



Global Industrial & Commercial Division



Energy Division



Data Networking Division



Telecom OSP Division



Automotive Division



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Electrical transmission & distribution products



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01

Electrical jointing

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Corrosion of Connectors

Two factors are associated with corrosion:

1. Atmospheric action
2. Galvanic action

For atmospheric action to result in corrosion, there must be moisture and oxygen.

Galvanic action results in corrosion when two dissimilar metals in the electrolytic series, for example, aluminium and copper, are in physical contact. In this case, moisture acts as an electrolyte.

In such an instance, the copper becomes a cathode and receives a positive charge; the aluminium becomes the anode and receives a negative charge.

The resultant current flow attacks the aluminium leaving the copper unharmed.

Both factors described above are influenced by environmental conditions - the chemical attack of airborne pollutants.

This occurs in rural areas to a lesser extent than in urban centres and more so in heavy industry locations such as steelworks, chemical plants, refineries, etc.

The problem of the mechanical jointing of two dissimilar metals in physical contact with each other, such as aluminium and copper, stems from their difference in electrical potential.

The column of metals listed here shows their relative positions in the Electrolytic Series, with the more anodic metals in the higher positions and the more cathodic in the lower.

The extent, or severity, of the corrosive action is proportional to the distance of separation of the metals in the list. i.e. the magnitude of the difference in electrolytic potential of the two metals, aluminium and copper, is quite considerable.

Aluminium to Aluminium Connections

No problem exists in the jointing of these conductors as electrolytic action is nonexistent. Nevertheless, care must be taken to prevent crevice corrosion and to select an aluminium alloy connector body not liable to stress corrosion cracking.

Aluminium to Copper Connections

The best choice is an aluminium bodied connector since it is not subject to the galvanic attack of the more vulnerable element - the aluminium conductor. It is good practice to use contact sealant on the aluminium connector body and brushed into the strands of the aluminium conductor. Wherever possible, install the aluminium conductor above the copper to prevent pitting from the galvanic action of copper salts washing over the aluminium connector and conductor when in a lower position.

Copper to Copper Connections

No problem exists in the jointing of these conductors as electrolytic action is nonexistent.

The Electrolytic Series

ANODIC (Corroded End)

Magnesium

Aluminium

Duralumin

Zinc

Cadmium

Iron

Chromium Iron (active)

Chromium-Nickel-Iron (active)

Soft solder

Tin

Lead

Nickel

Brasses

Bronze

Monel

Copper

Chromium Iron (passive)

Chromium-Nickel-Iron (passive)

Silver solder

Silver

Gold

Platinum

CATHODIC (Protected End)

Electrical Jointing of Aluminium

A particular phenomenon associated with the jointing of aluminium conductors, concerns the oxide film that forms rapidly on the surface of freshly cleaned aluminium exposed to air. This oxide film is an insulator and must be removed with a scratch brush in order to achieve a satisfactory and reliable electrical joint. The problem with aluminium is that the freshly cleaned surface will quickly re-oxidise, hence it is important to coat the surface with a contact sealant.

Contact Sealants

Various sealant formulations have been developed to provide improved electrical and mechanical performance as well as environmental protection to the contact area. The use of sealants is recommended for aluminium to aluminium or aluminium to copper connections. Sealants are also recommended for copper to copper joints which are subject to severe corrosive environments. Non-gritted sealants are recommended for flat connections and as a groove sealant in bolted connectors such as parallel groove clamps. Our gritted sealant is primarily used in compression connectors. The sharp metallic grit particles provide multi-contact current carrying bridges through remaining oxide films to ensure superior electrical conductivity.

Product Name	Description	Recommended Applications
EJC2	A mineral oil based corrosion inhibitor with added fluoride to dissolve aluminium oxide. Drop point 65.6°C	Palm to Palm Joints - Alum to Alum - Alum to Copper
Alvania ALV300	A mineral oil based corrosion inhibitor with added lithium. Drop point 180°C	Bolted Connections - Alum to Alum - Alum to Copper - Copper to Copper Palm to Palm - Copper to Copper
Alminox ALM325G	A mineral oil based corrosion inhibitor with added zinc grit. Drop point 188°C. Provides excellent outdoor weathering protection.	Compression Joints Bolted Connections - Alum to Alum - Alum to Copper

Contact Sealants and Scratch Brushes

EJC2

Recommended for use with flat, aluminium surface to surface bolted joints, such as busbar joints & terminal lugs. EJC2 contains fluoride which, together with scratch brushing, assists in breaking up the oxide film by chemically etching the connecting surfaces to ensure a low resistance joint. Catalogue number **EJC2**, supplied in 225g squeeze tubes.



ALMINOX

Recommended for aluminium to aluminium bolted or compression connections. Alminox contains sharp, conductive zinc granules suspended in a viscous petroleum base. Under pressure these granules make high pressure contact points with the parent metal to effect a sound electrical connection, whilst the base material seals the joint to prevent further corrosion. Catalogue number **ALM325G**, supplied in 325g squeeze tubes.



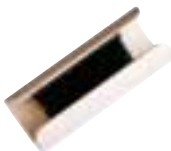
ALV300

Recommended for all bolted connections, such as parallel groove clamps, either aluminium to aluminium, or bi-metal copper to aluminium. When applied immediately after scratch brushing, ALV300 seals the exposed surface to prevent re-oxidation and permanently excludes the future ingress of air and moisture. ALV300 is extremely adhesive, resistant to water and has high temperature resistance to ensure continuous operation under all situations. Catalogue number **ALV300**, supplied in 225g squeeze tubes.



Scratch Brushes

The use of a suitable scratch brush to remove any existing oxide film, dirt or grease from the conductor is essential to ensure a sound electrical connection. Dulmison produces separate brushes for use on aluminium and copper conductors to prevent transference of metal particles.



White brush for use on aluminium.
Cat number: **SB3**



Black brush for use on copper.
Cat number: **SB4**



02

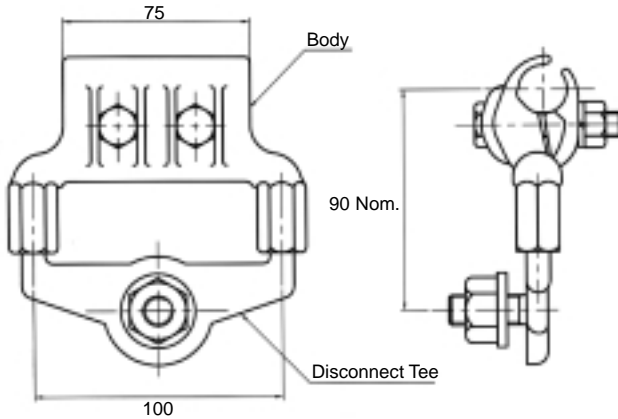


Bolted connectors and terminals

- › Tee Connectors
- › Bail Clamps
- › Service Tee Connectors
- › Service Taps
- › Split Bolt Clamps
- › Parallel Clamps
- › Parallel Groove Clamps
- › Tee Off Connectors
- › Bolted Lugs (Kulugs)

Disconnect Tee Connector

Type ADT5



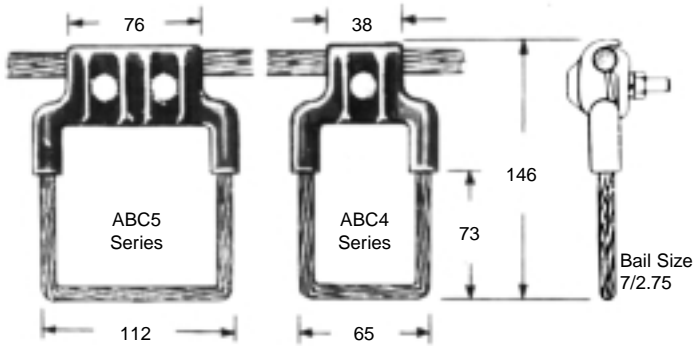
- Function:** ADT connectors provide a convenient means of connecting lugged service conductors to overhead mains conductors.
- Construction:** **Body** - High strength cast aluminium.
Disconnect tee - Tin plated brass with threaded stud and hexagonal nut to take slotted conductor lug.
- Hardware:** **Conductor clamp** - M10 aluminium or stainless steel (Refer table).
Disconnect tee - M12 or M16 tinned (Refer table)
- Features:** Pre-filled with Alminox jointing compound.
Captured hardware permits single tool installation.
- Order details:** Each connector packed in individual plastic bag.



Cat. No.	Conductor Range		Stud Size	Conductor Clamp Hardware	Tin Plated Body	Used on Conductor Type
	Stranding	Overall Dia. mm				
ADT5-1			M16	Stainless Steel	No	Aluminium
ADT5-2	7/2.25		M16	Aluminium	No	Aluminium
ADT5-1P		6.75 to 18.80	M16	Stainless Steel	Yes	Copper / Al
ADT5-2P	19/3.75		M16	Aluminium	Yes	Copper / Al
ADT5112			M12	Stainless Steel	No	Aluminium

Aluminium Bail Clamp

Type ABC



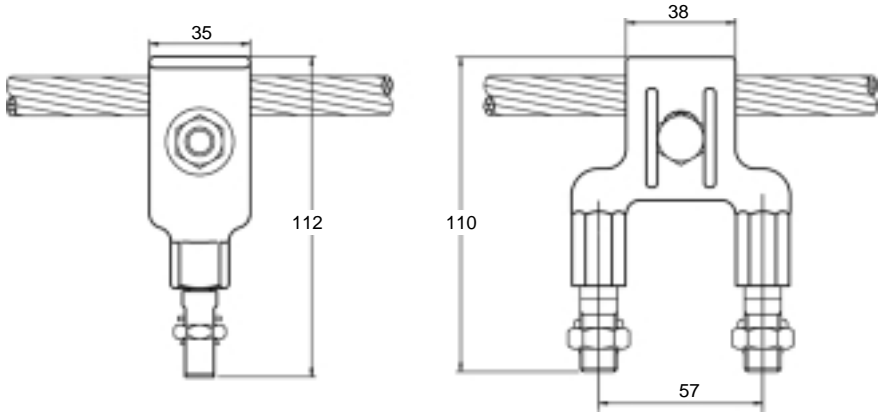
Made from high strength, high conductivity aluminium alloy. The type ABC bail clamp takes a wide range of conductors thus reducing stock. Unique side clamp and generous overlapping clamp body shield the line connection from the weather. Aluminium bolts are captured and permit single spanner installation. Stainless steel hardware is available if required. Supplied pre-filled with Alminox and individually packed in plastic bag.



Cat. No.	Dia. Copper Loop mm	Conductor Range		Weight kg each	Hardware
		Stranding	Overall Dia. mm		
ABC4-1	8.25	7/2.25 to 19/3.75	6.75 to 18.80	0.24	Stainless Steel
ABC4-2	8.25			0.24	Aluminium
ABC5-1	8.25			0.35	Stainless Steel
ABC5-2	8.25			0.35	Aluminium

Service Tee Connectors

Type STC



Cat. No. STC1

Cat. No. STC2

Type STC Tee connectors provide a convenient means of connecting copper service conductors to aluminium overhead mains.

The basic clamp is cast in aluminium and various hardware types are available (refer table). Service conductors are connected to the special tin plated split bolt connector.



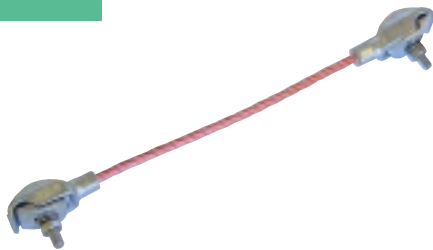
Cat. No.	Conductor Range		Weight kg each	Service Conductor Range	Hardware
	Stranding	Overall Dia. mm			
STC1-1	7/2.25	6.75 to 18.80	0.16	Max. three 7/1.70 (16mm ²) cables	Stainless Steel
STC1-2	to				Aluminium
STC1-3	19/3.75				Galv Steel
STC2-1	7/2.25	6.75 to 18.80	0.24	Max. three 7/1.70 (16mm ²) cables in each leg	Stainless Steel
STC2-2	to				Aluminium
STC2-3	19/3.75				Galv Steel

Bolted Connectors & Terminals

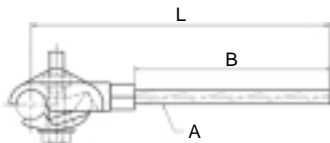
Service Tee Connectors

Type STC - Cont'd

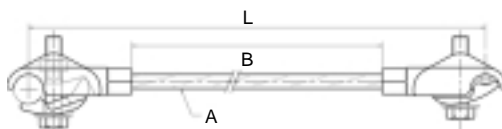
The connector is used with standard line taps when making copper to aluminium service connections.



Cat. No. STC16



Cat. No. STC110 & STC50



Cat. No.	Run Conductor Range	Copper Conductor Stranding A	Appln Length B mm	Total Length L mm	Previous Reference	Mating Line Tap	Hardware
STC16-1	7/2.75 - 19/3.75	7/2.75	125	207	STC1-6	B24	Stainless Steel
STC16-2	7/2.75 - 19/3.75	7/2.75	125	207	STC1-6	B24	Aluminium
STC110-1	7/2.50 - 19/3.75	7/2.75	255	385	STC1-10	B24	Stainless Steel
STC110-2	7/2.50 - 19/3.75	7/2.75	255	385	STC1-10	B24	Aluminium
STC110-3	7/2.50 - 19/3.75	7/2.75	255	385	STC1-10	B24	Galv Steel
STC50-1	19/2.00 - 19/3.75	19/2.00	600	815	-----	B25	Stainless Steel
STC50-2	19/2.00 - 19/3.75	19/2.00	600	815	-----	B25	Aluminium
STC50-3	19/2.00 - 19/3.75	19/2.00	600	815	-----	B25	Galv Steel

Type STC - Cont'd

These clamps are arranged to provide bolted tunnels for service take-off conductors.

Materials: High strength aluminium casting.

Cat. No. STC8050



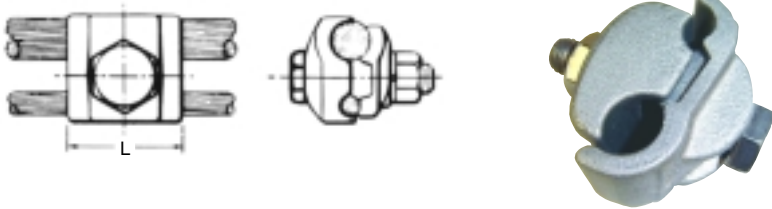
Cat. No. STC50B2



Cat. No.	Run Conductor Range		Weight kg each	Service Cond. Range	Hardware	
	Stranding	Overall Dia.			Clamp	Take Off
STC8050	7/2.50 - 19/3.75	7.5 - 18.80	0.165	Max. two 19/1.35 (25mm ²) cables	Galv Steel	St Steel self cutting
STC50B2	3/2.75 - 19/3.75	5.9 - 18.80	0.273	Max. one 7/3.75 (95mm ²) cable	Galv Steel	Galvanised

Service Tap

Type AC for Aluminium and ACSR Conductors



High strength, high conductivity aluminium alloy, properly proportioned to minimise stress corrosion and deterioration by galvanic action.

Keying tabs on connector body halves prevent mismatching. Hexagon head, high strength bolt provides one wrench installation.

Supplied pre-filled with Alminox joint compound.

Cat. No.	Conductor Range				L mm	Std. Pack	Weight kg each	Hardware
	Run	Overall Dia.	Tap	Overall Dia.				
AC58-1	7/3.00	9.00	7/1.04	3.12	35	10	0.11	Stainless Steel
AC58-2	to	to	to	to				Aluminium
AC58-3	7/4.50	13.50	19/1.78	8.90				Galv Steel
AC75-1	7/4.50	13.50	7/1.75	5.25	44	1	0.23	Stainless Steel
AC75-2	to	to	to	to				Aluminium
AC75-3	19/3.75	18.80	19/2.14	10.70				Galv Steel

Split Bolt Clamp

Type B

Manufactured to E.S.A.A. specification from hard drawn brass. Accommodates two maximum conductors as specified in table below. Standard finish is natural brass. Electro-tinned finish can be supplied when specified. Minimum order quantity is standard pack.



Cat. No.		Max. Conductor		Width of slot	Std. Pack	Std. Pack Weight kg	Mating Plastic Shroud Cat. No.
Natural Brass	Electro Tinned	Area mm ²	Overall Dia.				
B22	B22T	16	5.10	5.30	100	3.00	B22SHROUD
B24	B24T	35	7.65	8.30	50	2.60	
B25	B25T	70	10.70	10.90	25	2.50	
B26	B26T	95	12.60	12.90	20	2.00	
B28	B28T	185	17.64	18.50	5	1.30	



Bolted Connectors & Terminals

Parallel Clamp

Type AUP - for aluminium only

Features: Massive design and large space provide maximum protection against overload conditions. Spacing of U-bolts, tapered bell mouths and modified V-groove minimise cold flow, eliminate cable chafing and produce wiping action on conductors.

Materials: Body - aluminium alloy casting;

Hardware: Stainless steel.



Cat. No.	Conductor Range				Weight each kg
	Run		Tap		
	Stranding	Overall Dia.	Stranding	Overall Dia.	
AUP58	7/2.25 to 7/4.50	6.75 to 13.50	7/2.25 to 7/4.50	6.75 to 13.50	0.42
AUP75	7/3.75 to 19/3.75	11.30 to 18.80	7/3.75 to 19/3.75	11.30 to 18.80	0.84
AUP112	19/3.75 to 61/3.25	18.80 to 29.30	7/3.75 to 37/3.00	11.30 to 21.00	1.22
AUP1122	19/3.75 to 61/3.25	18.80 to 29.30	19/3.75 to 61/3.25	18.80 to 29.30	1.90

Parallel Clamp

Type KA

A rugged connector for heavy duty service connections. Compact construction permits quick and easy insertion of conductors.

Materials: High strength copper content alloy. Neoprene rings capture bolts during installation thus preventing their loss.

Hardware: High strength, corrosion resistant stainless steel bolts, nuts and washers.



Cat. No.	Conductor Range				Weight each kg
	Run		Tap		
	Area mm ²	Overall Dia.	Area mm ²	Overall Dia.	
KA1	25 to 50	6.42 to 8.90	4 to 50	2.55 to 8.90	0.11
KA2	50 to 70	8.90 to 10.70	4 to 70	2.55 to 10.70	0.14
KA3	70 to 95	10.70 to 12.60	4 to 95	2.55 to 12.60	0.25
KA4	120 to 150	14.21 to 15.75	16 to 150	5.10 to 15.75	0.48
KA4C	70 to 185	10.70 to 17.64	35 to 185	7.65 to 17.64	0.51
KA5	185 to 240	17.64 to 20.25	16 to 240	5.10 to 20.25	0.65

Bolted Connectors & Terminals

Parallel Groove Clamps - Copper



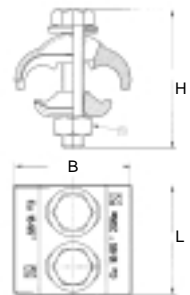
Material is forged copper for copper to copper connection throughout the conductor range. The clamps have serrated transverse grooves for maximum conductor contact, use copper bolts and utilise belleville washers to prevent thermal ratcheting under cyclic loads. The clamps are coated with an oxide inhibitor.

Cat. No.	Replaces	Type	Bolt Torque	Conductor Range		Dimensions mm			No./Size of Bolts	Wt kg
				mm ²	O.D.	L	B	H		
3029-FS	PGC10071 PG06 DPG12 PG0650K PG06702K	F / T	20Nm	6 to 70	2.7 to 10.5	35	35	42	2 x M8	0.19
3030-FS	PGC10092 DPG15 PG16952K	F / T	20Nm	16 to 95	5.1 to 12.5	40	42	50	2 x M8	0.26
3032-FS	PGC16152 DPG25	F / T	30Nm	16 to 150	5.1 to 15.7	50	52	56	2 x M10	0.43
DPG40	N/A	E / N	40Nm	150 to 240	15.7 to 20.3	71	65	70	2 x M12	0.90
DPG60	N/A	E / N	40Nm	300 to 400	22.6 to 26.7	105	75	70	3 x M12	1.67

Type: F = Forged body; T = Transverse groove; E = Extruded body; N = No groove.

Product Selection Matrix

Copper	Area of Cable - Copper - mm ²													
	6	10	16	25	35	50	70	95	120	150	185	240	300	400
6														
10														
16														
25														
35														
50														
70														
95														
120														
150														
185														
240														
300														
400														



Bolted Connectors & Terminals

Parallel Groove Clamps - Aluminium



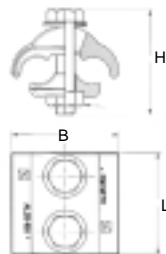
Material is forged aluminium for aluminium to aluminium connection throughout the conductor range. The clamps have serrated transverse grooves for maximum conductor contact, use galvanised steel bolts and utilise belleville washers to prevent thermal ratcheting under cyclic loads. The clamps are coated with an oxide inhibitor.

Cat. No.	Replaces	Type	Bolt Torque	Conductor Range		Dimensions mm			No./Size of Bolts	Wt kg
				mm ²	O.D.	L	B	H		
3929-FS	PGA16072	F / T	22 Nm	16 to 70	5.1 to 10.5	40	36	40	2 x M8	0.09
3931-FS	PGA16122 AA161202	F / T	22 Nm	16 to 120	5.1 to 14.0	50	45	50	2 x M8	0.14
3932-FS	PGA25152	F / T	40 Nm	25 to 150	6.3 to 15.7	55	50	50	2 x M10	0.21
3594-FS	AA352402	E / P	40 Nm	35 to 240	7.5 to 20.2	70	65	76	2 x M10	0.39
PGA35303	AA351853**	F / T	46 Nm	35 to 300	7.5 to 22.5	105	65	75	3 x M10	0.46
	PGA35303									
	AA953003									

Type: F = Forged body; T = Transverse groove; E = Extruded body; N = No groove; P = Parallel
 ** 2 bolt version available - Cat. No. 3553-FS

Product Selection Matrix

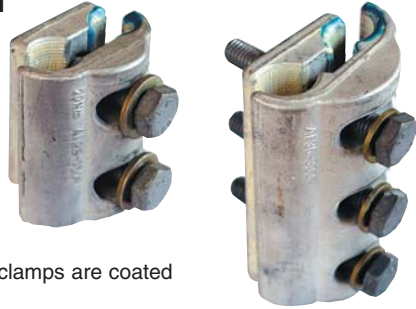
Alum	Area of Cable - Aluminium - mm ²													
	6	10	16	25	35	50	70	95	120	150	185	240	300	400
6														
10														
16														
25														
35														
50														
70														
95														
120														
150														
185														
240														
300														
400														



Bolted Connectors & Terminals

Parallel Groove Clamps - Bimetal

Material is forged aluminium clamp with a friction welded copper insert clearly marked in blue for making copper conductor connections. The clamps have serrated transverse grooves for maximum conductor contact, use galvanised steel bolts and utilise belleville washers to prevent thermal ratcheting under cyclic loads. The clamps are coated with an oxide inhibitor.

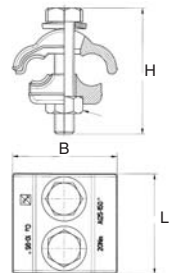


Cat. No.	Replaces	Type	Bolt Torque	Conductor Range				Dimensions			No./Size of Bolts	Wt kg
				Aluminium Run		Copper Tap		mm				
				mm ²	O.D.	mm ²	O.D.	L	B	H		
3920	PGB10121-015	F / T	29 Nm	16 - 95	5.1 - 12.5	1.5 - 10	1.4 - 4.1	30	43	45	1 x M8	0.18
3919-FS	PGB10121	F / T	29 Nm	16 - 70	5.1 - 11.7	6 - 50	2.75 - 9.0	30	43	45	1 x M8	0.18
3909-FS	PGB16072	F / T	22 Nm	16 - 70	5.1 - 11.7	6 - 50	2.75 - 9.0	40	42	45	2 x M8	0.11
3911-FS	PGB25152	F / T	22 Nm	25 - 150	6.3 - 15.70	10 - 95	5.10 - 12.50	40	45	50	2 x M8	0.15
3913-FS	PGB35183	F / T	25 Nm	35 - 185	7.50 - 17.50	35 - 185	7.50 - 17.50	96	57	66	3 x M10	0.44
3915-FS	PGB35303	F / T	25 Nm	35 - 300	7.50 - 22.50	35 - 240	7.50 - 20.20	105	65	76	3 x M10	0.68

Type: F = Forged body; T = Transverse groove

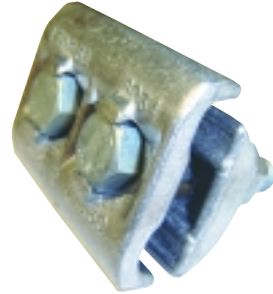
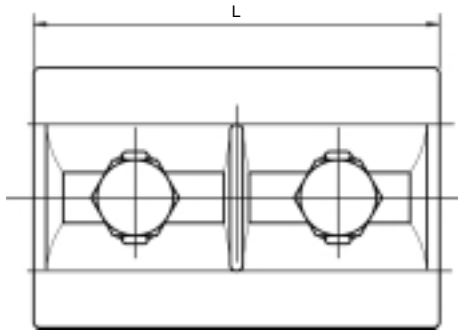
Product Selection Matrix

Bi-metal		Area of Cable - Aluminium - mm ²														
		1.5	6	10	16	25	35	50	70	95	120	150	185	240	300	400
Area of Cable - Copper mm ²	1.5															
	6															
	10															
	16															
	25															
	35															
	50															
	70															
	95															
	120															
	150															
185																
240																
300																
400																



Parallel Groove Clamps

Type LTDP with Parallel Sides



A universal aluminium line tap for equal and unequal combinations of aluminium and ACSR conductors.

Materials: Die cast aluminium

Cat. No.	Conductor Range				L mm	Hardware
	Run		Tap			
	Stranding	Overall Dia.	Stranding	Overall Dia.		
LTDP58-2	7/1.75 to 7/4.50	5.25 to 13.50	7/1.75 to 7/4.50	5.25 to 13.50	70	Aluminium
LTDP58-3	7/1.75 to 7/4.50	5.25 to 13.50	7/1.75 to 7/4.50	5.25 to 13.50	70	Galv Steel
LTDP75-2	7/2.50 to 19/3.75	7.50 to 19.00	7/2.50 to 19/3.75	7.50 to 19.00	95	Aluminium
LTDP75-3	7/2.50 to 19/3.75	7.50 to 19.00	7/2.50 to 19/3.75	7.50 to 19.00	95	Galv Steel

Notes: For aluminium to copper connections add 'P' for plating e.g. LTDP75-2P.
Not recommended for polluted or coastal locations.

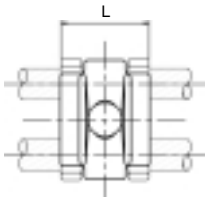
Bolted Connectors & Terminals

Parallel Groove Clamps

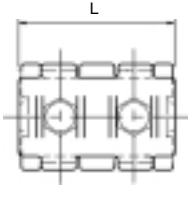
Type LT, LTD, LTX with Interlocking Fingers



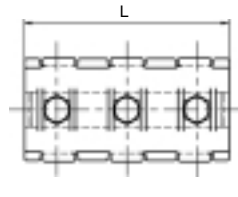
Type LT



Type LTD



Type LTX



A universal aluminium line tap for equal and unequal combinations of aluminium and ACSR conductors. The clamp has interlocking fingers for maximum conductor contact.

Materials: Die cast aluminium

Cat. No.	Conductor Range				Fig. No.	L mm	Hardware
	Run		Tap				
	Stranding	Overall Dia.	Stranding	Overall Dia.			
LT43-1	7/1.70 - 7/3.75	5.10 - 11.30	7/1.70 - 7/3.75	5.10 - 11.30	1	35	St Steel
LT43-2	7/1.70 - 7/3.75	5.10 - 11.30	7/1.70 - 7/3.75	5.10 - 11.30	1	35	Aluminium
LT43-3	7/1.70 - 7/3.75	5.10 - 11.30	7/1.70 - 7/3.75	5.10 - 11.30	1	35	Galv Steel
LT75-1	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	1	48	St Steel
LT75-2	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	1	48	Aluminium
LT75-3	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	1	48	Galv Steel
LTD58-1	7/1.75 - 7/4.50	5.25 - 13.50	7/1.75 - 7/4.50	5.25 - 13.50	2	70	St Steel
LTD58-2	7/1.75 - 7/4.50	5.25 - 13.50	7/1.75 - 7/4.50	5.25 - 13.50	2	70	Aluminium
LTD58-3	7/1.75 - 7/4.50	5.25 - 13.50	7/1.75 - 7/4.50	5.25 - 13.50	2	70	Galv Steel
LTD75-1	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	2	95	St Steel
LTD75-2	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	2	95	Aluminium
LTD75-3	19/1.78 - 19/3.75	8.90 - 18.80	19/1.78 - 19/3.75	8.90 - 18.80	2	95	Galv Steel
LTX75-1	7/3.00 - 19/3.75	9.00 - 18.80	7/3.00 - 19/3.75	9.00 - 18.80	3	110	St Steel
LTX75-2	7/3.00 - 19/3.75	9.00 - 18.80	7/3.00 - 19/3.75	9.00 - 18.80	3	110	Aluminium
LTX75-3	7/3.00 - 19/3.75	9.00 - 18.80	7/3.00 - 19/3.75	9.00 - 18.80	3	110	Galv Steel
LTX126-1	19/3.25 - 61/3.75	16.30 - 33.80	19/3.25 - 61/3.75	16.30 - 33.80	3	191	St Steel
LTX126-3	19/3.25 - 61/3.75	16.30 - 33.80	19/3.25 - 61/3.75	16.30 - 33.80	3	191	Galv Steel

Notes: For aluminium to copper connections add 'P' for plating e.g. LTD75-2P.
Not recommended for polluted or coastal locations.

Bolted Connectors & Terminals

Easitap - Tee Off Connectors

Type V

Type V-ET

An extremely versatile three-piece connector for all combinations of mains and tee off conductors. Typical connections include: Parallel tap; Tee connections; Cross connections and End-to-end connections.

Materials: Current carrying centre plate and outer planes are high strength copper alloy, Type V-ET are electro tinned.

Hardware: Stainless steel
All edges rounded for easy insertion of conductor.



Typical Connections



Type V Cat. No.	Type VET Cat. No.	Fig. No.	Metric Conductor Range								Dimensions mm			
			Run				Tap							
			Area mm ²		O.D.		Area mm ²		O.D.		B	H	J	W
V1B	VET1	1	16	35	5.10	7.65	16	35	5.1	7.65	35	40	8	37
V2B	VET2	1	50	95	8.90	12.60	16	35	5.1	7.65	37	49	8	41
V3B	VET3	1	50	95	8.90	12.60	50	95	8.9	12.46	46	56	10	46
V4B	VET4	1	120	240	14.21	20.25	16	35	5.1	7.65	37	56	8	49
V5B	VET5	1	120	240	14.21	20.25	50	95	8.9	12.46	43	57	10	46
V6B	VET6	2	120	240	14.21	20.25	120	240	14.21	20.25	52	70	10	52
V7B	VET7	1	240	500	20.25	28.80	16	35	5.1	7.65	37	62	8	59
V8B	VET8	1	240	500	20.25	28.80	50	95	8.9	12.46	46	73	10	62
V9B	VET9	2	240	500	20.25	28.80	120	240	14.21	20.25	52	78	10	62
V10B	VET10	2	240	500	20.25	28.80	240	500	20.25	28.80	62	87	10	62

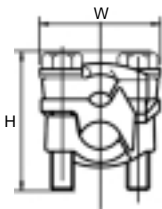


Fig. 1

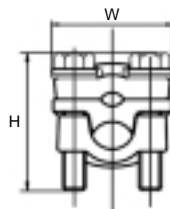
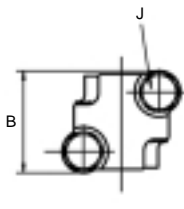
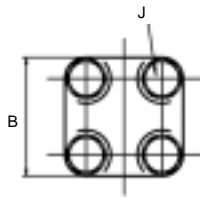


Fig. 2



Bolted Connectors & Terminals

Kulugs

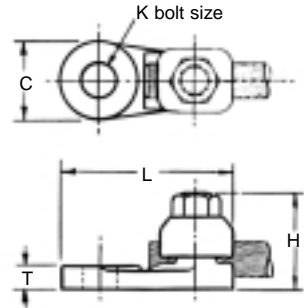
Type Q

For use wherever conductors are terminated. Easy installation - only a single nut to tighten. High mechanical strength, simple to disconnect, reusable.



Type Q

Material: Brass clamp body & nut

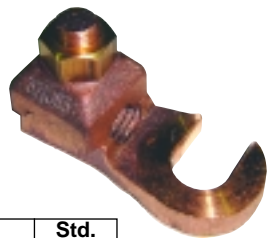


Cat. No.	Old Ref.	Conductor Range		Dimensions mm					Std. Pack
		Area mm ²	Overall Dia. mm	C	H	K	L	T	
H1802	Q2	10 - 16	4.05 - 5.10	19	25	M8	41	6	10
H1803	Q3	25 - 35	6.75 - 7.65	25	27	M10	53	5.5	10
H1804	Q4	50 - 70	8.90 - 10.70	32	34	M12	60	6.4	10
H1805	Q5	70 - 95	10.70 - 12.60	32	38	M12	65	7.9	10
H1806A	Q6	120	14.21 - 15.75	38	45	M16	76	8.7	1
H1806	Q6	150 - 185	15.75 - 17.64	38	45	M16	76	8.7	1
H1807	Q7	185 - 240	17.64 - 20.25	44	53	M20	86	10.3	1
H1808	Q8	300 - 400	22.68 - 25.65	51	63	M20	98	12.7	1

Slotted Kulugs

Type SQ

Material: Brass clamp body & nut



Cat. No.	Conductor Range		Dimensions mm					Std. Pack
	Area mm ²	Overall Dia. mm	C	H	Slot	L	T	
SQ6	120 - 150	14.21 - 15.75	37	47	M16	73	12	25



03

Compression joints and lugs

Mid Span Joints

- > Full Tension
- > Non Tension

Compression Lugs

- > Jumper Terminal
- > Single and Two Hole
- > 4 Core Sector
- > Compression Dies
- > Order/Inquiry Information Sheet

Compression Joints & Lugs

Compression Mid Span Joints - Full Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type – AAC

AAC Full Tension Midspan Joints, are manufactured from an Aluminium extrusion, equivalent in strength to the conductor onto which the fitting is applied.

Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

Cat. No.	AAC Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L	
HM603	Jupiter	7/2.25	6.75	11.0	240	38-110AL
HM604	Leo	7/2.50	7.50	14.0	240	38-140AL
HM606	Libra	7/3.00	9.00	14.0	280	38-140AL
HM608	Mars	7/3.75	11.25	18.0	320	38-180AL
HM611	Mercury	7/4.50	13.50	22.0	360	38-220AL
HM612	Moon	7/4.75	14.25	22.0	360	38-220AL
HM615	Neptune	19/3.25	16.25	28.5	400	40-285AL
HM616	Pluto	19/3.75	18.75	28.5	440	40-285AL
HM618	Saturn	37/3.00	21.00	34.5	480	40-345AL
HM620	Taurus	19/4.75	23.75	40.0	560	40-400AL
HM621	Triton	37/3.75	26.25	40.0	560	40-400AL
HM623	Uranus	61/3.25	29.25	44.5	640	40-445AL
HM624	Venus	61/3.75	33.75	47.5	780	40-475AL

Compression Joints & Lugs

Compression Mid Span Joints - Full Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type AAAC/6201 & AAAC/1120

AAAC Full Tension Compression Midspan Joints, are manufactured from an Aluminium extrusion, equivalent in strength to the conductor onto which the fitting is applied.

Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

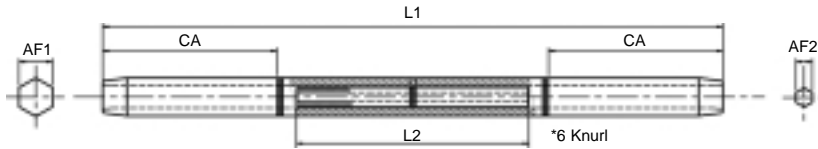
Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

Cat. No.	AAAC/6201 Code Name	AAAC/1120 Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
					A/F	L	
HM702	Diamond	Chlorine	7/2.50	7.50	14.0	240	38-140AL
HM703	Emerald	Fluorine	7/3.00	9.00	14.0	280	38-140AL
HM704	Garnet	Helium	7/3.75	11.25	18.0	320	38-180AL
HM705	Jade	Hydrogen	7/4.50	13.50	22.0	360	38-220AL
HM706	Jasper	Iodine	7/4.75	14.25	22.0	360	38-220AL
HM707	Opal	Krypton	19/3.25	16.25	28.5	400	40-285AL
HM708	Pearl	Neon	19/3.75	18.75	30.0	440	40-300AL
HM709	Ruby	Nitrogen	37/3.00	21.00	34.5	480	40-345AL
HM710	Rutile	Oxygen	19/4.75	23.75	40.0	560	40-400AL
HM711	Sapphire	Phosphorous	37/3.75	26.25	40.0	560	40-400AL
HM712	Spinel	Selenium	61/3.25	29.25	44.5	640	40-445AL
HM713	Topaz	Sulphur	61/3.75	33.75	47.5	780	40-475AL

Compression Joints & Lugs

Compression Mid Span Joints - Full Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type – ACSR

ACSR Full Tension Compression Midspan Joints, are manufactured from an Aluminium outer extrusion, and an inner steel tubular core. The two piece design ensures a design strength equivalent to the conductor onto which the fitting is applied.

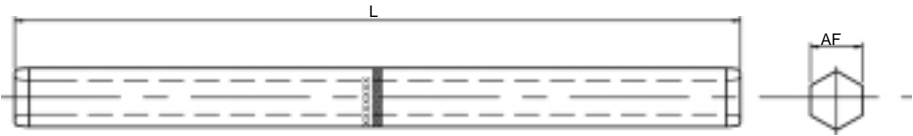
Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

ACSR		Conductor Stranding	Nom. Overall Cond. Dia.	Aluminium				Steel		
Cat. No.	Code Name			Dimensions						
				A/F1	Die	L1 Nom.	CA	A/F2	Die	L2 Nom.
HM507	Almond	6/1/2.50	7.50	14.0	38-140AL	400	100	6.8	38-68ST14	160
HM512	Apple	6/1/3.00	9.00	14.0	38-140AL	400	100	6.8	38-68ST14	160
HM516	Banana	6/1/3.75	11.25	18.0	38-180AL	440	120	9.5	38-95ST	160
HM521	Cherry	6/4.75+7/1.60	14.30	22.0	38-220AL	480	140	9.5	38-95ST	160
HM525	Grape	30/7/2.50	17.50	28.5	40-285AL	600	180	16.0	38-160ST	200
HM530	Lemon	30/7/3.00	21.00	34.5	40-345AL	640	180	17.0	40-170ST	240
HM532	Lime	30/7/3.50	24.50	40.0	40-400AL	680	200	19.0	40-190ST	240
HM535	Mango	54/7/3.00	27.00	40.0	40-400AL	720	220	17.0	40-170ST	240
HM536	Orange	54/7/3.25	29.25	44.5	40-445AL	720	220	19.0	40-190ST	240
HM538	Olive	54/7/3.50	31.50	47.5	40-475AL	760	240	19.0	40-190ST	240

Compression Mid Span Joints - Non Tension

for Hexagonal compression Dies in accordance with AS1154



Conductor type – AAC

Non Tension Compression Mid Span Joints are manufactured from an Aluminium extrusion.

As these joints are installed at low tension values, one fitting can be used for all cable types of the same size (OD).

Cat. No.	AAC Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L	
HN603	Jupiter	7/2.25	6.75	11.0	160	38-110AL
HN604	Leo	7/2.50	7.50	14.0	180	38-140AL
HN606	Libra	7/3.00	9.00	14.0	180	38-140AL
HN608	Mars	7/3.75	11.25	18.0	220	38-180AL
HN611	Mercury	7/4.50	13.50	22.0	240	38-220AL
HN612	Moon	7/4.75	14.25	22.0	260	38-220AL
HN615	Neptune	19/3.25	16.25	28.5	260	40-285AL
HN616	Pluto	19/3.75	18.75	28.5	260	40-285AL
HN618	Saturn	37/3.00	21.00	34.5	280	40-345AL
HN620	Taurus	19/4.75	23.75	40.0	280	40-400AL
HN621	Triton	37/3.75	26.25	40.0	300	40-400AL
HN623	Uranus	61/3.25	29.25	44.5	320	40-445AL
HN624	Venus	61/3.75	33.75	47.5	380	40-475AL

Compression Joints & Lugs

Compression Mid Span Joints - Non Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type - AAAC/6201 & AAAC/1120

Cat. No.	AAAC/6201 Code Name	AAAC/1120 Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
					A/F	L	
HN604	Diamond	Chlorine	7/2.50	7.50	14.0	180	38-140AL
HN606	Emerald	Fluorine	7/3.00	9.00	14.0	180	38-140AL
HN608	Garnet	Helium	7/3.75	11.25	18.0	220	38-180AL
HN611	Jade	Hydrogen	7/4.50	13.50	22.0	240	38-220AL
HN612	Jasper	Iodine	7/4.75	14.25	22.0	260	38-220AL
HN615	Opal	Krypton	19/3.25	16.25	28.5	260	40-285AL
HN616	Pearl	Neon	19/3.75	18.75	28.5	260	40-285AL
HN618	Ruby	Nitrogen	37/3.00	21.00	34.5	280	40-345AL
HN620	Rutile	Oxygen	19/4.75	23.75	40.0	280	40-400AL
HN621	Sapphire	Phosphorous	37/3.75	26.25	40.0	300	40-400AL
HN623	Spinel	Selenium	61/3.25	29.25	44.5	320	40-445AL
HN624	Topaz	Sulphur	61/3.75	33.75	47.5	380	40-475AL

Conductor type - ACSR

Cat. No.	ACSR Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L Nom.	
HN604	Almond	6/1/2.50	7.50	14.0	180	38-140AL
HN606	Apple	6/1/3.00	9.00	14.0	180	38-140AL
HN608	Banana	6/1/3.75	11.25	18.0	220	38-180AL
HN521	Cherry	6/4.75+7/1.60	14.30	22.0	260	38-220AL
HN634	Grape	30/7/2.50	17.50	28.5	260	40-285AL
HN618	Lemon	30/7/3.00	21.00	34.5	280	40-345AL
HN532	Lime	30/7/3.50	24.50	40.0	300	40-400AL
HN631	Mango	54/7/3.00	27.00	40.0	320	40-400AL
HN623	Orange	54/7/3.25	29.25	44.5	320	40-445AL
HN635	Olive	54/7/3.50	31.50	47.5	350	40-475AL

Compression Joints & Lugs

Compression Jumper Lugs

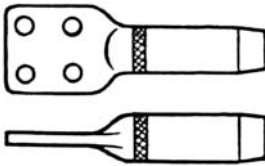
Type HL for AAC, AAAC & ACSR Conductors

Manufactured to Australian Standard AS 1154 (with palms to AS 2395)

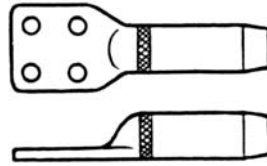
Material: High electrical conductivity grade aluminium alloy with terminal palms produced by forging or welding process, enabling required palm types to meet Australian Standard &/or customer requirements, irrespective of the size of the barrel section.

Enquiries and orders should specify the following:

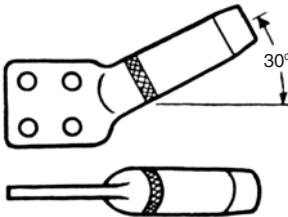
- a. Conductor Code - as per table on page 3-9
- b. Hole details - number of holes, diameter and spacing
- c. Bend details - palm angle and orientation
- d. Preferred standard palm orientations & configurations



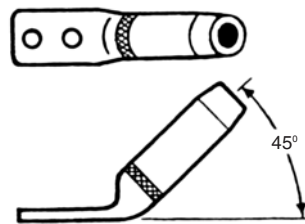
Centre Palm



Offset Palm



30° Palm bent on edge



45° Palm bent on flat

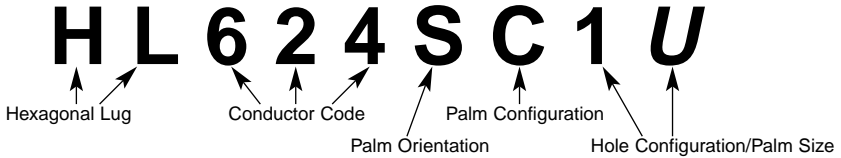
Refer Information Sheet on page 14

Compression Joints & Lugs

Compression Jumper Lugs

Type HL for AAC, AAAC & ACSR Conductors

Nomenclature for lug part numbers



Character

1) *H*

2) *L*

3) Conductor Code — { The preferred code for use is the AAC over the AAAC or ACSR codes.
 If the lug is required for an ACSR or AAAC conductor and a suitable AAC design is unavailable, only then use the ACSR or AAAC code.

4) Palm Orientation: *S* "S"traight — (Only used in conjunction with the below "C" or "O" palm configuration)
3 30°
4 45°
6 60°
9 90°
 (Only used in conjunction with the below "E" or "F" palm configuration)

5) Palm Configuration: *E* "E"dge Bent — (Only centre squashed. Only used in conjunction with the above angled lugs)
F "F"lat Bent
C Straight "C"entre — (Only used in conjunction with above "S" palm orientation for straight lugs)
O Straight "O"ffset

6/7) Hole code: *1* 1 x 14mm hole palm 32±3mm wide x 35mm min long x 6mm min thick undrilled palm per type 1 above.
1U
2 1 x 14mm hole palm 40±3mm wide x 45mm min long x 6mm min thick undrilled palm per type 2 above.
2U
3 2 x 14mm hole 50mm crs palm 40±3mm wide x 105mm min long x 12mm min thick undrilled palm per type 3 above.
3U
4 2 x 14mm hole 50mm crs palm 50±5mm wide x 105mm min long x 12mm min thick undrilled palm per type 4 above.
4U
5 4 x 14mm hole 50mm crs palm 100±5mm wide x 105mm min long x 12mm min thick undrilled palm per type 5 above.
5U
6 2 x 14mm hole 50mm crs palm 46±1mm wide x 105mm min long x 12mm min thick undrilled palm per type 6 above.
6U
7 2 x 18mm hole 60mm crs palm 66±1mm wide x 135mm min long x 20mm min thick undrilled palm per type 7 above.
7U
8 4 x 18mm hole 60mm crs palm 130±5mm wide x 135mm min long x 20mm min thick undrilled palm per type 8 above.
8U
9 2 x 18mm hole 60mm crs palm 56±1mm wide x 135mm min long x 20mm min thick undrilled palm per type 9 above.
9U
X Non standard palm or hole configuration
XU undrilled palm per type X above.

8) Variations: If variations on the standard compression lugs are required, please contact Dulmison.

Compression Joints & Lugs

Compression Jumper Lugs

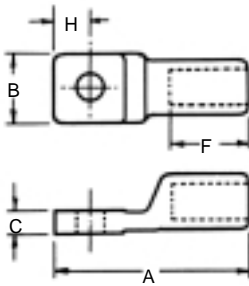
Type HL for AAC, AAAC & ACSR Conductors

Cond. Code	AAC & AAAC Conductors	Conductor Stranding	ACSR Conductors	Conductor Stranding	Conductor Dia. mm	Dimensions mm			Die Cat. No.
						A/F	CA	Std Bolt	
603	Jupiter Amethyst Boron	7/2.25			6.75	11.0	60	2 x M10	38-110AL
604	Leo Diamond Chlorine	7/2.50	Almond	6/1/2.50	7.50	14.0	60	2 x M10	38-140AL
605	Libra Emerald Fluorine	7/3.00	Apple	6/1/3.00	9.00	14.0	70	2 x M10	38-140AL
608	Mars Garnet Helium	7/3.75	Banana	6/1/3.75	11.25	18.0	80	2 x M10	38-180AL
611	Mercury Jade Hydrogen	7/4.50			13.50	22.0	80	2 x M12	38-220AL
612	Moon Jasper Iodine	7/4.75	Cherry	6/4.75+7/1.60	14.30	22.0	80	2 x M12	38-220AL
615	Neptune Opal Krypton	19/3.25			16.25	28.5	80	2 x M12	40-285AL
525			Grape	30/7/2.50	17.50	28.5	85	2 x M12	40-285AL
616	Pluto Pearl Neon	19/3.75			18.75	28.5 30.0 30.0	90	2 x M12	40-285AL 40-300AL 40-300AL
618	Saturn Ruby Nitrogen	37/3.00	Lemon	30/7/3.00	21.00	34.5	90	2 x M12	40-345AL
620	Taurus Rutile Oxygen	19/4.75			23.75	40.0	100	2 x M12	40-400AL
532			Lime	30/7/3.50	24.50	40.0	100	2 x M12	40-400AL
621	Triton Sapphire Phosphorus	37/3.75			26.25	40.0	100	4 x M12	40-400AL
535			Mango	54/7/3.00	27.00	40.0	100	4 x M12	40-400AL
623	Uranus Spinel Selenium	61/3.25	Orange	54/7/3.25	29.30	44.5	110	4 x M12	40-445AL
538			Olive	54/7/3.50	31.50	47.5	110	4 x M12	40-475AL
624	Venus Topaz Sulphur	61/3.75	Paw Paw	54/3.75+19/2.25	33.80	47.5	120	4 x M12	40-475AL

Compression Joints & Lugs

Aluminium Compression Lug

One hole palm - forged



All lugs are partly filled with oxide inhibitor and sealed with a plastic plug.

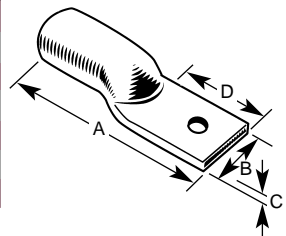
Cat. No.	Conductor Size mm ²	Stud Size	Dimensions mm					Hex Die Cat. No.	No. Of Crimps
			A	B	C	F	H		
H15114	25	10	65	22	5	32	10.5	38-90AL	1
H15119	35	10							1
H15124	50	10	73	26	8	32	14	38-132AL	1
H15129	70	10							1
H15134	95	10	80	30	10	32	15	38-173AL	1
H15138	120	10						40-172AL	1
H15142	150	10	90	36	11	30	18	38-220AL	1
H15147	185	12						40-220AL	1
H15153	240	12	115	46	12	41	25	38-284AL	2
H15159	300	12						40-283AL	1

NOTE: Blank palms are also available.

Terminal Lugs - Type SL

- Extruded aluminium tube • Pre-filled with jointing compound
- Designed for compression by hexagonal or indent type tools.

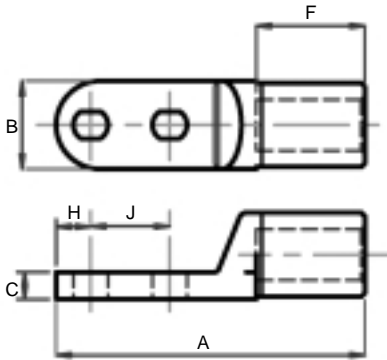
Cat. No.	Conductor Range O.D.	Stud Size	Dimensions mm			
			A	B	C	D
SL36	6 - 8	M10	81.0	22.2	7.4	38.1
SL44	8 - 10	M10	90.0	27.0	9.0	38.1
SL50	10 - 12	M12	92.1	27.6	7.9	38.1
SL58	12 - 13.5	M12	101.6	31.8	7.5	38.1
SL61	13 - 14.5	M12	104.8	34.9	9.9	38.1
SL68	14 - 16	M12	131.5	34.9	8.4	38.1
SL80	16.5 - 19.5	M12	125.4	41.3	9.9	38.1



Compression Joints & Lugs

Aluminium Compression Lug

Two hole palm



Die cast in high electrical conductivity grade aluminium. Barrel partly filled with oxide inhibitor and sealed with a plastic plug.

Cat. No.	Conductor Size mm ²	Stud Size	Dimensions mm						Hex Die Cat. No.
			A	B	C	F	H	J	
AHC095M2	95	M10	122	32	9	43	14	31	38-173AL
AHC120M2	120	M10	122	32	9	43	14	32	38-173AL
AHC150M2	150	M10	118	37	10	33	15	32	38-220AL
AHC240M2	240	M10	159	38	11	69	16	32	38-284AL
AHC300M2	300	M10	159	38	11	69	16	32	40-283AL

Compression Joints & Lugs

4 Core Sector Aluminium Compression Lug

Type AHCS



The Dulmison 4 core sector lug is for use on stranded and solid sector cables, and compacted round conductors. The lug design offers many advantages, especially when working in confined spaces such as URD turrets, pits or compact switchgear.



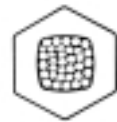
Dulmison 4 core sector lugs allow 90° sector shaped cable to be inserted in any of the four possible orientations. The assembly then requires a twist of no more than 45° for proper alignment. With conventional sector lugs, a twist of up to 180° may be required and this is often difficult to achieve in a confined space.

The lugs are compressed onto the cables using standard hexagonal dies ensuring that the barrel of the lug and the cable sector are properly formed together. Comprehensive tests have been performed to ensure that optimum electrical contact and mechanical properties have been achieved.

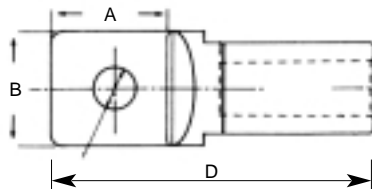
The lug features a unique square shape inside the barrel to accommodate solid sector shapes, and eliminates the need for pre-rounding of stranded sectors.



Before compression



After compression



Cat. No.	Conductor Size mm ²	Dimensions mm			Hole Dia.	Hex Die Cat. No.
		A	B	D		
AHCS1212	120	35	32	93	13.5	38-200AL
AHCS1812	185	38	38	105	14	38-250AL
AHCS240	240	38	34	121	13.5	38-284AL

Hexagonal Compression Dies

For Aluminium Crimp Lugs, Sleeves & Bi-metal Lugs

Cable Size mm ²	Die Cat. No.	Crimp Dimensions		Hydraulic Tool Cat. No.
		A/F	W	
25 35	38-90AL	9.00	25	12 Tonne #38A
50 70	38-132AL	13.20	25	
95 120	38-173AL	17.30	22	
150 185	38-220AL	22.00	18	
240 300	40-285AL	28.40	18	
400 500 630	40-390AL 40-432A	39.00 43.20	50 50	

Other tools are available please refer Dulmison or Utilux catalogue.

Compression Joints & Lugs

Order/Inquiry Information Sheet

All to be supplied to AS1154 and AS2395 standard dimensions unless specified otherwise

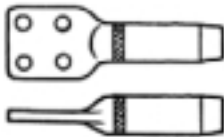
Conductor Stranding
 Conductor Diameter
 Conductor Code Name
 Quantity Required

Please copy this sheet, fill in the relevant details & forward to the Dulmison sales office in your region.

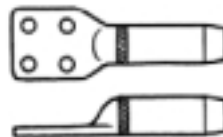
Company:.....
 Contact Name:.....
 Phone No:.....
 Fax/email:.....

Jumper Terminals (Clearly circle or mark as appropriate)

Palm Style



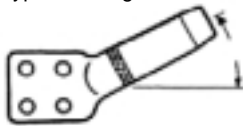
Centre (C)



Offset (O)

(Palm angle for offset = 0°)

Palm Type and Angle



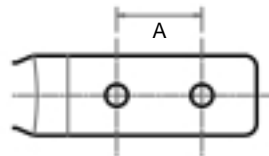
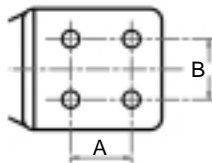
Edge (E)



Flat (F)

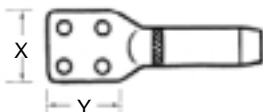
0°
30°
45°
60°
90°

No. of Holes _____



Spacing of Holes: A = _____ B = _____

Diameter of Holes (to suit bolt diameter) _____




Palm Dimensions (if not standard to AS2395): X = _____ Y = _____ Z = _____



04

Earthing rods and accessories

- › Extendable Earth Rods – Taperlock
 - › Extendable Earth Rods – Flush Jointed
 - › Extendable Earth Rods – Expansion Jointed
 - › Earth Rod Driving Accessories
 - › Non-Extendable Earth Rods – Domestic
 - › Non-Extendable Earth Rods – Heavy Duty
 - › Airport Earthing Terminals
 - › Earthing Bond
 - › Earthing Connectors
 - › Earth Rod Clamps
 - › Earthing Enhancement Compounds
 - › Connection Boxes
 - › Pole Earthing Terminals
 - › Earth Mats
- 

Earthing Rods & Accessories

Extendable Earth Rods

Taperlock Coupled Type CTE Copper Clad (Sheathed)

Type CTE earth rods are among the simplest to use. They have identical taper ends and are joined by a one-piece tapered coupling which locks upon driving. These rods may be driven by hand or machine.

Diameter	13mm	15mm	19mm
-----------------	-------------	-------------	-------------

Hand Driving Head

Average Driving	DHT15 DHTU22	DHT15 DHTU22	DHT19 DHTU22
Hard Driving	DHTU25	DHTU25	DHTU25



DHT15

Earthrods

Length mm	Cat No.	Pack Qty	Cat No.	Pack Qty	Cat No.	Pack Qty
1200	CTE1312	10	CTE1512	10	-	-
1440	CTE1314	10	CTE1514	5	-	-
1800	CTE1318	5	CTE1518	5	-	-
2000	-	-	-	-	CTE1920	5
2400	CTE1324	5	CTE1524	5	-	-
3000	CTE1330	5	CTE1530	5	-	-



CTE1314
Tapered end

Coupling

Cat No.	CCT13	CCT15	CCT19
---------	-------	-------	-------



CCT13

Driving Point

Average Driving	DPT13	DPT15	DPT19
Hard Driving	SDP13T	SDP15T	



DPT13



SDP13T

Earthing Rods & Accessories

Extendable Earth Rods

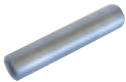
Taperlock Coupled Type STE Stainless Steel Clad (Sheathed)

Type STE earth rods are among the simplest to use. They have identical taper ends and are joined by a one-piece tapered coupling which locks upon driving. These rods may be driven by hand or machine.

Diameter	13mm	14mm
-----------------	-------------	-------------

Hand Driving Head

Average Driving	DHT15	DHT15
Hard Driving	DHTU22 DHTU25	DHTU22 DHTU25



DHT15

Earthrods

Length mm	Cat No.	Pack Qty	Cat No.	Pack Qty
1200	STE1312	10	STE1412	10
1440	STE1314	10	STE1415	5
1800	STE1318	5	STE1418	5
2400	STE1324	5	STE1424	5
3000	STE1330	5	STE1430	5



STE
Tapered end

Coupling

Cat No.	SCT13	SCT15
---------	-------	-------



SCT13

Driving Point

Average Driving	DPT12	DPT15
Hard Driving	SDP12T	SDP15T



DPT12



SDP12T



Earthing Rods & Accessories

Extendable Deep Driving Rods

Flush Jointed Series Type CCE - Copper Clad (Sheathed)

These deep driving flush-jointed electrodes have identical swaged ends to take driving points and coupling pins. They may be either hand or machine driven.

Diameter	13mm	15mm
-----------------	-------------	-------------

Hand Driving Head

Average Driving	DH15	DH15
-----------------	------	------

Earthrods

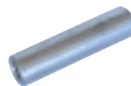
Length mm	Cat No.	Pack Qty	Cat No.	Pack Qty
1200	CCE1312	10	CCE1512	10
1440	CCE1314	10	CCE1514	5
1800	CCE1318	5	CCE1518	5
2400	CCE1324	5	CCE1524	5
3000	CCE1330	5	CCE1530	5

Coupling

Cat No.	CCA13	CCA15
---------	-------	-------

Driving Point

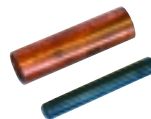
Average Driving	DP13	DP15
Hard Driving	SDP13	SDP15



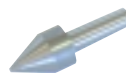
DH15



CCE1314
Swaged end



CCA13



DP13



SDP13



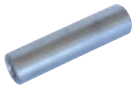
Earthing Rods & Accessories

Extendable Earthing Rods

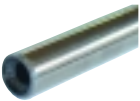
Expansion Jointed - Type SDE (Telstra) Stainless Steel Clad (Sheathed)

Telstra designed and approved earth rod featuring corrosion resistant stainless steel clad rods, extendable in 1440mm lengths.

The coupling system comprises of a stainless steel sleeve and hardened steel pin having a raised convolution at the midpoint. A secure and non-detachable joint is achieved by means of the pins convolute expanding and deforming the ends of the rod into the coupling sleeve as the rods are driven together.



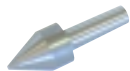
DH14



SDE
Machined end



C14L



DP14



SDP14D

Diameter	14mm
-----------------	-------------

Hand Driving Head

Average Driving	DH14
-----------------	------

Earthrods

Length mm	Cat No.	Pack Qty
1200	SDE1412K	10
1440	SDE1414L	10

Coupling

Cat No.	C14L
---------	------

Driving Point

Average Driving	DP14
Hard Driving	SDP14D



Earthing Rods & Accessories

Earth Rod Driving Accessories

Couplings, Driving Points, Tools

Machine Driving Heads	For Tapered End Extendable Rods		For Flush Jointed Extendable Rods
	CTE	STE	CCE Series Copper
Kango 900/950	MDH15K		MDH15KF

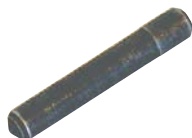


MDH15K



MDH15KF

Machine Driving Pin For use with above machine driving tools	---	MDP10M
--	-----	--------

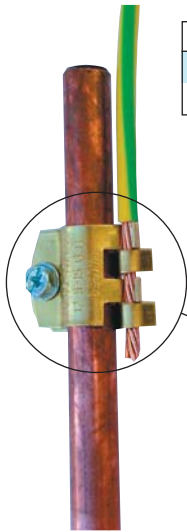


MDP10M

Earthing Rods & Accessories

Non-extendable Earth Rods (Domestic) Copper Clad (Sheathed)

Dulmison manufacture a broad range of non-extendable earth rods. Each rod incorporates an integral driving point, machined (not ground) to preserve the strength and rigidity of cold-drawn steel. The flat tip was developed for penetrating all types of soil.



Domestic Rod Pack, CNE1314D consists of :		
10 pcs/pack	CNE1314	Domestic earth rod
10 pcs/pack	EC13D	Earth clip

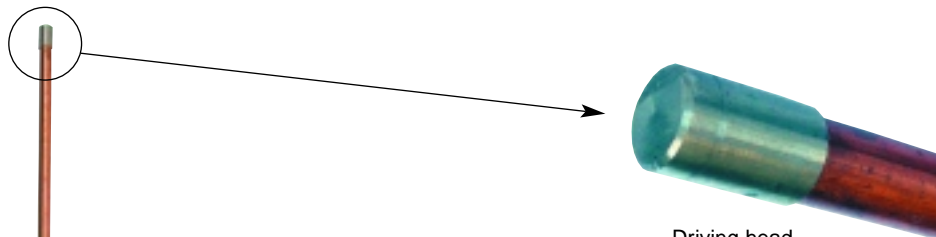


**Domestic Rod Earth Clip
EC13D**
Suitable for cables in the
range 4 - 25mm²

Earthing Rods & Accessories

Non-Extendable Earth Rods - Heavy Duty Series (Industrial)

Type LGR - Copper Clad (Sheathed)



Driving head incorporated onto rod

Recommended Clamps:

Clamp Types EP; ET; GB and FSC provide a copper to copper connection, either in parallel or right angle mode, accommodating single, two & three conductors.

