Fibre

FIBRE OPTIC CONNECTOR TERMINATION HOOK UP PROCEDURE

(AI502 Rev F – June 21)

***Images are for illustration purposes only**. Product supplied may differ slightly from that shown.*

Hawke International
UK Office,
Oxford Street West,
Ashton-under-Lyne,
Lancashire.
OL7 0NA. UK

Sales: +44 (0) 161 830 6698
Technical: +44 (0) 161 830 6697
Fax: +44 (0) 161 830 6648
E-mail: sales@ehawke.com

Connection Solutions
www.ehawke.com

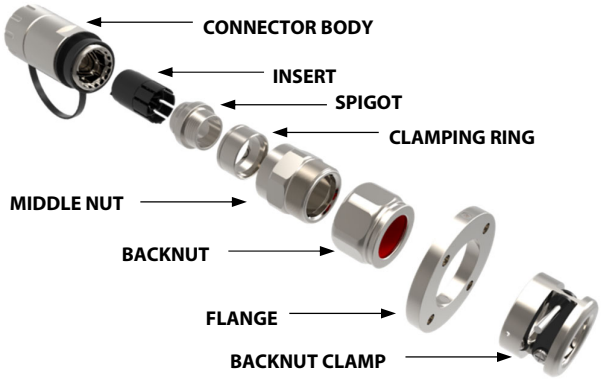
HAWKE International

IMPORTANT NOTE – PRODUCT SAFETY

Read *through the entire Assembly Instruction Sheet and any MSDS (Material Safety Data Sheets) before installing the connectors.*
Always *wear safety glasses when handling glass fibre. Dispose of glass fibre debris in a safe manner. Serious injury can occur from loose shards of glass lodging into skin or eyes.*
Protect *eyes and skin from exposure to uncured epoxy or alcohol. Be sure all containers are labelled and sealed properly.*
Never *view fibre ends if they are illuminated, eye damage may result. Verify that fibres are not "live" before viewing ends with the microscope.*

CP / CR PROCEDURE

1) *Unscrew the middle nut and back nut from the connector body and remove the armour clamping ring, spigot and insert. If you have purchased a connector with the optional backnut clamp and / or flange, slide these down the cable now (clamp first).*

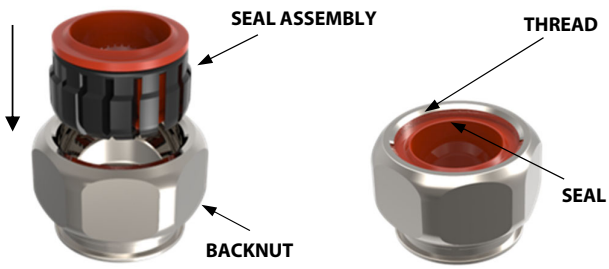


2) *Remove the two seal assemblies from the box and choose the required seal to suit the diameter of the cable outer jacket.*

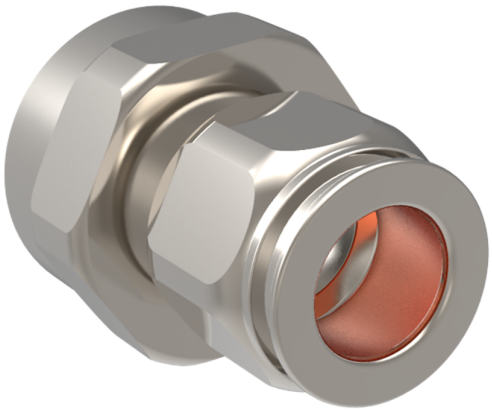
Os Size Seal
Range = 5.5 – 12mm

O, A & B Size Seal
O Range = 9.5 – 16mm
A Range = 12.5 – 20mm
B Range = 16.9 – 26mm

3) *Insert the seal into the backnut, ensuring that the flange on the seal goes past the thread as shown.*

