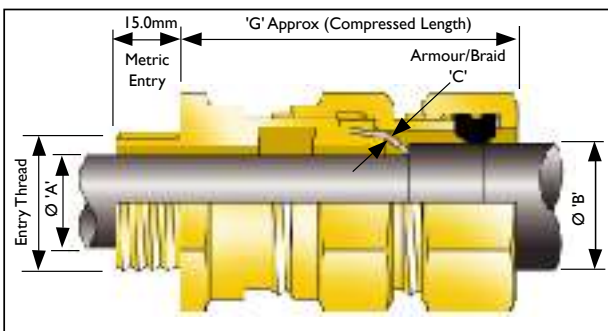
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Flameproof/Increased Safety and Industrial

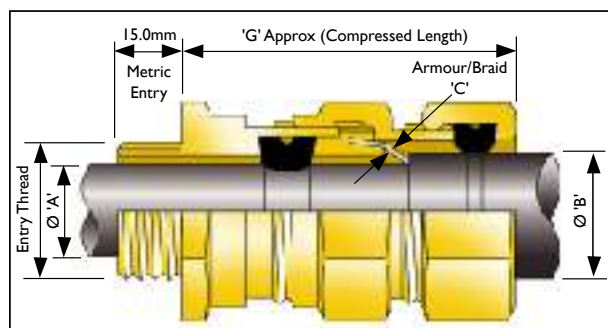
501/453 Flameproof / Increased Safety



151 Industrial



153 Industrial



501/453

Assembly instruction data sheet
No. A.I. 329.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 13 (501/453/Universal).

Page 14 (501/453/RAC).

Page 15 (501/453/RAC/L).

151

Assembly instruction data sheet
No. A.I. 335.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 30 (151/RAC).

153

Assembly instruction data sheet
No. A.I. 329.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 31 (153/RAC).

Page 32 (153/RAC/L).

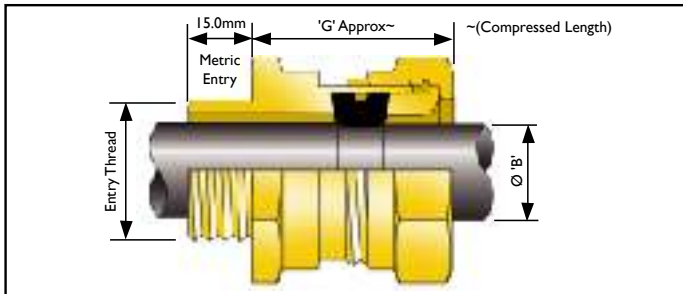
American Series Cable Glands

'H' Size (M90) cable glands are available with the exception of the 755.

Please contact Hawke International for details.

Oversize G, H and J Cable Glands

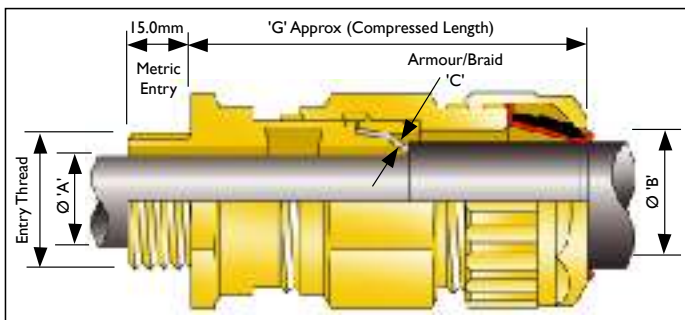
32I Increased Safety



The 32I cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

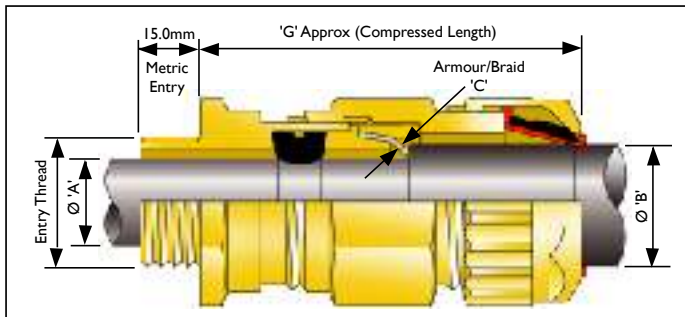
35I/RAC Increased Safety



The 35I/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

353/RAC Increased Safety



The 353/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

All of Hawke's Hazardous Area cable glands are dual certified (i.e. Flameproof and Increased Safety). The following cable glands are also available to Increased Safety certification only.

32I

Assembly instruction data sheet
No. A.I. 307. For sizes O s to J.
Baseefa Certificate No. BAS 01 ATEX 2266X.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 11 (501/421).

35I/RAC

Assembly instruction data sheet
No. A.I. 308. For sizes Os to F.
No. A.I. 335. For sizes G to J.
Baseefa Certificate No. BAS 01 ATEX 2268X.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 14 (501/453/RAC). **Please note however there is no inner seal with the 35I/RAC. This can be seen in the diagram opposite.**

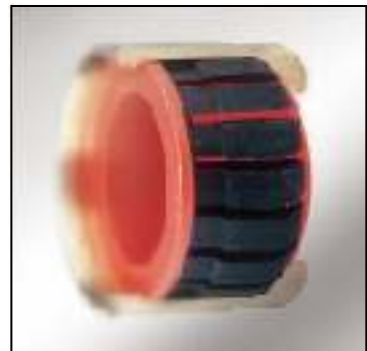
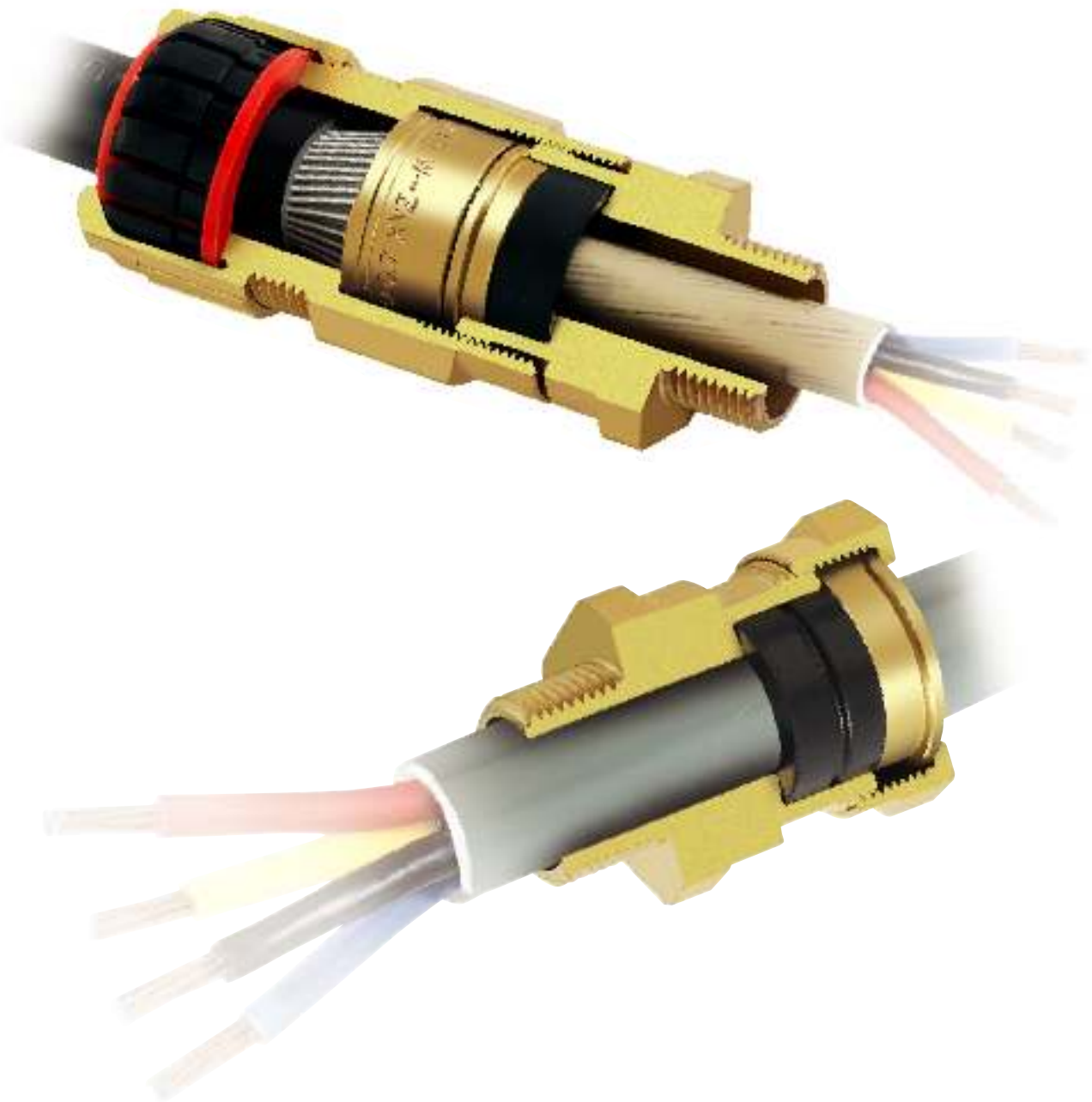
353/RAC

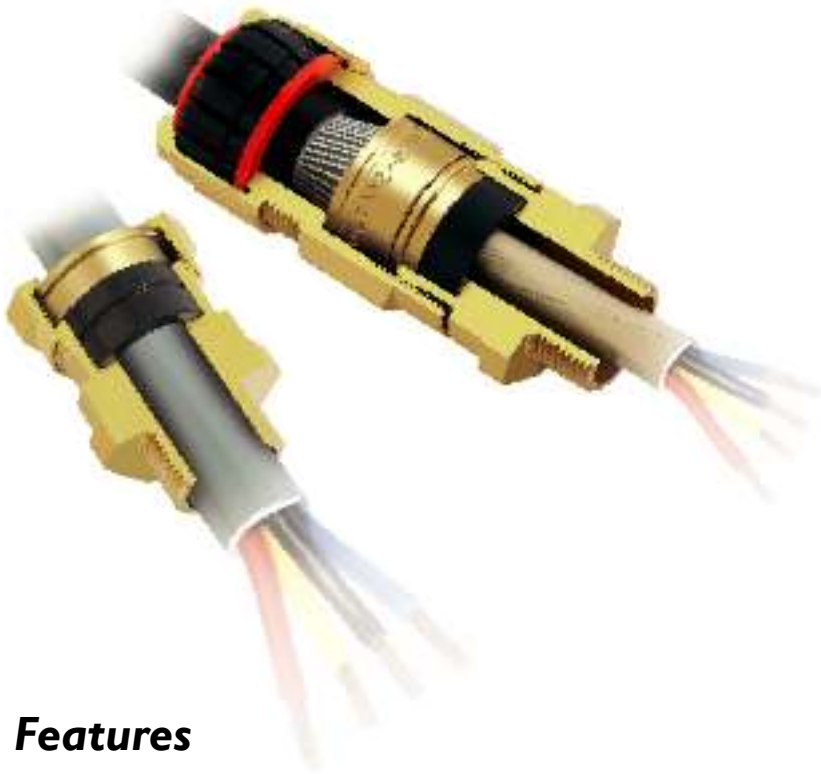
Assembly instruction data sheet
No. A.I. 302. For sizes Os to F.
No. A.I. 329. For sizes G to J.
Baseefa Certificate No. BAS 01 ATEX 2267X.

For application, features, technical data, general information, materials/finishes and cable gland ordering examples, please refer to :-

Page 14 (501/453/RAC).

Industrial Cable Glands





Features

- **Unique Rear Sealing System**

This arrangement offers IP66, IP67, IP68 (30 metres for 7 days), NEMA 4X and Deluge (DTS01) Ingress Protection. The seal is manufactured from a silicone material, has LSFZH properties, is ozone and oil resistant and is suitable for use at both high and low temperatures.

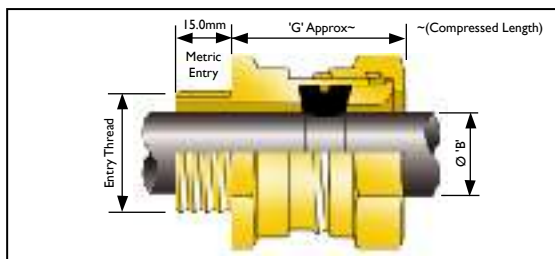
The Rear Sealing System covers the entire range of cable diameters without the need for special seals and the cable acceptance range is stamped on the backnut for ease of inspection. The backnut can be hand tightened, with only one further spanner turn required to ensure IP66, IP67, IP68 and NEMA 4X.

- **The Original Reversible Armour Clamp**

The original RAC clamping system was invented by Hawke over 10 years ago and is a well established proven performer in all conditions. Simply by reversing the clamping ring, the cable gland can adjust to accommodate all types of cable armour or braid. Unlike many of our competitors the correct clamping orientation is marked clearly with a 'W', 'Z' or 'X' and backed up by the presence of a groove in the component. Hawke's RAC clamping system is also fully inspectable when positioned on the cable.

- **Inspectable Deluge Seal**

Hawke's inspectable deluge seal offers IP66 and IP67 sealing and is certified as 'deluge proof' by ITS in accordance with DTS01. Indeed Hawke's deluge seal is so good that it exceeds the expectations of the offshore industry by not only preventing ingress into the equipment, but also into the cable gland, which could potentially corrode the cable armour.



Cable Gland Type 121

Industrial

CABLE GLAND SELECTION TABLE									
Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Outer Sheath 'B'						
	Metric	NPT* Std./Option	Standard Seal		Alternative Seal (S)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
2K	M16	-	3.0	8.0	-	-	27	19.0	21.2
Os	M20 ²	½"	3.0	8.0	-	-	32.8	24.0	27.7
O	M20 ²	½"	7.5	11.9	-	-	32.8	24.0	27.7
A	M20	¾"/½"	11.0	14.3	8.5	13.4	32.8	30.0	34.6
B	M25	1"/¾"	13.0	20.2	9.5	15.4	33.8	36.0	41.6
C	M32	1 ¼"/1"	19.0	26.5	15.5	21.2	35.2	46.0	53.1
C2	M40	1 ½"/1 ¼"	25.0	32.5	22.0	28.0	36.5	55.0	63.5
D	M50	2"/1 ½"	31.5	44.4/42.3 ¹	27.5	34.8	47.9	65.0	75.1
E	M63	2 ½"/2"	42.5	56.3/54.3 ¹	39.0	46.5	46.2	80.0	92.4
F	M75	3"/2 ½"	54.5	68.2/65.3 ¹	48.5	58.3	48	95.0	109.6
G	M80	3 ½"	67.0	73.0	-	-	41	106.4	123.0
H	M90	3 ½"	67.0	77.6	-	-	41	115.0	132.8
J	M100	4"	75.0	91.6	-	-	41	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable outer sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Assembly instruction data sheet No. A.I. 307.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 121 cable gland is manufactured as standard in brass, stainless steel and aluminium.
NPT entries, nickel plated as standard. Full nickel plating available.

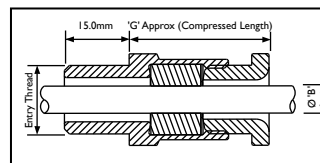
Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 121/C/M32
121/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. 121/C/M32/S
121/C/1 1/4" NPT/S



2K Size Cable Gland Design

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables.
- See technical section of the catalogue for installation rules and regulations.

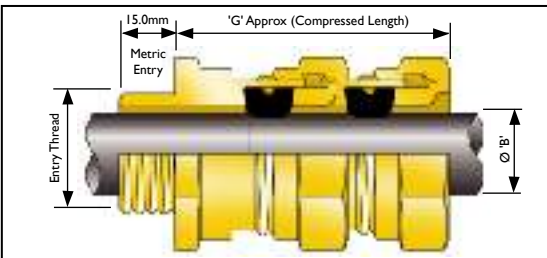
Features

- Provides a cable retention seal onto the cables outer sheath.

Technical Data

- Construction and test standards EN 50262. BS 6121 Part 1. Type A2.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +100°C as standard.

121 Cable Gland



CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Outer Sheath 'B'						
	Metric	NPT* Std./ Option	Standard Seal		Alternative Seal (\$)			Across Flats	Across Corners
			Min.	Max.	Min.	Max.			
Os	M20 ²	½"	3.0	8.0	-	-	52.3	24.0	27.7
O	M20 ²	½"	7.5	11.9	-	-	52.3	24.0	27.7
A	M20	¾"/½"	11.0	14.3	8.5	13.4	51.5	30.0	34.6
B	M25	1"/¾"	13.0	20.2	9.5	15.4	54.7	36.0	41.6
C	M32	1¼"/1"	19.0	26.5	15.5	21.2	55.9	46.0	53.1
C2	M40	1½"/1¼"	25.0	32.5	22.0	28.0	58.1	55.0	63.5
D	M50	2"/1½"	31.5	44.4/42.3 ¹	27.5	34.8	74.3	65.0	75.1
E	M63	2½"/2"	42.5	56.3/54.3 ¹	39.0	46.5	73.2	80.0	92.4
F	M75	3"/2½"	54.5	68.2/65.3 ¹	48.5	58.3	75	95.0	109.6
G	M80	3½"	67.0	73.0	-	-	68	106.4	123.0
H	M90	3½"	67.0	77.6	-	-	68	115.0	132.8
J	M100	4"	75.0	91.6	-	-	68	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable outer sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Assembly instruction data sheet No. A.I. 306.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 123 cable gland is manufactured as standard in brass.
NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 123/C/M32
123/C/1 1/4" NPT

Cable Gland with Alternative Seal (S)

e.g. 123/C/M32/S
123/C/1 1/4" NPT/S

Application

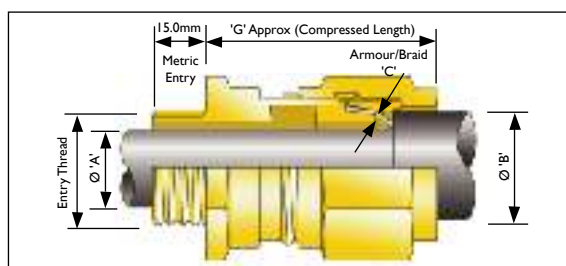
- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables.
- May be used on cables incorporating inner and outer cable sheaths.
- See technical section of catalogue for installation rules and regulations.

