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Product Manual for "Connecta" Modular Harnesses

Contents

Document: 'Connecta' Product Manual (Iss 1.6)

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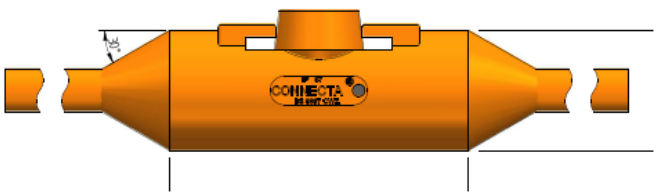
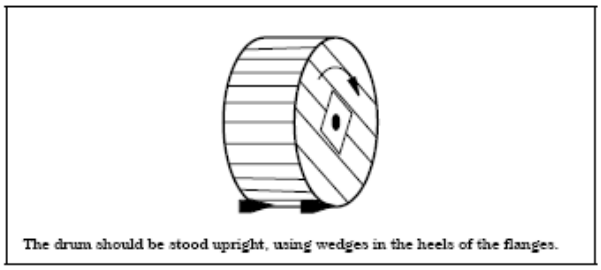


1. Drum Handling

Drums should be Secured, Moved, Orientated, and loaded in accordance with directions from BS 8512 (2008) Code of practice for Storage, Installation and disposal of wooden cable drums.
In Particular – **<u>at no time</u>** should the drums be orientated as per fig 1b below as this may cause serious damage to the modular Connecta harnesses and hence invalidate the warranty.

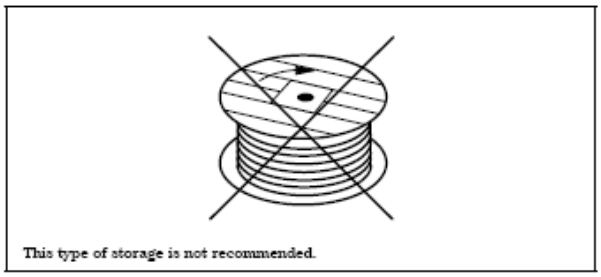
(*extract from BS 8512*)

Figure 1a Correct drum storage



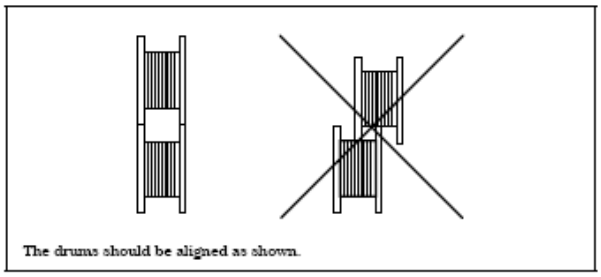
The drum should be stood upright, using wedges in the heels of the flanges.

Figure 1b Incorrect drum storage



This type of storage is not recommended.

Figure 1c Drum storage – view from the top



The drums should be aligned as shown.

Figure 3 Lifting by crane

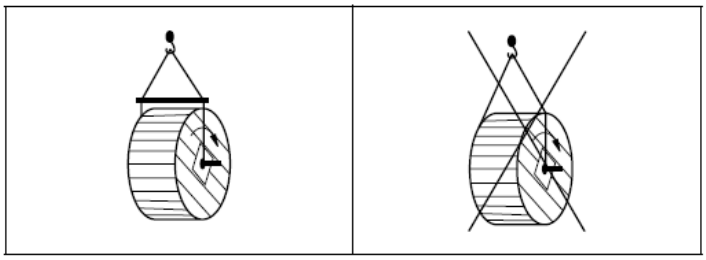
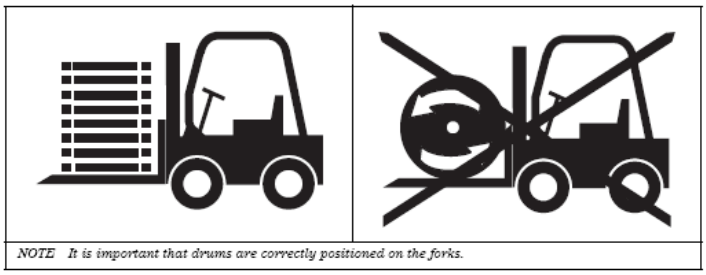


Figure 4 Lifting by fork lift trucks



NOTE It is important that drums are correctly positioned on the forks.