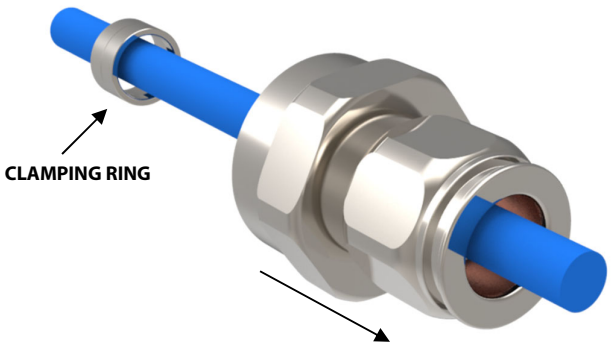


4) *Screw the back nut onto the middle nut. Do not compress the seal at this stage.*



5) *Slide the middle nut, backnut and armour clamping ring over the cable ensuring that the clamping ring is pointing in the required direction for the size of armour / braid. The alternative ring is supplied in the box.*

RING PART NO.	ARMOUR / BRAID THICKNESS	
	ORIENTATION 1	ORIENTATION 2
Os / O	*0.8 – 1.25*	*0.0 – 0.8*
A	*0.8 – 1.28*	*0.0 – 0.8*
B	*1.25 – 1.6*	*0.0 – 0.7*



CABLE PREPARATION

IMPORTANT NOTE

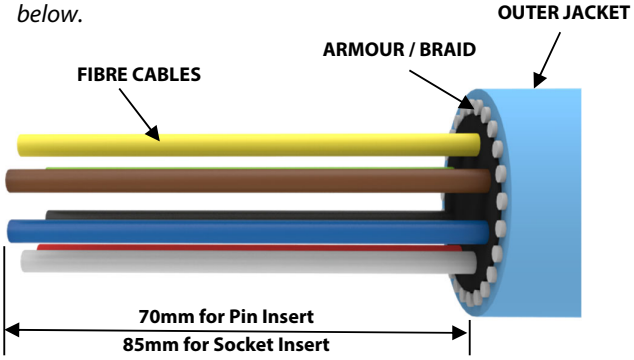
The information below is for guidance only.

It is recommended that all cable preparation and polishing procedures etc. involving fibre optics should be carried out by qualified personnel, therefore, the following instructions assume that the installer is an experienced fibre optic professional.

Pin & Socket Inserts

(repeat Pin Insert steps when preparing Socket Insert, taking note of the differing strip back lengths)

6) *Strip back the outer sheath, armour and inner sheath of the cable to the same point to reveal the fibre cables as shown below.*



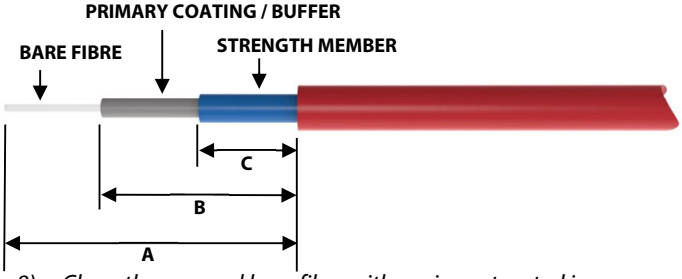
Single Mode – Fibre Size 9/125, Cladding 126
Multi Mode – Fibre Size 50/125 & 62.5/125, Cladding 127

7) *Slide heat shrink over the cable. Using the buffer strip tool, remove the secondary coating then the buffer (primary coating) in small increments (1/4" to 3/8") to the specified length.*

Cable Strip Lengths	Socket	Pin
Secondary (A)	*34.0 ± 0.75*	*29.0 ± 0.75*
Buffer (B)	*17.8 ± 0.75*	*11.0 ± 0.78*
Strength Member, if any (C)	*5.85 ± 3.8*	*5.85 ± 0.75*

Be careful not to damage glass fibre. Follow the direction of the arrow marked on the fibre strip tool and ensure all bits of buffer are cleaned from the tool before each length of buffer is stripped.