LGR 19mm Rods		
Length mm	Cat No.	Pack Qty.
1800	LGR1918	5
2000	LGR1920	3
2400	LGR1924	3
3000	LGR1930	3
3600	LGR1936	3
4500	LGR1945	3

Earthing Rods & Accessories

Airport Earthing Terminal for Static Electricity Earthing Type AET

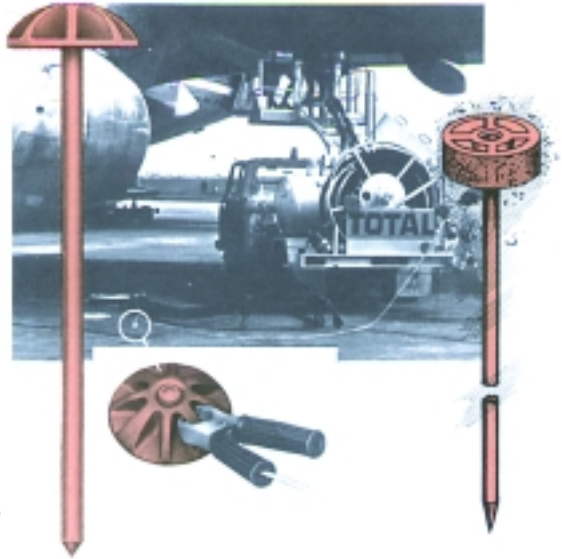
Catalogue No. AET1918

Standard length 1.8M, other lengths made to special order. Type AET electrodes provide for the earthing of airport tarmac areas where any generation of static electricity could be hazardous e.g. aircraft refuelling, servicing and cargo loading areas. The heavy duty capping has a ribbed design affording a fast, and positive earthing connection by means of earth lead connector clips.

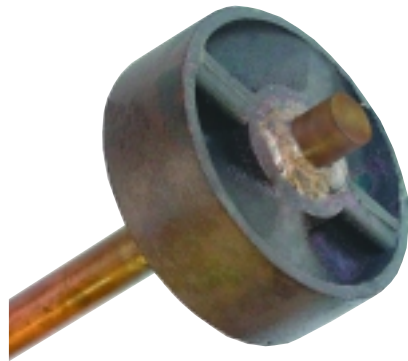
Also available flush fitted,
Catalogue No. AET1918F

Material: Solid steel core overlaid with copper cladding; heavy bronze cap.

Installation procedure: Drive electrode into ground to required depth. Remove protruding portion of rod above cap and finish flush.



AET1918



AET1918F

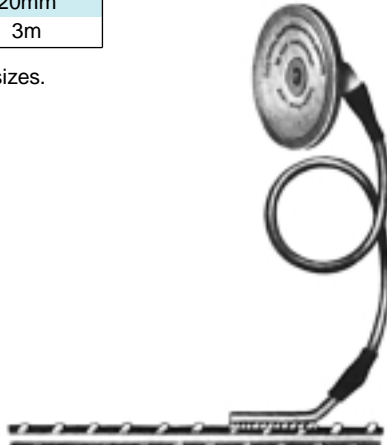
Earthing Rods & Accessories

Earthing Bond for Commercial Earthing Installations Type C70

The earthing bond system provides an earth connection welded to the steel reinforcement, thus offering a virtually indestructible, stable and low resistance path to earth.

	Cat No. C70
Bonding Cable	70mm ²
3 sec current rating	10kA
Lug Dia.	10mm
Terminal Thread	M10
Thread Depth	20mm
Cable Length	3m

Please enquire for other sizes.



Earthing Rods & Accessories

Heavy Duty Earthing Connector

Type CEC

Compress-on copper connections for copper earth rods & grid systems

- High strength, high conductivity connection
- Shake-proof, permanent and corrosion resistant
- High fault current capacity
- Versatile - covers wide variety of single or multi-earthing applications including grid systems
- Two profiles - '6' and 'C' - cover a wide variety of applications. Refer to table for specific catalogue numbers.

Cat No.	Box Qty	Open Section	Tap Off Conductor		Die Set
			Dia. mm	Cross Section mm ²	
CEC15035	40	Conductors	8.4	25 - 40	DU1315
CEC15070	40	50 - 120mm ²	11	50 - 70	
CEC15120	50	or Earth rods	15	95 - 120	
CEC15150	50	13 - 15mm dia	16.5	120 - 150	

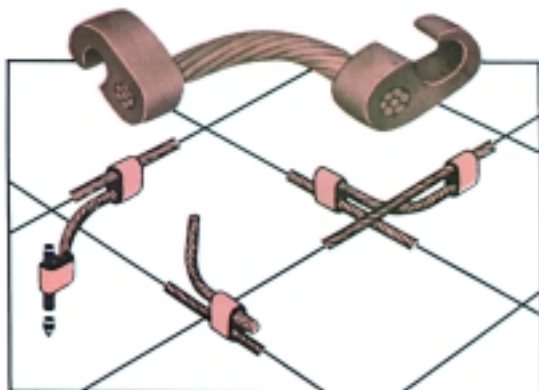


Profile '6'

Cat No.	Box Qty	Conductor Combination mm ²	Die Set
CEC070	50	70 - 35	DUOT
		50 - 50	
		70 - 50	
		70 - 70	
CEC095	50	70 - 95	DU1315
		95 - 95	



Profile 'C'
Crimp conductors side by side



Typical uses of
Profile '6'

Earthing Rods & Accessories

Earth Rod Clamps

Types GB & EL

This clamp is designed for either parallel or right angle connections, as illustrated.

Material: High copper content alloy castings with stainless steel U bolt, spring washers and nuts.



Cat No.	Conductor Range		Diameter of Electrode mm
	mm ²	Dia. mm	
GB1	16 - 35	5.10 - 7.65	13 - 19
GB2	50 - 120	8.90 - 14.21	13 - 19
GB3	150 - 185	15.75 - 17.64	13 - 19
EL21090	35 - 120	7.65 - 14.21	12 - 15

Earth Rod Clamps

Types EP & ET for multi-conductor earthing

For two earth conductors parallel to rod, or two or three earth conductors at right angles to rod.

Materials: Body - high copper content alloy casting; Hardware - stainless steel.

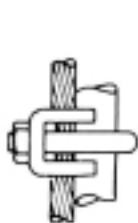


Fig. 1

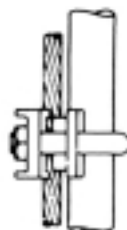


Fig. 2

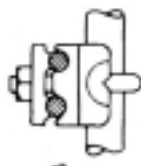


Fig. 3

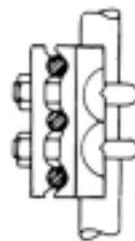


Fig. 4

Multiple Conductor Installations					
Cat No.	O.D. Ground Rod mm	Conductor Range		Fig. No.	No. of Conductors
		mm ²	Dia. mm		
EPO1	14-16	16 - 35	5.10 - 7.65	1	1
EP1	17-19	16 - 120	5.10 - 14.21	1	1
EP3	17-19	16 - 35	5.10 - 7.65	2	2
EP4	17-19	50 - 120	8.90 - 14.21	2	2
ET1	17-19	16 - 35	5.10 - 7.65	3	2
ET2	17-19	50 - 120	8.90 - 14.21	3	2
ET4	17-19	50 - 120	8.90 - 14.21	4	3



Type EP



Type ET



Type EP3

Earth Rod Clamps

Type GP for connecting up to 3 conductors to galvanised pipe

This clamp makes all connections parallel to the pipe.

Materials: Clamp body - high copper content alloy.

Hardware: Comprising U-bolts, washers and nuts - stainless steel.

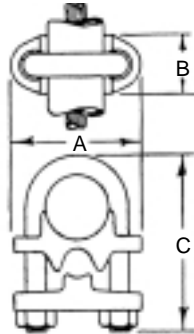


Fig. 1

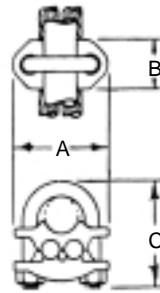


Fig. 2

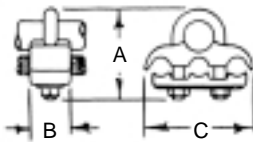


Fig. 3

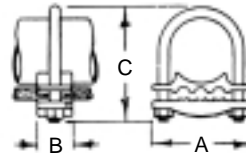


Fig. 4

For dimensions, refer to table on next page.

Earth Rod Clamps

Type GP for connecting up to 3 conductors to galvanised pipe



Cat No.	BS Pipe Series		Conductor Range		Fig. No.	No. of Cons	A	B	C	U-bolt Dia.		
	OD of Pipe	Nom. Bore	mm ²	Dia. mm								
GP01	26	19.00	16 - 35	5.10 - 7.65	1	1	57	32	71	M10		
GP1	34	25.40			1	1	65	32	86			
GP3					2	2	76	32	86			
GP5					3	3	95	38	86			
GP7	43	32.00			1	1	73	32	95			
GP9					2	2	81	32	95			
GP11					3	3	103	38	95			
GP13	48	38.00			50 - 120	8.90 - 14.21	1	1	80	32	102	M12
GP15							2	2	80	32	102	
GP19	60	51.00					1	1	100	32	124	
GP21							2	2	100	32	124	
GP23							4	3	100	38	124	
GP02	26	19.00	50 - 120	8.90 - 14.21			1	1	57	32	71	M10
GP2	34	25.40					1	1	65	32	86	
GP4							2	2	76	32	86	
GP6							3	3	95	38	86	
GP8	43	32.00					1	1	73	32	95	
GP10							2	2	81	32	95	
GP12							3	3	103	38	95	
GP14	48	38.00			50 - 120	8.90 - 14.21	1	1	80	32	102	M12
GP16							2	2	80	38	102	
GP20	60	51.00					1	1	100	32	124	
GP22							2	2	100	32	124	
GP24							4	3	100	38	124	

Earthing Rods & Accessories

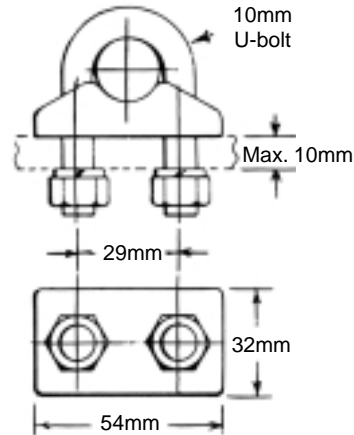
Earth Rod Clamps

Type FSC for earth to flat bar

For connecting copper earthing strip at right angles or parallel to the earthing electrode.

Material: High strength copper alloy casting; stainless steel U-bolt, nuts and spring washers.

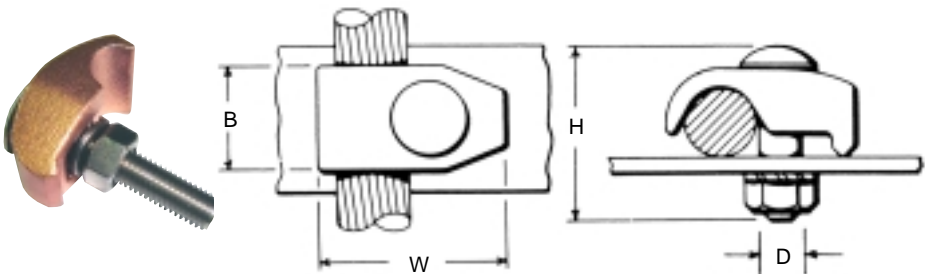
Cat No.	Earth Rod Dia. mm
FSC4	13 - 14
FSC5	15 - 16
FSC6	17 - 19



Type GF for conductor to flat bar

For clamping earth cable to flat metal. Needs only one spanner as head of bolt has square shank to prevent turning. Standard bolt grips 6mm bar.

Material: Cast copper alloy body accommodates range of cable sizes; stainless steel bolt, nut and spring washer.



Cat No.	Conductor Range		Dimensions mm			
	mm ²	Dia. mm	W	B	H	D
GF42	16 - 70	5.10 - 10.70	39	27	27	M10
GF58	70 - 135	10.70 - 15.25	50	37	37	M12

Earthing Rods & Accessories

Earth Rod Clamps

Single Conductor - Parallel

Simple and robust, these pinch and U-Bolt type clamps have a vee groove embodied in the casting to accommodate the earthing cable.

Material: Bodies are made from a high copper content alloy casting.

Cat No.	Rod Dia.	Conductor Size	
		CSA mm ²	Dia. mm
GRC5	13 - 15	10 - 35	4.05 - 7.65
CLAMP210	13 - 15	16 - 120	5.10 - 14.21
EP1	17 - 19	16 - 120	5.10 - 14.21



Type GRC5



CLAMP210



Type EP1

Earthing Enhancement Compounds

Cat No.	Composition	Standard
EARTHFIL	Bentonite, Gypsum, Sodium Sulphate	Conforms to AS2239
EARTHRITE	Bentonite, Gypsum, Sodium Sulphate	N/A
EARTH5050	Bentonite, Gypsum	Conforms to AS2239



Features: Stable, high conductivity providing long term low ground resistance. High expansion, low shrink characteristics. Non-toxic, non-corrosive.

Packaging: 20kg non-tear, plastic lined bags.

Installation: Apply as a dry mix or pourable slurry.

Dry mix will yield a volume of approximately 0.0176m³ (roughly 57 bags to the cubic metre).

Slurry will yield a volume of approximately 0.030m³ when mixed with 20 to 25 litres of water (roughly 33 bags to the cubic metre)

Connection Boxes

Boxes ERB1 and ERB3 feature hinged inspection lids & cable entry holes on the sides. Both boxes provide ample space for conductors and clamps.



Type ERB1



Type ERB3

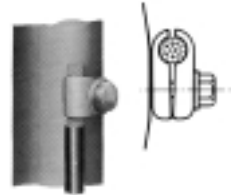
Earthing Rods & Accessories

Pole Earthing Terminal

Type CPET

The pole earthing conductor is held by two half-clamps which directly attach to the pole as illustrated.

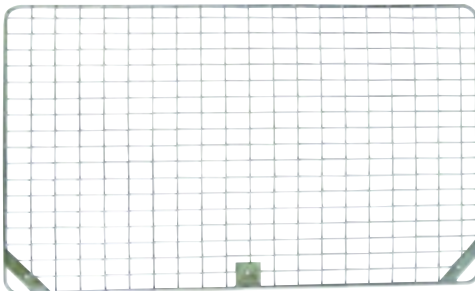
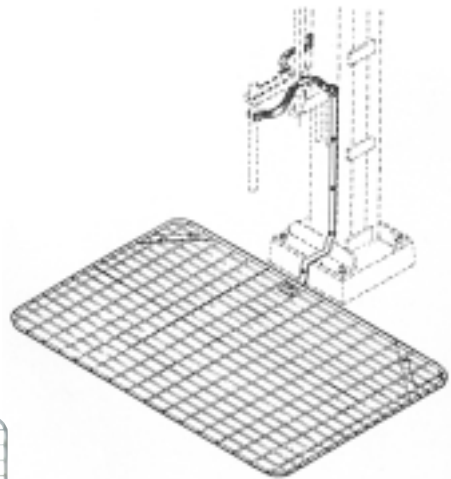
Materials: Cast brass with stainless steel hardware.



Cat No.	Conductor Range		Dia. Bolt & Washer	Bolt Length mm
	Stranding	Overall Dia.		
CPETM6	7/2.75 - 19/1.75	8.25 - 8.75	M10	35
CPETM24	19/1.75 - 19/2.00	8.75 - 10.00	M12	35

Earth Mat and Installation Kit

Cat No.	Description
EARTHMAT	Material: Galvanised steel Size: 1500 x 900mm Mesh: 76 x 50mm
KITY	Switching Kit to EARTHMAT





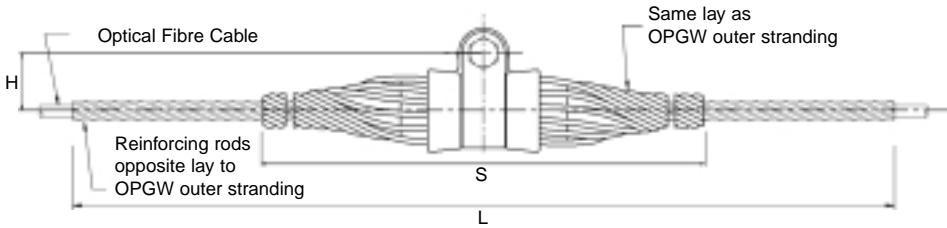
05

Fibre optic

- > OPGW Suspension Assemblies
- > OPGW Tension Assemblies
- > Earth Lead Assemblies
- > Downlead Clamps
- > Single-Ended Enclosures
- > Order/Inquiry Information Sheet

Optical Ground Wire (OPGW) cables

OPGW Suspension Assemblies



Application

Heliformed® suspension assemblies designed for use with OPGW cable. They reduce static compressive stresses at the support point and cushion the OPGW cable against the dynamic stress of aeolian vibration. The combination of elastomer inserts, HSU rods and reinforcing rods provide protection against bending stress. The cable is progressively stiffened up to the suspension point by the double rod sets and protected by the elastomer inserts.

The reinforcing rods are incorporated in this assembly to ensure the optical fibres within the

OPGW Range		Reinforcing Rod Cat No*	HSU Suspension Assembly Cat No*	Dimensions mm		
From	To			L	H	S
9.3	9.9	FORL093L -	HSU1430 -	2000	47	1118
10.0	10.4	FORL100L -	HSU1540 -	2030	47	1168
10.5	11.1	FORL105L -	HSU1625 -	2080	47	1270
11.2	11.8	FORL112L -	HSU1640 -	2140	54	1372
11.9	12.3	FORL119L -	HSU1750 -	2170	54	1372
12.4	12.7	FORL124L -	HSU1755 -	2190	54	1372
12.8	13.2	FORL128L -	HSU1875 -	2230	54	1422
13.3	13.6	FORL133L -	HSU1910 -	2260	59	1524
13.7	14.3	FORL137L -	HSU1955 -	2310	59	1524
14.4	15.0	FORL144L -	HSU2020 -	2350	59	1549
15.1	15.6	FORL151L -	HSU2150 -	2400	59	1626
15.7	16.2	FORL157L -	HSU2210 -	2440	59	1650
16.3	16.5	FORL163L -	HSU2270 -	2460	59	1650
16.6	16.9	FORL166L -	HSU2305 -	2490	64	1676
17.0	17.3	FORL170L -	HSU2375 -	2520	64	1676
17.4	17.9	FORL174L -	HSU2385 -	2560	64	1702
18.0	18.5	FORL180L -	HSU2450 -	2600	64	1727
18.6	19.0	FORL186L -	HSU2505 -	2630	64	1753
19.1	19.5	FORL191L -	HSU2555 -	2670	68	2032
19.6	20.0	FORL196L -	HSU2625 -	2700	68	2082
20.1	20.8	FORL201L -	HSU2700 -	2760	68	2082
20.9	21.2	FORL209L -	HSU2730 -	2790	68	2082
21.3	21.9	FORL213L -	HSU2770 -	2840	68	2082
22.0	22.4	FORL220L -	HSU2840 -	2870	68	2082
22.5	22.8	FORL225L -	HSU2890 -	2900	68	2082

OPGW cable are not subject to crushing forces imparted by the suspension housing unit or other bolted fittings when applied to the cable.

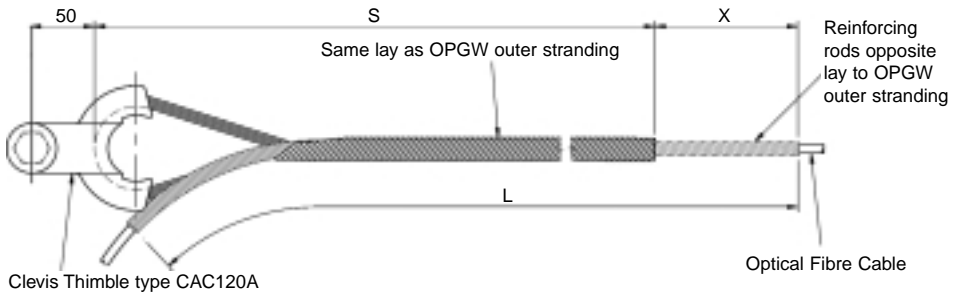
* A parallel groove clamp and earth lead may be ordered with the suspension assembly for tower earthing. Earthing through the fitting is not recommended.

Refer page 5-4 for earth lead assemblies.

** Standard designs are available for either Left Hand Lay or Right Hand Lay OPGW cable from 9.3mm diameter up to 22.8mm diameter.

Optical Ground Wire (OPGW) cables

OPGW Tension Assemblies



Application

Hellformed® deadends designed for use with OPGW cable at termination, section, angle and joint tower positions. They will hold up to the OPGW UTS (in accordance with AS1154) and maintain optical integrity over the operating load range. The tension assembly consists of a reinforcing rod set, a helical wire deadend and a clevis thimble. The OPGW is protected by the reinforcing rods and the mechanical load is taken by the deadend and transferred to the tower hardware by the clevis thimble.

* A parallel groove clamp and earth lead may be ordered with the tension assembly for tower earthing. Earthing through the ODE fitting is not recommended.

Refer page 5-4 for earth lead assemblies.

** Standard designs are available for either Left Hand Lay or Right Hand Lay OPGW cable from 9.3mm diameter up to 22.8mm diameter.

OPGW Range		Reinforcing Rod Cat No*.	Deadend Grip Cat No*.	Dimensions mm		
From	To			L	S	X
9.3	9.9	FORL093L-	FODL093L-	2000	1470	380
10.0	10.4	FORL100L-	FODL100L-	2030	1500	395
10.5	11.1	FORL105L-	FODL105L-	2080	1510	430
11.2	11.9	FORL112L-	FODL112L-	2140	1540	459
12.0	12.3	FORL120L-	FODL120L-	2170	1540	473
12.4	12.7	FORL124L-	FODL124L-	2190	1560	482
12.8	13.2	FORL128L-	FODL128L-	2230	1560	501
13.3	13.6	FORL133L-	FODL133L-	2260	1560	515
13.7	14.3	FORL137L-	FODL137L-	2310	1590	538
14.4	15.0	FORL144L-	FODL144L-	2350	1590	557
15.1	15.6	FORL151L-	FODL151L-	2400	1610	581
15.7	16.2	FORL157L-	FODL157L-	2440	1610	600
16.3	16.5	FORL163L-	FODL163L-	2460	1640	610
16.6	16.9	FORL166L-	FODL166L-	2490	1640	624
17.0	17.3	FORL170L-	FODL170L-	2520	1640	638
17.4	17.9	FORL174L-	FODL174L-	2560	1660	657
18.0	18.5	FORL180L-	FODL180L-	2600	1660	675
18.6	19.0	FORL186L-	FODL186L-	2630	1690	690
19.1	19.5	FORL191L-	FODL191L-	2670	1690	709
19.6	20.0	FORL196L-	FODL196L-	2700	1690	722
20.1	20.8	FORL201L-	FODL201L-	2760	1710	750
20.9	21.2	FORL209L-	FODL209L-	2790	1710	765
21.3	21.9	FORL213L-	FODL213L-	2840	1740	788
22.0	22.4	FORL220L-	FODL220L-	2870	1740	802
22.5	22.8	FORL225L-	FODL225L-	2900	1760	817

Optical Ground Wire (OPGW) cables Earth Lead Assemblies Type ELA

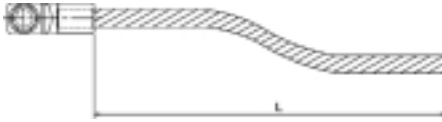


Fig. 1

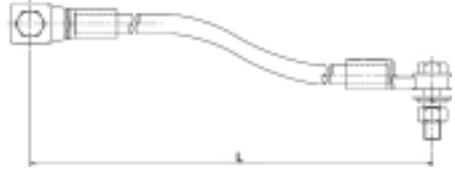


Fig. 2

Provides a direct electrical bonding connection between the OPGW cable and the attachment structure (tower or pole) for connection to the earthing system.

Cat No.	Fig No.	L mm	Structure Hardware Nut/Bolts/ Assembly	Parallel Groove Clamp		Bolted Tee Clamp	
				Up to 13.2 OPGW	Above 13.2 OPGW	Up to 19 OPGW	Above 19 OPGW
ELA37207	1	750	M12 x 55	LTD75-2	LTX126-3		
ELA37210		1000	M12 x 55	LTD75-2	LTX126-3		
ELA37215		1500	M12 x 55	LTD75-2	LTX126-3		
ELA37220		2000	M12 x 55	LTD75-2	LTX126-3		
ELA37225		2500	M12 x 55	LTD75-2	LTX126-3		
ELA11607M12D	2	750	M12 x 60			TCDA0619	TCDA1937
ELA11610M12D		1000	M12 x 60			TCDA0619	TCDA1937
ELA11615M12D		1500	M12 x 60			TCDA0619	TCDA1937
ELA11620M12D		2000	M12 x 60			TCDA0619	TCDA1937
ELA15710	1	1000	M16 x 60	LTX126-3	LTX126-3		
ELA15715		1500	M16 x 60	LTX126-3	LTX126-3		
ELA15720		2000	M16 x 60	LTX126-3	LTX126-3		
ELA15725		2500	M16 x 60	LTX126-3	LTX126-3		
ELA15730		3000	M16 x 60	LTX126-3	LTX126-3		



LTD75-2



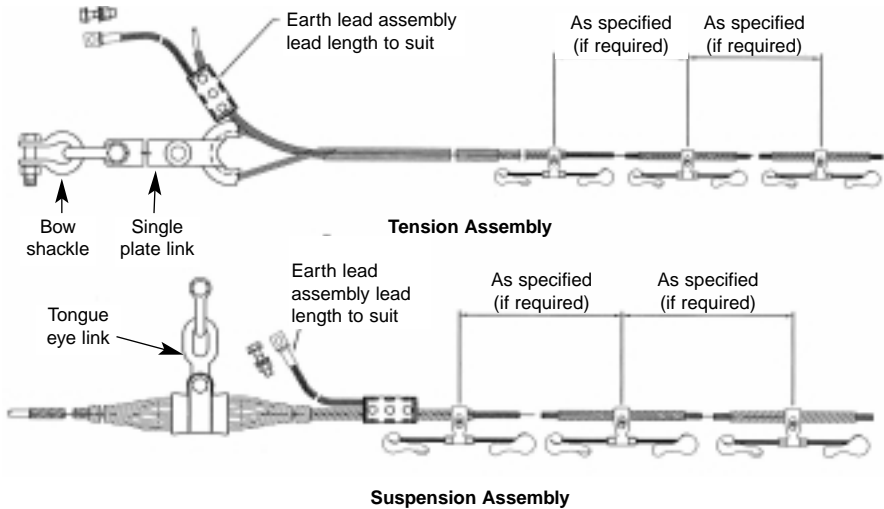
LTX126-3



TCDA1937

Optical Ground Wire (OPGW) cables

Typical Tension and Suspension Assemblies



Typical OPGW Suspension assembly complete with Dogbone® vibration dampers. Heliformed® Spiral Vibration Dampers are also available in lieu of Dogbone® vibration dampers. Various fittings such as those shown above can be used to attach the tension or suspension assembly to the structure.

Similar tension and suspension assemblies and accessories can be supplied for All Dielectric Self Supporting (ADSS) cable. Please consult our sales staff for further information.

Optical Ground Wire (OPGW) cables Fibre Optic Downlead Clamp

General Recommendations

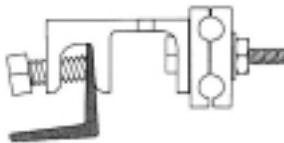
Fibre optic downlead clamps are designed to attach fibre cables to structures without causing undue stress to the optical fibres. The downlead clamp consists of two parts; the clamp base and keeper. Each clamp contains two grooves which accommodates a specific range of cable diameters. The base can be installed to either a curved pole surface or flat surfaces. Mounting hardware is only included when the Tower Attachment or Banding option is selected. Lag or machine bolts are not included.

Diameter Range mm	Cat No.	Cat No.	Cat No.	Cat No.	Cat No.
11.9 - 14.2	FODLC 1190	TFODLC 1190	FODLC X 1190	FODLC 1190 PBC	TFODLCU 1190
14.3 - 16.6	FODLC 1430	TFODLC 1430	FODLC X 1430	FODLC 1430 PBC	TFODLCU 1430
16.7 - 19.0	FODLC 1670	TFODLC 1670	FODLC X 1670	FODLC 1670 PBC	TFODLCU 1670
19.1 - 21.6	FODLC 1910	TFODLC 1910	FODLC X 1910	FODLC 1910 PBC	TFODLCU 1910
21.7 - 24.1	FODLC 2160	TFODLC 2160	FODLC X 2160	FODLC 2160 PBC	TFODLCU 2160
24.2 - 26.6	FODLC 2410	TFODLC 2410	FODLC X 2410	FODLC 2410 PBC	TFODLCU 2410

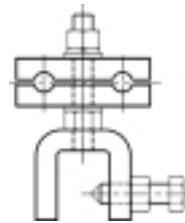
Down Lead Clamps



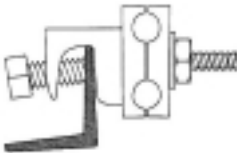
FODLC



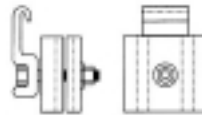
FODLCX



TFODLCU



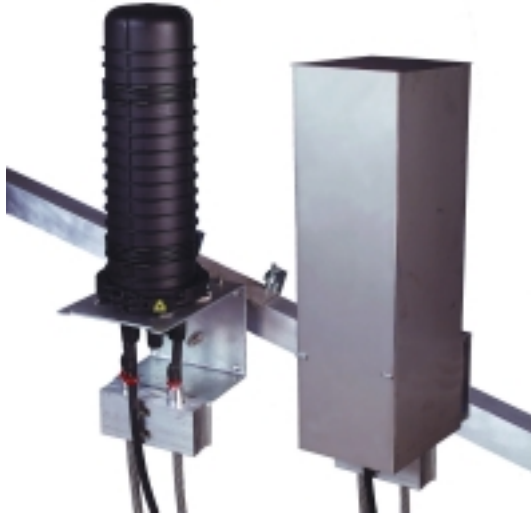
TFODLC



FODLC_PBC

OPGW/ADSS down lead clamps for timber/concrete poles

Optical Ground Wire (OPGW) cables Single-Ended Closure System Type FOSC-OPGW



The FOSC-OPGW is a single-ended closure system specially developed for use on the optical grounding wires of overhead electrical power lines.

The closure is suitable for use above ground; it can be attached to high voltage towers, poles, walls or other support structures. One model can be used to track and spur joint applications.

The FOSC-OPGW closure system has the following functions and features:

- Single-ended design with valve

- It permits the termination and sealing of:

 - OPGW (Optical Grounding Wire) cables

 - ADSS (All Dielectric Self Support) or conventional buried fibre optic cables

- Cable seals are manufactured from heat-shrinkable material

- Internal storage utilises FOSC splice trays which are hinged for access to any splice without disturbing other trays

- A galvanised steel mounting frame holds the thermoplastic dome and base and the OPGW cable clamps

- A pole mounting kit is included which allows the closure to be mounted on a traverse strut of a high voltage tower without the need to drill holes in the metal construction

- A stainless steel shot-gun protection enclosure is optionally available.

Optical Ground Wire (OPGW) cables Order/Inquiry Information Sheet

All to be supplied to AS1154 standard dimensions unless specified otherwise

Conductor Stranding
 Conductor Diameter mm
 Conductor UTS kN
 Conductor Lay (if known) RHL LHL
 Conductor Mass kg
 Conductor No of Fibres
 Conductor Span Length From (min) to (max)

Please copy this sheet, fill in the relevant details & forward to the Dulmison sales office in your region.
 Company:.....
 Contact Name:.....
 Phone No:.....
 Fax/email:.....

Please specify cable/conductor manufacturers technical specification if available:

.....

Please provide pole/tower details for attachment purposes:

.....

Please provide quantity requirements:

Tension Assemblies:
 Suspension Assemblies:
 Vibration dampers:
 Dogbone® Type
 Spiral Type
 Earth Lead Assemblies:
 Down Lead Clamps:
 Jointing Closure:

Please nominate preferred attachment fittings (refer Fibre Optic chapter)

.....



06

Flexible connectors

Flexible Laminated Connectors

- > Aluminium
- > Copper

Flexible Braid Connectors

- > Flat
- > Round
- > Round Insulated



Flexible Connectors

Type FL_A - Aluminium

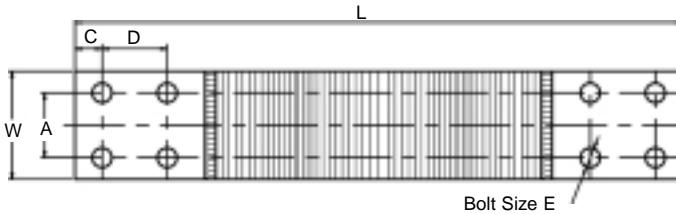
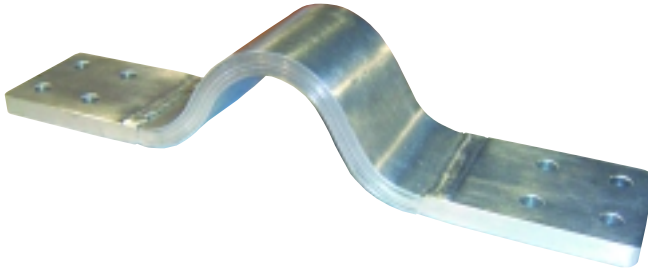


Fig. 1

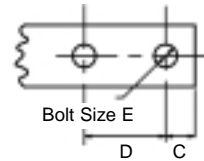


Fig. 2

Designed for flexible end to end connections between rectangular busbars or connections between busbars and terminal palms. Connectors consist of high conductivity aluminium laminates pre-formed to allow movement during expansion of the busbar system. The ends of the laminates are welded to solid aluminium terminals. Laminated connectors of other sizes and forms can be made to customers' specifications.

Table based on 40°C ambient plus 30°C maximum temperature rise.

Cat. No.	Fig. No.	Dimensions in Millimetres						Approx. Thickness	Approx. DC Rating Amp
		A	C	D	E	W	L		
FL2A 600	2	-	19	40	M12	51	300	10	600
FL3A 800	1	40	19	40	M12	76	360	12	800
FL4A 800	1	50	25	50	M12	102	400	10	800
FL4A 1200	1	50	25	50	M12	102	400	12	1200
FL4A 1600	1	50	25	50	M12	102	400	16	2000

Note: Other lengths and drillings to customer specifications are available.

Flexible Connectors

Type FL_C - Copper

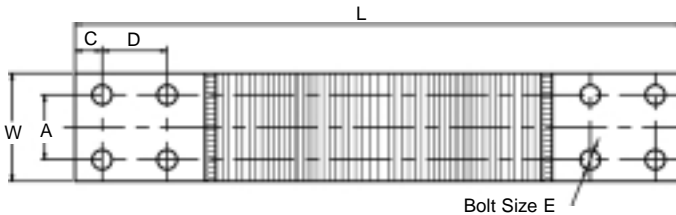
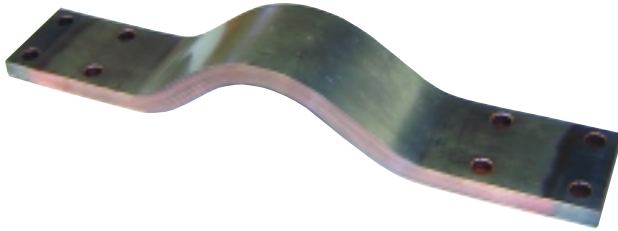


Fig. 1

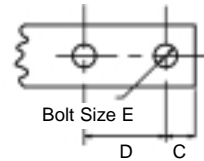


Fig. 2

Designed for flexible end to end connections between rectangular busbars or connections between busbars and terminal palms. Connectors consist of a series of high conductivity copper laminates pre-formed to allow movement during expansion of the busbar system. Laminated connectors of other sizes and forms can be made to customers' specifications.

Cat. No.	Fig. No.	Dimensions in Millimetres						Approx. Thickness	Approx. DC Rating Amp
		A	C	D	E	W	L		
FL2C 600	2	-	19	40	M10	51	300	9	600
FL2C 800	2	-	19	40	M10	51	300	10	800
FL2C 1200	2	-	19	40	M10	51	300	12	1200
FL3C 800	1	40	19	40	M10	76	300	9	800
FL3C 1200	1	40	19	40	M10	76	300	13	1200
FL3C 1800	1	40	19	40	M10	76	300	19	1800
FL4C 800	1	50	25	50	M12	102	400	6	800
FL4C 1200	1	50	25	50	M12	102	400	9	1200
FL4C 1800	1	50	25	50	M12	102	400	13	1800
FL4C 2400	1	50	25	50	M12	102	400	17	2400

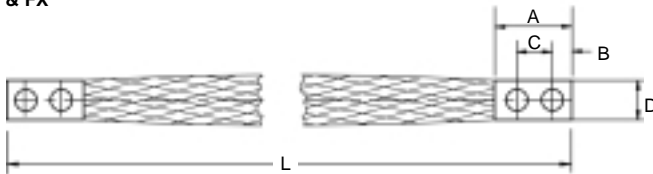
Note: Other lengths and drillings to customer specifications are available.

Flexible Connectors

Type F Series - Flat Braid



Type FA & FX



Type FB, FC

Series "F" flexible braid connectors consist of one or more tinned copper flat braids. Specially formed tinned copper ferrules are swaged onto the ends of the braids under high pressure to form solid rectangular terminals.

Current Ratings - Less than 30°C temperature rise above 40°C ambient temperature.

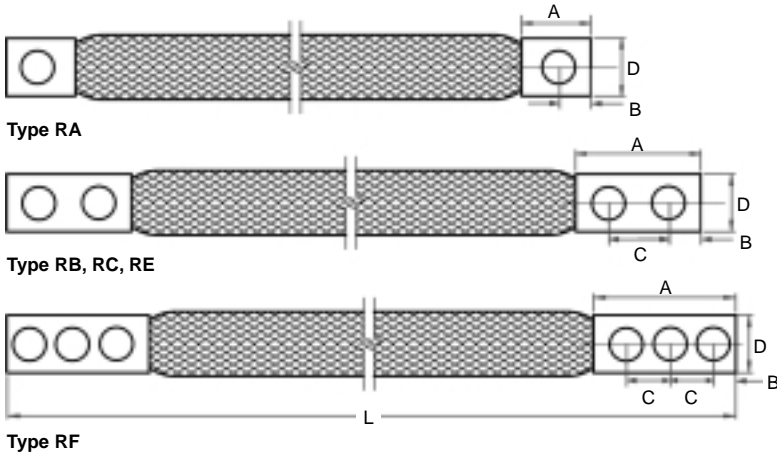
Short Time Rating - Based on maximum density being below 115 amps per mm². Time period basis, 3 seconds.

Cat. No.	Current Rating	Short Time Current Rating	No. of Braids	Approx. Thickness	Dimensions in Millimetres					Bolt Size
					A	B	C	D	L	
FA10300	100	2600	1	6	25	14	-	25	300	M10
FA30300	300	10700	4	8	25	14	-	25	300	
FA45300	450	16100	6	10	25	14	-	25	300	
FX10300	100	2600	1	6	25	14	-	25	300	M12
FX30300	300	10700	4	8	25	14	-	25	300	
FX45300	450	16100	6	10	25	14	-	25	300	
FB10300	100	2600	1	6	54	13	22	25	300	M10
FB30300	300	10700	4	8	54	13	22	25	300	
FB45300	450	16100	6	10	54	13	22	25	300	
FC10300	100	2600	1	6	54	13	29	25	300	M10
FC30300	300	10700	4	8	54	13	29	25	300	
FC45300	450	16100	6	10	54	13	29	25	300	

Note: 300mm Standard length. Other lengths and drillings to customer specifications available.

Flexible Connectors

Type R Series - Round Braid



Series "R" flexible braid connectors consist of one or more tinned copper round braids with specially formed tinned copper ferrules swaged onto the ends of the braids under high pressure to form solid rectangular terminals.

Current Ratings - Less than 30°C temperature rise above 40°C ambient temperature.

Short Time Rating - Based on maximum density being below 115 amps per mm². Time period basis, 3 seconds.

Cat. No.	Current Rating	Short Time Current Rating	No. of Braids	Approx. Thickness	Dimensions in Millimetres					Bolt Size
					A	B	C	D	L	
RA20300	200	6200	1	7.0	25	13	-	25	300	M10
RA40300	400	12500	2	8.5	25	13	-	25	300	
RB20300	200	6200	1	7.0	54	13	22	25	300	M10
RB40300	400	12500	2	8.5	54	13	22	25	300	
RC20300	200	6200	1	7.0	54	13	29	25	300	M10
RC40300	400	12500	2	8.5	54	13	29	25	300	
RC50300	500	20000	2	12.0	54	13	29	25	300	
RE70*	700	30000	3	14.0	83	19	40	40	*	M10
RE80*	800	37000	3	17.0	83	19	40	40	*	
RF60*	600	25000	2	10.5	152	25	50	49	*	M16
RF1K*	1000	50000	4	17.0	152	25	50	49	*	

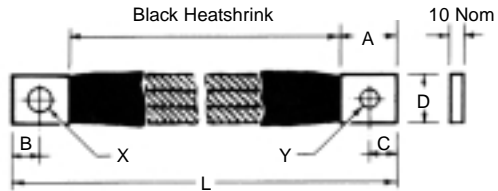
Note: *OVERALL LENGTH For types RA, RB & RC - standard length 300mm. Other lengths and drillings to customer specifications are available. For types RE and RF - required length in millimetres to be added to catalogue number e.g. RE70450.

Flexible Connectors

Type RG Series - Round Braid



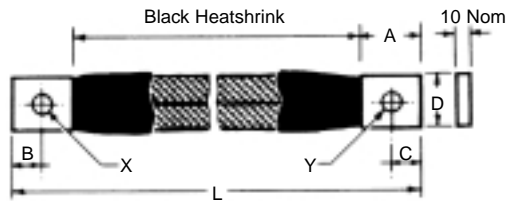
Series RG 1000 amp* connectors consist of 3 tinned copper round braids with specially formed tinned copper ferrules swaged on to both ends under high pressure to form solid rectangular terminals.



Cat. No.	Dimensions in Millimetres					Hole Dia. mm	
	A	B	C	D	L	X	Y
RG1K400	50	25	22	50	400	27	17
RG1K415	50	25	22	50	415	27	17
RG1K440	50	25	22	50	440	27	17
RG1K450X	50	25	22	50	450	13	17
RG1K465X	50	25	22	50	465	13	17
RG1K490X	50	25	22	50	490	13	17

Note: *Installed in free air. Other lengths and drillings to customer specifications are available.

Series RG 670 amp* connectors consist of 2 tinned copper round braids with specially formed tinned copper ferrules swaged on to both ends under high pressure to form solid rectangular terminals.



Cat. No.	Dimensions in Millimetres					Hole Dia. mm	
	A	B	C	D	L	X	Y
RG67375	50	22	22	50	375	20	17
RG67385	50	22	22	50	385	20	17
RG67425	50	22	22	50	425	20	17
RG67375X	50	22	22	50	375	13	17
RG67385X	50	22	22	50	385	13	17
RG67425X	50	22	22	50	425	13	17

Note: *Installed in free air. Other lengths and drillings to customer specifications are available.

07



Heliformed[®] line fittings

- > Technical and Selection
- > Deadends
- > Heligrips[®]
- > Clevis Thimbles and Socket Thimbles
- > Armour Rods
- > Line Guards
- > Insulator Ties
- > Line Splices
- > Spiral Dampers
- > Suspension and Support Units
- > Guy Loks and Guy Guards
- > Bird and Swan Diverters
- > Low Voltage Spreader Rods
- > Order/Inquiry Information Sheet

Technical Guide

Overview

Dulmison has been supplying Heliformed® fittings to markets throughout the world for over 49 years. The company obtained a manufacturing licence in 1957, and became the first and oldest manufacturer of Helical line fittings outside North America.

Over the last 49 years, a range of Heliformed® terminations, joints, and support and repair fittings have been developed. The range of application of these fittings is unsurpassed, and provides the most complete range of electrical distribution fittings of this type.

The apparent simplicity of Heliformed® fittings, their ease of installation in the field and their mechanical and electrical conductive efficiencies, belie the design back-up and manufacturing expertise necessary for what are essentially precision products. Heliformed® fittings are tailor made to match wide ranging differences in conductor materials, diameter configurations and service conditions that vary from coastal climates to hot arid plains.

Design

All Heliformed® fittings are designed to be compliant for use with the following Standards and or Recommendations;

- AS1222.1 SC/GZ Conductors (Galvanised Steel)
- AS1222.2 SC/AC Conductors (Aluminium Clad Steel)
- AS1531 AAC & AAAC Conductors (Aluminium and Aluminium Alloy)
- AS1746 HDC Conductors (Hard Drawn Copper)
- AS3607 ACSR Conductors (Aluminium Clad Steel Reinforced)

Heliformed® fittings are compliant with requirements of AS1154 Part 3.

Installation

Heliformed® fittings may be installed either by hand or by live line methods, and are designed to fit on to the conductor for which they are designed, without any question of malfunction or misapplication.

Colour Coding

Colour Coding is determined by the stranding of the conductor, on which the Heliformed® fitting is to be used as per AS1154 Part 3.

Individual Stranding Dia. mm	Colour Code
1.00	Black
1.25	Green
1.75	Purple
2.00	Yellow
2.25	Brown
2.50	Blue
2.75	White
3.00	Red
3.25	Orange
3.50	Purple
3.75	Black
4.00	Black
4.50	Green
4.75	Blue

Technical Guide

Fundamentals

Heliformed® Deadends have two lengths, Overall Length and Applied Length, the latter being the length from the cross over marks. (See fig 1). The cross over mark, (See fig 2) shows the starting point for application of the deadend. The colour code at this cross over point is as per the stranding of the conductor (See colour code page 7-2). An identification tag is always attached to the loop area of the fitting, and displays the fitting Cat. No., Range of Applications and/or stranding details.

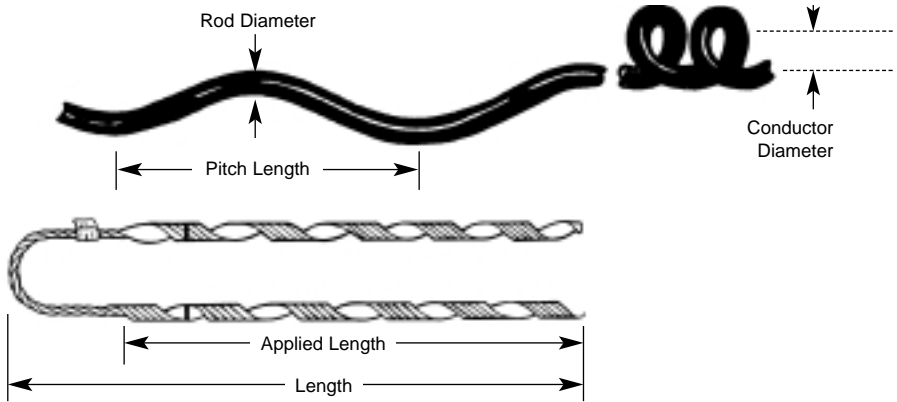


Fig 1

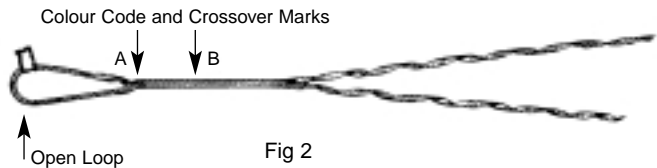


Fig 2

Lay Designation



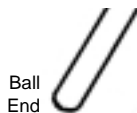
Right Hand Lay



Left Hand Lay

End Finish

Depending on the voltage, ends of the individual rods may be either chamfered, ball ended or EHV (Extra High Voltage) ended. EHV end finish is generally only ever required at a voltage greater than 330kV.



Selection Guide

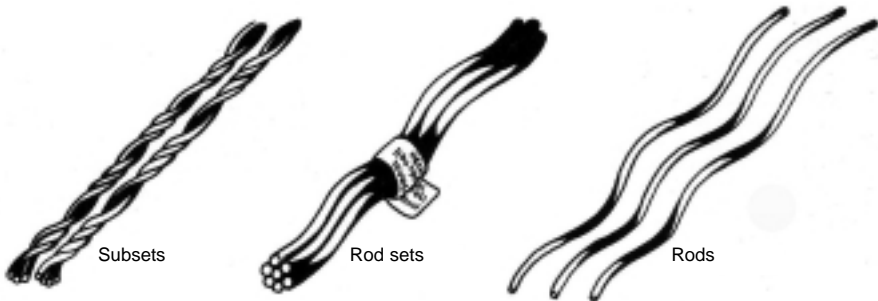
Loop Configuration

Open Helix Looped and Cable Looped Deadends can be provided. Open Helix Looped may be regarded as standard.



Supply Options - Subsets/Rods/Rod Sets

Depending on the intended use, Heliformed® products are supplied as individual rods (Lashing Rods - Line Guards) or sub sets (Deadends-Splices and Ties). Generally only subsets are gritted to enhance the holding strength and/or conductivity.



Important

For Technical and Stranding details of standard Australian and New Zealand conductors, please refer to Section 17. Once the size of the conductor is established, the appropriate range and fitting in each category can be obtained.

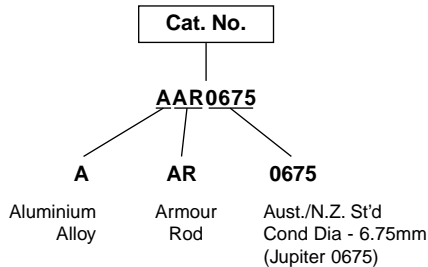
Selection Guide

Catalogue Numbering System

Alpha Numeric Identification

Heliformed® line fittings are identified by an alpha numeric catalogue numbering system derived as follows:

- Nature of fitting material
- Type of fitting
- Conductor diameter range, applicable to fitting (Aust./N.Z Standard Metric)



Although examination of the list of 'prefixes' and 'suffixes' listed below shows the system to be largely mnemonic, and thereby helpful in equating catalogue numbers with fittings, there are traps and, as always, "exceptions to the rule" (see below)

Standard Abbreviations

PREFIXES (Material type)

A Aluminium **L** Aluminium Clad Steel **C** Copper **S** Galvanised Steel

SUFFIXES (Fitting type)

AR Armour Rod	GG Heligrip®	ST Side Tie
DC Deadend for Copper	GL Guy Lok	TG Twin Grips
DE Deadend	LG Line Guard	TT Top Tie
DT Distribution Tie	LS Line Splice	WT Helitie®

Steel Deadends are catalogue SGG (steel guy grip) rather than SDE.

Note: A true suffix 'D' appearing at the end of a catalogue number indicates the fitting suits more than one conductor e.g. suits 7/2.75 Copper plus 19/1.75 Copper.

Exceptions to Standard Abbreviations

DIS Double Insulated Service Termination	FDE Full Tension Deadend (Multi Piece)
FSE Full Tension Deadend (Single Piece)	FTS Full Tension Splice (Multi Piece)
HSP Heliformed® Support Unit	HSU Heliformed® Suspension Unit
MSS Multi Strand Splice	NDE Limited Tension Coated Deadend
PGG Plastic Guy Guard	SVD Spiral Vibration Damper

Heliformed® Line Fittings

Holding Strengths for Splices & Deadends

Line Splices

Conductor Type	Conductor Stranding	Catalogue Prefix	Tension Rating (% of UTS)
ACSR	6/1 OR 6/7	FTS	90%
ACSR	3/4 OR 4/3	MSS	90%
ACSR	30/7	FTS	90%
AAC & AAAC	ALL	ALS	90%
HDC (Copper)	ALL	CLS	90%
SC/GZ (Galv)	ALL	SLS	90%
SC/AC (Alclad)	ALL	LLS	90%

Deadends

Conductor Type	Conductor Stranding	Catalogue Prefix	Tension Rating (% of UTS)
ACSR	6/1 OR 6/7	ADE	60 - 85%**
		LDE	60 - 85%**
		FSE	90%
		FDE	90%
ACSR	3/4 OR 4/3	ADE	60 - 85%**
		LDE	60 - 85%**
		FSE	90%
ACSR	30/7	ADE	60 - 85%**
		LDE	60 - 85%**
		FDE	90%
AAC & AAAC	ALL	ADE	90%
		LDE	90%
HDC (Copper)	ALL	CDE	90%
		SDC	90%
SC/GZ (Galv)	ALL	SGG	90%
		SGL	90%
SC/AC (Alclad)	ALL	LGG	90%

** For specific details relating to the holding strength of Deadends, please refer to the Termination and Deadend section of this catalogue.

Catalogue Prefix Codes

ALS-Aluminium Line Splice

CLS-Copper Line Splice

FTS-Full Tension Splice

MSS-Multi Strand Splice

SLS-Steel Line Splice

LLS-Aluminium Clad Line Splice

ADE-Aluminium Deadend

CDE-Copper Deadend

FDE-Full Tension Deadend

FSE-Full Tension Deadend (Single Piece)

LDE-Aluminium Clad Deadend

SDC-Steel D'end for Copper

SGG-Steel Heligrip® Deadend

LGG-Aluminium Clad Heligrip®

Heliformed® Line Fittings

Selection Guide

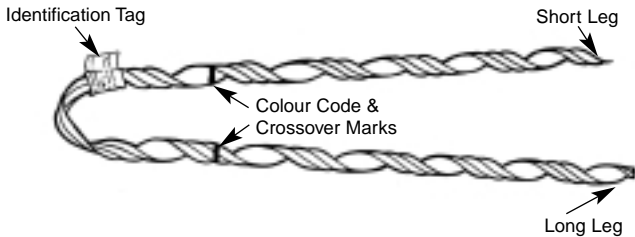
Index to Standard Range & Guide to Usage

Heliformed® Line Fitting		Cat. Prefix Code	AAC/AAAC	ACSR	HDC	SC/AC	SC/GZ	
Intended Use	Type							
Termination	DEADENDS - Bare							
	Aluminium Alloy	ADE	■	■				
	Aluminium Clad	LDE	■	■				
	Copper Alloy	CDE			■			
	Galvanised Steel Heligrip®	SGG					■	
	Aluminium Clad Steel Heligrip®	LGG				■		
	Al. Clad Steel Full Tension, Multi Piece	FDE		■				
	Al. Clad Steel Full Tension, Single Piece	FSE	■	■				
	Double Insulated	DIS	For House Service conductors only					
	Neoprene Covered	NDE	For House Service conductors only					
	Guy Lok	SGL					■	
Support and Protection	ARMOUR RODS							
	Aluminium Alloy	AAR	■	■				
	Copper Alloy	CAR			■			
	Galvanised Steel	SAR					■	
	Aluminium Clad Steel	LAR				■		
	LINE GUARDS							
	Aluminium Alloy	ALG	■	■				
	Copper Alloy	CLG			■			
	INSULATOR TIES							
	Aluminium Alloy Helities®	AWT	■	■		■		
Galvanised Steel Helities®	SWT					■		
Aluminium Alloy Distribution Ties	ADT	■	■		■			
Aluminium Clad Steel Distribution Ties	LDT	■	■		■			
Galvanised Steel Distribution Ties	SDT					■		
Aluminium Alloy Side Ties	AST	■	■					
Aluminium Clad Steel Side Ties	LST	■	■					
Aluminium Alloy Single Wire Top Ties	ATT	■						
SUSPENSION/SUPPORT UNITS								
Aluminium Alloy Suspension Unit	HSU	■	■		■			
Galvanised Steel Suspension Unit	SHS			■	■	■		
Aluminium Alloy Support Unit	HSP	■	■		■	■		
Joint and Restorative Repair	LINE SPLICES							
	Aluminium Alloy	ALS	■	See page 7-26				
	Copper Alloy	CLS			■			
	Galvanised Steel	SLS					■	
	Galvanised Steel & Al. Alloy Full Tension	MSS/FTS		■				
MISCELLANEOUS								
Spiral Vibration Damper	SVD	■	■	■	■	■		
Guy Guard	PGG					■		
Bird/Swan Diverters	BD/SD	■	■	■	■	■		
Low Voltage Spreader Rods	LVS	■	■	■	■			

Aluminium Based Deadends

Type ADE - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type LDE - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors



Aluminium Based Deadends have been designed as a simple and cost effective method of carrying out terminations on overhead distribution networks incorporating AAC, AAAC and ACSR Conductors. Their unique single piece design, provides uniform application pressure to the conductor, and eliminates cumbersome hardware and other components, which may be lost or damaged during installation or in service.

An entire range of fittings, have been developed, to cover the smallest earth wires, right up to the largest transmission conductors. Each fitting has a specific application range, as indicated in the following tables.

Rated Holding Strengths

On AAC and AAAC conductors, both an ADE and LDE fitting will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

On ACSR conductors, an ADE or LDE fitting will hold 60-85% of the ultimate tensile strength of the conductor, on which it is used.

Heliformed® Line Fittings

Aluminium Based Deadends

Type ADE - Aluminium Alloy for AAC, AAAC & ACSR Conductors

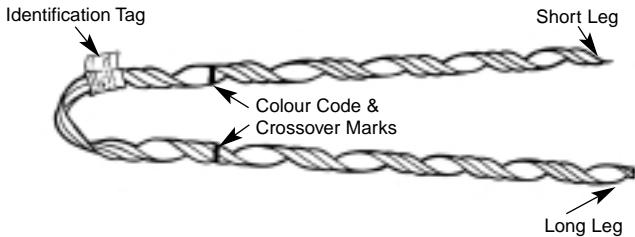
Type LDE - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	Aluminium Alloy Deadends	ACSR Stranding	Aluminium Clad Steel Deadends	Std Pack
4.10 - 4.42		ADE 0410			50
4.62 - 4.94		ADE 0462		LDE 0462	50
4.95 - 5.14		ADE 0495		LDE 0462	50
5.15 - 5.39	7/1.75	ADE 0525	3/4/1.75	LDE 0525	50
5.60 - 5.79		ADE 0560		LDE 0525	50
5.80 - 6.09		ADE 0580		LDE 0593	50
6.10 - 6.24		ADE 0610			50
6.25 - 6.54		ADE 0625			50
6.55 - 6.89	7/2.25	ADE 0675		LDE 0675	50
6.90 - 7.14		ADE 0690		LDE 0675	50
7.15 - 7.34		ADE 0715		LDE 0675	50
7.35 - 7.59	7/2.50	ADE 0750	6/1/2.50 - 3/4/2.50	LDE 0750	50
7.60 - 7.89		ADE 0760		LDE 0750	50
7.90 - 8.29	7/2.75	ADE 0790	6/1/2.75	LDE 0750	50
8.30 - 8.64		ADE 0830		LDE 0900	40
8.65 - 9.35	7/3.00	ADE 0900	6/1/3.00 - 4/3/3.00	LDE 0900	50
9.35 - 9.69		ADE 0935			30
9.70 - 10.15		ADE 0970			30
10.15 - 10.49		ADE 1015			30
10.50 - 10.79		ADE 1050			25
10.80 - 11.29	7/3.75	ADE 1125	6/1/3.75 - 4/3/3.75	LDE 1125	25
11.30 - 11.74		ADE 1130			25
11.75 - 12.24		ADE 1175			25
12.25 - 12.79		ADE 1225		LDE 1255	25
12.80 - 13.24		ADE 1280		LDE 1255	25
13.24 - 13.84	7/4.50	ADE 1350		LDE 1350D	20
13.85 - 14.44	7/4.75	ADE 1430	6/4.75 + 7/1.60	LDE 1430	20
14.45 - 15.09		ADE 1445			25
15.10 - 15.69		ADE 1510		LDE 1550	25
15.70 - 16.39	19/3.25	ADE 1625		LDE 1625	15
16.40 - 17.04		ADE 1640			25
17.05 - 17.79	19/3.50	ADE 1750	30/7/2.50	LDE 1750	10
17.80 - 18.54		ADE 1780			10
18.55 - 19.34	19/3.75	ADE 1875		LDE 1875	10
19.35 - 20.39		ADE 1989			10
20.40 - 21.82	37/3.00	ADE 2100	30/7/3.00	LDE 2100	10
22.46 - 23.75	37/3.25	ADE 2330	30/7/3.25		10
23.75 - 25.29	19/4.75	ADE 2375	30/7/3.50	LDE 2375	10
25.30 - 27.27	37/3.75	ADE 2625	54/7/3.00	LDE 2625	10
28.60 - 30.83	61/3.25	ADE 2930	54/7/3.25		10

Heliformed® Line Fittings

Copper Alloy Deadends

Type CDE - Copper Alloy for Hard Drawn Copper Conductors



Copper Alloy Deadends have been designed as a simple and cost effective method of carrying out terminations on Hard Drawn Copper (HDC) and Copper Alloy conductors. Fittings for smaller ranges are manufactured from Tin Bearing Copper Alloy wire, whilst larger fittings are manufactured from a unique Cadmium 'Free' Copper Alloy wire.

The material used in all fittings is ideally suited to coastal and polluted conditions, and replicates the strength and life of the conductor as closely as possible.

Rated Holding Strengths

On HDC conductors, a CDE fitting will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

Type CDE - For Hard Drawn Copper (HDC) Conductors

Conductor Range	HDC Conductor Stranding	Copper Alloy Deadends	Std Pack
3.57 - 3.75	7/1.25	CDE 0360	50
3.90 - 4.21		CDE 0400	50
4.80 - 5.25	7/1.75	CDE 0525	50
6.00 - 6.29	7/2.00	CDE 0600	50
6.30 - 6.57		CDE 0630	50
6.58 - 6.85		CDE 0658	40
6.89 - 7.41		CDE 0714	40
7.42 - 7.95		CDE 0742	40
7.70 - 7.99		CDE 0770	40
8.00 - 8.75	7/2.75 & 19/1.75	CDE 0825D	40
9.00 - 9.26		CDE 0900	40
9.30 - 9.99		CDE 0965	40
10.00 - 10.65	19/2.00 & 7/3.50	CDE 1000D	20
10.66 - 11.24		CDE 1068	20
11.25 - 12.04	7/3.75	CDE 1125	20
12.05 - 12.82	37/1.75 & 7/4.15	CDE 1225	15
12.82 - 13.19		CDE 1257	15
13.20 - 13.75	19/2.75	CDE 1375	10
14.50 - 15.03	19/3.00	CDE 1500	10
16.15 - 16.80		CDE 1615	10
17.50 - 18.08	37/2.50	CDE 1750	5
18.09 - 19.00		CDE 1809	5
19.01 - 20.19	37/2.75	CDE 1925	5
20.20 - 21.80	37/3.00	CDE 2100	5
22.60 - 24.36		CDE 2300	5
24.72 - 26.65	61/2.75	CDE 2565	5
28.43 - 30.65		CDE 2950	5

Heliformed® Line Fittings

Full Tension Deadends

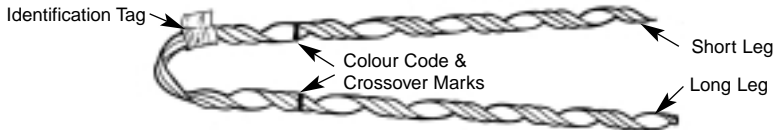
Type FSE - Single Piece, Aluminium Clad Steel for ACSR Conductors

Type FDE or FTDE - Multi Piece, Aluminium Alloy & Gal Steel for ACSR Conductors

Full Tension Deadends have been designed for use as a termination on ACSR - Aluminium Clad Steel Reinforced conductors. Two types of Full Tension Deadends are available -

Type FSE - Single Piece Construction

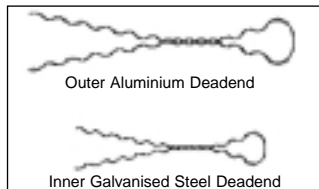
Designed for installation over the outer layer of the conductor only.



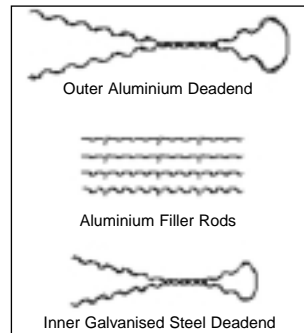
Type FDE or FTDE - Multi Piece Construction

Designed for installations where holding strength on the inner core strands is required. e.g. on greased inner core conductors, with 7 strands or greater in the core. The type FDE or FTDE fitting, can be supplied in two configurations.

