1. INTRODUCTION

ABCIRH connectors are designed for use in mass transportation, entertainment and industrial markets.

The products covered in this datasheet have been subjected to, and are in compliance with, Network Rail's rigorous environmental performance requirements for trackside installations. The products have been accepted for use in approved Network Rail applications.

The ABCIRH range of products has been designed to be assembled to a variety of cable types. This datasheet defines the recommended assembly procedure for specific products selected for use within Network Rail's Plug & Play programme.

2. DESCRIPTION

The connectors are supplied in kit form. Generally, kit constituent components will be a plug or receptacle connector assembly consisting of a metal outer protective body that houses the contact insulator; along with electrical contacts (supplied separately) and wire seals. Ancillary devices, such as adaptors to interface with shrink-boots, can be included in the kit or supplied separately.

When assembled, the contacts are retained inside the connector housing, within the contact insulator, and the cables exiting the rear of the connector via the wire seal are supported with a suitable strain relief device attached to the rear of the connector housing. Refer to *Figures 1 to 4* for illustrations.

Figure 1 — ABCIRH Series, Plug Connector Assembly with Heat Shrink Adaptor and Shrinkboot

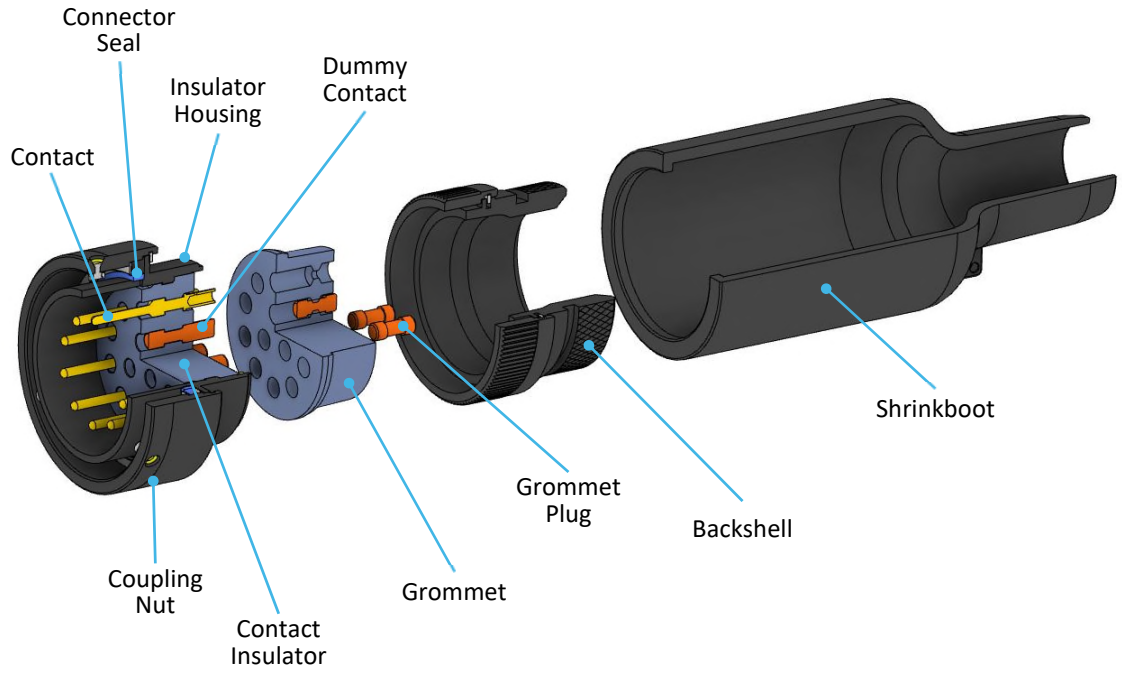


Figure 2 — ABCIRH Series, Receptacle Connector Assembly (Cable Coupler Style) with Heat Shrink Adaptor and Shrinkboot

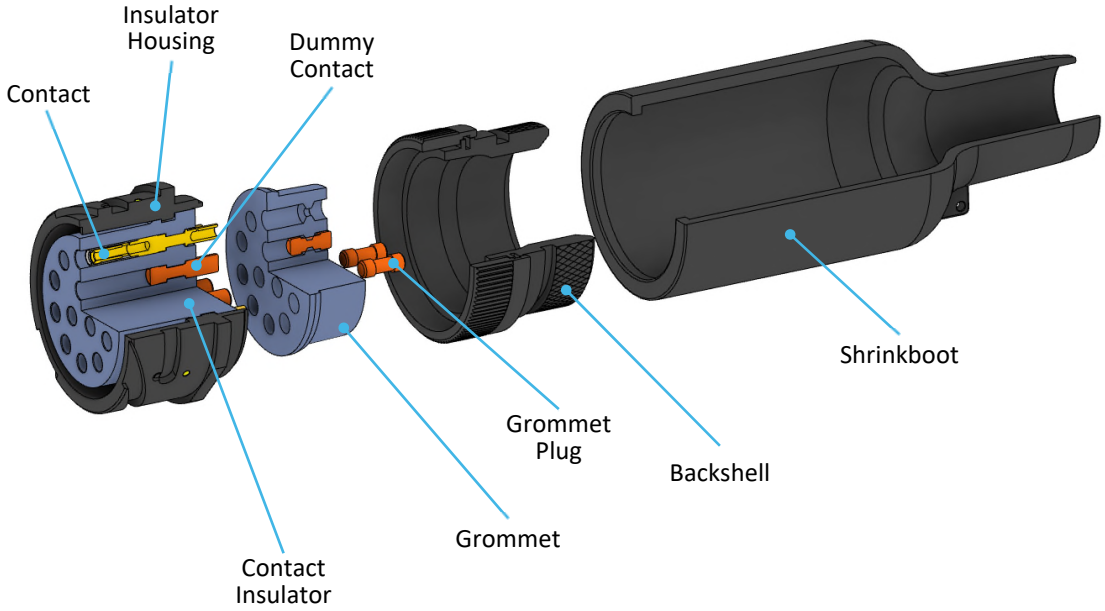


Figure 3 — ABCIRH Series, Receptacle Connector Assembly (Panel Mount Style) with Tapped Mounting Holes (M34 Mod Code), Grommet and Follower

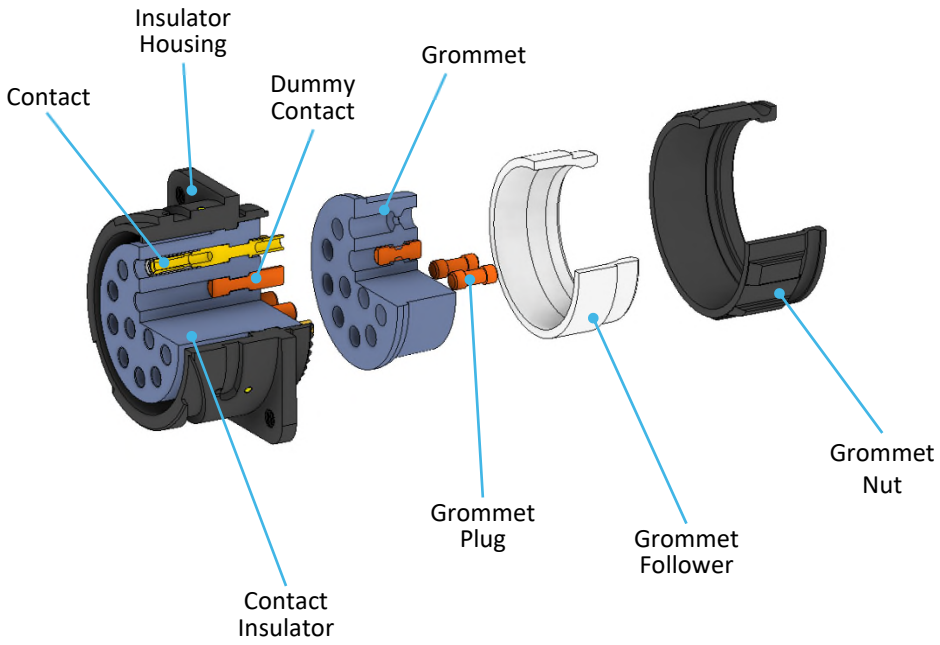
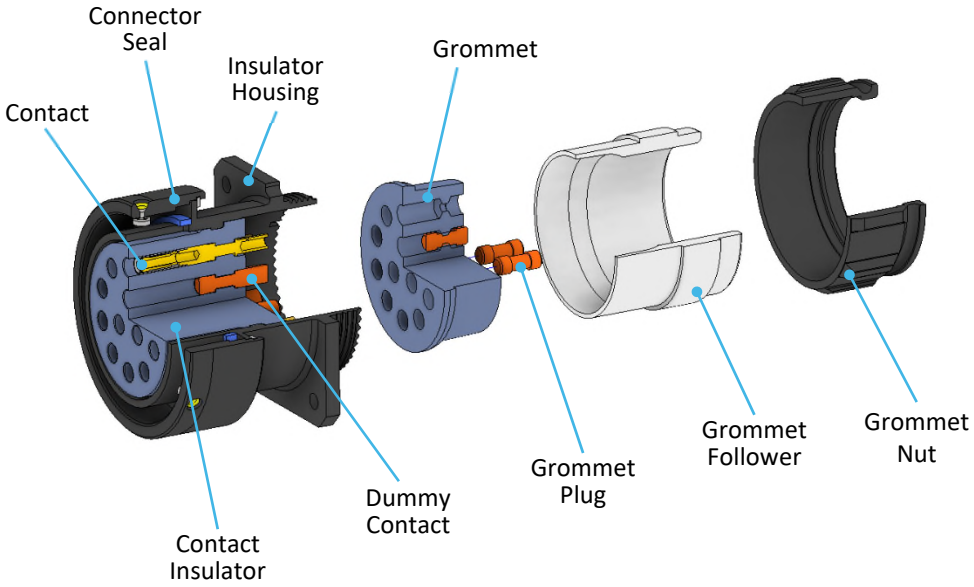
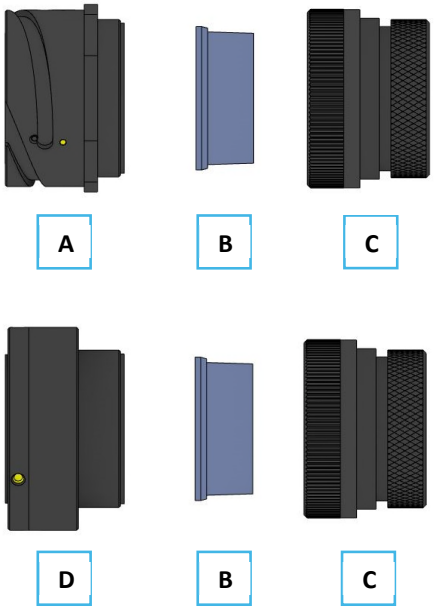