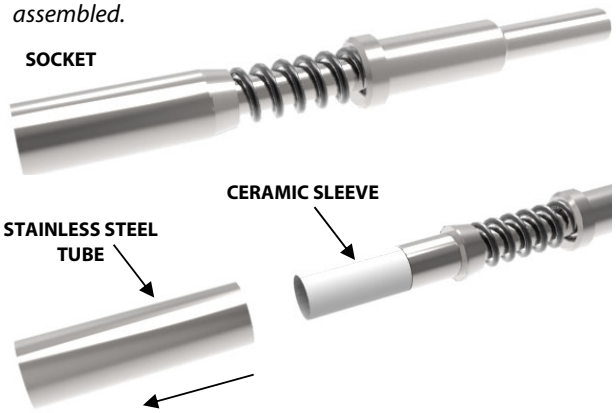
Note: *Check the expiration date of the anaerobic adhesive before using. Discard any adhesive that is expired. Adhesive should be kept warm in cold temperatures to facilitate injection into the connector.*



8) *Clean the exposed bare fibre with a wipe saturated in reagent grade alcohol (Isopropyl Alcohol IPA). While cleaning, bend fibre slightly to check for nicks. Fibre will break easily if nicked; remove any residue on the surface.*

TERMINAL PREPARATION
For the Socket Only

9) *Unscrew the Stainless Steel socket tube and remove the ceramic sleeve. Sockets now ready to be glued and assembled.*



10) *Using a syringe, insert the base adhesive to fill the inside of the pin / socket (Fig. A). Purge out any air bubbles. Insert needle fully into connector. Tip downward and inject adhesive until a small dot of adhesive appears out of the ferrule tip (See Fig. B). Then pull back slowly while continuing to fill the pin / socket. Place the fibre optic into the Activator Solution (Loctite 648 Retaining Compound). Carefully push the fibre optic through the contact until secondary coating prevents it going further and hold in place for a few seconds until the glue sets.*

Note: *Adhesive cures rapidly.*

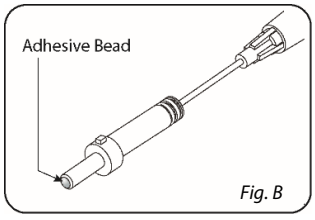
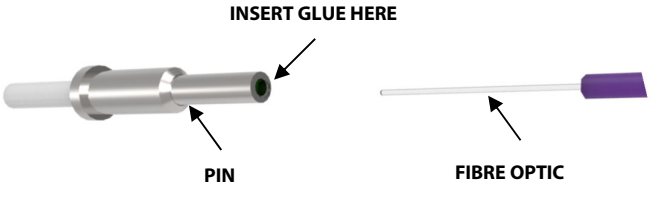
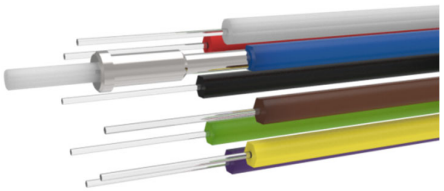


Fig. B

Note: *Pull back the syringe plunger to aerate the adhesive when not in use. Adhesive will cure without aeration in a syringe (bottle allows air to penetrate).*





11) *The fibre is now ready to be cleaved.*

It is recommended that the polishing process of each terminal is completed before moving onto the next.

IMPORTANT NOTE
DO NOT OVERPOLISH
Over polishing can create fibre undercutting resulting in expensive rework and product replacement

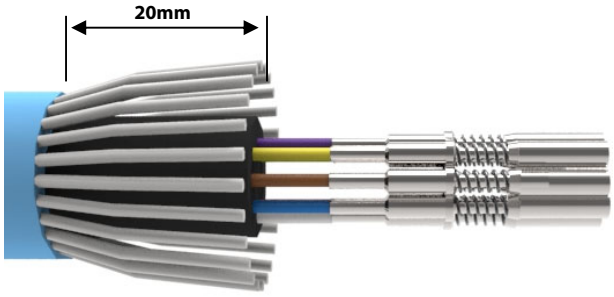
POLISHING

12) a) *Using 9 micron diamond film, remove adhesive (No pad)*
    b) *Then change to 3 micron diamond film to polish (Use pad).*
    c) *Change once again to 1 micron diamond film for the final polish (Use pad).*
    d) *For single mode only, finish by using 65-70 shore rubber pad with a 1 or 3 micron diamond film.*