Features

- Provides a cable retention seal onto the cables outer sheath at two independent sealing points.

Technical Data

- Construction and test standards EN 50262. BS 6121 Part 1. Type A2.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- DTS01 deluge protection certified by ITS.
- Operating temperature range -60°C to +100°C as standard.



Cable Gland Type 150/RAC Industrial

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Inner Sheath 'A'	Outer Sheath 'B'	'C' Armour/Braid			Across Flats	Across Corners
	Metric	NPT* Std./ Option			Max.	Max.			
O	M20 ²	1/2"	11.9	16.0	0.9/1.25	0/0.7	47.5	24.0	27.7
A	M20	3/4"/1/2"	14.3	20.5	0.9/1.25	0/0.7	47.5	30.0	34.6
B	M25	1"/3/4"	20.2	26.0	1.25/1.6	0/0.7	50.8	36.0	41.6
C	M32	1 1/4"/1"	26.5	33.0	1.6/2.0	0/0.7	54.9	46.0	53.1
C2	M40	1 1/2"/1 1/4"	32.5	41.0	1.6/2.0	0/0.7	64.4	55.0	63.5
D	M50	2"/1 1/2"	44.4/42.3 ¹	52.6	1.8/2.5	0/1.0	68.5	65.0	75.1
E	M63	2 1/2"/2"	56.3/54.3 ¹	65.3	1.8/2.5	0/1.0	70.1	80.0	92.4
F	M75	3"/2 1/2"	68.2/65.3 ¹	78.0	1.8/2.5	0/1.0	72.3	95.0	109.6

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Size O is available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches). Assembly instruction data sheet No. A.I. 325.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Alternative Reversible Armour Clamping Rings (RAC)

SELECTION TABLE		
Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Materials & Finishes

The 150/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 150/RAC/C/M32
150/RAC/C/1 1/4" NPT

Cable Gland with Alternative Clamping Ring (AR)

e.g. 150/RAC/C/M32/AR
150/RAC/C/1 1/4" NPT/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.
- See technical section of catalogue for installation rules and regulations.

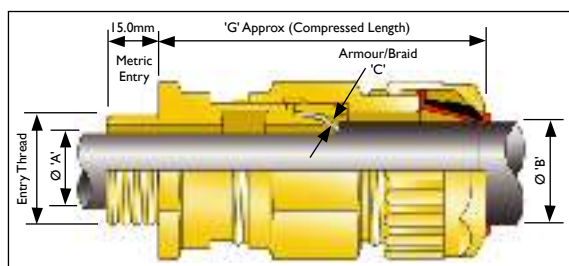
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.

Technical Data

- Construction and test standards BS 6121 Part 1.
Type BW, BX and BZ.

150/RAC Cable Gland



Cable Gland Type 151/RAC

CE
Industrial

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details						'G'	Hexagon Dimensions	
			Inner Sheath 'A'	Outer Sheath 'B'		'C' Armour/Braid		Across Flats		Across Corners	
	Metric	NPT* Std./Option		Max.	Min.	Max.	Orientation 1				Orientation 2
Os	M20 ²	1/2"	8.0	5.5	12.0	0.9/1.25	0/0.7	65.1	24.0	27.7	
O	M20 ²	1/2"	11.9	9.5	16.0	0.9/1.25	0/0.7	65.1	24.0	27.7	
A	M20	3/4"/1/2"	14.3	12.5	20.5	0.9/1.25	0/0.7	66.1	30.0	34.6	
B	M25	1"/3/4"	20.2	16.9	26.0	1.25/1.6	0/0.7	71.4	36.0	41.6	
C	M32	1 1/4"/1"	26.5	22.0	33.0	1.6/2.0	0/0.7	75.2	46.0	53.1	
C2	M40	1 1/2"/1 1/4"	32.5	28.0	41.0	1.6/2.0	0/0.7	77.1	55.0	63.5	
D	M50	2"/1 1/2"	44.4/42.3 ¹	36.0	52.6	1.8/2.5	0/1.0	90.3	65.0	75.1	
E	M63	2 1/2"/2"	56.3/54.3 ¹	46.0	65.3	1.8/2.5	0/1.0	96.7	80.0	92.4	
F	M75	3"/2 1/2"	68.2/65.3 ¹	57.0	78.0	1.8/2.5	0/1.0	96.0	95.0	109.6	

Larger cable glands available in 151 design. See page 23.

G	M80	3 1/2"	72.0	75.0	89.5	#	#	95.6	106.4	123.0
H	M90	3 1/2"	80.0	75.0	89.5	#	#	95.6	115.0	132.8
J	M100	4"	90.0	88.0	104.5	#	#	95.6	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Dedicated armour clamping rings are fitted. Please specify armour type and size.

Assembly instruction data sheet No. A.I. 308.

For sizes Os to F.

Assembly instruction data sheet No. A.I. 335.

For sizes G to J.

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 151/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium. NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. 151/RAC/C/M32
151/RAC/C/1 1/4" NPT

Cable Gland with Alternative Clamping Ring (AR)

e.g. 151/RAC/C/M32/AR
151/RAC/C/1 1/4" NPT/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.
- See technical section of catalogue for installation rules and regulations.

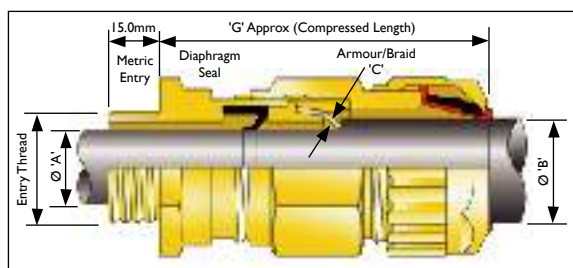
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Construction and test standards EN 50262. BS 6121 Part 1. Type CW, CX and CZ.
- IP66 ingress protection to IEC 60529 and EN 60529.
- Operating temperature range -60°C to +80°C as standard.

151/RAC Cable Gland



Cable Gland Type I53/RAC

CE
Industrial

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details						'G'	Hexagon Dimensions	
			Inner Sheath 'A'		Outer Sheath 'B'		'C' Armour/Braid			Across Flats	Across Corners
	Metric	NPT* Std./Option	Min.	Max.	Min.	Max.	Orientation 1	Orientation 2			
Os	M20 ²	1/2"	4.0	8.0	5.5	12.0	0.9/1.25	0/0.7	65.1	24.0	27.7
O	M20 ²	1/2"	7.5	11.9	9.5	16.0	0.9/1.25	0/0.7	65.1	24.0	27.7
A	M20	3/4"/1/2"	11.5	14.2	12.5	20.5	0.9/1.25	0/0.7	66.1	30.0	34.6
B	M25	1"/3/4"	13.7	20.1	16.9	26.0	1.25/1.6	0/0.7	71.4	36.0	41.6
C	M32	1 1/4"/1"	19.6	26.4	22.0	33.0	1.6/2.0	0/0.7	75.2	46.0	53.1
C2	M40	1 1/2"/1 1/4"	26.0	32.4	28.0	41.0	1.6/2.0	0/0.7	77.1	55.0	63.5
D	M50	2"/1 1/2"	30.0	44.5/42.3 ¹	36.0	52.6	1.8/2.5	0/1.0	90.3	65.0	75.1
E	M63	2 1/2"/2"	41.5	54.0	46.0	65.3	1.8/2.5	0/1.0	96.7	80.0	92.4
F	M75	3"/2 1/2"	53.0	66.0/65.3 ¹	57.0	78.0	1.8/2.5	0/1.0	96.0	95.0	109.6

Larger cable glands available in I53 design. See page 23.

G	M80	3 1/2"	67.0	73.0	75.0	89.5	#	#	95.6	106.4	123.0
H	M90	3 1/2"	67.0	77.6	75.0	89.5	#	#	95.6	115.0	132.8
J	M100	4"	75.0	91.6	88.0	104.5	#	#	95.6	127.0	146.7

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Dedicated armour clamping rings are fitted. Please specify armour type and size.

Assembly instruction data sheet No. A.I. 322.

For sizes Os to F.

Assembly instruction data sheet No. A.I. 329.

For sizes G to J.

Alternative Reversible Armour Clamping Rings (RAC)

Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The I53/RAC cable gland is manufactured as standard in brass, stainless steel and aluminium. NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread

e.g. I53/RAC/C/M32
I53/RAC/C/1 1/4" NPT

Cable Gland with Alternative Clamping Ring (AR)

e.g. I53/RAC/C/M32/AR
I53/RAC/C/1 1/4" NPT/AR

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables.
- Suitable for use with cables that exhibit "Cold Flow" characteristics.
- See technical section of catalogue for installation rules and regulations.

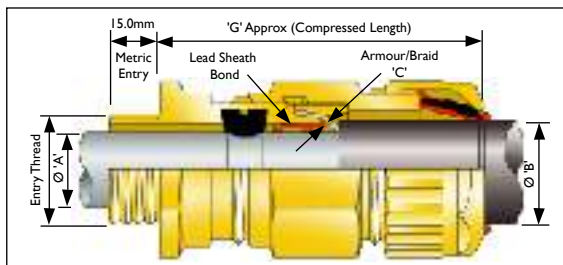
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Provides a diaphragm seal on the cables inner sheath. A diaphragm seal will not damage cable that has "Cold Flow" characteristics.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Construction and test standards EN 50262, BS 6121 Part 1, Type EIW, EIX and EIZ.
- IP66 and IP67 ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- Operating temperature range -60°C to +80°C as standard.

I53/RAC Cable Gland



Cable Gland Type

I53/RAC/L

For Lead Sheath Cables

CE

Industrial

CABLE GLAND SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details								'G'	Hexagon Dimensions	
			Inner Lead		Sheath 'A'		Outer Sheath 'B'		'C' Armour/Braid				
	Standard (L) Seal+Bond		Alternative (K) Seal+Bond										
	Metric	NPT* Std./Option	Min.	Max.	Min.	Max.	Min.	Max.	Orientation 1	Orientation 2		Across Flats	Across Corners
O	M20 ²	½"	7.5	8.5	-	-	9.5	16.0	0.9/1.25	0/0.7	65.1	24.0	27.7
A	M20	¾"/½"	-	-	8.5	10.8	12.5	20.5	0.9/1.25	0/0.7	66.1	30.0	34.6
B	M25	1"/¾"	13.0	16.7	11.0	15.4	16.9	26.0	1.25/1.6	0/0.7	71.4	36.0	41.6
C	M32	1¼"/1"	19.0	22.5	15.5	21.2	22.0	33.0	1.6/2.0	0/0.7	75.2	46.0	53.1
C2	M40	1½"/1¼"	25.0	28.5	22.0	28.0	28.0	41.0	1.6/2.0	0/0.7	77.1	55.0	63.5
D	M50	2"/1½"	31.5	40.3	27.5	34.8	36.0	52.6	1.8/2.5	0/1.0	90.3	65.0	75.1
E	M63	2½"/2"	42.0	52.0	39.0	46.5	46.0	65.3	1.8/2.5	0/1.0	96.7	80.0	92.4
F	M75	3"/2½"	54.5	63.8	51.0	58.3	57.0	78.0	1.8/2.5	0/1.0	96	95.0	109.6

Larger cable glands available in I53/L design. See page 23.

G	M80	3 1/2"	67.0	68.5	-	-	75.0	89.5	#	#	95.6	106.4	123.0
H	M90	3 1/2"	67.0	73.1	-	-	75.0	89.5	#	#	95.6	115.0	132.8
J	M100	4"	75.0	87.1	-	-	88.0	104.5	#	#	95.6	127.0	146.7

² Size O is available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 10.9mm.

General Information

All Metric entry threads are 1.5mm pitch medium fit.
All dimensions in millimetres (except* where dimensions are in inches).
Dedicated armour clamping rings are fitted. Please specify armour type and size.
Assembly instruction data sheet No. A.I. 302 + 336 For sizes O to F.
Assembly instruction data sheet No. A.I. 329 + 336 For sizes G to J.

Alternative Reversible Armour Clamping Rings (RAC)

SELECTION TABLE		
Size Ref.	Steel Wire Armour/Braid/Tape	
	Orientation 1	Orientation 2
O/Os	0.8 - 1.0	0.4 - 0.8
A	0.8 - 1.0	0.4 - 0.8
B	0.9 - 1.25	0.5 - 0.9
C	1.2 - 1.6	0.6 - 1.2
C2	1.2 - 1.6	0.6 - 1.2
D	1.45 - 1.8	1.0 - 1.45
E	1.45 - 1.8	1.0 - 1.45
F	1.45 - 1.8	1.0 - 1.45

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The I53/RAC/L cable gland is manufactured as standard in brass, stainless steel and aluminium. NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Thread/Standard Inner Seal + Bond

e.g. I53/RAC/C/M32/L
I53/RAC/C/1 1/4" NPT/L

Cable Gland with Alternative Clamping Ring (AR)

e.g. I53/RAC/C/M32/L/AR
I53/RAC/C/1 1/4" NPT/L/AR

Cable Gland with Alternative Inner Seal + Bond

e.g. I53/RAC/C/M32/K
I53/RAC/C/1 1/4" NPT/K

Application

- Outdoor or Indoor use.
- For use with single wire armoured 'W', wire braided 'X' and steel tape armoured 'Z', elastomer and plastic insulated cables with a lead inner sheath.
- See technical section of catalogue for installation rules and regulations.

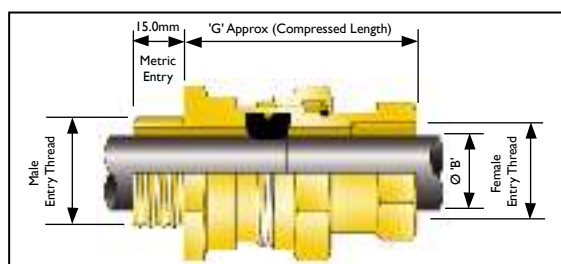
Features

- Provides armour clamping using one clamping arrangement for all armour/braid types.
- Provides a seal and an electrical bond on the cables lead inner sheath.
- Deluge protection option available.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer sheath.

Technical Data

- Construction and test standards EN 50262. BS 6121 Part 1. Type E2V, E2X and E2Z.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN 60529 and NEMA 4X.
- Operating temperature range -60°C to +80°C as standard.

I53/RAC/L Cable Gland



Cable Gland Type 114

CE
Industrial

CABLE GLAND SELECTION TABLE

Size Ref.	Male Entry Thread Size		Female Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
					Outer Sheath 'B'						
	Metric	NPT* Std./ Option	Metric	NPT #	Standard Seal		Alternative Seal (S)				
					Min.	Max.	Min.	Max.			
A	M20	¾"/½"	M20	-	11.0	14.3	8.5	13.4	63.9	30.0	34.6
B	M25	1"/¾"	M25	-	13.0	20.2	9.5	15.4	52.8	36.0	41.6
C	M32	1 ¼"/1"	M32	-	19.0	26.5	15.5	21.2	69.5	46.0	53.1
C2	M40	1 ½"/1 ¼"	M40	-	25.0	32.5	22.0	28.0	72.3	55.0	63.5
D	M50	2"/1 ½"	M50	-	31.5	44.4/42.3 ¹	27.5	34.8	92.8	65.0	75.1
E	M63	2 ½"/2"	M63	-	42.5	56.3/54.3 ¹	39.0	46.5	93.2	80.0	92.4
F	M75	3"/2 ½"	M75	-	54.5	68.2/65.3 ¹	48.5	58.3	94.9	95.0	109.6

¹ Smaller value is applicable when selecting reduced NPT entry option.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

All dimensions in millimetres (except* where dimensions are in inches).

Assembly instruction data sheet No. A.I. 310.

NPT female thread sizes equivalent to those shown in the table for the male thread size are available. Hexagon dimensions as shown may alter.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 114 cable gland is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland Ordering Examples

Cable Gland Type/Size/Male Thread/Female Thread

e.g. 114/C/M32/M32
114/C/1 1/4" NPT/M32

Cable Gland with Alternative Seal (S)

e.g. 114/C/M32/M32/S
114/C/1 1/4" NPT/M32/S

Application

- Outdoor or Indoor use.
- For use with non-armoured elastomer and plastic insulated cables installed in conduit.
- See technical section of the catalogue for installation rules and regulations.

Features

- Provides a cable retention seal onto the cables outer sheath.
- Provides female running coupler for cable gland or conduit entry.

Technical Data

- Construction and test standards EN 50262.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529 and EN 60529.
- Operating temperature range -60°C to +100°C as standard.