Figure 4 — ABCIRH Series, Plug Connector Assembly (Panel Mount Style, M425 Mod Code), with Grommet and Follower



3. ASSEMBLY PROCEDURE

3.1. Assembly Preparation



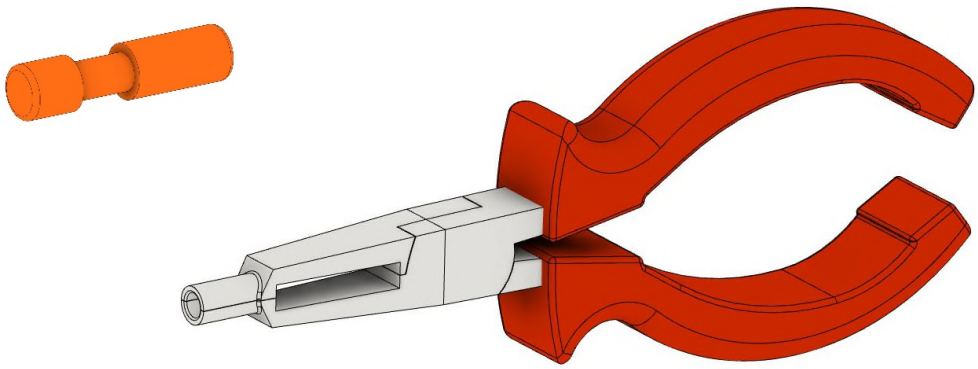
Ref.	Description
A	Coupler connector assembly
B	Grommet
C	Heat shrink adaptor assembly
D	Plug connector assembly

All assembly steps also applicable to other housing styles. Panel mount receptacle with tapped mounting holes and panel mount plug pictured above.

Obtain the components kit, production batch traveller (work order card) and drawing of the cable assembly. Locate the connector assembly and cable accessory within the components kit. Cross reference the part number label on the packaging against the kit list on the rear side of the batch traveller, and against the drawing parts list. Confirm this is correct before proceeding. Typical connector components are illustrated above.

3.2. Dummy Contact Assembly

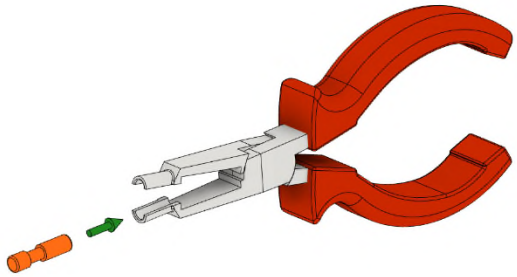
3.2.1. Description of Components and Assembly Equipment



Referring to the kit list and/or the cable assembly drawing, confirm if any connector cavities require fitment of dummy contacts. Where this is required, locate the correct components in the parts kit and set aside the appropriate quantity for assembly into the connector. A contact insertion pliers should be used to complete the assembly operation. An example of a dummy contact and contact insertion pliers is illustrated in the above image. Refer to Appendix A for insertion tool details.

N.B. Dummy contacts and assembly tools are not gender specific; suitable for plug and receptacle connectors.

3.2.2. Observe correct dummy contact orientation

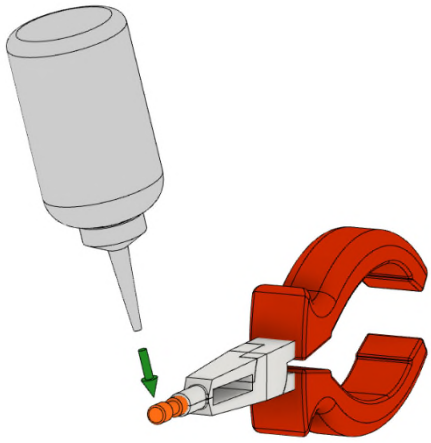


Insert the dummy contact into the assembly tool and use light pressure to prevent it from falling out.

Note the correct orientation of the dummy contact; the longest segment of the contact should be inserted into the tool as seen in the illustration.

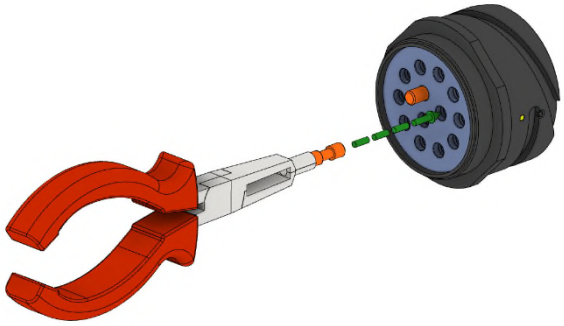
Note: Where required, this operation may also be carried out using an arbour press or similar for high volume purposes.

3.2.3. Lubricate the dummy contact



Use either isopropyl alcohol or Pronatur orange solvent to wet the outermost end of the dummy contact. The illustration depicts a dropper bottle being used for this purpose. However, the application may be via pipette, brush or dipping the dummy contact into the fluid.

3.2.4. Insert dummy contact into contact cavity

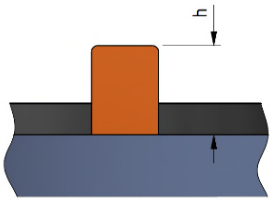


Referring to a suitable cable assembly drawing or other production documentation, locate the appropriate cavity. Offer the end of the dummy contact up to the cavity entrance then use firm pressure to press it into the cavity. A tactile 'click' will be felt when the dummy contact is properly seated.

Note the correct orientation of the dummy contact; the longest segment of the contact should be protruding from the connector rear as seen in the illustration.

Note: Coupler connector shown in illustration. Assembly steps also applicable to other housing variations and plug connectors.

3.2.5. Verify correct dummy contact position

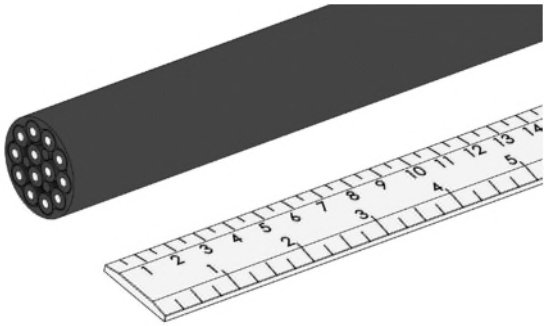


Cavity Size	Dimension (h) Min/Max
16	4.53/5.58
12	6.08/7.13
8	9.43/10.48

For quality assurance purposes, the correct location of the dummy contact may be checked by measuring from the rear face of the contact insulator to the rear face of the dummy contact. Refer to the illustration for reference information.

3.3. <u>Cable Sheath Removal</u>

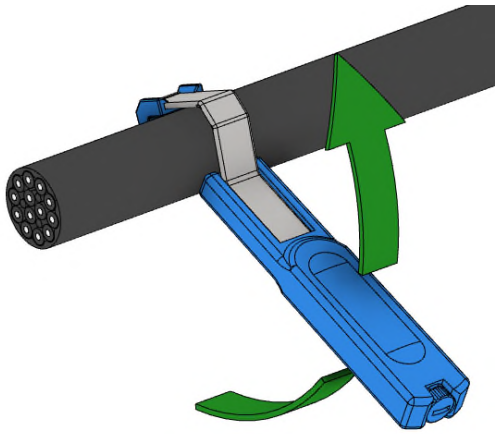
3.3.1. Sheath strip length determination



Referring to applicable manufacturing documentation and Appendix C, mark the appropriate strip length on the cable sheath.