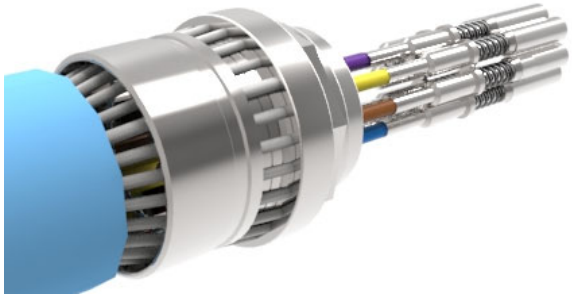
13) *Replace stainless steel sleeve and secure with Loctite 222*

ARMOUR / BRAIDED CABLE

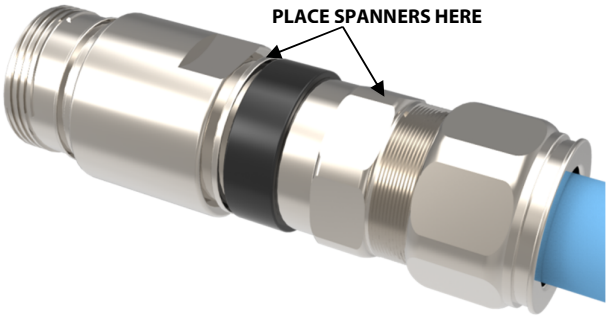
14) *Strip back the outer jacket of the cable to expose the armour / braid as shown below.*



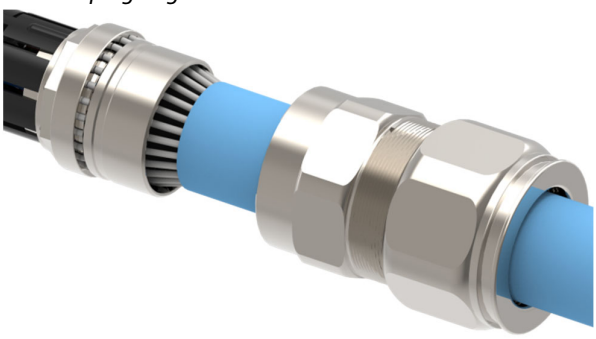
15) *Push the spigot over the inner sheath of the cable and spread the armour / braid over the spigot until the end of the armour / braid is up against the shoulder of the spigot. Position the armour clamping ring onto the armour / braid. If the armour / braid extends over the spigot shoulder then make the necessary cuts on the armour / braid.*



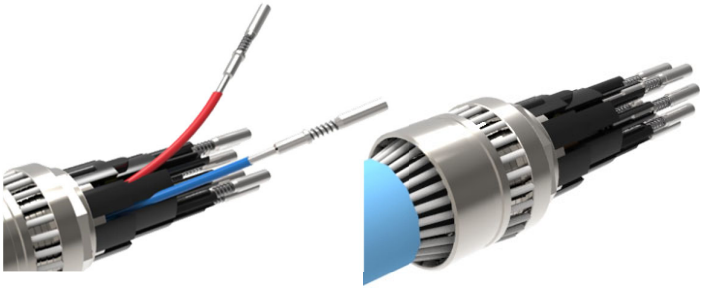
16) *Place the connector body over the spigot engaging the octagonal portion of the spigot. Move the middle nut up to meet the connector body. Place spanner on the flats of the connector body and hold it in position. Hand tighten the middle nut to the connector body then tighten a further ¾ turn with spanner.*



