



# 09

## High voltage ABC and covered conductor fittings

### 11 and 22kV

- › Strain and Bundle Restraint Assemblies
- › Suspension Clamps
- › Catenary Compression Joints and Midspans
- › Pole Hardware
- › Stringing Rollers
- › Stripping Tools
- › Assembly and Stringing Tools
- › Cable Data

### 11 up to 33kV

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

## Strain Assembly and Bundle Restraint

To secure HVABC conductors at strain or tension points, you must utilize 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 <sup>2</sup>	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 <sup>2</sup>	22kV Cable mm <sup>2</sup>
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 stabilized 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 <sup>2</sup>	22kV Cable mm <sup>2</sup>
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 mm2 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 mm2 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

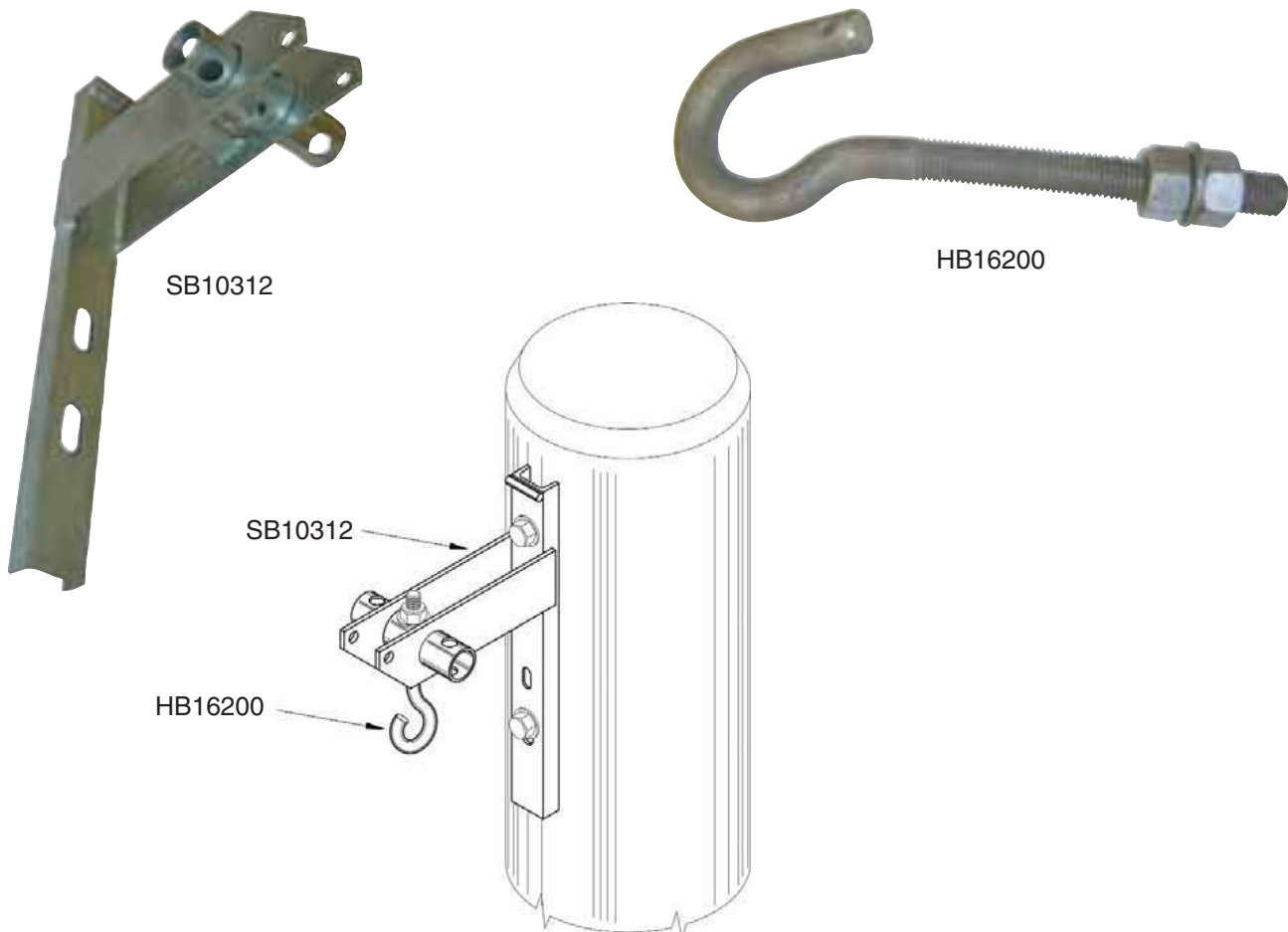
The two most widely used Pole Brackets are - SB10312 and IBHPBV. These items are manufactured from Galvanised Steel and can be either bolted or strapped to either concrete or timber poles.