Note: This step is applicable to sheathed multicore cable only. Omit for loose single conductor cable bundle scenario i.e. panel mount connector with no strain relief ancillary fitting.

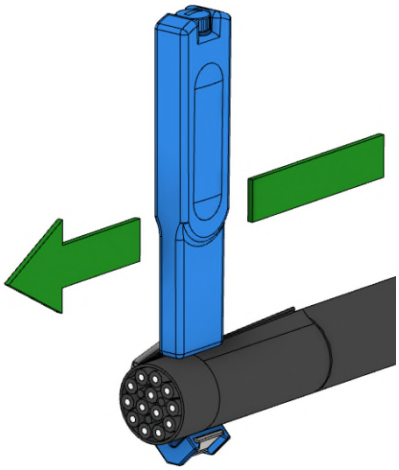
3.3.2. Sheath stripping, radial cut



Use a suitable cable sheath stripping tool to make a 360 degree radial cut at the marked position.

Note: Illustration depicts an example stripping tool. An appropriate tool should be selected, suitable for the cable type being prepared.

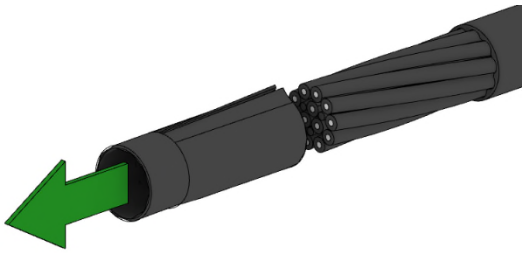
3.3.3. Sheath stripping, longitudinal cut



Adjust the cutting blade of the tool to allow longitudinal cutting. Starting at the radial cut line, draw the tool along the cable until it reaches the cable end.

Note: Illustration depicts an example stripping tool. An appropriate tool should be selected, suitable for the cable type being prepared.

3.3.4. Sheath removal and inspection

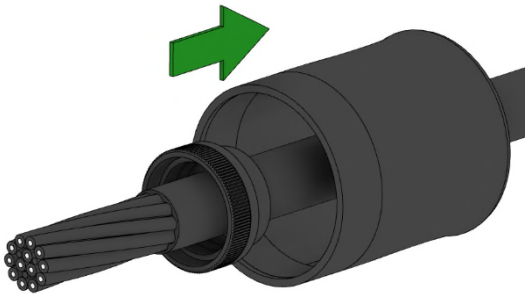


Peel the sheath away from the inner cable and slide the detached remnant off the cable end. Unwrap the transparent plastic tape and remove this from the cable.

Inspect the inner conductor insulation. Check for damage caused by the sheath striping and removal process. Reject and start again with a fresh cable where required.

3.4. <u>Preparation for Connector Assembly</u>

3.4.1. Assemble cable accessories onto cable

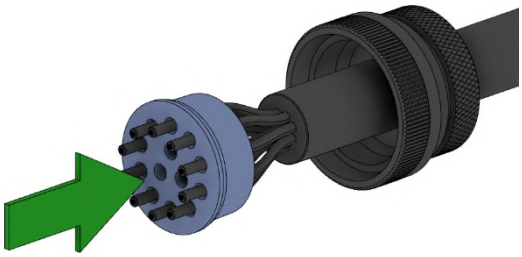


Referring to the manufacturing documentation and the parts kit, select the correct components and slide them onto the cable in preparation for the next assembly step (connector accessories, shrinkboots, cable idents etc.).

Ensure components are orientated correctly and in the correct order.

Note: Connector assembly steps are not gender specific and are therefore applicable to plug and receptacle types.

3.4.2. Assemble sealing grommet to cable



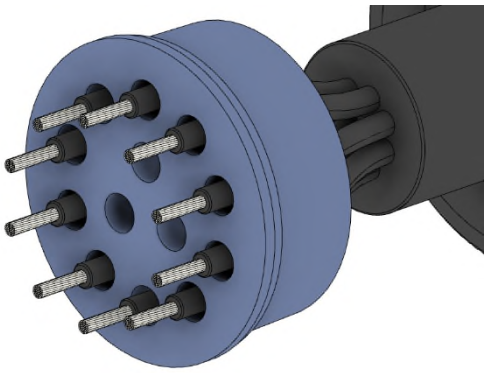
Referring to the relevant production documentation, ensure correct orientation of the grommet cavities with respect to the connector contact cavities. Insert each conductor core through the sealing grommet. Ensure cores are correctly located according to their respective connector installation positions.

Refer to the illustration for correct front/back orientation of sealing grommet.

Refer to Appendix F for information related to appropriate selection of grommets. This includes details of grommets with reduced sealing bores and options for building-up the wire insulation with shrink-sleeve where these grommets are not available. Wire diameter limits for each grommet are also listed here to ensure acceptable ingress protection is achieved.

3.5. Preparation of Inner Cable Cores

3.5.1. Inner core strip



Referring to applicable manufacturing documentation and Appendix C, use a suitable insulation stripping tool to remove the conductor insulation. Ensure that cut depth is set directly and does not damage conductor strands.

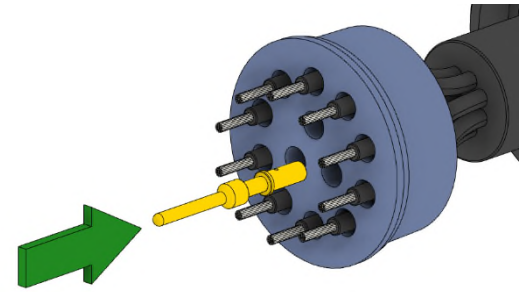
3.5.2. Inspection of inner cores

Remove the insulation slugs and inspect the inner cores for damage. Refer to IPC/WHMA-A-620 Section 3 for acceptance criteria.

Note: Class 3 acceptance criteria shall be met.

3.6. Assemble Contacts to Cable Conductors

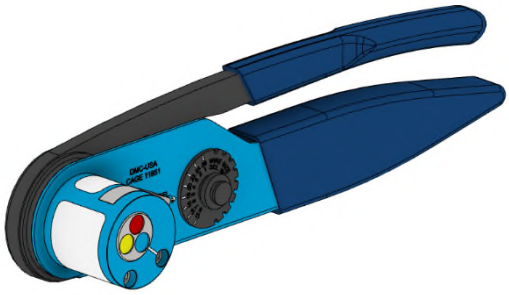
3.6.1. Insert cable conductor into crimp bucket



Slide the contact onto the conductor end. Ensure no conductor strands are free from the crimp bucket before proceeding to next steps. Refer to IPC/WHMA-A-620 Section 5 for acceptance criteria.

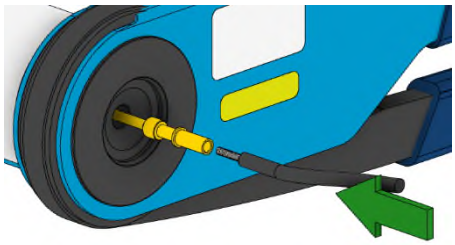
Note: Class 3 acceptance criteria shall be met.

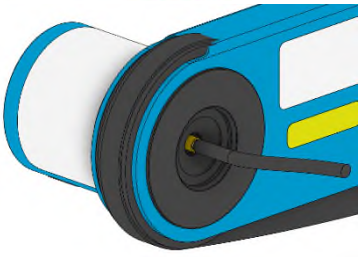
3.6.2. Crimp tool selection and setup



Select the appropriate crimp tool for the contacts that are being crimped. Determination of appropriate tool and settings can be found in Appendix A.

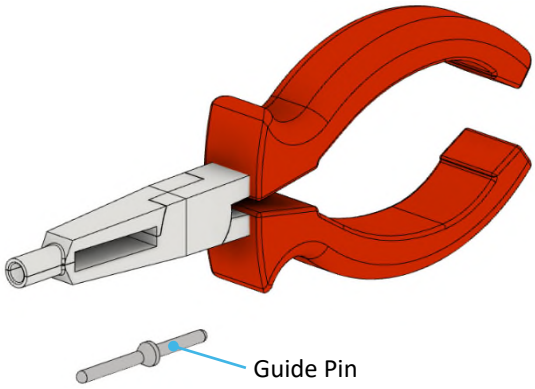
3.6.3. Crimp tool operation



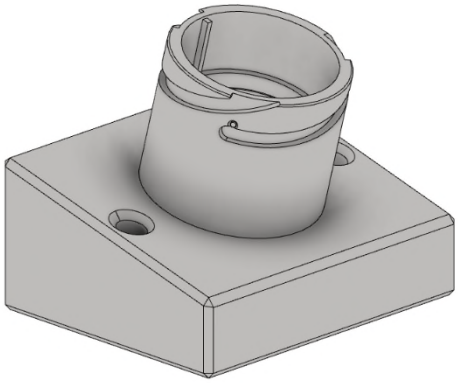


Insert the cable and contact into the crimp cavity. Ensure that the contact is fully home in the cavity and the cable is fully home in the crimp bucket then actuate the crimp tool.