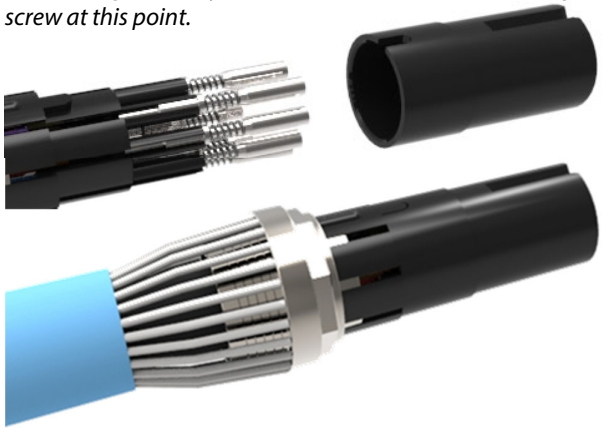
17) *Unscrew the middle nut and visually inspect the armour has been successfully clamped between the armour spigot and the clamping ring.*



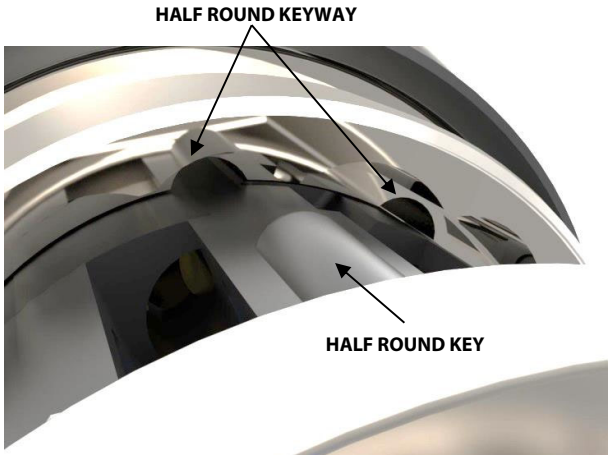
18) *Insert the terminals into the required location using the slotted insert retainer, fibres slot in through side channels.*



19) *Slide the insert cover over the terminals ensuring the insert locater is aligned, firmly push the insert together. If you are terminating an 8-way Fibre Ex connector, fit the retaining screw at this point.*

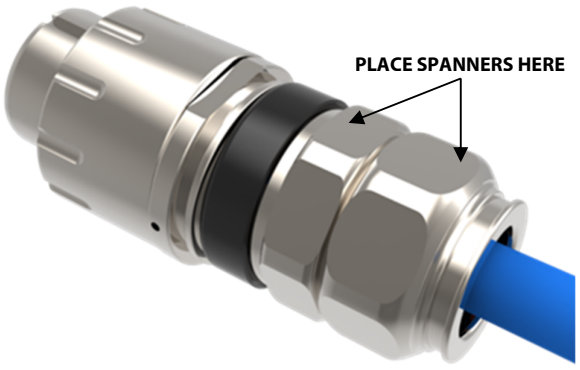


20) *Slide the insert into the connector body aligning the half round key on the rear contact retainer with the required half round key in the connector body. (The colour coded or numbered keying position is shown on the front of the connector body. Note: No colour coding or numbering for default 12 o'clock position). It should also be noted that the colour coded and numbered connector bodies are mutually interchangeable. Push the octagonal portion of the spigot into the connector body.*

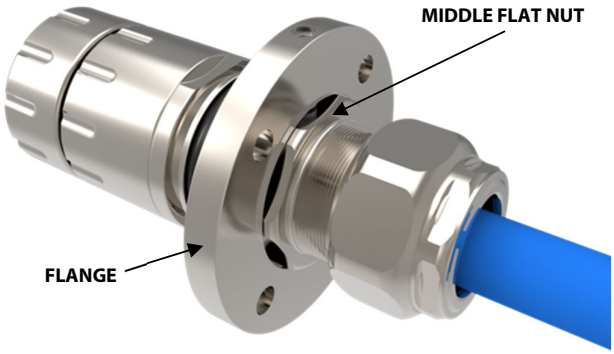


21) *Slide the middle nut over the clamp / spigot and hand tighten onto the connector body. Further tighten ½ to ¾ of a turn with spanner while holding the front shell with a spanner.*