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 string 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 galvanized 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 utilized 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 minimized.



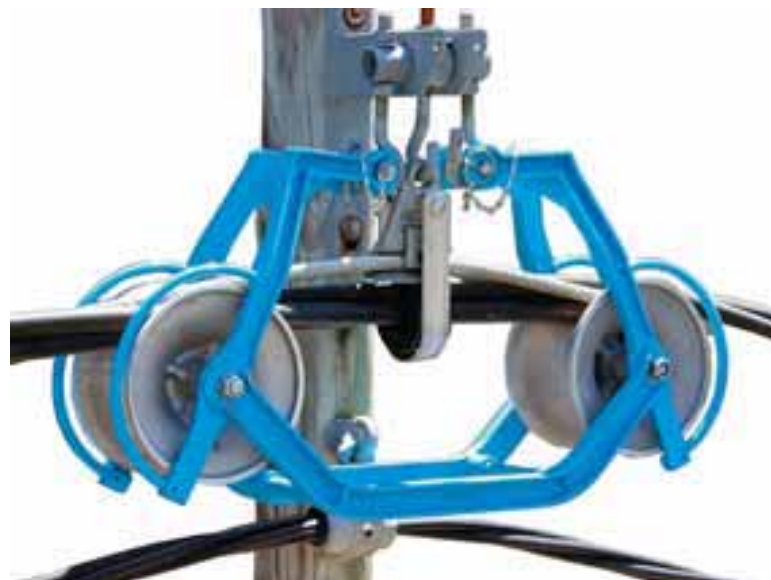
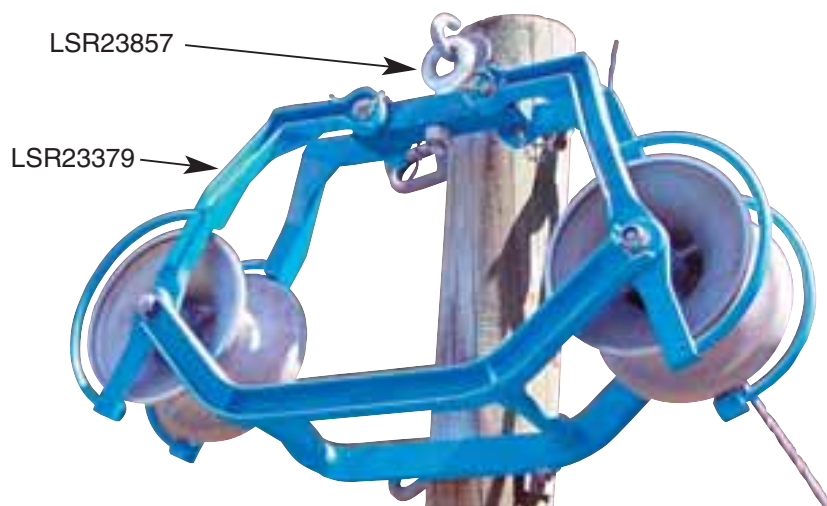
## Stringing Roller

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 185mm<sup>2</sup> - 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