The tool will release the crimped assembly upon completion of the crimping action. If the contact does not release, the tool actuation has not been completed, in this case, fully actuate the tool handle.

3.6.4. Inspection of crimped assembly	Inspect the completed assembly. Ensure the following: • No loose conductor strands outside of crimp bucket • Acceptable gap between conductor insulation and contact crimp bucket • Cable conductor visible in crimp bucket viewing hole • No cracks evident in the crimp bucket • Correct location of crimp indentations Refer to IPC/WHMA-A-620 Section 5.2 for acceptance criteria. *Note: Class 3 acceptance criteria shall be met.*
3.6.5. Complete strip/crimp for all conductors	Repeat steps 3.6.1 to 3.6.4 for all conductors.
3.7. <u>Connector Assembly</u> 3.7.1. Select appropriate assembly tools  	Referring to Appendix A, select the appropriate contact insertion tool and, where required, the appropriate contact guide pin. Guide pins shall be used for size 16 and size 12 female contacts to ease installation and prevent damaging locating features inside the contact insulator during assembly (refer to Appendix A for guide pin selection table).

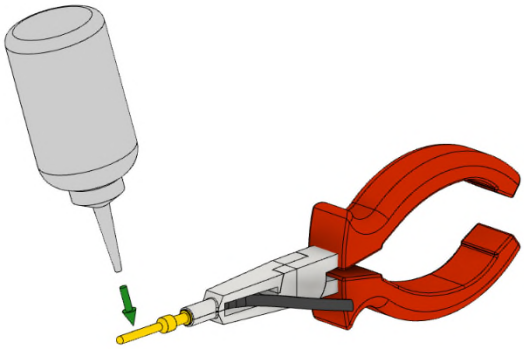
3.7.2. Insert connector into assembly fixture



For high volume assembly scenarios, it is preferable to insert the connector into an assembly fixture during the contact assembly operation. This is an optional step that lessens the difficulty of, and improves the speed of the operation; and removes risk of hand injury when guide pins protrude from the front of the connector during the installation process. This step may be omitted for low volume production or repair scenarios.

An example fixture is provided in the adjacent illustration.

3.7.3. Prepare for contact insertion operation

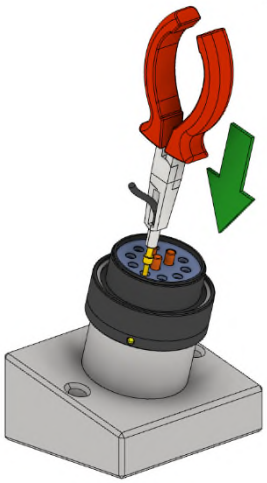


Insert the contact into the assembly tool.

The cable should be unrestricted as it exits the tool aperture at the rear of the tool head.

Use either isopropyl alcohol or Pronatur orange solvent to wet the front end of the contact (and guide pin, where required). Application of lubricant may be via pipette, brush or dipping into the fluid.

3.7.4. Insert contacts into contact insulator

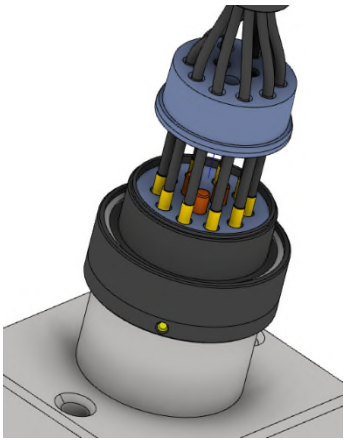


Referring to a suitable cable assembly drawing or other production documentation, locate the appropriate cavity. Offer the end of the contact or guide pin up to the cavity entrance then use firm pressure to press it into the cavity. A tactile ‘click’ will be felt when the contact is properly seated.

The contact layout may be predominantly circular array or predominantly linear array. The order in which contacts are inserted depends on this layout i.e. for circular array, consider assembling the centremost contacts first.

Note: Plug connector shown in illustration. Assembly steps also applicable to other housing variations.

3.7.5. Repeat contact installation steps



Repeat steps 3.7.1 through 3.7.4 for all remaining contacts.

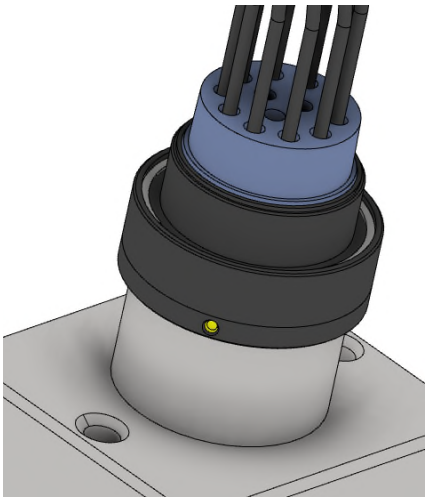
When all contacts are inserted into the connector, inspect the cable lay. Ensure that cable cross-over is minimised and that cables are laid out in a neat manner.

3.7.6. Confirm correct seating of contacts

Inspect the position of the contacts relative to the connector housing and to each other. If the assembly has been done correctly, there will be no prominent height mismatch.

For quality assurance purposes, the correct location of the contact may be checked per reference information provided in Appendix B

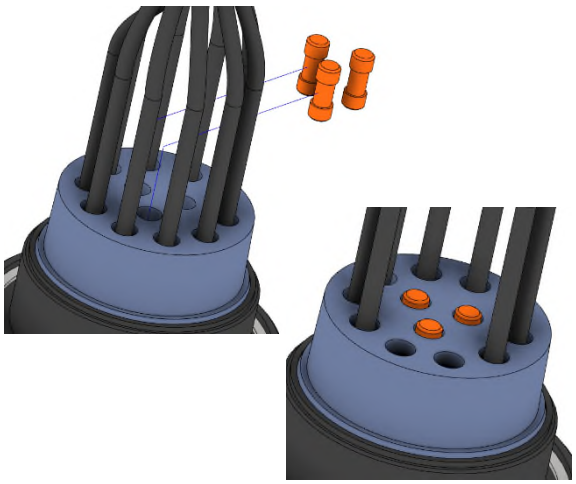
3.7.7. Grommet seating



Slide the sealing grommet down the cable cores until it is fully seated against the rear face of the contact insulator. It may be necessary to work around the body of the grommet in several positions to achieve this. If this is difficult as a result of excessive friction, lubricate the cable cores accordingly with the appropriate liquid.

Use either isopropyl alcohol or Pronatur orange solvent. Application of lubricant may be via pipette, brush or spray.

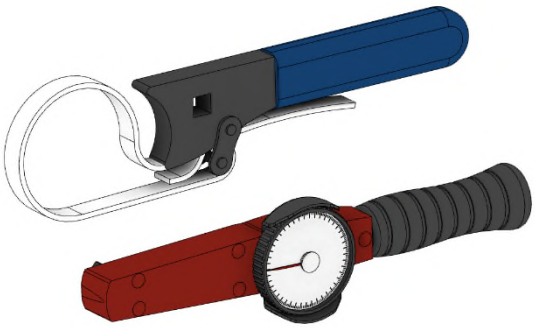
3.7.8. Insert grommet filler plugs



All empty grommet cavities must be filled with filler plugs. This can be done without the use of assembly tools. Press the filler plug into the grommet from the rear, successful engagement can be verified via a tactile “click”.

3.8. Cable Accessory Assembly

3.8.1. Description of assembly equipment



The assembly fixtures utilised in steps 3.7.2 & 3.8.3 form part of the required equipment for backshell assembly. Alternatively, appropriate mating connectors or stowage receptacles may be used in conjunction with a clamping device for the purpose of preventing connector rotation when tightening the cable accessory. Refer to the ABCIRH product catalogue for details of these products.

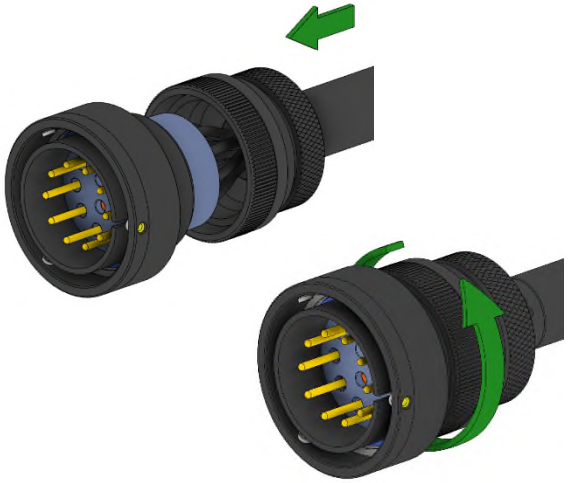
Other equipment required as follows:

- Strap wrench
- Torque wrench

Examples of this equipment are depicted in the adjacent illustration.