114 Cable Gland

Hawke Cable Glands

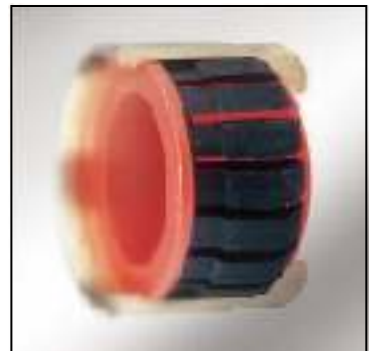
Flameproof/Increased Safety
and Industrial

Hawke Cable Glands

North American Series Cable Glands/Connectors



North American Series Cable Glands/Connectors

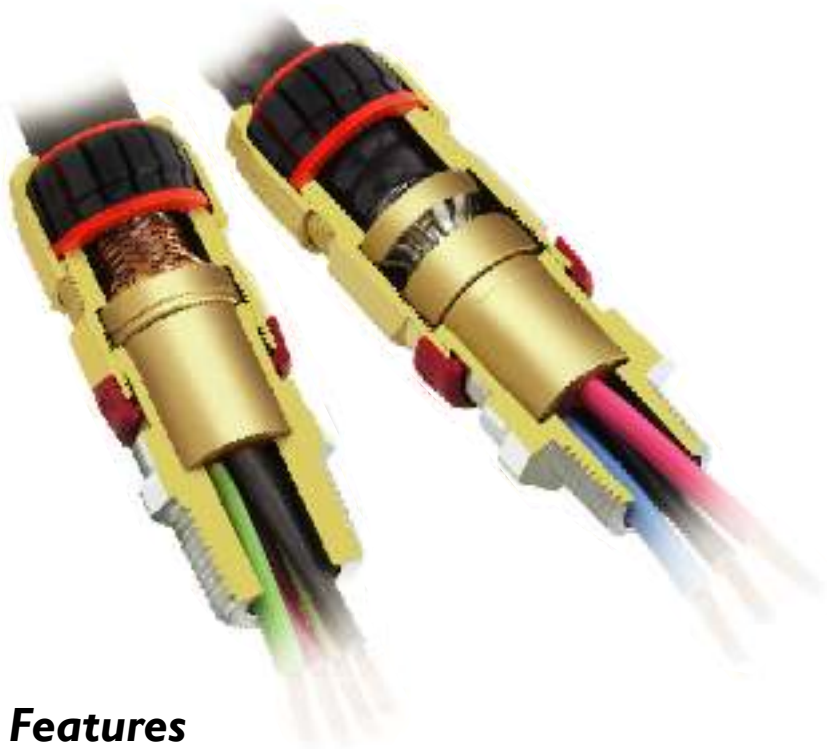




North American Series Cable Glands/Connectors

Explosion Proof and General Purpose

North American Series
Cable Glands/Connectors



Features

- **Unique Rear Sealing System**

This arrangement offers IP66, IP67, IP68 (30 metres for 7 days), NEMA 4X and Deluge (DTS01) Ingress Protection. The seal is manufactured from a silicone material, has LSFZH properties, is ozone and oil resistant and is suitable for use at both high and low temperatures.

The Rear Sealing System covers the entire range of cable diameters without the need for special seals and the cable acceptance range is stamped on the backnut for ease of inspection. The backnut can be hand tightened, with only one further spanner turn required to ensure IP66, IP67, IP68 and NEMA 4X.

- **Armour Grounding Device**

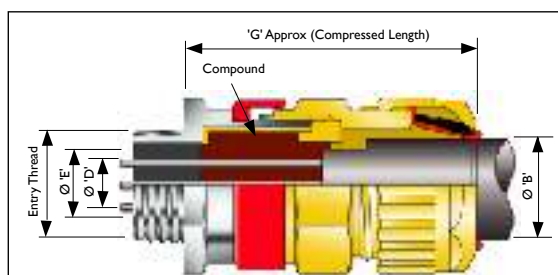
This device provides 360° armour grounding which is fully inspectable.

The grounding device is unique in that it remains in contact with the metal cable jacket when the cable gland/connector is disassembled for inspection.

- **Inspectable Deluge Seal**

Hawke's inspectable deluge seal offers IP66 and IP67 sealing and is certified as 'deluge proof' by ITS in accordance with DTS01. Indeed Hawke's deluge seal is so good that it exceeds the expectations of the offshore industry by not only preventing ingress into the equipment, but also into the cable gland/connector, which could potentially corrode the cable armour. The deluge seal is coloured red for hazardous location products and black for industrial general purpose products.





Cable Gland/Connector Type

710



Explosion Proof

CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details					'G'	Hexagon Dimensions	
			Inner Jacket/Cores			Outer Jacket 'B'				
	'D' Max. Over Cores	'E' Max. Inner Jacket	Max. No. Of Cores	Min.	Max.					
						Across Flats	Across Corners			
Os	1/2"	M20 ²	0.35"	0.39"	6	0.22"	0.47"	2.81"	0.94"	1.09"
O	1/2"	M20 ²	0.35"	0.39"	6	0.37"	0.63"	2.81"	0.94"	1.09"
A	1/2"/3/4"	M20	0.43"	0.64"	10	0.49"	0.81"	2.84"	1.18"	1.36"
B	3/4"/1"	M25	0.64"	0.93"	21	0.66"	1.02"	2.95"	1.42"	1.64"
C	1"/1 1/4"	M32	0.86"	1.23"	42	0.87"	1.30"	3.11"	1.81"	2.09"
C2	1 1/4"/1 1/2"	M40	1.04"	1.59"	60	1.10"	1.61"	3.26"	2.17"	2.50"
D	2"/1 1/2"	M50	1.46"	1.96"	80	1.42"	2.07"	3.36"	2.56"	2.96"
E	2 1/2"/2"	M63	1.88"	2.55"	100	1.81"	2.57"	3.56"	3.15"	3.64"
F	3"/2 1/2"	M75	2.32"	2.98"	120	2.24"	3.07"	3.76"	3.74"	4.31"

²'H' size cable gland/connector available.

Contact Hawke International for further details.

H	3 1/2"	M90	2.79"	3.12"	-	3.07"	3.52"	3.54"	4.18"	4.84"
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²Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 0.43".

General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Two part sealing compound and assembly instructions are supplied with the cable gland/connector.

Assembly instruction data sheet No. A.I. 316. For sizes A to F.

Assembly instruction data sheet No. A.I. 337. For size H.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 710 cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 710/C/1" NPT

Application

- Outdoor or Indoor use.
- For use with non-armoured cable, as permitted by the NEC.
- See technical section of the catalogue for installation rules and regulations.

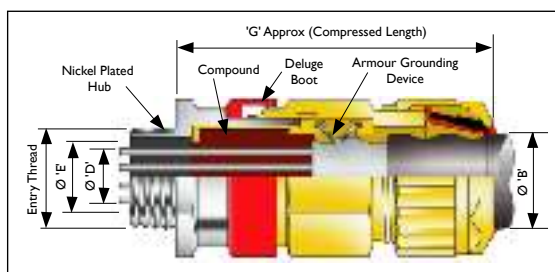
Features

- Provides a barrier seal between the individual insulated conductors within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland/connector compresses and distributes the compound evenly to effect a barrier seal at the point of entry into the enclosure.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure. Deluge seal is coloured red to indicate Hazardous Locations product.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

Technical Data

- UL Listed for use in Class I, Division 2, Gas Groups A, B, C and D.
- UL Listed for use in Class I, Zone 2, Gas Groups IIA, IIB and IIC.
- UL listed AExd IIC and AExe II Class I, Zone 2.
- Construction and test standards    UL Listed hazardous locations in USA and Canada. E84940.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN60529 and NEMA 4X.
- DTS01 deluge tested by ITS.
- Operating temperature range -50°C to +60°C as standard.

710 Cable Gland/Connector



Cable Gland/Connector Type 711 Class I Division I



CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details						'G'	Hexagon Dimensions	
			Inner Jacket/Cores				Outer Jacket 'B'				
	'D' Max. Over Cores	Armour Jacket 'E'		Max. No. Of Cores	Min.	Max.					
		Min.	Max.				Min.	Max.			
A	1/2"/3/4"	M20	0.43"	0.41"	0.64"	10	0.49"	0.81"	2.74"	1.18"	1.36"
B	3/4"/1"	M25	0.64"	0.49"	0.93"	21	0.66"	1.02"	2.95"	1.42"	1.64"
C	1"/1 1/4"	M32	0.86"	0.85"	1.23"	42	0.87"	1.30"	3.04"	1.81"	2.09"
C2	1 1/4"/1 1/2"	M40	1.04"	1.17"	1.59"	60	1.10"	1.61"	3.09"	2.17"	2.50"
D	2"/1 1/2"	M50	1.46"	1.37"	1.96"	80	1.42"	2.07"	3.37"	2.56"	2.96"
E	2 1/2"/2"	M63	1.88"	1.76"	2.55"	100	1.81"	2.57"	3.65"	3.15"	3.64"
F	3"/2 1/2"	M75	2.32"	2.29"	2.98"	120	2.24"	3.07"	3.73"	3.74"	4.31"

'H' size cable gland/connector available.

Contact Hawke International for further details.

H	3 1/2"	M90	2.79"	2.93"	3.47"	120	3.07"	3.52"	4.33"	4.18"	4.84"
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General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Two part sealing compound and assembly instructions are supplied with the cable gland/connector.

Assembly instruction data sheet No. A.I. 317. For sizes A to F.

Assembly instruction data sheet No. A.I. 338. For size H.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 711 cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 711/C/1" NPT

Application

- Outdoor or Indoor use.
- For use with continuous corrugated aluminium, Metal Clad (MCHL) cable.
- See technical section of the catalogue for installation rules and regulations.

Features

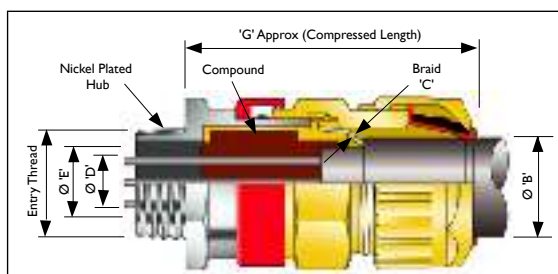
- Provides 360° armour grounding which is fully inspectable.
- Grounding Device remains in contact with cable when disassembled for inspection.
- Provides a barrier seal between the individual insulated cores within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland/connector compresses and distributes the compound evenly to create a barrier seal at the point of entry into the enclosure.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure. Deluge seal is coloured red to indicate Hazardous Location product.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

Technical Data

- UL Listed for use in Class I, Division I, Gas Groups A, B, C and D.
- UL Listed for use in Class I, Zone I, Gas Groups IIA, IIB and IIC.
- UL Listed AExd IIC and AExe II Class I, Zone I.
- Construction and test standards
 - UL Listed hazardous locations in USA and Canada. E84940
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN60529 and NEMA 4X.
- DTS01 deluge tested by ITS.
- Operating temperature range -50°C to +60°C as standard.

For Class I, Division 2 MC cable applications, the 713 cable gland/connector is available. Details and sizes are the same as the 711.

711 Cable Gland/Connector



Cable Gland/Connector Type

753



Explosion Proof

753 Cable Gland/Connector

CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details						'G'	Hexagon Dimensions	
			Inner Jacket/ Cores			Outer Jacket 'B'		'C'			
	NPT Std./ Option	Metric *	'D' Max. Over Cores	'E' Max. Inner Jacket	Max. No. Of Cores			Braid		Across Flats	Across Corners
						Min.	Max.				
Os	½"	M20 ²	0.35"	0.46"	6	0.22"	0.47"	0.008"/0.013"	2.80"	0.94"	1.09"
O	½"	M20 ²	0.35"	0.46"	6	0.37"	0.63"	0.008"/0.013"	2.80"	0.94"	1.09"
A	½"/¾"	M20	0.43"	0.49"	10	0.49"	0.81"	0.008"/0.013"	2.83"	1.18"	1.36"
B	¾"/1"	M25	0.64"	0.72"	21	0.66"	1.02"	0.008"/0.013"	2.94"	1.42"	1.64"
C	1"/1¼"	M32	0.86"	0.97"	42	0.87"	1.30"	0.008"/0.013"	3.10"	1.81"	2.09"
C2	1¼"/1½"	M40	1.04"	1.16"	60	1.10"	1.61"	0.008"/0.013"	3.26"	2.17"	2.50"
D	2"/1½"	M50	1.46"	1.64"	80	1.42"	2.07"	0.008"/0.013"	3.35"	2.56"	2.96"
E	2½"/2"	M63	1.88"	2.11"	100	1.81"	2.57"	0.008"/0.013"	3.56"	3.15"	3.64"
F	3"/2½"	M75	2.32"	2.61"/2.57"	120	2.24"	3.07"	0.008"/0.013"	3.76"	3.74"	4.31"

¹H' size cable gland/connector available.

Contact Hawke International for further details.

H	3 1/2"	M90	2.79"	3.05"	-	3.07"	3.52"	0.008"/0.013"	3.54"	4.18"	4.84"
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¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 0.43".

General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Two part sealing compound and assembly instructions are supplied with the cable gland/connector.

Assembly instruction data sheet No. A.I. 318. For sizes A to F.

Assembly instruction data sheet No. A.I. 339. For size H.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 753 cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 753/C/1" NPT

Application

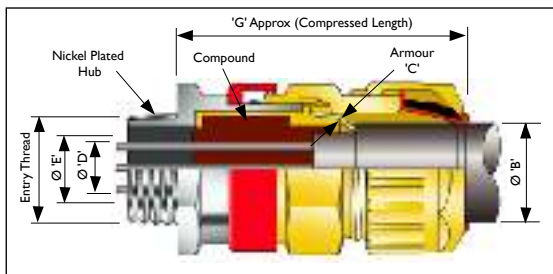
- Outdoor or Indoor use.
- For use with braid armoured marine shipboard jacketed or non-jacketed cable.
- See technical section of the catalogue for installation rules and regulations.

Features

- Provides a barrier seal between the individual insulated conductors within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland/connector compresses and distributes the compound evenly to effect a barrier seal at the point of entry into the enclosure.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure. Deluge seal is coloured red to indicate Hazardous Location product.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

Technical Data

- UL Listed for use in Class I, Division I, Gas Groups A, B, C and D.
 - UL Listed for use in Class I, Zone 1 and Zone 2, Gas Groups IIA, IIB and IIC.
 - UL Listed AExd IIC and AExe II Class I, Zone 1.
 - Construction and test standards
-    UL Listed hazardous locations in USA and Canada. E84941.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN60529 and NEMA 4X.
 - DTS01 deluge tested by ITS.
 - Operating temperature range -50°C to +60°C as standard.



Cable Gland/Connector Type 755

UL US
Explosion Proof

CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details								'G'	Hexagon Dimensions	
			Inner Jacket/ Cores			Outer Jacket 'B'		'C'					
	NPT Std./ Option	Metric *	'D' Max. Over Cores	'E' Max. Inner Jacket	Max. No. Of Cores			Steel Wire Armour		Braid		Tape	
						Min.	Max.						
Os	½"	M20 ²	0.35"	0.46"	6	0.22"	0.47"	0.036"/0.049"	0.008"/0.013"	0.008"/0.031"	2.80"	0.94"	1.09"
O	½"	M20 ²	0.35"	0.46"	6	0.37"	0.63"	0.036"/0.049"	0.008"/0.013"	0.008"/0.031"	2.80"	0.94"	1.09"
A	½"/¾"	M20	0.43"	0.49"	10	0.49"	0.81"	0.036"/0.049"	0.008"/0.013"	0.008"/0.031"	2.83"	1.18"	1.36"
B	¾"/1"	M25	0.64"	0.72"	21	0.66"	1.02"	0.049"/0.062"	0.008"/0.013"	0.008"/0.039"	2.94"	1.42"	1.64"
C	1"/1¼"	M32	0.86"	0.97"	42	0.87"	1.30"	0.062"/0.078"	0.008"/0.013"	0.008"/0.055"	3.10"	1.81"	2.09"
C2	1¼"/1½"	M40	1.04"	1.16"	60	1.10"	1.61"	0.062"/0.078"	0.008"/0.013"	0.008"/0.070"	3.26"	2.17"	2.50"
D	2"/1½"	M50	1.46"	1.64"	80	1.42"	2.07"	0.078"/0.098"	0.008"/0.013"	0.008"/0.070"	3.35"	2.56"	2.96"
E	2½"/2"	M63	1.88"	2.11"	100	1.81"	2.57"	0.098"	0.008"/0.013"	0.008"/0.070"	3.56"	3.15"	3.64"
F	3"/2½"	M75	2.32"	2.61"/2.57" ¹	120	2.24"	3.07"	0.098"	0.008"/0.013"	0.008"/0.070"	3.76"	3.74"	4.31"

¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 0.43".

General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Two part sealing compound and assembly instructions are supplied with the cable gland/connector.

Assembly instruction data sheet No. A.I. 319.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 755 cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 755/C/1" NPT

Application

- Outdoor or Indoor use.
- For use with armoured jacketed cable, as permitted by the NEC.
- See technical section of the catalogue for installation rules and regulations.