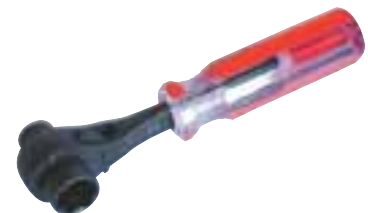
- **Type IBST5024**

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





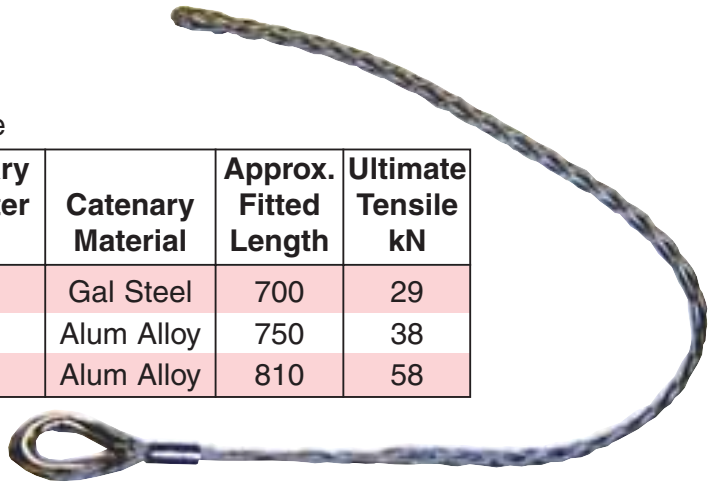
High Voltage ABC

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 <sup>2</sup>	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 300mm<sup>2</sup>



**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 utilizing 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 the 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 <sup>2</sup>	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 utilized on 11kV networks only.

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



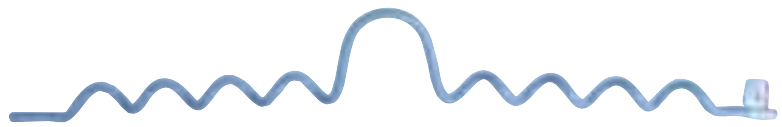
## Covered Conductor Fittings

### 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 <sup>2</sup>	Voltage kV
PST14307G	80	11
PST18307G	120	11
PST23407G	180	11



#### Top Ties

Top Tie Cat No.	Cable Size mm <sup>2</sup>	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 <sup>2</sup>	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 utilized 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 <sup>2</sup>	Line Tap Cable Size mm <sup>2</sup>	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 stabilized 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 utilizes 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

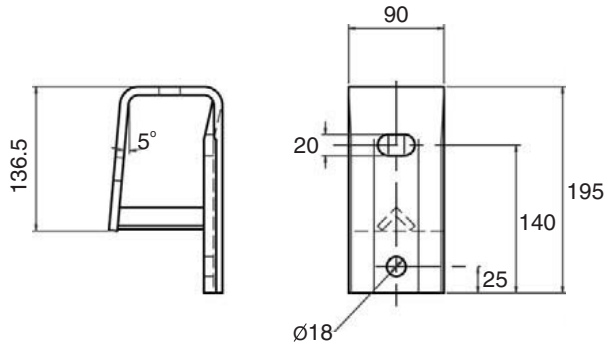
## Covered Conductor Fittings

### Mounting Bracket - Insulators

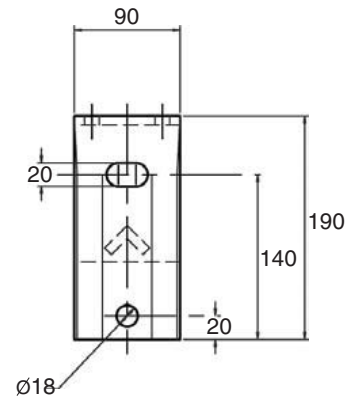
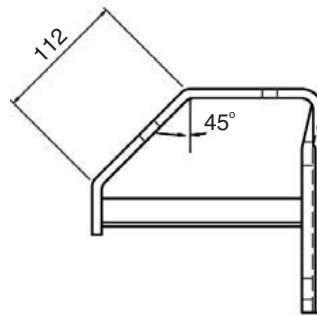
Brackets are available to mount insulators in either a trident (3 phases per bracket), or single phase format. All brackets are manufactured from Galvanised Steel. Brackets are not supplied with pole attachment hardware, due to the variety and type of mounting possibilities.



Cat. CCB05

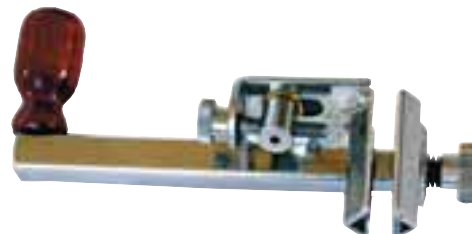


Cat. CCB45



### 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.

Assembly Cat No. LSR24570