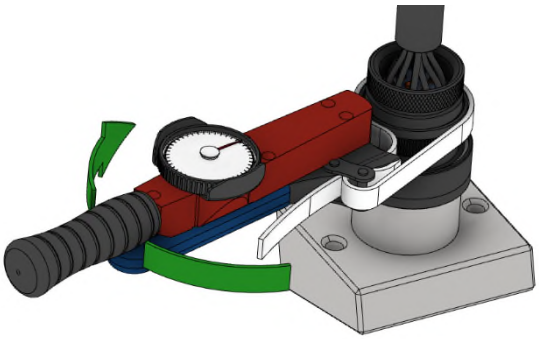
Note: Refer to Appendix D tooling details.

3.8.2. Move the accessory into position



Slide the cable accessory along the cable into position on the rear threads of the connector housing. Screw the accessory coupling ring onto the connector. Tighten until light resistance is felt then move to the next step.

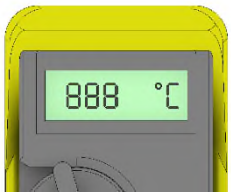
3.8.3. Tighten the accessory, use of torque wrench

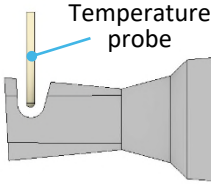


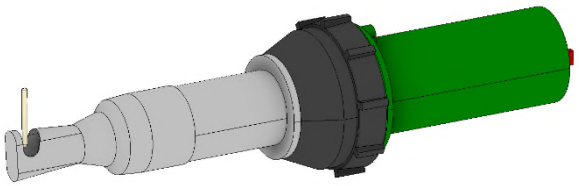
Locate the connector into the assembly fixture or mating connector. The mating connector shall be fully populated with contacts. If using a fixture, the fixture shall simulate a mating connector that is fully populated with contacts. This step is mandatory to prevent contacts being forced into an undesirable position (twisting or splaying out) when torsion/compression is applied to the assembly during tightening of the connector accessory.

Position the appropriate wrenches per the illustration and tighten the accessory. Refer to Appendix D for recommended tightening torque and tool part number information.

3.9. Heat Gun Temperature Calibration







The output air temperature of the heat gun shall be measured and adjusted in accordance with the below information. This procedure shall be conducted, and correct output temperature confirmed, prior to assembly of shrinkboots in either of the following scenarios (either with pre-coated boot or with hot melt tape).

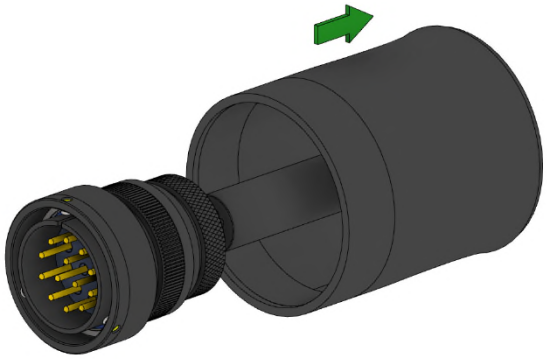
Refer to Tyco Code of Practice **ELE-3COP-711 (Variable Temperature Hot Air Gun Validation)**. This procedure shall be used to set the specific output air temperature that is required.

Heat gun temperatures shall be set as follows:

- **Pre-coated adhesive lined boots 240 °C** *(See 3.10)*
- **No pre-coat, with hot melt adhesive tape 200 °C (used on PE jacketed signal cable)** *(See 3.11)*

3.10. Shrinkboot Assembly With Pre-coat Adhesive Lining

3.10.1. Slide shrinkboot away from connector



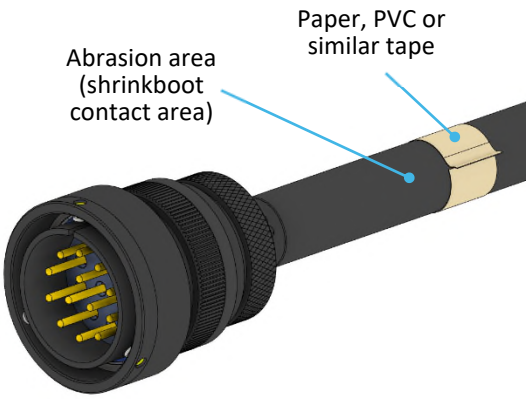
If a shrinkboot has already been positioned onto the cable, slide this further along so that it is out of reach of any debris created by the next process steps.

3.10.2. Degrease cable jacket and connector

Degrease the bonding area on the cable jacket and the connector accessory. Use isopropyl alcohol and lint-free cleaning cloth or pre-impregnated wipes. Set the assembly aside until the alcohol evaporates before moving to the next step.

Refer to Appendix E for more information relating to length of cable jacket to be cleaned.

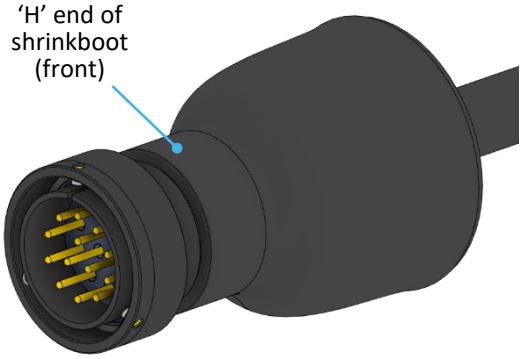
3.10.3. Abrade cable bonding area



Apply paper or PVC tape to the cable jacket in the appropriate position (per Appendix E) to contain the abraded area. The tape is used as a temporary measure to help to contain abrasion marks to a limited area of the cable jacket, to ensure a neat appearance. Abrade the jacket with 100 grit abrasive paper/cloth. Ensure the whole area is abraded and no smooth areas remain.

Remove and dispose of the tape then use a dry paper towel to wipe loose particles from the abraded area.

3.10.4. Apply heat to shrinkboot ('H' end)

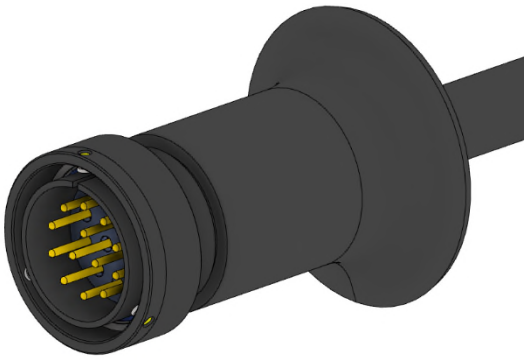


Use Leister CV1981 heat gun and PR26 reflector nozzle.

Note: The heat gun temperature should be calibrated daily, or immediately before use if the equipment is not used on a daily basis. Ensure the heat gun temperature has stabilised for at least two minutes prior to temperature measurement and adjustment. Air temperature should be measured with a calibrated thermocouple positioned 25mm from the end of the reflector. Temperature should be set to between 230 °C and 250 °C.

Slide the shrinkboot back up to the connector. Apply heat evenly to the 'H' end (connector end) of the boot first. Locate the boot rib into the groove on the connector accessory. Ensure uniform shape recovery is achieved.

3.10.5. Apply heat along shrinkboot length



After the 'H' end is recovered, continue to apply heat for a further sixty seconds, or until presence of adhesive flow is seen at the connector end of the boot. Then start to move the heat further along the boot gradually covering the centre portion. Ensure uniform shape recovery is achieved.

3.10.6. Apply heat to shrinkboot ('J' end)

Apply heat to the 'J' end of the boot to complete shape recovery. Continue applying heat for a further sixty seconds, or until presence of adhesive flow is seen at the cable end of the boot. Remove any excess adhesive from connector, boot and cable immediately before cooling occurs.

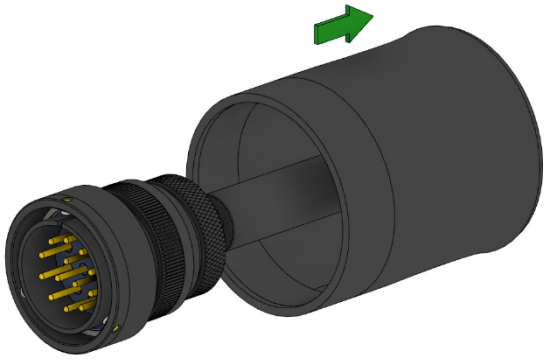
3.10.7. Cooling

Place the completed assembly into the cooling fixture, orientated as shown in the adjacent illustration. The assembly can be moved once the shrinkboot has cooled to ambient temperature. Where necessary, bend testing can be carried out after cooling has occurred.

Note: For further information refer to shrinkboot manufacturers Installation Instructions and Codes of Practice for Adhesive Lined Shapes.

3.11. Shrinkboot Assembly With Hot Melt Adhesive Tape (No Pre-coat)

3.11.1. Slide shrinkboot away from connector



If a shrinkboot has already been positioned onto the cable, slide this further along so that it is out of reach of any debris created by the next process steps.