Two Deadends
(one deadend for the inner core and one deadend for over the outer strands)
FIGURE 1



Two Deadends plus Filler Rods
(where the inner core deadend cannot be designed so as its diameter will align with the outer strands, so as to enable attachment of the second deadend)
FIGURE 2



Rated Holding Strengths

On ACSR conductors, FSE, FDE and FTDE fittings will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

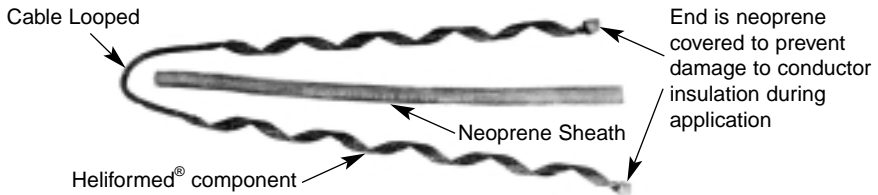
Type FSE/FDE/FTDE - For Aluminium Clad Steel Reinforced (ACSR) Conductors

ACSR Conductor Stranding	FSE Single Piece Fitting	FDE or FTDE Multi Piece Fitting	Std Pack
3/4/1.75	FSE 0525		50
6/1/2.50	FSE 0750		30
3/4/2.50	FSE 0750		30
6/1/3.00	FSE 0900	FTDE 0900	25
4/3/3.00	FSE 0900		25
6/1/3.75	FSE 1125	FDE 1125	25
4/3/3.75	FSE 1125		25
12/7/2.50		FTDE 1250	25
6/4.75 + 7/1.60	FSE 1430		20
30/7/2.50		FDE 1750	5
30/7/3.00		FDE 2100	5

Heliformed® Line Fittings

Double Insulated Deadends

Type DIS - Double Insulated - Copper & Aluminium Aerial Service Cables



The DIS fitting has been designed for terminating insulated aerial service cables of either single, webbed, 2, 3 or 4 core twisted or concentric neutral screened construction. The DIS fitting is designed to terminate the service cable directly to the fascia attachment on the house, without the need for a separate insulator. There is no span limitation in normal urban usage of the DIS fitting.

DIS fittings are composed of two components, a galvanised, gritted and coated (black) Heliformed® fitting, and a non-conductive Neoprene Sheath. The neoprene sheath is wrapped around the service cable prior to attachment of the Heliformed® fitting, to provide the double insulating layer.

The DIS fitting provides excellent resistance to UV attack and corrosion, and has been designed to operate in harsh operating environments, where temperature extremes, and vibration difficulties are known to occur.

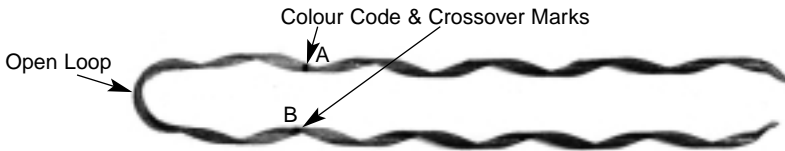
Area mm ²	Stranding	No. of Conductors	Cat. No.	Std. Pack	Colour Code
Twisted Conductors					
6	7/1.04	2, 3 & 4	DIS1400N	25	Red
10	7/1.35	2, 3 & 4	DIS1400N	25	Red
10	7/1.35	4	DIS1600N	25	White
16	7/1.70	2	DIS1400N	25	Red
16	7/1.35	3 & 4	DIS1600N	25	White
25	7/2.00	2	DIS1600N	25	White
25	7/2.00	3 & 4	DIS1900N	20	Blue
35	19/1.35	2	DIS1600N	25	White
35	19/1.35	4	DIS2200N	25	Green
Webbed Conductors					
6	7/1.04		DIS80610	25	Red
10	7/1.35		DIS80610	25	Red
16	7/1.70		DIS81600	25	White
Neutral Screened Conductors					
6	7/1.04	2	DIS1400N	25	Red
6	7/1.04	3 & 4	DIS1900N	20	Blue
10	7/1.35	2	DIS1400N	25	Red
10	7/1.35	3 & 4	DIS1900N	20	Blue
16	7/1.70	2	DIS1600N	25	White
16	7/1.70	3 & 4	DIS1900N	20	Blue

Note: Number of conductors includes the neutral screen.

Heliformed® Line Fittings

Limited Tension Deadends

Type NDE - Limited Tension - Copper & Aluminium Aerial Service Cables



The NDE is a coated galvanised steel termination, suitable for application over Polyethylene or Neoprene insulated, aluminium or copper conductors. The coated subsets of each Deadend leg exert a low radial pressure that does not damage the insulation on the conductor.

Because of the number of variables associated with the rating strength of this type of fitting (conductor size, number of cores, insulation thickness etc.), it is impractical to imply a rating as a proportion of the UTS of the conductor. In many applications the strength of the fitting will exceed the UTS of the conductor.

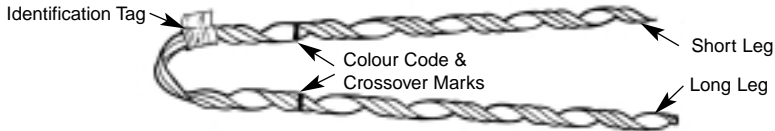
Area mm ²	Stranding	No. of Conductors	Cat. No.	Std. Pack	Colour Code
Twisted Conductors					
6	7/1.04	2 & 3	NDE1036	25	Blue
6	7/1.04	4	NDE1369	25	Red
10	7/1.35	2	NDE1036	25	Blue
10	7/1.35	2 & 3	NDE1369	25	Red
16	7/1.70	2	NDE1369	25	Red
16	7/1.35	2 & 3	NDE1554	20	Black
25	7/2.00	2	NDE1554	20	Black
25	7/2.00	3	NDE1973	15	Yellow
35	19/1.35	4	NDE2216	10	Blue
35	19/1.35	2, 2 & 3	NDE2216	10	Blue
Webbed Conductors					
6	7/1.04		NDE1036	25	Blue
10	7/1.35		NDE1369	25	Red
16	7/1.70		NDE1369	25	Red
25	7/2.00		NDE1554	20	Black
Neutral Screened Conductors					
6	7/1.04	2	NDE1036	25	Blue
6	7/1.04	2 & 3	NDE1554	20	Black
10	7/1.35	2	NDE1036	25	Blue
10	7/1.35	3	NDE1554	20	Black
10	7/1.35	4	NDE1973	15	Yellow
16	7/1.70	2	NDE1369	25	Red
16	7/1.70	3	NDE1554	20	Black
16	7/1.70	4	NDE2216	10	Blue

Heliformed® Line Fittings

SGG Heligrips®

Type SGG - Galvanised Steel for SC/GZ Conductors

Type LGG - Aluminium Clad Steel for SC/AC Conductors



SGG and LGG Heligrips®, are used for terminating guy wires, earthwires and stay conductors. Both SGG and LGG fittings are ideally suited to installations in the most difficult conditions, and will never relinquish their gripping power.

SGG and LGG Heligrips® are manufactured from the same materials as the conductors that they are applied to. This ensures that there is no chance of electrolytic or galvanic corrosion, as the fittings are completely compatible to the conductor to which they are applied.

SGG fittings are supplied as Right Hand Lay as the standard to match the applicable Right Hand Lay conductor. Left Hand Lay fittings are available to suit Left Hand Lay conductors. LGG fittings are always supplied as Left Hand Lay to suit Left Hand Lay conductors.

Rated Holding Strengths

SGG & LGG Heligrips® will hold a minimum of 90% of the UTS of the conductor as required by Australian Standard AS1154.1 - 2004.

Type SGG/LGG - for SC/GZ & SC/AC Conductors

Conductor Range	SC/GZ Stranding	Galvanised Steel Heligrip®	SC/AC Stranding	Aluminium Clad Heligrip®	Std. Pack
2.41 - 2.60		SGG 0245			50
2.80 - 3.15		SGG 0315			50
3.16 - 3.54		SGG 0345			50
3.55 - 3.69		SGG 0355			50
3.70 - 3.84		SGG 0375			50
4.20 - 4.39	3/2.00	SGG 0431			50
4.63 - 4.84	7/1.60	SGG 0480	7/1.60	LGG 0480L	50
4.85 - 5.04		SGG 0485			50
5.50 - 5.94	3/2.75	SGG 0593	3/2.75	LGG 0593L	50
5.95 - 6.19	7/2.00	SGG 0600			50
6.20 - 6.49		SGG 0620			40
6.50 - 7.01		SGG 0675	3/3.25	LGG 0700L	40
7.35 - 7.64		SGG 0750			30
7.65 - 7.99		SGG 0765			30
8.00 - 8.29	7/2.75	SGG 0825**	3/3.75 & 7/2.75	LGG 0825L	20
8.95 - 9.29		SGG 0895			20
9.30 - 9.69		SGG 0930			20
9.70 - 10.20	7/3.25 & 19/2.00	SGG 0975**	7/3.25	LGG 0975L	15
10.84 - 11.69	7/3.75	SGG 1125	7/3.75	LGG 1125L	20
11.85 - 12.19	7/4.00	SGG 1200			15
12.20 - 12.54		SGG 1220			15
13.06 - 13.97	19/2.75	SGG 1375**	19/2.75	LGG 1375L	5
16.00 - 16.40	19/3.25	SGG 1625	19/3.25	LGG 1625L	5

**Note: SGG0825, SGG0975 & SGG1375 are suitable for use with a standard thimble or with GY3 & GY4 insulators.

Heliformed® Line Fittings

Clevis Thimbles & Socket Thimbles

Type CTH - Aluminium for AAC, AAAC & ACSR Conductors

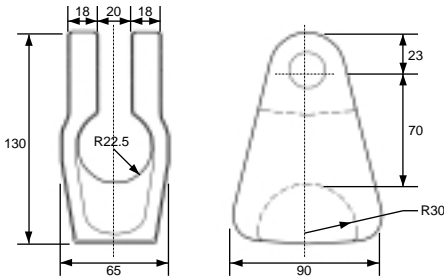
Type CAC - Galvanised MCI for SC/GZ Conductors

Type STH - Galvanised MCI for SC/GZ Conductors

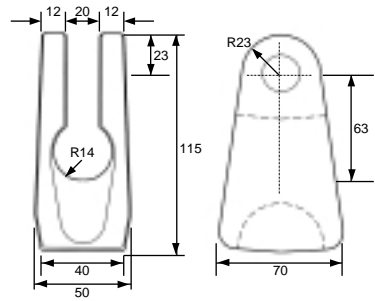
Materials

Aluminium alloy or galvanised MCI castings.

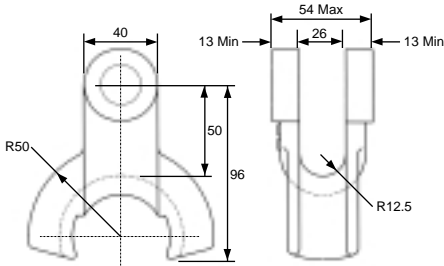
CTHL70*



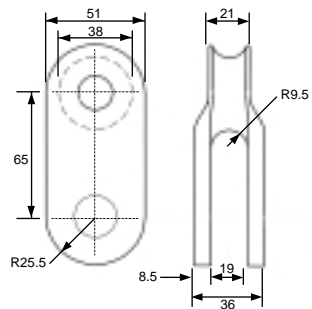
CTH70*



CAC120*



CAC438*

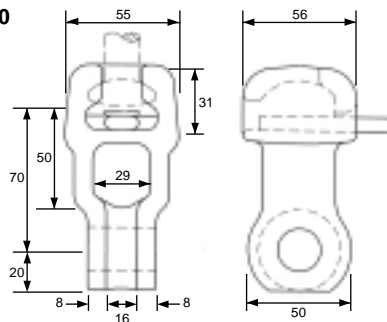


*Hardware

Add suffix 'A' for M16 bolt and nut assembly.

Add suffix 'Q' for 16mm dia. rivet and split pin assembly.

STH70



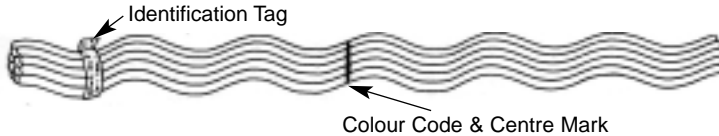
Armour Rods

Type AAR - Aluminium Alloy for AAC, AAAC and ACSR

Type CAR - Copper Alloy for Copper Conductors

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium Clad Steel for SC/AC Conductors



Application

Protection of conductors against bending & compressive stresses. Protection against abrasion & arcing damage. Repair of conductors having no more than 20% of outer strands damaged or broken.

Guide to Usage

As the degree of protection in specific situations is affected by such factors as line design, temperature, tension, exposure to wind flow, vibration history, etc., the following recommendations are made:

- (i) Armour Rods should be regarded as minimum protection for clamp style supports or suspension arrangements.
- (ii) They should be considered as minimum protection on hand tied, pin type construction of span lengths greater than 90M in urban areas, having no history of vibration.
- (iii) Armour Rods are not designed to act as vibration dampers. Their role is to provide conductors with an extra degree of protection at support points. In areas where a history of vibration is known, or where vibration is suspected, the supplementary use of Type SVD Heliformed® Spiral Vibration or Dogbone® Dampers should be considered.
- (iv) On pin type construction, the use of Helities® are recommended as being superior to usual armour-clamp arrangements.
- (v) At suspension points Heliformed® type HSU Suspension Units are recommended as superior to usual armour-clamp arrangements.

Restorative Repair

Armour Rods may be used to restore full conductivity and strength to aluminium, ACSR and copper conductors, where damage is outside of the support area and does not exceed 20% of the outer strand layer. Dulmison should be consulted when damage is located at the point of support. The conductor should be scratch brushed and greased prior to the application of Armour Rods used for repair.

Tapping

Heliformed® Armour Rods may be used as tap armour to protect conductors from wear and flash-over damage under hot line taps. Where tapping clamps are to be installed over the Armour Rods a moisture inhibitor, e.g. Alminox, should be applied. The conductor should be scratch brushed and greased prior to the application of Armour Rods used for tapping.

Heliformed® Line Fittings

Armour Rods

Type AAR - Aluminium Armour Rods for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Armour Rod	Std. Pack
4.95 - 5.29	7/1.75	3/4/1.75	AAR 0525	50
5.30 - 5.79			AAR 0530	50
5.80 - 6.19			AAR 0580	50
6.20 - 6.59			AAR 0620	50
6.60 - 6.94			AAR 0675	50
6.95 - 7.34			AAR 0695	50
7.35 - 7.84	7/2.50	6/1/2.50 - 3/4/2.50	AAR 0750	50
7.85 - 8.29	7/2.75	6/1/2.75	AAR 0785	40
8.30 - 8.79			AAR 0830	40
8.80 - 9.29	7/3.00	6/1/3.00 - 4/3/3.00	AAR 0900	40
9.30 - 9.89			AAR 0930	40
9.90 - 10.49			AAR 0990	25
10.50 - 11.09			AAR 1050	25
11.10 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	AAR 1125	25
11.80 - 12.44			AAR 1180	25
12.45 - 13.24			AAR 1245	25
13.25 - 13.99	7/4.50		AAR 1350	20
14.00 - 14.89	7/4.75	6/4.75 + 7/1.60	AAR 1430	20
14.90 - 15.39			AAR 1490	20
15.40 - 16.04			AAR 1540	15
16.05 - 16.64	19/3.25		AAR 1625	15
16.65 - 17.24			AAR 1665	15
17.25 - 17.89	19/3.50	30/7/2.50	AAR 1750	15
17.90 - 18.80	19/3.75		AAR 1875	10
18.81 - 19.89			AAR 1881	10
19.90 - 20.70			AAR 1990	5
20.71 - 21.49	37/3.00	30/7/3.00	AAR 2100	5
21.50 - 23.04	37/3.25	30/7/3.25	AAR 2150	5
23.60 - 24.80	19/4.75	30/7/3.50	AAR 2375	5
24.80 - 25.84			AAR 2480	5
25.85 - 26.30	37/3.75	54/7/3.00	AAR 2630	5
26.31 - 27.04			AAR 2700	5
27.05 - 27.89			AAR 2705	5
27.90 - 28.94			AAR 2790	5
28.95 - 29.49	61/3.25	54/7/3.25	AAR 2930	3
29.50 - 30.69			AAR 2950	3
30.70 - 32.24		54/7/3.50	AAR 3150	3
32.25 - 33.74			AAR 3225	3
33.75 - 35.34	61/3.75	54/3.75 + 19/2.25	AAR 3375	3

Heliformed® Line Fittings

Armour Rods

Type CAR - Copper Armour Rods for Copper Conductors

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium Clad Steel for SC/AC Conductors

Type CAR - Copper Armour Rods for Copper Conductor

Conductor Range	HDC Conductor Stranding	Copper Armour Rod	Std. Pack
4.88 - 5.29	7/1.75	CAR 0525	25
6.00 - 6.34	7/2.00	CAR 0600	25
7.50 - 7.99		CAR 0750	20
8.00 - 8.49	7/2.75 & 19/1.75	CAR 0825	20
8.50 - 8.94		CAR 0875	20
8.95 - 9.44		CAR 0900	15
9.45 - 9.99	7/3.25	CAR 0945	10
10.00 - 10.64	19/2.00	CAR 1000	10
11.45 - 12.09		CAR 1145	10
12.10 - 12.84	37/1.75 & 7/4.15	CAR 1225	10
12.85 - 13.59		CAR 1285	10
13.60 - 14.39	19/2.75	CAR 1375	5
14.40 - 15.04	19/3.00	CAR 1500	5
15.90 - 16.94		CAR 1590	5
16.95 - 17.84	37/2.50	CAR 1750	5
17.85 - 18.69		CAR 1785	5
18.70 - 19.49	37/2.75	CAR 1925	5

Type SAR - Galvanised Steel for SC/GZ Conductors

Type LAR - Aluminium clad Steel for SC/AC Conductors

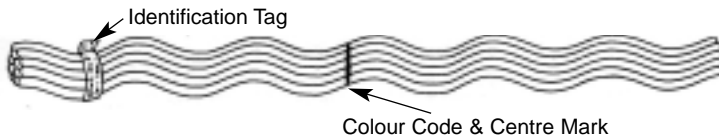
Conductor Range	SC/GZ Stranding	Galvanised Armour Rod	SC/AC Stranding	Aluminium Clad Armour rod	Std. Pack
4.10 - 4.39	3/2.00	SAR 0431			50
4.80 - 6.00	7/1.60, 7/2.00 & 3/2.75	SAR 0480D	3/2.75	LAR 0593L	50
6.75 - 7.27			3/3.25	LAR 0700L	25
7.35 - 7.84				LAR 0735L	25
7.85 - 8.29	7/2.75	SAR 0825	3/3.75 & 7/2.75	LAR 0825L	30
8.78 - 9.23			7/3.00	LAR 0900L	20
9.50 - 10.24		SAR 0975	7/3.25	LAR 0975L	20
11.10 - 11.79	7/3.75	SAR 1125	7/3.75	LAR 1125L	20
11.80 - 12.44	7/4.00	SAR 1200			10
12.45 - 13.24	19/2.50	SAR 1245	19/2.50	LAR 1245L	15
13.25 - 13.99	19/2.75	SAR 1375	19/2.75	LAR 1375L	10
15.75 - 16.51	19/3.25	SAR 1625	19/3.25	LAR 1625L	5

Note: Helities® and Distribution Ties are available for installation over Armour Rods.
Refer to table on Page 7-21.

Line Guards

Type ALG - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type CLG - Copper Alloy for Copper Conductors



Application

Line Guards may be regarded as a light duty version of the armour rod intended for protection of conductors against abrasion and arc-over. They may also be used as patch rods to conductors where damage has occurred.

Compatibility

Suited to highly polluted areas and coastal locations when used with appropriate conductor.

Guide to Usage

As with Armour Rods, the degree of protection afforded conductors against abrasion and arc-over is influenced by such factors as line design, temperature, tension, exposure to wind flow and vibration etc. The following may be taken as a guide:

- (i) Regard as a minimum protection for hand tied spans of less than 107m in urban areas with a history of vibration.
- (ii) It is recommended that Helities® be used in place of normal hand tie combinations on pin type construction.
- (iii) Line Guards are recommended where clamp type supports or suspensions are used or where there are hand tied spans of 91m or more. In these situations Heliformed® Armour Rods are preferable.
- (iv) Line Guards are not recommended where vibration is suspected.

Restorative Repair

Line Guards may be used to restore full conductivity and strength to aluminium, ACSR and copper conductors, where damage is outside of the support area and does not exceed 10 - 15% of the outer strand layer. Dulmison should be consulted when damage is located at the point of support. The conductor should be scratch brushed and greased prior to the application of Line Guards used for repair.

Tapping

Heliformed® Line Guards may be used as tap armour to protect conductors from wear and flash-over damage under hot line taps. Where tapping clamps are to be installed over the Line Guards a moisture inhibitor e.g. Alminox should be applied. The conductor should be scratch brushed and greased prior to application of Line Guards used for tapping.

Heliformed® Line Fittings

Line Guards

Type ALG - Aluminium Line Guards for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Line Guards	Std. Pack
5.25 - 5.59	7/1.75	3/4/1.75	ALG 0525	50
5.60 - 6.19			ALG 0560	50
6.20 - 6.59			ALG 0620	50
6.60 - 6.94	7/2.25		ALG 0675	50
6.95 - 7.34			ALG 0695	50
7.35 - 7.84	7/2.50	6/1/2.50 - 3/4/2.50	ALG 0750	50
7.85 - 8.29	7/2.75	6/1/2.75	ALG 0785	50
8.30 - 8.79			ALG 0830	50
8.80 - 9.29	7/3.00	6/1/3.00 - 4/3/3.00	ALG 0900	50
9.30 - 9.89			ALG 0930	50
9.90 - 10.49			ALG 0990	50
10.50 - 11.09			ALG 1050	50
11.10 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	ALG 1125	40
11.80 - 12.44			ALG 1180	25
12.45 - 13.24			ALG 1245	25
13.25 - 13.99	7/4.50		ALG 1350	25
14.00 - 14.89	7/4.75	6/4.75 + 7/1.60	ALG 1430	25
14.90 - 15.39			ALG 1490	25
15.40 - 16.04			ALG 1540	25
16.05 - 16.64	19/3.25		ALG 1625	25
16.65 - 17.24			ALG 1665	25
17.25 - 17.89	19/3.50	30/7/2.50	ALG 1750	25
17.90 - 18.80	19/3.75		ALG 1875	25
18.81 - 20.14			ALG 1881	25
20.15 - 21.34	37/3.00	30/7/3.00	ALG 2100	20
21.35 - 22.84	37/3.25	30/7/3.25	ALG 2135	15
22.85 - 24.24	19/4.75	30/7/3.50	ALG 2375	15
24.25 - 25.04			ALG 2450	15
25.05 - 25.84			ALG 2505	15
25.85 - 27.04	37/3.75	54/7/3.00	ALG 2625	10
27.05 - 27.89			ALG 2705	10
27.90 - 29.29			ALG 2925	10
29.30 - 30.69	61/3.25	54/7/3.25	ALG 2930	10
30.70 - 32.24		54/7/3.50	ALG 3150	10
32.25 - 33.74			ALG 3225	5
33.75 - 35.34	61/3.75	54/3.75 + 19/2.25	ALG 3375	5

Heliformed® Line Fittings

Line Guards

Type CLG - Copper Line Guards for Hard Drawn Copper (HDC) Conductors

Conductor Range	HDC Conductor Stranding	Copper Line Guard	Std. Pack
5.00 - 5.29	7/1.75	CLG 0525	50
6.00 - 6.34	7/2.00	CLG 0600	50
8.00 - 8.49	7/2.75 & 19/1.75	CLG 0825	25
8.50 - 8.94		CLG 0875	25
9.45 - 9.99	7/3.25	CLG 0945	25
10.00 - 10.39	19/2.00	CLG 1000	25
10.40 - 10.79		CLG 1050	15
10.80 - 11.44		CLG 1080	15
12.10 - 12.84	31/1.75 & 7/4.15	CLG 1225	15
13.60 - 14.39	19/2.75	CLG 1375	15
14.40 - 15.04	19/3.00	CLG 1500	10
16.95 - 17.84	37/2.50	CLG 1750	5
18.70 - 19.49	37/2.75	CLG 1925	5

Sizes of Helities® & Distribution Ties for fitting over Armour Rods

Conductor			Cond. Dia. mm	Armour Rods Cat. No.	Dia. over A/Rods	Helitie® Cat. No.	Distribution Tie Cat. No.
ACSR	AAC	SC/GZ					
---	---	7/1.60	4.80	SAR0480D	8.86	SWT0865(*)	SDT0865(*)
3/4/1.75	---	---	5.25	AAR0525	11.15	AWT1125(*)	LDT1125(*)
---	---	3/2.75	5.93	SAR0480D	10.00	SWT1036(*)	SDT1036(*)
3/4/2.50	---	---	7.50	AAR0750	14.80	AWT1430(*)	LDT1350(*)
6/1/3.00	7/3.00	---	9.0	AAR0900	16.30	AWT1625(*)	LDT1625(*)
6/1/3.75	7/3.75	---	11.25	AAR1125	19.37	AWT1900(*)	LDT1900(*)
---	7/4.50	---	13.50	AAR1350	22.44	AWT2150(*)	LDT2150(*)
6/4.75 + 7/1.60	7/4.75	---	14.30	AAR1430	23.24	AWT2290(*)	LDT2290(*)
---	19/3.25	---	16.25	AAR1625	26.01	AWT2588(*)	LDT2588(*)
---	19/3.75	---	18.75	AAR1875	28.51	AWT2751(*)	LDT2751(*)

***Note:** When ordering Helities® and Distribution Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Heliformed® Line Fittings

Helities®

Type AWT - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type SWT - Galvanised Steel for SC/GZ Conductors

Features

Superior to hand ties with Armour Rods Helitie® pad, and Neoprene pad provides improved protection against abrasion and fatigue under wind sway and vibration.



Line Angles

Lines angles of up to 10 degrees can be accommodated. Larger angles can be obtained using Side Ties with pins and brackets of varying cant.

Type AWT - Aluminium Helities® for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Helitie®	Std. Pack
6.30 - 6.59			AWT0630(*)	50
6.60 - 6.84	7/2.25		AWT0675(*)	50
6.85 - 7.14			AWT0685(*)	50
7.40 - 7.69	7/2.50	6/1/2.50 - 3/4/2.50	AWT0750(*)	50
9.00 - 9.34	7/3.00	6/1/3.00 - 4/3/3.00	AWT0900(*)	50
10.45 - 11.14			AWT1045(*)	50
11.15 - 11.79	7/3.75	6/1/3.75 - 4/3/3.75	AWT1125(*)	50
11.80 - 12.89			AWT1180(*)	50
12.90 - 14.09	7/4.50		AWT1350(*)	50
14.10 - 15.09	7/4.75	6/4.75+7/1.60	AWT1430(*)	50
15.10 - 16.04			AWT1510(*)	50
16.05 - 16.89	19/3.25		AWT1625(*)	50
16.90 - 17.94	19/3.50	30/7/2.50	AWT1750(*)	50
17.95 - 18.99	19/3.75		AWT1875(*)	50
19.00 - 20.19			AWT1900(*)	50
20.20 - 21.49	37/3.00	30/7/3.00	AWT2020(*)	50
21.50 - 22.89	37/3.25	30/7/3.25	AWT2150(*)	50
22.90 - 24.34	19/4.75	30/7/3.50	AWT2290(*)	20
25.88 - 27.50	37/3.75	54/7/3.00	AWT2588(*)	20
28.70 - 30.30	61/3.25	54/7/3.25	AWT2950(*)	10

Type SWT - Galvanised Steel Helities® for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galvanised Steel Helitie®	Std. Pack
4.85 - 5.04		SWT0485(*)	50
5.58 - 6.16	3/2.75+7/2.00	SWT0593(*)	50
7.37 - 7.75		SWT0765(*)	50
7.76 - 8.35	7/2.75	SWT0825(*)	50
8.65 - 8.99		SWT0865(*)	50
9.50 - 10.30	7/3.25 & 19/2.00	SWT1036(*)	50
11.76 - 12.19	7/4.00	SWT1176(*)	50

***Note:** When ordering Helities®, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

- For conductor diameters over 21.50 we recommend that an insulator be supplied to us to ensure correct application for fitting.

Side Ties

Type AST - Aluminium Alloy for AAC, AAAC & ACSR Conductors



Application

For securing conductors to the side groove on both pin and post type insulators.

Features

Resilient Neoprene pad eliminates conductor abrasion at insulator interface, which is generated by wind sway and vibration. In such locations, Heliformed® side ties are equivalent to armour rod combinations with regard to conductor fatigue. At locations with a history of fatigue damage or excessive vibration, Heliformed® Spiral Vibration Dampers, Type SVD are recommended.

Type AST - Aluminium Side Ties for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Helitie®	Std. Pack
4.95 - 5.29	7/1.75	3/4/1.75	AST0525(*)	50
7.23 - 7.79	7/2.50	6/1/2.50 - 3/4/2.50	AST0750(*)	50
9.00 - 9.34	7/3.00	6/1/3.00 - 4/3/3.00	AST0900(*)	50
10.45 - 11.14			AST1045(*)	50
11.15 - 11.80	7/3.75	6/1/3.75 - 4/3/3.75	AST1125(*)	50
13.00 - 14.00	7/4.50		AST1350(*)	50
14.00 - 15.10	7/4.75	6/4.75+7/1.60	AST1430(*)	50
15.10 - 16.04			AST1510(*)	50
16.04 - 16.89	19/3.25		AST1625(*)	50
16.90 - 17.94	19/3.50	30/7/2.50	AST1750(*)	50
17.95 - 18.99	19/3.75		AST1875(*)	50
19.00 - 20.19			AST1900(*)	50
20.59 - 21.64	37/3.00	30/7/3.00	AST2100(*)	30
22.63 - 23.95	37/3.25	30/7/3.25	AST2375(*)	30
27.80 - 30.70	61/3.25	54/7/3.25	AST2950(*)	10

***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Heliformed® Line Fittings

Side Ties

Type LST - Aluminium Clad Steel for SC/GZ Conductors

Type SST - Galvanised Steel for SC/GZ Conductors

Type LST - Aluminium Clad Steel Side Tie for SC/AC Conductor Left Hand Lay standard

Conductor Range	SC/AC Stranding	Aluminium Clad Steel Side Tie	Std. Pack
5.05 - 5.29		LST0525(*)	50
5.75 - 5.99	3/2.75	LST0593(*)	50
7.29 - 8.05	3/3.75	LST0750(*)	50
8.47 - 9.35	7/3.00	LST0900(*)	50
10.46 - 11.11		LST1046(*)	50
11.15 - 11.74	7/3.75	LST1125(*)	50
14.10 - 15.09		LST1410(*)	50
16.05 - 16.89	19/3.25	LST1625(*)	50
16.87 - 17.94		LST1750(*)	50
17.95 - 18.99		LST1875(*)	40
19.00 - 20.00		LST1900(*)	40
22.90 - 24.60		LST2290(*)	25
25.88 - 27.50		LST2588(*)	25
27.51 - 30.34		LST2850(*)	25

Note: LST Side Ties may also be used on AAC, AAAC and ACSR conductors.

***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Type SST - Galvanised Steel Side Tie for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galvanised Steel Side Tie	Std. Pack
4.80 - 5.00	7/1.60	SST0480(*)	50
5.58 - 6.16	7/2.00 & 3/2.75	SST0593(*)	50
7.80 - 8.59	7/2.75	SST0825(*)	25
9.18 - 10.13		SST0975(*)	20
10.84 - 11.69	7/3.75	SST1125(*)	20
13.30 - 14.09	19/2.75	SST1375(*)	15
14.82 - 16.36	19/3.25	SST1575(*)	10

Note: LST Side Ties may also be used on AAC, AAAC and ACSR conductors.

***Note:** When ordering Side Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Distribution Ties

Type LDT - Aluminium Clad Steel for AAC, AAAC & ACSR Conductors

Type SDT - Galvanised Steel for SC/GZ Conductors



Application

For securing conductors in the top groove on both pin and post type insulators. Light duty version of a Helitie®.

Features

Resilient Neoprene pad eliminates conductor abrasion at insulator interface, which is generated by wind sway and vibration. They are recommended as an improvement, over armour rods secured with hand tire wire, as well as clamp top insulators.

Type LDT - Aluminium Clad Steel Distribution Ties for AAC, AAAC & ACSR Conductor

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Aluminium Clad Distribution Tie	Std. Pack
4.80 - 5.49	7/1.75	3/4/1.75	LDT0525(*)	50
5.50 - 6.24			LDT0593(*)	50
6.25 - 7.04	7/2.25		LDT0625(*)	50
7.05 - 7.99	7/2.50	6/1/2.50 - 3/4/2.50	LDT0750(*)	50
8.47 - 9.35	7/3.00	6/1/3.00 - 4/3/3.00	LDT0900(*)	50
10.59 - 11.69	7/3.75	6/1/3.75 - 4/3/3.75	LDT1125(*)	50
13.25 - 14.94	7/4.50 & 7/4.75	6/4.75+7/1.60	LDT1350(*)	50
14.95 - 16.99	19/3.25		LDT1625(*)	50
17.00 - 18.25	19/3.50	30/7/2.50	LDT1750(*)	50
18.25 - 19.23	19/3.75		LDT1875(*)	50
19.76 - 21.75	37/3.00	30/7/3.00	LDT2150(*)	50
21.75 - 24.58	37/3.25 & 19/4.75	30/7/3.25 & 30/7/3.50	LDT2290(*)	25
24.59 - 26.50	37/3.75	54/7/3.00	LDT2588(*)	25
27.10 - 30.20	61/3.25	54/7/3.25	LDT2950(*)	25

Type SDT - Galvanised Steel Distribution Tie for SC/GZ Conductor

Conductor Range	SC/GZ Stranding	Galvanised Steel Distribution Tie	Std. Pack
5.58 - 6.16	7/2.00 & 3/2.75	SDT0593(*)	50
8.00 - 9.09	7/2.75	SDT0865(*)	25
9.10 - 10.30		SDT0910(*)	20

***Note:** When ordering Distribution Ties, nominate insulator type and neck diameter as follows:

- Add suffix 7 to catalogue number for insulators with 76mm neck diameter
- Add suffix 9 for 90mm neck diameter, and
- Add suffix 1 for 112mm neck diameter.

Heliformed® Line Fittings

Line Splices

Type ALS - Aluminium Alloy for AAC & AAAC Conductors



Application

Joining and restorative repair on conductors of aluminium, copper and galvanised steel.

Conductivity

In all cases - aluminium alloy, copper and galvanised steel - Heliformed® Line Splices will provide conductivity equal to, or better than, an equivalent length of unspliced conductor. To ensure a good long term joint, the conductor must be scratch brushed and greased prior to the application of the splice.

Holding Strength

On all aluminium, copper and galvanised steel conductors of homogeneous stranding, Heliformed® Line Splices will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004.

Compatibility

As Heliformed® Line Splices relate to their conductor materials - aluminium, copper and galvanised steel - problems due to incompatibility do not arise.

Installation Pointers

Heliformed® Line Splices should not be reused after original installation. Restorative repair should be limited to damage in the span and should not be used at the point of support. Installation should not be closer than 150mm to existing Armour Rods or Line Splice.

Conductor Range	AAC & AAAC Stranding	Aluminium Alloy Splices	Std Pack
5.00 - 5.39	7/1.75	ALS 0525	50
6.25 - 6.54		ALS 0625	50
6.55 - 6.89	7/2.25	ALS 0675	50
6.90 - 7.14		ALS 0690	50
7.35 - 7.59	7/2.50	ALS 0750	50
8.30 - 8.64		ALS 0830	40
8.95 - 9.35	7/3.00	ALS 0900	40
10.15 - 10.49		ALS 1015	20
10.80 - 11.29	7/3.75	ALS 1125	15
13.24 - 13.84	7/4.50	ALS 1350	10
13.85 - 14.44	7/4.75	ALS 1430	10
15.10 - 15.69		ALS 1510	10
15.70 - 16.39	19/3.25	ALS 1625	5
17.05 - 17.79	19/3.50	ALS 1750	5
17.80 - 18.54		ALS 1780	5
18.55 - 19.34	19/3.75	ALS 1875	5
19.35 - 20.14		ALS 1989	5
20.14 - 20.99		ALS 2025	5
21.00 - 21.59	37/3.00	ALS 2100	5
22.89 - 24.68	37/3.25 & 19/4.75	ALS 2375	3
25.65 - 26.69	37/3.75	ALS 2625	2
26.70 - 27.74		ALS 2700	2
28.54 - 30.00	61/3.25	ALS 2930	2

Heliformed® Line Fittings

Line Splices

Type CLS - Copper Line Splices for HDC Conductors

Type LLS - Aluminium Clad Steel Line Splices for SC/AC Conductors

Type CLS - Copper Line Splices for HDC Conductor

Conductor Range	HDC Conductor Stranding	Copper Alloy Splices	Std Pack
3.90 - 4.21	7/1.35	CLS 0400	50
4.80 - 5.25	7/1.75	CLS 0525	50
6.00 - 6.27	7/2.00	CLS 0600	50
6.54 - 6.87		CLS 0660	50
7.40 - 7.69		CLS 0740	30
7.70 - 8.09		CLS 0770	20
8.10 - 8.75	7/2.75 & 19/1.75	CLS 0825D	20
8.76 - 9.23		CLS 0900	15
9.24 - 9.99	7/3.25	CLS 0965	10
10.00 - 10.54	19/2.00 & 7/3.50	CLS 1000	10
10.55 - 11.08		CLS 1068	10
11.25 - 11.69	19/2.75	CLS 1125	10
12.05 - 12.54	37/1.75 & 7/4.15	CLS 1225	10
12.55 - 13.09		CLS 1255	10
13.65 - 14.09	19/2.75	CLS 1375	5
14.50 - 15.04	19/3.00	CLS 1500	5
16.39 - 17.66	37/2.50	CLS 1750	5
18.09 - 18.67		CLS 1809	5
18.68 - 19.64	37/2.75	CLS 1885	5
19.65 - 20.48		CLS 1965	2
20.49 - 21.54		CLS 2100	2
23.00 - 23.94		CLS 2300	2
28.43 - 30.65		CLS 2950	2

Type LLS - Aluminium Clad Steel Line Splices for SC/AC Conductor (Left Hand Lay standard)

Conductor Range	SC/AC Stranding	Aluminium Clad Line Splices	Std Pack
5.25 - 5.60		LLS 0525L	50
5.60 - 5.94	3/2.75	LLS 0593L	50
6.75 - 7.27	3/3.25	LLS 0700L	50
8.00 - 8.29	3/3.75 & 7/2.75	LLS 0825L	20
9.70 - 10.04	7/3.25	LLS 0975L	20
10.84 - 11.69	7/3.75	LLS 1125L	20
13.25 - 14.29	19/2.75	LLS 1375L	5
15.75 - 16.51	19/3.25	LLS 1625L	5

Line Splices

Type SLS - Galvanised Steel Line Splices for SC/GZ Conductors

Type SLS - Galvanised Steel Line Splices for SC/GZ Conductor

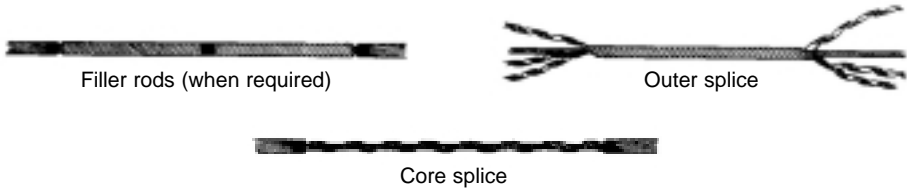
Conductor Range	SC/GZ Stranding	Galv. Steel Line Splices	Std Pack
2.45 - 2.64		SLS 0245	50
4.15 - 4.49	3/2.00	SLS 0431	50
4.50 - 4.99	7/1.60	SLS 0480	50
5.50 - 5.94	3/2.75	SLS 0593	50
5.95 - 6.19	7/2.00	SLS 0600	50
6.51 - 7.01		SLS 0675	50
7.35 - 7.64		SLS 0735	30
7.92 - 8.29	7/2.75	SLS 0825	30
9.70 - 10.04		SLS 0975	20
11.15 - 11.49	7/3.75	SLS 1125	20
11.85 - 12.19	7/4.00	SLS 1200	10
3.05 - 13.99	19/2.75	SLS 1375	10
16.00 - 16.44	19/3.25	SLS 1625	5

Heliformed® Line Fittings

Full Tension Line Splices

Type FTS - Galvanised Steel & Aluminium Alloy for 6/1 or 30/7 ACSR Conductors

Type MSS - Galvanised Steel & Aluminium Alloy for 3/4 or 4/3 ACSR Conductors



Application

Full Tension Splices have been designed for joining ACSR. Two types of Full Tension Splices are available -

Type FTS - Multi Piece Construction - designed to hold both the inner steel core of the conductor, as well as the outer layers. This is of particular importance on conductors with greased cores. Filler rods may be needed on 30/7 type conductors to bridge the gap between the inner core and the outer strands, for attachment of the outer splice layer.

Type MSS - Multi Strand Construction - designed for installations on 3/4 or 4/3 type conductors. The fitting is comprised of a mixture of galvanised steel and aluminium strands, which typically match the number and strength of those used in the conductor.

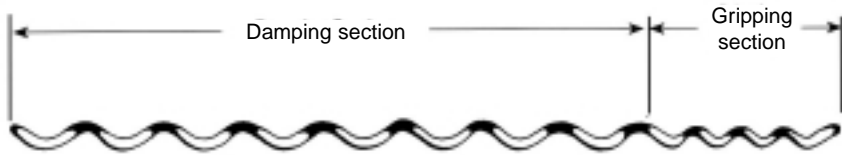
Rated Holding Strengths

On ACSR conductors, FTS and MSS fittings will hold a minimum of 90% of the ultimate tensile strength of the conductor as required by Australian Standard AS1154.1 - 2004. Splices should not be reapplied after original installation.

ACSR Conductor Stranding	FTS Full Tension Splice	MSS Multi Strand Splice	Std. Pack
3/4/1.75		MSS 0525	50
6/1/2.50	FTS 0750		30
3/4/2.50		MSS 0750	50
6/1/3.00	FTS 0900		20
4/3/3.00		MSS 0900	25
6/1/3.75	FTS 1125		10
4/3/3.75		MSS 1125	20
6/4.75 + 7/1.60	FTS 1430		10
30/7/2.50	FTS 1750		5
30/7/3.00	FTS 2100		5

Spiral Vibration Dampers

Type SVD - for all AAC, AAAC, ACSR, Copper, SC/AC & SC/GZ Conductors



Application

Spiral Vibration Dampers are designed to reduce aeolian vibration in conductors, generated by wind turbulence for conductors between 4.4mm and 19.3mm OD.

Vibration control would be recommended in areas as follows:

- In Rural Areas
- Where are normally associated with top tie insulators
- Where spans exceed 107m and/or 15% tension 16⁰C
- As an important supplemental protection at deadends, also at Armour Rods, Helities[®], Side Ties and similar tangent support hardware

Materials

Spiral Vibration Dampers are made of solid, non-corrosive high impact strength UV resistant PVC rod. Material withstands ambient temperatures in the range -40⁰ to 70⁰C.

Installation

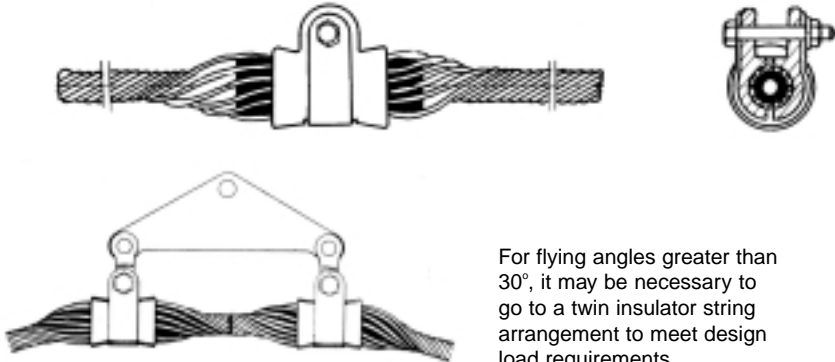
Engineering calculations are unnecessary for placement. The Gripping Section should be installed approximately 100mm to 120mm from Deadends, Armour Rods or other conductor hardware. Generally, one Spiral Vibration Damper at each end of a span is adequate. However, for spans exceeding 245 metres (800 feet), two Spiral Vibration Dampers at each end of the span are recommended.

Conductor Dia. Range mm	Catalogue Number	Std. Pack	Colour Code
4.41 - 6.34	SVD 0441	25	Red
6.35 - 8.29	SVD 0635	25	Blue
8.30 - 11.72	SVD 0830	25	Black
11.73 - 14.31	SVD 1173	25	Yellow
14.32 - 19.30	SVD 1432	8	Green

Heliformed® Suspension Units

Type HSU - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Type SHS - Galvanised Steel for SC/GZ Conductors



For flying angles greater than 30°, it may be necessary to go to a twin insulator string arrangement to meet design load requirements.

Application

1. For the reduction of static stresses at conductor suspension points and to provide greater protection to conductors against the dynamic stresses of aeolian vibration.
2. To give conductors protection against impulse and flash-over.
3. To protect conductors against abrasion, bending and compression stresses. The protection offered by HSU fittings is superior to armour-clamp combinations.
4. To install line angles up to and including 30° and, through use of double units, up to 60°.

Materials

- Bolt and Nut - Galvanised steel
- Split pin - Stainless steel, humpback
- Strap - High strength aluminium alloy
- Neoprene insert - Formulated for resistance to ozone attack, weathering and temperature extremes. Design embodies aluminium alloy reinforcement moulded into the neoprene.
- Housing - For conductor sizes up to 9.9mm OD and for SC/GZ conductors, housings are pressed galvanised steel. For larger conductors, housings are high strength aluminium castings.

Heliformed® Line Fittings

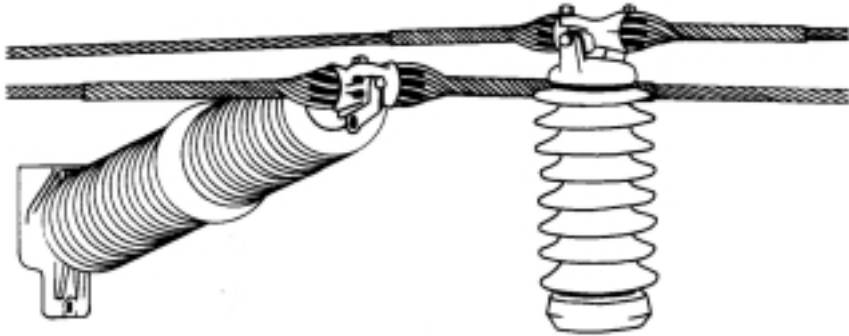
Heliformed® Suspension Units

Type HSU - Aluminium Alloy for AAC, AAAC & ACSR Conductors

Conductor Range	AAC/AAAC Stranding	ACSR Stranding	Heliformed® Suspension Unit
7.23 - 7.79	7/2.50	6/1/2.50 - 3/4/2.50	HSU 0750
7.70 - 8.34	7/2.75	6/1/2.75	HSU 0825
8.35 - 9.04	7/3.00	6/1/3.00 - 4/3/3.00	HSU 0900
9.05 - 9.89			HSU 0975
9.90 - 10.64			HSU 1050
10.65 - 11.44	7/3.75	6/1/3.75 - 4/3/3.75	HSU 1125
11.45 - 12.24			HSU 1145
12.25 - 13.04	7/4.50		HSU 1270
13.05 - 13.79			HSU 1350
13.80 - 14.59	7/4.75	6/4.75 + 7/1.60	HSU 1430
14.60 - 15.09			HSU 1460
15.10 - 15.75			HSU 1510
15.76 - 16.36	19/3.25	30/7/2.50	HSU 1625
16.40 - 17.09			HSU 1640
17.10 - 17.54	19/3.50		HSU 1750
17.55 - 18.04			HSU 1755
18.05 - 18.59			HSU 1805
18.60 - 19.09	19/3.75		HSU 1875
19.10 - 19.54			HSU 1910
19.55 - 20.19			HSU 1955
20.20 - 20.94			HSU 2020
20.95 - 21.49	37/3.00	30/7/3.00	HSU 2100
21.50 - 22.09			HSU 2150
22.10 - 22.69			HSU 2210
22.70 - 23.04	37/3.25	30/7/3.25	HSU 2270
23.05 - 23.84	19/4.75		HSU 2375
23.85 - 24.44			HSU 2385
24.45 - 25.04		30/7/3.50	HSU 2450
25.05 - 25.54			HSU 2505
25.55 - 26.44	37/3.75		HSU 2625
26.45 - 27.29		54/7/3.00	HSU 2700
27.30 - 27.69			HSU 2730
27.70 - 28.39			HSU 2770
28.40 - 28.89			HSU 2840
28.90 - 29.89	61/3.25	54/7/3.25	HSU 2930
29.90 - 30.69			HSU 2990
30.70 - 31.14			HSU 3070
31.15 - 31.99		54/7/3.50	HSU 3150
32.00 - 32.69			HSU 3200
32.70 - 33.39			HSU 3270
33.40 - 34.44	61/3.75	54/3.75 + 19/2.25	HSU 3375
34.94 - 37.66			HSU 3625

Heliformed® Support Units

Type HSP - Aluminium Alloy for AAC, AAAC & ACSR Conductors



Application

To protect conductors against fatigue, abrasion, stress damage and aeolian vibration damage when supported on line post insulators either upright or horizontally.

Materials

The unit comprises of two reinforced neoprene cushion halves for enclosing the conductor within an aluminium rod cage secured by two piece aluminium housing fitted with two hex head cap screws. The assembly mounts directly on the trunnion cap of the horizontal or upright line post insulator.

Features

Permits optimum tensioning of conductors with complete safety. Cushioned support grips the conductor gently distributing clamping stresses over a wide support area. Can accommodate line angles up to 30 degrees.

Conductor		Cond. Dia. mm	Heliformed® Support Unit	Colour Code
AAC/AAAC	ACSR			
7/3.75	6/1 + 4/3/3.75	11.25	HSP1125	Black
7/4.50	---	13.50	HSP1350	Green
7/4.75	6/4.75 + 7/1.60	14.30	HSP1430	Blue
19/3.25	---	16.25	HSP1625	Orange
---	30/7/2.50	17.50	HSP1750	Blue
19/3.75	---	18.75	HSP1875	Black

Heliformed® Line Fittings

Guy Lok

Type SGL - Galvanised Steel for SC/GZ Conductors



Application

For use with galvanised steel guy strand in most guying applications. Heliformed® Guy Loks are used for a neat, high strength and fast way to secure pole anchoring guys.

Description

Heliformed® Guy Loks are designed to replace the heavier, conventional arrangements of nuts, bolts and thimbles etc. with a low profile, high strength Heliformed® Guy Lok that is quickly made and presents a neat finished appearance.

They take only moments to install or just about as long as it takes to secure one nut and bolt. Once the Heliformed® Guy Lok is in position, the assembly is complete and permanent.

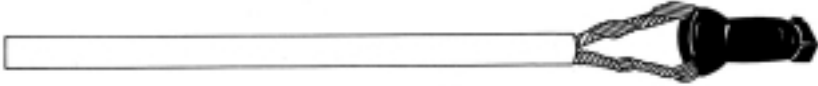
Guide to Usage

Heliformed® Guy Loks are used in single construction at the pole top where the “wrap around” method of construction is designed. It has been established that the Heliformed® Guy Lok will remain fully operative under the most difficult conditions, tension, impact, temperature extremes, in fact, any force to be met in functional performances.

Conductor		Heliformed® Guy Lok	Std. Pack	Colour Code
SC/GZ	Dia. mm			
3/2.00	4.31	SGL0431	50	Yellow
7/1.60	4.80	SGL0480	50	Black
3/2.75	5.93	SGL0593	50	White
7/2.00	6.00	SGL0600	50	Yellow
7/2.75	8.25	SGL0825	50	White
7/3.25	9.75	SGL0975D	40	Orange
19/2.00	10.00	SGL0975D	40	Yellow
7/3.75	11.25	SGL1125	25	Black
7/4.00	12.00	SGL1200	25	Black
19/2.75	13.75	SGL1375	10	White
19/3.25	16.25	SGL1625	10	Orange

Guy Guards

Type PGG - Plastic guy guard



Application

Intended where anchor / pole guys are exposed to cattle, pedestrian or vehicular traffic. To give high visibility to pole anchoring guys, and thereby collision protection in exposed positions. The plastic material is selected for its ability to retain good physical characteristics within a range of extreme temperatures. Fade resistant, gloss white, light weight PVC.

Guide to Usage

Standard lengths are shown in the table, but other lengths can be made to order.

Available in helically split or unsplit for use on existing or new installations.

Plastic Guy Guard	Internal Diameter mm	Standard Length m	Std. Pack
PGG2	25	1.8	50
PGG2S	25	1.8	50
PGG2520	25	2.0	50
PGG2520S	25	2.0	50
PGG3020	30	2.0	50
PGG3020S	30	2.0	50
PGG3025	30	2.5	50
PGG3	35	2.4	20

Note: "S" denotes Guy Guard is split helically along its length for installation on existing guys.

Heliformed® Line Fittings

Bird & Swan Flight Diverters

Type BD/BFD/SD - for all types of conductors

Application

Bird Flight Diverters provide a visual image which helps birds avoid collisions with power lines. Studies show that proper installation of the flight diverters may reduce collisions by up to 90%.

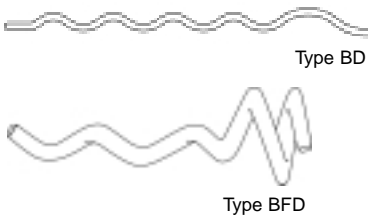
Materials

Bird flight diverters are made from solid, non-corrosive, high impact strength, UV resistant PVC rod. The material withstands ambient temperatures in the range -40° to 70° and type BD is orange in colour as this has proven to be most effective in terms of sighting by various bird species. Type BFD are grey in colour but yellow is available by adding the suffix '-Y' to the catalogue number.

Installation

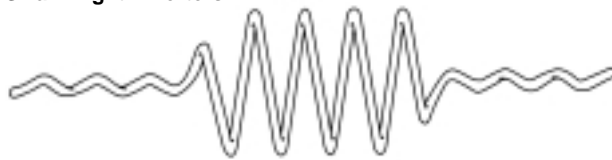
Recommended spacing for Bird Flight Diverters is 5 metres apart on each outer conductor phase, with one phase staggered at half a pitch out of line. In the case of Swan Flight Diverters, installation is recommended at a 3 - 5 meter spacing alternated evenly across all conductor phases.

Bird Flight Diverters



Conductor Dia. Range mm	Catalogue Number	Std. Pack	Colour Code
4.41 - 6.34	BD 0441	50	Red
6.35 - 8.29	BD 0635	50	Blue
8.30 - 11.72	BD 0830	50	Black
11.73 - 14.31	BD 1173	50	Yellow
14.32 - 19.30	BD 1432	50	Green
19.30 - 21.80	BFD1960	50	Red
21.80 - 24.60	BFD2220	50	Blue
24.60 - 26.70	BFD2460	50	Brown
26.70 - 28.70	BFD2700	50	Green
28.70 - 30.80	BFD3035	50	Red

Swan Flight Diverters



Cat. No.	Conductor Range mm	Rod Dia mm	Overall Length mm	O.D. of Diverter Coil	Colour Code	Weight kg
SFD0445	4.4 - 6.3	9.5	508	175	Black	0.18
SFD0635	6.4 - 8.9	9.5	584.2	175	Blue	0.21
SFD0890	9.0 - 11.4	9.5	635	188	Brown	0.23
SFD1140	11.4 - 15.2	9.5	889	200	Green	0.32
SFD1520	15.2 - 19.6	12.7	965.2	200	Purple	0.64
SFD1960	19.6 - 21.8	12.7	965.2	200	Red	0.64
SFD2220	21.8 - 24.6	12.7	1016	200	Blue	0.68
SFD2460	24.6 - 26.7	12.7	1016	200	Brown	0.68
SFD2700	26.7 - 28.7	12.7	1168.4	200	Green	0.91
SFD3035	28.8 - 30.8	12.7	1168.4	200	Red	0.91

Low Voltage Spreader Rods

Type LVS & FGS - for all types of conductors

Application

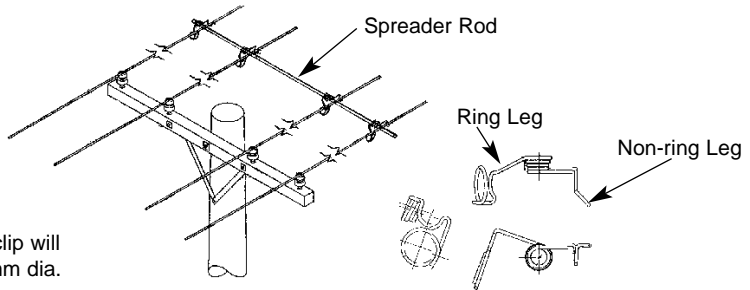
Dulmison Low Voltage Spreader Rods are used to maintain the required midspan spacing of low voltage conductors and thus preventing clashing.

Material

Low Voltage Spreader Rods are made from solid, non-corrosive high impact strength UV resistant PVC rod, or pultruded smooth skinned UV stabilised fibreglass. Material withstands ambient temperatures in the range -40°C to 70°C and is white in colour.

Installation

The spring clips are first fitted to the spreader rod at the required conductor spacings whilst on the ground. The two legs of the clip are hand sprung towards each other to enlarge the hole opening, slid along the spreader rod into position and released. Using the appropriate safety procedures, the assembled spreader rod is laid across the conductors at the midspan location. The non-ring leg of the spring clip is first hooked under the conductor, followed by the ring leg.



Note: Spring clip will suit up to 16mm dia. conductor

Stainless steel spring clip
Cat. No. FGSS125

Length	Catalogue Number	Std. Pack	Material
1350	LVS12135	50	PVC
1800	LVS12180	40	PVC
2100	LVS12210	30	PVC
2400	LVS12240	30	PVC
2700	LVS12270	25	PVC
3000	LVS12300	25	PVC
2000	FGSR125-2	25	Fibreglass
2100	FGSR125-2-1	25	Fibreglass
2500	FGSR125-2-5	25	Fibreglass
3000	FGSR125-3	25	Fibreglass

Heliformed® Line Fittings

Order/Inquiry Information Sheet

All to be supplied to AS1154 and AS2395 standard dimensions unless specified otherwise

Conductor Stranding
 Conductor Diametermm
 Conductor Code Name
 Quantity Required

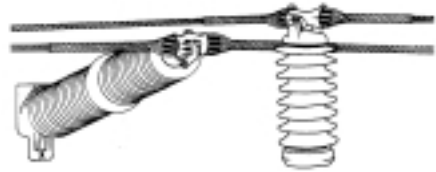
Please copy this sheet, fill in the relevant details & forward to the Dulmison sales office in your region.

Company:.....
 Contact Name:.....
 Phone No:.....
 Fax/email:.....

Heliformed® Suspension Units



Heliformed® Support Units



Assembly supplied with M16 bolts as standard. Can also be supplied with M20 bolt to suit 160kN tongue fittings. Please clearly indicate type required.

M16

M20



08

Low voltage ABC fittings (Aerial Bundle Conductor)

- > Insulation Piercing Connectors (IPC's)
- > House Service Connectors
- > Bare to Insulated Conductors
- > Mains Connection Boxes
- > Full Tension – Pre-Insulated Sleeves
- > Non Tension – Pre-Insulated Sleeves
- > Pre-Insulated Lugs
- > Tooling for Pre-Insulated Sleeves and Lugs
- > Strain Clamps – Mains and Service
- > Suspension Clamps
- > Roller Clamps
- > Pole Fuse (Fused Switch Disconnect)
- > Pole Hardware
- > Façade Mounting Brackets
- > Stripping Tools
- > Assembly and Stringing Tools

Insulation Piercing Connectors

Dulmison, through its partnership with Michaud in France, provide a comprehensive range of Insulation Piercing Connectors - IPC's. Michaud's dedication to product quality and technical performance makes them a market leader in the manufacture of IPC's - worldwide.

The range of Michaud IPC products available include;

- Insulated Mains to Insulated Mains
- Insulated Mains to Insulated Service

- Bare Mains to Insulated Mains
- Bare Mains to Insulated Service

- 2 Stage Connectors, for Live Line Connections

- Insulated Mains to Multiple Insulated Service

- Short Circuiting - Test



Features of all Michaud IPC's are;

- Insulated types suit both Aluminium and Copper Cables - Bi-Metallic
- Conform to the requirements of AS/NZS4396
- Plastic Components are UV Stabilised Glass reinforced Polymer
- All Fasteners are Stainless Steel
- All Connections are made using Torque controlled Shear Off screw
- Connectors are completely water tight to prevent corrosion
- Di-electric Strength in water is over 6kV
- Flexible End sealing caps
- Fastener thread is shielded from cable area, to eliminate cable damage whilst tightening
- Bare connections are made through contact plates compatible to conductor type
- Permanently engraved with Traceability information
- Clearly labelled with Application ranges.

Please see the following pages for full details of available products.

Insulation Piercing Connectors

Insulated cable to insulated cable (Aluminium or Copper)

Cat No.	Fig No.	Cable Range 1 mm ²	Cable Range 2 mm ²	No. of Bolts	Shear Head A/F mm
K440	1	10 - 95	1.5 - 6	1	13
K441	1	25 - 95	6 - 35	1	13
K442	1	35 - 150	1.5 - 25	1	13
K443	1	35 - 150	6 - 35	1	13
K445	1	25 - 95	25 - 95	1	17
K446	2	50 - 150	50 - 150	2	17



Fig. 1



Fig. 2

Bare cable to insulated (Aluminium or Copper) cable

Cat No.	Fig No.	Bare Cable Material	Bare Cable Size mm ²	Insulated Cable Size mm ²	No. of Bolts	Shear Head A/F mm	Type of Piercing Connection
K470	3	Copper	7 - 95	6 - 35	1	13	Standard
K472	4	Copper	7 - 120	25 - 95	1	17	Standard
K474	5	Copper	50 - 240	35 - 150	2	17	Standard
K471	3	Aluminium	7 - 95	35 - 150	1	13	Standard
K473	4	Aluminium	7 - 120	25 - 95	1	17	Standard
K475	5	Aluminium	35 - 240	50 - 150	2	17	Standard
K235	6	Copper	7 - 95	6 - 35	1	13	Two Stage*
K236	6	Aluminium	7 - 95	6 - 35	1	13	Two Stage*

* Two Stage IPC's, are able to be installed whilst conductor is under load, up to max of 100A.



Fig. 3



Fig. 4



Fig. 5



Fig. 6

Insulation Piercing Connectors

Insulated cable to multiple insulated cables (Aluminium or Copper)

Cat No.	Fig No.	Cable Range 1 mm ²	Cable Range 2 mm ²	No. of Taps	No. of Bolts	Shear Head A/F mm
K390	1	35 - 150	6 - 25	2	1	13



Fig. 1

Insulated cables (Aluminium or Copper) - Short circuiting - Test

Cat No.	Fig No.	Cable Range 1 mm ²	Cable Range 2 mm ²	No. of Bolts	Shear Head A/F mm
K362	2	16 - 25	16 - 25	1	13
K363	2	35 - 70	16 - 70	1	13
K364	2	54 - 150	16 - 150	1	13

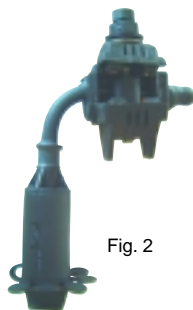


Fig. 2

Flexible End Caps

Cat No.	Fig No.	Length mm ²	Cable Entry Dia. mm	Application Range mm ²
K01	3	32	7	10 - 50
K02	3	40	10.5	35 - 95
K03	3	50	13	95 - 150



K01



K02



K03

Fig. 3

House Service Connectors & Neutral Bonding Options

The House service connector is used to make an electrical connection from an Insulated Supply cable to and Insulated Consumers cable. Due to the construction of most consumers mains, this side of the connector is a stripped connection, whereas the supply connection is by means of Insulation Piercing.