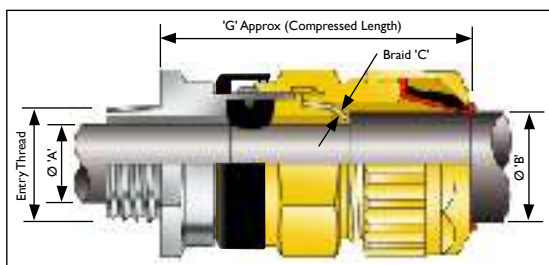
Features

- Provides a barrier seal between the individual insulated conductors within the cable and prevents entry of the products of an explosion into the cable.
- Assembly of the cable gland/connector compresses and distributes the compound evenly to effect a barrier seal at the point of entry into the enclosure.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure. Deluge seal is coloured red to indicate Hazardous Location product.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

Technical Data

- UL Listed for use in Class I, Division 2, Gas Groups A, B, C and D.
- UL Listed for use in Class I, Zone 2, Gas Groups IIA, IIB and IIC.
- UL Listed AExd IIC and AExe II Class I, Zone 2.
- Construction and test standards UL Listed hazardous locations in USA and Canada. E84940.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN60529 and NEMA 4X.
- DTS01 deluge tested by ITS.
- Operating temperature range -50°C to +60°C as standard.

755 Cable Gland/Connector



Cable Gland/Connector Type

153/X



General Purpose

CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details							'G'	Hexagon Dimensions	
			Inner Jacket 'A'				Outer Jacket 'B'		'C'			
	Standard Seal		Alternative Seal (S)		Braid							
							Min.	Max.	Min.		Max.	Min.
	NPT Std./Option	Metric *									Across Flats	Across Corners
Os	½"	M20 ²	0.12"	0.31"	-	-	0.22"	0.47"	0.008"/0.013"	2.56"	0.94"	1.09"
O	½"	M20 ²	0.30"	0.46"	-	-	0.37"	0.63"	0.008"/0.013"	2.56"	0.94"	1.09"
A	½"/¾"	M20	0.44"	0.56"	0.34"	0.52"	0.49"	0.81"	0.008"/0.013"	2.60"	1.18"	1.36"
B	¾"/1"	M25	0.52"	0.79"	0.38"	0.60"	0.66"	1.02"	0.008"/0.013"	2.81"	1.42"	1.64"
C	1"/1¼"	M32	0.75"	1.04"	0.61"	0.83"	0.87"	1.30"	0.008"/0.013"	2.96"	1.81"	2.09"
C2	1¼"/1½"	M40	0.99"	1.27"	0.87"	1.10"	1.10"	1.61"	0.008"/0.013"	3.04"	2.17"	2.50"
D	2"/1½"	M50	1.24"	1.74"/1.67" ¹	1.09"	1.37"	1.42"	2.07"	0.008"/0.013"	3.54"	2.56"	2.96"
E	2½"/2"	M63	1.68"	2.21"/2.14" ¹	1.54"	1.83"	1.81"	2.57"	0.008"/0.013"	3.81"	3.15"	3.64"
F	3"/2½"	M75	2.15"	2.68"/2.57" ¹	1.91"	2.29"	2.24"	3.07"	0.008"/0.013"	3.78"	3.74"	4.31"

¹ 'H' size cable gland/connector available.

Contact Hawke International for further details.

H	3 1/2"	M90	2.64"	3.06"	-	-	2.96"	3.52"	0.008"/0.013"	4.8"	4.53"	5.23"
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¹ Smaller value is applicable when selecting reduced NPT entry option.

² Sizes Os and O are available with an M16 thread size. For O size with M16 thread, the maximum cable inner sheath diameter is 0.43".

General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Assembly instruction data sheet No. A.I. 341.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 153/X cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 153/CX/M32
153/CX/1" NPT

Cable Gland/Connector with Alternative Seal (S)

e.g. 153/CX/M32/S
153/CX/1" NPT/S

Application

- Outdoor or Indoor use.
- For use with armoured marine shipboard jacketed or non-jacketed cable.
- See technical section of the catalogue for installation rules and regulations.

Features

- Provides armour clamping for marine shipboard cable.
- Provide a seal on the cables inner jacket.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

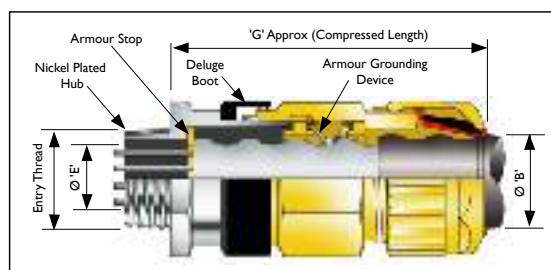
Technical Data

- Construction and test standards    UL Listed wet locations. E218332.
- IP66, IP67 and IP68 (30 metres for 7 days) ingress protection to IEC 60529, EN60529 and NEMA 4X.
- DTS01 deluge tested by ITS.
- Operating temperature range -50°C to +60°C as standard.

Cable Gland/Connector Type 701



General Purpose



CABLE GLAND/CONNECTOR SELECTION TABLE

Size Ref.	Entry Thread Size		Cable Acceptance Details				'G'	Hexagon Dimensions	
			Armour Jacket 'E'		Outer Jacket 'B'			Across Flats	Across Corners
	NPT Std./ Option	Metric *							
A	1/2"/3/4"	M20	0.41"	0.64"	0.49"	0.81"	2.74"	1.18"	1.36"
B	3/4"/1"	M25	0.49"	0.93"	0.66"	1.02"	2.95"	1.42"	1.64"
C	1"/1 1/4"	M32	0.85"	1.23"	0.87"	1.30"	3.04"	1.81"	2.09"
C2	1 1/4"/1 1/2"	M40	1.17"	1.59"	1.10"	1.61"	3.09"	2.17"	2.50"
D	2"/1 1/2"	M50	1.37"	1.96"	1.42"	2.07"	3.37"	2.56"	2.96"
E	2 1/2"/2"	M63	1.76"	2.55"	1.81"	2.57"	3.65"	3.15"	3.64"
F	3"/2 1/2"	M75	2.29"	2.98"	2.24"	3.07"	3.73"	3.74"	4.31"

'H' size cable gland/connector available.

Contact Hawke International for further details.

H	3 1/2"	M90	2.93"	3.47"	3.07"	3.52"	4.33"	4.18"	4.84"
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General Information

All dimensions in inches (except* where dimensions are in millimetres).

All Metric entry threads are 1.5mm pitch medium fit.

Assembly instruction data sheet No. A.I. 315. For sizes A to F.

Assembly instruction data sheet No. A.I. 342. For size H.

Accessories including locknuts, sealing washers, serrated washers, earth tags, shrouds, adaptors and reducers available. See pages 44 - 48.

Materials & Finishes

The 701 cable gland/connector is manufactured as standard in brass, stainless steel and aluminium.

NPT entries, nickel plated as standard. Full nickel plating available.

Cable Gland/Connector Ordering Examples

Cable Gland/Connector Type/Size/Thread

e.g. 701/C/1" NPT

Application

- Outdoor or Indoor use.
- For use with continuous corrugated aluminium and interlocked steel Metal Clad, MCHL and Teck type cables.
- See technical section of the catalogue for installation rules and regulations.

Features

- Provides 360° armour grounding which is fully inspectable.
- Grounding Device remains in contact with cable when disassembled for inspection.
- Provides an outer deluge seal to prevent moisture ingress to the cable armour and enclosure.
- Provides a cable retention and low smoke and fume, zero halogen seal onto the cables outer jacket.

Technical Data

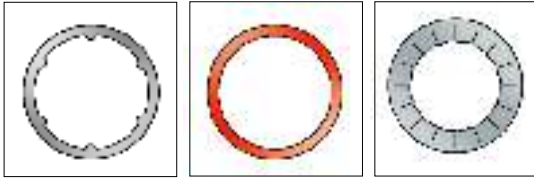
- Construction and test standards    UL Listed wet locations. E165706.
- IP66 and IP67 ingress protection to IEC 60529, EN60529 and NEMA 4X.
- DTS01 deluge tested by ITS.
- Operating temperature range -50°C to +60°C as standard.

701 Cable Gland/Connector

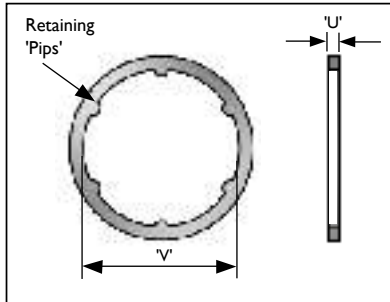
Accessories



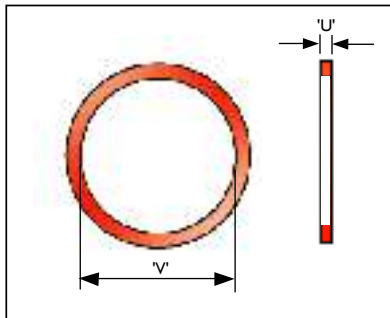
Cable Gland Accessories



Nylon Sealing Washer



Red Fibre Washer



SEALING WASHER SELECTION TABLE		
Metric Cable Gland Size 'V'	NPT * Cable Gland Size 'V'	'U'
M20	1/2"	1.5
M20	3/4"	1.5
M25	1"	1.5
M32	1 1/4"	1.5
M40	1 1/2"	1.5
M50	2"	1.5
M63	2 1/2"	1.5
M75	3"	1.5
M80	3 1/2"	1.5
M90	3 1/2"	1.5
M100	4"	1.5

General Information

All dimensions in millimetres (except* where dimensions are in inches).
Hawke does not recommend the use of tapered entry threads in enclosures with plain clearance holes. Parallel threaded entries are recommended for this purpose.

Washers for M80, M90 and M100 sizes are only available in Red Fibre.

Application

- For use on cable gland entry threads.

Features

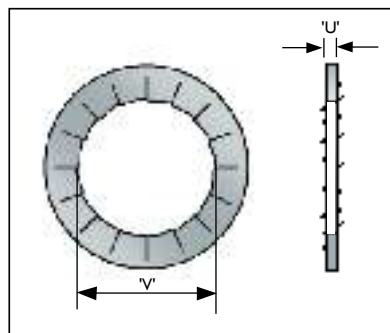
- To maintain ingress protection rating at the enclosure.
- Retaining 'Pips' make washer captive on metric cable gland entry thread.

Ordering Examples

Sealing Washer Type/Size/Thread

e.g. Nylon Washer/M25
Fibre Washer/M25

Serrated Washer



SERRATED WASHER SELECTION TABLE		
Metric Cable Gland Size 'V'	NPT * Cable Gland Size 'V'	'U'
M20	1/2"	1.5
M20	3/4"	1.5
M25	1"	1.5
M32	1 1/4"	1.5
M40	1 1/2"	1.5
M50	2"	1.5
M63	2 1/2"	1.5
M75	3"	1.5

General Information

All dimensions in millimetres (except* where dimensions are in inches).
Hawke does not recommend the use of tapered entry threads in enclosures with plain clearance holes. Parallel threaded entries are recommended for this purpose.

Application

- For use on cable gland entry threads.

Features

- To dampen vibrations of the cable gland/equipment assembly which may loosen the cable gland or locknut.

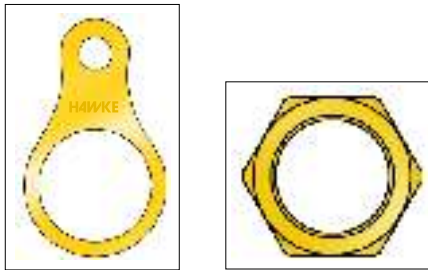
Materials & Finishes

Hawke serrated washers are manufactured as standard in stainless steel.

Ordering Examples

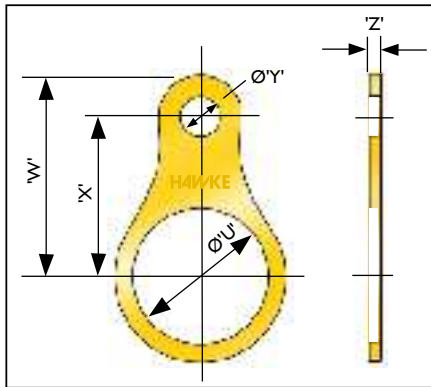
Serrated Washer/Size/Thread

e.g. Serrated Washer/M25
Serrated Washer/1" NPT



Cable Gland Accessories

Earth Tags



EARTH TAG SELECTION TABLE				
Metric Cable Gland Size 'U'	'Y'	'W'	'X'	'Z'
M20	7.0	39.6	33.1	1.6
M25	10.5	45.5	36.5	1.6
M32	12.2	52.0	40.9	1.6
M40	13.6	59.6	44.2	1.6
M50	13.5	78.9	58.1	1.6
M63	13.5	87.6	66.8	1.6
M75	13.5	93.7	72.9	1.6
M80	14.0	128.0	104.0	3.0
M90	14.0	128.0	104.0	3.0
M100	14.0	128.0	104.0	3.0

Features

- Provides an earth bond attachment for a cable gland.

Materials & Finishes

Hawke earth tags are manufactured as standard in brass. Stainless Steel locknuts are available, but dimensions may differ slightly to those stated in the selection table. Please contact Hawke for details.

Ordering Example Earth Tag /Size/Thread

e.g. Earth Tag/M25



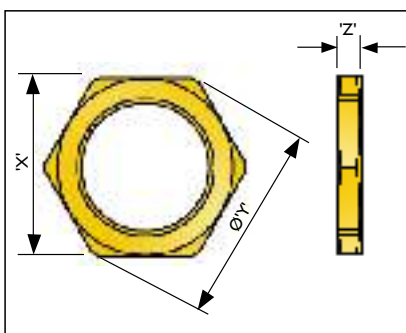
Alternative Shape may be supplied dependant upon size.

General Information

All dimensions in millimetres.

Hawke does not recommend the use of tapered entry threads in enclosures with plain clearance holes. Parallel threaded entries are recommended for this purpose.

Heavy Duty Locknuts



LOCKNUT SELECTION TABLE							
Metric x 1.5mm Pitch				NPT			
Metric Cable Gland	Across Flats 'X'	Across Corners 'Y'	'Z'	NPT * Cable Gland	Across Flats 'X'	Across Corners 'Y'	'Z'
M16	19.0	21.9	3.2	-	-	-	-
M20	24.0	26.9	4.0	1/2"	30.0	33.6	4.7
M20	24.0	26.9	4.0	3/4"	30.0	33.6	4.7
M25	30.0	33.6	4.0	1"	36.0	40.3	6.4
M32	46.0	53.1	4.0	1 1/4"	46.0	53.1	6.4
M40	46.0	53.1	4.8	1 1/2"	55.0	61.6	6.4
M50	65.0	72.8	4.7	2"	65.0	72.8	6.4
M63	80.0	89.6	6.4	2 1/2"	80.0	89.6	6.4
M75	95.0	107.0	6.4	3"	95.0	107.0	6.4
M80	106.4	119.2	10.0	3 1/2"	127.0	143.0	9.0
M90	106.4	119.2	10.0	3 1/2"	127.0	143.0	9.0
M100	127.0	142.2	10.0	4"	139.7	158.0	9.0

General Information

All dimensions in millimetres (except* where dimensions are in inches).

Hawke does not recommend the use of tapered entry threads in enclosures with plain clearance holes. Parallel threaded entries are recommended for this purpose.

Features

- Secures a cable gland in position at the equipment.

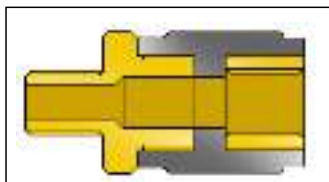
Materials & Finishes

Hawke heavy duty locknuts are manufactured as standard in brass.

Stainless Steel locknuts are available, but dimensions may differ slightly to those stated in the selection table. Please contact Hawke for details.

Ordering Example Locknut /Size/Thread

e.g. Locknut/M25



Cable Gland Accessories

Flameproof, Increased Safety and Industrial

PVC Shrouds



PCP Shrouds



SHROUD SELECTION TABLE

Size Ref. #
O/Os
A
B
C
C2
D
E
F
G
H
J

Application

- Outdoor or Indoor use.
- For fitting over cable glands when additional environmental and corrosion protection is required.

Materials & Finishes

Hawke shrouds are supplied in black as standard.

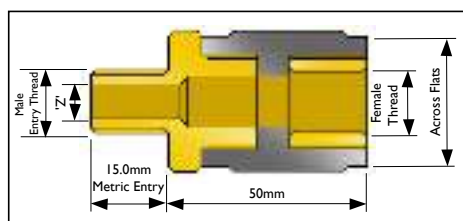
Ordering Examples

Shroud Type/Size

e.g. PVC Shroud/C
PCP Shroud/C

Cable Gland Accessories

Insulated Adaptor Types 478, 378 and 178



INSULATED ADAPTOR SELECTION TABLE

Size Ref.	Male Thread		Female Thread #	'Z' Bore	Hexagon Dimensions	
	Metric	NPT * Std./Option			Across Flats	Across Corners
A	M20	¾"/1½"	M20	14.3	30.0	34.6
B	M25	1"/¾"	M25	20.2	36.0	41.6
C	M32	1¼"/1"	M32	26.5	46.0	53.1
C2	M40	1½"/1¼"	M40	32.5	55.0	63.5
D	M50	2"/1½"	M50	44.5	65.0	75.1
E	M63	2½"/2"	M63	56.3	80.0	92.4
F	M75	3"/2½"	M75	68.3	95.0	109.6

General Information

All dimensions in millimetres (except* where dimensions are in inches).

Female NPT threads available. Please contact Hawke International for details.

Materials & Finishes

Insulated portion manufactured from glass filled nylon.

Female insert and entry component are manufactured as standard in brass.

Application

- Outdoor or Indoor use.
- Provides electrical insulation between a cable gland or a conduit fitting and an electrical enclosure. e.g. to provide a means of isolating armour/braid on signal/instrument cable.