Please note that preparation of the bonding faces of the shrinkboot may need to be carried out prior to this step if the boot needs to be positioned over the cable prior to fitting the connector (if the boot does not fit over the connector). If this is necessary, refer to 3.11.2 and prepare the boot before assembly to the cable.

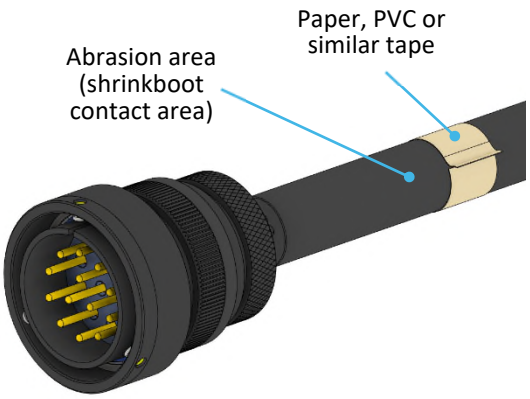
3.11.2. Degrease cable jacket, connector and prepare the shrinkboot

Degrease the bonding area on the cable jacket and the connector accessory. Use isopropyl alcohol and lint-free cleaning cloth or pre-impregnated wipes. Set the assembly aside until the alcohol evaporates before moving to the next steps. Degrease the inner faces of the shrinkboot using the same method.

Abrade the inner faces of the shrinkboot with 100 grit abrasive paper/cloth.

Refer to Appendix E for more information relating to length of cable jacket to be cleaned.

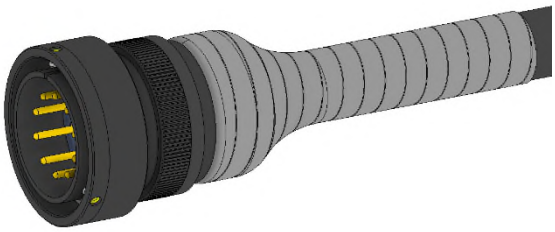
3.11.3. Abrade cable bonding area



Apply paper or PVC tape to the cable jacket in the appropriate position (per Appendix E) to contain the abraded area. The tape is used as a temporary measure to help to contain abrasion marks to a limited area of the cable jacket, to ensure a neat appearance. Abrade the jacket with 100 grit abrasive paper/cloth. Ensure the whole area is abraded and no smooth areas or printed text remain.

Remove and dispose of the tape then use a **dry paper towel** to wipe loose particles from the abraded area.

3.11.4. Wrap hot melt tape around bonding area



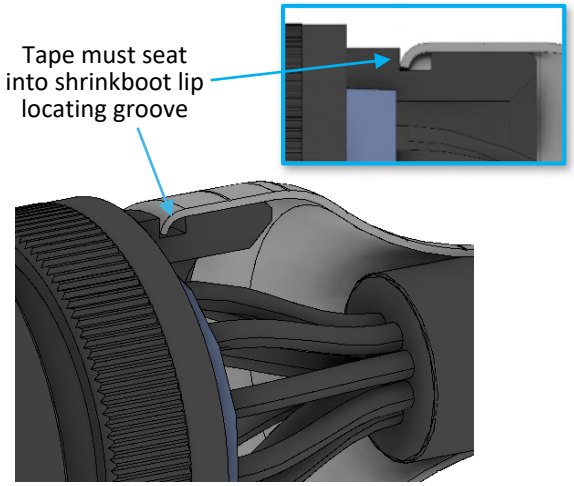
Starting at the cable accessory; locate the tape into the shrinkboot lip locating groove and ensure one full 360° wrap is pushed into this area before coiling the tape over the remaining area to be bonded.

The tape shall be held in place at its start position by steaking the overlapping portion to itself. Examples of how this shall be achieved are:

- by pressing a hot knife or the end of a hot heat gun nozzle into the tape
- by pressing a blunt tool such as a screwdriver blade into the tape.

Refer to the manufacturer's codes of practice for further information. TE Connectivity COP: ELE-3COP-607

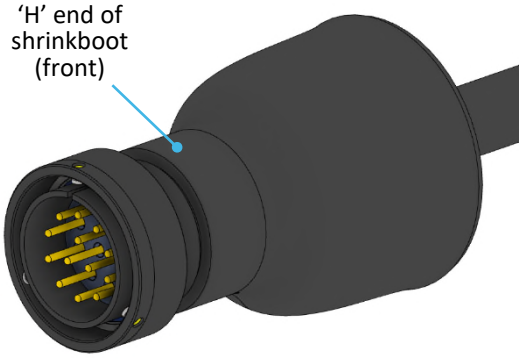
3.11.5. Location of tape on accessory and cable



Prior to moving the shrinkboot into position, ensure that the tape is seated into the shrinkboot lip retaining groove.

As a general rule of thumb, it is advised that the tape should be wrapped twice around all bonding areas.

3.11.6. Apply heat to shrinkboot ('H' end)

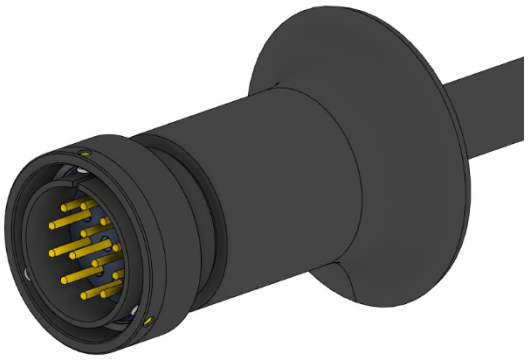


Use Leister CV1981 heat gun and PR26 reflector nozzle.

Note: The heat gun temperature should be calibrated daily, or immediately before use if the equipment is not used on a daily basis. Ensure the heat gun temperature has stabilised for at least two minutes prior to temperature measurement and adjustment. Air temperature should be measured with a calibrated thermocouple positioned 25mm from the end of the reflector. Temperature should be set in accordance with section 3.9 of this specification.

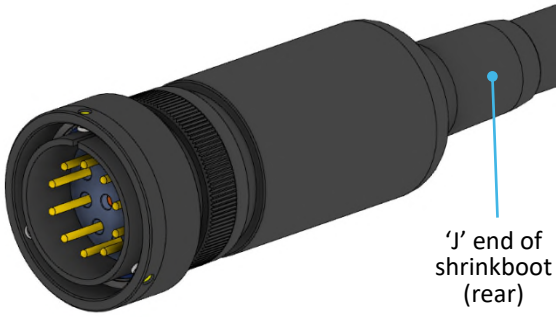
Slide the shrinkboot back up to the connector. Apply heat evenly to the 'H' end (connector end) of the boot first. Locate the boot rib into the groove on the connector accessory. Ensure uniform shape recovery is achieved.

3.11.7. Apply heat along shrinkboot length



After the 'H' end is recovered, continue to apply heat for a further sixty seconds, or until presence of adhesive flow is seen at the connector end of the boot. Then start to move the heat further along the boot gradually covering the centre portion. Ensure uniform shape recovery is achieved.

3.11.8. Apply heat to shrinkboot ('J' end)



Apply heat to the 'J' end of the boot to complete shape recovery. Continue applying heat for a further sixty seconds, or until presence of adhesive flow is seen at the cable end of the boot. Remove any excess adhesive from connector, boot and cable immediately before cooling occurs.

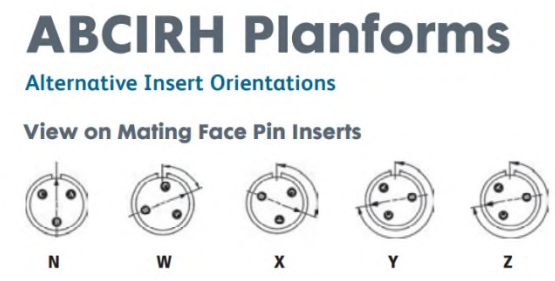
3.11.9. Cooling

Place the completed assembly into the cooling fixture, orientated as shown in the adjacent illustration. The assembly can be moved once the shrinkboot has cooled to ambient temperature. Where necessary, bend testing can be carried out after cooling has occurred.

Note: For further information refer to shrinkboot manufacturers Installation Instructions and Codes of Practice for Adhesive Lined Shapes.

4. Coupling Verification

4.1.1. General description

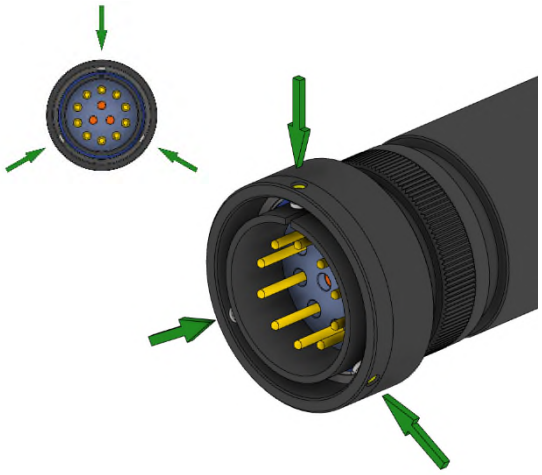


Applicable either during electrical testing at the assembly site or during installation or maintenance at the end use location, this section provides information about connector features that are provided for the user to verify successful coupling of the connector pair.