2. Drum Storage

- The Modular ‘Connecta’ harness drums when removed from their delivery transport / containers should be immediately moved to an indoor / under-cover storage location.
- The ‘Connecta’ harness drums should be stored on level dry base which is free from potential flooding.
- The ‘Connecta’ harness drums should be stored in areas that are free from rodent or termite infestation.

- The Modular ‘Connecta’ harnesses must remain on the original supply drums until the harnesses are installed - any re-winding or re-drumming of the ‘Connecta’ harnesses will invalidate the manufacturer warranty.

3. Drum Loading

- Drums should be loaded onto the cable installation vehicle using lifting methodology in accordance with BS 8512 and any customer specific drum movement protocols.

- Drum lagging battens should be fully removed before prior to commencement of installation activities – paying particular attention to remove all the batten securing nails.

- At this point the installer may wish to conduct a pre-installation Insulation resistance test.
  IR tests should be conducted with a 500v DC testing instrument connected to the cable end only. With open ended harnesses; the remote cable end should 1st be un-covered and conductors splayed prior to testing. We do not recommend IR testing via direct connection to the socket contacts within the moulded outlets .

4. Harness Installation

- Connecta Harnesses are manufactured from contiguous cable lengths – whereby the conductors remain un-broken but the outer sheath and armours are removed, to enable connection, prior to being over-moulded.
  This means that the ‘Connecta’ harnesses do not have the same tensile strength as per the raw material cable from which they are manufactured – and hence cannot withstand single end pulling as per the cable without moulded outlets.

- When unwinding the drum - care should be taken to **Avoid Snagging** of the modular outlets – this can occur when layers of cable ride up over the outlet position which is about to be removed from the drum.

- Connecta harnesses should be paid off from the delivery drum by carefully by rotating the drum so as to put **minimal pulling tension*** on the harness – **do not use a cable pulling winch** – the harness should then be lifted and **placed** onto the intended final support structure. (* as close to zero as possible). The following 2 options that are commonly used:

    - Unwinding from a slowly moving vehicle – this requires people positioned on the vehicle to unwind the drum and prevent outlets from snagging and people to ensure that the harness is placed safely onto the static cable management. Note: it may be more practicable to place the harness temporarily onto the ground before lifting it into its final position on the cable management (tray/ladder/hanger).
      Caution – do not allow the installed harness to be dragged by the installing vehicle.

- Unwinding from a static position* – this is less practicable as it requires people to carry the harness along the tunnel - the drum should be rotated to allow the harness to be paid off and carried – **NO CABLE WINCHING**.
  Warning: **at no point should the harness be allowed to drag along the ground** as this may lead to snagging of outlets and irreparable cable and outlet damage.

- As stated before - the harnesses should only be installed from their original supply drums i.e., no re-winding or re-drumming should take place as this will invalidate the manufacturer warranty.

- As each of the moulded outlets are lifted into place – the installers should check that the red plastic transit cap is securely held in place. If this cap is loose, it may be re-secured by the addition of a lap of insulation tape.

- Note: the red plastic transit caps are not suitable for extended use after the harness has been installed into the tunnel. The transit cap should be replaced by either the permanent fly-lead plug or a specially designed permanent blanking plug.