Technical Data

478 Certification and Approval

- Baseefa Certificate No. BAS I 125U.
- Exd IIC.
- Suitable for use in Zone I and Zone 2.
- Suitable for use in Gas Groups IIA, IIB and IIC.

378 Certification and Approval

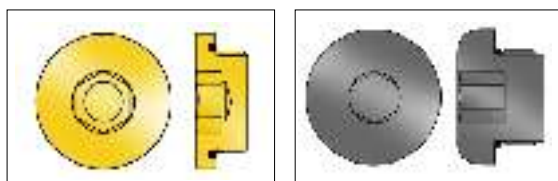
- Baseefa Certificate No. Ex 813167U.
- EExe II.
- Suitable for use in Zone I and Zone 2.

178 Industrial

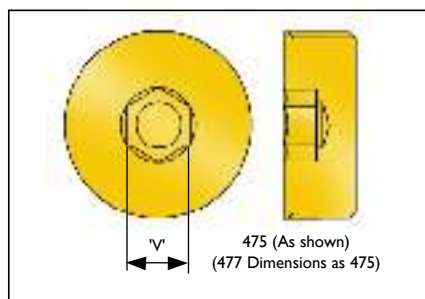
Ordering Example

Insulated Adaptor/Size/Male Thread/Female Thread

e.g. 478/C/M32/M32



Type 475 and 477 Flameproof



477 AND 475 STOPPING PLUGS		
Thread Size		Hex. Key
Metric x 1.5p	NPT *	Across Flats Size 'V'
M20	3/4"/1/2"	10.0
M25	1"/3/4"	10.0
M32	1 1/4"/1"	14.0
M40	1 1/2"/1 1/4"	14.0
M50	2"/1 1/2"	17.0
M63	2 1/2"/2"	17.0
M75	3"/2 1/2"	19.0

General Information

All dimensions in millimetres (except* where dimensions are in inches).
The 475 - Flameproof EExd (removable from outside the enclosure).
The 477 - Flameproof EExd (removable from inside the enclosure).

Materials & Finishes

475 and 477 Stopping plugs are manufactured as standard in brass.

Features

- To close unused cable gland entries and maintain the flameproof integrity of the equipment.

Technical Data

- Flameproof EExd IIC  II 2 GD IP66.
- Baseefa Certificate No. BAS 01 ATEX 2244X.
- Alternative Certification Options Available.
-  GOST R-Exd IICU/Exe IIU.
-  AUS-Exd IIC/Exe II.

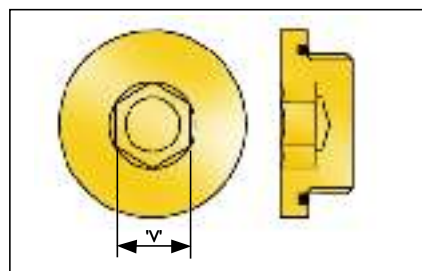
Stopping Plugs

Ordering Example

Stopping Plug Type/Size/Thread

e.g. 477/M32

Type 387 Increased Safety



387 STOPPING PLUGS	
Thread Size	Hex. Key
Metric x 1.5p	Across Flats Size 'V'
M16	10.0
M20	10.0
M25	10.0
M32	10.0
M40	10.0
M50	10.0
M63	10.0
M75	10.0

General Information

Ingress Protection

To meet with IP66 and IP67, the stopping plugs must be fitted perpendicular to the equipment face in a suitably sized threaded or plain hole and the equipment face must be smooth. Plain holes must be no larger than 0.7mm above the major diameter of the stopping plug thread and the plug must be held in place with a locknut. An serrated washer may also be fitted.

Features

- To close unused cable gland entries and maintain the increased safety integrity of the equipment

Technical Data

- Increased Safety EExe II  II 2 GD IP66.
- Baseefa Certificate No. BAS 01 ATEX 2112U.
- Alternative Certification Options Available.
-  AUS-Exd IIC/Exe II.

Materials & Finishes

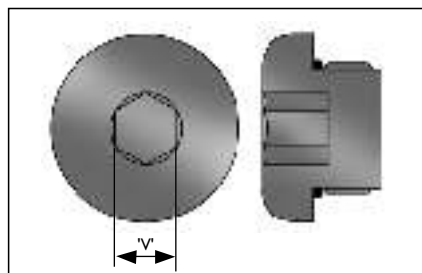
387 Stopping plugs are manufactured as standard in brass.

Stopping Plugs Ordering Example

Stopping Plug Type/Size/Thread

e.g. 387/M32

Type 375 Increased Safety



375 STOPPING PLUGS	
Thread	Hex. Key
Metric x 1.5p	Across Flats Size 'V'
M20	10.1
M25	10.1

General Information

Ingress Protection

To meet with IP66 and IP67, the stopping plugs must be fitted perpendicular to the equipment face in a suitably sized threaded or plain hole and the equipment face must be smooth. Plain holes must be no larger than 0.7mm above the major diameter of the stopping plug thread and the plug must be held in place with a locknut. An optional serrated washer may also be fitted.

Features

- To close unused cable gland entries and maintain the increased safety integrity of the equipment

Technical Data

- Increased Safety EExe II  II 2 GD IP66.
- Baseefa Certificate No. BAS 01 ATEX 2104U.
- Alternative Certification Options Available.
-  AUS-Exd IIC/Exe II.

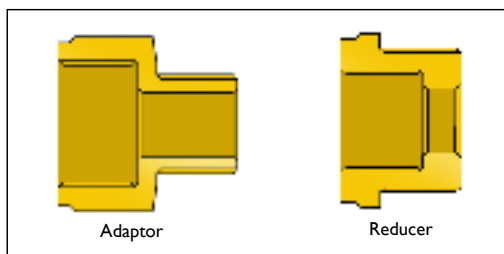
Materials & Finishes

375 Stopping plugs are manufactured as standard in Black Nylon.

Stopping Plugs Ordering Example

Stopping Plug Type/Size/Thread

e.g. 375/M20



Adaptors and Reducers Type 476 and 376

ATEX  

Flameproof and Increased Safety

		ADAPTOR AND REDUCER SELECTION TABLE															
		Male Thread															
		Metric								NPT							
		M16	M20	M25	M32	M40	M50	M63	M75	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
Female Thread	Metric	M16															
		M20															
		M25															
		M32															
		M40															
		M50															
		M63															
		M75															
	NPT	1/2"															
		3/4"															
		1"															
		1 1/4"															
		1 1/2"															
		2"															
		2 1/2"															
		3"															

Application/Features

- Provides a means of connection between the equipment and cable glands with dissimilar thread sizes or types.

Only metric female thread types are permitted by the ATEX Directive for flameproof EExd applications.

Flameproof adaptors/reducers are permitted with female thread types other than metric, providing the equipment has been certified for use with the adaptor/reducer. EExe adaptors/reducers have no ATEX thread type restriction

Technical Data

- Flameproof EExd and Increased Safety EExe.  II 2 GD IP66.
- Baseefa Certificate No. BAS 01 ATEX 2249X.
- Baseefa Certificate No. BAS 01 ATEX 2241U (see*). (Component approval only).
- Baseefa Certificate No. BAS 01 ATEX 2242X (EExe II only).
- Suitable for use in Zone 1, Zone 2, Zone 21 and Zone 22.
- Suitable for use in Gas Groups IIA, IIB and IIC.
- Construction and test standards EN 50014, EN 50018, EN 50019 and EN 50281-1-1.
- IEC 60079-0, IEC 60079-1 and IEC 60079-7.
- Alternative Certification Options Available.
 -   CEPEL BR-Exd IIC/Exe II.
 -   GOST R-Exd IICU/Exe IIU.
 -  AUS-Exd IIC/Exe II.

General Information

All Metric entry threads are 1.5mm pitch medium fit.

Materials & Finishes

Hawke adaptors/reducers are manufactured as standard in brass.

Adaptor/Reducer Ordering Examples

476/Adaptor or Reducer/Male Thread Size/Female Thread Size.

e.g. 476/R/M25/M20
476/A/M25/3/4" NPT.

Technical Data



Technical Data

The intent of this section of the catalogue is to identify important features that may be useful in the selection and installation of explosion protected electrical equipment.

There are numerous different regulations, codes, guidelines and standards for the design, installation and maintenance of electrical and non-electrical systems for use in potentially explosive atmospheres. The type of operational facility, geographic location, operator practice, local and national legislation, authority having jurisdiction etc. will determine many of the design and installation rules permitted. A fixed or floating petroleum facility located offshore, for example, would not be designed or classified in the same manner as an onshore petrochemical facility.

1.0 Potentially Explosive Atmospheres

An explosive atmosphere is defined as a mixture: -

- Of flammable substances in the form of gases, vapours, mists, dusts or fibres
- With air
- Under atmospheric conditions
- In which, after ignition has occurred, combustion spreads to the entire unburned mixture

2.0 Area Classification (Classification of Locations)

The purpose of area classification is to provide a basis for the correct selection, installation and location of electrical and non-electrical equipment in those areas. Areas must be classified depending on the properties of the flammable vapours, liquids, gases, mists, combustible dusts or fibres that may be present and the likelihood that a flammable or combustible concentration or quantity is present.

The aim of area classification is to avoid ignition of flammable releases that may occur in the operation of facilities. The intent is to reduce to an acceptable minimum level the probability of a flammable atmosphere and an ignition source occurring at the same time.

3.0 CENELEC and IEC

3.1 Area Classification

Area classification is the division of a facility into three-dimensional hazardous areas and non-hazardous areas and the sub-division of the hazardous area into 'Zones'.

Hazardous areas may be sub-divided into three Zones as follows: -

Flammable gases and vapours	
Zone 0	An area in which an explosive atmosphere is constantly present, or present for long periods.
Zone 1	An area in which an explosive atmosphere is likely to occur in normal operation. (Rough Guide: 10 hours or more / year but less than 1,000 hours / year)
Zone 2	An area in which an explosive atmosphere is not likely to occur in normal operation and if it occurs, it will exist only for a short time. (Rough Guide: Less than 10 hours / year)

Combustible Dusts	
Zone 20	An area in which combustible dust, as a cloud, is present continuously or frequently, during normal operation, in sufficient quantity to be capable of producing an explosive concentration of combustible dust in a mixture with air
Zone 21	An area, in which combustible dust, as a cloud, is occasionally present during normal operation, in a sufficient quantity to be capable of producing an explosive concentration of combustible dust in a mixture with air.
Zone 22	An area, in which combustible dust, as a cloud, may occur infrequently and persist for only a short period, or in which accumulations of layers of combustible dust may give rise to an explosive concentration of combustible dust in mixture with air.

For further information on the classification of hazardous areas, see: -

- IEC 60079-10** ■ Electrical Apparatus for Explosive Gas Atmospheres, Classification of Hazardous Areas
- IEC 61241-3** ■ Electrical apparatus for use in the presence of combustible dust
(Proposed Change to IEC 61241-10) Part 3: Classification of areas where combustible dusts are, or may be, present
- IEC 60079-10** ■ Electrical Apparatus for Explosive Gas Atmospheres, Classification
- PR EN 50281-3** ■ Classification of areas where dusts are, or may be, present
- Institute of Petroleum** ■ Model Code of Safe Practice in the Petroleum Industry, Part 15: Area Classification Code for Petroleum Installations, IP 15

3.2 Classification Society

A Classification Society may also enforce requirements for the design and installation of facilities. These requirements, which are in addition to statutory requirements, may influence the design and installation of the electrical systems. Classification Societies include ABS, DNV and Lloyds Register.

3.3 Design and Installation of Electrical Systems for Hazardous (Classified) Areas

There are numerous regulation codes, guidelines and standards for the design, selection and installation of electrical installation in potentially explosive atmospheres. These requirements are in addition to the requirements for installations in non-hazardous areas.

There are several types of protection, i.e. construction techniques, available for electrical apparatus in hazardous areas. The type of protection permitted will depend upon the applicable installation codes and rules to be adopted.

The selection of electrical apparatus should be in accordance with the following: -

- Classification of the hazardous area
- Temperature class or ignition temperature of the gas, liquid, vapours, mist, dust or fibre
- Where applicable, the gas, vapour or dust classification in relation to the group or sub-group of the electrical apparatus
- External influences and ambient temperature

3.4 Apparatus selection according to Zones

Apparatus for use in Zone 0

- Intrinsic safety 'ia'

Apparatus for use in Zone 1

- Electrical apparatus permitted for use in Zone 0.
- Flameproof enclosure 'd'
- Pressurised apparatus 'p'
- Powder filling 'q'
- Oil immersion 'o'
- Increased safety 'e'
- Intrinsic safety 'ib'
- Encapsulation 'm'

Apparatus for use in Zone 2

- Electrical apparatus permitted for use in Zone 0 or Zone 1 or
- Electrical apparatus designed specifically for Zone 2 (for example type of protection 'n' or
- Electrical apparatus complying with the requirements of a recognised standard for industrial electrical apparatus, which does not, in normal operation, have ignition - capable hot surface and does not in normal operation produce arcs or sparks. This equipment must be in an enclosure with a degree of protection and mechanical strength suitable for the environment and be assessed by a person who is familiar with the requirements of any relevant standards and codes of practice.

Apparatus for use in Zones 20, 21 and 22

- Refer to EN 50281-1-2 Electrical apparatus protected by enclosures - Selection, installation and maintenance.

3.5 Apparatus selection according to the ignition temperature of the gas or vapour

The equipment must be selected so that its maximum surface temperature will not reach the ignition temperature of any gas or vapour that may be present.

Temperature class of electrical apparatus	Maximum surface temperature of electrical apparatus	Ignition temperature of gas or vapour
T1	450°C	>450°C
T2	300°C	>300°C
T3	200°C	>200°C
T4	135°C	>135°C
T5	100°C	>100°C
T6	85°C	>85°C

If the marking of the electrical apparatus does not include an ambient temperature range, the apparatus is only for use within an ambient temperature range from -20°C to +40°C.

For further information regarding data for flammable gases and vapours, see PD IEC 60079-20.

3.6 Apparatus selection according to apparatus grouping

The grouping of gases and vapours are classified into Group I and Group II categories. Group I is relevant to atmospheres containing firedamp (a mixture of gases, composed mostly of methane, found underground in mines).

Group II is intended for use in all other places with potentially explosive atmospheres. Group II electrical apparatus with types of protection 'd' and 'i' are further sub-divided into apparatus group IIA, IIB or IIC. Electrical apparatus with type of protection 'n' may also be sub-divided if it contains certain devices or components.

Gas / Vapour Sub-division	Apparatus sub-group permitted
IIA (typical gas propane)	IIA, IIB or IIC
IIB (typical gas ethylene)	IIB or IIC
IIC (typical gases acetylene and hydrogen)	IIC

3.7 Apparatus Construction Standards

CENELEC	IEC
EN 50014 - General Requirements	IEC 60079-0 - General Requirements
EN 50015 - Oil Immersion 'o'	IEC 60079-6 - Oil Immersion 'o'
EN 50016 - Pressurisation 'p'	IEC 60079-2 - Pressurisation 'p'
EN 50017 - Powder Filling 'q'	IEC 60079-5 - Powder Filling 'q'
EN 50018 - Flameproof Enclosure 'd'	IEC 60079-1 - Flameproof Enclosure 'd'
EN 50019 - Increased Safety 'e'	IEC 60079-7 - Increased Safety 'e'
EN 50020 - Intrinsic Safety 'i'	IEC 60079-11 - Intrinsic Safety 'i'
EN 50021 - Electrical Apparatus type 'n'	IEC 60079-15 - Electrical Apparatus type 'n'
EN 50028 - Encapsulation 'm'	IEC 60079-18 - Encapsulation 'm'

3.8 Installation Standards and Codes

There are numerous different regulations, codes, guidelines and standards for the design, installation and maintenance of electrical and non-electrical systems for use in potentially explosive atmospheres. The type of operational facility, geographic location, operator practice, local and national legislation, authority having jurisdiction etc. will determine many of the design and installation rules permitted.

For further information on the design, selection and installation of equipment for use in hazardous areas see: -

- IEC 60079-14** ■ Electrical installations in hazardous areas (other than mines)
- IEC 61892-7** ■ Mobile and fixed offshore units - Electrical installation, Part 7: Hazardous areas
- IEC 612141-1-2** ■ Electrical apparatus in the presence of combustible dust.
- (Proposed Change to IEC 612141-14)** Part 1-2: Electrical apparatus protected by enclosures and surface temperature
- EN 60079-14** ■ Electrical installations in hazardous areas (other than mines)
- EN 50281-1-2** ■ Electrical apparatus for use in the presence of combustible dust
- Part 1 - 2. Electrical apparatus protected by enclosures - selection, installation and maintenance.

3.9 Inspection Standards and Codes

For information regarding the installation and maintenance of equipment for use in hazardous see: -

- | | |
|--------------|---|
| IEC 60079-17 | ▪ Inspection and maintenance of electrical installations in hazardous areas (other than mines) |
| IEC 61241-17 | ▪ Electrical apparatus for use in the presence of combustible dust atmosphere - Part 17: Inspection and maintenance |

4.0 ATEX 94/9/EC Directive

ATEX is the term used when referring to the European Unions (EU) Directive 94/9/EC

The ATEX Directive main objectives are to guarantee the free circulation of goods within the European Union by aligning the technical and legal requirements of the Member States.

"ATEX" is derived from the French "Atmosphères Explosibles".

The Directive is named: - "Approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres".