Each plug connector has three equi-spaced visual indicator marks on the outside face of the coupling ring. Each receptacle connector has three visual indicator marks on the outside face of the housing.

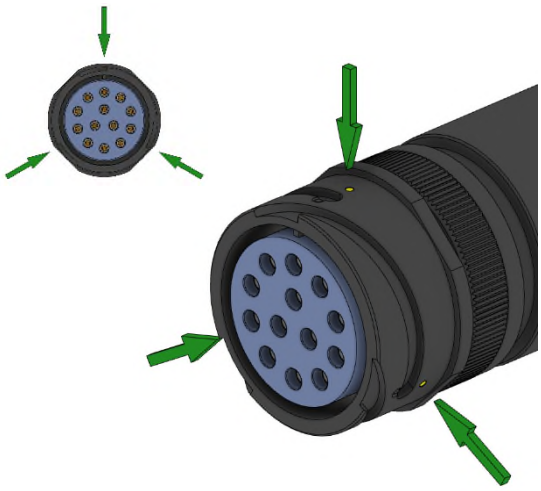
These indicators may be one of five different colours. Each colour corresponds to alternative contact layout orientation options as follows: Yellow - N, Blue – W, Green – X, Purple – Y and White – Z.

4.1.2. Location of visual indicators - plug



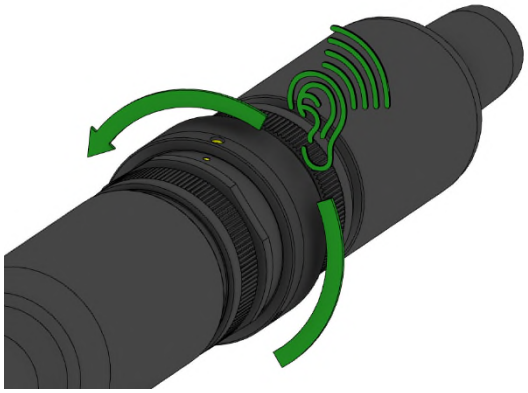
The adjacent illustration indicates the locations of visual indicators on the plug assembly.

4.1.3. Location of visual indicators - receptacle



The adjacent illustration indicates the locations of visual indicators on the receptacle assembly.

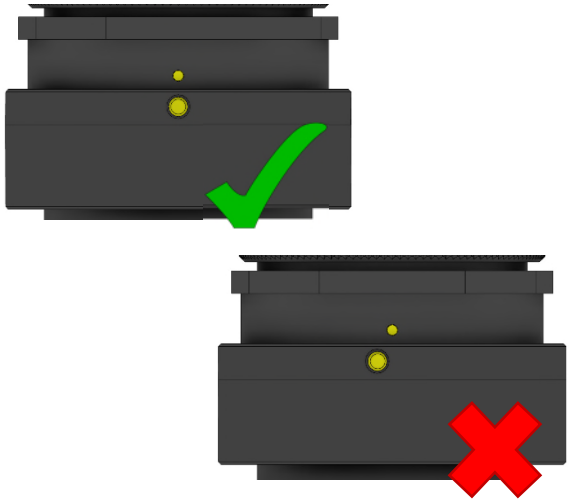
4.1.4. Audible indicator



Additional to the visual indication of fully coupled connector pairs, each connector has features that provide an audible indication of successful coupling.

When rotating the coupling nut through the end of its motion, an audible “click” will be heard when components snap into the fully coupled position. This snapping action also provides physical feedback to the user.

4.1.5. Alignment of visual indicators



When fully coupled, visual indicators of both connectors shall be in alignment as indicated.

5. APPENDICES

5.1. Appendix A — Crimp and assembly tooling data

Crimp Tooling and Recommended Tool Settings
STRANDED Copper Alloy Wire Cores

Contact Size/Type	Contact Part Number	Wire Size (CSA mm²)	Tool Body Ref. No.	Tool Setting	Turret/ Locator/ Die Set* Ref. No.	Tool Position	Insertion Tool Ref. Number	Extraction Tool Ref. Number	Socket Guide Pins
16 Pin	ABB-16-KPK-F80	0.93/1.50	FT8 [A]	5	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
			WA27F [B]	6	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
16 Skt	ABB-16-KSK-F80	0.93/1.50	FT8	5	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
			WA27F	6	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
12 Pin	ABB-12-KPK-F80	2.50/3.00	FT8	7	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
			WA27F	8	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
12 Skt	ABB-12-KSK-F80	2.50/3.00	FT8	7	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
			WA27F	8	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
12/16 Pin	ABB-12-16-KPK-F80	0.93/1.50	FT8	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
			WA27F	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
12/16 Skt	ABB-12-16-KSK-F80	0.93/1.50	FT8	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
			WA27F	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
12/18 Pin	ABB-12-18-KPK-F80	0.75/0.93	FT8	4	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
			WA27F	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
12/18 Skt	ABB-12-18-KSK-F80	0.75/0.93	FT8	4	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
			WA27F	5	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
100 Pin	ABB-100-KPK-F80	10.00	ABBPL0550A1130	—	MRP0925*	—	†	†	†
100 Skt	ABB-100-KSK-F80								
100/12 Skt	ABB-100-12-KSK-F80	2.50	M309 [C]	4	ABBTP1913	—	†	†	†
			WA27-309-2C [D]						
100/16 Skt	ABB-100-16-KSK-F80	1.50	M309	3	ABBTP1913	—	†	†	†
			WA27-309-2C						
100/18 Skt	ABB-100-18-KSK-F80	0.75	M309	4	ABBTP1913	—	†	†	†
			WA27-309-2C						
100/40 Pin	ABB-100-40-KPK-F80	4.00	ABBPL0550A1130	—	MRP31042*	—	†	†	†
100/40 Skt	ABB-100-40-KSK-F80								
160 Pin	ABB-160-KPK-F80	16.00	ABBPL0550A1130	—	MRP0924*	—	†	†	†
160/18 Skt	ABB-160-18-KSK-F80	0.75	WA23 [E]	—	WA23-226DA [F]	—	†	†	†
					WA23-374L [G]				

[A] DMC Tools FT8 manually actuated crimp tool body (M22520/1-01)
[B] DMC Tools WA27F pneumatically actuated version of FT8 crimp tool body
[C] DMC Tools M309 manually actuated crimp tool body
[D] DMC Tools WA27-309-2C pneumatically actuated version of M309 crimp tool body
[E] DMC Tools WA23 heavy duty large gauge pneumatically actuated crimp tool body
[F] Die set for DMC Tools WA23 crimp tool body
[G] Locator for DMC Tools WA23 crimp tool body

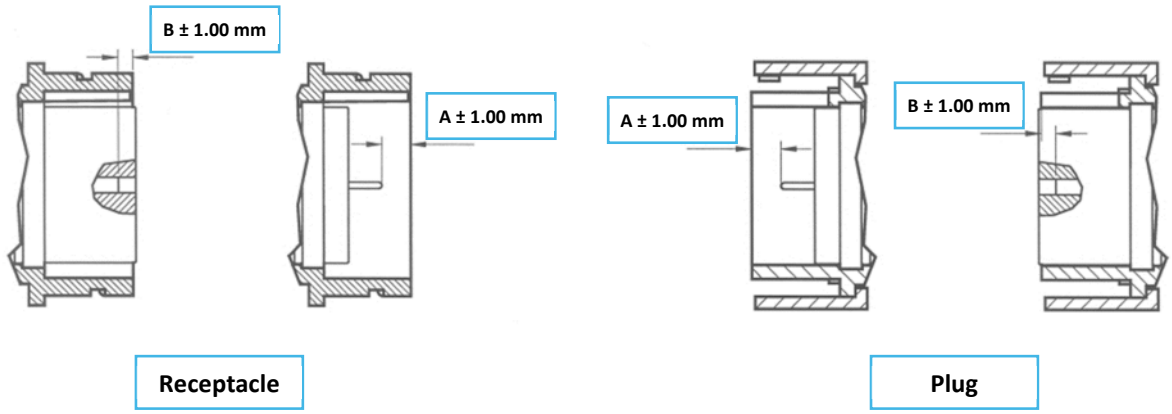
* Hexagon crimp dies
† Assembly tools not required

