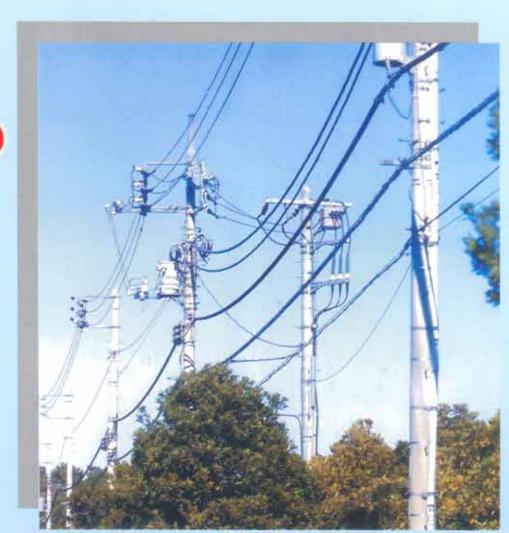




AERIAL BUNCHED CABLES

for Over-head Power Distribution



unistan.



"UNISTAR" Aerial Bunched Conductor (ABC) is a very novel concept for Over Head power distribution. When compared to the conventional bare conductor over head distribution system, ABC provides higher safety and reliability, lower power losses and ultimate system economy by reducing installation, maintenance and operative cost. This system is ideal for rural distribution and specially attractive for installation in difficult terrains such as hilly areas, forest areas, coastal areas etc.

ABC is also considered to be the best choice for power distribution in congested urban areas with narrow lanes and bylanes. In developing urban complex, ABC is the better choice because of flexibility for re-routing as demanded by changes in urban development plan.

CONSTRUCTION OF ABC

XLPE insulated power conductors of Aluminium (neutral conductor and street lighting conductors, if and when necessary) are laid together (twisted) around a high tensile stranded and galvanized steel (Aluminium Alloy may be used but sparingly) bare or insulated messenger wire to form the Aerial Bunched Cable. This assembly is directly strung on to distribution pole / towers by means of standard hardwares available in the market.

XLPE is cross-linkable low density polyethylene which is made thermoset by special formulation from base polymer of thermoplastic low density polyethylene. XLPE combines the best electrical properties of LDPE and superior thermo mechanical properties.

Details of common types and sizes of ABC

are furnished in this Catalogue:

Table 1 & 1 A : 1.1 kV Aerial Bunched
Cables generally to
IS:14255
(Three phase and one
insulated reduced neutral
conductor around bare
steel messenger).

Table 2 & 2 A : 1.1 kV Aerial Bunched
Cables generally to
IS:14255
(Three phase and one
insulated neutral
conductor around bare
steel messenger).

Table 3 & 3 A : 11 kV Aerial Bunched
Cables generally to
IS:7098/Part-2
(Three phase conductors
around bare steel
messenger).

STRINGING

No difficulty is envisaged during stringing of ABC in the conventional method but care shall be taken that insulated conductors do not get damaged during installation. Dragging the ABC on the ground is to be avoided. Tension to be applied during stringing shall be 25% of the breaking load of the messenger wires. This will allow line to have sag within specified limit of 1.5% of the span at the lowest ambient temperature.

JOINTING

While mid-span jointing is permissible for 1.1 KV ABC system by conventional technique, our recommendation will be to draw the line in such a way as to bring the joints at the supports. Mid-span jointing is

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not at all recommended in the case of HT lines. Under unavoidable circumstances, line tapping at the support points may be allowed through suitably designed clamp connectors/PG clamps. The semi conducting screen continuity shall be maintained at all joints as far as possible to avoid fluctuations during system disturbances. The 3-phase screens may be shorted and earthed through suitable non-linear surge arrestor. Attempting to make a tap-off from power conductors in the region where catenary is under tension is not recommended.

SURGE/LIGHTNING ARRESTORS

The usage of conventional surge / lightning arrestors on the main line is recommended as in the case of bare conductor lines to protect line and equipment, especially at terminal ends and at open tap-off poles (At least one set in every KM span).

APPLICATION

ABC can be conveniently used:

- a) as replacement of bare lines in Rural areas, in woods and in other localities where the spare is limited,
- b) as replacement of bare lines where reliability of supply is of prime importance.
- as replacement of bare lines where high degree of stability of supply voltage is of importance,
- d) in hilly terrains where cost of erection of overhead lines or under ground cable becomes very high,
- e) for temporary supplies.

ADVANTAGES

In comparison to bare overhead power distribution lines, ABC has very high reliability in maintaining services because power and neutral conductors are insulated with the best dielectric medium, resulting in the following advantages:

- Less fault rate on account of good protection against line and ground faults by high winds or falling trees or birds especially in hilly areas & forests as encountered in Rural distribution networks.
- High insulation resistance to earth in all seasons and polluted atmospheres.
 Negligible leakage currents and low losses.
- Multiple circuits of Power and Telephone cables could be strung in the same set of poles or any other supports.
- Better adaptability to run concurrently with existing over-head bare conductor system without any interference.
- High capacitance and low inductance leading to low impedance of lines.
- Lower voltage drop, higher current capacities. VIS-À-VIS Better Voltage Regulation.
- Longer spans and longer distance lines are possible with better system stability.