Major Features of the connectors include;

- The connectors are bi-metallic and will accept both Copper and Aluminium Cables.
- The connectors are fully insulated and Water Proof
- Multiple rib sealing system, to ensure integrity of seal on all cable sizes - even ribbed.
- Consumers cable can be disconnected and reconnected
- Tested to applicable requirements of AS/NZS4396
- Connector is marked with cable sizes, and stripping requirements
- Customers and Mains sides are clearly differentiated with both marking and Bolt Colour
- Incorporates Shear Head on all contact screws.
- Available with Test Point, to eliminate need for removal of screws for continuity tests.
- Temporary plug available until customers side is connected.
- Available with Neutral Bonding Tail

Cat No.	Fig No.	Supply Cable Range mm ²	Supply Connection Type	Supply Bolt Colour	Customer Cable Range mm ²	Customer Connection Type	Customer Bolt Colour	Neutral Bonding Tail	Test Point
K28	1	6 - 35	Ins Piercing	Black	4 - 35	Strip Cable	White	No	Yes
K96	2	6 - 35	Ins Piercing	Black	4 - 35	Strip Cable	White	No	No
K97/1	3	6 - 35	Ins Piercing	Black	4 - 35	Strip Cable	White	300mm	No
K97/2	3	6 - 35	Ins Piercing	Black	4 - 35	Strip Cable	White	500mm	No
K97/3	3	6 - 35	Ins Piercing	Black	4 - 35	Strip Cable	White	800mm	No
K97/T	4	6 - 35	Ins Piercing	Black	10mm ² Tail	Stripped Tail	White	240mm	No



Fig. 1



Fig. 3



Fig. 2



Fig. 4

Cat No.	Supply Side Range mm ²	Copper Tail Length mm	Lug Hole Size mm
IPCNB/1	16.95	800	m10
IPCNB/2	16.95	500	m12

Lead supplied unattached



Bare Mains to Service Connectors

R Series

This range of product provides for XPLE or PVC Copper or Aluminium Service Cable Connection to Bare Copper and Bare Aluminium Mains in a complete moisture free environment. The Service connection is made with Insulation Piercing Technology where there is no need to strip the cable.

Two separate connectors are used -

R235 for connection to Bare Copper Mains

R236 and R237 for connection to Bare Aluminium Mains

Bare Copper Mains to XLPE or PVC Copper or Aluminium Service Cables

Cat No.	Fig No.	Bare Mains Range mm ²	Area mm ²	O.D. mm	Tap Range	Pack Qty.
R235	1	7/1.00 - 19/3.00	5.5 - 135	3 - 15	6 - 35	10



Fig. 1

Bare Aluminium Mains to XLPE or PVC Copper or Aluminium Service Cables

Cat No.	Fig No.	Bare Mains Range mm ²	Area mm ²	O.D. mm	Tap Range	Pack Qty.
R236	2	7/1.75 - 19/3.75	16 - 210	5 - 19	1 x 6 - 35	10
R237	3	7/1.75 - 19/3.75	16 - 210	5 - 19	2 x 6 - 35	10



Fig. 2



Fig. 3

- All tested to applicable requirements of AS/NZS4396
- Both Mains and Tap Bolts incorporate Shearhead technology for use with a standard M8 socket
- Polycarbonate windows employed on all tap facilities to ensure the operator can see the actual connection
- Connectors can be disconnected and reconnected from the Mains with ease

Mains Connection Box

These products contain the 'K' Series range of House Service Connectors and provide an environmentally protective chamber in which to house and mount the connectors. It also provides protection of the Consumers Mains against UV degradation.

The boxes come in single and three phase models with the standard K96 House Service Connector (see page 8-5) or with the Neutral Bonding Connector K97 (also page 8-5). Options are available to include the K28 House Service Connector with Polarity Test Point. All connectors plug in to the base for safe and secure bi-metallic mains to service connections.

Cat No.	Single Phase	Three Phase	Phase Connectors	Neutral Connectors	Phase Connector includes Polarity Test point	Neutral Connector includes Bonding Tail	Fig. No.
K450	Y	N	K96	K97	N	Y	-
K451	Y	N	K96	K96	N	N	1
K452	Y	N	K28	K97	Y	Y	-
K453	Y	N	K28	K28	Y	N	1
K454	N	Y	K96	K97	N	Y	2
K455	N	Y	K96	K96	N	N	3
K456	N	Y	K28	K97	N	Y	2
K457	N	Y	K28	K28	Y	N	-
K458*	Y	N	Nil	Nil	N/A	N/A	-
K459*	N	Y	Nil	Nil	N/A	N/A	-

Note: * Empty boxes, no connectors

- IP66D Rated
- Suits easy entry of consumers Mains through the rear of base.



Fig. 1



Fig. 3

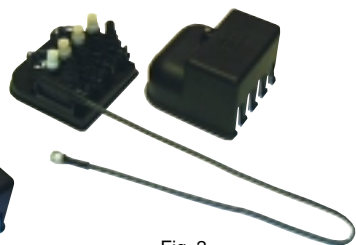


Fig. 2

Pre-Insulated Compression Sleeves

Pre-Insulated sleeves are used to make an electrical joint, between two aerial bundle insulated conductors. The products are supplied for Full Tension or Non Tension applications.

Features of all Pre-Insulated Sleeves are -

- Totally Insulated and Water Proof
- Colour Coded to applicable cable size
- Labelled with Cable size, Die size, Strip Length, Compression locations
- Permanently engraved with Traceability data



Uutilux Tool #111

Full Tension Sleeves

Cat No.	Fig No.	Cable Size mm ²	Diameter mm	Length of Sleeve	Die Size mm	Die Part No.	End Cap Colour
K101	1	16	20	104	17.3	111-140173AL	Blue
K103	1	25	20	104	17.3	111-140173AL	Orange
K106	1	35	20	104	17.3	111-140173AL	Red
K110	1	50	20	104	17.3	111-140173AL	Yellow
K170	1	95	25	137	21.5	111-215AL	Grey
K185	1	150	25	178	21.5	111-215AL	Violet

* Sleeves to connect cables of differing sizes are also available. Refer Dulmison for details

Non Tension Sleeves

Cat No.	Fig No.	Cable 1 Size mm ²	Cable 2 Size mm ²	Diameter mm	Length of Sleeve	Die Size mm	Die Part No.
K30	2	6	6	16	71	14	111-140173AL
K31	2	6	10	16	71	14	111-140173AL
K32	2	6	16	16	71	14	111-140173AL
K33	2	6	25	16	71	14	111-140173AL
K35	2	10	10	16	71	14	111-140173AL
K36	2	10	16	16	71	14	111-140173AL
K37	2	10	25	16	71	14	111-140173AL
K39	2	16	16	16	71	14	111-140173AL
K40	2	16	25	16	71	14	111-140173AL
K53	2	16	35	16	71	14	111-140173AL
K42	2	25	25	16	71	14	111-140173AL
K54	2	25	35	16	71	14	111-140173AL
K55	2	35	35	16	71	14	111-140173AL



Fig. 1



Fig. 2

Pre-Insulated Compression Lugs

Pre-Insulated lugs are used to terminate aerial bundle insulated conductors, onto switchgear, busbars or isolators. The products are available in either Aluminium or Bi-Metallic form.

Features of all Pre-Insulated Lugs are -

- Totally Insulated and Water Proof
- Colour Coded to applicable cable size
- Labelled with Cable size, Die size, Strip Length, compression locations
- Permanently engraved with Traceability data



Utilux Tool #111

Bi-Metallic - Aluminium Body - Copper Palm

Cat No.	Fig No.	Cable Size mm ²	Diameter mm	Total Length mm	Palm Size mm	Hole Dia. mm	Die Part No.	Die Size mm	End Cap Colour
K159	1	16	16	73	Ø20	10.3	111-140173AL	14.0	Blue
K160	1	25	16	73	Ø20	10.3	111-140173AL	14.0	Orange
K163	1	35	20	93	Ø25	12.8	111-140173AL	17.3	Red
K164	1	50	20	93	Ø25	12.8	111-140173AL	17.3	Yellow
K167	1	95	20	93	Ø25	12.8	111-140173AL	17.3	Grey
K158	1	150	25	112	Ø30	12.8	111-215AL	21.5	Violet



Fig. 1



Fig. 2

Aluminium - Aluminium Body - Aluminium Palm

Cat No.	Fig No.	Cable Size mm ²	Diameter mm	Total Length mm	Palm Size mm	Hole Dia. mm	Die Part No.	Die Size mm	End Cap Colour
K140	2	16	16	107	32.5 x 40.5	14	111-140173AL	17.3	Blue
K141	2	25	20	107	32.5 x 40.5	14	111-140173AL	17.3	Orange
K142	2	35	20	107	32.5 x 40.5	14	111-140173AL	17.3	Red
K143	2	50	20	107	32.5 x 40.5	14	111-140173AL	17.3	Yellow
K148	2	95	20	118	32.5 x 40.5	14	111-215AL	21.5	Grey
K150	2	150	25	118	32.5 x 40.5	14	111-215AL	21.5	Violet

Strain Clamps

Strain clamps are available for both Mains and Service Aerial Bundled Cables. Capable of clamping from 1 to 4 cores. If uneven number of cores are clamped, use filler cables in other locations.

Mains Strain Clamps

- Glass Reinforced UV Stabilised clamping blocks
- High Strength Aluminium Alloy tensions straps
- Conforms to requirements of AS3766
- All Hardware is stainless steel - lubricated to eliminate binding
- Jaws sprung loaded to facilitate easy insertion of cores.



Fig. 1 - IBT25095

Cat No.	Fig No.	Number of Cores	Range of Cable mm ²
IBT25095	1	2	50 - 95
IBT5095	2	4	50 - 95
IBT95150	2	4	95 - 150

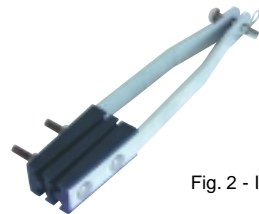


Fig. 2 - IBT5095

Service Strain Clamps

Type IBT

- Glass Reinforced UV Stabilised clamping blocks
- High Strength Aluminium Alloy Strap
- Hardware is stainless steel
- Can also be rotated to act as suspension clamp
- Is supplied in Eye and Hook Form
- Conforms to requirements of AS3766.



Fig. 3 - IBST435-2

Type IBS

- Stainless Steel Bail arm - detachable
- Conforms to requirements of AS3766
- Wedge action created by sliding jaws
- No loose components, jaws attached to body.



Fig. 4 - IBTH21635

Cat No.	Fig No.	Number of Cores	Range of Cable mm ²	Hook or Eye
IBST435-2	3	2 up to 4	4 - 35	Detachable
IBTH21635	4	2	16 - 35	Hook
IBTH41635	4	4	16 - 35	Hook
IBTC21635	5	2	16 - 35	Eye
IBTC41635	5	4	16 - 35	Eye



Fig. 5 - IBTC21635

Suspension Clamps

Type IBSC

- EPDM UV Stabilised Rubber Insert
- Galvanised body - With captive bolt slot
- Galvanised steel hardware - Oversize wing nut.
- Suitable for Line Deviation up to 30 degrees
- Conforms to requirements of AS3766.

Cat No.	Fig No.	2 Core mm ²	3 Core mm ²	4 Core mm ²
IBSC425	1			25
IBSC435	1	50	50	35
IBSC450	1			50
IBSC470	1	95		70
IBSC495	1			95



Fig. 1 - IBSC425

Type IBSL

- Cast Aluminium Body
- Conforms to requirements of AS3766
- Stainless Steel Hardware
- Increased Slip Strength
- Optional Weak Link Feature - Sawcut through eye.

Cat No. with Weak Link	Cat No. without Weak Link	Fig No.	Number of Cores	Cable Size mm ²
IBSL50F	IBSL50N	2	4	50
IBSL95F	IBSL95N	2	4	95
IBSL150F	IBSL150N	2	4	150



Fig. 2 - IBSL150F

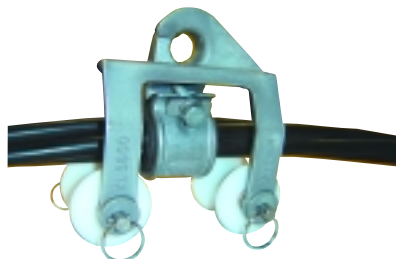


Fig. 3 - IBSRC495

Type IBSRC

- Cast Aluminium Body
- Conforms to requirements of AS3766
- Integrated Stringing Roller Design
- UV Stabilised split elastomer bush
- Controlled release of conductor.

Cat No.	Fig No.	2 Core mm ²	3 Core mm ²	4 Core mm ²
IBSRC250	3	50		
IBSRC450	3	95		50
IBSRC495	3			95
IBSRA		Auxiliary Stringing Roller		



IBSRC with IBSRA installed

Fused Switch Disconnects (Pole Fuse)

Fused Switch Disconnects (FSD), is a single-phase device that is normally installed at the pole. It provides electrical protection to either an aerial service supplying an individual customer or for a low voltage circuit of a pole mounted transformer.

Type - K291 and K491

- Accepts 100A Barrel type fuse (58 x 22mm)
- Pig Tail type extraction - Type **FEHBX**
- UV Stabilised Body - Fully waterproof seals
- Torque controlled shear head screws
- Insulation Piercing on all cable sizes and types
- K291 Application range: 6 - 95mm² - Copper or Alum
- K491 Application range: 6 - 35mm² - Copper or Alum
- Facility to be gang mounted (See fig. 3)
- Self Supported whilst being mounted
- Cable entry ports designed to eliminate moisture ingress.



Fig. 1 - K291



Fig. 2 - K491

Type - K292

- 160A Size 00 Din Fuse links or 250A Solid link
- Hinged fuse carrier, extraction via hot stick - Type **LOS3**
- UV Stabilised Body - Fully water proof seals
- Torque controlled shear head screws
- Insulation Piercing on all cable sizes and types
- Large Application range: 6 - 95mm² - Copper or Alum
- Facility to be gang mounted (See fig 3)
- Self Supported whilst being mounted
- Angled cable entry ports to eliminate moisture ingress.



Fig. 3 - K292

Available Cat No.'s and associated hardware

Cat No.	Fig No.	Number of Fittings in Assy	Fuse Rating	Fuse Type	Shear Head A/F mm
K291	1	N/A	100	HRC58x22	13
K491	2	N/A	100	HRC58x22	13
K292	3	N/A	160 / 250	DIN00	13
K292GANG	4	3	160 / 250	DIN00	13
K292GANG4	4	4	160 / 250	DIN00	13
IBSB1PH	5	Single-Phase Bracket			
IBSB3PH		Three Phase Bracket			
IBSB4PH		Three Phase plus Neutral Bracket			

Fig. 5 - IBSB3PH

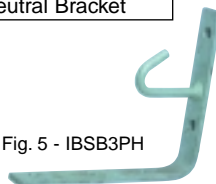


Fig. 4 - K292GANG

Fused Switch Disconnects (Cont'd)

Type - NHP

- UV Stabilised Glass Reinforced body
- Double Circlip retention of fuse
- Comes with integral attachment bracket - Pattern B
- Extraction with Tee Tool - Type - **FEHBX**

Cat No.	Fig No.	Cable Range mm ²	Fuse Rating	Fuse Type
NHP100AD	7	6 - 35	100	HRC58x12
IPSNG	8	Swan Neck Bracket Pattern B		
COMBHOOK	9	Combination Bracket Pattern B		
PIGTAIL	10	Combination Loop Bracket Pattern B		



Fig. 7 - NHP100AD



Fig. 8 - IPSNG

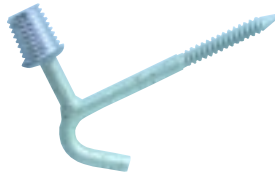


Fig. 9 - COMBHOOK



Fig. 10 - PIGTAIL

Pole Hardware

A variety of brackets, hooks, and weak links are available, as mounting fixtures for LVABC suspension and strain clamps. All brackets are fabricated from high strength steel, and are galvanised to either AS1214 or AS4680 respectively. All brackets meet the requirements as defined in AS3766.

Hook Bolts

- Shaped locating plate to lock onto pole
- Supplied with nut and washer.

Cat No. 16mm Diameter	Cat No. 20mm Diameter	Fig No.	Mounting Length	Thread Length
IBH16250	IBH20250	1	250	150
IBH16300	IBH20300	1	300	150
IBH16325	IBH20325	1	325	150
IBH16350	IBH20350*	1	350	150
IBH16400	IBH20400	1	400	150
IBH16450	IBH20450*	1	450	150

* Long Hook - 200mm available



Fig. 1

Double Suspension Clamp Bracket

- Use when line deviations exceed 30 degrees
- Two suspension clamps fitted to reduce lead in and exit angles
- For IBSL suspensions clamps, use IBYB12A only.

Cat No.	Fig No.	Diameter of Material	Hanging Depth	Hook Centres	Min Failing Load kN
IBYB12	2	16	106	174	12
IBYB12A	2	16	125	300	12
IBYB24	2	20	100	200	24

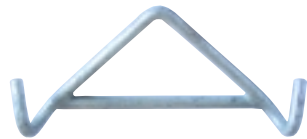


Fig. 2 - IBYB12A

Mechanical Weak Link

- Installed between suspension fitting on pole support fitting
- Will withstand normal loading, but will fail under impact loads
- Eliminates damage to suspension fitting and cables.

Cat No.	Fig No.	Diameter of Material	Total Length	Material Type	Min Failing Load kN
IBWL02	3	6	81	S/Steel	12
IBWL04	3	10	100	Gal Steel	12
IBWL08	3	12	100	Gal Steel	24

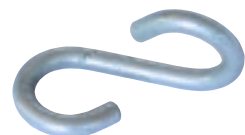


Fig. 3 - IBWL08

Pole Hardware (Cont'd)

Eye Nut

- Screwed onto threaded device to produce Eye attachment.

Cat No.	Fig No.	Thread Size	Thread Length	Material Type	Diameter of eye Material
EN16	4	M16	30	Gal Steel	12
EN20	4	M20	40	Gal Steel	16
EN2020	4	M20	40	Gal Steel	20
EN24	4	M24	45	Gal Steel	20



Fig. 4 - EN16

Hook Nut

- Screwed onto threaded device to produce Hook attachment.

Cat No.	Fig No.	Thread Size	Diameter of eye Material	Material Type	Failing Load kN
IBHN12	5	M16	16	Gal Steel	12
IBHN24	5	M20	20	Gal Steel	24



Fig. 5 - IBHN12

Hook Bracket

- Designed for Façade mounted strain clamps
- Can be strapped to concrete poles with Stainless Steel strap
- Used as temporary hook, for attachment of stringing rollers.

Cat No.	Fig No.	Mounting Centres	Diameter of eye Material	Material Type	Failing Load kN
IBHB12	6	150	16	Gal Steel	12
IBHB24	6	150	20	Gal Steel	24

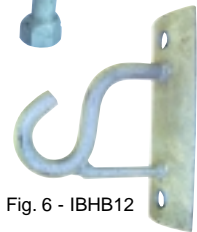


Fig. 6 - IBHB12

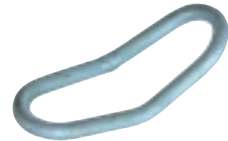


Fig. 7 - IBSSB

Service Support Bracket - Cat No. IBSSB

- Used as a service strain clamp attachment point
- Used in conjunction with hook bolts or hook brackets
- Galvanised Steel

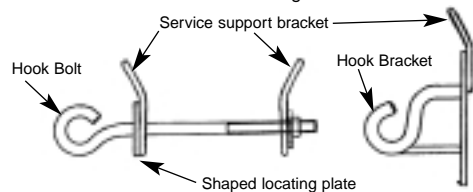


Fig. 7a - Cat IBSSB application

Facade Mounting Brackets

- Made from UV stabilised glass reinforced polymer
- Brackets include 6mm drive nail
- Cables can be supported on bracket during installation.

Cat No.	Fig No.	Drill Size mm	Offset from Structure	Installs Into	Cable Capacity mm
BRPF1	8	12	10	Masonry	2 x ϕ 25 - 56
BRPF1T	8	None	10	Timber	2 x ϕ 25 - 56
BRPF6	9	12	60	Masonry	2 x ϕ 25 - 56

Fig. 8 - BRPF1

Fig. 9 - BRPF6



Assembly and Stringing Tools

Cable Stripping Tools

The IBLST Stripping tool, is designed to remove the tough cross linked polyethylene insulation from low voltage aerial cables. The length of insulation removed is able to be controlled to suit stripping for lugs and sleeves.

Cat No.	Fig No.	Cable Size mm ²
IBLST50	1	50
IBLST95	1	95
IBLST150	1	150
IBLSTB		Spare Blade

Fig. 1 - IBLST150 Tool



Fig. 3 - 5930



Running Sheaves - Cat No. 5930

- Attaches to standard hardware, using Socket Tongue supplied
- Accommodates cables up to 4 x 150mm²
- Provides clear working space for linesmen
- Suitable for stringing angles up to 60 degrees - SWL - 10.8kN
- No lifting of cables required.

Core Separating Tools - Cat No. - IBSW95

- Suitable for LVABC up to 150mm²
- Supplied in pair - on metre of rope
- Impact resistant material.

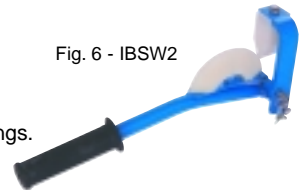
Fig. 5 - IBSW95



Core Separating Tools - Cat No. - IBSW2

- Suitable for LVABC up to 150mm²
- Enables separation of cores close to adjacent equipment
- Durable separation wedges, able to used under tension loadings.

Fig. 6 - IBSW2



Ratchet Spanners - Cat No. IBL6-6

- Used on all overhead Shear bolt connectors
- 13mm and 17mm across flats in one spanner
- Reversible Ratchet
- Fits stainless steel nuts used in strain and suspension clamps
- Fixed socket that cannot be lost or dropped during installation.

Fig. 7 - IBL6



Assembly and Stringing Tools (Cont'd)

Swivels

- For use with pulling socks, to eliminate twist.

Cat No.	Length mm	Diameter mm	Maximum Cable Diameter mm	Safe Working Load kN
SWIVEL1	122	28.5	10.0	1000
SWIVEL2	178	50.0	18.5	2000



Pulling Socks

- Nylon Stranding, Alloy Ferrule, Soft Double Eye.

Cat No.	Cable Size mm ²	No. of Plys	Net Grip Length mm	Ultimate Tensile kN
LV425	4 x 25	2	550	15
LV435	4 x 35	2	550	15
LV495	4 x 95	3	600	25
LV4150	4 x 150	3	600	25



Cable Cutter - Cat No. #109/1

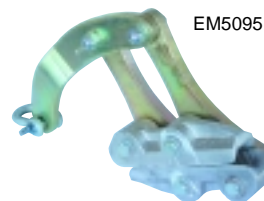
- Ratchet operation Forged Construction.
- For cables up to 300mm².



Come-alongs - Tensioning Devices

- Rugged Steel Plated Construction
- Cast Aluminium Clamping jaws

Cat No.	Cable Application Range mm ²	Holding Strength kN	Weight kg
EM35	2 x 25 - 35 & 4 x 16 - 50	5.9	3.2
EM5095	4 x 50 - 95	7.8	5.8
EM95150	4 x 95 - 150	9.0	6.5





09

High voltage ABC and covered conductor fittings

11 and 22kV

- › Strain and Bundle Restraint Assemblies
- › Suspension Clamps
- › Catenary Compression Joints and Line Splices
- › Stringing Hardware
- › Pole Hardware
- › Assembly and Stringing Tools

11 up to 33kV

- › Strain Clamps and Covers
- › Heliformed® Deadends
- › Compression Joints and Covers
- › Top and Side Ties
- › Insulator Top Clamps
- › Parallel Groove Clamps and Covers
- › Working Earth Points
- › Insulation Piercing Connector – Surge Protection
- › Insulator Support Brackets
- › Stripping Tools
- › Assembly and Stringing Tools

Strain Assembly and Bundle Restraint

To secure HVABC conductors at strain or tension points, you must utilise two types of fittings to secure both the Catenary, as well as the ABC bundle itself.

The Catenary is secured at a strain point using a standard Dulmison Heliformed® Catenary Deadend of applicable size and type - refer table below.



Cat No.	HVABC Cable Type AS3599.1 or .2	HVABC Cable Size mm ²	Catenary Stranding	Catenary Material	Colour Code
SGG0600	Metallic Screened	35	7/2.00	Gal Steel	Yellow
SGG0975	Metallic Screened	35 to 185	19/2.00	Gal Steel	Yellow
ADE1350	Non Metallic Screened	35 - 95	7/5.00	Alum Alloy	Blue
ADE1750	Non Metallic Screened	120 - 185	19/3.65	Alum Alloy	Black

The HVABC bundle assembly, must be secured to the catenary so it does not drift into the middle of the span. This eliminates bird caging, or spreading of the cores.

Dulmison have developed a Heliformed® bundle restraint for this purpose, which is simple to apply and is designed to avoid damage to the phase cores. The assembly is comprised of two Heliformed® deadends, which interlock, to tie the catenary to the bundle. The deadend used to retain the catenary, is designed to be applied over the Catenary deadend as above.



Cat No.	HVABC Cable Type AS3599.2	11kV Cable mm ²	22kV Cable mm ²
IBHR1450	Non Metallic Screened	35 - 50	
IBHR1455	Non Metallic Screened	70	35
IBHR1460	Non Metallic Screened	95	50
IBHR1465	Non Metallic Screened	120 - 185	70 - 95
IBHR1765	Non Metallic Screened	120 - 150	
IBHR1770	Non Metallic Screened	185	
IBHR1775	Non Metallic Screened		120 - 150
IBHR1780	Non Metallic Screened		185

Suspension Clamp

The HVABC suspension clamp is suitable for use on metallic and non-metallic screened HVABC cables, for voltages up to 22kV. It is designed to accommodate line deviations up to 45 degrees. It can be used at both intermediate suspension locations, as well as a secondary means of securing a bundle to the catenary at strain locations. If used in this manner, an IBHR bundle restraint, as per the preceding page, is not required.

Incorporates UV stabilised semi-conductive elastomeric insert, aluminium alloy strap, high strength cast aluminium clamp, and stainless steel hardware. Design of clamps, allows for a minimum of lifting of conductor during installation. Minimum failing load of clamp - 40kN.



Cat No.	HVABC Cable Type AS3599.2	Catenary Diameter mm	11kV Cable mm ²	22kV Cable mm ²
IBSH1050	Metallic Screened	6 - 10	35	
IBSH1055	Metallic Screened	6 - 10	50	
IBSH1060	Metallic Screened	6 - 10	70	35
IBSH1065	Metallic Screened	6 - 10	95 - 120	50
IBSH1070	Metallic Screened	6 - 10	150	70 - 95
IBSH1075	Metallic Screened	6 - 10	185	120
IBSH1080	Metallic Screened	6 - 10		150
IBSH1085	Metallic Screened	6 - 10		185
IBSH1840	Non Metallic Screened	14 - 18	35 - 50	
IBSH1845	Non Metallic Screened	14 - 18	70	
IBSH1850	Non Metallic Screened	14 - 18	95 - 120	35 - 50
IBSH1855	Non Metallic Screened	14 - 18	150	70
IBSH1860	Non Metallic Screened	14 - 18	185	95 - 120
IBSH1865	Non Metallic Screened	14 - 18		150
IBSH1870	Non Metallic Screened	14 - 18		185

Heliformed® Line Splice

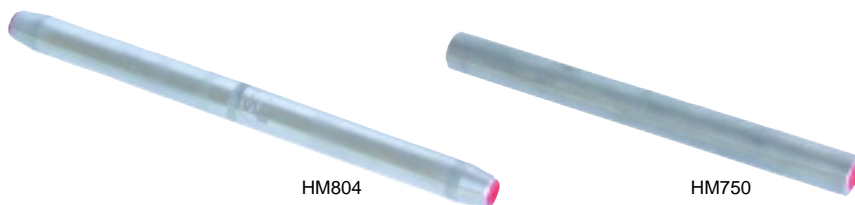
At locations where joints of the catenary on HVABC cables are required, a Heliformed® Line Splice or a Compression Midspan Joint can be used.

For details of Joints for connecting conductor cores, please refer to the Cable Accessories CD, and the available range of Raychem Medium Voltage Joints and Heat Shrink sleeving, together with the Utilux Catalogue for details of applicable compression connectors.



Cat No.	HVABC Cable Type AS3599.1 or .2	Catenary Stranding	Catenary Diameter mm	Catenary Material	11kV mm ² or 22kV
SLS0600	Metallic Screened	7/2.00	6.0	Gal Steel	35
SLS0975D	Metallic Screened	19/2.00	10.0	Gal Steel	35 - 185
ALS1430	Non Metallic Screened	7/5.00 Compacted	14.3	Alum Alloy	35 - 95
ALS1750	Non Metallic Screened	19/3.65 Compacted	17.5	Alum Alloy	120 - 185

Compression Midspan Joint



Cat No.	HVABC Cable Type AS3599.1 or .2	Catenary Stranding	Catenary Diameter mm	Catenary Material	11kV mm ² or 22kV
HM804	Metallic Screened	7/2.00	6.0	Gal Steel	35
HM808	Metallic Screened	19/2.00	10.0	Gal Steel	35 - 185
HM750	Non Metallic Screened	7/5.00 Compacted	14.3	Alum Alloy	35 - 95
HM751	Non Metallic Screened	19/3.65 Compacted	17.5	Alum Alloy	120 - 185

Stringing Hardware

The two most widely used Pole Brackets are - SB10312 and IBHPBV. These items are manufactured from Galvanised Steel and can be either bolted or strapped to either concrete or timber poles.

Both brackets incorporate a cylindrical mounting tube, complete with 3 hook mounting holes, which are used for two purposes.

- The middle hole is used to locate and mount a suspension clamp.
- The outer two holes (each side) are used to locate and mount a stringing roller assembly - Product No LSR23379, and to adjust its height whilst stringing.

Both the suspension clamp and stringing roller are attached to the tube, using Support Hooks - Product No HB16200. These hooks are manufactured from galvanised steel, have a minimum failing load of 12kN and are supplied with washers and nuts. The two outer hooks that locate the stringing roller, are used to adjust its mounted height for stringing. This adjustment allows the rollers to be located at a height that eliminates any necessity to lift either the conductor bundle or catenary for attachment into the suspension clamp.

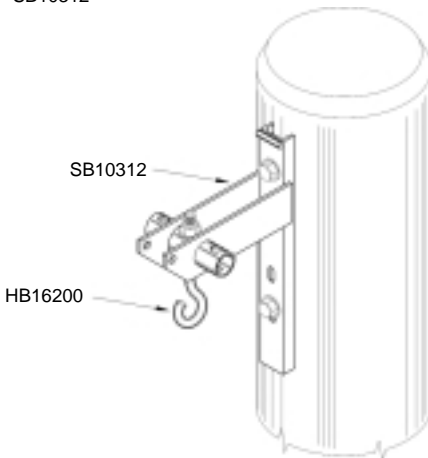
The SB10312 bracket is generally utilised at a point below the top of the pole, whereas the IBHPBV is generally installed at the pole top. The IBHPBV bracket has the facility to mount an insulator on its tope surface to support a bare conductor during retrofit work, so as customer outages are minimised.



SB10312



HB16200



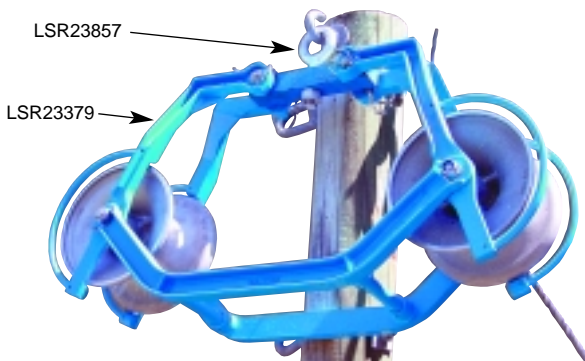
Stringing Roller

Type LSR23379

The LSR23379 stringing roller is a versatile, lightweight and safe product. It is suitable for use on line deviations up to 45 degrees, and accommodates HVABC cables up to 185mm² - 22kV.

The deep profile design of the rollers, ensure conductors do not stick or jam during stringing, and the frame design ensures that the conductor is guided and retained at all times. Its wide entry design allows for easy application of suspension clamps, and plenty of working space. Its mounting on support hooks allows for vertical height adjustment, which eliminates the dangerous practice of lifting conductors to secure in suspension clamps. With a weight of just 9kg, it is safe for one person to handle.

The standard assembly is used in conjunction with support hooks and associated brackets at suspension clamp locations, but with the addition of the **Yoke Assembly - LSR23857**, it can also be attached to a hook bolt or bracket at the start of a stringing run, where a suspension point is not required. This allows for the cable to be temporarily supported at termination or strain points, until tensile loads are applied and strain clamps fitted.



Pole Hardware

A variety of brackets, hooks, and hardware are available, as mounting fixtures at HVABC suspension and strain locations. All brackets are fabricated from high strength steel, and are Galvanised to either AS1214 or AS4680 respectively. All brackets meet the requirements as defined in AS3766.

Hook Bolts

- Shaped Locating plate to lock onto pole
- Supplied with nut and washer.

Cat No. 16mm Diameter	Cat No. 20mm Diameter	Mounting Length	Thread Length
IBH16250	IBH20250	250	150
IBH16300	IBH20300	300	150
IBH16325	IBH20325	325	150
IBH16350	IBH20350*	350	150
IBH16400	IBH20400	400	150
IBH16450	IBH20450*	450	150

* Long Hook - 200mm available



Hook Nut

- Screwed onto threaded device to produce Hook attachment.

Cat No.	Thread Size	Diameter of Eye Material	Material Type	Failing Load kN
IBHN12	M16	16	Gal Steel	12
IBHN24	M20	20	Gal Steel	24



Hook Bracket

- Can be strapped to concrete poles with Stainless Steel strap
- Used as temporary hook, for attachment of stringing rollers.

Cat No.	Fig No.	Mounting centres	Diameter of Eye Material	Material Type	Failing Load kN
IBHB12	6	150	16	Gal Steel	12
IBHB24	6	150	20	Gal Steel	24



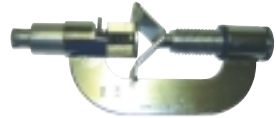
Tooling and Cable Stringing Equipment

Cable Stripping Tools

Two types of stripping tools are available for use on HVABC cables -

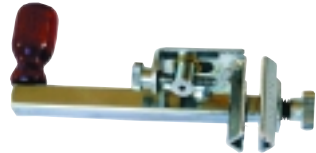
- **Type IBST1342**

Used for removal of Semi conductive Screen
 Cut depth adjustable in 0.1mm increments
 Spiral scoring function
 Durable design



- **Type IBST5024**

Used for removal of core insulation
 Removes insulation up to 5.5mm thick
 Cable range from 12 - 32mm
 Long life blade - **Type IBST5024B**



Ratchet Spanners - Cat No. IBLS-6

- 13mm and 17mm across flats in one spanner
- Reversible Ratchet
- Fits stainless steel nuts used in suspension clamps
- Fixed socket that cannot be lost or dropped during installation



Swivels

- For use with pulling socks, to eliminate twist

Cat No.	Length mm	Diameter mm	Max. Cable Diameter mm	Safe Working Load kN
SWIVEL1	122	28.5	10.0	1000
SWIVEL2	178	50.0	18.5	2000

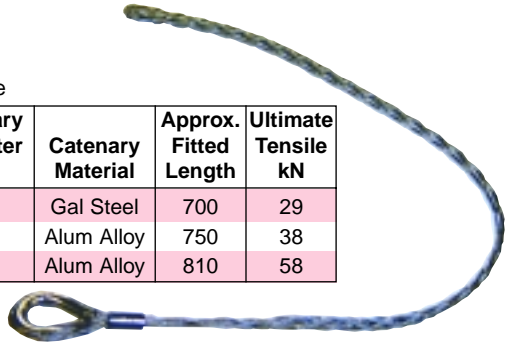


Tooling and Cable Stringing Equipment (Cont'd)

Pulling Socks - Catenary

Galvanised stranding, single eye, alloy ferrule

Cat No.	HVABC Cable Type AS3599.1 or .2	Catenary Diameter mm	Catenary Material	Approx. Fitted Length	Ultimate Tensile kN
HDGW08	Metallic Screened	10.0	Gal Steel	700	29
HDGW10	Non Metallic Screened	14.3	Alum Alloy	750	38
HDGW15	Non Metallic Screened	17.5	Alum Alloy	810	58



Pulling Socks - HVABC Bundle

Mono-filament nylon, double eye, Aluminium alloy ferrule

Cable Size mm ²	Metallic Screened HVABC		Non Metallic Screened HVABC	
	11kV	22kV	11kV	22kV
35	HV33511MS	HV33522MS	HV33511NMS	HV33522NMS
50	HV35011MS	HV35022MS	HV35011NMS	HV35022NMS
70	HV37011MS	HV37022MS	HV37011NMS	HV37022NMS
95	HV39511MS	HV39522MS	HV39511NMS	HV39522NMS
120	HV312011MS	HV312022MS	HV312011NMS	HV312022NMS
150	HV315011MS	HV315022MS	HV315011NMS	HV315022NMS
185	HV318511MS	HV318522MS	HV318511NMS	HV318522NMS

Cable Cutter - Product No - #109/1

- Ratchet operation Forged Construction
- For cables up to 300mm²



Come-alongs - Catenary

Cat No.	HVABC Cable Type AS3599.1 or .2	Catenary Diameter mm	Ultimate Tensile kN
KG162520	Metallic Screened	10.0	29
CHVABC2	Non Metallic Screened	14.3	38
CHVABC2	Non Metallic Screened	17.5	58



Covered Conductor Fittings

CCT - Strain Clamps and Covers

To secure CCT conductors at strain or tension points, the most common method is utilising a rack driven wedge assembly. The clamp incorporates a clevis attachment point, and stringing eye, as well as a clamping bar, to lock the conductor in position once tensioned. The contoured design, eliminates stresses on the conductor as it exits the clamp. The UV Stabilised cover, completes the assembly, and makes the strain assembly fully covered. The cover assembly has been designed for assembly over standard insulators. The assembly is suitable for use on conductors voltages from 11 up to 33kV.

Clamp Cat No.	Cover Cat No.	Cable Size mm ²	Cable Stranding
CCS80	CCC80120	80	7/3.75
CCS120	CCC80120	120	7/4.75
CCS180	CCC180	180	19/3.50



CCT - Uncovered Strain Connections

In areas where a fully covered system is not required (for example at termination points where tree proximity is not an issue), an aluminium Heliformed® Deadend may be used, over the conductor insulation, to eliminate the need for stripping the conductor. This system is utilised on 11kV networks only.

Deadend Cat No.	Cable Size mm ²	Cable Outer Diameter mm
ADE1875	80	17.9 - 19.4
ADE2100	120	20.9 - 22.4
ADE2375	180	24.1 - 25.7



CCT - Compression Joints and Covers

At locations where CCT conductors must be joined midspan, a series of compression joint kits are available. All kits are supplied complete with Raychem heatshrink mastic lined sleeves, to ensure the joint area is both insulated and sealed. This added sealing slows the onset of corrosion, and decreases resistance in the joint, resulting for otherwise unprotected rapid oxidation of the connection. Compression joints are suitable for all voltages of CCT - 11 up to 33kV, and are compatible with the material of the conductor.

Clamp Cat No.	Cable Size mm ²	Cable Stranding
HM704CCT	80	7/3.75
HM706CCT	120	7/4.75
HM718CCT	180	19/3.50



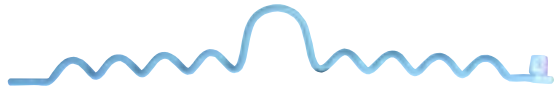
Covered Conductor Fittings

CCT - Non Metallic Heliformed® Top & Side Ties

At suspension locations, whether they be at pin or post type insulators, a series of non-metallic Top and Side ties are available. The ties are installed over the insulation of the conductor, and therefore stripping is not required. Ties are manufactured from UV Stabilised PVC, and are available for 76mm Insulator neck size. Ties may be supplied in a colour to suit the conductor insulation. Standard colour is Grey. Ties are easily applied by hand, as with other Heliformed® ties. Ties are suitable for angular deviations up to 30 degrees.

Side Ties

Deadend Cat No.	Cable Size mm ²	Voltage kV
PST14307G	80	11
PST18307G	120	11
PST23407G	180	11



Top Ties

Top Tie Cat No.	Cable Size mm ²	Voltage kV
PTT14307G	80	11
PTT18307G	120	11
PTT23407G	180	11



CCT - Insulator Top Clamps

At suspension locations where stresses at the connection point, or line angle deviations do not allow for installation of plastic ties, a rigid clamp top can be installed to secure the conductor. The clamps are manufactured from aluminium alloy, and have an application range of 7 up to 32mm. The clamp can be applied over the conductor insulation. Covers can be provided to protect the clamp from accidental contact.

Top Clamp Cat No.	Cable Size mm ²	Voltage kV
Y11195	80 up to 180	11
Y11195	80 up to 180	22
Y11195	80 up to 120	33



Covered Conductor Fittings

Parallel Groove Clamps for Line Taps & Non Tension Joints

Parallel Groove clamps can be utilised in non tension applications as conductor joints, as well as line taps to either insulated or bare conductors. Both aluminium and bi-metallic are available, and both items can be covered using an applicable cover. All clamps are supplied complete with oxide inhibitor and Belleville spring washers, to control forces generated during electrical heat cycling.

PG Clamp Cat No.	Clamp Type	CCT Cable Size mm ²	Line Tap Cable Size mm ²	Line Tap Cable Size mm	Suitable Cover Cat No.
3594-FS	Aluminium	80 up to 180	35 - 240	7.5 - 20.2	CCPGC154
3913-FS	Bi-Metallic	80 up to 180	35 - 185	7.5 - 17.5	CCPGC154



Cat. 3594-FS



Cat. 3913-FS

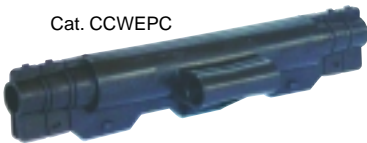


Cat. CCPGC154

Working Earth Point Covers - Cat No. CCWEPC

Working Earth Point covers are designed to cover a stripped area of conductor which would be used as a local earthing location. The cover is manufactured from UV stabilised material, and is designed such that it can be opened, moved and reapplied using hot sticks. The cover can be easily trimmed to produce a next fit on all sizes of CCT at all voltages.

Cat. CCWEPC



End detail



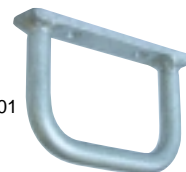
Insulation Piercing Connector - Lightning Protection Cat No. CCIPC11120

For applications where Surge Arrestors are used for lightning protection, a connection from the arrester to the conductor can be made using an IPC. This connector utilises shear head bolts, which remain proud of the connector after shearing. An earth lead, with lug, can be attached to this additional length of bolt on the top of the connector. At the bottom of the connector a stirrup - **Type 25705F01** can also be attached as a means to attach a temporary earth.

Cat. CCIPC11120



Cat. 25705F01



Covered Conductor Fittings

Mounting Bracket - Insulators

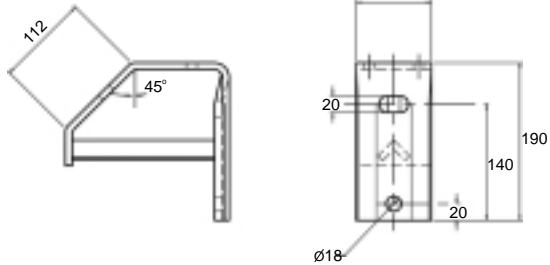
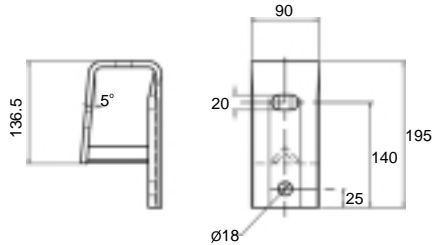
Brackets are available to mount insulators in either a trident (3 phases per bracket), or single phase format. All brackets are manufactured from Galvanised Steel. Brackets are not supplied with pole attachment hardware, due to the variety and type of mounting possibilities.



Cat. CCB05

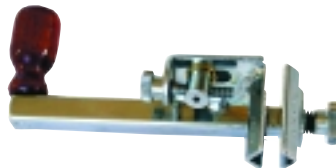


Cat. CCB45



Cable Stripping Tools

- Cat No. IBST5024**
 Used for removal of core insulation
 Removes insulation up to 5.5mm thick
 Cable range from 12 - 32mm
 Long life blade - **Cat No. IBST5024B**

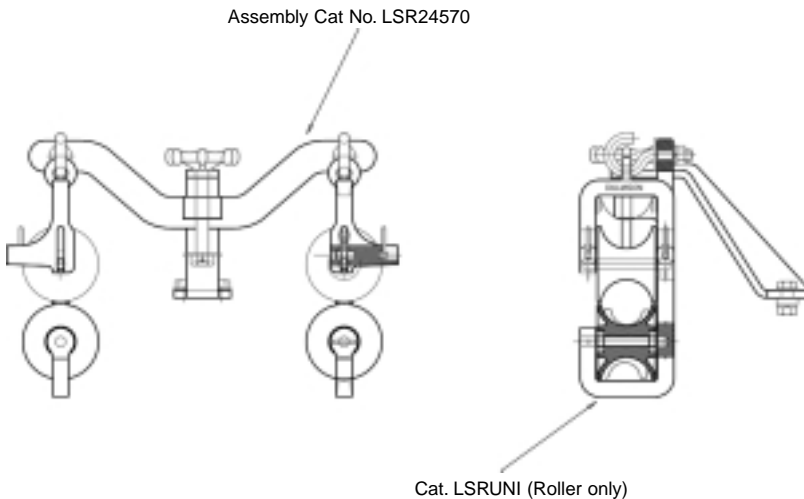


Covered Conductor Fittings

Stringing Roller - Assemblies - Cat No. LSR24570 & LSRUNI

A unique stringing roller assembly has been designed to allow quick, safe and trouble free installation of all sizes of CCT conductors. The assembly has been designed for attachment to the CCB brackets. Features of the rollers include -

- Vertical height adjustment and lowering of cables - no lifting required
- Movable top roller for easy insertion of conductors.
- Top roller locks in position, so as conductor cannot disengage whilst being strung
- Lightweight design, able to be installed and removed by one person
- Durable Aluminium rollers with bearings
- Suitable for stringing angles up to 30 degrees.
- Rollers can also be used to string LVABC up to 150sqmm.
- LSRUNI is a stringing roller only. It does not include attaching bracket.





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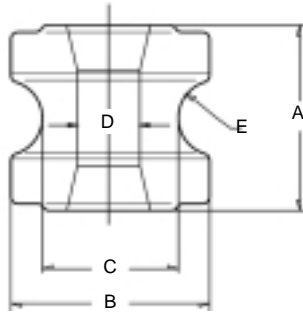
Insulators

- › Low Voltage Shackle and Pin
- › Guy Strain
- › Standard Line Pin
- › Aerodynamic Line Pin
- › Line Post (Porcelain)
- › Line Post (Composite)
- › Clamp Top Clamps
- › Studs and Pins
- › Disc
- › Long Rod – Distribution
- › Long Rod – Transmission
- › Station Post

Insulators

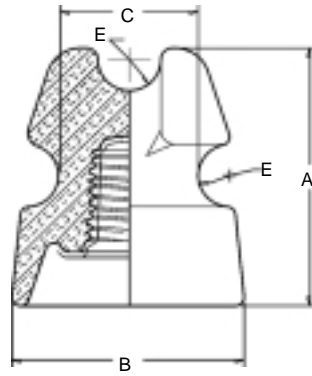
Shackle & Pin

Porcelain LV



Shackle Type

SHLV1 : SHLV2 : SHLV8



Pin Type

LVL P

Cat No.	Dimensions mm					Thread	Pin	Min F.L. kN
	A	Dia. B	Dia. C	Dia. D	Rad. E			
SHLV1	54	57	39	17	17	-	-	9 kN
SHLV2	76	80	54	17	12	-	-	20 kN
SHLV8	32	57	40	17	7	-	-	9 kN
LVL P	91	82	52	-	11	Patt "B"	B/100/3.5	7 kN

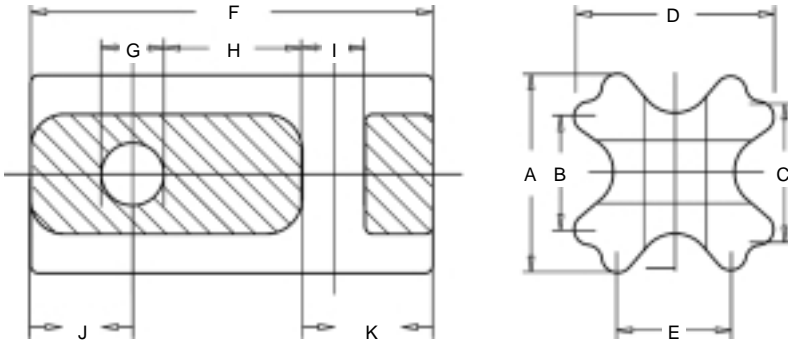
Dimensions and Performance characteristics in accordance with AS3608

Threads in accordance with AS2947.3

Insulators

Guy Strain

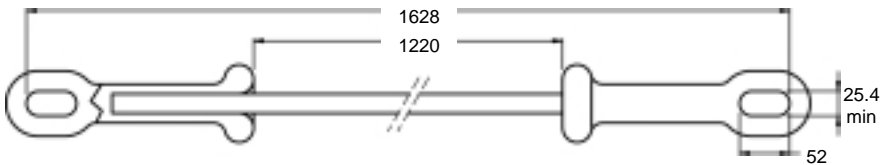
Porcelain, LV



Cat No.	Dimensions mm											Min F.L. kN
	A	B	C	D	E	F	G	H	I	J	K	
GY2	73	41	44	73	44	146	22	51	22	37	37	71 kN
GY3	115	57	67	115	57	216	38	51	38	63	63	222 kN
GY4	115	57	67	115	57	280	38	51	38	95	95	222 kN

Dimensions and Performance characteristics in accordance with AS3609

Fibreglass, HV

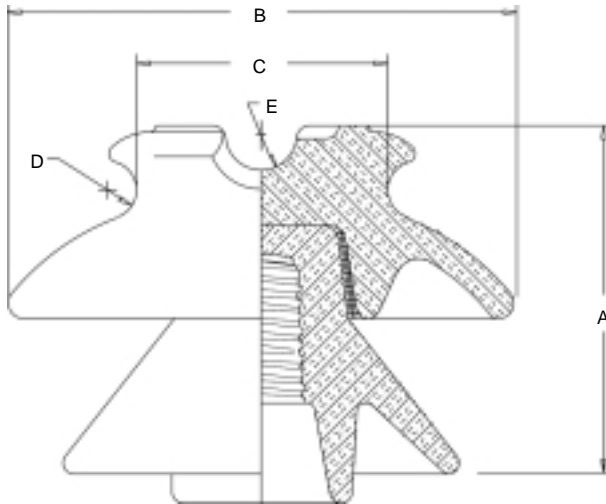


Cat No.	Min. F.L. kN	Arcing Distance mm	End Fitting
NEE220N1630	220	1220	Eye/Eye
NEE220N1630H	220	1094	Eye/Eye + Arcing Horns

Insulators

Standard Line Pin

Porcelain



Cat No.	Voltage	Creepage mm	Dimensions mm					Thread	Pin	Min F.L. kN
			A	B	C	D	E			
P11	11 kV	180	106	140	76	R13	R16	Patt "A"	A/130/7	7 kN
P22	22 kV	420	168	228	113	R13	R16	Patt "C"	C/150/11	11 kN
P33	33 kV	534	194	279	113	R13	R16	Patt "C"	C/200/11	11 kN

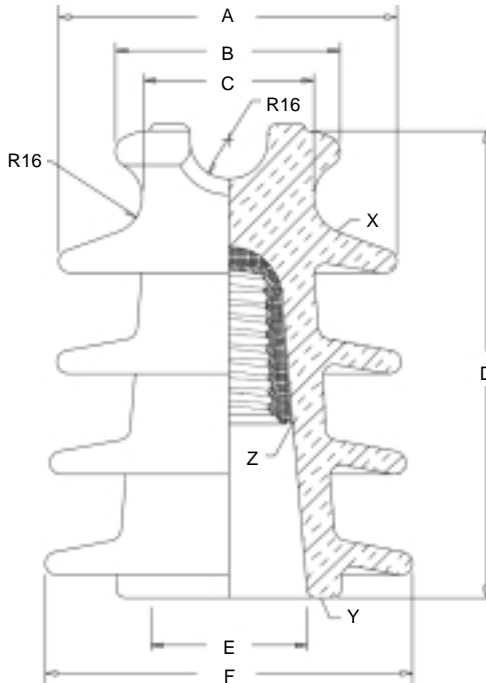
Dimensions and Performance characteristics in accordance with AS2947.2

Threads in accordance with AS2947.3

Insulators

Aerodynamic Line Pin

Porcelain



Cat No.	Voltage	Creepage		Dimensions mm						Pin	Min F.L. kN
		X - Y	X - Z	A	B	C	D	E	F		
ALP/11/275	11 kV	235	275	136	102	76	152	76	136	C/150/7	7 kN
ALP/22/450	22 kV	365	450	148	102	76	200	74	160	C/200/11	11 kN
ALP/22/490	22 kV	380	490	127	102	76	240	89	165	C/200/11	11 kN
ALP/33/920	33 kV	755	920	240	102	76	320	133	240	C/300/7	11 kN

Dimensions and Performance characteristics in accordance with AS2947.2

Threads - Pattern C in accordance with AS2947.3

Insulators

Line Post

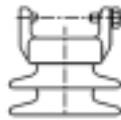
Porcelain

LIVE END

Tie-Top T



Vertical
Clamp Top C



Horizontal
Clamp Top H

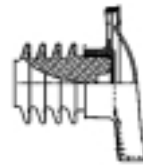
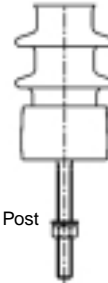


GROUND END



X-Arm

Pin Post



Gain Base

Cat No.	Designation	Nominal Voltage kV	Height	Creepage	Base Mount	Line End	Net Weight kg
H11536	R7ET105N	11	276	275	Pin Post	T	5
H11358	R18ET150N	11/22	285	452	X-Arm	T	10
H11376	R12EH150N	11/22	352	460	X-Arm	H	12
H11213	R11EHG150N	11/22	390	540	Gain Base	H	15
H11357	R11ET150N	22	318	575	X-Arm	T	11
H11632	R11ET150N	22	365	480	Pin Post	T	9
H11368	R11ET200N	22/33	487	610	X-Arm	T	16
H11173	R11ET150N	22	487	610	X-Arm	T	16
H11174	R11EH150N	22	560	634	X-Arm	H	20
H11461	R12.5ET200L	33	487	920	X-Arm	T	16
H11472	R11EC200N	33	530	825	X-Arm	C	20
H11529	R11EH200N	33	560	825	X-Arm	H	20
H11654	R11ET250N	44/66	532	1300	X-Arm	T	19
H11663	R12.5EH250N	44/66	617	1295	X-Arm	H	23
H11669	R12.5EHG250N	44/66	598	1295	Gain Base	H	31
H11647	R12.5ET350L	66	752	1510	X-Arm	T	25
H11167	R12.5ET350L	66	784	1920	X-Arm	T	32
H11170	R12.5EC350L	66	820	1920	X-Arm	C	35
H11171	R12.5EH350L	66	848	1920	X-Arm	H	35
H11251	R12.5EHG350L	66	829	1920	Gain Base	H	42
H14056	R12.5EHG650L	132	1500	3300	Gain Base	H	91

Dimensions and performance characteristics in accordance with AS2947.2

Insulators

Line Post

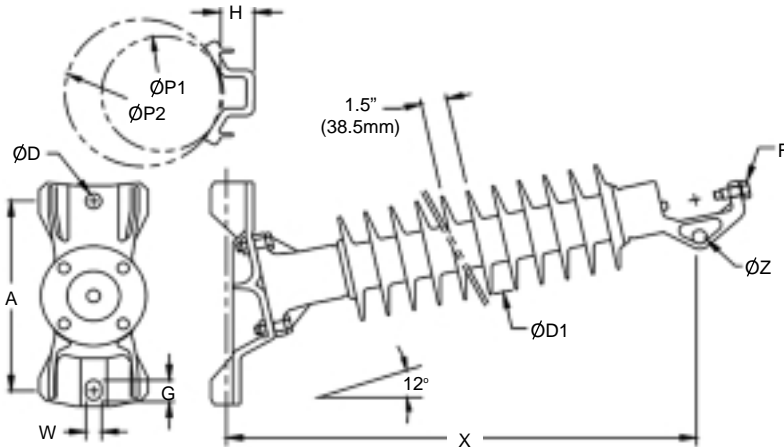
Synthetic (Composite)

P1/P2 = 7"/10" (178mm/254mm)

H = 2.2" (55mm)

F = 5/8" (11mm) bolt & lockwasher

Z = Min. 0.79" (20mm)



A = 12" (305mm)

G = 1.5" (38mm)

D = 0.94" (24mm)

W = 0.94" (24mm)

D1 = 6.8" (173mm)

Cat No.	Nominal Voltage kV	MDCL	Spacing	Creepage	Ground End Fitting	Line End Fittings
PKG30XH016	66	11kN	889	1958	Std. Gain Base	HCT
NPKN30XH019	66	9kN	966	2354	Flange	HCT
NPKN30XH030	132	6kN	1389	3736	Flange	HCT
PKG30XH030	132	6kN	1417	3700	Std. Gain Base	HCT
BKG30XH030	132	6kN	1421	3700	Bendable Gain Base	HCT

Available in EPDM or Silicon

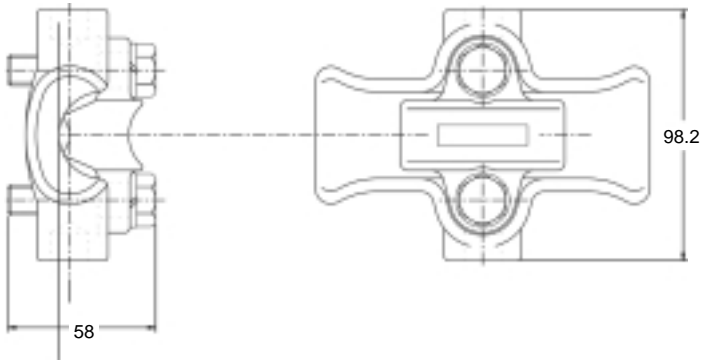
Other voltage and MDCL available on request.

Dimensions and performance characteristics in accordance with IEC601109 & AS4435.4

Insulators

Clamp Top Clamps

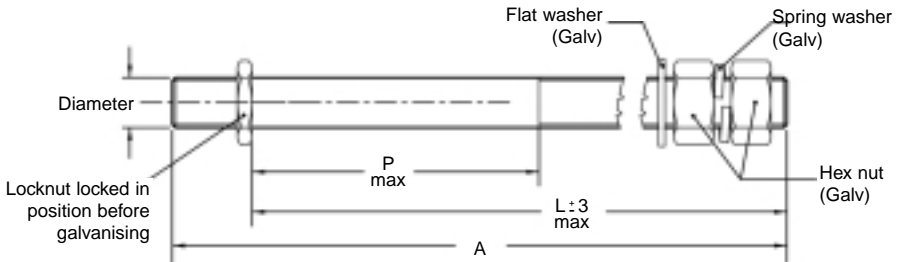
Aluminium and Copper conductors



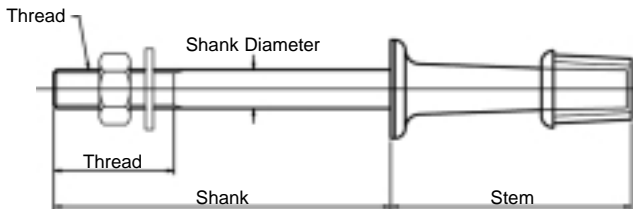
Cat No.		Conductor Dia. mm	
Ferrous	Aluminium	Max.	Min.
	Y11195	7	32
47101	42111	14.2	6.35
47102		21.3	8.89
47103		26.9	12.7
47104	47114	38.1	25.4

Insulators

Studs & Pins



Cat No.	Thread	Overall Length A	Shank Length L	Length P max.	To suit X-arm min.	To suit X-arm max.
11007	M24	239	200	77	71	150
10885	M24	219	180	78	72	130
10886	M24	100	61	5	-	12
10887	M20	239	200	77	71	156



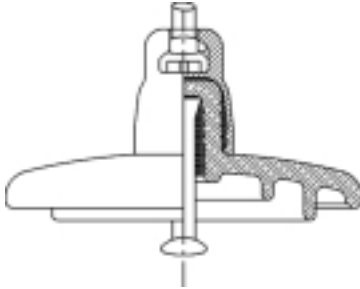
Insulator Pin Type reference	Min. Failing Load kN	Shank			Stem	
		Diameter A	Length B	Thread Length min. C	Length J	Head Pattern
Standard Units						
B10035	3.5	16	140	50	98	B
A1307	7	20	165	80	128	A
C1507	7	20	165	80	148	C
C15011	11	24	165	80	148	C
C20011	11	24	165	80	198	C
C3007	7	24	165	80	298	C
Special Units						
B100SP	3.5	16	165	70	98	B
A030SP	7	20	200	100	128	A
C150SP	7	20	200	100	148	C
C20011L	11	24	200	100	198	C

Insulators

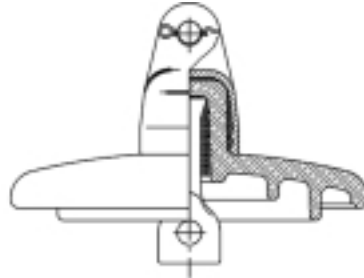
Disc

Porcelain and Toughened Glass

Ball & Socket (B & S)



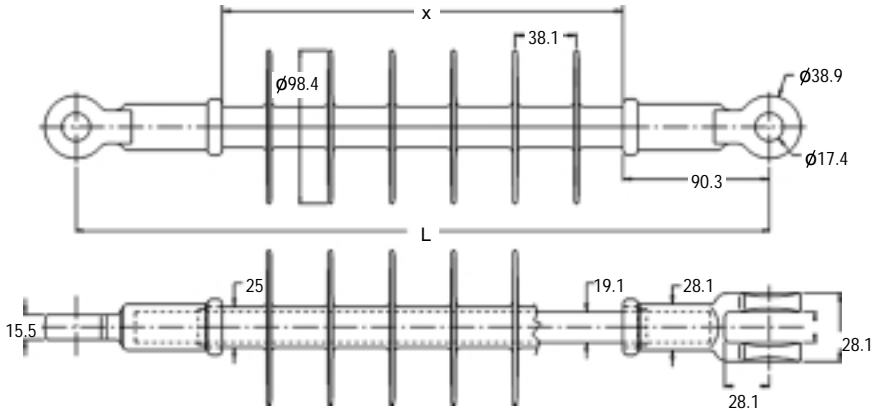
Tongue & Clevis (T & C)



Catalogue No.	Fixing	Diameter mm	Pitch mm	Rating kN	Zinc Collar	Std Pack
Toughened Glass Standard Profiles						
CT70-8/146DC	T & C	205	146	70	Yes	6
B8/146	B & S	255	146	70		6
CT70/146	T & C	255	146	70		6
B13/146	B & S	255	146	125		6
Fog Profiles						
F9P/146DC	B & S	255	146	70	Yes	6
CTV8/146H	T & C	255	146	70		6
Aerodynamic Profiles						
F12D-A/146DC	B & S	380	146	120	Yes	4
Porcelain						
D70S	B & S	255	146	70		6
D70C	T & C	255	146	70		6
D160S	B & S	280	146	160		4

Insulators

Long Rod - Distribution Synthetic (Composite)

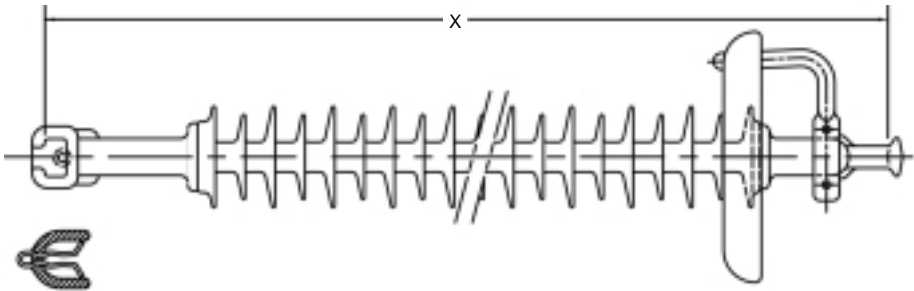


Specifications	Unit	Catalogue No.				
		GLPDS-15	GLPDS-28	GLPDS-35	GLPDS-46	
Recommended application	kV max	15	28	35	46	
Section length = L	mm	330	438	480	574	
Insulation length = X	mm	151	247	299	394	
Dry arcing distance	mm	190	285	345	432	
Leakage distance	mm	422	645	838	1171	
Low frequency flashover	Dry	kV	95	130	150	173
	Wet	kV	71	114	122	156
Critical impulse flashover pos.	kV	155	211	239	326	
Radio influence Max. Riv. at 1000 kHz	μV	2.9	0.1	2.9	7.8	
Design tension strength	kN	107	107	107	107	
Routine test load	kN	37	37	37	37	
Tensile rating	kN	70	70	70	70	
Design torsion rating	Nm	67	67	67	67	
Quantity of sheds	units	4	6	8	10	
Net weight	kg	1.09	1.24	1.33	1.51	
Standard package	units	15	15	15	12	

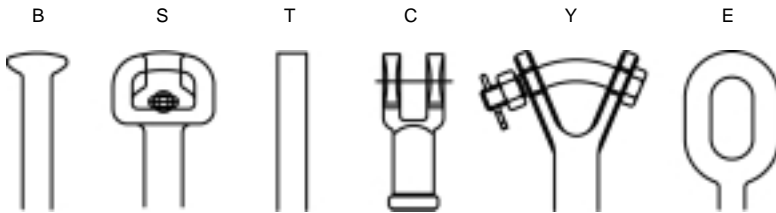
Insulators

Long Rod - Transmission

Synthetic (Composite)



End fittings available:



Catalogue No.	Nom. Voltage kV	SML kN	Spacing mm	Creepage mm	Ground End Fitting	Line End Fitting
NCT70XM021	66	70	749	1822	Clevis	Tongue
FSB70XM021	66	70	755	1960	Socket	Ball
FYB120XM023	66	120	924	1935	Y-Clevis	Ball
FSB70XM043	132	70	1337	3647	Socket	Ball
NEY120XM043	132	120	1484	3641	Eye	Y-Clevis
FSB160XM043	132	160	1474	3641	Socket	Ball

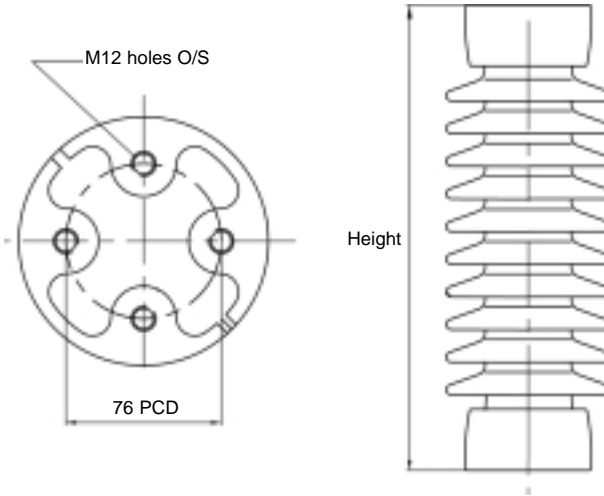
Available in EPDM or Silicon.