Crimp Tooling and Recommended Tool Settings
SOLID Copper Alloy Wire Cores

Contact Size/Type	Contact Part Number	Wire Size (Ø mm)	Tool Body Ref. No.	Tool Setting	Turret/ Locator Ref. No.	Tool Position	Insertion Tool Ref. Number	Extraction Tool Ref. Number	Socket Guide Pins
16 Pin	ABB-16-KPK-F80	1.40	FT8 [A]	3	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
			WA27F [B]	3	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
16 Skt	ABB-16-KSK-F80	1.40	FT8	3	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
			WA27F	3	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
16/18 Pin	ABB-16-18-KPK-F80	0.90	FT8	3	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
			WA27F	3	ABBTH592	Blue	ABB-IT-16	ABB-ET-16	—
16/18 Skt	ABB-16-18-KSK-F80	0.90	FT8	3	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
			WA27F	3	ABBTH592	Red	ABB-IT-16	ABB-ET-16	ABB-16-SGP
12/16 Pin	ABB-12-16-KPK-F80	1.40	FT8	3	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
			WA27F	3	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	—
12/16 Skt	ABB-12-16-KSK-F80	1.40	FT8	3	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP
			WA27F	3	ABBTH592	Yellow	ABB-IT-12	ABB-ET-12	ABB-12-SGP

[A] DMC Tools FT8 manually actuated crimp tool body (M22520/1-01)
[B] DMC Tools WA27F pneumatically actuated version of FT8 crimp tool body

5.2. Appendix B — Contact Position



Connector Size	Pin Position 'A' Contact Size						
	20 (mm)	16S (mm)	16 (mm)	12 (mm)	(8) 100 (mm)	(4) 160 (mm)	(0) 500 (mm)
20	9.8	6.6	6.6	3.0	2.3	2.3	2.3
24	9.8	6.6	6.6	3.0	2.3	2.3	2.3
32	9.8	6.6	6.6	3.0	2.3	2.3	2.3
40	9.8	6.6	6.6	3.0	2.3	2.3	2.3

Connector Size	Socket Position 'B' Contact Size						
	20 (mm)	16S (mm)	16 (mm)	12 (mm)	(8) 100 (mm)	(4) 160 (mm)	(0) 500 (mm)
20	1.40	—	2.60	2.60	2.60	2.60	2.60
24	1.40	—	2.60	2.60	2.60	2.60	2.60
32	1.40	—	2.60	2.60	2.60	2.60	2.60
40	1.4		2.60	2.60	2.60	2.60	2.60

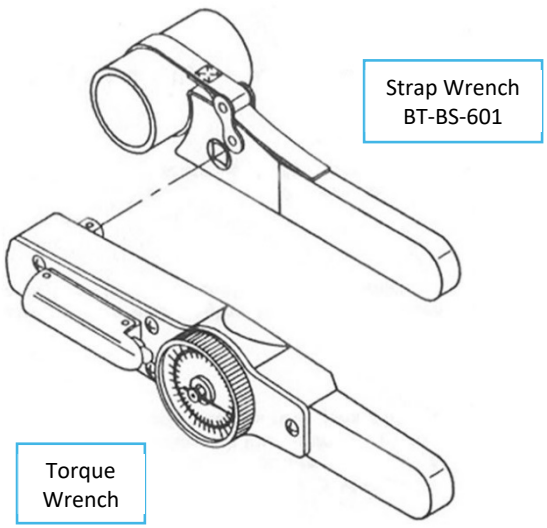
5.3. Appendix C – Cable Strip Lengths

Connector/Backshell Configuration	Contact Arrangement	Sheath Strip Length (mm)	Inner Core Strip Length (mm)
ABCIR-H-01-GM-20	20-23	40	12.0
ABCIR-H-SE06-GM-20			
ABCIR-H-01-GM-20	20-4	40	6.7
ABCIR-H-SE06-GM-20			
ABCIR-H-01-GM-24	24-2	40	6.7
ABCIR-H-SE06-GM-24			
ABCIR-H-01-GM-32	32-A13	90	6.7
ABCIR-H-SE06-GM-32			
ABCIR-H-01-GM-32	32-76	90	6.7
ABCIR-H-SE06-GM-32			
ABCIR-H-01-GM-32	32-31	90	6.7
ABCIR-H-SE06-GM-32			
ABCIR-H-01-GM-32	32-A48	90	6.7
ABCIR-H-SE06-GM-32			
ABCIR-H-01-GM-32	32-17	90	12.0
ABCIR-H-SE06-GM-32			
ABCIR-H-01-GM-40	40-A31	90	6.7
ABCIR-H-SE06-GM-40			

5.4. Appendix D – Accessory Torque Values and Tooling

Connector/ Backshell Size	Torque Value (in/lb +5% -0%)	Torque Value (Nm +5% -0%)	Tooling			
			Strap Wrench Manufacturer Ref.	Strap Wrench P/No. Ref.	Torque Wrench Manufacturer Ref.	Torque Wrench P/No. Ref.
20	70	7.90	DMC Tools	BT-BS-601	DMC Tools	BT-ST-751
24	70	7.90	DMC Tools	BT-BS-601	DMC Tools	BT-ST-751
32	85	9.60	DMC Tools	BT-BS-601	DMC Tools	BT-ST-751
40	125	14.13	DMC Tools	BT-BS-601	DMC Tools	BT-ST-751

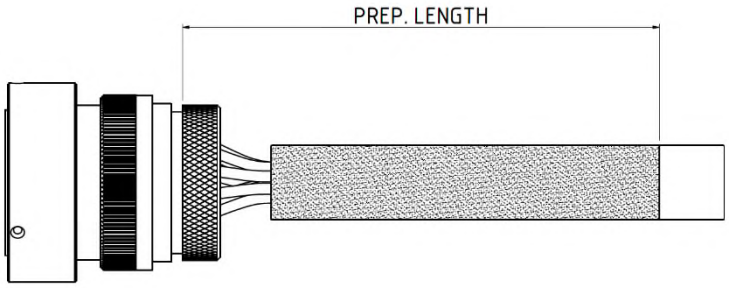
Note: For guidance only. Due to the vast number of permutations available for contact arrangements and cable sizes these values are based upon the most densely populated contact arrangements with cables at the maximum limits for the grommet.



5.5. Appendix E — Cable Jacket Length Preparation and Heat Shrink Tooling

Connector/ Backshell Size	Shrinkboot Part Number		Prep. Length (mm)	Heat Gun Ref.	Reflector Nozzle Ref.	Max. Power Output (Watts)	Approximate Heat Setting	Calibration Temperature (°C)
	Hellermann Ref.	Tyco Ref.						
20	157-42-HW8	202K163-100-86-0	100	Leister Triac CV1981	PR26	1600	4	230 to 250
24	157-43-HW8	202K163-100-86-0	120					
32	158-43-HW8	202K174-100-86-0	150					
40	159-43-HW8	202K185-100-86-0	190					

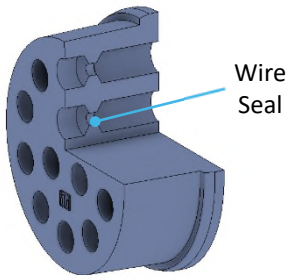
Note: 'Prep. Length' is measured from the rearmost face of the boot lip location groove to the end of the prep area on the cable jacket.



5.6. Appendix F — Utilisation of Reduced Bore Grommets

5.6.1. Unless otherwise specified, connector accessories are supplied with standard wire sealing grommets. These grommets provide sealing at the rear of the connector assembly, at the point of entry of individual wire cores. Standard grommets are suitable for a specific range of wire diameters. Information related to standard wire seal dimensions for these grommets is listed below for reference.

Standard Wire Sealing Grommets* Acceptable Wire Diameter Size Limits		
Contact Size	**Min OD (mm)**	**Max OD (mm)**
16S	1.52	3.20
16	1.52	3.20
12	2.44	5.12
8	4.90	7.20
4	8.18	11.00
0†	14.00	16.00



Contact Arrangement
32-A13 Illustrated

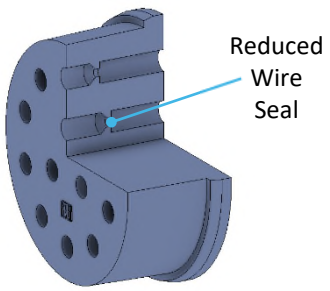
*Standard wire sealing grommets available for all catalogue listed contact layouts

†Grommet reducing bushes are available to suit 35 mm², 25 mm² and 16 mm² wire

5.6.2. When utilising wire and cable that is smaller in diameter than the minimum size listed above, grommets are available with wire seals of a reduced diameter. At present, these grommets are available for a selected range of contact layouts. Information related to our reduced bore grommets (RBG grommets) is listed below for reference.

Note: In the absence of grommets with reduced wire seals, the wire insulation may be increased to the appropriate size (in accordance with dimensions in the above table) with the use of adhesive lined heatshrink sleeving. Use manufacturer's instructions and the below illustration for guidance.

Reduced Bore Wire Sealing Grommets Contact Layout Availability*		
Connector Size	**Contact Layout Ref.**	**Ordering Information**
20	4	Add M323 mod code to connector part number reference when ordering
24	2	
32	76	
32	A13	
40	A31	



Contact Arrangement
32-A13 Illustrated

*Consult factory for additional requirements and contact arrangements not listed

Reduced Bore Wire Sealing Grommets Acceptable Wire Diameter Size Limits		
Contact Size	**Min OD (mm)**	**Max OD (mm)**
12	1.52	3.20