The Directive covers electrical and non-electrical equipment and protective systems intended for use in potentially explosive atmospheres in mining and surface industries.

The Directive covers: -

- equipment and products that have potential ignition sources
- protective systems - products that control the effects of incipient explosions
- safety devices - products that may be outside a potentially explosive atmosphere but that have an explosion safety function.
- components - products that are intended to form parts of equipment or protective systems

To ensure compliance with the Directive, equipment must meet with the essential requirements specified in the Directive and be marked with the CE marking.

The process of ensuring that equipment complies with the Directive, conformity assessment procedure(s) must be complied with. These procedures may involve a Notified Body. A Notified body is a body that is independent of the product manufacturer and assesses conformity of the products and the manufacturer with the Directive. The Notified Body has to be approved and appointed by its government.

Conformity assessment procedures include, but are not limited by: -

- EC Type examination - including testing and inspection of a product design, where appropriate
- Production Quality Assurance - including the assessment, periodic auditing, testing and inspection of production samples, where appropriate, and of the manufacturers quality system.
- Product Verification - the inspection and/or testing of each production item for conformity with the type that was subjected to EC Type Examination
- Internal Control of Production - the verification by the manufacturer that the product design and each production item conform to either harmonised European Standards or the essential requirements or a combination of the two

The ATEX Directive came into force on a voluntary basis on 1st March 1996 and will become mandatory from the 1st July 2003 and all products within its scope will have to comply before being placed on the market or put into service.

The Directive classifies equipment into eight categories depending on the equipment's area of use: -

- Category M1 ▪ equipment intended for mining use and is required to remain functional in the presence of an explosive atmosphere.
- Category M2 ▪ equipment intended for mining use but is intended to be de-energised in the event of an explosive atmosphere.
- Category 1G ▪ non-mining equipment for use in Zone 0.
- Category 2G ▪ non-mining equipment for use in Zone 1.
- Category 3G ▪ non-mining equipment for use in Zone 2.
- Category 1D ▪ non-mining equipment for use in Zone 20.
- Category 2D ▪ non-mining equipment for use in Zone 21.
- Category 2D ▪ non-mining equipment for use in Zone 22.

4.1 ATEX 137 Directive 99/92/EC

The Directive covers the use of equipment in potentially explosive atmospheres and its aim is to establish minimum requirements for improving the safety and health of workers.

Article 137 of Directive 89/391/EC was published in the official journal of the EC on 28th January 2000 as Directive 99/92/EC, it is the 15th individual Directive of the framework Directive 89/391/EEC.

The article defines the: -

- Obligations of the employees re. the prevention and protection against explosions
- Assessment obligations re. the assessment of explosion risks.
- General obligations re. the safety and health of worker
- Requirements for explosion protection documents

In places where potentially explosive atmospheres may occur in such quantities as to endanger the health and safety of workers, the point of entry must be marked with the sign shown below in accordance with Section II, Article 7 of the Directive.



5.0 Wiring Systems

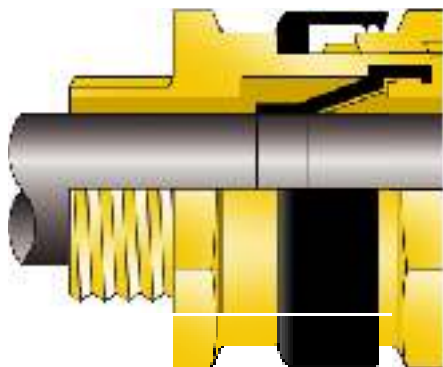
Cable systems and accessories should be installed in positions that prevent them from being subject to mechanical damage, corrosion, chemical attack, heat and other detrimental environmental conditions. Selection of the wiring system and cable type must consider these influences and where exposure to such conditions are unavoidable, protective measures such as minimising the risk of mechanical damage by the use of appropriate armoured cable types should be considered.

The connection of cables and conduits to the electrical apparatus must be in accordance with the requirements of the relevant type of protection and installation rules.

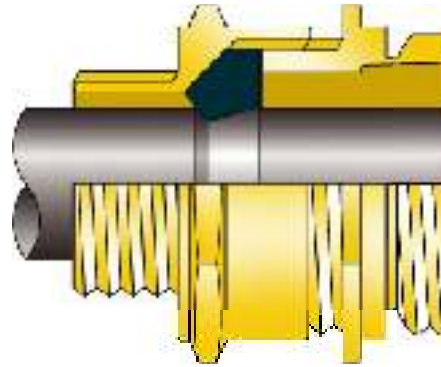
5.1 CENELEC and IEC Wiring Methods

With the introduction of cables incorporating new construction materials and especially cables with fire retardant or fire resistant properties such as cables complying with IEC 60331 and IEC 60332, cables may exhibit "cold flow" characteristics. "Cold flow" is a term used for thermoplastic materials that flow when subjected to pressure at ambient temperature. These "cold flow" characteristics could have adverse effects on the protection of the apparatus. A suitable cable gland should be used that does not incorporate displacement / compression seals that act upon the part(s) of the cable having cold flow characteristics.

To overcome this problem, Hawke has developed cable glands that incorporate diaphragm seals that act upon the "cold flow" cable sheath without compressing or damaging the cable. A typical cable gland incorporating displacement/compression seals and a Hawke 501/453/Universal cable gland incorporating a diaphragm seal are shown below.



No cable damage due to Hawke 501/453
Universal diaphragm seal cable gland
design.



Cable damage as found with cable gland
designs incorporating compression /
displacement seals.

The IEC and CENELEC installation standards, IEC 60079-14 and EN 60079-14 address "cold flow" in Clause 9.1.3.

5.2

Extract from EN 60079-14 : 1997 / IEC 60079-14 : 1996 Installations in hazardous areas

9.1.3 Connections

The connection of cables and conduits to the electrical apparatus shall be made in accordance with the requirements of the relevant type of protection.

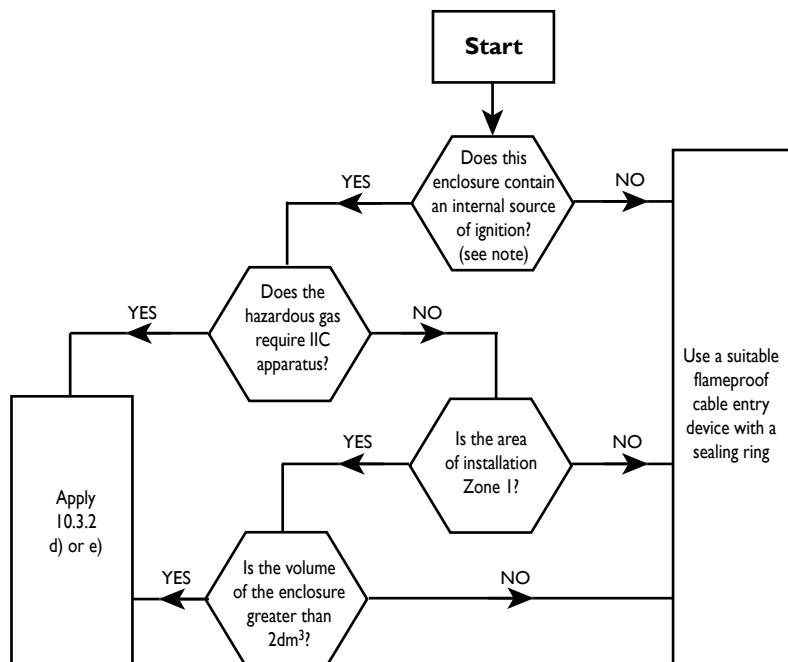
Notes:

1 Certain types of cable employ materials which can exhibit significant "cold flow" characteristics which could have adverse effects on the protection of the apparatus. Where such cable is to be used, a suitable cable entry device should be employed, for example cable entry devices not employing compression seals which act upon the part(s) of the cable having "cold flow" characteristics.

2 "Cold flow" can be more fully described as "thermoplastic materials which flow when subjected to pressure of ambient temperature".

Figure 1 - Selection chart for cable entry devices into flameproof enclosures for cables complying with item b) of 10.3.2

It is important to read notes and 10.3.2 before selecting appropriate cable gland for flameproof applications from Figure 1 below



NOTE - Internal sources of ignition include sparks or equipment temperatures occurring in normal operation which can cause ignition. An enclosure containing terminals only or an indirect entry enclosure (see 10.3.1) is considered not to constitute an internal source of ignition.

Hazardous Area Information

10.3 Cable Entry Systems

10.3.1 General

It is essential that cable entry systems comply with all the requirements referred to in the appropriate apparatus standard, that the cable entry device is appropriate to the type of cable employed, maintains the respective method of protection and is in accordance with clause 9.

Where cables enter into flameproof apparatus via flameproof bushings through the wall of the enclosure which are part of the apparatus (indirect entry), the parts of the bushings outside the flameproof enclosure will be protected in accordance with one of the types of protection listed in IEC 79-0. Normally the exposed part of the bushings will be within a terminal compartment which will either be another flameproof enclosure or will be protected by protection type 'e'. Where the terminal compartment is Ex'd', then the cable system shall comply with 10.3.2. Where the terminal compartment is Ex'e', then the cable system shall comply with 11.3.

Where cables enter into flameproof apparatus directly, the cable system shall comply with 10.3.2.

10.3.2 Selection

The cable entry system shall comply with one of the following:

- a) cable entry device in compliance with IEC 79-1 and the particular type of cable intended for use with that device;
- b) thermoplastic, thermosetting or elastomeric cable which is substantially compact and circular, has extruded bedding and the fillers, if any, are non-hygroscopic, may utilize flameproof cable entry devices, incorporating a sealing ring selected in accordance with figure 1;
- c) mineral insulated cable with or without plastic outer covering with appropriate flameproof cable entry device;
- d) flameproof sealing device (for example a stopper box or sealing chamber) specified in the apparatus documentation or having component approval and employing cable entry devices appropriate to the cables used. The sealing devices such as stopper boxes or sealing chambers shall incorporate compound or other appropriate seals which permit stopping around individual cores. Sealing devices shall be fitted at the point of entry of cables to the apparatus;
- e) flameproof cable entry devices incorporating compound filled seals around the individual cores or other equivalent sealing arrangements;
- f) other means which maintain the integrity of the flameproof enclosure.

NOTE - Where a factory-made termination of the encapsulated type is used, no attempt should be made to interfere with the connection to the apparatus or to replace the cable.

Hazardous Area Information

11.3 Wiring Systems

11.3.1 General

Cables and conduits shall be installed in accordance with clause 9 and the following additional requirements concerning cable entries and conductor terminations.

11.3.2 Cable Entry Devices

The connection of cables to increased safety apparatus shall be effected by means of cable entry devices appropriate to the type of cable used. They shall maintain protection type 'e' and shall incorporate a suitable sealing component to achieve IP54 degree of protection of the terminal enclosure.

NOTES

- 1 To meet IP 54 it may be necessary to seal between the cable and the enclosure (for example by means of a sealing washer or thread sealant).
- 2 Threaded cable entry devices into threaded cable entry plates or enclosures of 6mm or greater thickness need no additional sealing between the cable entry device and the entry plate or enclosure providing the axis of the cable entry device is perpendicular to the external surface of the cable entry plate or enclosure.

ACKNOWLEDGEMENT

Extracts from BS EN 60079-14 : 1997 reproduced with the permission of BSI under licence no. PD/1998 1818 and 1920. Complete editions of the standards can be obtained by post from BSI Customer Services, 389 Chiswick high Road, London. W4 4AL

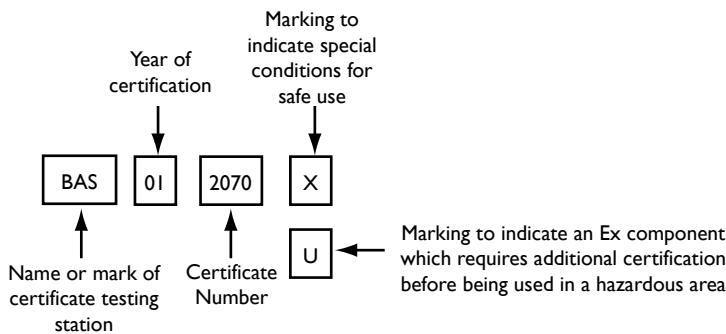
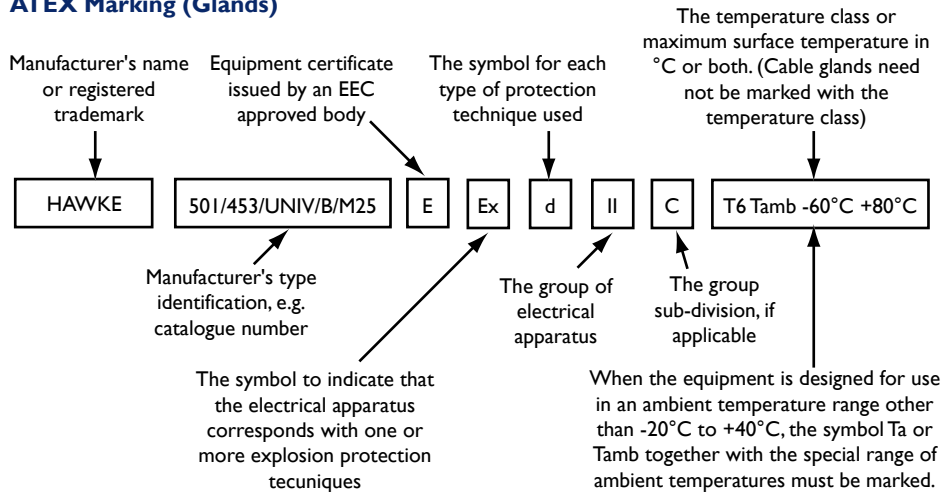
5.3 Wiring Methods for Type of Protection 'e' - Increased Safety:

The cable entry device, e.g. cable gland, must comply with all the requirements referred to in the appropriate Standard, be appropriate to the cable type, and maintain the type 'e' integrity of the equipment.

A minimum ingress protection rating of IP54 is required for increased safety equipment. To meet with this requirement it may be necessary to provide a seal between the cable gland and the equipment, for example, by the use of a sealing washer or thread sealant. Where cable glands are fitted into non-metallic enclosures, metallic enclosures with a painted type finish or enclosures with non-threaded clearance holes, additional ingress and earthing / bonding considerations may be necessary. Please refer to the sealing washer, earthing tag, serrated washer and locknut accessories shown in the catalogue.

6.0 Apparatus Marking - IEC and CENELEC (Group II)

6.1 ATEX Marking (Glands)



6.2 ATEX Marking (Enclosures)

- The name and address of the manufacturer
- Type, serial number and the year in which the equipment was constructed
- The specific marking of explosion protection Ex followed by the symbol of the equipment group and the category.

'EN50 014 EN50 019 EN50 281' (optional), Ex 'EExell' Temperature Classification, Ex 0600 Ex , Gas and Dust Groups, Maximum Surface Temperature of the enclosure (T), IP rating, Certification Name and Number, 'DO NOT OPEN WHEN ENERGIZED', Maximum Dissipated Power (Watts), Volts and Amps.

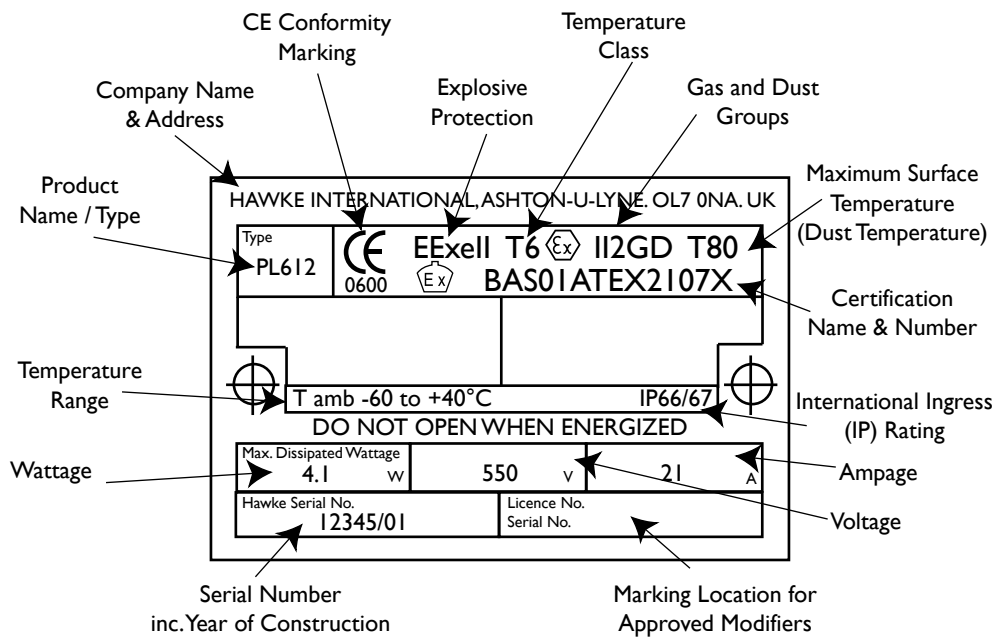
Note: If the temperature range is outside the normal range of -20°C to +40°C, it must be marked on the label.

Technical Data

Hawke Cable Glands and Enclosures

- For equipment Group II :-
the letter "G" where explosive atmospheres caused by gases, vapour or mists are concerned
and / or
the letter "D" where explosive atmospheres caused by dusts are concerned

Example:



6.2 Additional CE Marking

The CE conformity marking must consist of the initials **CE** and be followed by the identification number of the notified body responsible for production control.