Other voltage and SML's available on request.

Dimensions and performance characteristics in accordance with IEC601109 and AS4435.1

Station Post

Porcelain



Cat No.	Designation	Nom. Voltage kV	Impulse Voltage kV	Height mm	Creepage mm	Net Wt kg
H11656	C6-95-I	11	95	254	305	7
H10903	C8-110-II	11	110	254	400	9
H10841	C6-125-II	22	125	305	607	10
H11103	C4-150-I	22	150	355	630	11
H10747	C4-150-II	22	150	355	750	13
H10755	C6-170-I	22/33	170	381	760	14
H10965	C4-200-I	33	200	458	885	16
H10843	C4-200-II	33	200	458	956	17
H10765	C10-200-II	33	200	458	995	15
H11666	C9-200-II	33	200	475	995	15
H11132	C6-200-I	33	200	508	885	20
H14009	C9-250-I	33	250	559	1170	17
*H11610	C6-350-II	66	350	762	1740	44
*H14002	C8-350-II	66	350	762	1765	36

Note: H11610 and H14002 have M16 O/S holes on 127 PCD. Dimensions and performance characteristics in accordance with AS4398.1. Details of Station Posts above 66kV available on request.



11

Line accessories and pole hardware

- > Line and Earthing Clamps
- > Insulated Earthing Sticks
- > Earthing Leads
- > Earthing End Clamps, Trifurcating Plates, Stakes
- > Earthing Stick Accessories
- > Aircraft Warning Markers
- > Line Stringing Rollers
- > Gain Blocks
(Cross Arm Mounting Blocks)
- > Pole Steps
- > Cross Arm Braces
- > Pole Hardware
- > Earthing Sets Order/
Inquiry Information Sheet

Line and Earthing Clamps

A comprehensive range of both Aluminium and Copper Line Earthing clamps are available. Each clamp is available in several connection formats. All clamps have been tested to relevant short time current ratings as stated. Test reports available on request.

Type - LLC100

- Brass Body - Stainless steel spindle
- Accepts conductors - 4.8 up to 19.0mm Diameter
- Spring Loaded lower jaw for positive pressure
- Split bolt lead attachment - up to 8.3mm diameter
- Short time current rating - min 12kA for 0.8 sec
- Available in the following formats
 - LLC100D** - Tee Spindle - 6mm - Brass Body
 - LLC100DT** - As above but tin plated
 - LLC100R** - 32mm Brass Ring - Brass Body
 - LLC100RT** - As above but tin plated
 - LLC100H** - Insulated Moulded Handle - Brass Body
 - LLC100HT** - As above but tin plated



Type LLC100D



Type LLC100RT

Type - LLC8F

- Aluminium Alloy Body - Stainless steel hardware
- Accepts conductors - 5.1 up to 21.0mm Diameter
- Comes supplied with Tin Plated Ferrule
- Attaches to all standard sticks
- M12 Lug attachment for Earth lead takeoff



Type LLC8F

Type - LLC13

- Aluminium Alloy Body - Stainless steel spindle
- Accepts conductors - 5 up to 35mm Diameter
- 2 bolt lug attachment - M10
- Short time current rating - min 40kA for 1 sec
- Available in the following formats
 - LLC13** - 32mm Brass ring
 - LLC13S** - Tee Spindle - 6mm
 - LLC13H** - Insulated Moulded Handle



Type LLC13H

Line and Earthing Clamps (Cont'd)

Type - LLC14

- Aluminium Alloy Body - Stainless steel spindle
- Accepts conductors - 5 up to 40mm Diameter
- Also accepts Busbar in two orientations
Horizontal - 40 x 35mm
Vertical - 7 x 50mm
- Single lug attachment hole - M12
- Short time current rating - min 31.5kA for 1 sec
- Available in the following formats
LLC14A - Blank Spindle
LLC14R3 - 32mm Brass ring
LLC14T - Tee Spindle - 6mm
LLC14H - Insulated Moulded Handle



Type LLC14R3

Type - LLC9

- Cast Gunmetal Body - Tin Plated - Stainless steel spindle
- Accepts conductors and busbars - 12 up to 90mm Diameter
- Single lug attachment hole - M12
- Available in the following formats
LLC9 - Tee Spindle - 3mm
LLC9A - Tee Spindle - 6mm
LLC9B - 32mm Brass Ring



Type LLC9

Type - L4A202

- Cast Gunmetal Body - Tin Plated - Stainless steel spindle
- Accepts conductors and busbars - 10 up to 50mm Diameter
- Spring tensioned main jaw - constant force
- Single lug attachment hole - M12
- Short time current rating - min 37.3kA for 0.5 sec
- Available in the following formats
L4A202W - Tee Spindle - 3mm
L4A202WP - Blank Spindle



Type L4A202

Type - 9320822

- Aluminium Alloy Body - Stainless steel spindle
- Accepts conductors and busbars - 5 up to 32 mm Diameter
- Snap action main jaw - constant force
- Double lug attachment holes - M12
- Short time current rating - min 29.7kA for 0.5 sec
- Available in the following formats
9320822 - 32mm Brass ring
LLC200H - Insulated Moulded Handle



Type 9320822

Insulated Earthing Sticks

A comprehensive range of insulated earthing sticks are available, for both permanent attachment or temporary/removable attachment, to all types of earthing clamps.

Where a permanent attachment is required to create a rigid earthing stick assembly or 3 phase earthing set, the earth clamps are pinned or screwed to attaching fixtures to join the insulated stick to the earthing head. Where there is a need to temporarily connect an earth stick to an earth clamp, a series of standard earth sticks and attachment devices are available. All Earth sticks are provided with warning labels which include recommended voltage rating clearances, and handling warning. All Earth sticks are rated at 100kV per foot (305mm).

One Piece Sticks - all fitted with rubber end boots

Cat No.	Stick Length mm	End Connection Type
FOS4-1	1220	Screw - Male - 5/8" UNF
FOS6-1	1830	Screw - Male - 5/8" UNF
FOS8-1	2440	Screw - Male - 5/8" UNF
FOS10-1	3050	Screw - Male - 5/8" UNF
FOS11-1	3350	Screw - Male - 5/8" UNF
FOS12-1	3660	Screw - Male - 5/8" UNF



Type FOS6-1

Cat No.	Stick Length mm	End Connection Type
FOS4-2	1220	Bayonet - Male
FOS6-2	1830	Bayonet - Male
FOS8-2	2440	Bayonet - Male



Type FOS6-2

Cat No.	Stick Length mm	End Connection Type
FOS6-1A9	900	Universal
FOS6-1A	1830	Universal



Type FOS6-1A

Extension Sticks - to be used with One Piece Sticks

Cat No.	Stick Length mm	End Connection Type
FXS4-1	1220	Screw - Male - 5/8" UNF
FXS6-1	1830	Screw - Male - 5/8" UNF
FXS8-1	2440	Screw - Male - 5/8" UNF
FXS10-1	3050	Screw - Male - 5/8" UNF
FXS12-1	3660	Screw - Male - 5/8" UNF



Type FXS6-1

* Used with FOS#-1 Type One Piece sticks

Cat No.	Stick Length mm	End Connection Type
FEHX-2	300	LV Fuse Extractor - Pigtail
FXSX6A	1830	LV Fuse Extractor - Pigtail



Type FEHX-2

* Used with FOS#-2 Type One Piece sticks

Cat No.	Stick Length mm	End Connection Type
FXS6-1B9	900	Universal
FXS6-1A	1830	Universal



Type FXS6-1A

* Used with FOS6#-1 Type One Piece sticks

Earthing Leads

Due to the nature and variety of lead sizes, lugs and end configurations, it is not possible to list the available products in this catalogue. An inquiry sheet is located further on in this section, which allows you to specify both the earth clamps and stick requirements, as well as the lead lengths and end attachment options. Earth leads are generally designed to meet short time current rating requirements unless specified otherwise.

For further details please contact Dulmison.

Cross Section of Copper Cable mm ²	Short Time Current Rating and Duration (sec)			
	3s	2s	1s	0.5s
35	4000	4900	6900	10000
95	10800	13200	18700	26500



Earth End Clamps, Trifurcation Plates and Stakes

At the end of every earth lead, a connection must be made to either an earthed structure or earth itself. For these purposes several end configurations are available. An earth lead may be supplied with a compression lug only, if required.

Earth Clamp - LEC635R

- Manufactured from brass alloy
- Self aligning jaws
- Able to be hand tightened
- Accepts round rod or bar 6 - 35mm
- Accepts flat bar up to 35mm
- Short Time Current Rating - 44kA for 0.5 Sec



Earth Stake - 791669

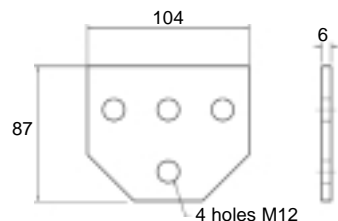
Earth Stake Clamp - LGES2

- Earth stake is galvanised star picket - 1700mm long
- Clamp has Gun metal body
- U Bolt and nuts - galvanised
- Accepts conductors up to 200mm²



Earth Trifurcation Plate - 22447-01

- 6mm Aluminium alloy plate
- 4 x M12 Attachment holes
- Used to connect 3 phase leads at one location before attachment to earth



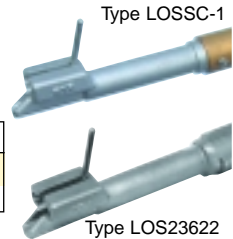
Earth Stick Accessories

Earthing stick accessories are utilised, for the temporary attachment of Earth clamps, pulling fuses and carriers, as well as disconnecting dropout fuses. Accessories are typically either clamped or screwed onto earth sticks, as shown on prior pages in this section. Compatibility is as indicated.

Operating Head - Sprung Loaded

- Cast Aluminium Body
- Stainless Steel operating hook to capture brass ring on earth clamp
- Spring loaded for positive alignment
- Captures the 32mm Brass ring on all types of earth clamps.

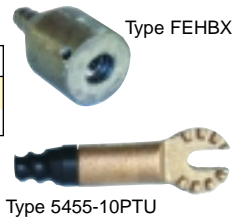
Cat No.	Connection Type	Suits Stick No/s
LOSSC-1	Screw - Female - 5/8" UNF	Type FOS#-1 & Type FXS#-1
LOS23622	Universal	Type FOS#-1A & FXS#-1A



Fuse Extractor Heads

- Pigtail design.

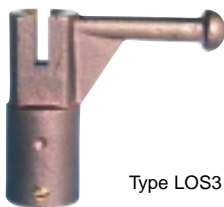
Cat No.	Connection Type	Suits Stick No/s
FEHBX	Screw - Female - 5/8" UNF	Type FOS#-1 & Type FXS#-1
5455-10PTU	Universal	Type FOS#-1A & FXS#-1A



Dropout Fuse / Tee Spindle heads

- Suitable for HXO drop out fuses
- Cast Aluminium or Gun Metal bodies
- 10mm locating spigot
- LOS4 supplied with retention latch and cord
- LOS6A - angled head -

Cat No.	Connection Type	Suit Tee Spindle Size	Suits Stick No/s
LOS3	Female - 5/8" UNF	3mm	Type FOS#-1 & Type FXS#-1
LOS3M12	Female - 5/8" UNF	6mm	Type FOS#-1 & Type FXS#-1
LOS4	Female - 5/8" UNF	3mm	Type FOS#-1 & Type FXS#-1
LOS4M12	Female - 5/8" UNF	6mm	Type FOS#-1 & Type FXS#-1
LOS6A	Female - 5/8" UNF	Not applicable	Type FOS#-1 & Type FXS#-1



Aircraft Warning Markers

Aircraft warning markers are most commonly utilised as a visual indicator of a power line, adjacent to airports, across river crossings, and on mining sites. All markers are manufactured from UV Stabilised homogenous materials (not coated). Markers are intended for use in accordance with CAA, FAA and Standards Australia requirements. Markers are available in 4 colours, so as to ensure that a colour is selected that does not blend with adjacent or line of sight countryside. These aircraft warning markers should not be installed on energised power lines above 150kV, please consult Dulmison for more information.

- Polyethylene Sphere
- 300mm Diameter or 600mm Diameter
- Sphere attached to conductor using Heliformed® fittings
- Heliformed® fittings are supplied with fitting

UFO3 - 300mm Diameter

Cat No.	Conductor Application Range mm
UFO3060*	6.00 - 7.99
UFO3080*	8.00 - 9.99
UFO3100*	10.00 - 11.99
UFO3120*	12.00 - 13.99
UFO3140*	14.00 - 15.99
UFO3160*	16.00 - 18.99
UFO3190*	19.00 - 22.49
UFO3225*	22.50 - 26.49

* Add suffix for colour -
W = White
Y = Yellow
R = Red
O = Orange



UFO6 - 600mm Diameter

Cat No.	Conductor Application Range mm
UFO6060*	6.00 - 7.99
UFO6080*	8.00 - 9.99
UFO6100*	10.00 - 11.99
UFO6120*	12.00 - 13.99
UFO6140*	14.00 - 15.99
UFO6160*	16.00 - 17.99
UFO6180*	18.00 - 19.99
UFO6200*	20.00 - 21.99
UFO6220*	22.00 - 23.99
UFO6240*	24.00 - 25.99
UFO6260*	26.00 - 27.99
UFO6280*	28.00 - 29.99
UFO6300*	30.00 - 31.99
UFO6320*	32.00 - 33.99

* Add suffix for colour -
W = White
Y = Yellow
R = Red
O = Orange



Line Stringing Roller - for Cross Arm Mounting

- Suitable for all types of bare conductors
- Range of application up to 33mm diameter
- Single screw clamping to cross arms
- Swinging top bar, for easy insertion of conductors
- Galvanised frame.

Cat No.	Cross arm size mm	Roller Material
LSR4	75 - 100	High Durability Nylon
LSR5	100 - 125	High Durability Nylon
LSR6	125 - 150	High Durability Nylon
LSR4A	75 - 100	Aluminium Alloy
LSR5A	100 - 125	Aluminium Alloy
LSR6A	125 - 150	Aluminium Alloy



Type LSR

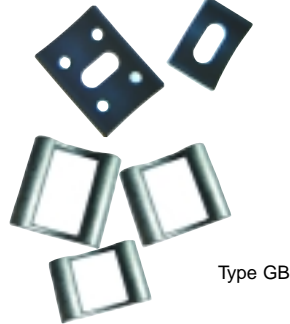
Gain Blocks - Cross Arm Mounting Blocks

- Available in two materials
- Cast high strength Aluminium Alloy
- UV Stabilized and reinforced polymer
- Aluminium block incorporates cross arm locating groove
- Polymer blocks available in 4 sizes

Cat No.	Cross arm size mm	Block Material
GBP75	75	Reinforced Polymer
GBP100	100	Reinforced Polymer
GBP125	125	Reinforced Polymer
GBP150	150	Reinforced Polymer
GB100	100	Aluminium Alloy
GB125	125	Aluminium Alloy
GB150	150	Aluminium Alloy



Type GBP



Type GB

Pole Step - PS16250A

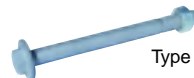
- High Strength Steel - Galvanised
- 16mm Dia x 250mm Long
- Forged foot retention at end
- Driven directly into timber poles



Type PS16250A

Step Bolt - SB16180

- For concrete poles
- 16mm Dia x 180mm Long



Type SB16180

Cross Arm Braces

- High Strength Steel - Galvanised
- 6mm Thick material



Type XABRA

Cat No.	Hole Centres mm	Brace width mm
XABRA03	863	40
XABRA04	800	50
XABRA05	500	50
XABRA06	1000	50

Hook Bolts

- Shaped Locating plate to lock onto pole
- Supplied with Nut and washer

Cat No. 16mm Dia.	Cat No. 20mm Dia.	Mounting Length mm	Thread Length mm
IBH16250	IBH20250	250	150
IBH16300	IBH20300	300	150
IBH16325	IBH20325	325	150
IBH16350	IBH20350*	350	150
IBH16400	IBH20400	400	150
IBH16450	IBH20450*	450	150

* Long Hook - 200mm available

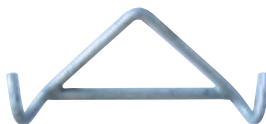


Type IBH

Double Suspension Clamp Bracket

- Use when line deviations exceed 30 degrees
- Two suspension clamps fitted to reduce lead in and exit angles
- For IBSL suspensions clamps, use IBYB12A only

Cat No.	Diameter of Material	Hanging Depth mm	Hook Centres	Min. Failing Load kN
IBYB12	16	106	174	12
IBYB12A	16	125	300	12
IBYB24	20	100	200	24

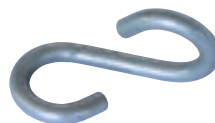


Type IBYB12A

Mechanical Weak Link

- Will withstand normal loading, but will fail under impact loads
- Eliminates damage to suspension fitting and cables

Cat No.	Diameter of Material	Total Length mm	Material Type	Min. Failing Load kN
IBWL02	6	81	S/Steel	2
IBWL04	10	100	Galv Steel	4
IBWL08	12	100	Galv Steel	8



Type IBWL08

Eye Nut

- Screwed onto threaded device to produce Eye attachment

Cat No.	Thread Size	Thread Length mm	Material Type	Dia. of Eye Material
EN16	M16	30	Galv Steel	12
EN20	M20	40	Galv Steel	16
EN2020	M20	40	Galv Steel	20
EN24	M24	45	Galv Steel	20

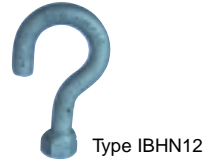


Type EN16

Hook Nut

- Screwed onto threaded device to produce Hook attachment

Cat No.	Thread Size	Dia. of Eye Material	Material Type	Failing Load kN
IBHN12	M16	16	Galv Steel	12
IBHN24	M20	20	Galv Steel	24



Hook Bracket

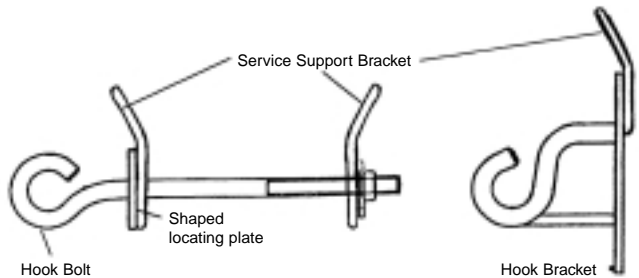
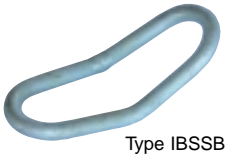
- Designed for Façade mounted strain clamps
- Can be strapped to concrete poles with Stainless Steel strap
- Used as temporary hook, for attachment of stringing rollers

Cat No.	Mounting Centres	Dia. of Eye Material	Material Type	Failing Load kN
IBHB12	150	16	Galv Steel	12
IBHB24	150	20	Galv Steel	24



Service Support Bracket - Cat No. IBSSB

- Used as a service strain clamp attachment point
- Used in conjunction with hook bolts or hook brackets
- Galvanised Steel

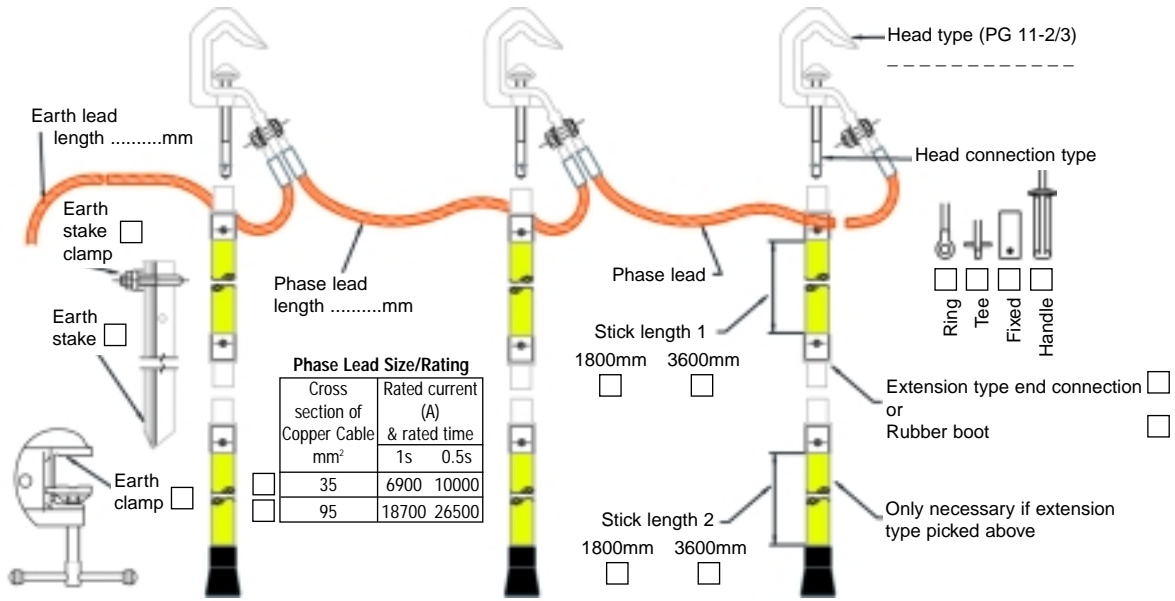


Type IBSSB application

Earth Set

Order/Inquiry Information Sheet

Number of Phases (1 or 3)
 Are earth sticks required? No Yes No. required



Tick boxes and fill in details where appropriate

Please copy this sheet, fill in the relevant details and forward to the Dulmison sales office in your region.

Company

Contact Name

Phone No.

Fax/email





12

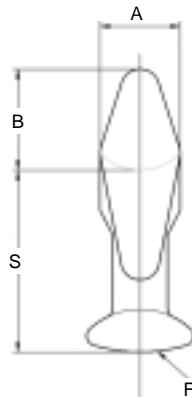
Line hardware

- > Ball Hook
- > Tongue Hook
- > Bow Shackle
- > D Shackle
- > Ball Eye Link
- > Ball Clevis
- > Ball Eye Extension Link
- > Ball Clevis Extension Link
- > Socket Clevis
- > Socket Clevis Extension Link
- > Socket Tongue
- > Socket Tongue Twisted
- > Clevis Tongue
- > Clevis Tongue Twisted
- > Turnbuckles
- > Sub Assembly Diagram
- > Single Plate Link
- > Double Plate Link
- > Sag Link
- > Yoke Plate
- > Suspension/Support Units
- > Compression Fittings
- > Vibration Dampers
- > Conductor Spacers
- > Bolted Clamps
- > Typical String Assemblies

Ball Hooks & Tongue Hook



Fig. 1 Ball Hook Short Shank



Optional hole for safety latch

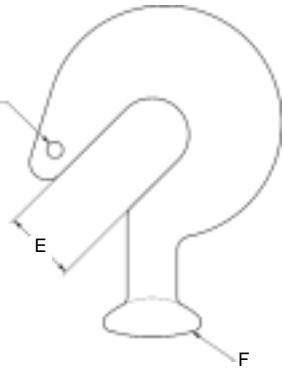


Fig. 2 Ball Hook Long Shank



Cat BHSS70

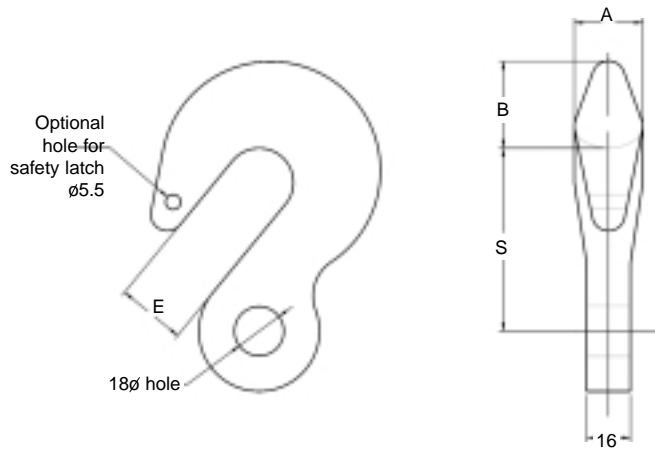


Fig. 3 Tongue Hook

Cat No.	Minimum Failing Load kN	Dimensions					Material	Fig. No.
		A	B	E	F (Ball)	S		
BHSS70	70	25	32	20	16	57	Forged Steel	1
BHLS70	70	25	32	25	16	82	Forged Steel	2
TH70	70	25	32	25	-	67	Forged Steel	3

Bow Shackle

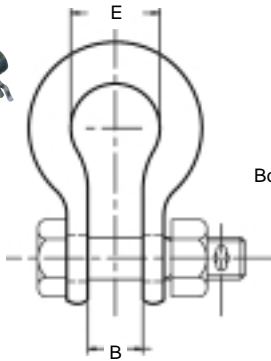


Fig. 1

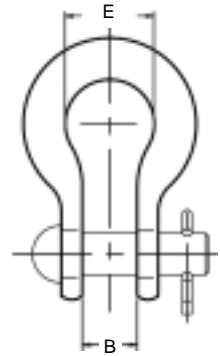
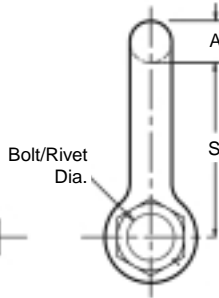


Fig. 2

Cat No.	Minimum Failing Load kN	Dimensions					Material	Fig. No.
		A	B	E	Bolt/Rivet Dia.	S		
S70A	70	16	22.50	34	16	67	Forged Steel	1
S70Q	70	16	22.50	34	16	67	Forged Steel	2
S120A	120	16	22.50	34	16	67	Forged Steel	1
S160A	160	20	24.50	40	20	76	Forged Steel	1

D Shackle

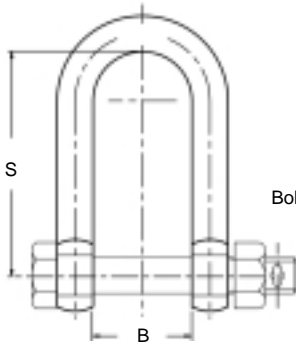


Fig. 1

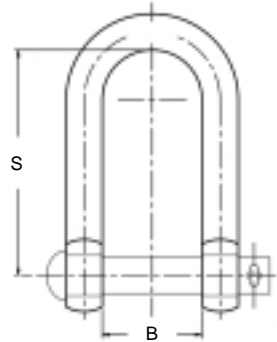
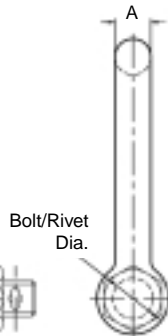


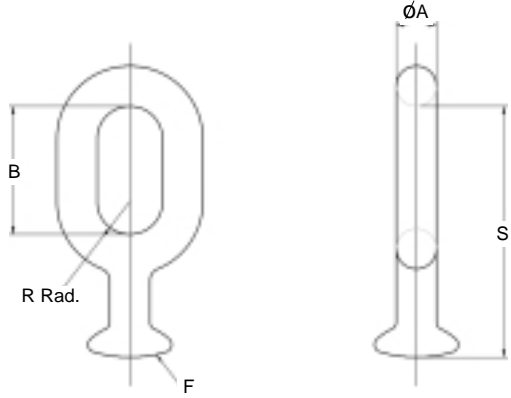
Fig. 2

Cat No.	Minimum Failing Load kN	Dimensions				Material	Fig. No.
		A	B	Bolt/Rivet Dia.	S		
SD70A	70	16	44	16	100	Forged Steel	1
SD70Q	70	16	44	16	100	Forged Steel	2

Ball Eye Link

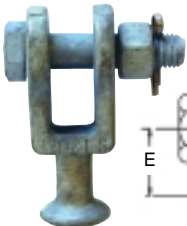


Cat BEL70



Cat No.	Minimum Failing Load kN	Dimensions					Material
		A	B	R	S	F (Ball)	
BEL70	70	16	50	13	100	16	Forged Steel
BEL120	120	16	50	13	100	16	Forged Steel
BEL160	160	20	64	16	128	20	Forged Steel

Ball Clevis



Cat BC120A

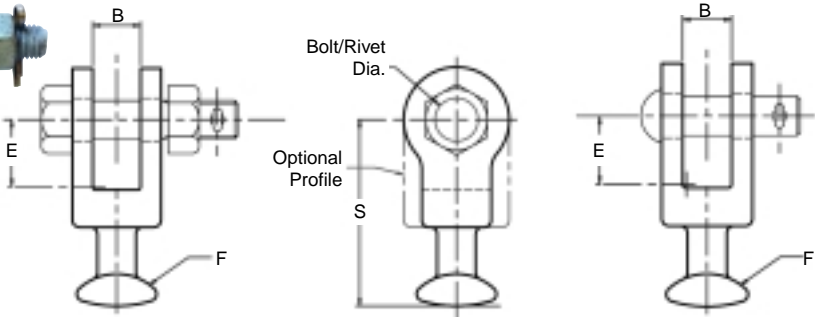
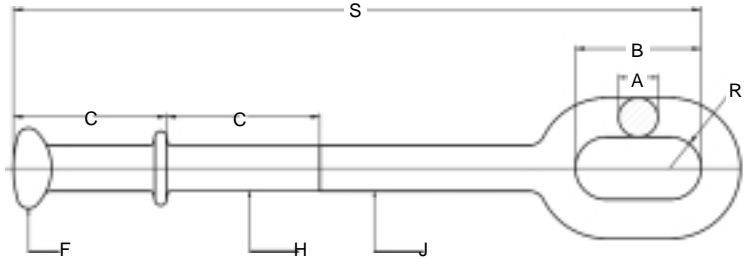
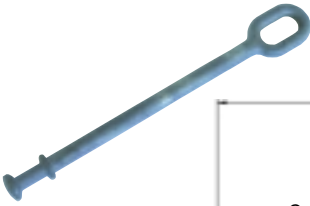


Fig. 1

Fig. 2

Cat No.	Minimum Failing Load kN	Dimensions					Material	Fig. No.
		B	E	S	Bolt/Rivet Dia.	F (Ball)		
BC70A	70	20	28	78	16	16	Forged Steel	1
BC70Q	70	20	28	78	16	16	Forged Steel	2
BC120A	120	20	28	78	16	16	Forged Steel	1
BC160A	160	24	35	95	20	20	Forged Steel	1

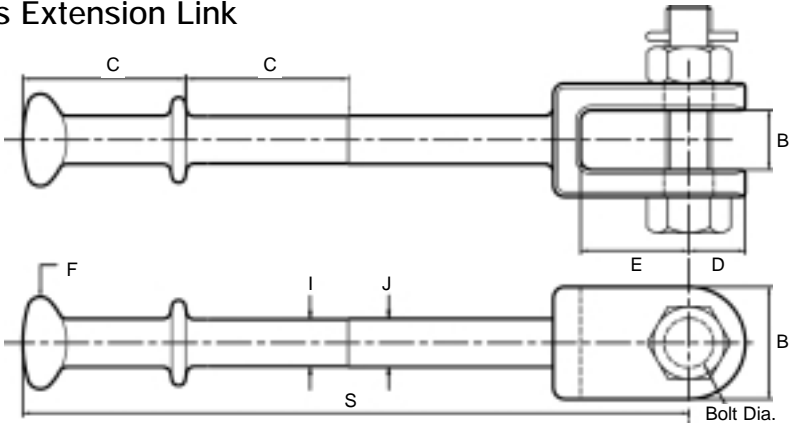
Ball Eye Extension Link



Cat No.	Minimum Failing Load kN	Dimensions								Material
		A	B	C	F	I	J	R	S	
BEEL160A	160	20	64	78	20	23	24	16	250	Forged Steel
BEEL160D	160	20	64	78	20	23	24	16	500	Forged Steel
BEEL160E	160	20	64	78	20	23	24	16	800	Forged Steel

Standard length S also available in 350, 1000 and 1330mm long

Ball Clevis Extension Link



Cat No.	Minimum Failing Load kN	Dimensions									Material
		B	C	D	E	F	Bolt Dia.	I Max	J	S	
BCEL160A	160	24	78	24	35	20	20	23	24	295	Forged Steel

Socket Clevis

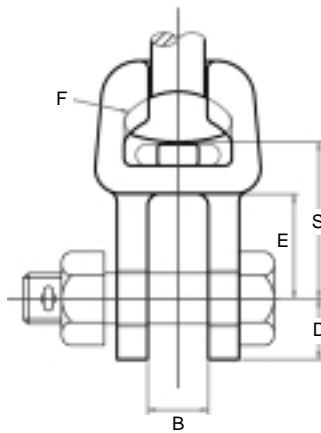


Fig. 1

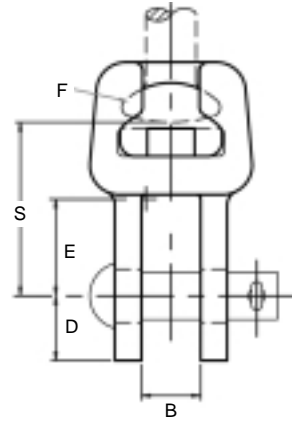
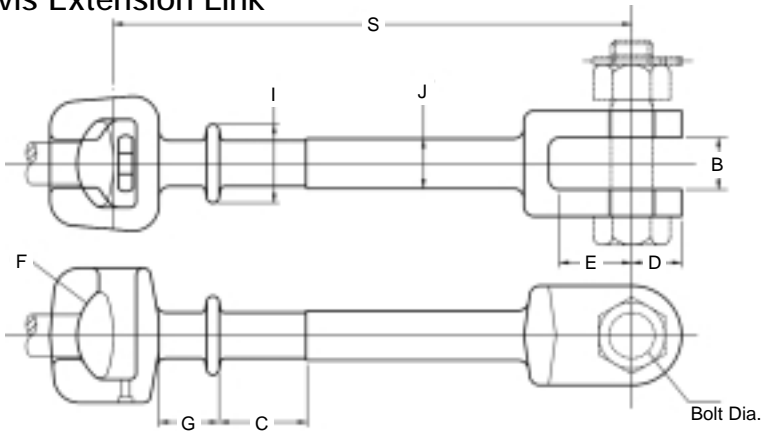


Fig. 2

Cat No.	Minimum Failing Load kN	Dimensions					Bolt/Rivet Dia.	S	Material	Fig. No.
		B	D	E	F (Ball)					
SC70A	70	20	22	28	16	16	59	Cast Iron	1	
SC70Q	70	20	22	28	16	16	59	Cast Iron	2	
SC120A	120	20	22	28	16	16	59	Forged Steel	1	
SC160A	160	24	24	35	20	20	62	Forged Steel	1	

Note: Standard fitting supplied with W clip; for R clip add suffix R

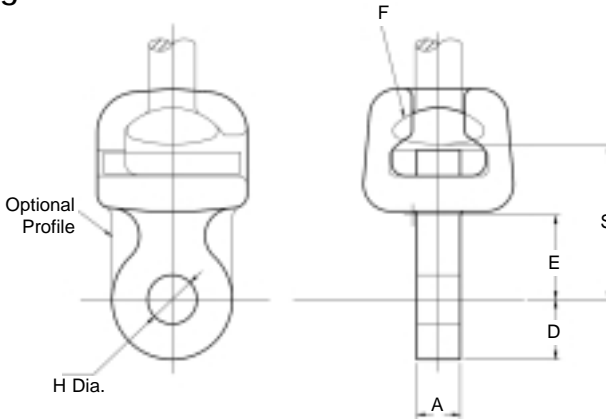
Socket Clevis Extension Link



Cat No.	Minimum Failing Load kN	Dimensions									
		B	C	D	E	F Socket	G	Bolt Dia.	I Max.	J	S
SCEL160A	160	24	78	24	35	20	25	20	23	24	250

Note: Standard fitting supplied with W clip; for R clip add suffix R

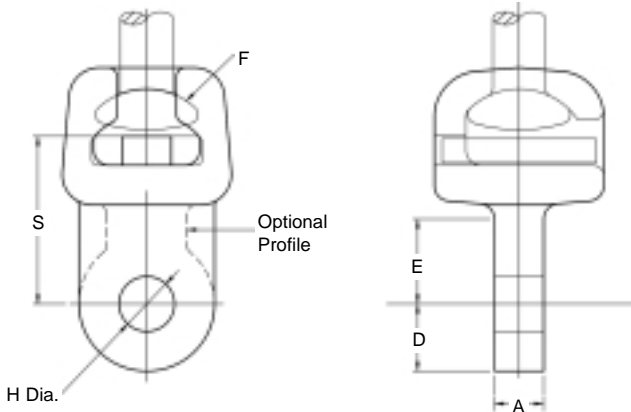
Socket Tongue



Cat No.	Minimum Failing Load kN	Dimensions						Material
		B	D	E	F (Ball)	H Dia.	S	
ST70	70	16	22	28	16	18	57	Cast Iron
ST120	120	16	22	28	16	18	57	Forged Steel
ST160	160	20	24	35	20	22	57	Forged Steel

Note: Standard fitting supplied with W clip; for R clip add suffix R

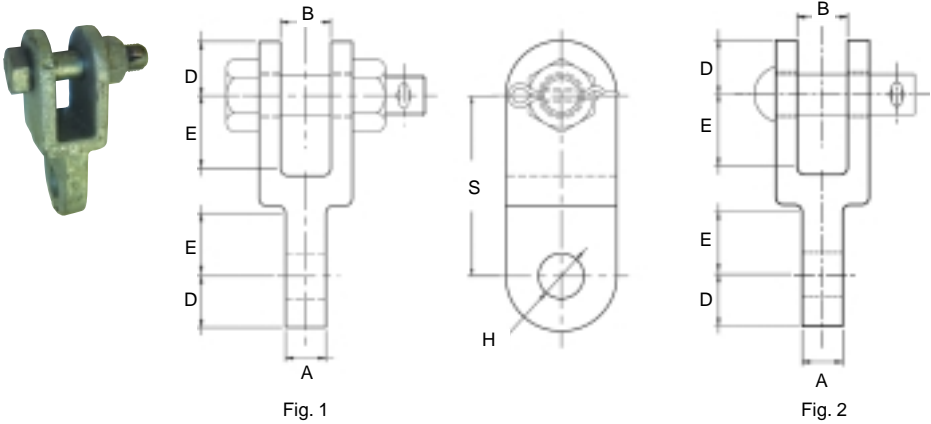
Socket Tongue Twisted



Cat No.	Minimum Failing Load kN	Dimensions						Material
		B	D	E	F (Ball)	H Dia.	S	
STT70	70	16	22	28	16	18	57	Cast Iron
STT120	120	16	22	28	16	18	57	Forged Steel
STT160	160	20	24	35	20	22	57	Forged Steel

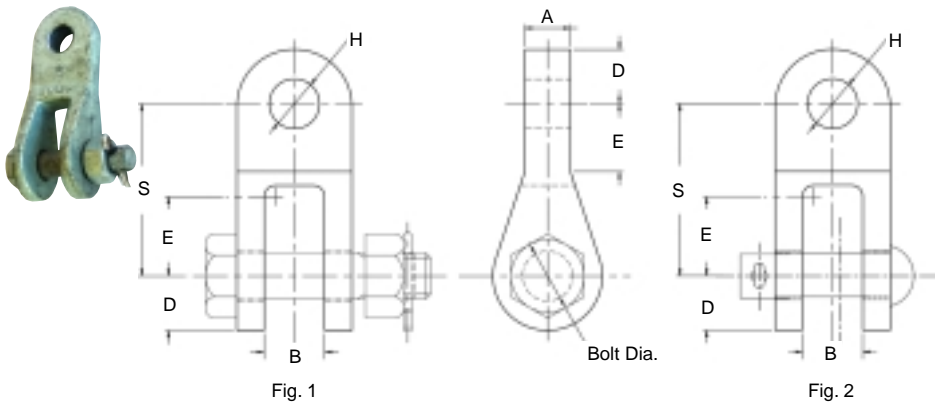
Note: Standard fitting supplied with W clip; for R clip add suffix R

Clevis Tongue



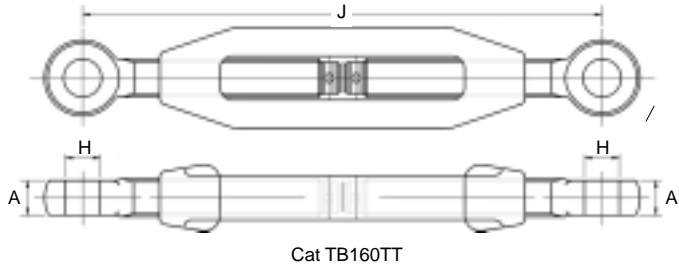
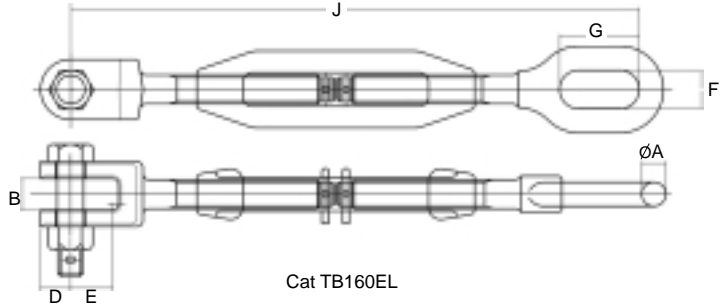
Cat No.	Minimum Failing Load kN	Dimensions							Material	Fig. No.
		A	B	D	E	H Dia.	Bolt/Rivet Dia.	S		
CT70A	70	16	20	22	28	18	16	72	Cast Iron	1
CT70Q	70	16	20	22	28	18	16	72	Cast Iron	2
CT120A	120	16	20	22	28	18	16	72	Forged Steel	1

Clevis Tongue Twisted



Cat No.	Minimum Failing Load kN	Dimensions							Material	Fig. No.
		A	B	D	E	H Dia.	Bolt/Rivet Dia.	S		
CTT70A	70	16	20	22	28	18	16	76	Forged Steel	1
CTT70Q	70	16	20	22	28	18	16	76	Forged Steel	2
CTT120A	120	16	20	22	28	18	16	76	Forged Steel	1
CTT160A	160	20	24	24	35	22	20	76	Forged Steel	1

Turnbuckles



Cat No.	Minimum Failing Load kN	Dimensions							Bolt Dia.	Material
		A	B	D	E	F	G			
TB160**	160	20	24	24	35	32	64	20	Forged Steel	

**When ordering turnbuckles nominate suffix as follows:

TB160 followed by -

EE Nominating Eye/Eye

ET Nominating Eye/Tongue

EL Nominating Eye/Clevis

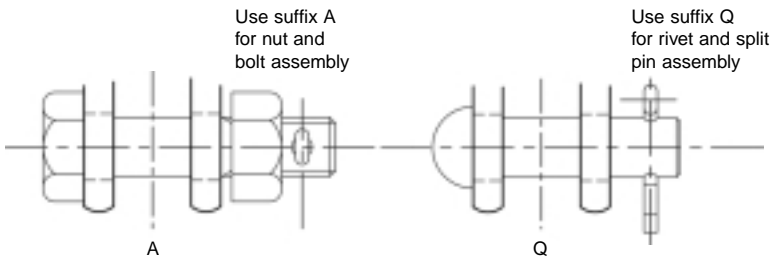
TL Nominating Tongue/Clevis

LL Nominating Clevis/Clevis

TT Nominating Tongue/Tongue

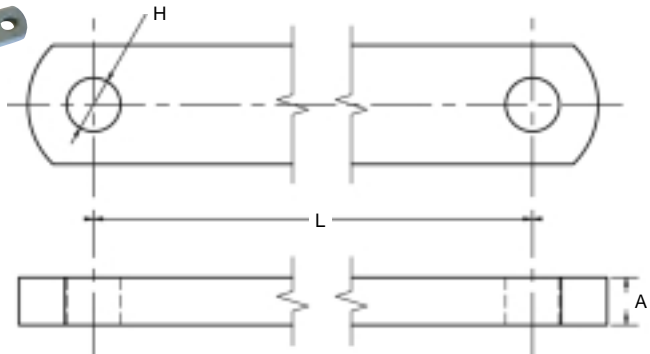
Other sizes may be available on request.

Sub Assembly ZZ



Bolt diameter 16mm for 70kN/120kN and 20mm for 160kN
Rivet diameter 16mm for 70kN

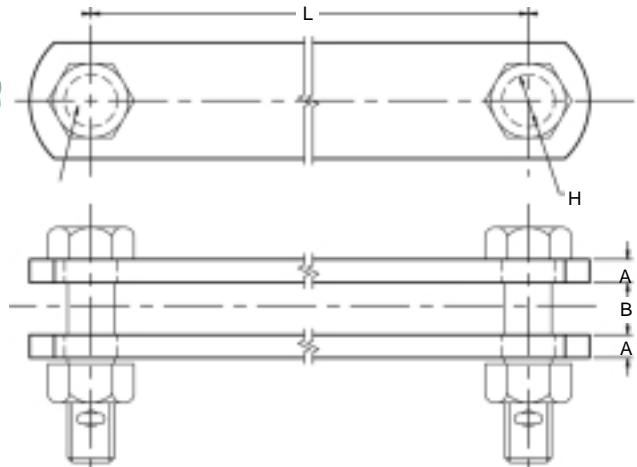
Single Plate Link



Cat No.	Minimum Failing Load kN	Dimensions			Material
		A	L	H Dia.	
SPL120__	120	16	As required	18	Galv Steel
SPL160__	160	16	As required	18	Galv Steel

Note: To above Cat No. add suffix to denote dimension 'L' e.g. SPL120150 (in 25mm steps)

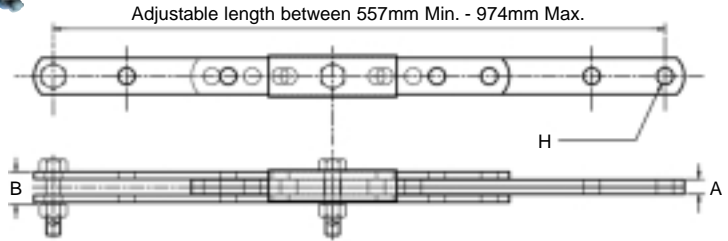
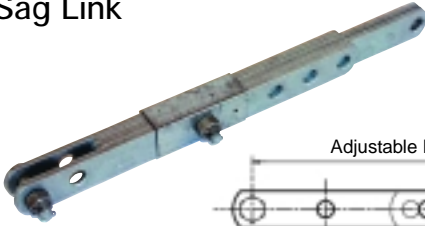
Double Plate Link



Cat No.	Minimum Failing Load kN	Dimensions			Bolt Dia.	Material
		A	B	L		
DPL70__	70	8	20	As required	16	Galv Steel
DPL120__	120	8	20	As required	16	Galv Steel
DPL160__	160	10	24	As required	20	Galv Steel

Note: To above Cat No. add suffix to denote dimension 'L' e.g. DPL70100 (in 25mm steps)

Sag Link

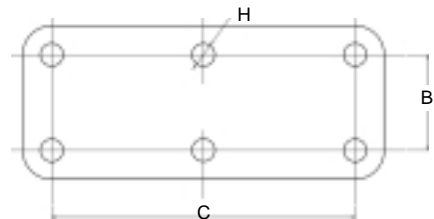
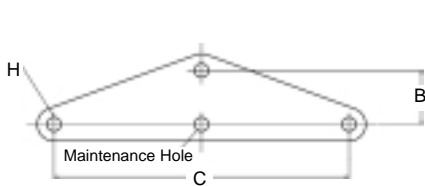


Cat No.	Minimum Failing Load kN	Dimensions				Material
		A	B	H Dia.	Bolt Dia.	
SL70	70	16 - 18	20	16	18	Galv Steel
SL120	120	16 - 18	20	16	18	Galv Steel
SL160**	160	20 - 22	24	20	22	Galv Steel

Note: Other variations available.

Yoke Plate - Triangular/Rectangular

Typical only, consult Dulmison for more details



Cat No. Triangular	Cat No. Rectangular	Minimum Failing Load kN	Dimensions				Material
			A	B	C	H Dia.	
YPT70	YPR70	70	16	76	380	18	Galv Steel
YPT120	YPR120	120	16	76	380	18	Galv Steel
YPT160	YPR160	160	20	76	380	22	Galv Steel

Note: Dimensions 'B' and 'C' are subject to customer requirements.

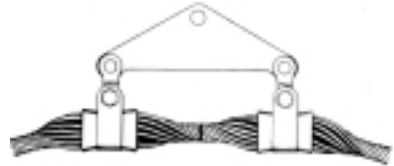
Heliformed® Suspension Units

Type HSU - Aluminium Alloy for AAC, AAAC & ACSR conductor

Type SHS - Galvanised Steel for SC/GZ conductor (Refer Dulmison Sales office for further information)

Type LHS - Aluminium Clad Steel for SC/AC conductor

Refer pages 7-31 and 7-32 for details.



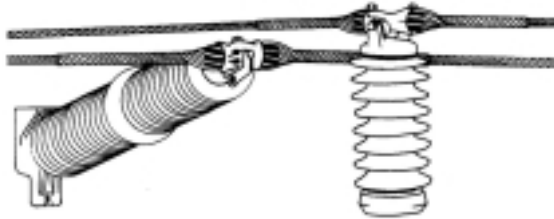
Cond. Type & Stranding		Dia. mm	Catalogue Number	Colour Code
AAC/AAAC	ACSR			
7/2.50	6/1+3/4/2.50	7.50	HSU0750	Blue
7/3.00	6/1+4/3/3.00	9.00	HSU0900	Red
7/3.75	6/1+4/3/3.75	11.25	HSU1125	Black
7/4.50	-	13.50	HSU1350	Green
7/4.75	6/4.75+7/1.60	14.30	HSU1430	Blue
19/3.25	-	16.25	HSU1625	Orange
-	30/7/2.50	17.50	HSU1750*	Blue
19/3.75	-	18.75	HSU1875*	Black
-	30/7/3.00	21.00	HSU2100*	Red
19/4.75	-	23.75	HSU2375*	Blue
-	30/7/3.75	24.50	HSU2450*	Purple
37/3.75	-	26.25	HSU2625*	Black
-	54/7/3.00	27.00	HSU2700*	Red
61/3.25	54/7/3.25	29.30	HSU2930*	Orange
-	54/7/3.50	31.50	HSU3150*	Purple
61/3.75	54/3.75+19/2.25	33.75	HSU3375*	Black

* Standard bolt size 16mm. Add suffix '2' for 20mm bolt.

Heliformed® Support Units

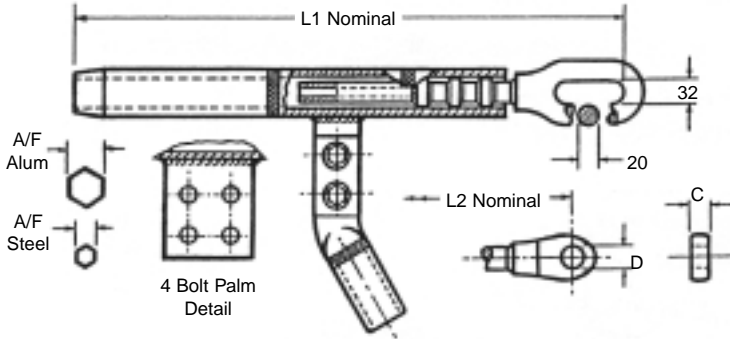
Type HSP - Aluminium Alloy for AAC, AAAC & ACSR conductor

Refer page 7-33 for details.



Cond. Type & Stranding		Dia. mm	Catalogue Number	Colour Code
AAC/AAAC	ACSR			
7/3.75	6/1+4/3/3.75	11.25	HSP1125	Black
7/4.50	-	13.50	HSP1350	Green
4/4.75	6/4.75+7/1.60	14.30	HSP1430	Blue
19/3.25	-	16.25	HSP1625	Orange
-	30/7/2.50	17.50	HSP1750	Blue
19/3.75	-	18.75	HSP1875	Black
-	30/7/3.00	21.00	HSP2100	Red
19/4.75	-	23.75	HSP2375	Blue
-	30/7/3.75	26.50	HSP2650	Purple
37/3.75	-	26.25	HSP2625	Black

Compression Deadends, Full Tension with Jumper Lugs using hexagonal Compression Dies



For ACSR conductors			Nom. Overall Cond. Dia.	Dimensions					
Cat No.	Code Name	Conductor Stranding		A/F1	A/F2	Eye Tail		Tongue Tail	
						L1	C	D	L2
HD507	ALMOND	6/1/2.50	7.50	14.00	6.80	350	12	18.0	320
HD512	APPLE	6/1/3.00	9.00	14.00	6.80	350	12	18.0	320
HD516	BANANA	6/1/3.75	11.30	18.00	9.50	370	12	18.0	340
HD521	CHERRY	6/4.75 +7/1.60	14.30	22.00	9.50	390	12	18.0	360
HD525	GRAPE	30/7/2.50	17.50	28.50	16.00	480	16	18.0	420
HD530	LEMON	30/7/3.00	21.00	34.50	17.00	540	20	22.0	490
HD532	LIME	30/7/3.50	24.50	40.00	19.00	560	20	22.0	510
HD535	MANGO	54/7/3.00	27.00	40.00	17.00	580	20	22.0	530
HD536	ORANGE	54/7/3.25	29.30	44.50	19.00	580	22	22.0	530
HD538	OLIVE	54/7/3.50	31.50	47.50	19.00	600	22	22.0	550
HD541	PAW PAW	54/3.75 +19/2.25	33.80	47.50	20.00	600	22	22.0	550

Note: Tongue tail arrangement preferred to eye tail arrangement for ranges Almond to Grape inclusive. To identify eye tail arrangement add suffix 'E'. For tongue tail arrangement add suffix 'T'.

Compression Deadends, Full Tension with Jumper Lugs using hexagonal Compression Dies

For AAC conductors			Nom. Overall Cond. Dia.	Dimensions				
Cat No.	Code Name	Cond. Stranding		A/F	Eye Tail		Tongue Tail	
					L1	C	D	L2
HD604	LEO	7/2.50	7.50	14.0	310	12	18	280
HD606	LIBRA	7/3.00	9.00	14.0	330	12	18	300
HD608	MARS	7/3.75	11.30	18.0	350	12	18	320
HD611	MERCURY	7/4.50	13.50	22.0	370	12	18	340
HD612	MOON	7/4.75	14.30	22.0	370	12	18	340
HD615	NEPTUNE	19/3.25	16.30	28.5	420	12	18	390
HD616	PLUTO	19/3.75	18.80	28.5	440	12	18	410
HD618	SATURN	37/3.00	21.00	34.5	460	12	18	430
HD620	TAURUS	19/4.75	23.80	40.0	500	16	18	480
HD621	TRITON	37/3.75	26.30	40.0	500	16	18	480
HD623	URANUS	61/3.25	29.30	44.5	580	20	20	530
HD624	VENUS	61/3.75	33.80	47.5	600	20	20	570

Note: Tongue tail arrangement preferred to eye tail arrangement for ranges Jupiter to Triton inclusive. Eye tail arrangements for Uranus and larger should have centre palm arrangements. To identify eye tail arrangement add suffix 'E'. For tongue tail arrangement add suffix 'T'.

For AAAC conductors			Nom. Overall Cond. Dia.	Dimensions					
Cat No.	Code Name			Cond. Stranding	A/F	Eye Tail		Tongue Tail	
	AAAC	AAAC/1120				L1	C	D	L2
HD702	DIAMOND	CHLORINE	7/2.50	7.50	14.0	310	12	18	280
HD703	EMERALD	FLUORINE	7/3.00	9.00	14.0	330	12	18	300
HD704	GARNET	HELIUM	7/3.75	11.30	18.0	350	12	18	320
HD705	JADE	HYDROGEN	7/4.50	13.50	22.0	370	12	18	340
HD706	JASPER	IODINE	7/4.75	14.30	22.0	370	12	18	340
HD707	OPAL	KRYPTON	19/3.25	16.30	28.5	420	12	18	380
HD708	PEARL	NEON	19/3.75	18.80	30.0	440	12	18	420
HD709	RUBY	NITROGEN	37/3.00	21.00	34.5	460	12	18	450
HD710	RUTILE	OXYGEN	19/4.75	23.80	40.0	500	20	22	490
HD711	SAPPHIRE	PHOSPHORUS	37/3.75	26.30	40.0	500	20	22	490
HD712	SPINEL	SELENIUM	61/3.25	29.30	44.5	580	22	22	530
HD713	TOPAZ	SULPHUR	61/3.75	33.80	47.5	600	22	22	570

Note: Tongue tail arrangement preferred to eye tail arrangement for ranges Amethyst to Pearl inclusive. Eye tail arrangements for Spinel and larger should have centre palm arrangements. To identify eye tail arrangement add suffix 'E'. For tongue tail arrangement add suffix 'T'.

Compression Mid Span Joints - Full Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type – AAC

AAC Full Tension Midspan Joints, are manufactured from an Aluminium extrusion, equivalent in strength to the conductor onto which the fitting is applied.

Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

Cat. No.	AAC Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L	
HM603	Jupiter	7/2.25	6.75	11.0	240	38-110AL
HM604	Leo	7/2.50	7.50	14.0	240	38-140AL
HM606	Libra	7/3.00	9.00	14.0	280	38-140AL
HM608	Mars	7/3.75	11.25	18.0	320	38-180AL
HM611	Mercury	7/4.50	13.50	22.0	360	38-220AL
HM612	Moon	7/4.75	14.25	22.0	360	38-220AL
HM615	Neptune	19/3.25	16.25	28.5	400	40-285AL
HM616	Pluto	19/3.75	18.75	28.5	440	40-285AL
HM618	Saturn	37/3.00	21.00	34.5	480	40-345AL
HM620	Taurus	19/4.75	23.75	40.0	560	40-400AL
HM621	Triton	37/3.75	26.25	40.0	560	40-400AL
HM623	Uranus	61/3.25	29.25	44.5	640	40-445AL
HM624	Venus	61/3.75	33.75	47.5	780	40-475AL

Compression Mid Span Joints - Full Tension

for Hexagonal Compression Dies in accordance with AS1154



Conductor type AAAC/6201 & AAAC/1120

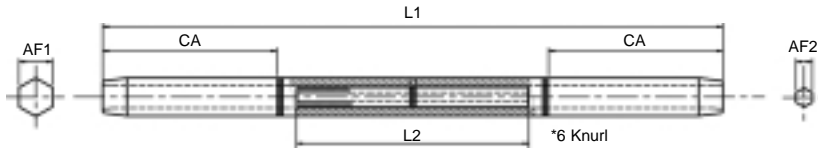
AAAC Full Tension Compression Midspan Joints, are manufactured from an Aluminium extrusion, equivalent in strength to the conductor onto which the fitting is applied.

Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

Cat. No.	AAAC/6201 Code Name	AAAC/1120 Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
					A/F	L	
HM702	Diamond	Chlorine	7/2.50	7.50	14.0	240	38-140AL
HM703	Emerald	Fluorine	7/3.00	9.00	14.0	280	38-140AL
HM704	Garnet	Helium	7/3.75	11.25	18.0	320	38-180AL
HM705	Jade	Hydrogen	7/4.50	13.50	22.0	360	38-220AL
HM706	Jasper	Iodine	7/4.75	14.25	22.0	360	38-220AL
HM707	Opal	Krypton	19/3.25	16.25	28.5	400	40-285AL
HM708	Pearl	Neon	19/3.75	18.75	30.0	440	40-300AL
HM709	Ruby	Nitrogen	37/3.00	21.00	34.5	480	40-345AL
HM710	Rutile	Oxygen	19/4.75	23.75	40.0	560	40-400AL
HM711	Sapphire	Phosphorous	37/3.75	26.25	40.0	560	40-400AL
HM712	Spinel	Selenium	61/3.25	29.25	44.5	640	40-445AL
HM713	Topaz	Sulphur	61/3.75	33.75	47.5	780	40-475AL

Compression Mid Span Joints - Full Tension for Hexagonal Compression Dies in accordance with AS1154



Conductor type – ACSR

ACSR Full Tension Compression Midspan Joints, are manufactured from an Aluminium outer extrusion, and an inner steel tubular core. The two piece design ensures a design strength equivalent to the conductor onto which the fitting is applied.