TABLE 1 1.1 KV AERIAL BUNCHED CABLES GENERALLY TO IS:14255

(Three phase and one insulated reduced neutral conductor around bare steel messenger).

| | Phase Conductor ⇒ | | 3x25 | 3x35 | 3x50 | 3x70 | 3x95 |
|-----|---|-------|--------------------------------|---------------------|---------------|----------------|--------------|
| | Neutral Conductor | | 1x16 | 1x16 | 1x25 | 1x35 | 1x50 |
| | Messenger Conductor | | 1x35 | 1x35 | 1x35 | 1x55 | 1x55 |
| 1 | Trade Name | | | 00100000 | UNISTAR | S DO CARGO | |
| 2 | Rated Voltage | Volts | 1100 | 1100 | 1100 | 1100 | 1100 |
| 3 | Reference Standard | | Gene | rally to IS 14 | 255/1995 | | |
| 4 | PHASE CONDUCTOR | | | | | | |
| 4.1 | Conductor | | | | | | |
|) | Material | | | | to IS 8130/ | 84, H4 Grad | |
| i) | Nominal cross-sectional area | Sqmm | 25 | 35 | 50 | 70 | 95 |
| ii) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | | | i, compacted | | |
| () | Max. DC resistance at 20°C | Ω/km | 1.2 | 0.868 | 0.641 | 0.443 | 0.32 |
| 1.2 | Insulation | | 2707-27 | | | | 20 0 |
|) | Material | | | ked Polyethy | | | |
| (i) | Nominal thickness | mm | 1.2 | 1.2 | 1.5 | 1.5 | 1.5 |
| ii) | Nominal dia over insulation | mm | 8.8 | 9.9 | 11.7 | 13.4 | 15.3 |
| 5 | NEUTRAL CONDUCTOR | | | | | | |
| 5.1 | Conductor | | | range of Tanada con | | | |
|) | Material | - | 100 | | to IS 8130/8 | | |
| i) | Nominal cross-sectional area | Sqmm | 16 | 16 | 25 | 35 | 50 |
| ii) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | | | , compacted | | |
| () | Max. DC resistance at 20°C Insulation | Ω/km | 1.91 | 1.91 | 1.2 | 0.868 | 0.641 |
| 5.2 | Material | | Cross link | ked Polyethy | long to IS 14 | 255/05 Dia | ok onlove |
| (i) | Nominal thickness | mm | 1.2 | 1,2 | 1.2 | 1.2 | 1.5 |
| ii) | Nominal dia over insulation | mm | 7.7 | 7.7 | 8.8 | 9.9 | 11.7 |
| 5 | MESSENGER CONDUCTOR (BARE) | 3000 | . Car | F.A.K | 0.0 | 0.0 | 1117 |
|) | Material | | High Ten | sile galvaniz | ad stool stra | nd to 15 309 / | Dari 21/06 |
| i) | Nominal cross-sectional area | Sqmm | 35 | 35 | 35 | 55 | 55 |
| ii) | Shape of conductor | Oquin | | | Stranded Circ | 1 | 00 |
| v) | Min. Breaking load | KN | 41 | 41 | 41 | 62 | 62 |
| 0 | Approx. messenger diameter | mm | 7.8 | 7.8 | 7.8 | 9.5 | 9.5 |
| 7 | Number of Conductor | 2040 | 1,10 | 7.10 | 7.100 | 0.0 | 5.5 |
|): | Phase conductors | | 3 | 3 | 3 | 3 | 3 |
| i) | Neutral conductor | | 1 | 1 | 1 | 1 | 1 |
| ii) | Bare Steel messenger | | 1 | 1 | 1 | 1 | 1 |
| В | Identification of Conductors | | | | | | |
|) | Phase conductors | | By providi | ng one, two | & three ridge | ie. | |
| i) | Neutral conductor | | | ng four ridge | _ | 3 | |
| - | | Ohana | 200 300000 0000 | | 2. 2. | D | to be to the |
| 9 | Assembly | | & Neutral cor xceeding 35 t | | | | |
| 10 | Approx Cable weight | Kg/km | 630 | 720 | 895 | 1260 | 1545 |
| 11 | Continuous current carrying | | 85 | 105 | 130 | 165 | 200 |
| | capacity of cable when laid | Amps | 60 | 103 | 130 | 105 | 200 |
| 51 | freely in air at 50oC ambient air temperature | | | | | | |





TABLE 1A 1.1 KV AERIAL BUNCHED CABLES GENERALLY TO IS:14255

(Three phase and one insulated reduced neutral conductor around bare steel messenger).