22) *Tighten the backnut to form a seal around the cable. Further tighten 1 to 1 ½ turns with a spanner while holding the middle nut with a spanner.*

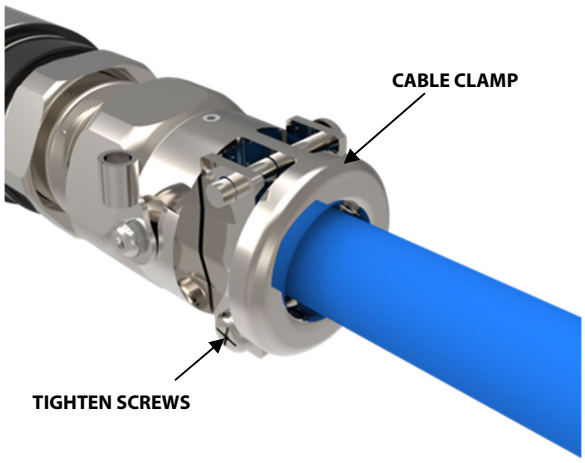


23) *If the optional mounting flange is required, slide the flange over the backnut and position on the middle nut. Align the grub screw with one of the flats and tighten. If the flange is used on a CR connector, it may also be placed on the connector body as shown below.*

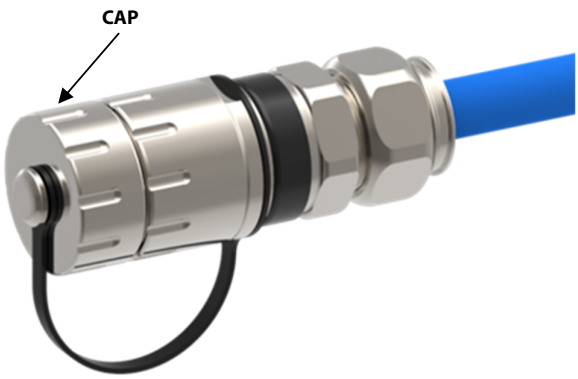


24) *If the optional cable clamp has been purchased, tighten the screws on the clamping bars equally until the clamping bars tough the cable. Tighten each screw a further 2 to 4 turns or until adequately clamped.* **DO NOT OVERTIGHTEN as this could damage the cable**.

If the cable clamp is used with unarmoured cable, the connector should be earthed via the crimp with a 4mm² conductor.



25) *Screw the cap back onto the connector. Stick the corresponding round colour coded / numbered sticker onto label in the circular space provided.*
(NB: White = 12 o'clock / Position 1, this is the default position).



SCHEDULE OF LIMITATIONS

- *The protective caps shall be fitted immediately following separation.*
- *The Type BR Bulkhead connectors may be fitted to Exd or Exe enclosures where the interface temperature does not exceed 80°C. The integral cables shall be mechanically protected by the enclosure, or equally effective means.*
- *The Type CP/CR In-line connectors are intended for use with resilient cables only, capable of withstanding axial loads in excess of 30N without damage.*
- *When used in dust environments, or fitted to increased safety enclosures, the Type BR bulkhead mounting thread shall be sealed in accordance with the installation code of practice to ensure that an ingress protection level of IP6* is maintained.*
- *Units coded Ex [op is] shall only be supplied from a separately certified optical source marked with coding to include 'Ex op is'. The marked gas group and 'T' rating shall match (or exceed) those marked on the optical source, as limited by the maximum specified radiated power/irradiance levels (prescribed by Table 2 of IEC 60079-28).*
- *Flameproof joints are not intended to be repaired.*
- *User / installer must check for the presence of external substances that may cause damage.*
- *User / installer is responsible for ensuring external forces do not damage / interfere with equipment.*
- *Ex op pr connector must be isolated from the supply before any attempt is made to remove cap or separate the two halves. (Do Not Open When Energised).*
- *Single Mode – Fibre Size 9/125, Cladding 126*
- *Multi Mode – Fibre Size 30/125 & 62.5/125, Cladding 127*