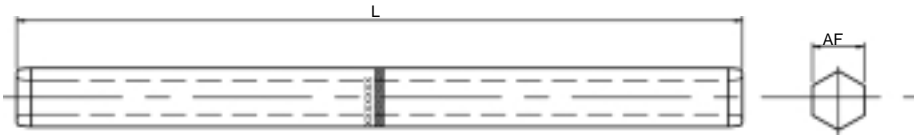
Each fitting is manufactured with internal and external tapers, to eliminate stresses associated with compression, and reduce corona discharge.

Each fitting is clearly marked with the compression length, the applicable conductor stranding, and the appropriate compression die size. All design parameters for the items in this section are in accordance with AS1154.

ACSR		Conductor Stranding	Nom. Overall Cond. Dia.	Aluminium				Steel		
Cat. No.	Code Name			Dimensions						
				A/F1	Die	L1 Nom.	CA	A/F2	Die	L2 Nom.
HM507	Almond	6/1/2.50	7.50	14.0	38-140AL	400	100	6.8	38-68ST14	160
HM512	Apple	6/1/3.00	9.00	14.0	38-140AL	400	100	6.8	38-68ST14	160
HM516	Banana	6/1/3.75	11.25	18.0	38-180AL	440	120	9.5	38-95ST	160
HM521	Cherry	6/4.75+7/1.60	14.30	22.0	38-220AL	480	140	9.5	38-95ST	160
HM525	Grape	30/7/2.50	17.50	28.5	40-285AL	600	180	16.0	38-160ST	200
HM530	Lemon	30/7/3.00	21.00	34.5	40-345AL	640	180	17.0	40-170ST	240
HM532	Lime	30/7/3.50	24.50	40.0	40-400AL	680	200	19.0	40-190ST	240
HM535	Mango	54/7/3.00	27.00	40.0	40-400AL	720	220	17.0	40-170ST	240
HM536	Orange	54/7/3.25	29.25	44.5	40-445AL	720	220	19.0	40-190ST	240
HM538	Olive	54/7/3.50	31.50	47.5	40-475AL	760	240	19.0	40-190ST	240

Compression Mid Span Joints - Non Tension

for Hexagonal compression Dies in accordance with AS1154



Conductor type – AAC

Non Tension Compression Mid Span Joints are manufactured from an Aluminium extrusion.

As these joints are installed at low tension values, one fitting can be used for all cable types of the same size (OD).

Cat. No.	AAC Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L	
HN603	Jupiter	7/2.25	6.75	11.0	160	38-110AL
HN604	Leo	7/2.50	7.50	14.0	180	38-140AL
HN606	Libra	7/3.00	9.00	14.0	180	38-140AL
HN608	Mars	7/3.75	11.25	18.0	220	38-180AL
HN611	Mercury	7/4.50	13.50	22.0	240	38-220AL
HN612	Moon	7/4.75	14.25	22.0	260	38-220AL
HN615	Neptune	19/3.25	16.25	28.5	260	40-285AL
HN616	Pluto	19/3.75	18.75	28.5	260	40-285AL
HN618	Saturn	37/3.00	21.00	34.5	280	40-345AL
HN620	Taurus	19/4.75	23.75	40.0	280	40-400AL
HN621	Triton	37/3.75	26.25	40.0	300	40-400AL
HN623	Uranus	61/3.25	29.25	44.5	320	40-445AL
HN624	Venus	61/3.75	33.75	47.5	380	40-475AL

Compression Mid Span Joints - Non Tension

for Hexagonal Compression Dies in accordance with AS1154



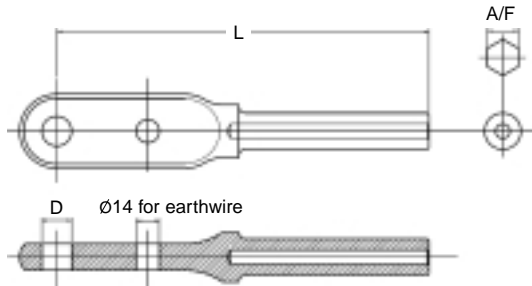
Conductor type - AAAC/6201 & AAAC/1120

Cat. No.	AAAC/6201 Code Name	AAAC/1120 Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
					A/F	L	
HN604	Diamond	Chlorine	7/2.50	7.50	14.0	180	38-140AL
HN606	Emerald	Fluorine	7/3.00	9.00	14.0	180	38-140AL
HN608	Garnet	Helium	7/3.75	11.25	18.0	220	38-180AL
HN611	Jade	Hydrogen	7/4.50	13.50	22.0	240	38-220AL
HN612	Jasper	Iodine	7/4.75	14.25	22.0	260	38-220AL
HN615	Opal	Krypton	19/3.25	16.25	28.5	260	40-285AL
HN616	Pearl	Neon	19/3.75	18.75	28.5	260	40-285AL
HN618	Ruby	Nitrogen	37/3.00	21.00	34.5	280	40-345AL
HN620	Rutile	Oxygen	19/4.75	23.75	40.0	280	40-400AL
HN621	Sapphire	Phosphorous	37/3.75	26.25	40.0	300	40-400AL
HN623	Spinel	Selenium	61/3.25	29.25	44.5	320	40-445AL
HN624	Topaz	Sulphur	61/3.75	33.75	47.5	380	40-475AL

Conductor type - ACSR

Cat. No.	ACSR Code Name	Conductor Stranding	Nom. Overall Cond. Dia.	Dimensions mm		Die
				A/F	L Nom.	
HN604	Almond	6/1/2.50	7.50	14.0	180	38-140AL
HN606	Apple	6/1/3.00	9.00	14.0	180	38-140AL
HN608	Banana	6/1/3.75	11.25	18.0	220	38-180AL
HN521	Cherry	6/4.75+7/1.60	14.30	22.0	260	38-220AL
HN634	Grape	30/7/2.50	17.50	28.5	260	40-285AL
HN618	Lemon	30/7/3.00	21.00	34.5	280	40-345AL
HN532	Lime	30/7/3.50	24.50	40.0	300	40-400AL
HN631	Mango	54/7/3.00	27.00	40.0	320	40-400AL
HN623	Orange	54/7/3.25	29.25	44.5	320	40-445AL
HN635	Olive	54/7/3.50	31.50	47.5	350	40-475AL

Compression Deadend - for Earthwire using Hexagonal Compression Dies



Material: Stainless Steel

Cat No.	Conductor Stranding SC/GZ (AC)	Nom. Overall Cond. Dia.	Dimensions		
			A/F	L	D
HD806T	7/2.75	8.25	17.0	225	18
HD807T	7/3.25	9.75	17.0	225	18
HD808T	19/2.00	10.00	19.0	225	18
HD809T	7/3.75	11.25	19.0	225	18
HD811T	19/2.75	13.75	26.0	240	18
HD812T	19/3.25	16.25	26.0	260	18

Compression Midspan Joint - for Earthwire using Hexagonal Compression Dies



Material: Stainless Steel

Cat No.	Conductor Stranding SC/GZ (AC)	Nom. Overall Cond. Dia.	Dimensions	
			A/F	L
HM804	3/2.75	5.90	11.0	160
HM807	7/3.25	9.75	17.0	240
HM808	19/2.00	10.00	19.0	240
HM809	7/3.75	11.25	19.0	250
HM811	19/2.75	13.75	26.0	260
HM812	19/3.25	16.25	26.0	300

Dogbone Vibration Damper

Materials:

- Clamp - cast of high strength aluminium alloy.
- Bolt - stainless steel bolt
- Flat Washer - stainless steel
- Spring Washer - stainless steel
- Messenger - exclusive Heliformed® 19 strand EHS galvanised steel.
- Masses - high grade zinc.

General Recommendations:

Dogbone Dampers are designed to eliminate conductor fatigue damage and line maintenance costs by effectively diminishing aeolian vibration, thereby allowing increased line tensions. The messenger cable and unique dogbone shape of the masses are designed to achieve optimal energy dissipation for minimal clamp movement. The messenger cable and dogbone weights are matched to give additional resonant modes and wider effective frequency response. The mechanical impedance of the damper is matched to the conductor to optimise performance. The offset dogbone shaped masses introduces a torsional mode of vibration damping not present in conventional Stockbridge type dampers.



The range of Dogbone Vibration Dampers is a development resulting from our extensive experience and research in the field of conductor vibration control. The Dogbone concept is based on the known and proven principles of the Stockbridge Damper but embodies improvements which increase both power dissipation and range of frequency response beyond those of a Stockbridge Damper. The performance of the Dogbone Damper has been further improved using the latest CIGRE and IEEE recommended methods including I.S.W.R. Power Dissipation and Mechanical Impedance Testing.

Radio Interference Voltage (RIV):

Dogbone Dampers are designed to be corona free at all operating voltages.

Placement:

Due to the many parameters involved and the exhaustive tests conducted by Dulmison for optimum damper placement and performance, it is recommended that Dulmison be consulted for exact damper requirements.

Option:

Armour Rods can be supplied for added protection to OPGW Cable. See page 7-16 for details.

See overleaf for table of catalogue numbers and conductor suitability.

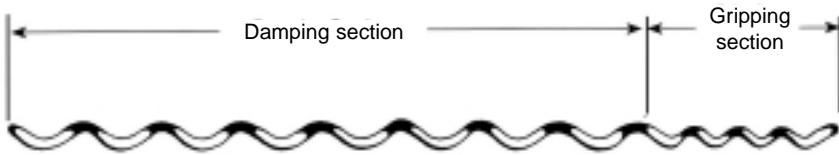
Dogbone Vibration Damper

Cont'd

Cat No.	Clamp Diameter Range	Conductor Type			
		AAC	AAAC	ACSR	SC/GZ
DB05B07SS	7.1-10.0				7/2.75 7/3.25
DB05B10SS	10.1-12.0			BANANA	7/3.75 7/4.00
DB05B12SS	12.1-15.0	MERCURY MOON	HYDROGEN IODINE JADE JASPER	CHERRY	19/2.75
DB05B15SS	15.1-18.0	NEPTUNE	KRYPTON OPAL	GRAPE	19/3.25
DB05B18SS	18.1-21.0	PLUTO	NEON PEARL		
DB05B21SS	21.1-24.0	Only used for OPGW			
DB05B24SS	24.1-27.0	Only used for OPGW			
DB1B18SS	18.1-21.0	SATURN	NITROGEN RUBY	LEMON	
DB1B21SS	21.1-24.0	TAURUS	OXYGEN RUTILE		
DB2B21SS	21.1-24.0				
DB2B24SS	24.1-27.0	TRITON	PHOSPHORUS SAPPHIRE	LIME MANGO	
DB2B27SS	27.1-31.0	URANUS	SPINEL SELENIUM	ORANGE	
DB3B31SS	31.1-34.0	VENUS	SULPHUR SILICON TOPAZ	OLIVE PAW PAW	

Heliformed® Spiral Vibration Damper

Type SVD, for standard metric conductors 4.42mm to 19.30mm O.D.



Dulmison Spiral Vibration Dampers are designed for use on conductors and guy wires ranging from 4.42mm to 19.30mm. They are designed to reduce aeolian vibration by acting as an interference device for the aeolian vibration pattern, and are generally the most effective devices for use on small diameter conductors and earthwires. Dulmison Spiral Vibration Dampers are manufactured from UV stable, high impact PVC and are suitable for use in ambient temperatures ranging from -40°C to 70°C. Further information is shown on page 7-30 of this catalogue.

Conductor Dia. Range mm	Catalogue Number	Std. Pack	Colour Code
4.41 - 6.34	SVD 0441	25	Red
6.35 - 8.29	SVD 0635	25	Blue
8.30 - 11.72	SVD 0830	25	Black
11.73 - 14.31	SVD 1173	25	Yellow
14.32 - 19.30	SVD 1432	8	Green

Posilok Twin Spacer with Elastomeric Conductor Bushes

**Materials:**

Spacer, body, keeper, and Posilok clamp fastener - high strength aluminium alloy.

Clamp liner - an elastomer compound specially formulated for resistance to ozone, ultraviolet, weathering, high and low temperature variations and compression set. The conductor range and part number is moulded into the inside of each liner.

Posilok Twin Spacer Dampers are available for conductor sizes ranging from 18mm to 35mm and for spacing ranging from 200mm to 520mm. Dulmison Posilok Twin Spacers have been successfully used for over 25 years in Australia, USA, UK and many other countries. Posilok Twin Spacers feature an elastomer lined clamp that minimises damaging static compressive stresses on the conductor while providing high slip strength. The clamp action of the Posilok makes this spacer easy to use with the clamp being fastened by the action of the locking pin. This method of clamping ensures that the clamp is always properly fastened, with a controlled amount of force exerted through the rubber onto the conductor.

General Recommendations:

Posilok Spacers are designed to maintain specified subconductor spacing. Furthermore they are designed to withstand the forces and movements caused by transient conditions such as short circuit differential icing and wind loading, without either causing damage to the subconductors or sustaining damage themselves. Dulmison's exclusive Posilok fastener maintains a clamping force, independent of the installing lineman. The Posilok clamp design was developed specifically to eliminate the variables involved with other types of fasteners. When properly installed it exerts a positive vibration proof grip on the conductor. Correct installation is easily verified from the ground.

The Posilok spacer is flexible enough to allow some longitudinal movement between subconductors, and yet rigid enough to restrain the subconductors under adverse conditions. They provide a smooth, unitised construction which minimises corona and presents a low level of RIV. The range of Posilok spacers are designed to accommodate all conductor sizes, all EHV voltages, and all bundle configurations.

Radio Interference Voltage (RIV) and Corona:

Posilok spacers are designed to have satisfactory performance commensurate with the operating voltage of the transmission line.

Vibration:

Although the elastomer cushioned housing is designed to minimise conductor damage, vibration dampers must be used on lines subjected to aeolian vibration.

Bolted Option (Cast Bar Spacer):

Cast bar spacers are available to suit most Australian standard conductors in twin, triple and four conductor configurations with spacings from 70mm to 520mm. Cast bar spacers are used in varying applications in substations such as overhead strung bus bars and down droppers. They can also be used in transmission line applications for jumper (pilot) strings.



Spacer Dampers

Materials:

Frame - High strength aluminium alloy

Posilok Arm - (xSDP)

Bolted Arm - (xSDB)

Elastomer Liners - used only with the Posilok Keeper

especially compounded for resistance to ozone, weathering, extreme high and low temperatures and compression set. The conductor range is moulded into the inside of each insert.

General Recommendations:

Spacer Dampers are recommended for multi-conductor bundles with industry standard spacing. The Spacer Damper is designed to withstand the forces and movements caused by transient conditions such as short circuit, differential icing and wind loading, without either causing damage to the subconductors or sustaining damage themselves. The design accommodates both longitudinal movement of the subconductors, vertical sag differences, as well as compressive and tensile forces. When the Spacer Damper is installed in accordance with Dulmison's recommendations for subspan lengths, it constitutes a system which replaces conventional spacers and vibration dampers. Spacer Dampers will control both aeolian vibration and subconductor oscillation to levels recognised as acceptable within the industry and to the customers expressed needs. Dulmison will tailor the recommendations to terrain and design parameters.

Corona and RIV:

Spacer Dampers are designed to have a satisfactory performance commensurate with the operating voltage of the transmission line.

Fault Currents:

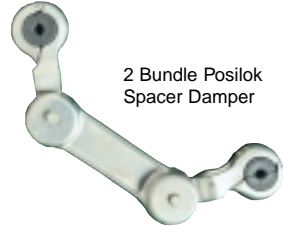
All of Dulmison's Spacer Dampers are designed for a minimum compressive withstand load between clamps of 1130kg and a minimum tensile to withstand load of 560kg.

Placement:

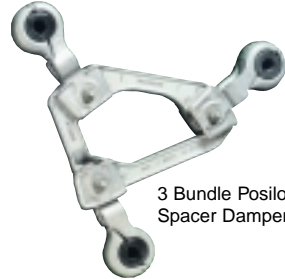
Due to the many factors involved in designing an effective spacer damper system, it is recommended that Dulmison be consulted for specific recommendations on both the choice of Spacer Dampers and placement.

Damping:

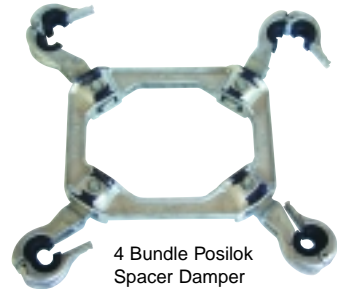
Spacer Dampers can accommodate torsional clamp arm movement of plus or minus 13 degrees, conical clamp arm movement of plus or minus 8 degrees, and longitudinal movement of plus or minus 38mm. These are possible because of the properties of our elastomeric damping elements. There are two per arm, one on each side. They are especially compounded to give long life under conditions of ozone, ultra violet light, anticipated temperature extremes, and continual conductor motion. Their ability to dampen over many years has been well established throughout the world in all types of climates.



2 Bundle Posilok
Spacer Damper



3 Bundle Posilok
Spacer Damper



4 Bundle Posilok
Spacer Damper

Clevis Suspension Clamps for Aluminium Based Conductors

Materials: Aluminium alloy body

Hardware: Galvanised steel

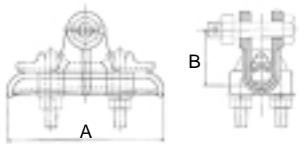


Fig. 1

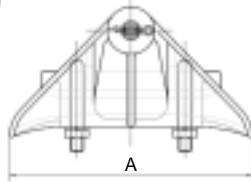


Fig. 2

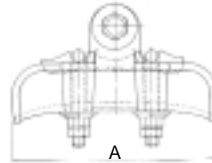


Fig. 3

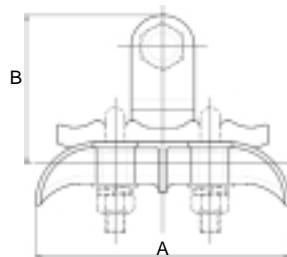
Cat No.	Minimum Failing Load kN	Dimensions		Conductor Diameter Range mm	Hardware	Fig.
		A	B			
ACC0721H	44	152	62	7-21	Hex Pin	1
ACC0721A	44	152	62	7-21	Bolt	1
ACC0721Q	44	152	62	7-21	Rivet	1
ACC1723A	40	200	76	12-28	Bolt	3
ACC2032A	70	230	84	20-32	Bolt	2
ACC2032H	70	230	84	20-32	Hex Pin	2

Note: Diameter allowance should be made for Heliformed® rods if required.
Other sizes also available

Clevis Suspension Clamps for Steel or Copper Conductors

Materials: Cast iron body, hot dipped galvanised

Hardware: Galvanised steel

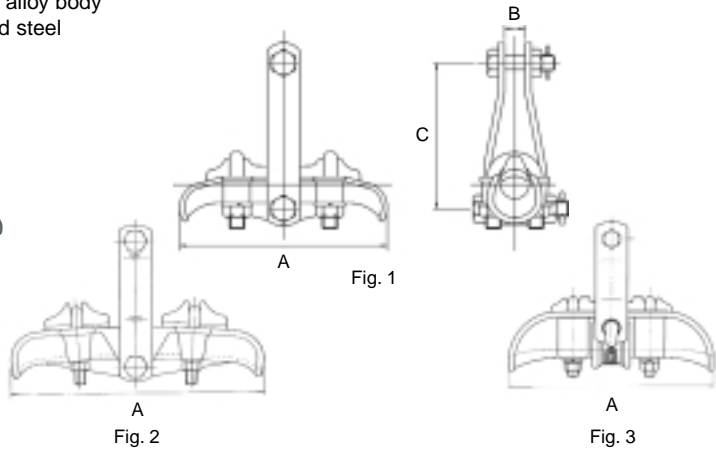


Cat No.	Minimum Failing Load kN	Dimensions		Conductor Diameter Range mm	Hardware	Fig.
		A	B			
SCC0615H	24	152	71	6 - 15	Hex Pin	1
SCC0615A	24	152	71	6 - 15	Bolt	1
SCC0615Q	24	152	71	6 - 15	Rivet	1

Trunnion Suspension Clamps for Aluminium Based Conductors

Materials: Aluminium alloy body

Hardware: Galvanised steel



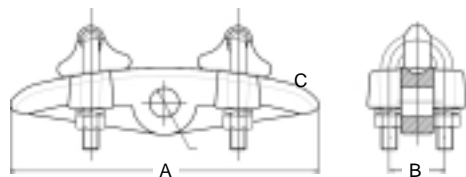
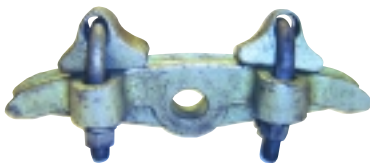
Cat No.	Minimum Failing Load kN	Dimensions			Conductor Diameter Range mm	Hardware	Fig.
		A	B	C			
ATC1221A	44	152	20	95	12 - 21	Bolt	1
ATC2127A	44	203	20	120	21 - 27	Bolt	1
ATC2736A	44	229	20	140	27 - 36	Bolt	1
ATC3646A	44	250	23	150	36 - 44	Bolt	2
ATC4652A	44	300	20	175	46 - 52	Bolt	2
ATC4565A	44	327	47	140	45 - 65	Bolt	3

Note: Diameter allowance should be made for Heliformed® rods if required.

Suspension Clamp for Steel or Copper Conductors

Materials: Galvanised cast iron

Hardware: Galvanised steel

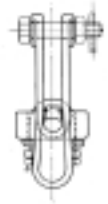
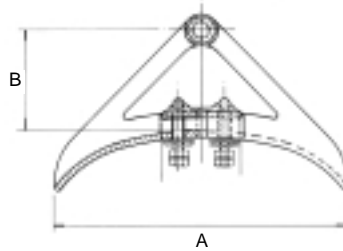


Cat No.	Minimum Failing Load kN	Dimensions			Conductor Diameter Range mm
		A	B	C	
SCC0244	70	230	22	20	6.5 - 16
SCC0818M	70	230	41.5	23	8 - 19

Aluminium Angle Clamp for Aluminium Based Conductors

Materials: Aluminium alloy body

Hardware: Galvanised steel



Cat No.	Minimum Failing Load kN	Dimensions		Conductor Diameter Range mm	Hardware
		A	B		
AAC0616A	34	280	103	6 - 16	Bolt
AAC1025A	34	330	130	16 - 25	Bolt
AAC1025H	34	330	130	16 - 25	Hex Pin

Strain Clamp

Materials: Refer table

Hardware: Galvanised steel

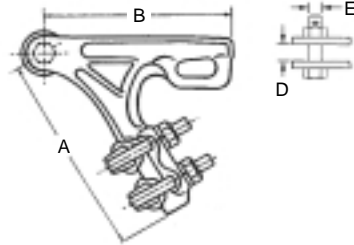


Fig. 1

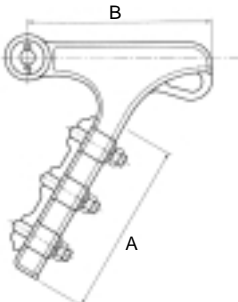


Fig. 2

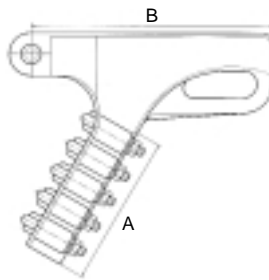


Fig. 3

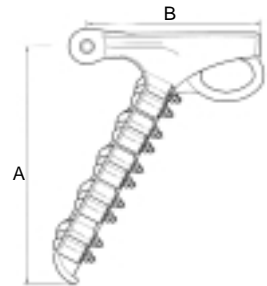
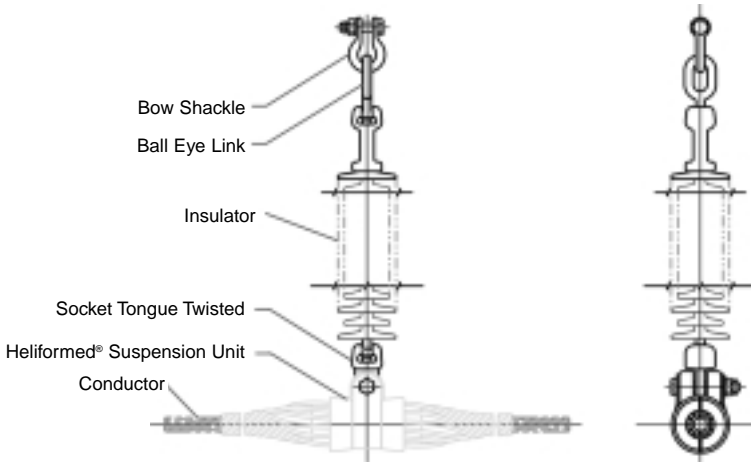


Fig. 4

Cat No.	Material	Dimensions				Conductor Diameter Range mm	Hardware	Fig.
		A	B	D	E			
ASC0614A	Al. Alloy	193	175	17.5	16	8.0 - 11.0	Bolt	1
SCK3A12-19.5	Al. Alloy	187	200	21	16	12.0 - 19.5	Rivet	2
SCL5A29	Al. Alloy	210	330	30	16	13.0 - 30.0	Rivet	3
SCL5A31	Al. Alloy	489	350	38	16	17.5 - 31.0	Rivet	4
SCL5A46	Al. Alloy	489	350	47	16	28.5 - 47.0	Rivet	4
STC5-15-4749T	Galv. Iron	187	200	19	16	5.0 - 15.0	Rivet	2

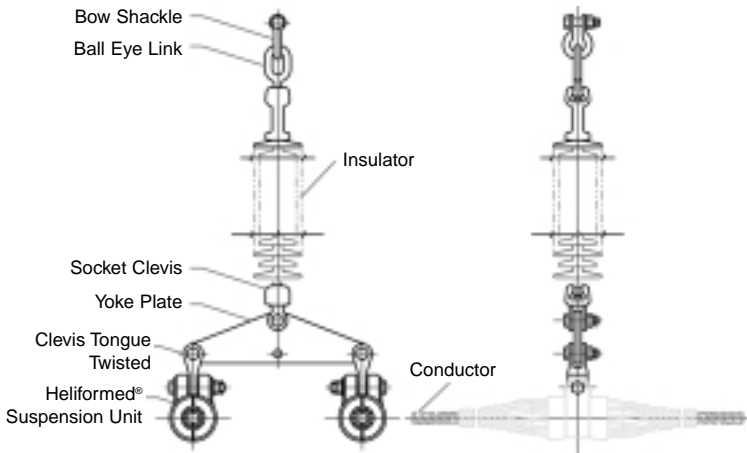
Typical String Assemblies

Single Conductor Single Insulator Suspension Assembly



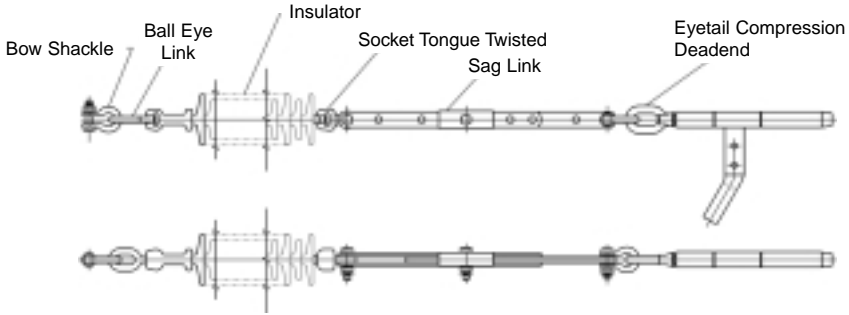
Typical String Assemblies

Twin Conductor Single Insulator Suspension Assembly



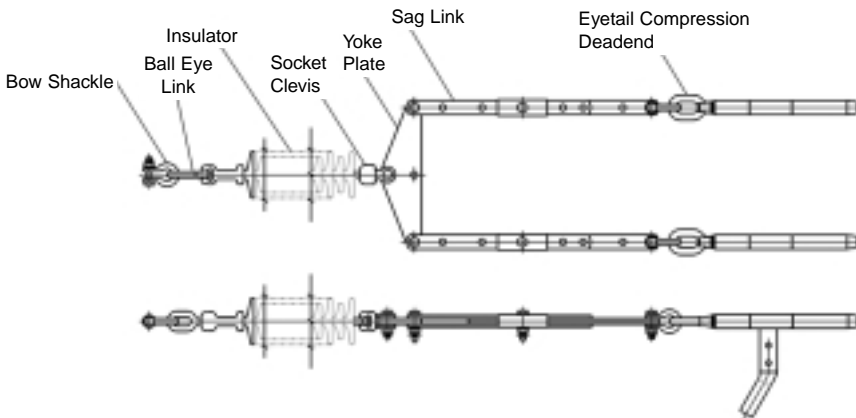
Typical String Assemblies

Single Conductor Single Insulator Tension Assembly



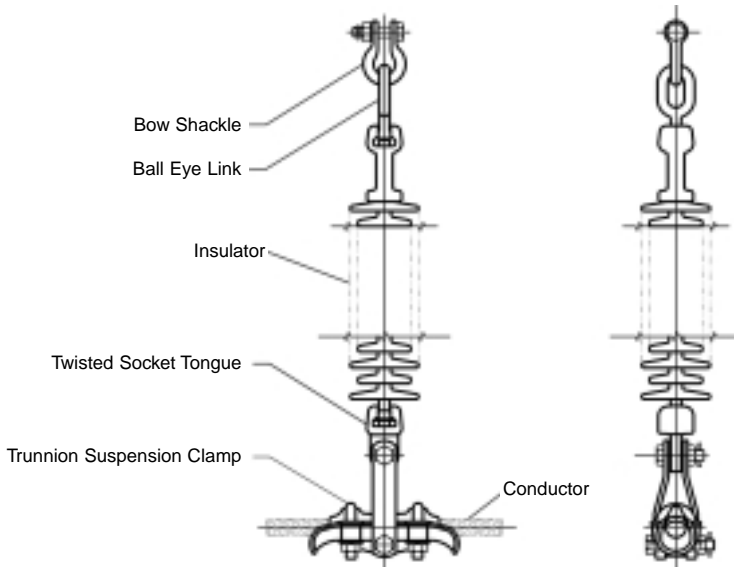
Typical String Assemblies

Twin Conductor Single Insulator Tension Assembly



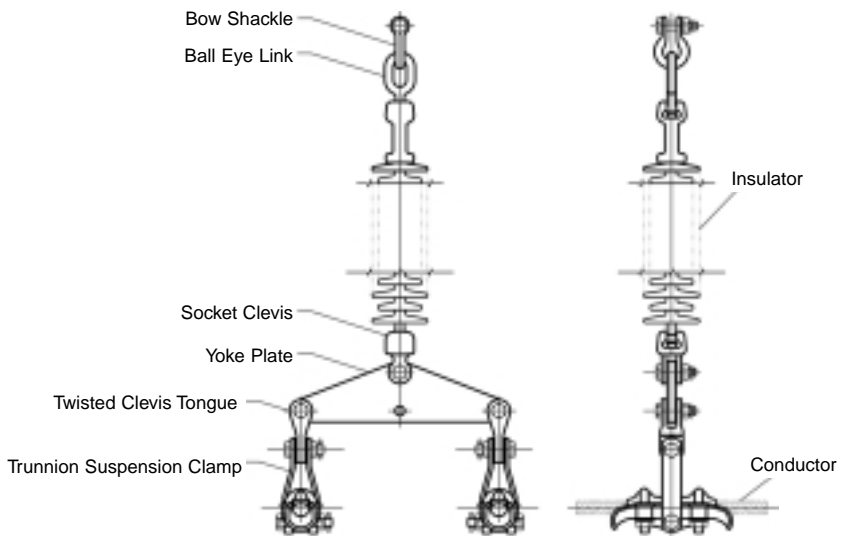
Typical String Assemblies

Single Conductor Single Insulator Jumper (Pilot) Assembly



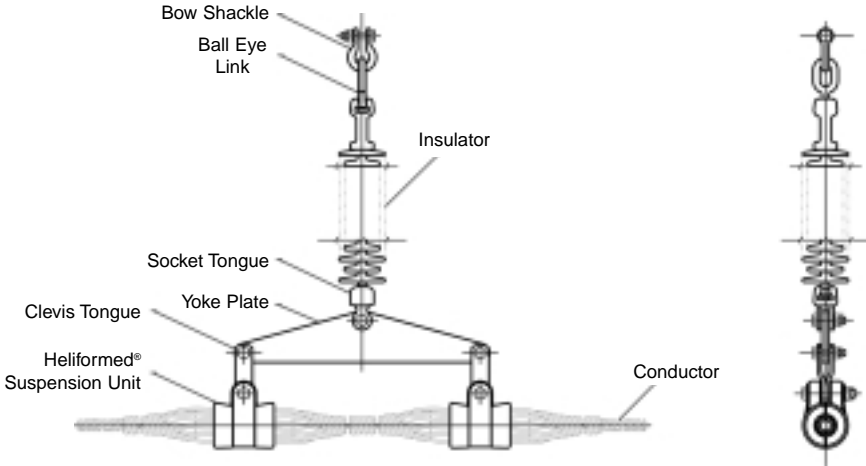
Typical String Assemblies

Twin Conductor Single Insulator Jumper (Pilot) Assembly



Typical String Assemblies

Single Conductor Single Insulator Flying Angle Assembly





13



Screw anchors

- > Selection
- > Double Helix
- > Single Helix
- > Accessories

Selection of Screw Anchors

The selection of the most appropriate Dulmison Screw Anchor for any particular application should be done by comparing the holding capacity of the anchor with the maximum load in the guy wire.

The maximum load in the guy is determined from the line design, the holding strength of the anchor will depend on the soil classification and the size and installing torque for the anchor.

Care must be taken in the anchor selection, and the holding strength must be carefully compared with the maximum guy load, as a poor choice may result in a failure of the anchor.

Soil Classification

The most important factor affecting the holding strength that can be achieved by a screw anchor is the type of soil in which it is installed. The Soil Classification Table (see Page 13-3) has been designed to assist in the identification of the soil. However, while a reasonable assessment of the surface soil type, the holding strength of the anchor will depend on the soil at the depth to which the anchor is driven. Often the soil is different at this level, as different soil strata may be encountered in driving the anchor.

The best way to check the holding strength of the anchor is to do a proof loading (pull out) test on each anchor installation, but this is not always possible nor economical.

Following extensive field trials, it has been established that there is good correlation between the installation torque and the soil conditions. This means that the holding strength of the anchors can be determined from the installation torque.

Tables on page 13-4 show the relationship between the holding strength and the torque applied for several sizes of single and double flight anchors.

Of course the installation torque is only an indication of the soil conditions at the time of installation. Care should therefore be taken when anchors are installed in hard dry ground that may become water logged following rain.

Installation Techniques

The holding strength that can be achieved by an anchor can also be affected by installation technique, and care must be taken by the operator that the soil is not churned by allowing the anchor to act as an auger as it is installed. This is most easily avoided by keeping a downward pressure on the anchor during installation.

Determination of Guy Loads

The maximum design loading in the guy should usually be available as part of the line design information and this design load should be used with the rated strength tables and graph attached to select the most suitable anchor for each job.

Load-Rating Factor

For some loading conditions, however, it may be desirable to use a load rating factor for the holding strength of the anchor. When the continuous (everyday) tension in the guy exceeds 50% of the maximum working tension of the guy, there is a possibility that the anchor may creep. Even though there is no failure of the anchor in the ground, this may lead to relaxation of the guy, and necessitate periodic retensioning. To avoid this, the load rating factor which is found from Page 13-3 should be applied to the holding strength of the anchor.

Screw Anchors

Selection of Screw Anchors

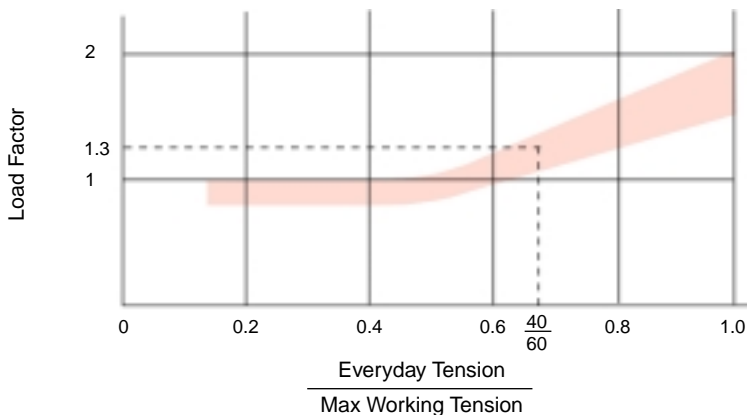
Example

- | | |
|--|------------|
| 1. Guy Wire - a. Everyday Tension kN | 40 |
| b. Maximum Working Tension (MWT) kN | 60 |
| 2. Soil Classification (at installation depth) | 5 |
| 3. Load Rating Factor (LRF) | 1.3 |
| 4. Anchor Holding Load required kN (LRF x MWT) | 80 |
| 5. Anchor Size Required (Page13-4) | 300 single |

Soil Classification Table

Soil Class Classification Number	Description of Soil	Standard Penetrometer Test Blows / 300mm
1	Solid bedrock	
2	Hardpan; dense sand -very dense sand; compact gravel; laminated rock; slate schist; sandstone	41 - 46
3	Hard clay; dense sand; shale; broken bedrock; compact clay; gravel mixtures	34 - 41
4	Very stiff hard clay; claypan; medium -dense sand gravel; compact gravel and sand	27 - 34
5	Very stiff clay; medium sand; loose sand and gravel	20 - 27
6	Stiff -very stiff clay; medium sand; clayey silt	13 - 20
7	Medium -stiff clay; loose sand, fill, silt	6 - 13
8	Very soft -soft clay; very loose sand; swamp; marsh; saturated silt; humus	0 - 6

Load Rating Factor Graph



Selection of Screw Anchors

Rated Holding Strength & Installation Torque

Single Helix	Anchor Size	Soil Classification					
		2	3	4	5	6	7
Holding Strength (kN)	200	115	95	80	60	45	25
Installation Torque (Nm)		7600	5600	3700	2300	1300	400
Holding Strength (kN)	250		105	85	70	50	30
Installation Torque (Nm)			6100	4200	2500	1500	600
Holding Strength (kN)	300		115	95	80	60	40
Installation Torque (Nm)			6800	4400	3100	1750	800

Double Helix	Anchor Size	Soil Classification					
		2	3	4	5	6	7
Holding Strength (kN)	200 + 200		(145)	120	95	70	45
Installation Torque (Nm)			(7900)	5700	3800	2200	6800
Holding Strength (kN)	250 + 250		(165)	135	110	85	60
Installation Torque (Nm)			(8300)	6000	4100	2500	900

Figures inside brackets indicate that consistent installation is difficult, and highly skilled operators are needed.

Screw Anchors

Power Installed Screw Anchors

Double Helix

Installation Torque & Pullout Strength:

Material:

Threads:

Heads:

Rods & Nuts:

Refer to additional holding strength charts.

High strength alloy steel.

All threads are M24 and rated to 160kN mfl.

Heads are covered in protective coating

Hot dipped galvanised.



Eye Nut

Cat. No.	Hole Size
250080	M24

Rod



Cat. No.	Dim. 'L' mm	c/w Eye Nut
250075	2133	Yes
250076	2000	Yes
250064	1067	No
250061	2133	No



Coupling

Cat. No.	Length mm	Outside Dia.
250095	50	Ø 34

Head



Anchor Head Cat. No.	Hub Size	Flight Size	Max. Rated Torque kNm
250005	35	100	9
250053	35	200	9
250037	38	200	11
250055	35	250	9
250054	38	250	11
250058	35	300	9
250056	38	300	11
250059	35	350	9
250057	38	350	11



Screw Anchors

Power Installed Screw Anchors

Single Helix

Installation Torque & Pullout Strength:

Material:

Threads:

Heads:

Rods & Nuts:

Refer to additional holding strength charts.

High strength alloy steel.

All threads are M24 and rated to 160kN mfl.

Heads are covered in protective coating.

Hot dipped galvanised.



Eye Nut

Cat. No.	Hole Size
250080	M24



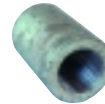
Rod

Cat. No.	Dim. 'L' mm	c/w Eye Nut
250075	2133	Yes
250076	2000	Yes
250064	1067	No
250061	2133	No



Coupling

Cat. No.	Length mm	Outside Dia.
250095	50	Ø 34



Head

Anchor Head Cat. No.	Hub Size	Flight Size	Max. Rated Torque kNm
250025	35	150	9
250029	35	200	9
250027	38	200	11
250028	35	250	9
250011	38	250	11
250030	35	300	9
250032	38	300	11
250031	35	350	9

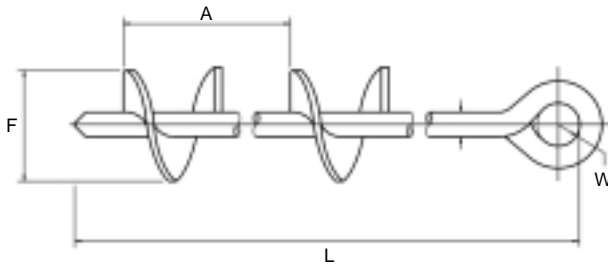
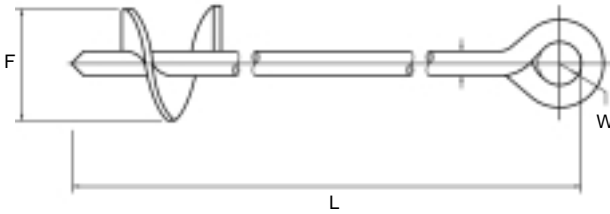


Screw Anchors

Hand Installed Screw Anchors

Type HISA

The easy to use multi purpose galvanised anchors you can use again and again.

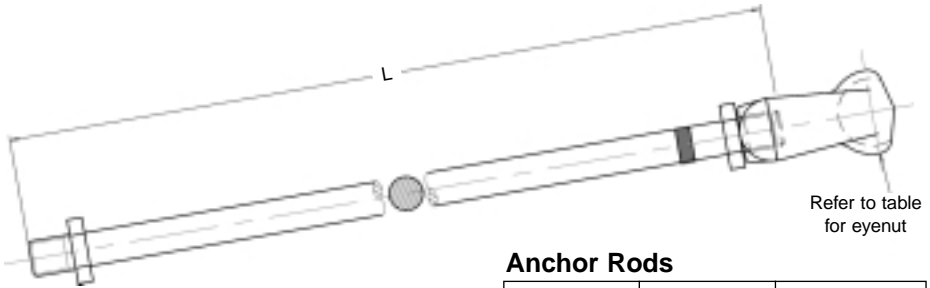


Cat. No.	Length L	Flyte Dia. F	Flyte Sep. A	Radius R	Rod Dia. W
HISA1001	1270	100	-	15	20
HISA1002	1270	100	146	15	20
HISA1003	1800	175	-	15	20

Screw Anchors

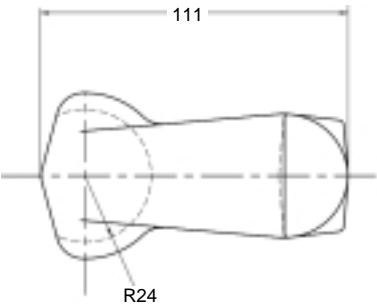
Power Installed Screw Anchors

Anchor Accessories



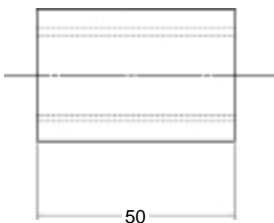
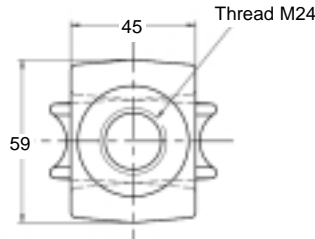
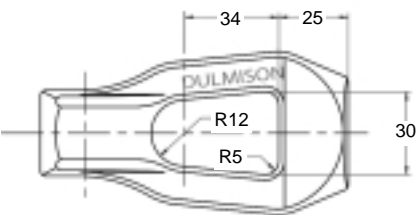
Anchor Rods

Cat. No.	Dim. 'L' mm	c/w Eye Nut
250075	2133	Yes
250076	2000	Yes
250064	1067	No
250061	2133	No



Thimble Eye Nut

Cat. No.	Hole Size
250079	M20
250080	M24
250084	M36



Anchor Couplings

Cat. No.	Length mm	Outside Dia.
250095	50	Ø 34

14

Substation fittings

- > Busbar Support Clamps
- > Flat Busbar to Busbar Connectors
- > Straight Busbar to Busbar Connectors
- > Reducers Busbar to Busbar
- > Tee Connectors Busbar to Busbar
- > Straight Busbar to Palm Connectors
- > Right Angle Busbar to Palm Connectors
- > Straight Busbar to Conductor Connectors
- > Tee Connectors Busbar to Conductor
- > Straight Conductor to Conductor Connectors
- > Tee Connectors Conductor to Conductors
- > Straight Conductor to Palm Connectors
- > Right Angle Conductor to Palm Connectors
- > Straight Stud to Palm Connectors
- > Palmless Connectors
- > Flat Busbar Connectors

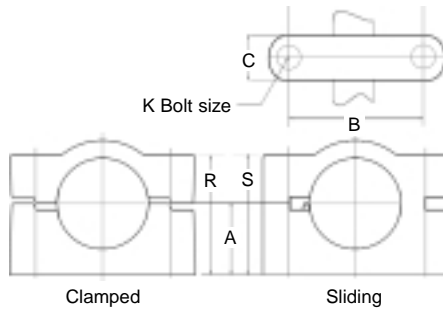
Substation Fittings

Aluminium Busbar Support Clamps

Type ABS



Busbar support clamps are cast to size in Aluminium Alloy and fitted with stainless steel bolts. Clamps may be converted from clamping to sliding type or vice versa, by simply reversing the cap.



Cat. No.	O.D. Tube mm	Dimensions mm					
		A	B	C	K	R	S
ABS15	12.7	21	76	25	M12	37	38
ABS17	15.9	23	51	25	M10	36	37
ABS25	19.1	25	76	25	M12	41	42
ABS30	25.4	25	51	32	M10	41	46
ABS35	25.4	25	76	38	M12	46	51
ABS40	31.8	27	51	38	M10	46	51
ABS42	41.3	33	76	38	M12	56	59
ABS45	31.8	29	76	38	M12	52	54
ABS50	38.1	32	51	32	M10	57	59
ABS55	38.1	33	76	38	M12	57	59
ABS60	50.8	40	76	38	M12	70	72
ABS65	57.2	43	76	38	M12	76	78
ABS70	60.3	43	76	38	M12	76	79
ABS75	63.5	54	127	51	M16	98	100
ABS80	80.0	54	127	51	M16	103	105
ABS85	76.2	54	127	51	M16	103	105
ABS100	88.9	60	127	51	M16	110	111
ABS102	100.0	61	127	51	M16	110	112

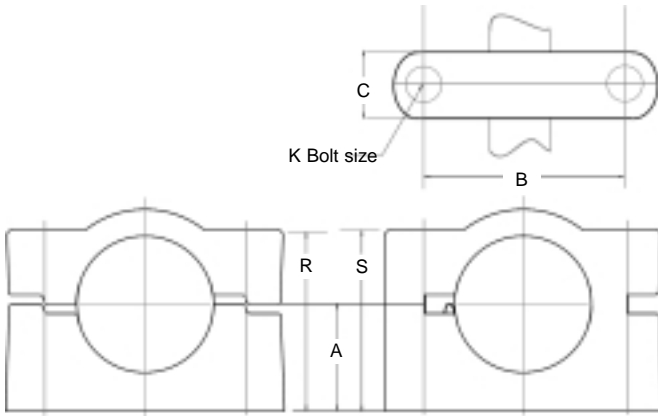
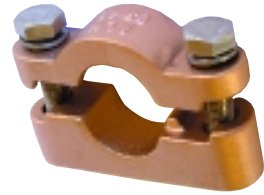
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Busbar Support Clamp

Type BS - Copper

Busbar support clamps are cast to size in high strength copper alloy. Standard bolts are stainless steel. Clamps may be converted from clamping to sliding type or vice versa, by simply reversing the cap.



Cat. No.	O.D. Tube mm	Dimensions mm					
		A	B	C	K	R	S
BS5	6.35	14.0	50.8	25.4	M10	25.4	26.9
BS10	12.70	19.0	50.8	28.5	M10	31.7	33.3
BS15	12.70	19.0	76.2	28.5	M12	36.5	38.1
BS17	15.88	22.0	50.8	25.4	M10	38.1	36.5
BS20	19.05	22.0	50.8	28.5	M10	34.9	36.5
BS25	19.05	25.4	76.2	28.5	M12	39.7	41.2
BS30	25.40	25.4	50.8	28.5	M10	46.0	47.6
BS35	25.40	25.4	76.2	28.5	M12	41.2	42.8
BS40	31.75	28.5	50.8	28.5	M10	49.2	50.8
BS45	31.75	28.5	76.2	28.5	M12	42.8	44.4
BS50	38.10	31.7	50.8	28.5	M10	53.9	55.5
BS55	38.10	31.7	76.2	28.5	M12	49.2	50.8
BS60	50.80	38.0	76.2	28.5	M12	68.2	69.8
BS70	63.50	44.5	127.0	31.7	M16	82.5	84.1

Note: Adaptor plate part No. E8045 available to suit 127mm PCD insulators and above BS type connectors.

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Tube Connector Busbar to Flat

Type TF - Copper; ATF - Aluminium

These connectors provide an inexpensive tube to flat termination. They also combine with the flexible braid connections to provide expansion joints between tubes in lines, tubes at right angles and between tube and flat terminals. Connectors can be supplied with stainless steel bolts and nuts.

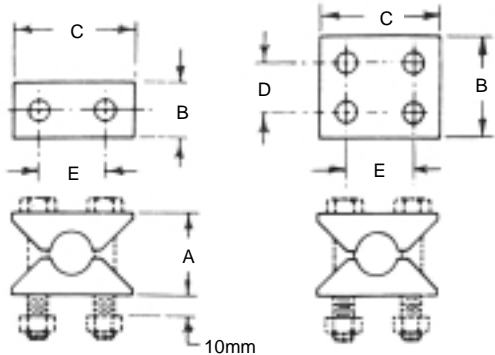


Fig. 1

Fig. 2

Cat. No.		O.D. Tube mm	Fig. No.	Dimensions mm					Bolt Size
Without Bolts	With Bolts			A	B	C	D	E	
TF10	TF10B	12.7	1	32	25	54	---	29	M10
TF15	TF15B	15.9	1	32	25	54	---	29	M19
TF20	TF20B	15.9	2	32	48	54	22	29	M10
TF25	TF25B	19.1	1	38	25	57	---	32	M10
TF30	TF30B	19.1	2	35	48	57	22	32	M10
TF34	TF34B	25.4	1	44	22	57	---	38	M10
TF35	TF35B	25.4	1	44	29	60	---	38	M10
TF40	TF40B	25.4	2	41	48	60	22	38	M10
TF45	TF45B	25.4	2	41	54	64	29	38	M10
TF4522	TF4522B	25.4	2	40	76	76	51	51	M10
TF45A	TF45AB	27.0	2	43	54	64	29	38	M10
TF46	TF46B	28.6	1	44	29	60	---	38	M10
TF47	TF47B	28.6	2	44	54	64	29	38	M10
TF49	TF49B	30.0	2	46	54	70	29	44	M10
TF50	TF50B	31.8	2	48	54	70	29	44	M12
TF52	TF52B	34.0	2	51	54	70	29	44	M10
TF53	TF53B	35.0	2	51	54	70	29	44	M10
TF54	TF54B	38.1	1	57	22	70	---	51	M10
TF55	TF55B	38.1	2	54	54	76	29	51	M10
TF56	TF56B	38.1	2	60	76	83	44	54	M12
TF57	TF57B	40.0	2	56	55	76	29	51	M10
TF60	TF60B	48.0	2	64	57	83	29	57	M10
TF65	TF65B	50.8	2	67	54	89	29	64	M10
TF67	TF67B	60.0	2	80	54	98	29	73	M10
TF70	TF70B	63.5	2	84	54	105	29	80	M10
TF75	TF75B	76.2	2	95	54	114	29	89	M10

Note: To order in aluminium, add prefix 'A' to catalogue number.

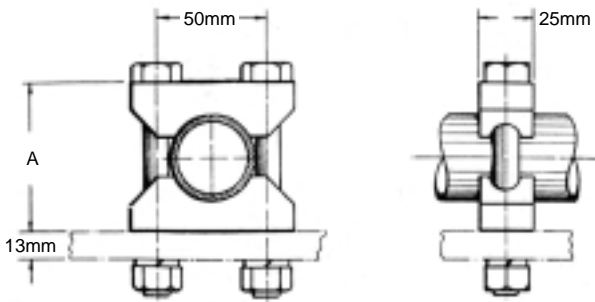
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Tube Connector

Type PTC - Copper

For the connection of tubular busbar to switchgear terminal plates with four 14mm diameter holes at 50mm centres. Two PTC connectors are required per termination. Materials: High copper content alloy castings. Stainless steel bolts, washers and nuts.



Cat. No.	O.D. Tube mm	Dimension A
		mm
PTC4010	25.4	52
PTC4012	30.2	57
PTC4020	38.1	68

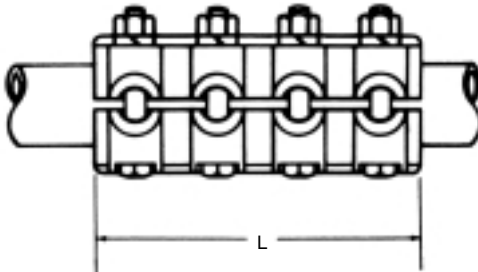
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Aluminium Straight Connector Busbar to Busbar

Type AST

Type AST straight connectors are cast to size in high strength aluminium alloy and fitted with stainless steel bolts and nuts. Both connector halves are identical.



Cat. No.	O.D. Tube mm	Length L mm	Bolt Size
AST5	19.1	105	M10
AST20	25.4	127	
AST35	31.8	152	
AST50	38.1	152	
AST85	50.8	178	
AST86	57.2	191	
AST88	60.3	191	M12
AST90	63.5	191	
AST95	76.2	216	
AST80M	80.0	178	
AST100	88.9	216	
AST100M	101.6	184	

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Straight Connector Busbar to Busbar

Type ST - Copper

This heavy duty connector is cast to size. The minute surface projections provide a multiple point high pressure contact which gives a low resistance joint. Both connector halves are identical. Connectors are supplied with stainless steel bolts, nuts and spring washers.

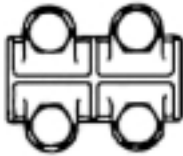


Fig. 1

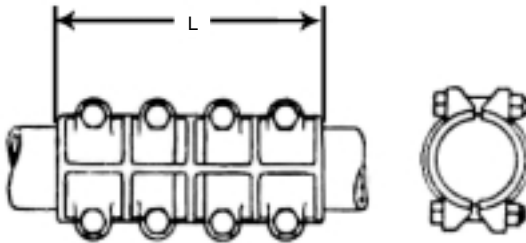


Fig. 2

Cat. No.	O.D. of Tube mm	Fig.	Dimension L mm	Bolt Size
ST5	19.1	1	70	M10
ST20	25.4	1	83	M12
ST20C	25.4	2	127	M10
ST27	28.6	2	140	M10
ST35	31.8	1	102	M12
ST50	38.1	1	102	M12
ST85	50.8	2	159	M12
ST95	76.2	2	229	M12

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

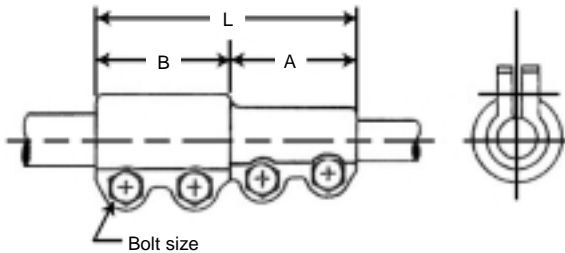
Substation Fittings

Reducer Busbar or Studs

Type RS - Copper

The type RS reducer is designed for use with solid copper busbar tube and equipment studs.

Materials: High copper content alloy casting. Stainless steel bolts, washers and nuts.



Cat. No.	O.D. of Tube mm		Dimensions mm			Bolt Size
	Run	Tap	A	B	L	
RS1110	28.6	25.4	57	51	108	M10
RS1210	30.2	25.4	57	51	108	M10
RS1508	38.1	22.2	60	57	117	M10
RS1509	38.1	25.0	60	57	117	M10
RS1511	38.1	28.6	60	54	114	M10
RS1512	38.1	30.2	60	54	114	M10
RS1514	38.1	34.9	60	54	114	M10
RS1610	39.7	25.4	60	57	117	M10
RS1818	44.5	44.5	76	76	152	M12

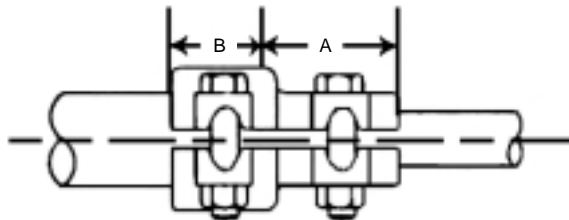
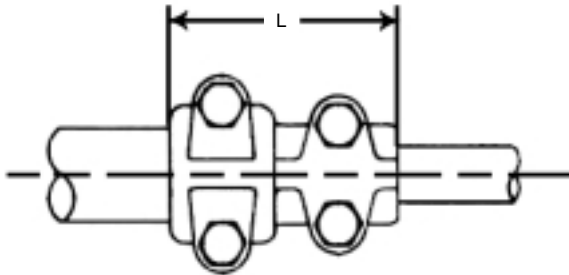
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Reducer Busbars

Type RT - Copper

The type RT is a two piece design suitable for use with tubular busbar. It is cast in high copper content alloy and fitted with stainless steel bolts, nuts and spring washers.



Cat. No.	O.D. of Tube mm		Dimensions mm			Bolt Size
	Run	Tap	A	B	L	
RT15	25.4	19.1	44	35	79	M10
RT30	31.8	19.1	48	32	79	M10
RT32C	31.8	25.4	57	56	114	M10
RT45	38.1	25.4	51	51	102	M12
RT47	38.1	30.2	51	51	102	M12
RT60	44.5	25.4	54	44	98	M12
RT65	44.5	31.8	62	46	108	M12
RT75	50.8	25.4	54	44	98	M12
RT80	50.8	38.1	64	48	111	M12
RT90	76.2	38.1	64	51	114	M12

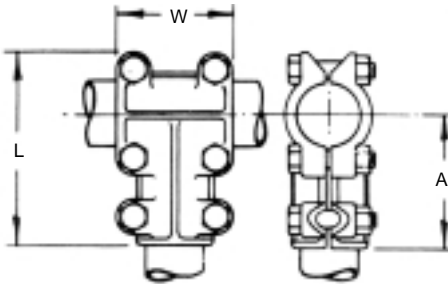
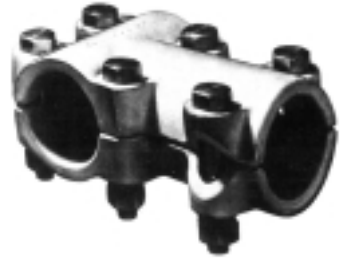
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Aluminium Tee Connector Busbar to Busbar

Type ATT

Type ATT tee connectors are cast to size in high strength aluminium alloy. Both connector halves are identical. Supplied with stainless steel bolts and nuts.



Cat. No.	Conductor Range OD mm		Dimensions mm			Bolt Size
	Run	Tap	A	L	W	
ATT28	28.6	25.4	75	111	44	M10
ATT35	31.8	31.8	108	152	83	M12
ATT3830	38.1	30.0	106	149	86	M12
ATT50	38.1	38.1	111	156	90	M12
ATT75	50.8	25.4	108	159	76	M12
ATT2020	50.8	50.8	127	178	102	M12
ATT2410	60.3	25.4	114	171	89	M12
ATT2413	60.3	31.8	114	171	102	M12
ATT2415	60.3	38.1	114	171	102	M12
ATT88	60.3	60.3	133	187	108	M12
ATT89	63.5	63.5	137	191	121	M12
ATT93	76.2	50.8	130	194	99	M12
ATT95	76.2	76.2	175	238	114	M12
ATT8064	80.0	63.5	184	248	114	M12
ATT8080	80.0	80.0	175	238	114	M12
ATT99	88.9	50.8	143	222	105	M12
ATT100	88.9	60.3	146	219	108	M12
ATT3535	88.9	88.9	197	270	146	M12
ATT10060	100.0	60.3	201	282	127	M16
ATT10080	100.0	80.0	202	283	143	M16
ATT100100	100.0	100.0	305	283	143	M16
ATT4525	114.3	63.5	194	292	117	M12
ATT11480	114.3	80.0	210	298	152	M16
ATT4533	114.3	82.6	210	298	152	M16

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Tee Connector Conductor to Conductor

Type TT - Copper

This heavy duty connector is cast to size. The minute surface projections provide a multiple point high pressure contact which gives a low resistance joint. Both connector halves are identical. Connectors are supplied with stainless steel bolts and nuts. Refer to table on adjoining page for conductor ranges and dimensions.



Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

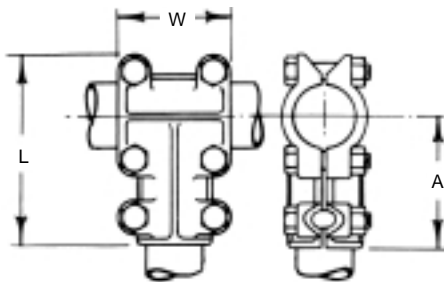


Fig. 2

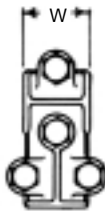


Fig. 1

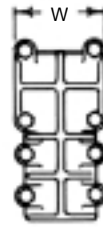


Fig. 3

Substation Fittings

Tee Connector

Type TT - Copper

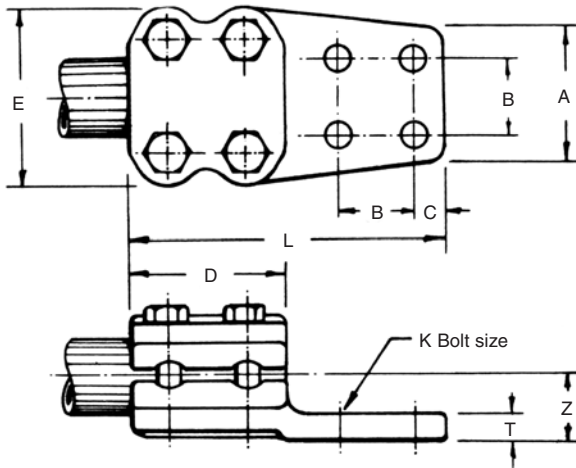
Cat. No.	O.D. of Tube mm		Fig. No.	Dimensions mm			Bolt Size
	Run	Tap		A	L	W	
TT3	15.9	15.9	1	55	80	35	M10
TT5	19.1	19.1	1	57	83	38	M10
TT7	20.6	20.6	1	57	83	38	M10
TT10	19.1	25.4	1	68	98	44	M12
TT15	25.4	19.1	1	62	92	38	M10
TT17	22.2	20.6	1	68	98	44	M12
TT20	25.4	25.4	1	70	103	43	M12
TT20C	25.4	25.4	2	68	98	76	M10
TT21	28.6	28.6	1	71	107	44	M12
TT25	25.4	38.1	1	87	121	44	M12
TT27	28.6	15.9	2	73	108	50	M10
TT28	30.2	25.4	1	75	111	44	M12
TT30	31.8	19.1	1	64	95	44	M10
TT32	31.8	25.4	1	75	111	44	M12
TT35	31.8	31.8	1	76	114	44	M12
TT40	31.8	44.5	2	102	138	86	M12
TT45	38.1	25.4	1	76	117	50	M12
TT45C	38.1	25.4	2	76	114	92	M10
TT50	38.1	38.1	2	105	146	83	M12
TT50C	38.1	38.1	2	80	117	92	M10
TT55	38.1	50.8	2	110	149	97	M12
TT60	44.5	25.4	1	80	124	50	M12
TT65	44.5	31.8	1	110	156	73	M12
TT70	44.5	44.5	2	110	154	89	M12
TT75	50.8	25.4	1	84	133	50	M12
TT78	48.4	31.8	2	102	151	90	M12
TT79	50.8	31.8	2	102	151	90	M12
TT80	50.8	38.1	2	108	157	90	M12
TT83	48.4	50.8	2	116	164	95	M12
TT84	48.4	48.4	2	116	164	95	M12
TT85	50.8	50.8	2	116	162	95	M12
TT86	54	50.8	2	116	168	95	M12
TT88	63.5	38.1	2	114	168	95	M12
TT90	76.2	38.1	2	114	178	83	M12
TT95	76.2	76.2	3	156	216	95	M12
TT100	88.9	60.3	2	140	211	109	M12

Substation Fittings

Aluminium Terminal Lug Busbar to Palm

Type ABT

For terminating tubular aluminium busbar at switchgear palms. Castings are in high strength aluminium. Bolts and nuts are stainless steel.