5. Cable Harness Support / Fixing

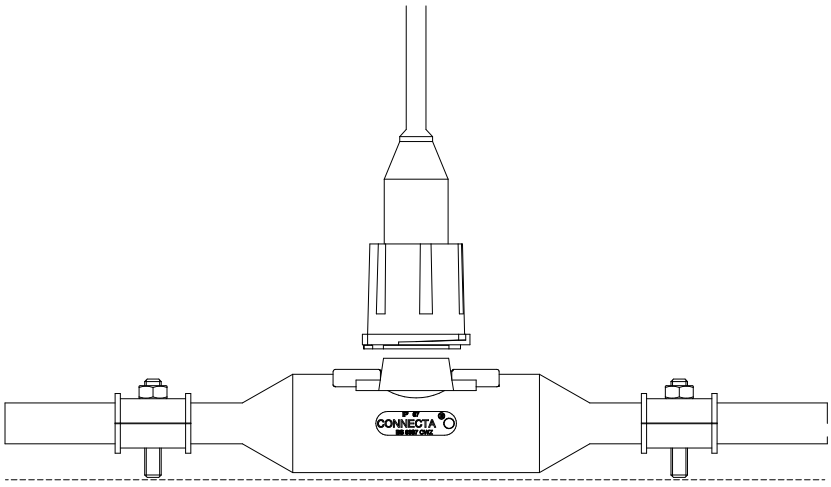


Figure 2

- Fixings are required to properly support the moulded Connecta outlets and ensure that the main cable remains straight as it enters and exits the outlet mouldings; allowing any cable route bends# to occur beyond these fixings. Connecta harness moulded outlets are required to be fixed with **BICON - Fire Resistant Claw cleats** on both sides of the moulded outlets as close to the moulding as the tray* / ladder will allow - as shown in the Fig 2 above.

  (note: # bends must not be tighter than the minimum recommended bending radii for the cable)
  *(note: * packing pieces are available to allow the cleats to be secured to cable tray)*

- The cable between moulded outlets should be similarly secured with fire resistant cleats / fixings at a frequency in accordance with BS 7671 – 18th Edition Wiring regulations (2018) - onsite guide table D1.

▼ **Table D1** Spacings of supports for cables in accessible positions

Overall diameter of cable, d* (mm)	Maximum spacings of clips (mm)							
	Non-armoured thermosetting or thermoplastic (PVC) sheathed cables				Armoured cables		Mineral insulated copper sheathed or aluminium sheathed cables	
	Generally		In caravans					
	Horizontal†	Vertical†	Horizontal†	Vertical†	Horizontal†	Vertical†	Horizontal†	Vertical†
1	2	3	4	5	6	7	8	9
$d \leq 9$	250	400	250 (for all sizes)	400 (for all sizes)	–	–	600	800
$9 < d \leq 15$	300	400			350	450	900	1200
$15 < d \leq 20$	350	450			400	550	1500	2000
$20 < d \leq 40$	400	550			450	600	–	–

NOTES:

For the spacing of supports for cables having an overall diameter exceeding 40 mm, the manufacturer's recommendations should be observed.

* For flat cables taken as the dimension of the major axis.

† The spacings stated for horizontal runs may be applied also to runs at an angle of more than 30 ° from the vertical. For runs at an angle of 30 ° or less from the vertical, the vertical spacings are applicable.

6. Harness Testing, Jointing & Terminating

- IR tests should be conducted with a 500v DC testing instrument connected to the cable end only - with open ended harnesses the remote cable end should 1st be un-covered and conductors splayed prior to testing. We do not recommend IR testing via direct connection to the socket contacts within the moulded outlets..

- Where harnesses are supplied in multiple sections, usually due to drum length and size restrictions, they should be jointed with Prysmian BICON supplied cable joints that are compliant with the cables from which the harnesses are manufactured. Where harnesses are not supplied with a blank remote end outlet, i.e. there is a short cable tail – this should be stop end jointed with a Prysmian BICON supplied cable joint that is fully compliant with the cables from which the harnesses are manufactured.