Example: **CE**
0600

7.0 CE Marking ☞

The CE Marking is intended to facilitate the free movement of products within the European Union. By affixing CE marking to products, the manufacturer is making a legal declaration that the product meets with the appropriate requirements of all relevant European Directives. CE marking only applies to products within the scope of the Directives. It should not be applied to products if they are outside the

7.1 EMC, Electromagnetic Compatibility Directive

Most electrical and electronic products made or sold in the EU must: -

- Be constructed so they do not cause excessive electromagnetic interference and are not unduly affected by electromagnetic interference;
- In the case of certain radio-transmitting equipment, be subject to EC type examination by a notified body; and
- Carry CE marking

Cable glands are not considered to come within the scope of the Directive, however we have carried out independent third-party testing on the EMC shielding effectiveness of our armoured type cable glands fitted onto single wire armoured and braided-type cables. The electromagnetic ingress between the cable sample (perfect connection) and that of the cable sample fitted with the cable gland was of such a small magnitude that it could be regarded as within acceptable uncertainty of measurement. As such, it can be concluded that the shielding effectiveness of single wire armoured or braided cable is maintained when fitted with an appropriate Hawke armoured type cable gland.

7.2 Low Voltage Directive

The Low voltage Directive 73/23/EEC embodies a number of principles: -

- Only electrical equipment that does not jeopardise the safety of people, domestic animals and property, is permitted on the market.
- Only electrical equipment, that satisfies the CE marking requirements of the LVD, is in compliance.
- Electrical equipment is not required to be tested or marked for approval by an independent third party
- Enforcement is the responsibility of each member state within its national jurisdiction.
- The regulations apply to all electrical equipment, except where extensions apply, that is designed for use between 50 and 1000 volts ac or 75 and 1500 volts dc.
- Only components, which are in themselves "electrical equipment", need satisfy the Low Voltage Directive.

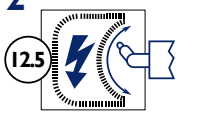
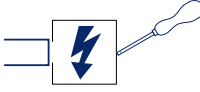
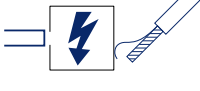
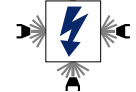
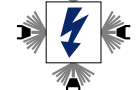
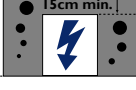
Cable glands are not in themselves "electrical equipment" and therefore do not fall within the scope of the LVD.

8.0 Certification / Listing / Approvals

Electrical equipment for use in potentially explosive atmospheres is usually certified, listed or approved by a recognised Certification Body or Test House. In Europe, there are numerous Certification Bodies such as BASEEFA 2001 Limited and SIRA in the UK. In North America, there are many recognised Certification Bodies and testing laboratories such as UL, FM and the CSA. The definition of "Approved" by the NEC is "Acceptable to the authority having jurisdiction". The definition "Listed" by the NEC is "Equipment, materials or services included in a list published by an organisation that is acceptable to the authority having jurisdiction". Further information is given in the NEC.

9.0 CENELEC and IEC Degree of Protection, IP Code

The standards EN 60529 and IEC 60529 describe a system for classifying the degrees of protection provided by the enclosures of electrical equipment as follows :-

First Number			Second Number		
0		Non-protected Protection of persons against access to hazardous parts inside the enclosure and against solid foreign objects	0		Non-protected Protection of the equipment inside the enclosure against harmful effects due to the ingress of water
1		Protected against objects of 50mm diameter and greater An object probe, sphere of 50mm diameter, shall not fully penetrate	1		Protected against vertically falling water drops Vertically falling drops shall have no harmful effects
2		Protected against solid foreign objects of 12.5mm diameter and greater An object probe, sphere of 12.5mm diameter, shall not fully penetrate	2		Protected against vertically falling water drops when enclosure tilted up to 15° Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical
3		Protected against solid foreign objects of 2.5mm diameter and greater An object probe, sphere of 2.5mm diameter, shall not penetrate at all	3		Protected against spraying water Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects
4		Protected against solid foreign objects of 1.0mm diameter and greater An object probe, sphere of 1.0mm diameter, shall not penetrate at all	4		Protected against splashing water Water splashed against the enclosure from any direction shall have no harmful effects
5		Dust-protected Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of apparatus or to impair safety	5		Protected against water jets Water projected in jets against the enclosure from any direction shall have no harmful effects
6		Dust-tight No ingress of dust	6		Protected against powered water jets Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
Typical Designation : IP66			7		Protected against the effects of temporary immersion in water for 30 mins Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardised conditions of pressure and time
			8		Protected against the effects of continuous immersion in water Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7

The protection of the enclosure and the equipment inside against external influences or conditions, such as: mechanical impacts, corrosion, corrosive solvents, solar radiation, icing moisture (e.g. produced by condensation), and explosive atmospheres, are matters that should be dealt with by the relevant product Standard.

There are additional and supplementary optional letters to the above coding; these designators are A, B, C & D and H, M, S & V, and further information can be found in the relevant Standard(s).

9.1 Deluge Ingress Protection

On offshore facilities, equipment may be located in areas subject to emergency deluge systems. Equipment that has been evaluated as certified for use in hazardous areas may not be suitable for use in these locations. A testing method for electrical equipment to be installed in areas subject to deluge systems, DTS01, has been prepared by the Explosion and Fire Hazards Group of ERA Technology (now known as ITS) in collaboration with Shell UK Exploration and Production Ltd.

Testing includes: -

- Energising the equipment (where appropriate) for 60 minutes prior to the deluge test, then interrupting the electrical power at the start of the deluge test and resuming after 60 minutes until the completion of the deluge test.
- Carrying out insulation resistance testing before and after pre-conditioning and after the deluge test, where applicable.
- Carrying out pre-conditioning by exposure to vibration and thermal ageing at 90% relative humidity and at a temperature 20K above the equipments maximum service temperature and/or at least 80°C of any appropriate seals.
- Carrying out deluge test using a deluge chamber fitted with deluge nozzles that apply a salt water solution deluge pressure within the range of 3.5 bar to 4.5 bar at a water temperature in the range of 5°C to 10°C for 3-hours.

10.0 IECEx Scheme

The objective of the IECEx Scheme is to facilitate international trade in electrical equipment intended for use in potentially explosive atmospheres by eliminating the need for multiple national certification. The IECEx Scheme provides a means for manufacturers to obtain Certificates of Conformity that will be accepted at national level in all participating countries. A Certificate of Conformity may be obtained from any certification body accepted into the scheme. The objective of the IECEx Scheme is world-wide acceptance of one standard, one certificate, and one mark.

For the IEC scheme to achieve its objective, every applicable national standard will need to be identical to the corresponding IEC standard. A transition period will be necessary to allow time for participating IECEx Scheme countries to align their national standards with the IEC standards and work towards national acceptance of IECEx Certificates of Conformity and the IECEx mark.

11.0 North American Hazardous (Classified) Locations

11.1 Area Classification

Area classification is the division of a facility into a two or three-dimensional hazardous location, a non-hazardous location and the sub-division of the hazardous location into 'Divisions' or 'Zones'.

Hazardous (classified) locations may be sub-divided as follows: -

Technical Data

Hawke Cable Glands and Enclosures

In the United States of America, hazardous (classified) locations are sub-divided into three Zones or two Divisions, as follows: -

Class I, Flammable Gases, Vapors or Liquids	Class I, Flammable Gases, Vapors or Liquids
Division 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some time under normal operating conditions.	Zone 0: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or for long periods at time under normal operation conditions. Zone 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist some of the time under normal operating conditions.
Division 2: Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions	Zone 2: Where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions.

Class II, Combustible Dusts
Division 1: Where ignitable concentrations of flammable gases, vapors or liquids can exist all of the time or some time under normal operating
Division 2: Where ignitable concentrations of combustible dusts are not likely to exist under normal operating conditions

There is no Zone classification for dusts, fibres or flyings at present in the NEC

Class III, Ignitable Fibres and Flyings
Division 1: Where ignitable concentrations of ignitable fibres and flyings can exist all of the time or some of the time under normal operating conditions
Division 2: Where ignitable concentrations of ignitable fibres and flyings are not likely to exist under normal operating conditions

For further information on the classification of hazardous (classified) locations see: -

NEC, NFPA 70	- National Electric Code, NFPA 70
NFPA 30	- Flammable and Combustible Liquids Code
NFPA 497	- Recommended Practice for the Classification of Flammable Liquids, Gases or Vapours and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
NFPA 499	- Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas
ANSI/API RP500	- Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
ANSI/API RP 505	- Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 or Zone 2

11.2 Apparatus selection according to Class I

Apparatus for use in Class I, Division 1

- Explosion-proof
- Intrinsically safe
- Purged / pressurised (type X or Y)

Apparatus for use in Class I, Division 2

- Any Class I, Division 1 method
- Non-incendive
- Non-sparking device
- Purged / pressurised (type Z)
- Hermetically sealed
- Oil immersion

Apparatus for use in Class I, Zone 0

- Intrinsic safety AEx ia
- Class I, Division 1 intrinsically safe

Apparatus for use in Class I, Zone 1

- Any Class I, Zone 0 method
- Any Class I, Division 1 method
- Flameproof, AEx d
- Increased safety, AEx e
- Intrinsic safety, AEx ib
- Purged pressurised, AEx p
- Powder filling, AEx q
- Oil immersion, AEx o
- Encapsulation, AEx m

Apparatus for use in Class I, Zone 2

- Any Class I, Zone 0 or 1 method
- Any Class I, Division 1 or 2 method
- Type of protection AEx n

Intrinsically safe equipment listed for use in Class I, Division 1, locations for the same gas or as permitted by Section 505-7(d) of the NEC, and with suitable temperature rating is permitted in Class I, Zone 0 locations.

Equipment approved for use in Class I, Division 1 or listed for use in Class I, Zone 0 locations for the same gas, or as permitted by Section 505-7(d) of the NEC, and with a suitable temperature rating is permitted in Class I, Zone 1 locations.

Equipment approved for use in Class I, Division 1 or Division 2 locations for the same gas, or as permitted by Section 505-7(d) of the NEC, and with a suitable temperature rating is permitted in Class I, Zone 2 locations.

Equipment listed as classified for use in Class I locations is not necessarily acceptable for Class II locations as it may not be dust-tight or operate at a safe temperature with a dust covering.

11.3 Apparatus selection according to the ignition temperature of the gas or vap

The equipment must be selected so that its maximum surface temperature will not reach the ignition temperature of the gas or vapor that may be present.

Temperature class of electrical apparatus	Maximum surface temperature of electrical apparatus	Ignition temperature of gas or vapour
T1	450°C	>450°C
T2	300°C	>300°C
T2A	280°C	>280°C
T2B	260°C	>260°C
T2C	230°C	>230°C
T2D	215°C	>215°C
T3	200°C	>200°C
T3A	180°C	>180°C
T3B	165°C	>165°C
T3C	160°C	>160°C
T4	135°C	>135°C
T4A	120°C	>120°C
T5	100°C	>100°C
T6	85°C	>85°C

Low ambient conditions require special consideration. Explosion proof of dust ignition proof equipment may not be suitable for use at temperatures lower than -25°C (-13°F) unless they are identified for low temperature service. Unless the equipment is marked otherwise, it is for use only in an ambient temperature range of -25°C (-13°F) to +40°C (+104°F).

Equipment that is approved for Class I and Class II should be marked with the maximum safe operating temperature.

For information regarding data for flammable gases and vapors, see NFPA 497 and NFPA 325.

11.4 Apparatus selection according to the ignition temperature of the dust

The equipment must be selected so that its maximum surface temperature will be less than the ignition temperature of the specific dust.

For information regarding data for dusts, see NFPA 499.

11.5 Apparatus selection according to apparatus grouping

Equipment that is approved for Class I and Class II should be marked with the maximum safe operating temperature.

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The grouping of Class I gases and vapors are classified into categories A, B, C and D.

Gas / Vapor Group
A (typical gas - acetylene)
B (typical gas - hydrogen)
C (typical gas - ethylene)
D (typical gas - propane)

The grouping of Class II dusts are classified into categories E, F, and G.

Dust Group
E (typical atmospheres containing combustible metal dusts)
F (typical atmospheres containing coal dusts)
G (typical atmospheres containing grain dusts)

11.6 Apparatus Construction Standards

- ANSI / UL 1203 - Explosion-proof and Dust-ignition Proof Electrical Equipment for use in Hazardous (Classified) Locations
- ANSI / ISA - S12.12 - Non-incendive Electrical Equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations.
- ANSI / NFPA 496 - Standard for Purged and Pressurised Enclosures for Electrical Equipment.
- ANSI / UL 913 - Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II and III, Division 1, Hazardous Locations.
- ANSI / UL 698 - Industrial Control Equipment for use in Hazardous (Classified) Locations.
- ANSI / UL 2225 - Metal-Clad Cables and Cable-Sealing Fittings for use in Hazardous (Classified) Locations.
- UL 1604 - Electrical Equipment for use in Class I and II, Division 2 and Class III Hazardous (Classified) Locations.
- ANSI / UL 2279 - Electrical Equipment for use in Class I, Zone 0, 1 and 2 Hazardous (Classified) Locations.
- ISA S12.0.01 - Electrical Apparatus for use in Class I, Zone 0, 1 Hazardous (Classified) Locations, General Requirements.
- ISA S12.22.01 - Electrical Apparatus for use in Class I, Zone 1 and 2 Hazardous (Classified) Locations, Type of Protection - Flameproof 'd'
- ISA S12.16.01 - Electrical Apparatus for use in Class I, Zone 1 and 2 Hazardous (Classified) Locations, Type of Protection - Increased Safety 'e'.

11.7 Installation Standards and Codes

NEC, NFPA 70	- National Electrical Code (NEC)
USCG 45 CFR Parts 110 - 113	- Shipping, Sub-Chapter J, Electrical Engineering
ANSI / API RP 14F	- Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class 1, Division 1 and Division 2 Locations.
API RP 14FZ	- Recommended Practice for Design and Installation of Electrical systems for fixed and floating offshore petroleum facilities for Unclassified and Class 1, Zone 0, Zone 1 and Zone 2 Locations.

12.0 Wiring Systems

Cable systems and accessories should be installed in positions that prevent them from being subject to mechanical damage, corrosion, chemical attack, heat and other detrimental environmental conditions. Selection of the wiring system and cable type must consider these influences and where exposure to such conditions are avoidable, protective measures such as minimising the risk of mechanical damage by the use of appropriate armoured cable types should be considered.

The connection of cables and conduits to the electrical apparatus must be in accordance with the requirements of the relevant type of protection and installation rules.

12.1 National Electrical Code (NEC) Wiring Methods

In Class I, Division 1 locations, the NEC permits the following wiring methods: -



Hawke Type 711
CableGland/
Connector

- Type MC cable, listed for use, with a gas / vapor tight continuous corrugated aluminum sheath, an overall jacket of suitable polymeric material, separate grounding conductors, in accordance with Sections 250-122 and 501-4 of the NEC, and provided with termination fittings listed for the application, e.g. Hawke type 711 cable gland/connector.
- Type ITC cable, listed for use with a gas / vapor tight continuous aluminum sheath, an overall jacket of suitable polymeric material in accordance with Section 501-4 of the NEC and provided with termination fittings listed for the application, e.g. Hawke type 711 cable gland/connector.
- Threaded rigid metal conduit, threaded steel intermediate metal conduit, or type MI cable with termination fittings approved for the location and in accordance with Section 501-4 of

All boxes, fittings and joints must be explosion-proof.

In Class I, Division 2 locations, the NEC permits the following wiring methods: -

- Type MC, MV, ITC, PLTC, TC or MI cable with approved termination fittings in accordance with Section 501-4 of the NEC.
- Threaded rigid metal conduit, threaded steel intermediate metal conduit.
- Non-incendive field wiring using any of the methods suitable for wiring in ordinary locations in accordance with Section 501-4 of the NEC.

Boxes, fittings and joints need not be explosion-proof except as required by the NEC code.

12.2 Cable Seals, Class I, Division 1



Hawke Type 71 I
Cable Gland/
Connector

Cables must be sealed at the termination. The sealing fitting, e.g. a barrier type cable gland, must provide a seal against the passage of gas or vapours through the fitting. Type MC cables with multi-conductors, a gas / vapour tight continuous corrugated aluminum sheath and an overall jacket with a suitable polymeric material must be sealed with an appropriate fitting, e.g. Hawke type 71 I, after removing the cables jacket and all other coverings so that the sealing compound surrounds each individual insulated conductor. Cables with twisted pairs and shielded cables require the removal of the shielded material or separation of the twisted pairs unless the fitting, e.g. cable gland, is an approved means which minimises the entrance of gases or vapours and prevents propagation of flame into the cable core. If the fitting complies with this requirement, there will be information provided in the fittings installation instructions detailing the means to achieve the seal. Additional testing may be required on the fitting and the style and type of cable to show compliance with the sealing requirements.

A NRTL approved cable sealing fitting e.g. barrier type cable gland, must be fitted onto cables that enter explosion-proof enclosures.

Further guidance is given in Section 501-5(d) of the NEC.

12.3 Cable Seals, Class I, Division 2

Cables must be sealed at the point of entrance into enclosures that require to be approved for Class I locations. A sealing fitting must comply with the above criteria given in "Cable Seals, Class I, Division 1".

A NRTL approved cable sealing fitting e.g. barrier type cable gland, must be fitted onto cables where they enter explosion-proof enclosures.