Cat. No.	O.D. Tube mm	No. of holes in Palm	Dimensions mm								
			A	B	C	D	E	K	L	T	Z
ABT20	25.4	2	38	38	16	83	83	M12	162	10	32
ABT30	31.8	2	38	38	16	83	83	M12	162	10	32
ABT40	38.1	4	67	38	16	76	86	M12	156	11	35
ABT50	50.8	4	83	50	16	76	100	M12	165	14	42
ABT54	57.2	---	83	---	---	80	105	---	168	14	44
ABT57	60.3	---	83	---	---	83	108	---	171	14	46
ABT63	61.0	2	83	50	30	83	100	M12	172	14	46
ABT64	63.5	4	83	50	16	83	100	M12	172	14	46
ABT80	80.0	4	83	50	15	83	130	M12	172	16	57
ABT95	76.2	---	83	---	---	83	171	---	172	16	55
ABT105	88.9	---	102	---	---	83	140	---	184	14	61

Note: Details of unlisted sizes available on request.

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Terminal Lug Busbar to Palm

Type BT - Copper



Designed for tube to flat connections. Castings are of high copper content alloy. Lugs are machined on underside. Lugs are supplied with stainless steel bolts and nuts. Note type BT20A is machined on both sides of the lug.

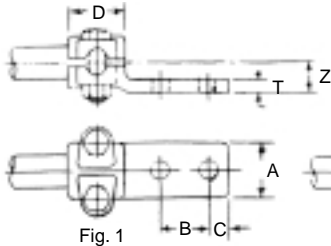


Fig. 1

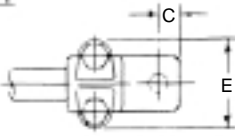


Fig. 2

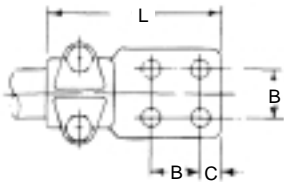


Fig. 3

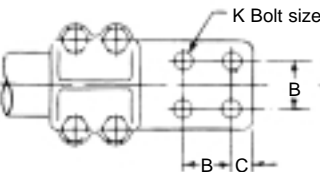


Fig. 4

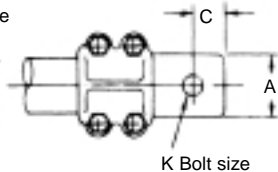


Fig. 5

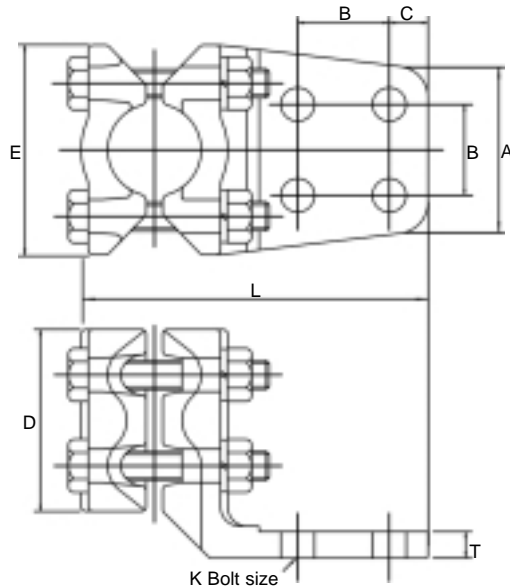
Cat. No.	O.D. Tube mm	Fig. No.	Dimensions mm								
			A	B	C	D	E	L	K	T	Z
BT2	12.7	2	29	---	14	32	38	64	M10	6	16
BT3	15.9	2	32	---	16	32	49	70	M10	10	16
BT5	19.1	2	32	---	16	35	52	73	M12	10	20
BT10	19.1	1	33	29	13	35	52	94	M10	10	20
BT20	25.4	1	41	38	16	44	67	121	M12	10	23
BT20A	25.4	5	38	---	19	51	59	108	M12	6	16
BT30	31.8	1	48	38	16	51	59	127	M12	10	26
BT33	33.3	3	70	38	16	51	76	130	M12	10	30
BT40	38.1	3	70	38	16	51	80	130	M12	11	30
BT46	46.0	4	70	38	16	64	89	146	M12	11	37
BT50	50.8	4	70	38	16	70	95	152	M12	11	37

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Right Angle Aluminium Terminal Lug Busbar to Palm Type ABT-L

Designed for terminating tubular aluminium busbar at right angles to the contact surface. Castings are in high strength aluminium. Bolts and nuts are stainless steel.



Cat. No.	O.D. Tube mm	No. of holes in Palm	Dimensions mm							
			A	B	C	D	E	L	K	T
ABT30L	31.8	2	67	38	16	83	81	156	M12	13
ABT40L	38.1	4	67	38	16	76	87	143	M12	13
ABT57L	60.3	---	83	---	---	79	105	185	---	14
ABT250L	63.5	4	89	38	25	89	111	216	M12	14

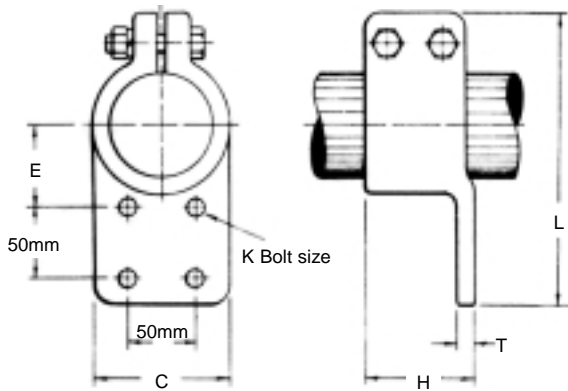
Note: Details of unlisted sizes available on request.

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Right Angle Terminal Lug Busbar or Stud to Palm Type LS - Copper

For the connection of vertical tubular busbar to switchgear terminal plates. Bolts, nuts and spring washers are stainless steel.



Cat. No.	O.D. Tube mm	Dimensions mm					
		C	E	H	L	T	K
LS5	19.1	79	35	44	133	10	M12
LS7	22.2	79	35	44	133	10	M12
LS20	25.4	76	41	64	143	10	M12
LS20C	25.4	102	57	64	171	13	M12
LS25	30.2	102	67	76	184	19	M12
LS25C	30.2	102	57	64	171	13	M12
LS28A	30.2	140	75	76	235	13	M16
LS30	31.8	83	43	64	146	13	M12
LS40	38.1	102	57	60	184	13	M12
LS50	50.8	102	60	73	193	13	M12
LS54	57.2	102	73	76	200	13	M12
LS95	76.2	102	67	83	216	13	M12
LS2018	30.2	76	54	64	143	10	M10

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

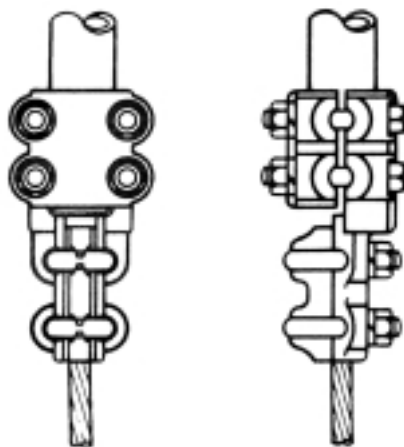
Substation Fittings

Aluminium End Connector Busbar to Conductor

Type AE - Tube to Conductor

A heavy duty tube-to-conductor end connector. The adjustable tap takes a large range of conductors which may be clamped before attaching to tubular bus.

Materials: Cast aluminium alloy body, stainless steel bolts, U-bolts, washers and nuts.



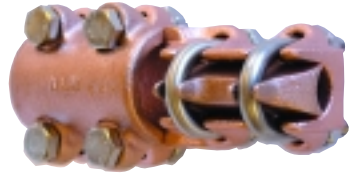
Cat. No.	O.D. Tube mm	Range for Aluminium & Cu Cond.	
		mm ²	Dia. Range
AE1065	25.4	70 - 150	10.70 - 15.75
AE1265	30.2		
AE1365	31.8		
AE1565	38.1		
AE3065	76.2		
AE12102	30.2	240 - 400	20.25 - 25.65
AE13102	31.8		
AE14102	34.9		
AE15102	38.1		
AE80M837	80.0		
AE80M102	80.0	240 - 400	20.25 - 25.65
AE10837	25.4	150 - 240	15.75 - 20.25
AE60837	60.0		
AE15117	38.1	400 - 500	25.65 - 28.80
AE35837	88.9	150 - 240	15.75 - 20.25
AE2550	25.4	35 - 95	7.65 - 12.46

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

End Connector Busbar to Conductor

Type E - Copper, for connecting tube to conductor



A heavy duty tube-to-conductor end connector. The adjustable tap takes a large range of conductors which may be clamped before attaching to tubular bus.

Materials: High copper content alloy casting with stainless steel bolts, U-bolts, washers and nuts. Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

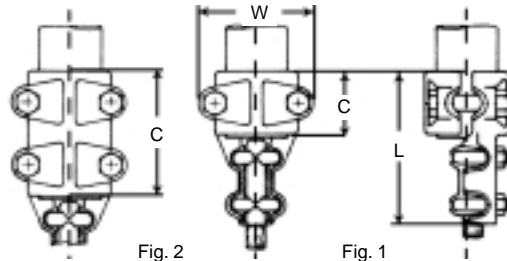


Fig. 2

Fig. 1

Cat. No.	O.D. Tube Run mm	Conductor Range		Fig. No.	Dimensions in mm		
		Area mm ²	O.D. mm		C	L	W
E5	12.7	16 - 95	5.10 - 12.60	1	31.7	86.5	42.9
E10	19.1	25 - 95	6.42 - 12.60	1	35.0	88.9	52.4
E15	19.1	35 - 95	7.65 - 12.60	1	35.0	98.4	52.4
E17	22.2	25 - 95	6.42 - 12.60	1	35.0	88.9	54.0
E20	25.4	25 - 95	6.42 - 12.60	1	35.0	88.9	58.8
E25	25.4	35 - 95	7.65 - 12.60	1	35.0	98.4	58.8
E30	25.4	70 - 150	10.70 - 15.75	1	44.5	117.5	68.2
E31C	25.4	150 - 240	15.75 - 20.25	2	60.3	141.3	58.8
E32C	25.4	500 - 630	28.80 - 33.80	2	76.2	190.5	73.0
E33C	30.0	70 - 150	10.70 - 15.75	2	63.5	139.7	47.6
E35	31.8	35 - 95	7.65 - 12.60	1	50.8	117.5	76.2
E40	31.8	70 - 150	10.70 - 15.75	1	50.8	127.0	76.2
E45	31.8	150 - 240	15.75 - 20.25	1	50.8	136.5	76.2
E46	31.8	240 - 400	20.25 - 25.65	2	76.2	168.3	69.9
E50	38.1	35 - 95	7.65 - 12.60	1	50.8	117.5	81.0
E55	38.1	70 - 150	10.70 - 15.75	1	50.8	123.9	81.0
E55C	38.1	70 - 150	10.70 - 15.75	2	76.2	149.3	76.2
E60C	38.1	150 - 240	15.75 - 20.25	2	76.2	155.6	76.2
E65	50.8	35 - 95	7.65 - 12.60	1	50.8	117.5	95.3
E70	50.8	70 - 150	10.70 - 15.75	1	50.8	127.0	95.3
E75	50.8	150 - 240	15.75 - 20.25	1	50.8	130.1	95.3
E80	76.2	35 - 95	7.65 - 12.60	1	57.1	108.0	127.0
E85	76.2	70 - 150	10.70 - 15.75	1	57.1	127.0	127.0
E90	76.2	150 - 240	15.75 - 20.25	1	57.1	142.8	127.0

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

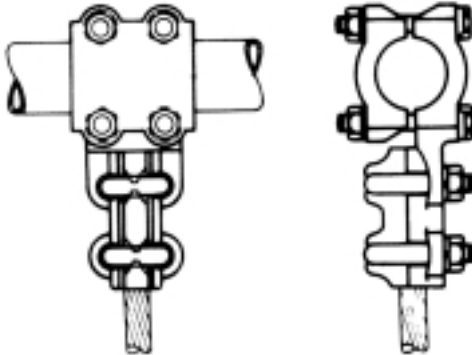
Substation Fittings

Aluminium Tee Connector Busbar to Conductor

Type AT

A heavy duty tube-to-cable tee connector. The adjustable tap takes a large range of cables which may be clamped before attaching to tubular bus.

Materials: Cast aluminium alloy body, stainless steel bolts, U-bolts, washers and nuts.



Cat. No.	O.D. Tube mm	Conductor Range	
		mm ²	Dia. Range
AT2550	25.4	35 - 95	7.65 - 12.46
AT1065	25.4	70 - 150	10.70 - 15.75
AT10102	25.4	240 - 400	20.25 - 25.65
AT301521	30.0	175 - 345	15.00 - 21.00
AT3034	30.0	500 - 630	28.80 - 33.80
AT1350	31.8	35 - 95	7.65 - 12.46
AT1465	34.9	70 - 150	10.70 - 15.75
AT14837	34.9	150 - 240	15.75 - 20.25
AT1550	38.1	35 - 95	7.65 - 12.46
AT15837	38.1	150 - 240	15.75 - 20.25
AT15102	38.1	240 - 400	20.25 - 25.65
AT50102	50.0	240 - 400	20.25 - 25.65
AT2065	50.8	70 - 150	10.70 - 15.75
AT2365	57.2	70 - 150	10.70 - 15.75
AT2465	60.3	70 - 150	10.70 - 15.75
AT24102	60.3	240 - 400	20.25 - 25.65
AT3065	76.2	70 - 150	10.70 - 15.75
AT80837	80.0	150 - 240	15.75 - 20.25
AT80102	80.0	240 - 400	20.25 - 25.65
AT3565	88.9	70 - 150	10.70 - 15.75
AT35837	88.9	150 - 240	15.75 - 20.25
AT351339	88.9	500 - 630	28.80 - 32.76
AT100837	100.0	150 - 240	15.75 - 20.25
AT100102	100.0	240 - 400	20.25 - 25.65

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Tee Connector Busbar to Conductor

Type T - Copper; Tube run to conductor tap

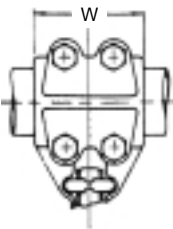


Fig. 2

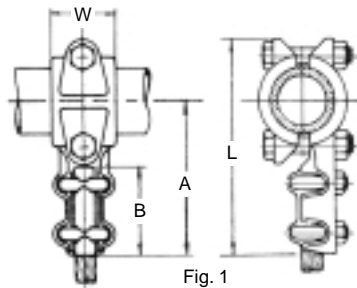


Fig. 1



A heavy duty tube-to-conductor tee connector. The adjustable tap takes a large range of conductors which may be clamped before attaching to tubular bus. Refer to table on adjoining page for conductor ranges and dimensions.

Materials: High copper content alloy casting. Stainless steel U-bolts, bolts, spring washers and nuts.

Substation Fittings

Tee Connector Busbar to Busbar

Type T - Copper; Tube run to conductor tap

Cat. No.	O.D. Tube Run mm	Conductor Range		Fig. No.	Dimensions mm			
		Area mm ²	O.D. mm		A	B	L	W
T10	19.1	25 - 95	6.42 - 12.46	1	81	51	106	35
T15	19.1	35 - 95	7.65 - 12.60	1	90	60	117	35
T20	25.4	25 - 95	6.42 - 12.46	1	84	50	113	35
T25	25.4	35 - 95	7.65 - 12.60	1	92	60	121	35
T30	25.4	70 - 150	10.70 - 15.75	1	106	70	142	44
T31C	25.4	150 - 240	15.75 - 20.25	2	110	80	140	60
T33	30.2	70 - 150	10.70 - 15.75	1	106	70	140	44
T35	31.8	35 - 95	7.65 - 12.60	1	103	60	142	51
T40	31.8	70 - 150	10.70 - 15.75	1	110	70	146	51
T45	31.8	150 - 240	15.75 - 20.25	1	117	76	156	51
T46	31.8	240 - 400	20.25 - 25.65	2	121	83	156	70
T48	34.1	70 - 150	10.70 - 15.75	1	110	73	148	51
T50	38.1	35 - 95	7.65 - 12.60	1	106	60	146	51
T55	38.1	70 - 150	10.70 - 15.75	1	113	70	152	51
T55C	38.1	70 - 150	10.70 - 15.75	2	111	70	148	76
T60	38.1	150 - 240	15.75 - 20.25	1	119	76	159	51
T64	40.0	630 - 800	32.76 - 37.05	2	146	102	192	80
T65	50.8	35 - 95	7.65 - 12.60	1	111	60	156	51
T69	48.4	70 - 150	10.70 - 15.75	1	118	70	164	51
T70	50.8	70 - 150	10.70 - 15.75	1	121	70	168	51
T75	50.8	150 - 240	15.75 - 20.25	1	127	76	175	51
T77	60.3	70 - 150	10.70 - 15.75	1	130	70	187	57
T80	76.2	35 - 95	7.65 - 12.60	1	127	60	191	57
T85	76.2	70 - 150	10.70 - 15.75	1	137	70	200	57
T90	76.2	150 - 240	15.75 - 20.25	1	140	76	206	57
T105	88.9	150 - 240	15.75 - 20.25	1	151	80	222	64

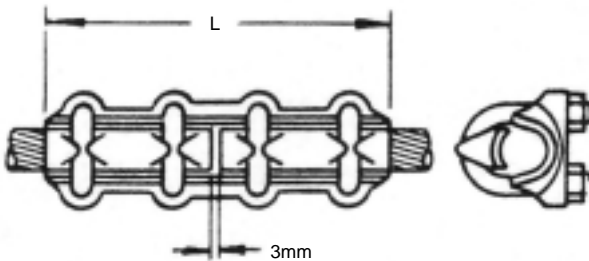
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Straight Connector Conductor to Conductor

Type SC - Copper

Suitable for sub-station applications which require rugged and vibration proof connections. The longitudinal wave cast in both connector base and clamping bar assures high pull-out strength. Connectors are supplied with stainless steel U-bolts and nuts.



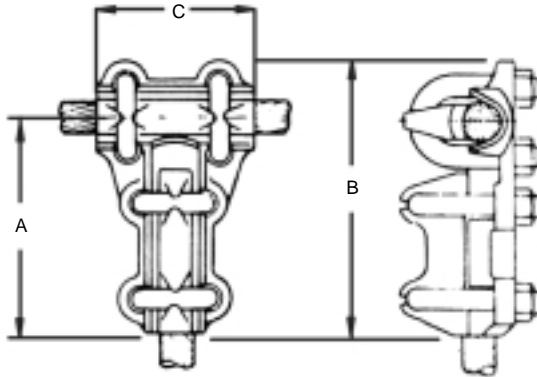
Cat. No.	Conductor Range				Dimension L mm
	Run		Tap		
	Area mm ²	O.D.	Area mm ²	O.D.	
SC1	16 - 35	5.10 - 7.65	16 - 35	5.10 - 7.65	79
SC2	25	6.42	25	6.75	105
SC3	35 - 95	7.65 - 12.46	35 - 95	7.65 - 12.60	127
SC4	70 - 150	10.70 - 15.75	25	6.75	127
SC5	70 - 150	10.70 - 15.75	70 - 150	10.70 - 15.75	143
SC7	150 - 240	15.75 - 20.25	25	6.75	149
SC8	150 - 240	15.75 - 20.25	70 - 150	10.70 - 15.75	149
SC9	150 - 240	15.75 - 20.25	150 - 240	15.75 - 20.25	156

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Aluminium Tee Connector Conductor to Conductor Type ATC

A high strength aluminium alloy tee connector for all aluminium and SCA run and tap conductors. U-bolts and nuts are stainless steel.



Cat. No.	Conductor Range OD mm		Dimensions mm		
	Run	Tap	A	B	C
ATC2	6.17 - 11.35	6.17 - 11.35	71	94	51
ATC5	10.20 - 16.30	10.20 - 16.30	92	116	70
ATC8	16.30 - 21.00	10.20 - 16.30	111	137	83
ATC9	16.30 - 21.00	16.30 - 21.00	110	136	83
ATC10	21.00 - 26.50	16.30 - 21.00	119	156	89
ATC12	21.00 - 26.50	21.00 - 26.50	127	165	89
ATC13	25.40 - 22.80	16.30 - 21.00	116	157	102
ATC15	25.40 - 33.80	25.40 - 33.80	130	170	89

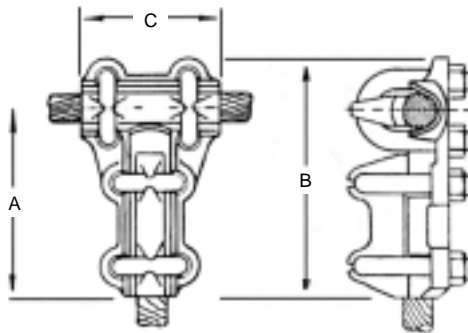
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Tee Connector Conductor to Conductor

Type TC - Copper

Designed for substation applications such as strain buses, suspension of long droppers and for making important tee-off connections which require rugged and vibration- proof connectors. The longitudinal wave cast in both the connector base and clamping bar assures high pull-out strength. Connectors are supplied with stainless steel U-bolts, and nuts.



Cat. No.	Conductor Range				Dimensions mm		
	Run		Tap		A	B	C
	Area mm ²	O.D.	Area mm ²	O.D.			
TC1	16 - 35	5.10 - 7.65	10 - 35	5.10 - 7.65	60	79	38
TC2	25 - 70	6.42 - 10.70	25 - 70	6.42 - 10.70	70	90	51
TC3	35 - 95	7.65 - 12.60	35 - 95	7.65 - 12.60	83	103	60
TC4	70 - 150	10.70 - 15.75	25 - 70	6.42 - 10.70	75	98	70
TC5	70 - 150	10.70 - 15.75	70 - 150	10.70 - 15.75	92	116	70
TC6	70 - 150	10.70 - 15.75	150 - 240	15.75 - 20.25	95	122	70
TC7	150 - 240	15.75 - 20.25	25 - 70	6.42 - 10.70	76	105	76
TC8	150 - 240	15.75 - 20.25	70 - 150	10.70 - 15.75	95	122	76
TC9	150 - 240	15.75 - 20.25	150 - 240	15.75 - 20.25	102	127	76
TC12	240 - 400	20.25 - 25.65	240 - 400	20.25 - 25.65	121	156	83
TC20	500 - 630	28.80 - 32.76	500 - 630	28.80 - 33.80	140	178	102

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Bolted Tee Connector Conductor to Conductor

Type BRCT - Bolted run, compression tee

Material: Die cast aluminium body with tubular aluminium barrel section, argon arc welded to form Tee Connector. Suitable for AAC, AAAC and ACSR conductors from 20mm dia. up to 34mm dia. through the bolted run and from 14mm up to 34mm for the tap connection. Other types available, see pages XX - XX and consult Dulmison for further details.



Cat. No.	Run Connector		Tap Connector	
	Range	Type	Range	Type
BRCT1	54/7/3.25	ACSR	61/3.25	AAC, AAAC
	61/3.25	AAC, AAAC		
BRCT2	54/3.75 + 19/2.25	ACSR	61/3.75	AAC, AAAC
	61/3.75	AAC, AAAC		
BRCT3	54/3.75 + 19/2.25	ACSR	54/3.75 + 19/2.25	ACSR
	61/3.75	AAC, AAAC		
BRCT4	30/7/3.5	ACSR	30/7/3.5	ACSR
BRCT5	54/3.75 + 19/2.25	ACSR	61/3.75	AAC, AAAC
BRCT6	54/7/3.5	ACSR	54/7/3.5	ACSR

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Aluminium Terminal Lug Conductor to Palm

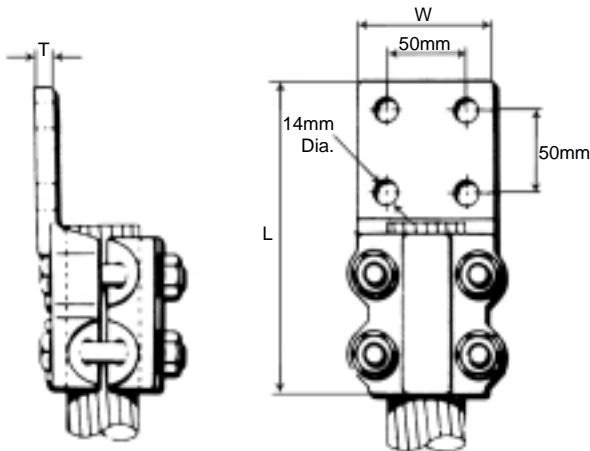
Types AN & AN-B22

A clamp-type aluminium alloy terminal which accommodates a broad range of aluminium, copper and SCA conductors.

Type AN75 is normally supplied with blank palm. 1 or 2 bolt drillings can be supplied to customers' specifications.

Type AN93-B22 through AN134-B22 has four 14mm holes drilled at 50mm centres. Other drillings on request.

Heads of bolts are captured to permit single spanner installation. Suitable for use on copper or aluminium terminal pads when installed with Alminox. Standard hardware is stainless steel.



Cat. No.	Conductor Range		Dimensions			No. of Holes
	mm ²	O.D. mm	L mm	W mm	P mm	
AN75	35 - 185	7.65 - 17.64	149	44	85	---
AN93B22	150 - 300	15.75 - 22.68	171	83	89	4
AN113B22	300 - 500	22.68 - 28.80	179	83	96	4
AN134B22	500 - 630	28.80 - 33.80	188	83	95	4

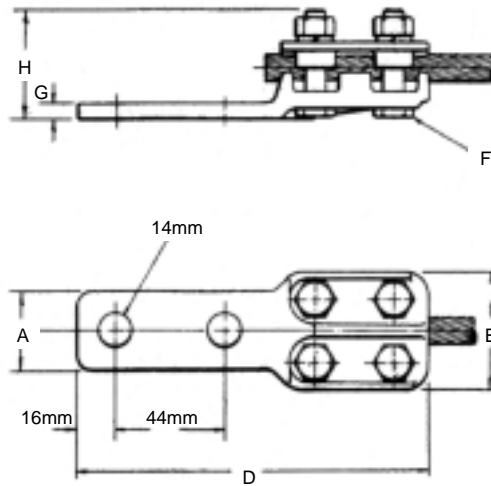
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Terminal Lug Conductor to Palm

Type NT - Copper

The type NT terminal lug is designed for use with imported switchgear having the NEMA standard terminal drilling. Castings are of high copper content alloy. Bolts, nuts and spring washers are stainless steel.



Cat. No.	Conductor Range		Dimensions mm					
	Area mm ²	O.D.	A	D	E	F	G	H
NT1	16 - 70	5.10 - 10.70	32	129	49	M10	6	40
NT2	70 - 150	10.70 - 15.75	38	129	56	M10	8	46
NT3	150 - 240	15.75 - 20.25	44	146	62	M10	10	52
NT4	240 - 400	20.25 - 25.65	54	152	76	M12	13	59
NT5	400 - 630	25.65 - 33.80	64	159	83	M12	13	65

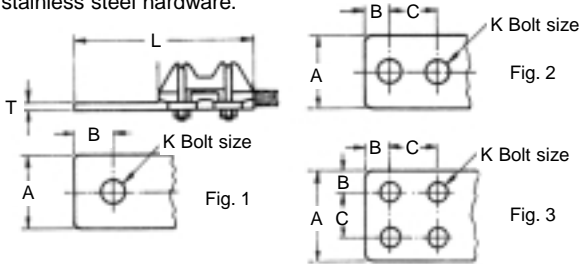
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Terminal Lug Conductor to Palm

Type TL - Copper; ATL - Aluminium

A high compression lug particularly suited to connection subject to vibration and strain. The longitudinal wave case of both lug and clamping bar assures high pullout strength. Supplied with stainless steel hardware.



Cat. No.	Conductor Range		Fig. No.	Dimensions mm					
	Area mm ²	O.D.		A	B	C	K	T	L
TL0	16 - 35	5.10 - 7.65	1	25	13	---	M10	6	67
TL0 2B1	16 - 35	5.10 - 7.65	1	50	25	---	M10	7	92
TL0 187	16 - 35	5.10 - 7.65	2	25	13	48	M10	7	113
TL1	25 - 70	6.75 - 10.70	2	32	13	29	M10	6	105
TL2	35 - 95	7.65 - 12.60	2	32	13	29	M10	8	117
TL2 150	35 - 95	7.65 - 12.60	2	32	16	38	M10	9	137
TL2 187	35 - 95	7.65 - 12.60	2	32	13	48	M10	9	137
TL2 200	35 - 95	7.65 - 12.60	2	32	16	50	M12	9	149
TL2 B1	35 - 95	7.65 - 12.60	1	44	22	---	M20	9	108
TL3	70 - 150	10.70 - 15.75	2	35	16	38	M12	10	140
TL3 B22	70 - 150	10.70 - 15.75	3	79	14	50	M12	8	160
TL3 187	70 - 150	10.70 - 15.75	2	35	16	48	M12	10	149
TL3 2B1	70 - 150	10.70 - 15.75	1	50	25	---	M10	9	127
TL3 B4	70 - 150	10.70 - 15.75	3	64	13	38	M10	7	137
TL3 B22C	70 - 150	10.70 - 15.75	3	102	25	50	M12	14	181
TL4	150 - 240	15.75 - 20.25	2	38	16	38	M12	10	146
TL4 B22	150 - 240	15.75 - 20.25	3	83	16	50	M12	10	165
TL4 187	150 - 240	15.75 - 20.25	2	38	16	48	M12	10	156
TL4 B4	150 - 240	15.75 - 20.25	3	64	13	38	M10	8	140
TL4 B5	150 - 240	15.75 - 20.25	3	76	13	50	M10	7	159
TL5	240 - 400	20.25 - 25.65	2	41	16	38	M12	13	156
TL5 B22	240 - 400	20.25 - 25.65	3	83	16	50	M12	10	173
TL5 187	240 - 400	20.25 - 25.65	2	41	16	48	M12	13	165
TL5 B4	240 - 400	20.25 - 25.65	3	76	19	38	M10	9	165
TL5 B5	240 - 400	20.25 - 25.65	3	76	13	50	M10	9	165
TL6	400 - 500	25.65 - 28.80	2	48	19	38	M12	14	165
TL6 B22	400 - 500	25.65 - 28.80	3	83	16	50	M12	9	176
TL7	500 - 630	28.80 - 32.76	2	48	19	38	M12	16	178
TL7 B22	500 - 630	28.80 - 32.76	3	83	16	50	M12	11	187
TL7 B4	500 - 630	28.80 - 32.76	3	76	19	38	M10	10	184
TL7 B5	500 - 630	28.8 - 32.76	3	76	13	50	M10	10	184

Note: To order in aluminium, add prefix 'A' to catalogue number.

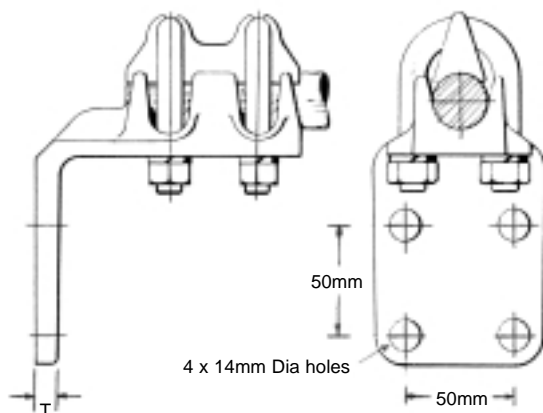
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Right Angle Terminal Lug Conductor to Palm

Type TLC - Copper; ATLC - Aluminium

For use when terminating conductors at right angles to switchgear terminal plates. Castings are in high copper content alloy. U-bolts, nuts and spring washers are stainless steel.



Cat. No.	Conductor Range		Dimension T mm
	Area mm ²	O.D.	
TL3C22	70 - 150	10.70 - 15.75	8
TL4C22	150 - 240	15.75 - 20.25	10
TL7C22	500 - 630	28.80 - 33.80	11

Note: To order in aluminium, add prefix 'A' to catalogue number.

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

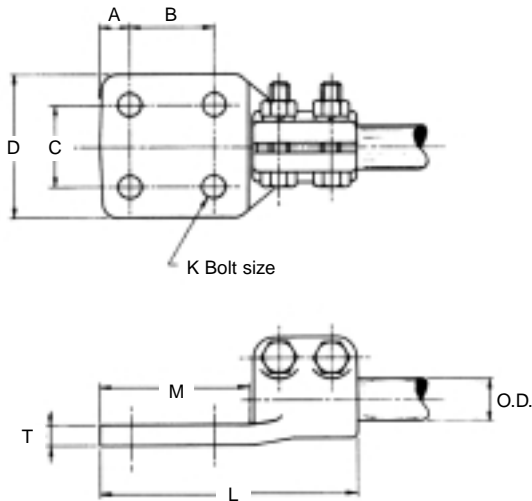
Substation Fittings

Terminal Lug Stud or Busbar to Palm

Type CS - Copper

For the connection of vertical tubular busbar to switchgear terminal plates. Also used on equipment studs to provide a flat contact palm.

Materials: Terminal lugs are cast in high copper content alloy. Bolts, nuts and spring washers are stainless steel.



Cat. No.	O.D. Tube mm	Dimensions mm							
		A	B	C	D	L	M	T	K
CS5	19.1	16	51	51	83	130	83	10	M12
CS20	25.4	16	51	51	83	149	83	13	M12
CS20B	25.4	19	38	38	83	149	83	13	M10
CS112	28.6	16	38	38	76	149	76	10	M12
CS28	30.2	---	---	---	76	146	76	10	M12
CS28C	30.2	25	51	51	102	171	108	13	M12
CS30C	31.8	25	51	51	102	171	108	13	M12
CS38	34.9	25	51	51	102	171	105	13	M12
CS40C	38.1	25	51	51	102	171	105	13	M12
CS42	39.7	25	51	51	102	171	105	13	M12
CS42A	39.7	35	70	70	140	210	143	13	M16
CS181	46.0	25	38	51	102	178	105	16	M12
CS231	58.7	25	38	51	102	203	108	19	M12
CS250	63.5	25	38	51	102	203	108	19	M12

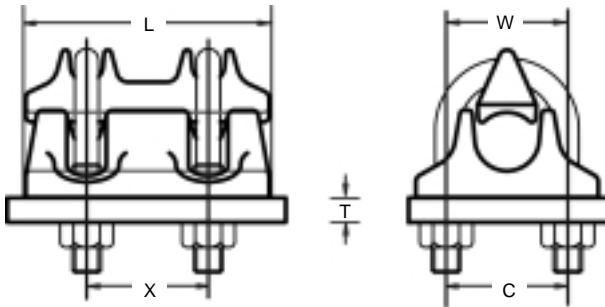
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Palmless Connector

Types PC & PCS - Copper; APC & APCS - Aluminium

Low cost connectors for clamping cable to switchgear terminal plates with four 14mm diameter holes at 50mm centres. Castings are of high copper content alloy. U-bolts, nuts and spring washers are stainless steel.



Cat. No.	Cable Range		Dimensions mm					No. of Holes
	Area mm ²	O.D.	C	L	T	W	X	
*PCS1	25 - 120	6.75 - 14.21	22	32	7	44	---	2 x 9.5
*PCS2	50 - 300	8.90 - 22.68	33	38	7	50	---	2 x 11.5
PC3	70 - 150	10.70 - 16.00	50	102	13	76	50	4 x 14.0
PC4	150 - 240	15.00 - 21.00	50	102	13	76	50	4 x 14.0
PC5	240 - 400	20.00 - 25.65	50	102	13	76	50	4 x 14.0
PC7	500 - 630	28.80 - 33.80	50	102	13	76	50	4 x 14.0

Note: PSC1 & PSC2 are single U-bolt connectors. To order in aluminium, add prefix 'A' to catalogue number.

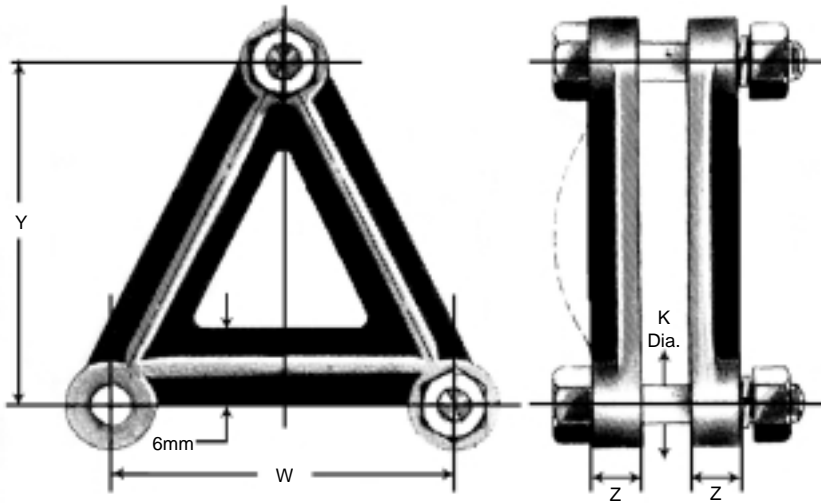
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Flat Busbar Connector

Type BAC - Copper

A 3-bolt 'A' shape connector for end-to-end or tee connecting flat copper busbar. Clamp halves are high strength copper alloy. Bolts and nuts are stainless steel.



Cat. No.	Width of Busbar mm		Dimensions mm			
	Run	Tap	K	W	Y	Z
BAC5151	50.8	50.8	M10	62	62	13
BAC7651	76.2	50.8	M10	62	87	13
BAC7676	76.2	76.2	M10	87	87	13
BAC10251	101.6	50.8	M12	65	116	14
BAC10276	101.6	76.2	M12	90	116	14
BAC1521	152.4	101.6	M12	117	178	14

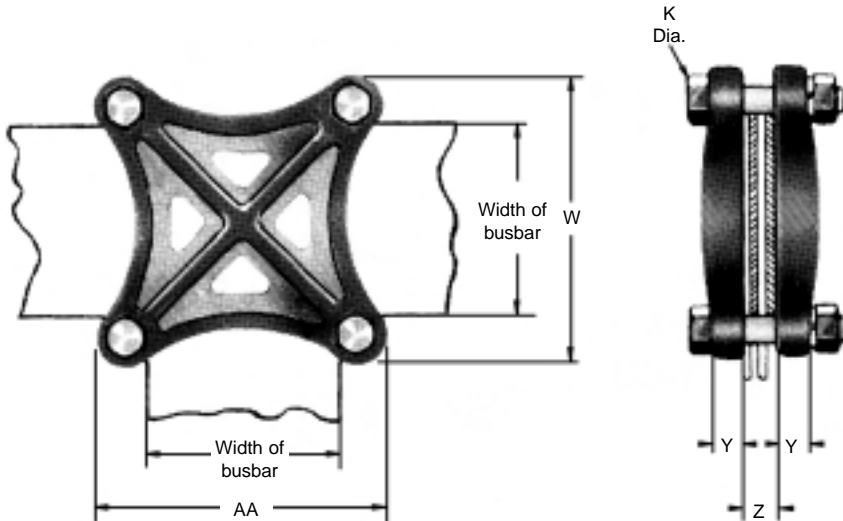
Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

Substation Fittings

Flat Busbar Connector

Type BC - Copper

A heavy duty 4-bolt connector for cross-over, tee or end-to-end jointing of flat copper busbar. Clamp halves are made of high strength copper alloy. Bolts and nuts are stainless steel.



Cat. No.	Width of Busbar mm		Dimensions mm			
	Run 'A'	Tap 'B'	K	W	Y	Z
BC2	50.8	50.8	M10	89	11	19
BC3	76.2	76.2	M10	114	13	32
BC4	101.6	101.6	M12	149	16	32
BC6	152.4	152.4	M16	213	25	32

Note: Dimension 'Z' is standard spacing between connector halves. If greater spacing is required, please specify for determination of bolt length.

Fittings on this page have a minimum current rating, in line with the maximum Australian Standard conductor size or busbar size that the fitting can accept.

A close-up photograph of surge arrester components, including a metal cap and a threaded terminal, set against a dark red background. The number '15' is overlaid in large white font.

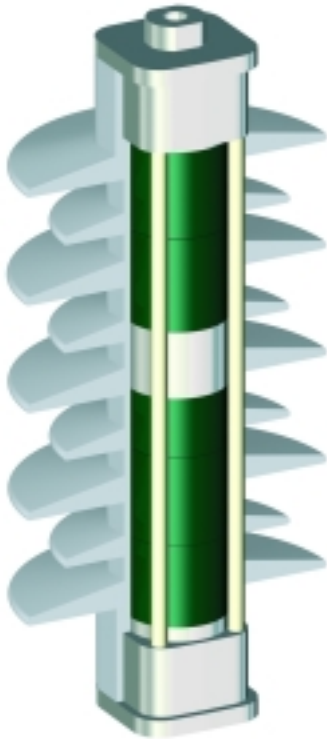
15



Surge arresters

- > Distribution
- > Station Class
- > Surge Counters
- > Sheath Voltage Limiter
- > DC Traction
- > Airfield Lighting
- > Transmission

Distribution Class - Open Cage Polymeric 'OCP'



OCP is the latest gapless, zinc oxide arrester family from Bowthorpe.

The OCP development was based on 25 years of internal experience in arrester design and manufacture within Dulmison.

BOWTHORPE OCP BENEFITS:

Tested in accordance with IEC60099-4 at independent accredited laboratories.

Superior protection margins.

Direct molded housing to prevent moisture ingress.

Low residual voltages.

High-energy handling.

Superior TOV performance.

Safe non-shattering short circuit behavior to higher current levels.

Maintenance free.

Hydrophobic silicone housing, tracking and erosion resistant.

Excellent cantilever and tensile performance.

Excellent vibration and impact withstand capability.

Quality design and manufacturing, ISO 9001 and 14001 compliant.

Refer Brochure: Bowthorpe MV arresters OCP EPP-1098 for details

Distribution Class - Polymeric 'OCP1'

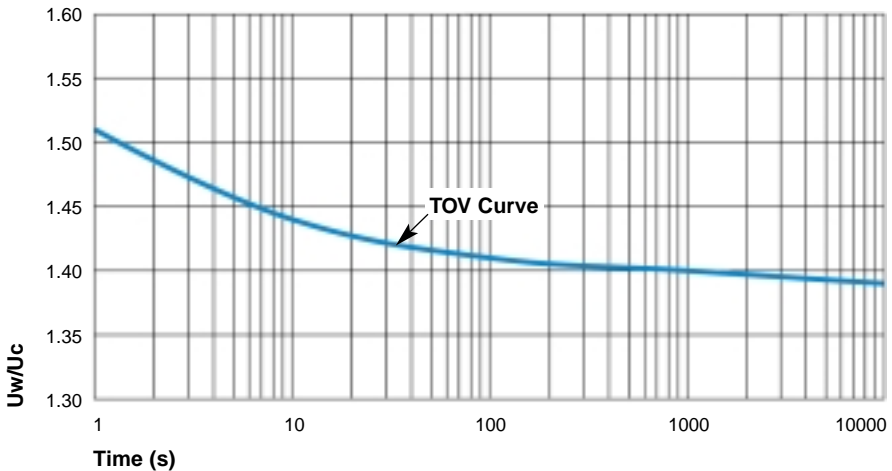
Application:

Protection of MV networks and equipment from lightning and switching surge related over-voltages in areas with relatively high iso-keraunic levels. Suitable for both outdoor and indoor use to protect transformers and cable end terminations.

Generic technical data:

OCP1 series	3-24kV Uc
Rated discharge current (8/20 μ s):	10kA
Line discharge class 1 according to	IEC 60099-4
Operating duty impulse withstand current (4/10 μ s):	100kA
Long duration current impulse (2000 μ s):	350A
High current short circuit: (pre-failing method)	25kA
(Safe non-shattering failure mode)	
Energy 2 Long duration impulses:	4.1kJ/kVUc
Cantilever strength	350 Nm

TOV of OCP1 with 100kA single shot high current prior energy



Temperature of samples(pre-heated): 60 degrees C according to IEC 60099-4, Ed 2.0 2004. TOV Curve applies to an arrester which has a pre-stress applied prior to TOV verification. This pre-stress is equivalent to one high current impulse of 100kA, 4/10 as per the switching surge operating duty test.

Uw = TOV withstand voltage; Uc = continuous operating voltage.

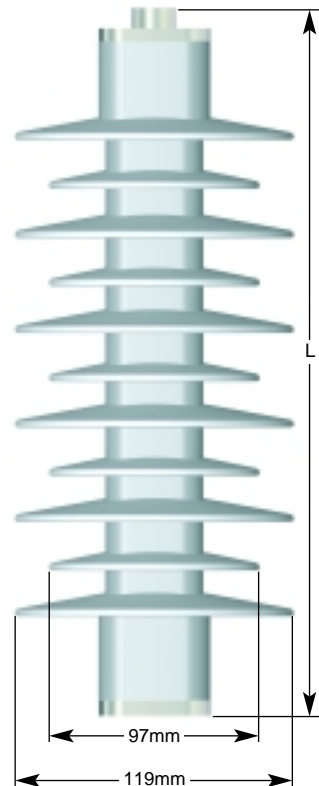
Surge Arresters

Distribution Class - Polymeric 'OCP1'

OCP1-	Uc kV (rms)	Ur kV (rms)	Residual Voltage in kV when tested to the following impulse waveforms					
			Lightning			Switching		
			8/20µS			1/20µS		
			5kA	10kA	20kA	10kA	125A	500A
4	4	5	13.03	13.83	15.31	15.04	10.42	10.77
5	5	6.2	16.29	17.29	19.14	18.80	13.02	13.46
6	6	7.5	19.55	20.75	22.97	22.56	15.62	16.15
8	8	10	26.06	27.66	30.62	30.08	20.83	21.54
9	9	11.2	29.32	31.12	34.45	33.84	23.44	24.23
10	10	12.5	32.58	34.58	38.28	37.60	26.04	26.92
12	12	15	39.10	41.50	45.94	45.12	31.25	32.30
15	15	18.7	48.87	51.87	57.42	56.40	39.06	40.38
18	18	22.5	58.64	62.24	68.90	67.68	46.87	48.46
20	20	25	65.16	69.16	76.56	75.20	52.08	53.84
21	21	26.2	68.42	72.62	80.39	78.96	54.68	56.53
22	22	27.5	71.68	76.08	84.22	82.72	57.29	59.22
24	24	30	78.19	82.99	91.87	90.24	62.50	64.61

OCP-xxS; Standard housing parameters

OCP1-	Impulse	PF Wet	FO Dist mm	Creepage mm	Height L mm
	SW kV	WS kV			
4	106	47	176	379	183
5	106	47	176	379	183
6	106	47	176	379	183
8	106	47	176	379	183
9	106	47	176	379	183
10	106	47	176	379	183
12	106	47	176	379	183
15	128	57	214	503	220
18	154	68	254	629	260
20	154	68	254	629	260
21	180	80	293	755	299
22	180	80	293	755	299
24	180	80	293	755	299



OCP-xxL; Extended housing parameters

OCP1-	Impulse	PF Wet	FO Dist mm	Creepage mm	Height L mm
	SW kV	WS kV			
4	128	57	214	503	214
5	128	57	214	503	214
6	128	57	214	503	214
8	128	57	214	503	214
9	128	57	214	503	214
10	128	57	214	503	214
12	128	57	214	503	214
15	154	68	254	629	254
18	180	80	293	755	293
20	180	80	293	755	293
21	205	91	334	882	334
22	205	91	334	882	334
24	205	91	334	882	334

Surge Arresters

OCP Series naming and order query description

Example: OCP = 'Open Cage Polymeric'

OCP0 - 12S - ABC

Line discharge class:

- 0 = 5kA, 65kA high current
- 1 = 10kA, 100kA high current, class 1
- 2 = 10kA, 100kA high current, class 2

Uc

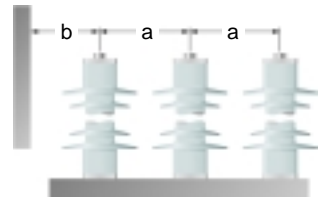
Housing creepage:

- S = standard creepage
- L = extended creepage

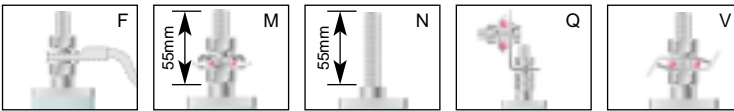
Accessory selection:

- M = Mounting bracket
- E = Earth connection
- L = Line connection

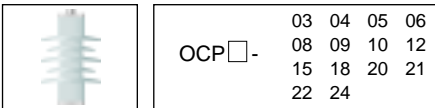
System Voltage Um	ph/ph (a)	ph/ground (b)
12	185	165
24	315	295
36	445	425



Line lead accessories

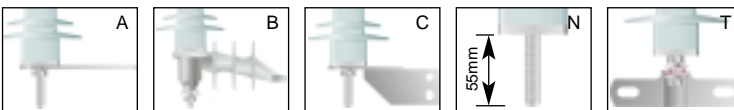


Arrester Type = Continuous Operating Voltage U_C in kV

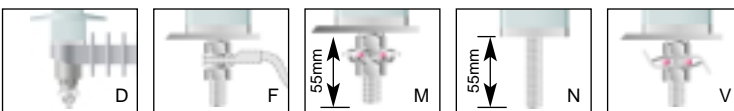


OCP [] - 12 [] - [] []

Mounting accessories



Ground lead accessories



Additional accessory options available on request.

Please contact: surgearresters@dulmison.com.au with your specific requirements.

Station Class - Porcelain



- Conventional design
- High voltage porcelain
- Glazed externally and internally
- Varistors in single column, spring loaded with air cavity
- Up to 400kV
- Pressure relief performance 40kA
- Grey or Brown

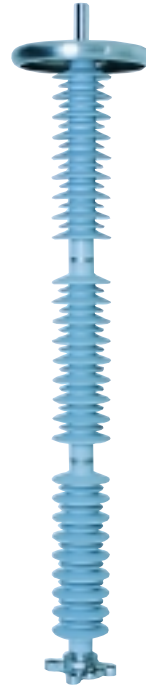
Cat No.	Voltage Rating kV	Duty kA	Line Discharge Class	Pressure Relief Class kA
MAA	3 - 220	10	2	40
MBA	3 - 156	10	2	25
MCA	3 - 360	10	3	40
MDA	3 - 360	20	4	40

Refer brochure: Transmission Surge Arresters BOW-EPP-0001 for details.

Station Class - Polymeric

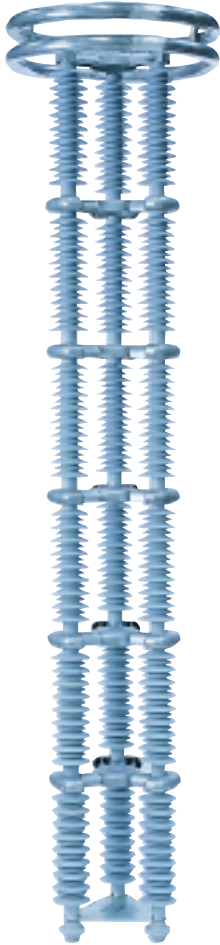
- Patented design
- Void free construction
- High cantilever strength which maintains electrical continuity
- Non shattering
- 25 kA Short Circuit performance
- Up to 3 units high
- Extended Creepage available

Cat No.	Voltage Rating kV	Duty kA	Line Discharge Class
HSR	6 - 48	10	2
2HSR	48 - 84	10	2
3HSR	96 - 132	10	2



Refer brochure: Transmission Surge Arresters BOW-EPP-0001 for details.

Station Class - Polymeric



- Patented Series Parallel design provides the best solution for higher voltage systems
- Line Discharge Class 2,3,4 & 5 high energy levels
- 3KV to 800KV rated systems
- Series Parallel design is the number one seismic arrester which meets the requirements of BPA in USA
- NGC Approval at 132, 275 & 400kV
- Easy Installation in Remote Locations

Cat No.	Voltage Rating kV	Duty kA	Line Discharge Class
2P	30 - 168	10	3
3P, 4P, 5P	96 - 525	10/20	3, 4 & 5

Refer brochure: Transmission Surge Arresters BOW-EPP-0001 for details.

Surge Counters



- SC12
- SC13 (With Leakage Current Display)
- & AC (With Auxiliary Contacts)

- Arrester base must be insulated
- Insulated bases are available for all Dulmison arresters
- Same robust design for over twenty years
- Leading supplier to OEMs

Sheath Voltage Limiter

- Protection of single bond and cross bonded HV cables.
- Protects against short circuit induced over voltage



Cat No.	Voltage Rating kV	Line Discharge Class
CPA	1, 3, 6 & 9	1
CSPA2	1, 3, 6 & 9	2
CSPA3	1, 3, 6 & 9	3

DC Traction

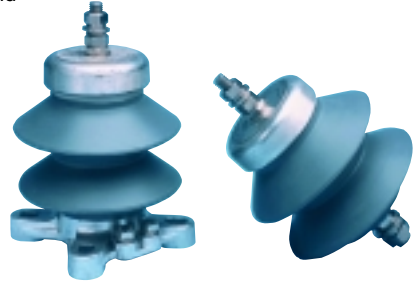
Main Features

The arrester has a 10kA nominal discharge current and 100kA duty cycle performance to EN 50123-5-2003.

The patented void free construction of this arrester design results in a unit with strength which is impervious to the ingress of moisture.

The arrester has the following features:

- No internal airspace so no moisture ingress
- Vandal proof
- High cantilever and torsional strength
- Non-explosive failure mode
- Low weight and small size
- Resistant to transport damage and careless handling
- Easy to install



Electrical Performance

Classification (8/20 μ s nominal discharge current)	– 10,000 Amps
Voltage Rating	– 1kV to 4.9kV DC
High Current Operation Duty	– 100kA 4/10 μ s
High Current Single Impulse Energy	– 2.3kJ/kV at Ur
Operating Duty Cycle – 2 shots hi-current followed by the voltage profile Ur (300s) then Uc- (1800s) as per EN50123-5 2003 clause 4.7.5.4 and figure 4.1 to prove thermal stability.	

Refer brochure: DC Traction BOW-EPP-0005 for details

Airfield Lighting

**Technical Data**

Arrester Type 2DCAFL4 is housed in a die-cast aluminium box finished in grey paint and complies with IP65. The box is fitted with four aluminium cable glands to accommodate supply cables with diameter 11.00mm to 13.5mm. The box has a stainless steel M12 earth terminal stud with two lock nuts and clamp washers.

The box lid is removed for connections and the internal screw-type terminals will accommodate wires up to 6mm diameter. (Hexagon Key provided.)

Box size: 260mm x 160mm x 90mm

The Arrester Type 2DCAFL4 has the following electrical performance -

Nominal a.c. rating	4.0kv rms
Maximum continuous operating d.c. voltage	5.2kv
Arrester Classification	5000A
High Current	65kA
Energy handling capability equivalent	1 (IEC 60099-4 Clause 7.4.2 table 4 & 7.5.5.5)
Withstand based on 2000ms rectangular wave	250A
Operating temperature	-40°C to +40°C
Standard	IEC 60099-4 2001

Transmission Line Arrester

Key Features

- HV arrester suspended from a transmission line giving enhanced transmission line performance.
- Increasing system line voltage on standard insulated transmission lines.

Benefits of TLA Applications

- Minimising circuit breaker operation with possible system outage resulting from back flashover on the transmission line.
- Switching overvoltages are absorbed over the length of the line reducing the severity of surge at the substation.
- Transmission systems can be operated even where sub-soil gives poor tower footing resistance.
- Eliminating interrupted power supply for sensitive industrial processes.
- Installing Transmission Line Arresters on a standard 3 phase voltage system along the line, at calculated intervals, allows for optimum performance of the TLA, to give an increased system line voltage.
- Therefore eliminating the need to increase the standard insulation level required on conventional system upgrade.

Cat No.	Voltage Rating kV	Duty kA	Line Discharge Class
TLA1	16 - 45	10	2
TLA2	48 - 96	10	2
TLA3	108 - 144	10	2
TLA4	150 - 192	10	2





16

Underground

- › Turrets, Panels and Bases
- › Turret Security Equipment
- › Aluminium Service Blocks
- › Wedge Links
- › Shrouds
- › Cable Glands
- › Cable Clamps
- › Consumer Connection Pits
- › Heavy Duty Pits
- › Service Pit and Lid
- › Pit Accessories
- › Insulation Piercing Connectors
- › Pit Connectors
- › Marking Tapes
- › Cable Support Rollers
- › LV Mains to Service Branch Joints
- › LV Jointing Tools

URD Turret - Series Eleven

High density injection moulded polyethylene turrets and bases

Easily transported and installed

Strong but light base and turret allow easy transport and installation. Turret is easily and simply secured to base with D-head stainless steel or socket button-head screws.

Maintenance-free design

The all weather polyethylene construction requires no painting or maintenance, as protection against corrosion/moisture is not an issue.

Turret Details

Material: High impact polyethylene.

Colour: Green

Venting: For vented turrets add suffix "V". For example, the catalogue number for 'tall vented' would be UT11GV.

Markings: Danger Electricity.

IP Rating: IP44



Turret

Cat No.	Vent	H	W	D
UT11G	N	550	293	225.5
UT11GV	Y	550	293	225.5
UT11SG	N	335	306	238.5
UT11SGV	Y	335	306	238.5

Base

Cat No.	L	Top	Top Depth	Supplied Hardware
UEC11MG	350	550	510	None
UEC11MGE	350	550	510	D-Head DHB10MW22
UEC11MGS	350	550	510	Socket Screw UESM10

URD Series Eleven Panels

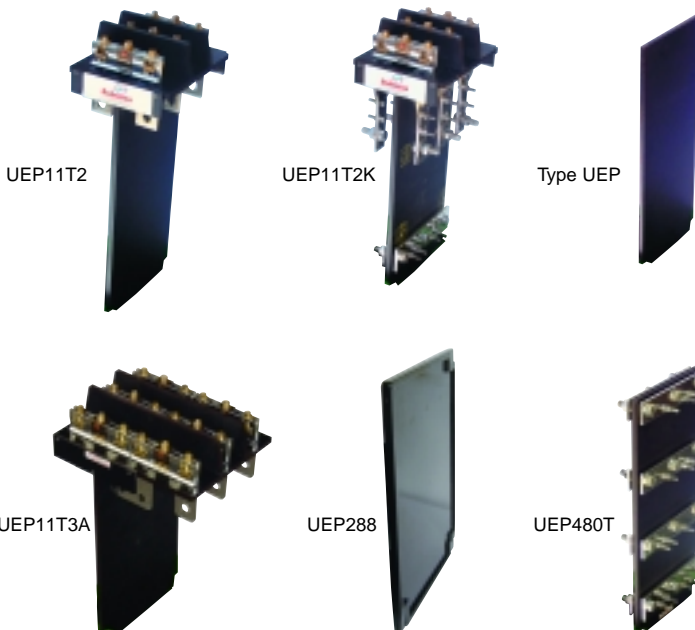
These panels fit the tapered slots cast in the UEC Series Eleven bases. Order panels separately. Small panel UEP240 and UEP288 fit the small UT11SG turret. All other panels require the larger UT11G Series turrets.

Materials:

Switch panel type X to AS1795 except panel UEP288 which is injected moulded plastic.

Panel

Cat No.	H	W	Type	Take Offs	Neutral Bar
UEP11T2	515	205	Wedge	1 in 1 out	No
UEP11T2K	510	205	Wedge	3 in 3 out	Yes
UEP11T3A	440	200	Wedge	2 dual in 2 dual out	No
UEP288	205	288	Blank	N/A	N/A
UEP240	240	205	Blank	N/A	N/A
UEP390	390	205	Blank	N/A	N/A
UEP480T	480	205	Blank	N/A	N/A
UEP495	495	205	Blank	N/A	N/A
UEP535	535	205	Blank	N/A	N/A
UEPW495	495	288	Blank	N/A	N/A



URD Turret - EV Series

Self extinguishing reinforced fibreglass

The interchangeable turrets, bases and panels provide a combination that can meet wide ranging conditions in the field and provide cost savings in purchasing and inventory.

Turret Details

Turret:	Self extinguishing fibreglass
Venting:	Top vent holes on turret sides with a venting step at the base provides flow through air circulation and minimise condensation.
Door:	Turrets containing RD in the part number have a removable and lockable door
Hardware:	UESM10 socket button screw or DHBM10W22 D-Head bolt
IP Rating:	IP46D

Base Details

Function:	UEC1 base tapered on all sides
	UEC3 base tapered on three sides and flat at the back for mounting close to structures



Turret

Cat No.	Material	Colour	H	W	D
UET1SEV	F/G	Beige	470	380	318
UETEVE	F/G	Beige	620	375	318
UETEVEGN	F/G	Green	620	375	318



UEPFL1



UEPFS1



UEPFL2B

Panel

Cat No.	H	W	Wedge Links
UEPFL1	610	343	-
UEPFL2B	572	346	3
UEPFS1	425	343	-



Base

Cat No.	Material	H	W	D
UEC1	Concrete	230	654	654
UEC3	Concrete	235	640	640

URD Paralleling Pillar and Base

Series URDIC65

The paralleling pillar and base are designed to house a 3-phase switch disconnecter (FSD) for low voltage mains cable interconnecting. Alternatively they are suitable for servicing industrial/commercial customers.

URDIC pillars and bases are interchangeable with fibreglass EV Series cover and corresponding concrete base.

Turret Details

Material: High impact UV resistant polyethylene
 Colour: Green.
 Venting: Top and bottom vented
 Hardware: 4 x DHB10MW22 are provided standard with the base. There is also an Option 2 kit of 4 x UESM10 if requested.



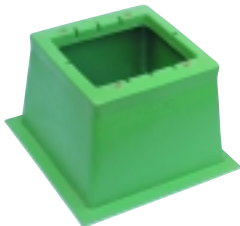
Turret

Cat No.	Material	H	W	D
URDIC65	Polyethylene	645	395	360



Panel

Cat No.	Material	H	W
UEFLL	Gal Steel	569	346



Base

Cat No.	Material	H	W	D
URDIB65	Polyethylene	365	560	560

URD Pillars - the Slimline

The Slimline is designed to house commercial or industrial distribution equipment adjacent to a wall or shopfront.

Turret Details

Material: Self Extinguishing Fibreglass
 Venting: Top vented
 Marking: Danger Electricity
 Hardware: DHB32 or UES11, order separately
 IP Rating: IP56

Turret

Cat No.	Colour	H	W	D
UETSL1V	Beige	768	572	279



Panel

Cat No.	H	W
UEPFSL1	738	396



Base

Cat No.	Material	H	W	D
UECSL1	Concrete	400	635	311



Industrial / Commercial Pillar

Type UET8

Type UET8 has a designed capacity to accommodate fuses, circuit isolation and other distribution equipment for industrial and commercial systems. Panel material is high grade Switch panel Type X to AS1795, Part 1 supplied either blank or drilled and fitted to customer requirements.