- ‘Connecta’ harnesses manufactured with FR/LSOH armoured cables should be terminated into their associated distribution panels using BICON LSOH C-type Glands. ‘Connecta’ harnesses manufactured with FR/LSOH un-armoured cables should be terminated into their associated distribution panels using BICON approved LSOH A1/A2 Glands.

7. Fly Lead Termination

- Termination of the fly leads into their associated luminaire or luminaire control box is normally conducted in a work shop* environment away from the final installation site - the completed assembly (luminaire + fly lead cable) can then be taken to site for installation.

- Prior to cutting, stripping and terminating, details from the temporary supply label should be noted for transfer to any specified permanent cable/equipment label – noting in particular the cable conductor cross section, plug fuse rating and serial number.

- The fly leads should be terminated into their associated luminaire or power outlet equipment using suitably sized BICON LSOH Brass A1/A2 compression glands fitted with fully LSOH compliant Seals and shrouds.

8. Fly Lead Installation

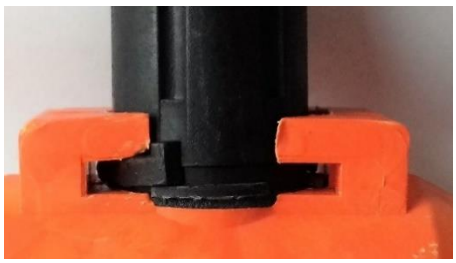
- Normal practice is to 1st install the lighting luminaire equipment complete with trailing fly-lead prior to plugging in the fly lead.

- Fly-lead plugs should not be inserted or removed on load - i.e. the harnesses should always be de-energised before any such activity.

- Only at the point of installing the fly-leads should the transit caps be removed – at no point should the harness outlets be left without either a transit cap or permanent fly-lead or sealing cap.

- Prior to installation of the fly-lead plug into the moulded socket – the installer should check that there is no dirt or foreign objects on either the plug pins, plug moulding or socket moulding. If dirt or foreign objects are found the moulded plug/outlet should be cleaned prior to mating the plug & socket. Note: cleaning can be done with a cable jointing type alcohol wipe - but water based wipes should be avoided.

- The plugs and sockets are mated by 1st aligning the plug keyway & earth pin / socket then firmly pushing home and finally twisting the locking ring until it is secured.
    - The smaller size 54 plug has an external socket mounted seal which requires the plug to fully pushed home so that the seal is squashed, and the locking nut fully engaged.
    - The larger size 60/70 plug has an internal plug mounted seal which requires the plug to be pushed home and the locking nut twisted - so that the locking nut bayonets engage by at least 20mm.

Size 54 Plug Engagement & Locking	Size 60/70 Plug Engagement & Locking
	

- The fly lead cable should be secured with fire resistant cleats / fixings at a frequency in accordance with BS 7671 – 18th Edition Wiring regulations (2018) - onsite guide table D1.
- The fly lead cable should be routed so that any bends are not tighter than the minimum recommended bending radii.

9. On-going inspection & Maintenance

- Under normal conditions the ‘Connecta’ modular harnesses should not need any maintenance.

- Equipment and Luminaire repair is best conducted away from the tunnel location by un-plugging and removing the fly-lead plug - to enable this repair we suggest that spare assemblies with fly-lead and moulded plug are kept available so that replacement can be made without leaving the outlet moulding un-covered. All connections and dis-connections of the moulded plugs should be made with the power feed de-energized.
  At no point should the connector outlets be left without either a plug or temporary/permanent blanking cap in place.

- Plug Removal / Fuse Check Procedure
  - Twist Locking nut anti-clockwise to un-lock – then slide away from socket.
  - Remove Plug from socket.
  - Inspect both - plug & socket contacts.
  - Using Small flat screwdriver unscrew the phase pin (fuse holder) - test fuse.

Removed Plug & Locking Nut	Phase Pin/fuse holder removed
	

- During the life of the installation the user should periodically check the cables and outlets for any external damage – if cables are found to be damaged, they should be immediately sealed with tape prior to requesting suitable repair materials from the Prysmian.