12.4 United State Coast Guard - Wiring Methods

Electrical installations in hazardous (classified) locations must comply with the general requirements of Section 43 of the IEEE standard 45 and either the NEC Articles 500 - 505 or IEC 60079 series publications.

In hazardous (classified) locations, the USCG 46 CFR Sub-Chapter J, permits the following wiring methods: -



Hawke Type 753
Cable Gland/
Connector

- Marine shipboard cables that are permitted for use, must meet all the requirements of either IEEE standard 45, IEC 60092-3 and the applicable flammability requirements. Cables constructed to IEC 60092-3 must meet with the flammability requirements of IEC 60332-3, Category A.
- Metal-clad (type MC) cables that are permitted for use, must have a continuous corrugated gas tight, vapor-tight, and water-tight sheath of aluminum or other suitable metal that is close fitting around the conductors and with fillers. The MC cable must have an overall jacket of an impervious PVC or thermoset material and be certified or listed to UL 1569.

For information on other wiring methods permitted and further information, refer to Subpart 111-60 of the USCG 46 CFR.

Each cable entry into explosion-protected equipment must be made with an appropriate fitting or cable gland that maintains the integrity of the equipment.

12.4.1 Cables with multi-conductors that enter explosion-proof enclosures, must be sealed with an appropriate fitting, e.g. barrier type cable gland, after removing the cables jacket and all other coverings so that the sealing compound surrounds each individual insulated conductor. Cables with twisted pairs and shielded cables require the removal of the shielded material or separation of the twisted pairs unless the fitting, e.g. barrier type cable gland, is an approved means which minimises the entrance of gases or vapours and prevents propagation of flame into the cable core. If the fitting complies with this requirement, there will be information provided in the fittings installation instructions detailing the means to achieve the seal. Additional testing may be required on the fitting, and the style and type of cable to show compliance with the sealing requirements.

The equipment grounding path should be carefully considered when using Shipboard Cables or type TC cables, as these may not inherently provide a grounding means. The armor of Shipboard Cables should be grounded but can not be used as the grounding conductor. An appropriate sized grounding conductor should be included in each cable.

12.5 American Petroleum Institute - Wiring Methods

Class I, Division I

The API RP 14F Recommended Practice for the design and installation of electrical systems for fixed and floating offshore petroleum facilities recommends the following wiring methods for hazardous (classified) locations.

- Type MC-HL metal clad cables as defined in UL 2225.
- Armored marine shipboard cable with an overall impervious sheath over the armor, constructed in accordance with UL 1309, and listed as "Shipboard Cable Marine" by a National Recognised Testing Laboratory (NRTL). This wiring method is a departure from the NEC.
- Type ITC cable that is NRTL - listed for use in Class I, Division I locations with a gas / vapor tight continuous corrugated aluminum sheath and with an overall PVC or other suitable polymeric jacket.
- Threaded rigid copper-free aluminum conduit.
- Threaded rigid steel, hot dipped galvanized conduit, coated with PVC, or other suitable material, and with the interior protected by an additional means.

An NRTL approved cable sealing fitting, e.g. barrier type cable gland complying with UL 2225, must be fitted onto cables where they enter explosion-proof enclosures.

For further information and other wiring methods acceptable for Division I, refer to Clause 6.4.2.2 of the API RP 14F.

For fitting requirements of cables with multi-conductors, twisted pairs or shielded conductors into explosion proof equipment. See clause 12.4.1.

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Hawke Type 710
Cable Gland/
Connector

Class I, Division 2

- Wiring methods as recommended for use in Division I.
- Type MC cable with a gas / vapour tight continuous corrugated aluminum sheath, an overall PVC or other suitable polymeric jacket, and grounding conductors in accordance with NEC 250-122.
- Non-armored marine shipboard cable, with an overall impervious jacket in accordance with UL 1309 and listed as "Shipboard Cable Marine" by a NRTL. This wiring method is a departure from the NEC.

Additional wiring methods acceptable for Division 2 include type PLTC, ITC, TC and MV cables. It is recommended that an overall PVC or other suitable polymeric material jacket is included for these cable types.

For additional information, refer to Clause 6.4.2.3 of API RP14F.

In Division I locations, all electrical equipment (except intrinsically safe systems and equipment inside purged enclosures) should be explosion-proof.

In Division 2 locations, the equipment does not need to be explosion-proof, except where necessary to maintain the integrity of the installation.

Further information on the use of equipment is given in Clause 6.4.7 of API RP14F.

An NRTL approved cable sealing fitting, e.g. barrier type cable gland complying with UL 2225, must be fitted onto cables where they enter explosion-proof enclosures.

For fitting requirements of cables with multi-conductors, twisted pairs or shielded conductors into explosion proof equipment. See clause 12.4.1.

Class I, Zones 0, I and 2

The API RP 14 FZ, Recommended Practice for the design and installation of electrical systems for fixed and floating offshore petroleum facilities for unclassified and Class I, Zone 0, Zone I and Zone 2 locations, recommends the following wiring methods for hazardous (classified) locations.

Class I, Zone I

- Type MC-HL metal clad cables as defined in UL 2225.
- Armored marine shipboard cable with an overall impervious sheath over the armor, constructed in accordance with UL 1309, and listed as "Shipboard Cable Marine" by a National Recognised Testing Laboratory (NRTL). This wiring method is a departure from the NEC.
- Type ITC cable that is NRTL - listed for use in Class I, Division I locations with a gas / vapor tight continuous corrugated aluminum sheath and with an overall PVC or other suitable polymeric jacket.
- Threaded rigid copper-free aluminum conduit.
- Threaded rigid steel, hot dipped galvanized conduit, coated with PVC, or other suitable material, and with the interior protected by an additional means.

Non-armored marine shipboard cable, with an overall impervious jacket in accordance with UL 1309 and listed as "Shipboard Cable Marine" by a NRTL. This wiring method is a departure from the NEC.

For further information and other wiring methods acceptable for Zone I, refer to Clause 6.4.2.2 of the API RP14FZ.

For fitting requirements of cables with multi-conductors, twisted pairs or shielded conductors into explosion proof equipment. See clause 12.4.1.

Class I, Zone 2

- Wiring methods as recommended for use in Zone 1.
- Type MC cable with a gas / vapor tight continuous corrugated aluminum sheath, an overall PVC or other suitable polymeric jacket, and grounding conductors in accordance with NEC 250-122.
- Non-armored marine shipboard cable, with an overall impervious jacket in accordance with UL 1309 and listed as "Shipboard Cable Marine" by a NRTL. This wiring method is a departure from the NEC.

Additional wiring methods acceptable for Zone 2 include type PLTC, ITC, TC and MV cables. It is recommended that an overall PVC or other suitable polymeric material jacket is included for these cable types.

For additional information, refer to Clause 6.4.2.3 of API RP14FZ.

Further information on the use of equipment is given in Clause 6.4.7 of API RP14FZ.

An NRTL approved cable sealing fitting, e.g. barrier type cable gland complying with UL 2225, must be fitted onto cables where they enter explosion-proof enclosures.

For fitting requirements of cables with multi-conductors, twisted pairs or shielded conductors into explosion proof equipment. See clause 12.4.1.

Where cables enter equipment which is permitted for use in Zone 2 or unclassified areas and that is not explosion-proof, a suitable cable fitting e.g. cable gland design, need not be explosion-proof, except when necessary to maintain the integrity of the enclosure and as required by the Recommended Practice.

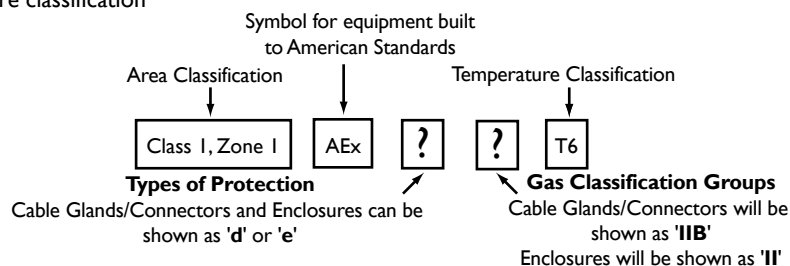
In unclassified and Zone 2 locations, when the metallic sheath is approved as a grounding conductor, the continuous metal sheath of the MC cable or the combined metallic sheath and grounding conductors may be used as the grounding conductor when used with termination fittings that are NRTL listed to UL 514B.

12.6 National Electrical Code (NEC) Zone Equipment Marking

Equipment that is listed for use in Class I, Zones as permitted by the NEC, should be marked as follows:-

- Class I, Zone 0 or Class I, Zone 1 or Class I, Zone 2.
- Applicable gas classification group(s)
- Temperature classification

Example:



12.7 National Electrical Code (NEC) Division Equipment Marking

Equipment that is approved for use in Class I, Class II or Class III, Division 1 or 2 as permitted by the NEC, may be marked as follows:-

- Class I or Class II or Class III or a combination of where appropriate.
- Division 1 or Division 2 equipment not marked to indicate a Division or marked Division I is suitable for both Division 1 and 2 locations as defined in the NEC.
- Group classification.
- Operating temperature or temperature range or as permitted by the NEC.

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12.8 North American Ingress Protection

Non-Hazardous Locations

NEMA Enclosure Type Number	Application
1	For indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt.
2	For indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, and to provide a degree of protection against dripping and light splashing of liquids.
3	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, and windblown dust; and that will be undamaged by the external formation of ice on the enclosure.
3R	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, and snow; and that will be undamaged by the external formation of ice on the enclosure.
3S	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, and windblown dust; and in which the external mechanism(s) remain operable when ice laden.
4	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by the external formation of ice on the enclosure.
4X	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt, rain, sleet, snow, windblown dust, splashing water, hose-directed water, and corrosion; and that will be undamaged by the external formation of ice on the enclosure.
5	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against settling airborne dust, lint, fibres, and flyings; and to provide a degree of protection against dripping and light splashing of liquids.
6	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against hose-directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.
6P	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against hose-directed water and the entry of water during prolonged submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.
12	Enclosures constructed (without knockouts) for indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint, fibres, and flyings; and against dripping and light
12K	Enclosures constructed (without knockouts) for indoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint, fibres, and flyings; and against dripping and light splashing of liquids.
13	For either indoor or outdoor use to provide a degree of protection (personnel against incidental contact with the enclosed equipment) against falling dirt; against circulating dust, lint fibres, and flyings; and against the spraying, splashing, and seepage of water, oil, and non-corrosive coolants.

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Hazardous Locations

Enclosure Type Number	Application
7	For indoor use in hazardous locations classified as Class I, Division I, Groups A, B, C, or D as defined in NFPA 70.
8	For indoor use in hazardous locations classified as Class II, Division I, Groups E, F, or G as defined in NFPA 70.
9	For indoor use in hazardous locations classified as Class II, Division I, Groups E, F, or G as defined in NFPA 70.

Further information can be found in NEMA Standard Publication 250 and UL 50 Standard Publication.

The enclosures are designed to protect and to provide additional protection as stated below: -

NEMA Enclosure Type Number	IEC and CENELEC 60529
1	IP10
2	IP11
3	IP54
3R	IP14
3S	IP54
4 and 4X	IP56
5	IP52
6 and 6P	IP67

The IEC and CENELEC 60529 Standards and NEMA degrees of protection can not be fully compared as equivalent ratings. The NEMA Standard includes tests for environmental conditions such as mechanical damage, corrosion, rusting, ice formation, etc.

13.0 Abbreviations, Acronyms and Definitions

ABS	American Bureau of Shipping. ABS is a ship classification society involved with establishing and administering of standards and rules for marine vessels and structures.
AEx	A marking prefix for apparatus complying with one or more types of explosion protection techniques for installation in accordance with Article 505
ANSI	American National Standards Institute
API	American Petroleum Institute
ATEX	EU Directive 94/9/EC Equipment and protective systems intended for use in potentially explosive atmospheres

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Abbreviations, Acronyms and Definitions (cont'd)

BASEEFA	British Approvals Service for Electrical Equipment in Flammable Atmospheres. They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres. BASEEFA is a constituent of EECS - a branch of the Health & Safety Executive,
BASEEFA (2001) Ltd	They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres.
CEC	Canadian Electric Code. The CEC, Part I, CSA Standard C22.1, is a safety standard for the installation and maintenance of electrical equipment.
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardization. CENELEC is a European Standards Organisation that publishes harmonised standards for the European market. CENELEC comprises the National Committees of the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.
CEPEL	Centro de Pesquisas de Energia Electrica (Brazil). In Brazil, all electrical or electronic equipment for use in potentially explosive atmospheres should be certified by a Brazilian certification body recognised by INMETRO. CEPEL is an accredited body that is able to issue relevant certification.
CFR	Code of Federal Regulations
Cold Flow	Certain types of cable employ materials that can exhibit "cold flow" characteristics that could have adverse effects on the protection of the apparatus. Where such cable is used, a suitable cable entry device should be employed, for example cable entry devices not employing compression seals that act upon the part(s) of the cable having "cold flow" characteristics. "Cold flow" can be more fully described as thermoplastic materials that flow when subjected to pressure at ambient temperature.
CSA	Canadian Standards Association. A service they offer includes testing and certification services to US and Canadian Standards, as well as international certification through agreements with other approval authorities.
DNV	Det Norske Veritas
EECS	Electrical Equipment Certification Service (UK). They provide a range of testing and certification services primarily related to equipment and systems intended for use in potentially explosive atmospheres. EECS has two divisions, the Mining Equipment Certification Services (MECS), and BASEEFA. The EECS is a branch of the Health & Safety Executive, UK.
EEx	A marking prefix for apparatus complying with one or more types of explosion protection techniques in accordance with CENELEC standards.

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Hawke Cable Glands and Enclosures

Abbreviations, Acronyms and Definitions (cont'd)

Explosionproof	A term used to describe equipment that is capable of withstanding an explosion of a specified gas or vapour that may occur within it and preventing the ignition of a specified gas or vapour surrounding it.
Flameproof	A type of protection of electrical apparatus in which the enclosure will withstand an internal explosion of a flammable mixture which has penetrated into the interior, without suffering damage and without causing ignition, through any joints or structural openings in the enclosure, of an external explosive atmosphere consisting of one or more of gases or vapours for which it is designed.
FM	Factory Mutual Research Corporation (USA). Services they offer include the testing and approval of electrical equipment in accordance with US and international Standards.
Hazardous Areas	Locations where fire or explosion hazards may exist due to the presence of flammable gases, vapours, mists, ignitable fibres or dusts
IADC	International Association of Drilling Contractors
IEC	International Electrotechnical Commission. Founded in 1906, the IEC is the world organisation that prepares international standards for all electrical, electronic and related technologies. The membership consists of more than 50 participating countries.
IECEX	The aim of the IECEX Scheme is to facilitate international trade in electrical equipment intended for use in potentially explosive atmospheres by eliminating the need for multiple national certificates.
Increased Safety	A type of protection applied to electrical apparatus that does not produce arcs or sparks in normal service and under specified abnormal conditions, in which additional measures are applied so as to give increased security against the possibility of excessive temperatures and of the occurrence of arcs and sparks
INMETRO	Instituto Nacional de Metrologia, Normalização Qualidade Industrial (Brazil)
Intrinsically Safe System	An assembly of interconnected items of apparatus which may comprise intrinsically safe apparatus, associated apparatus and other apparatus, and interconnecting cables in which the circuits within those parts of the system that may be exposed to explosive gas atmospheres are intrinsically safe circuits
Impervious Sheathed Cable	Cable constructed with an impervious metallic or non-metallic overall covering that prevents the entrance of gases, moisture or vapours into the insulated conductor or cable
IP	A system of rating standard levels of Ingress Protection provided by the apparatus.
ISA	The International Society for Measurement and Control (formerly Instrument Society of America)
ISO	International Organisations for Standardisation. A worldwide federation of national standard bodies from 130 countries. ISO's mission is to promote the development of standardisation to facilitate international exchange of goods service.
ITS	Intertek Testing Services

Technical Data

Hawke Cable Glands and Enclosures

Abbreviations, Acronyms and Definitions (cont'd)

Marine Shipboard Cable	Impervious sheathed armoured or non-armoured cable constructed in accordance with UL 1309/CSA C22.2 No. 245, except that an overall impervious sheath is required over the armoured construction, and listed as "Shipboard Cable, Marine" by a Nationally Recognised Testing Laboratory (NRTL)
Maximum Surface Temperature	The highest temperature of a surface accessible to a flammable mixture under conditions of operation and within the ratings of the equipment
MC Cable	Metal-clad cable as defined by NEC Article 334
MC-HL Cable	Metal-clad cable for hazardous locations as defined in UL 2225
NEC	National Electric Code ® (ANSI/NFPA 70)
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration, U.S. Department of Labor National Recognised Test Laboratories (NRTL's) recognised by OSHA include CSA, FMRC and UL. The NRTL determines that the specific products meet the relevant standards of safety as required by OSHA and that the products are safe for use in the U.S. workplace. For further information, refer to OSHA's web site at www.osha.gov
PLTC	Power-limited tray cable as defined by NEC article 725
Potentially Explosive Atmosphere	A mixture with air, under atmospheric conditions, of flammable substances in the form of a gas, vapour, mist or dust in which, after ignition, combustion spreads through the un-consumed mixture.
SCS	SIRA Certification Service (UK). They provide a range of testing and certification services and have agreements with other international approval authorities.
TC	Power and control cable as defined by NEC Article 340
UL	Underwriters Laboratories Inc ® (USA)
USCG	United States Coast Guard

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