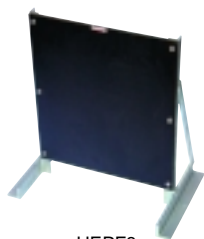
Turret Details

Material:	Self Extinguishing Fibreglass
Colour:	Green
Venting:	Top and bottom vented
Marking:	Danger Electricity
Hardware:	DHB32 or UES11, order separately
IP Rating:	IP44



Turret

Cat No.	Material	H	W	D
UET8O	FG	745	490	380



UEPF8



UEP26215

Panel

Cat No.	Material	H	W
UEP26215	FG	560	425
UEPF8	FG	620	575



Base

Cat No.	Material	H	W	D
UEC8	Concrete	295	740	568

URD Pillars

Type UETSD1C

Supplied as complete pillar assembly. Comprising of turret, panel and base, or just turret and base. Designed for commercial or industrial distribution where quick access is required through a key locked door.

Details

Material:	Self Extinguishing Fibreglass
Colour:	Green or Beige, please confirm at time of order
Venting:	Top vented
Marking:	Danger Electricity
Hardware:	Not applicable
IP Rating:	IP44

Turret and Base assembly

Cat No.	H	W	D
UETSD1NP	1100	740	225

Panel, sold separately

Cat No.	Panel Configuration
UETSD1PG2C	C/W active link and lexan covers
22171K02	Blank



UETSD1PG2C
(neutral bar not shown)

Complete Pillar

Cat No.	Panel Configuration	H	W	D
UETSD1C	22171K02	1100	740	225
UETSD1AWC	UETSD1PG2C	1100	740	225



UETSD1C



UETSD1AWC

Industrial/Commercial Pillar

Type UET SD2

This pillar design provides easy access to fuses etc. via a hinged lockable door. Standard locking provided is L & F ACR19 camlock. Available on request is Lockwood Type 201 series lock.

Turret Details

Material: Self Extinguishing Fibreglass
 Venting: Bottom - by clearance with base
 Marking: Danger Electricity
 Hardware: DHB32 or UES11, order separately
 IP Rating: IP44

Turret

Cat No.	Material	Colour	H	W	D
UETSD2	FG	Beige	900	520	400
UETSD2G	FG	Green	900	520	400



Panel

Cat No.	H	W
UEPFS2	768	474



Base

Cat No.	Material	H	W	D
UECSD	Concrete	280	534	280



Industrial/Commercial Pillar

Type UETSD4

This large pillar is designed for sitting close to building alignments, walls, etc. and meets requirements for housing industrial distribution busbar gear. It has a padlockable and removable door to facilitate access.

Details

Material:	Self Extinguishing Fibreglass
Venting:	Top and bottom vented
Colour:	Green
Marking:	Danger Electricity
Hardware:	DHB32 or UES11, order separately
IP Rating:	IP56

Turret

Cat No.	Colour	H	W	D
UETSD4	Green	1280	710	270



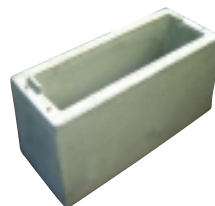
Panel

Cat No.	Material	H	W
UEPSD4	F/G	820	675



Base

Cat No.	Material	H	W	D
UECSD4	Concrete	390	780	330



Industrial/Commercial Pillar

Type UETSD5

This pillar with lockable door, complies with AS3000 requirements of lock being at a minimum height of 1.2m above ground. Door is removable for easy re-entry, inspection and maintenance.

Turret Details

Material:	Self Extinguishing Fibreglass
Venting:	Top and Bottom
Colour:	Beige. For other colours refer Dulmison
Security:	Lockable door
Marking:	Danger Electricity
Hardware:	DHB32 or UES11, order separately
IP Rating:	IP56

Turret

Cat No.	Material	H	W	D
UETSD5	FG	1310	450	320



Panel

Cat No.	H	W
UEPFSD5	1100	375



Base

Cat No.	Material	H	W	D
UECSD5	Concrete	400	620	380

Commercial/Industrial Distribution Pillar

Front and Rear Access Type UETSD6

Supplied as complete pillar assembly, comprising of turret, panel and base or just turret and base. This pillar is designed for front and rear access for simplified equipment installation and servicing. It has low maintenance design and materials. It is UV stabilised for a long service life and light weight to be easily transported and site installed. The design accommodates panels or busbars for strip fuses. The removable base front panel facilitates laying of larger cable sizes and provides easy service access.

Details

- Material: Self Extinguishing Fibreglass
- Venting: Top venting with interior baffles to protect wiring and equipment against unauthorised intrusion of foreign objects.
- Panel Mounting: Two internal moulded fibreglass angles provide for simple attachment of panels or busbars for strip fuses.
- Security: 3-point door locking and latching bars. Customers may install lock cylinders to meet own master key system
- Marking: Danger Electricity
- Hardware: DHB32 or UES11, order separately
- IP Rating: IP44

Turret and Base Assembly

Cat No.	Colour	H	W	D
UETSD6	Beige	1630	710	412
UETSD6GN	Green	1630	710	412



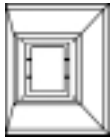





Panel, sold separately

Cat No.	H	W	D
UEPSD6	1100	680	10



URD Fast Find Table

					
Turret	Panel	Base	Bolts	Locking	Tool
UT11G UT11GV	UEP11T2 UEP11T2K UEP11T3A UEP390 UEP480T UEP495 UEP535 UEPW495	UEC11MG UEC11MGE UEC11MGS	DHB10MW22 UESM10	LD3M LP3	E18340 E19882
UT11SG UT11SGV	UEP288 UEP240				
UET1SEV	UEPFS1				
UETEVEV UETEVEGN	UEPFL1 UEPFL2B UEPFL2P	UEC1 UEC3	DHB10MW22 UESM10	LD1 LP1	E18340 E19882
URDIC65	UEFLL UEPFS1 UEPFL1 UEPFL2B UEPFL2P	URDIB65	DHB10MW22 UESM10	----	E18340 E19882
UETSL1V	UEPFSL1	UECSL1	DHB32 UES11	LD1 LP1	E18340 E19882
UET80	UEP26215 UEPF8	UEC8	DHB32 UES11	----	E18340
UETSD1C UETSD1AWC			N/A	----	
UETSD2 UETSD2G	UEPFSD2	UECSD	DHB32 UES11	----	E18340 E19882
UETSD4	UEPSD4	UECSD4	DHB32 UES11	----	E18340 E19882
UETSD5	UEPSD5	UECSD5	DHB32 UES11	----	E18340 E19882
UETSD6 UETSD6GN	UEPSD6 UETSD6P UETSD6GP	UETSD6 UETSD6GN	DHB32 UES11	----	E18340 E19882

Turret Security Equipment

Turret Hold Down Bolts

Socket Button Head Screws - Stainless steel.

Cat No.	Size
UESM10	M10 x 32mm
UES11	1 1/4" x 3/8" W



D Head Bolts - Stainless steel

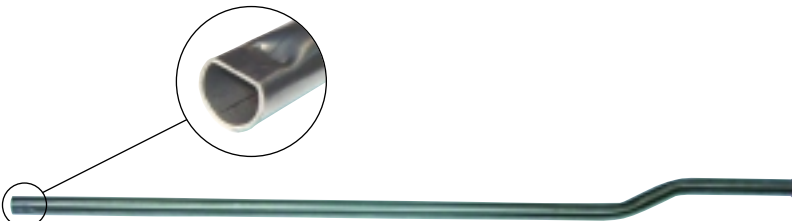
Cat No.	Size
DHB32	1 1/4" x 3/8" W
DHB38	1 1/2" x 3/8" W
DHB10MW22	M10 x 30mm



D Head Bolt Spanners

Tube Spanner - Short

Cat No.	Description
E18340	126mm long tool for UET80 turret where design prevents use of T-bar types. Can be used on all DHB bolts on all turrets



S-Bar Spanner - Long

Cat No.	Description
E19882	780mm long tool for all DHB D head bolts

Turret Security Equipment

Locking Devices

Cat Nos. LD1 and LP1

For turrets types UET EV, UET1 SEV and UET SL1V.
Padlocks not included.



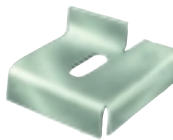
Cat Nos. LD3M and LP3

For turrets types UET Series Eleven. Padlocks not included.

Locking devices LD1/LP1 and LD3M/LP3 have similar, but not interchangeable, components. Each have stainless steel bolts with flat extension drilled to accept padlocks and have stainless steel locking plates. These locking devices, in conjunction with their appropriate turret hold down bolts, provide turrets with a high degree of security against unauthorised entry.



Cat. LD3M & LP3



Cat. LD3M



Cat. LP1 & LD1-3



Cat. LP1 & LD1-2



Cat. LP3

Aluminium Service Blocks

Type ASB (Reg. design No. S8326)

Designed for use where two or more lugs are to be bolted together with provision for copper cable tee-off sockets. Made of high conductivity aluminium alloy and fitted with cadmium plated grub screws in tee-off sockets. Tee-off holes are pre-packed with Alminox.



The standard grub screws have a screw driver slot but can be supplied with an Allen Key screw on request. Type ASB1 and ASB2 can be supplied in brass. Consult Dulmison for further details.

Cat No.	Clamping Bolt Size	Length mm	Height mm	Thickness mm	Number & Size of Service Cable Holes
ASB1	1 x M12	40	50	12	2 x 8mm
ASB2	2 x M12	90	50	12	2 x 8mm
ASB3	3 x M12	140	50	12	2 x 8mm

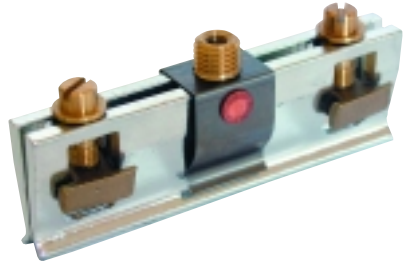
Note: Hardware can be supplied upon request.

Standard aluminium bolt 40mm x M12 with nut and flat washer. Add -2 to part number eg. ASB1-2
 Standard stainless steel bolt 40mm x M12 with nut and spring washer. Add -1 to part number eg. ASB1-1

Wedge Link

Type WL400

Designed for 400 amp. continuous current and for matching link palms spaced at 82.5mm centres.



Wedge Link Operating Handle

Type UELOH1

This is an insulated handle for screwing onto the threaded stud of Type WL400 Wedge Link. Insulated rubber gloves are recommended as an added safeguard. Each handle is electronically tested to 1,000 volts rating prior to supply.



LV Termination Shrouds

Types SHDL; SHDS

These shrouds slip over the cable terminations to prevent accidental contact with live parts and are held in place with plastic wire ties (not supplied). Their pliability permits elongated distortion to accommodate multi-cable installations.

Material: Fire retardant PVC

Colour: Black

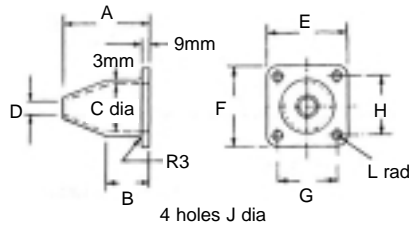


Cat No.	O.D. mm	I.D. mm	L mm
SHDL90	90	84	150
SHDS66	66	62	90

Cable Gland

Type CG (Similar to BS2562)

Type CG Cable Glands are made from high strength copper alloy with a smooth finish for easy wiping. Lower section of gland may be cut to suit larger cables.

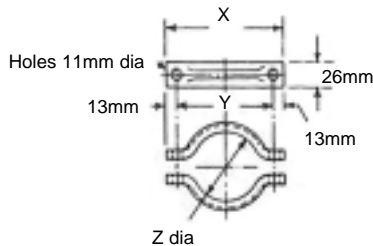


Cat No.	Dia. over metal sheath of cable	Dimensions in mm									
		A	B	C	D	E	F	G	H	J	L
CG2	25 to 83 mm	156.00	92.00	89.00	24.00	124.00	114.30	95.30	85.70	14.00	14.00

Cable Gland Armour Clamps

Type CGAC

Cast in copper alloy and supplied with galvanised steel bolts, nuts and spring washers. Suitable for fixing cable armour to outside of Type CG cable gland.



Cat No.	Matching Cable Gland	Dimensions in mm		
		X	Y	Z
CGAC2	CG2	172.00	146.00	103.00

Cable Clamps

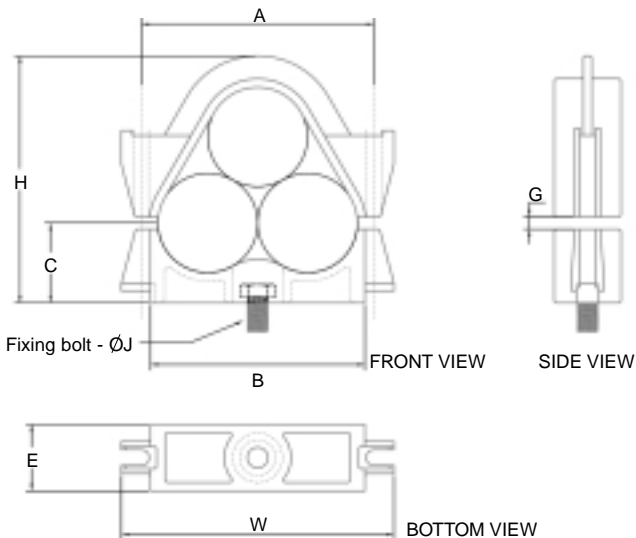
Type CAB

Three Way (Trefoil)

2 Bolt Clamps

High strength cast aluminium.

20kN bursting strength.



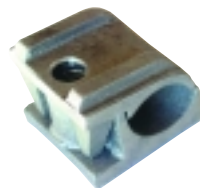
Cat No.	Cable OD mm	Clamp Dimensions in mm								
		A	B	C	E	G	H	J	K Bolt Dia	W
CAB5420	19 - 20	65	73	17.5	37	5	63	-	8	73
CAB5427	25 - 27	65	80	20	38	5	67	-	8	86
CAB5429	27 - 29	70	80	20	38	5	70	-	8	90
CAB5435	33.5 - 35	86	76	30	38	5	89	10	8	104
CAB5437	35 - 37	89	79	32	38	5	95	12	10	111
CAB5440	38 - 40	98	87	35	41	6.5	104	12	10	118
CAB5441	39 - 41	98	87	35	41	6.5	104	12	10	121
CAB5442	40.5 - 42.5	102	94	35	41	6.5	111	12	10	124
CAB5444	42 - 44	104	96	35	41	6.5	104	12	10	126
CAB5446	44.5 - 46.5	108	102	38	45	6.5	111	12	10	128
CAB5448	46 - 48	114	106	39	45	6.5	118	12	10	132
CAB5449	48 - 50	115	108	41	45	6.5	127	12	10	137
CAB5452	50 - 52	120	112	42	45	6.5	130	12	10	142
CAB5454	52 - 54	126	116	42	45	6.5	131	12	10	148
CAB5456	54 - 56	127	120	44	46	6.5	135	12	10	150
CAB5459	56.5 - 59	130	121	45	48	6.5	137	16	10	152
CAB5466	63.5 - 66	151	146	50	48	6.5	165	16	10	178
CAB5472	66 - 72	165	160	52	60	6.5	158	-	12	195
CAB5476	74 - 76	172	170	54	62	6.5	165	-	12	202
CAB5478	76 - 78	192	165	55	60	10	170	-	12	225
CAB5482	80 - 82	196	178	66	64	10	204	16	12	228

Cable Clamps

Type CAB (Cont'd)

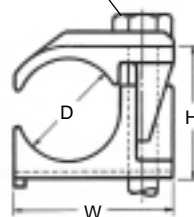
Single Way Single Bolt Clamps

A self aligning, interlocking, non-magnetic clamp. Fits standard channels.



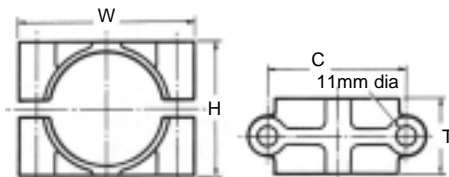
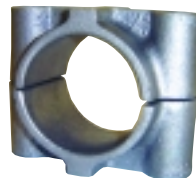
Cat No.	Cable Dia. D mm		Dimensions in mm		
	Min	Max	H	W	Bolt Dia.
CAB5125	19	25	31	41	10
CAB5130	24	30	36	46	10
CAB5135	29	35	41	51	10
CAB5141	34	41	48	58	10
CAB5147	40	47	54	64	10
CAB5154	46	54	61	71	10

(Bolt not supplied)



Single Way 2 Bolt Clamps

For larger diameter cables. Non magnetic. For flat or channel mounting.

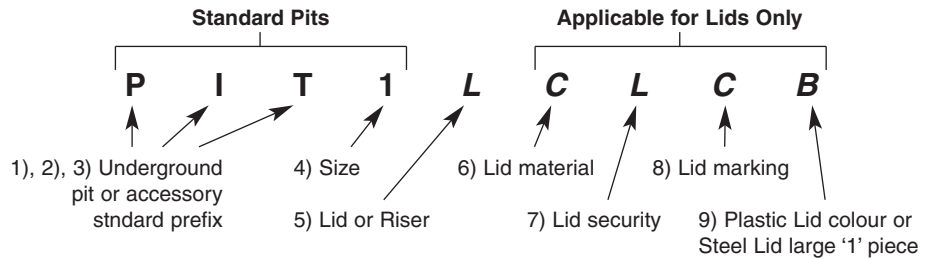


Cat No.	Cable Dia. mm	Dimensions in mm			
		H	C	T	W
CAB5960	55-60	72	73	45	96
CAB5967	60-67	79	80	45	105
CAB5974	67-74	88	89	50	112
CAB5981	74-81	95	96	50	121
CAB59105NI	101-105	124	120	65	154

Consumer Connection Pits

Dulmison consumer connection pits are made of high strength HDPE and polypropylene plastic exhibits excellent weather and chemical stability for long installation life. Design embodies special ribbing for on site strength and stability. Pits are extendable. Pit lids are available in concrete and galvanised steel checkerplate.

Pit Nomenclature



Character Representation

- 1) **P**
- 2) **I**
- 3) **T**
- 4) Refer table
- 5) Accessory: **L** = Lid

- R** = Riser

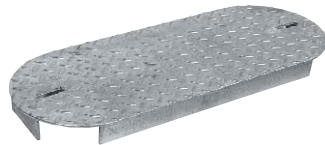
- 6) Lid material: **C** = Concrete
 P = Plastic
 S = Steel

- 7) Lid security: **L** = Lockable (Steel Only)
 T = Tamper Proof (Standard)

- 8) Lid marking: **C** = Communication
 E = Electrical
 U = (unmarked)

- 9) Lid colour: **B** = Black
 (for plastic only)

- or
- Lid Size: **1** = Non-preferred one piece
 (for steel only) lid for larger size pits



Applicable for Lid part numbers only



Consumer Connection Pits



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT1		419 x 155 x 350	3.00
PIT1LCT(E/C/U)	Concrete	1 lid per pit	8.00
PIT1LST(E/C/U)	Steel	1 lid per pit	4.80

Riser for PIT1 is PIT1, height increase from 100mm to 200mm



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT2		553 x 180 x 514	6.00
PIT2LCT(E/C/U)	Concrete	1 lid per pit	16.00
PIT2LST(E/C/U)	Steel	1 lid per pit	7.70

Riser for PIT2 is PIT2, height increase from 100mm to 325mm



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT3		663 x 243 x 570	8.20
PIT3LCT(E/C/U)	Concrete	1 lid per pit	25.00
PIT3LST(E/C/U)	Steel	1 lid per pit	13.10

Riser for PIT3 is PIT3, height increase from 100mm to 325mm



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT4		584 x 281 x 760	9.50
PIT4LCT(E/C/U)	Concrete	1 lid per pit	27.00
PIT4LST(E/C/U)	Steel	1 lid per pit	14.40

Riser for PIT4 is PIT4, height increase from 100mm to 400mm



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT5		580 x 330 x 580	12.00
PIT5S	Split	1 lid per pit	
PIT5LCT(E/C/U)	Concrete	1 lid per pit	30.00
PIT5LST(E/C/U)	Steel	1 lid per pit	16.20
PIT5LSL(C/U)	Steel	1 lid per pit	16.70

Riser for PIT5 is PIT5R , height increase is 200mm to 450mm
Riser for PIT5S is PIT5S, height increase is 150mm to 370mm

Consumer Connection Pits

Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT6		1240 x 440 x 614	26.00
PIT6LCT(E/C/U)	Concrete	2 lids per pit	38.00
PIT6LST(E/C/U)	Steel	2 lids per pit	19.70
PIT6LST(E/C/U)1	Steel	1 lid per pit	38.80
PIT6LSL(C/U)	Steel	2 lids per pit	20.20
PIT6LSL(C/U)1	Steel	1 lid per pit	39.40



Riser for PIT6 is PIT6, height increase 332mm or PIT 8, height increase 440mm
For concrete lids PIT-TBAR is required

Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT7		910 x 440 x 1075	26.00
PIT7LCT(E/C/U)	Concrete	2 lids per pit	38.00
PIT7LST(E/U)	Steel	2 lids per pit	15.20
PIT7LST(E/C/U)1	Steel	1 lid per pit	28.50
PIT7LSLU	Steel	2 lids per pit	15.80
PIT7LSL(C/U)1	Steel	1 lid per pit	29.10



Riser for PIT7 is PIT7, height increase 370mm
For concrete lids PIT7TBAR is required

Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT8		1240 x 440 x 834	29.00
PIT6LCT(E/C/U)	Concrete	2 lids per pit	38.00
PIT6LST(E/C/U)	Steel	2 lid per pit	19.70
PIT6LST(E/C/U)1	Steel	1 lid per pit	38.80
PIT6LSL(C/U)	Steel	2 lids per pit	20.20
PIT6LSL(C/U)1	Steel	1 lid per pit	39.40



Riser for PIT8 is PIT8, height increase 440mm or PIT 6, height increase 332mm
For concrete lids PIT-TBAR is required



Heavy Duty Pits

For larger cable requirements

Series 450

Designed for commercial or domestic applications and trafficable areas, these heavy duty polypropylene pits are strong, durable and easy to install. The Series 450 pits are also available with riser units for 295mm depth increases. Ideal as an electrical or communications cable jointing pit.

Series 600

This large capacity heavy duty polypropylene pit is ideal for trafficable commercial projects. Optional risers are available for 300mm depth increases. Series 600 pits are well suited for large electrical or communication cable jointing where large radii are involved.

Covers: Available to Australian Standard AS3996 Class A (Light Duty) and Class B (Heavy Duty) in concrete or galvanised steel checkerplate.

Installation: When being used in trafficable areas, the Series 450 and Series 600 pits must be installed with a concrete collar to fully support the top of the pit. This collar should be approximately 150 x 150mm around the top perimeter.



Pit Lid	Material (Type)	Overall Dim	
		Pits - inside dims	Weight (kg)
PIT450		450 x 450 x 450	8.00
PIT450LCTU	Concrete	1 lid per pit	
PIT450LSTU	Steel	1 lid per pit	13.00
PIT450R		Height increase of 295mm	



PIT600R

Pit Lid	Material (Type)	Overall Dim	
		Pits - inside dims	Weight (kg)
PIT600		600 x 600 x 600	14.30
PIT600LCT(E/C/U)	Concrete	1 lid per pit	60.00
PIT600LSTU	Steel	1 lid per pit	19.00
PIT600R		Height increase of 300mm	



PIT600

Service Pit and Lid

Designed with wide side wall ribbing for high strength, the Dulmison service pit is made from linear, medium density polyethylene and exhibits excellent weather and chemical stability. Pit lids are available in concrete or glass filled nylon.



Pit Lid	Material (Type)	Overall Dim	Weight (kg)
		Pits - inside dims Lids - Per Pit	
PIT300D		320 x 530	4.50
PIT300DLCT(E/C/U)	Concrete	390 Dia	18.6
PIT300DLPT(E/C/U)*	Plastic	390 Dia	1.5

Plastic Pit Lid Features

- Tamper proof - latched
- Surface is non-slip
- Made from UV resistant material
- 3 tonne load carrying capability
- Lightweight - 1/12 that of concrete equipment
- Able to be retrofitted into existing pits



Pit Accessories

Lid Lifting Hook for concrete pit lids with lifting bore
Cat No. **LIDLIFTERHK**



Lid Lifter for concrete pit lids with elongated hole
Cat No. **LIDLIFTER**



Lid Lifter for plastic pit lids
Cat No. **PLLIFTER**



Insulation Piercing Connectors - Fused Type IPC

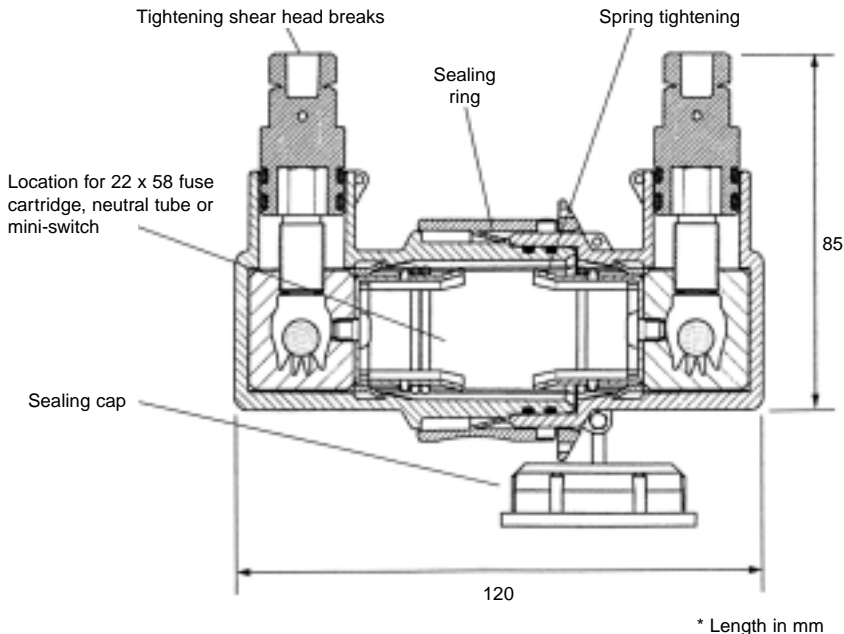
These fully waterproof, insulated connectors are suitable for installation in a pit and enable underground services to be connected quickly and safely by one person using a ratchet spanner.

The connectors have been rigorously tested and avoid the need for stripping, compression tooling or heat shrinking.



K199

- Terminals incorporate insulation piercing technology
- Simple, quick, fail safe three step installation
- Terminals accept a wide range of cables from 6-50mm²
- The K199 terminal has 2 cable entry points to suit phase connections and 100AMP fuse capacity with a 22 x 58 barrel type
- The tapered flexible cable seal enables the connector to remain waterproof, even when cables are not in straight alignment with the connector
- Terminals suit XLPE and PVC insulated single core and multi-core cables
- Reusable - up to three times with copper cable
- Connector is able to be separated with the fuse remaining in the dead side
- Plug provided to cap live side after connector is separated



Pit Connectors - GelPort

Submersible Secondary Connectors for URD Distribution

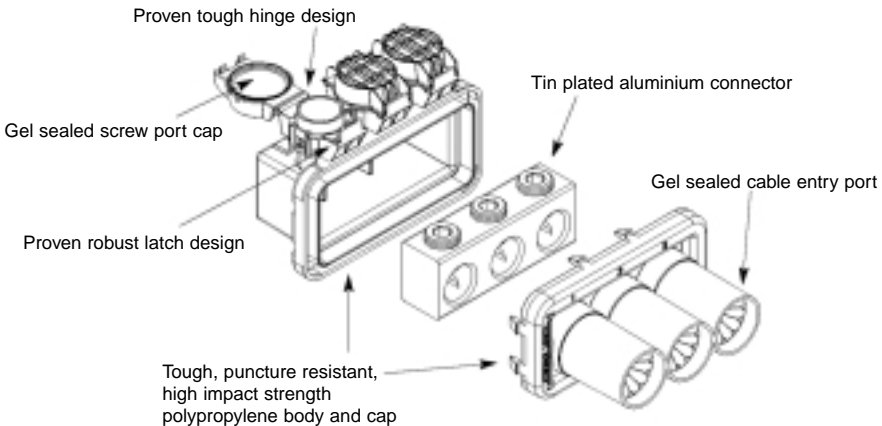
GelPort submersible secondary connectors utilise the sealing properties of PowerGel sealant technology to completely encapsulate and protect cable connections, even under water. Versatile and easy to install, the GelPort connector features no loose parts, no boots to trim, and no maintenance. This innovative product is available in 3, 4, 5, 6, and 8 port configurations, and is suitable for use on 4-150mm cables carrying up to 600V. GelPort secondary connectors dramatically reduce corrosion issues, resulting in longer service life and greater customer satisfaction.



To install GelPorts strip the cable and push it into the gel-filled cable port. The cable is encapsulated in gel and instantly sealed. It's that simple.



Cat No.	Number of Wire Ports	Conductor Use Range mm ²	Length	Width	Height
GPRT-350-3P	3	4-150	117	97	89
GPRT-350-4P	4	4-150	149	97	89
GPRT-350-5P	5	4-150	180	97	89
GPRT-350-6P	6	4-150	212	97	89
GPRT-350-8P	8	4-150	276	97	89



Marking Tapes

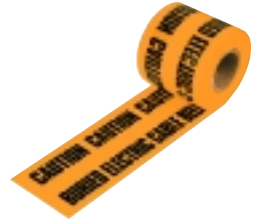
Type ELECTAPE

Protect your underground services with marking tapes from Dulmison. ELECTAPE is 100% Australian made, manufactured and tested to comply with AS2468.1-1995. It is marked CAUTION BURIED ELECTRIC CABLE BELOW and comes in a roll of 350m.

ELECTAPE conforms to all aspects of AS2648.1-1995 for:

- Material
- Width 150mm
- Colour (orange)
- Chemical Resistance
- Elongation
- Tear Resistance
- Impact Resistance
- Marking

Other underground tapes are also available.



Cable Support Rollers

Type CSR

Construction: Tubular galvanised steel frame; aluminium supports roller; stainless steel axle. Tubular frame members prevent unit sinking under load. Unit may be used as corner roller by turning on its side and staking through tubular members for stability. Roller has a 152mm diameter.



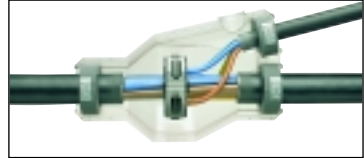
Principle Dimensions mm

Cat No.	Length	Width	Height	Roller
CSR3	381	235	244	152 Dia.

Low Voltage - Mains to Service - Branch Joints

Joints are designed for use with 4 core sector shaped polymeric mains cables, together with 4 or 5 core polymeric Branch cables. Joints are available with one of 2 encapsulation shell types as follows:

- Impact Resistant Polycarbonate - Type BAV
Supplied as two clip together halves



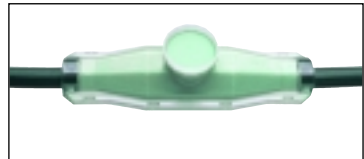
- Impact Resistant Polypropylene - Type MM
Supplied in Hinged form



All Kits are supplied complete with all necessary jointing materials, including foam seals, fillers, appropriate connectors, safety gloves and instructions.

Two types of filler material are available, and can be supplied in mixing satchels, or in tins. (Satchels being standard) Shelf life of both fillers is 2 years. Full technical details and MSDS data is available for each product.

- GUROFLEX - A Patented, ISOCYANATE free, environmentally friendly, 2 component cold casting compound. It is qualified to CENELEC HD623, and can be used on XLPE, PVC, PE or Paper insulated cables. Colour - Green.



- RAPID 3010 - This is a conventional two part Hydrophobic Polyurethane resin. It is qualified to CENELEC HD623, and can be used on XLPE, PVC or PE insulated cables - Colour - Blue.



Low Voltage - Mains to Service - Branch Joints (Cont'd)

Three types of connectors are available, within each kit. The mains to branch ring style connectors, incorporate insulation piercing technology to make the mains connection. All connectors are range taking. Mantle connectors are of the screw type, and can be supplied with insulating shrouds.

- **HELLSTERN** - Two Piece design - top and bottom
Tightening screws on each side, all mains connections made simultaneously, and all screws tightened from the top of the joint.
- **HINGED** - Ring Design
Is clipped into position over mains cores. Each core Connection can be carried out individually.
- **MANTLE** - Screwed Design
Nickel plated screw connector, available with Insulating Shrouds.



Full Joint Kits

Cat No.	Mains Cable Range - No. of cores - mm ²	Service Cable Range	Resin Type	Connector Type	Connector Cat No.
BAV-2-GD-MC25	5 x 10 - 25	5 x 10 - 25	GUROFLEX	Mantle	GURO-MC25-I
BAV-2-GD-MC25	5 x 10 - 25	5 x 10 - 25	RAPID3010	Mantle	GURO-MC25-I
MM-5-GD-AU01	4 x 120 - 240*	4 x 6 - 70	GUROFLEX	Hinged	JOR05373
MM-5-3C-AU01	4 x 120 - 240*	4 x 6 - 70	RAPID3010	Hinged	JOR05373
MM-5-GD-AU02	4 x 185 - 240*	4 x 6 - 70	GUROFLEX	Hellstern	HEL-6879
MM-5-3C-AU02	4 x 185 - 240*	4 x 6 - 70	RAPID3010	Hellstern	HEL-6879
MM-7-GD-AU01	4 x 240**	4 x 6 - 70	GUROFLEX	Hellstern	HEL-6880
MM-7-3C-AU01	4 x 240**	4 x 6 - 70	RAPID3010	Hellstern	HEL-6880
MM-7-GD-AU02	4 x 185 - 240*	4 x 6 - 70	GUROFLEX	Hellstern	HEL-6879
MM-7-3C-AU02	4 x 185 - 240*	4 x 6 - 70	RAPID3010	Hellstern	HEL-6879

* Can only be used on 240 Solid Sector cable

** Can only be used on 240 Stranded Sector cable

Note: MM-7 has a larger case than the MM-5 for greater clearance.

LV Jointing Tools



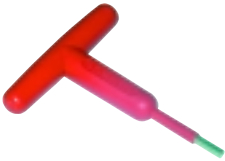
Mains cable over sheath removal tool - Cat No. **UNI25**

- Ratchet Design
- Suitable for cables over 25mm in diameter
- Strips circumferentially as well as longitudinally



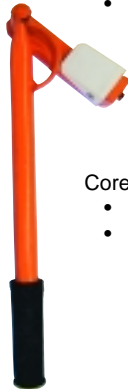
Mains cable over sheath removal tool - Cat No. **JOR-20300**

- Fully Insulated Handle - rated at 1000V
- Non flammable thermoplastic material
- Suitable for cables over 20mm in Diameter
- Comes with protective cove for blade



Insulated Hex Drive - Cat No. **#TBOX5MM & #TBOX8MM**

- Fully Insulated and rated handle - 1000V
- 5mm and 8mm Hex sizes



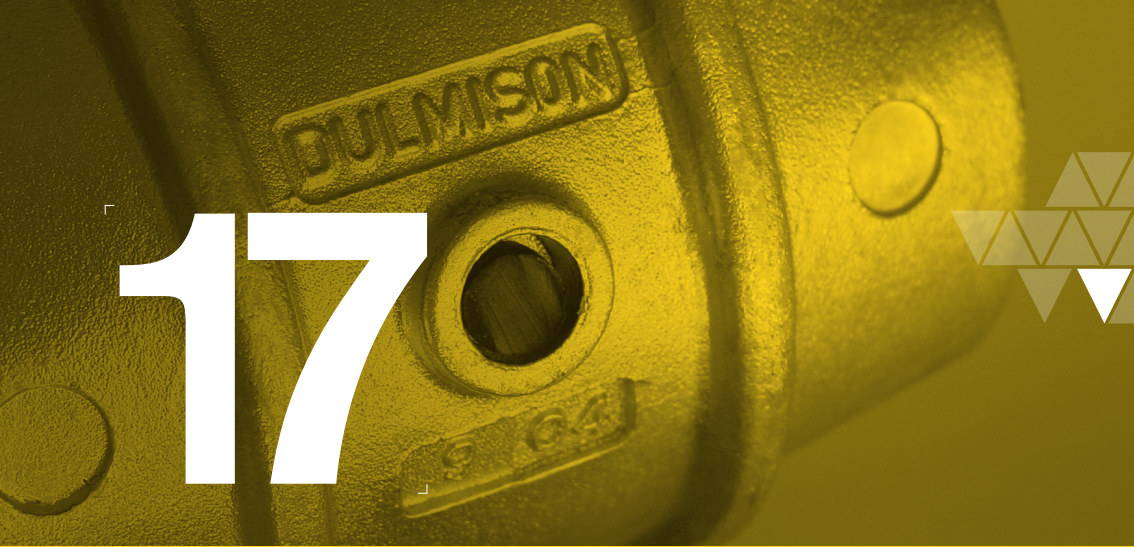
Core separation Tool - Cat No. **IBSW1**

- Unique Hinged design, for controlled separation
- Nylon wedges, eliminates damage to cores.



Core Separation Tool - Cat No. **JOR-20400**

- Impact Resistant Thermoplastic
- Can be used on energised 1000 volt cables
- Designed to be driven to separate cores



17

Helpful reference tables

Reference Tables

Australian Standard Metric Conductors

AAC - All Aluminium Conductor - AS1531

Metric						Imperial		
Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Code Name	Stranding	O.D. Inches
Gemini	7/1.75	5.25	16.6	16.84	3.01	Bug	7/064	0.192
Jupiter	7/2.25	6.75	27.5	27.83	4.76	Locust	7/093	0.279
Leo	7/2.50	7.50	33.9	34.36	5.71	-	-	-
Leonids	7/2.75	8.25	41.1	41.58	6.72	-	-	-
Libra	7/3.00	9.00	48.9	49.48	7.98	Grub	7/118	0.354
Mars	7/3.75	11.3	76.3	77.28	11.8	-	7/144	0.432
Mercury	7/4.50	13.5	110	111.3	16.9	Wasp	7/173	0.519
Moon	7/4.75	14.3	122	124.0	18.9	-	7/186	0.558
Neptune	19/3.25	16.3	154	157.6	24.7	Hornet	19/128	0.640
Orion	19/3.50	17.5	180	182.80	28.7	-	-	-
Pluto	19/3.75	18.8	206	209.8	31.9	Chafer	19/149	0.745
Saturn	37/3.00	21.0	256	261.60	42.2	Cockroach	19/166	0.830
Sirius	37/3.25	22.8	301	307.00	48.2	-	-	-
Taurus	19/4.75	23.8	331	336.7	51.3	Butterfly	19/183	0.915
Triton	37/3.75	26.3	400	408.50	62.2	Centipede	37/149	1.043
Uranus	61/3.25	29.3	495	506.10	75.2	Scorpion	37/168	1.176
Ursula	61/3.50	31.5	574	586.90	87.3	-	-	-
Venus	61/3.75	33.8	659	673.40	97.2	Cicada	37/183	1.281
Virgo	91/4.50	49.5	1410	1447	207	-	-	-

Reference Tables

Australian Standard Metric Conductors

AAAC - All Aluminium Alloy Conductor - AS1531

Metric						Imperial		
Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Code Name	Stranding	O.D. Inches
Agate	7/1.75	5.25	14.3	16.84	4.71	Bug	7/064	0.192
Amethyst	7/2.25	6.75	23.7	27.83	7.78	Locust	7/093	0.279
Diamond	7/2.50	7.50	29.3	34.36	9.64	-	-	-
Dolomite	7/2.75	8.25	35.4	41.58	11.6	-	-	-
Emerald	7/3.00	9.00	42.2	49.48	13.9	Grub	7/118	0.354
Garnet	7/3.75	11.3	65.8	77.28	21.7	-	7/144	0.432
Jade	7/4.50	13.5	94.8	111.3	31.2	Wasp	7/173	0.519
Jasper	7/4.75	14.3	106	124.0	34.8	-	7/186	0.558
Opal	19/3.25	16.3	134	157.6	44.2	Hornet	19/128	0.640
Patronite	19/3.50	17.5	155	182.80	51.3	-	-	-
Pearl	19/3.75	18.8	178	209.8	58.8	Chafer	19/149	0.745
Ruby	37/3.00	21.0	221	261.60	73.5	Cockroach	19/166	0.830
Ruthenium	37/3.25	22.8	260	307.00	86.1	-	-	-
Rutile	19/4.75	23.8	285	336.7	94.4	Butterfly	19/183	0.915
Sapphire	37/3.75	26.3	345	408.50	115	Centipede	37/149	1.043
Spinel	61/3.25	29.3	427	506.10	135	Scorpion	37/168	1.176
Tantalum	61/3.50	31.5	495	586.90	156	-	-	-
Topaz	61/3.75	33.8	568	673.40	179	Cicada	37/183	1.281
Zircon	91/4.50	49.5	1220	1447	384	-	-	-

Reference Tables

Australian Standard Metric Conductors

AAAC 1120 - All Aluminium Alloy Conductor - AS1531

Metric						Imperial		
Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Code Name	Stranding	O.D. Inches
Argon	7/1.75	5.25	16	16.84	4	Bug	7/0.064	0.192
Boron	7/2.25	6.75	26.5	27.83	6.61	Locust	7/0.093	0.279
Chlorine	7/2.50	7.50	32.8	34.36	8.18	-	-	-
Chromium	7/2.75	8.25	39.7	41.58	9.91	-	-	-
Fluorine	7/3.00	9.00	47.2	49.48	11.8	Grub	7/0.118	0.354
Helium	7/3.75	11.3	73.7	77.28	17.6	Blue-Bottle	7/0.144	0.432
Hydrogen	7/4.50	13.5	106	111.3	24.3	Wasp	7/0.173	0.519
Iodine	7/4.75	14.3	118	124.0	27.1	-	7/0.186	0.558
Krypton	19/3.25	16.3	150	157.6	37.4	Hornet	19/0.128	0.640
Lutetium	19/3.50	17.5	173	182.80	41.7	-	-	-
Neon	19/3.75	18.8	199	209.8	47.8	Chafer	19/0.149	0.745
Nitrogen	37/3.00	21.0	248	261.60	62.2	Cockroach	19/0.166	0.830
Nobelium	37/3.25	22.8	291	307.00	72.8	-	-	-
Oxygen	19/4.75	23.8	320	336.7	73.6	Butterfly	19/0.183	0.915
Phosphorus	37/3.75	26.3	387	408.50	93.1	Centipede	37/0.149	1.043
Selenium	61/3.25	29.3	478	506.10	114	Scorpion	37/0.168	1.176
Silicon	61/3.50	31.5	555	586.90	127	-	-	-
Sulfur	61/3.75	33.8	636	673.40	145	Cicada	37/0.183	1.281
Xenon	91/4.50	49.5	1360	1447	300	-	-	-

Reference Tables

Australian Standard Metric Conductors

ACSR/GZ - Aluminium Conductor (Galvanised) Steel Reinforced - AS3607

Metric						Imperial		
Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Code Name	Stranding	O.D. Inches
Almond	6/1/2.50	7.50	29.0	34.36	10.5	Gopher	6/1/093	0.279
Apple	6/1/3.00	9.00	41.8	49.48	14.9	Ferret	40549	8.354
Banana	6/1/3.75	11.3	65.2	77.31	22.8	Mink	6/1/144	0.432
Cherry	6/4.75 + 7/1.60	14.3	105	120.4	33.2	Dog	6/186 + 7/062	0.558
Grape	30/7/2.50	17.5	144	181.6	63.7	Wolf	30/7/102	0.714
Lemon	30/7/3.00	21.0	207	261.5	90.1	Panther	30/7/118	0.826
Lime	30/7/3.50	24.5	282	356.0	121	Bear	30/7/132	0.924
Mango	54/7/3.00	27.0	373	431.2	118	Bison	54/7/11	81.062
Orange	54/7/3.25	29.3	438	506.0	137	Brolga	54/7/129	1.162
Olive	54/7/3.50	31.5	508	586.9	159	Moose	54/7/139	1.251
Paw Paw	54/3.75 + 19/2.25	33.8	583	671.7	179	Finch	54/143 + 19/086	1.293
Peach	54/4.75 + 19/2.85	42.8	936	1078	284	-	-	-
EXTRA HIGH STRENGTH								
Quince	3/4/1.75	5.25	8.77	16.84	12.7	-	-	-
Raisin	3/4/2.50	7.50	17.9	34.36	24.4	-	-	-
Sultana	4/3/3.00	9.00	31.6	49.48	28.3	-	-	-
Walnut	4/3/3.75	11.3	49.4	77.31	43.9	-	-	-

Reference Tables

Australian Standard Metric Conductors

ACSR/AZ - Aluminium Conductor (Aluminised) Steel Reinforced - AS3607

Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN
Barley	6/1/2.50	7.50	29.0	34.36	10.3
Bean	6/1/3.00	9.00	41.8	49.48	14.5
Cabbage	6/1/3/75	11.3	65.2	77.31	21.5
Carrot	6/4.75 + 7/1.60	14.3	105	120.4	31.9
Corn	30/7/2.50	17.5	144	181.6	61.6
Garlic	30/7/3.00	21.0	207	261.5	87.2
Millet	30/7/3.50	24.5	282	356.0	116
Oats	54/7/3.00	27.0	373	431.2	115
Onon	54/7/3.25	29.3	438	506.0	132
Parsnip	54/7/3.50	31.5	508	586.9	153
Potato	54/3.75 + 19/2.25	33.8	583	671.7	177
Rice	54/4.75 + 19/2.85	42.8	936	1078	277

Reference Tables

Australian Standard Metric Conductors

ACSR/AC - Aluminium Conductor (Aluminium Clad) Steel Reinforced - AS3607

Code Name	Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN
Angling	6/1/2.50	7.50	30.7	34.36	10.7
Archery	6/1/3.00	9.00	44.1	49.48	15.0
Baseball	6/1/3.75	11.3	68.9	77.31	22.4
Bowls	6/4.75+7/1.60	14.3	109	120.4	32.6
Cricket	30/7/2.50	17.5	155	181.6	64.6
Darts	30/7/3.00	21.0	224	261.5	91.3
Diving	30/7/3.50	24.5	305	356.0	121
Golf	54/7/3.00	27.0	390	431.2	119
Gymnastics	54/7/3.25	29.3	457	506.0	138
Hurdles	54/7/3.50	31.5	530	586.9	159
Lacrosse	54/3.75+19/2.25	33.8	608	671.7	181
Rugby	54/4.75+19/2.85	42.8	976	1078	287
EXTRA HIGH STRENGTH					
Skating	3/4/1.75	5.25	10.4	16.84	12.3
Soccer	3/4/2.50	7.50	21.2	34.36	24.9
Swimming	4/3/3.00	9.00	35.2	49.48	28.8
Tennis	4/3/3.75	11.3	54.9	77.31	42.8

Reference Tables

Australian Standard Metric Conductors

SC/GZ - Steel Conductor / Galvanised - AS1222

Strands/Wire Diameter mm	Metric				Imperial	
	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Stranding	O.D. Inches
3/2.00	4.31	1.40	9.43	11.70	3/080	0.172
3/2.75	5.93	2.60	17.82	22.20	3/104	0.224
-	-	-	-	-	7/064	0.192
7/2.00	6.00	3.20	21.99	26.00	7/080	0.240
7/2.75	8.25	6.10	41.58	49.00	7/104	0.312
7/3.25	9.75	8.60	58.07	68.70	7/128	0.384
7/3.75	11.30	11.00	77.28	91.30	7/144	0.432
19/2.00	10.00	8.80	59.70	70.50	19/080	0.400
-	-	-	-	-	7/160	0.480
19/2.75	13.80	17.00	112.90	133.00	19/104	0.520
19/3.25	16.30	23.00	157.60	186.00	19/128	0.64

Australian Standard Metric Conductors

SC/AC - Steel Conductor / Aluminium Clad - AS1222

Strands/Wire Diameter mm	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN
3/2.75	5.93	5.91	17.82	22.70
3/3.00	6.47	7.03	21.21	27.00
3/3.25	7.00	8.26	24.89	31.60
3/3.75	8.08	11.00	33.12	39.30
7/2.75	8.25	13.70	41.58	50.10
7/3.00	9.00	16.30	49.48	59.70
7/3.25	9.75	19.20	58.07	69.90
7/3.75	11.30	25.50	77.28	86.90
7/4.25	12.80	32.80	99.33	105.00
19/2.75	13.80	37.10	112.90	136.00
19/3.00	15.00	44.10	134.30	162.00
19/3.25	16.30	51.80	157.60	189.00
19/3.75	18.80	68.90	209.80	236.00
19/4.25	21.30	88.60	269.60	286.00

Reference Tables

Australian Standard Metric Conductors

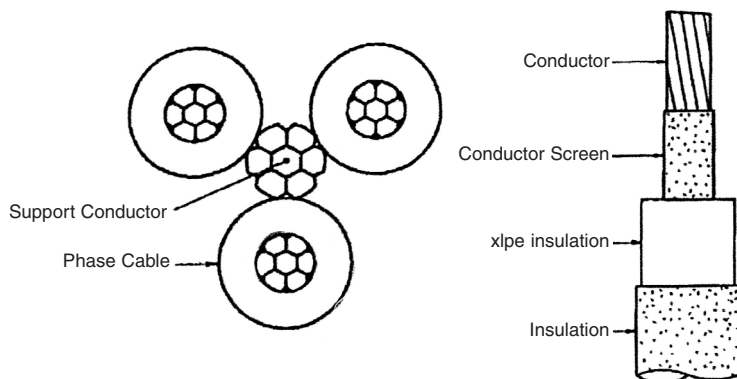
HDC Hard Drawn Copper Conductor - AS1746

Strands/Wire Diameter mm	Metric				Imperial	
	Overall Diameter (Approx) mm	Calculated Equivalent Aluminium Area mm ²	Sectional Area mm ²	Calculated Minimum Breaking Load kN	Stranding	O.D. Inches
7/1.00	3.00	8.68	5.498	2.32	7/036	0.108
7/1.25	3.75	13.60	8.589	3.59	7/048	0.144
7/1.75	5.25	26.60	16.840	6.89	7/064	0.192
7/2.00	6.00	34.70	21.990	8.89	7/080	0.240
7/2.75	8.25	65.30	41.580	16.20	19/064	0.320
19/1.75	8.75	71.70	45.700	18.30	7/118	0.354
19/2.00	10.00	93.60	59.700	23.60	7/136	0.408
7/3.50	10.50	106.00	67.350	25.40	19/083	0.415
7/3.75	11.30	121.00	77.280	28.80	-	-
37/1.75	12.30	139.00	88.990	35.60	37/072	0.504
19/2.75	13.80	177.00	112.900	43.10	-	-
19/3.00	15.00	211.00	134.300	50.80	19/116	0.580
37/2.50	17.50	284.00	181.600	70.30	37/093	0.651
37/2.75	19.30	344.00	219.800	83.90	37/103	0.721
37/3.00	21.00	409.00	261.600	98.90	37/118	0.826
61/2.75	24.80	566.00	362.300	138.00	91/093	1.023

Reference Tables

Australian Standard Metric Conductors

HV ABC Non Metallic Screened Cables - AS3599



11kV

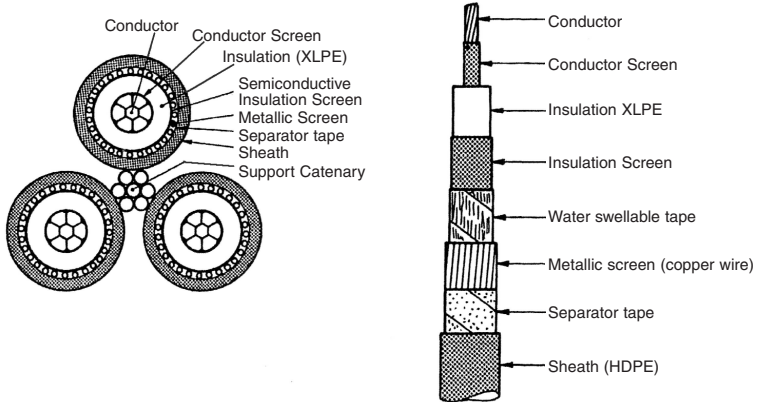
Size	Phase			AAAC/1120 Support Conductor (Catenary)			Bundled Cable Dia.
	Insulation Thickness mm	Screen Thickness mm	Phase Cable Dia. mm	No. & Nominal Dia. of Wires in Conductor prior to Compaction	Compacted Conductor Dia. mm	Calculated Breaking Load kN	Circumscribing Circle mm
35	3.4	1.0	18	7/5.00	14.1 - 14.4	27.1	51
50	3.4	1.0	19	7/5.00	14.1 - 14.4	27.1	53
70	3.4	1.0	21	7/5.00	14.1 - 14.4	27.1	56
95	3.4	1.0	23	7/5.00	14.1 - 14.4	27.1	60
120	3.4	1.0	24	19/3.65	17.3 - 17.7	41.7	66
150	3.4	1.0	26	19/3.65	17.3 - 17.7	41.7	69
185	3.4	1.0	27	19/3.65	17.3 - 17.7	41.7	72

22kV

Size	Phase			AAAC/1120 Support Conductor (Catenary)			Bundled Cable Dia.
	Insulation Thickness mm	Screen Thickness mm	Phase Cable Dia. mm	No. & Nominal Dia. of Wires in Conductor prior to Compaction	Compacted Conductor Dia. mm	Calculated Breaking Load kN	Circumscribing Circle mm
35	5.5	1.0	23	7/5.00	14.1 - 14.4	27.1	59
50	5.5	1.0	24	7/5.00	14.1 - 14.4	27.1	62
70	5.5	1.0	25	7/5.00	14.1 - 14.4	27.1	65
95	5.5	1.0	27	7/5.00	14.1 - 14.4	27.1	68
120	5.5	1.0	29	19/3.65	17.3 - 17.7	41.7	75
150	5.5	1.1	30	19/3.65	17.3 - 17.7	41.7	78
185	5.5	1.1	32	19/3.65	17.3 - 17.7	41.7	82

Australian Standard Metric Conductors

HV ABC Metallic Screened Cables - AS3599



11kV

Size	Phase			Support Catenary		Bundled Cable Dia.
	Insulation Thickness mm	Screen Thickness mm	Phase Cable Dia. mm	No. & Nominal Dia. of Wires in Conductor	Calculated Breaking Load kN	Circumscribing Circle mm
35	3.4	0.8	24	7/2.00	26	58
35	3.4	0.8	24	19/2.00	70.5	54
50	3.4	0.8	25	19/2.00	70.5	62
70	3.4	0.8	27	19/2.00	70.5	66
95	3.4	0.8	29	19/2.00	70.5	69
120	3.4	0.8	31	19/2.00	70.5	72
150	3.4	0.8	32	19/2.00	70.5	75
185	3.4	0.8	34	19/2.00	70.5	78

22kV

Size	Phase			Support Catenary		Bundled Cable Dia.
	Insulation Thickness mm	Screen Thickness mm	Phase Cable Dia. mm	No. & Nominal Dia. of Wires in Conductor	Calculated Breaking Load kN	Circumscribing Circle mm
35	5.5	0.8	28	7/2.00	26	67
35	5.5	0.8	28	19/2.00	70.5	63
50	5.5	0.8	29	19/2.00	70.5	71
70	5.5	0.8	32	19/2.00	70.5	75
95	5.5	0.8	33	19/2.00	70.5	78
120	5.5	0.8	35	19/2.00	70.5	81
150	5.5	1.0	37	19/2.00	70.5	85
185	5.5	1.0	39	19/2.00	70.5	88

Technical Requirements for Covered Conductors (CCT)

Characteristics	Units	Conductor Size and Type								
		80			120			180		
Nominal cross-sectional area	mm ²	80			120			180		
Stranding and nominal wire diameter	No./mm	7/3.75			7/4.75			19/3.50		
Material		AAAC/1120 or AAAC/6201 or AAAC/1350								
Approximate conductor diameter*	mm	11.3			14.3			17.5		
Voltage rating	kV	6.35/11	12.7/22	19.1/33	6.35/11	12.7/22	19.1/33	6.35/11	12.7/22	19.1/33
Covering thickness:										
(a) Minimum average	mm	3.40	5.50	8.00	3.40	5.50	8.00	3.40	5.50	8.00
(b) Minimum at any point	mm	2.96	4.85	7.10	2.96	4.85	7.10	2.96	4.85	7.10
(c) Maximum at any point	mm	4.00	6.40	9.30	4.00	6.40	9.30	4.00	6.40	9.30
Resultant overall diameter range*	mm	17.9 to 19.4	22.1 to 24.2	27.1 to 30	20.9 to 22.4	25.1 to 27.2	30.1 to 33.0	24.1 to 25.7	28.3 to 30.5	33.3 to 36.3
Approximate mass#	kg/km	450	635	900	640	845	1145	870	1105	1440
Colour code		Red	Red	Red	Yellow	Yellow	Yellow	Blue	Blue	Blue

Reference Tables

Nominal Cable Dimensions

Cross Section Area mm ²	Strand No./Wire Diameter mm	O.D. of Cond.	O.D. of PVC Single Core Cable	O.D. of PVC Ins. Single Core Sheathed	O.D. of Single Core Xlpe/PVC	Two Core	Two Core + Earth	Three Core + Earth	Four Core + Earth
1	1/1.13 7/0.40	1.13 1.20	2.8	4.1	-	-	-	-	-
1.5	1/1.3 7/0.50	81.38 1.5	3.2	4.4	-	9.4	-	-	-
2.5	7/0.67	2.01	3.7	5.1	-	10.8	-	-	-
4	7/0.85	2.55	4.6	6	-	12.2	-	-	-
6	7/1.04	3.12	5.2	6.6	-	13.4	-	-	-
10	7/1.35	4.05	6.1	8.1	-	-	16.6	18.1	20
16	7/1.70	5.1	7.2	9.3	-	-	18.6	20.4	22.6
25	19/1.35	6.75	8.9	-	11.4	-	22.1	23.8	26.5
35	19/1.53	7.65	10.1	-	12.6	-	24.4	26.5	29.5
50	19/1.7	88.9	11.9	-	14.1	-	28	30.6	34.3
70	19/2.14	10.7	13.5	-	16	-	31.5	34.8	39
95	37/1.7	812.46	15.9	-	18.2	-	-	39.6	44.6
120	37/2.03	14.21	17.4	-	20	-	-	43.3	48.8
150	37/2.25	15.75	19.5	-	22.2	-	-	48.4	54.6
185	37/2.52	17.64	-	-	24.4	-	-	53.7	60.7
240	61/2.25	20.25	-	-	27.4	-	-	61	69.1
300	61/2.52	22.68	-	-	30.3	-	-	67.6	76.6
400	61/2.85	25.65	-	-	33.8	-	-	-	-
500	61/3.20	28.8	-	-	35.7	-	-	-	-
630	127/2.52	32.76	-	-	40.2	-	-	-	-

Reference Tables

Cable Cross Sections

Annealed Aluminium and Copper Stranded Conductors

Metric			Imperial				
Nominal Cross Sectional Area mm ²	Number and Nominal Diameter of Wires	Nominal Diameter of Cond. mm	Nominal Cross Sectional Area mm ²	Number and Nominal Diameter of Wires		Nominal Cross Sectional Area inches ²	Nominal Diameter of Conductor mm
				Inches	mm		
1	1/1.13	1.13	0.97	1/.044	1/1.12	0.0015	1.12
-	-	-	1.25	3/.029	3/.737	0.0019	1.59
1.5	1/1.38	1.38	-	-	-	-	-
-	-	-	1.93	3/.036	3/.914	0.0030	1.97
2.5	7/0.67	2.01	-	-	-	-	-
-	-	-	2.93	7/.029	7/.737	0.0045	2.21
4	7/0.85	2.55	-	-	-	-	-
-	-	-	4.52	7/.036	7/.914	0.0070	2.74
6	7/1.04	3.12	-	-	-	-	-
-	-	-	6.75	7/.044	7/1.12	0.0100	3.35
-	-	-	9.43	7/.052	7/1.32	0.0146	3.96
10	7/1.35	4.05	-	-	-	-	-
-	-	-	14.28	7/.064	7/1.63	0.0025	4.88
16	7/1.70	5.10	-	-	-	-	-
-	-	-	18.29	19/.044	19/1.12	0.0300	5.59
25	7/2.14	6.75	25.5	19/.052	19/1.32	0.0400	6.60
35	19/1.53	7.65	-	-	-	-	-
-	-	-	38.7	19/.064	19/1.63	0.0600	8.13
50	19/1.78	8.90	-	-	-	-	-
-	-	-	65.1	19/.083	19/2.11	0.1000	10.50
70	19/2.14	10.7	-	-	-	-	-
-	-	-	75.3	37/.064	37/1.63	0.1200	11.40
95	19/2.52	12.60	95.3	37/.072	37/1.83	0.1500	12.80
120	37/2.03	14.21	126.7	37/.083	37/2.11	0.2000	14.80
150	37/2.25	15.75	-	-	-	-	-
-	-	-	159.1	37/.093	37/2.36	0.2500	16.50
185	37/2.52	17.64	-	-	-	-	-
-	-	-	195.1	37/.103	37/2.62	0.3000	18.30
240	61/2.25	20.25	-	-	-	-	-
-	-	-	262.2	61/.093	61/2.36	0.4000	21.30
300	61/2.52	22.80	-	-	-	-	-
-	-	-	321.6	61/.103	61/2.62	0.5000	23.50
-	-	-	391.1	91/.093	91/2.36	0.6000	26
400	61/2.85	25.65	-	-	-	-	-
-	-	-	479.7	91/.103	91/2.62	0.7500	28.80
500	61/3.20	28.80	-	-	-	-	-
630	127/2.52	32.76	-	-	-	-	-
-	-	-	669.4	127/.103	127/2.62	1	34
800	127/2.85	37.05	800	127/.112	127/2.84	1.2400	36.92
1000	127/3.20	41.60	1000	127/.125	127/3.18	1.5000	41.34

Reference Tables

Conversion Tables for Non-Metric Cable Sizes

British Standard	Metric Equivalent mm ²
33	0.0507
32	0.0591
31	0.0682
30	0.0779
29	0.0937
28	0.0111
27	0.0136
26	0.0164
25	0.0203
24	0.0245
23	0.0292
22	0.0397
21	0.0519
20	0.0657
19	0.81
18	1.17
17	1.59
16	2.08
15	2.63
14	3.24
13	4.29
12	5.48
10	8.30

Imperial Inches ²	Metric Equivalent mm ²
0.001	0.657
0.0015	0.981
0.002	1.28
0.003	1.97
0.0032	2.08
0.0045	2.98
0.007	4.6
0.01	6.81
0.0145	9.59
0.0225	14.5
0.03	18.6
0.04	26
0.06	39.4
0.075	49.9
0.1	66.3
0.12	76.8
0.15	97.2
0.2	129
0.25	162
0.3	199
0.4	267
0.5	328
0.6	399
0.75	489
0.85	557
1.0	683
1.25	807
1.5	1050

American Wire Gauge AWG	Metric Equivalent mm ²	American Wire Gauge AWG	Metric Equivalent mm ²
30	0.0507	250 MCM	127
29	0.0645	300 MCM	152
28	0.0806	350 MCM	177
27	0.102	400 MCM	203
26	0.128	450 MCM	228
25	0.163	500 MCM	253
24	0.205	550 MCM	279
23	0.259	600 MCM	304
22	0.324	650 MCM	329
21	0.412	700 MCM	355
20	0.519	750 MCM	380
19	0.652	800 MCM	405
18	0.826	850 MCM	431
17	1.04	900 MCM	456
16	1.31	950 MCM	481
15	1.65	1000 MCM	507
14	2.08	1100 MCM	557
13	2.63	1200 MCM	608
12	3.31	1300 MCM	659
11	4.17	1400 MCM	709
10	5.26	1500 MCM	760
9	6.63	1600 MCM	811
8	8.37	1700 MCM	861
7	10.6	1800 MCM	912
6	13.3	1900 MCM	963
5	16.8	2000 MCM	1010
4	21.2	-	-
3	26.7	-	-
2	33.6	-	-
1	42.4	-	-
0	53.5	-	-
2/0	67	-	-
3/0	85	-	-
4/0	107	-	-



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