TECHNICAL SPECIFICATION

Certification:	*Ex II2GD Ex op pr IIC Gb, Extb IIIC T85°C Db*	CE
Alternative markings include the following:		
Ex[dbe] op pr IIC T6 Gb – for bulkhead / box mount version		
Ex[op is] IIC T3 Ga – with separately certified 'op is' source		
Tamb: -40°C to +60°C		
Certificates:	*Baseefa16ATEX0030X*	*IECEx BAS16.0032X*
IP Rating: IP66 / 67		
Note:	*Caps to be fitted to maintain IP ratings when the connector halves are separated.*	
Deluge Rating:	*DTS01*	
Outer Seal Range:	*Os 5.5 to 12mm*	
	O 9.5 to 16mm	
	A 12.5 to 20.5mm	
	B 16.9 to 26.0mm	
Armour/Braid Sizes: 0 to 1.6mm		
Keying Positions:	**Op pr CP / CR** *Position 1-5*	**BR** *1-5 factory set*
	Op is CP / CR *Position 6*	**BR** *6 factory set*
Fibre Type:	*Single mode and Multi mode*	
Ratings:	*8 Way*	
Maximum number of make and break operations 500 cycles (clean after 100 matings)		
Storage Temperature: -40°C to +70°C		

Ex op is			
Radiated Power mW	*IIA*	*IIB*	*IIC*
Up to 15	*T6*		
Up to 35	*T6*	*T4*	
Up to 150	*T3*	*N/A*	
Irradiance Power mW/mm²	*IIA*	*IIB*	*IIC*
Up to 5	*T6*		
Up to 20	*T3*	*N/A*	*N/A*

CLEANING DEVICE

A 1.6mm ferrule cleaning device required. Hawke recommends IBC Cleaner M16 - 13309. This device is used to maintain a clean dust/dirt free surface on the polished end of the contact. To ensure that this surface is kept in optimum condition, it is essential that the cleaning stick is used before every engage and after each disengage. When the connector pair are not mated, it is imperative that the protective cap is used to maintain the IP rating of the connector. ***Not fitting the cap will render the contact useless if left unprotected. The cap must only be removed before engagement.***

To use the cleaning stick you must first select the appropriate nib for the contact concerned.

For pin contacts:
Slide the attached nib on to the end of the cleaning stick.

For sockets:
The nib should be removed.

Place the cleaning stick on to the contact and with one smooth move, push towards the contact until you hear a click. Once back in its original position move on to the next contact. Should further cleaning be required repeat the process.

Declaration of Conformity in accordance with European Directive 2014/34/EU and UK Statutory Instrument 2016/1107
Manufacturer: *Hawke International*
Address: *Oxford Street West, Ashton-under-Lyne, OL7 0NA, United Kingdom*

Equipment: FibreEx Connectors

Provisions of the Directive fulfilled by the Equipment:
Group II Category 2GD Ex op is IIC Gb, Extb IIIC Db – IP66
Group II Category 2GD Ex op pr IIC Gb, Extb IIIC Db – IP66

Notified Body for EU-Type Examination: *SGS-Fimko 0598 Helsinki Finland*
EU-type Examination Certificate: *Baseefa16ATEX0030X*
Notified Body for production: *0598*

Notified Body for UK-Type Examination: *SGS-Baseefa 1180 Buxton UK*
UK-type Examination Certificate: *BAS21UKEX0056X*
Notified Body for production: *1180*

Harmonised Standards used: *EN 60079-0:2018, EN 60079-1:2014, EN 60079-7:2015+A1:2018, EN 60079-28:2015, EN 60079-31:2014*

On behalf of the above named company, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives.

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A. Reid
Technical Manager