| | Phase Conductor | | 3x120 | 3x150 | 3x185 | 3x240 |
|-------|-----------------------------------|--|------------------|--|------------------|----------------|
| | Neutral Conductor | | 1x70 | 1x70 | 1x95 | 1x120 |
| | Messenger Conductor | | 1x55 | 1x55 | 1x55 | 1x55 |
| | Trade Name | | | | STAR | |
| 2 | Rated Voltage | Volts | 1100 | 1100 | 1100 | 1100 |
| 3 | Reference Standard | | | Generally to I | S 14255/1995 | |
| 1 | PHASE CONDUCTOR | | | | | |
| 1.1 | Conductor | | | | | |
|) | Material | _ | 10,000,000 | Aluminium to IS | 8130/84, H4 G | |
|) | Nominal cross-sectional area | Sqmm | 120 | 150 | 185 | 240 |
| i) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | | Stranded, com | pacted circular | |
| /) | Max. DC resistance at 20°C | Ω/km | 0.253 | 0.206 | 0.164 | 0.125 |
| 1.2 | Insulation | | | | | |
|) | Material | | Cross-linke | d Polyethylene | to IS 14255/95, | Black color |
|) | Nominal thickness | mm | 1.8 | 1.8 | 1.8 | 2.0 |
| i) | Nominal dia over insulation | mm | 17.2 | 18.6 | 20.2 | 23.0 |
| 5 | NEUTRAL CONDUCTOR | | | | | |
| 5.1 | Conductor | | | | | |
|) | Material | | | Aluminium to IS | 8130/84, H4 G | Grade |
| i) | Nominal cross-sectional area | Sqmm | 70 | 70 | 95 | 120 |
| ii) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | 1 | Stranded Cor | npacted Circula | ar . |
| 1) | Max. DC resistance at 20°C | Ω/km | 0.443 | 0.443 | 0.32 | 0.253 |
| 5.2 | Insulation | | | | | |
|) | Material | | Cross-linke | d Polyethylene | to IS 14255/95, | Black color |
| (i) | Nominal thickness | mm | 1.5 | 1.5 | 1.5 | 1.8 |
| i) | Nominal dia over insulation | mm | 13.4 | 13.4 | 15.3 | 17.2 |
| 3 | MESSENGER CONDUCTOR (BARE) | | | | | |
|) | Material | | High Tensi | le galvanized st | eel strand to IS | 398 (Part 2)/9 |
| 1 | Nominal cross-sectional area | Sqmm | 55 | 55 | 55 | 55 |
| ii) | Shape of conductor | SAWAY | .037/ | Stranded | Circular | |
| v) | Min. Breaking load | KN | 62 | 62 | 62 | 62 |
|) | Approx. messenger diameter | mm | 9.5 | 9.5 | 9.5 | 9.5 |
| , | Number of Conductor | 1 | | | | |
|) | Phase conductors | | 3 | 3 | 3 | 3 |
|): | Neutral conductor | | 1 | 1 | 1 | 1 |
| i) | Bare Steel messenger | | 1 | 1 | 1 | 1 |
| 3 | Identification of Conductors | | | | 100 | |
|) | Phase conductors | By provid | ling one, two 8 | three ridges | | |
| í): | Neutral conductor | | ling four ridges | The second secon | | |
| 3 | Assembly | The second secon | | ctors twisted aro | und Bare mess | enger in RH |
| | | not excee | eding 35 times t | he diameter of in | nsulated Phase | conductor |
| 0 | Approx Cable weight | Kg/km | 1870 | 2120 | 2520 | 3160 |
| 11 | Continuous current carrying | Amps | 235 | 270 | 315 | 380 |
| 11.17 | capacity of cable when laid | 3341311111 | 355505 | | | |
| | freely in air at 50oC ambient | | | | | |
| | air temperature | | | | | |
| | Short circuit rating of conductor | KA | 11.3 | 14.2 | 17.5 | 22.6 |





TABLE 2 1.1 KV AERIAL BUNCHED CABLES GENERALLY TO IS:14255

(Three phase and one insulated neutral conductor around bare steel messenger).

| | Phase Conductor Neutral Conductor | | 3x16 1x16 | 3x25 1x25 | 3x35 1x35 | 3x50 1x50 | 3x70 1x70 | 3x95 1x95 |
|---------|--|---|--|--------------|--------------|--|--------------|----------------|
| | Messenger Conductor | | 1x35 | 1x35 | 1x35 | 1x35 | 1x55 | 1x55 |
| 1 | Trade Name | 1 | 1,100 | 1200 | | ISTAR | Inve | 11100 |
| 2 | Rated Voltage | Volts | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 |
| 3 | | VUILS | 1100 | | nerally to I | | | 1100 |
| 4 | Reference Standard | | | Ger | ierally to i | 5 14255/1 | 990 | |
| 3 | PHASE CONDUCTOR | | | | | | | |
| 4.1 | Conductor Material | | | Alumin | ium to IS 8 | 0120/04 L | M Crada | |
|) i) | Nominal cross-sectional area | Sqmm | 16 | 25 | 35 | 50 | 70 | 95 |
| ii) | Flexibility class as per IS 8130 | oquiiii | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | 01033 E | | nded, com | | | Ciass i |
| v) | Max. DC resistance at 20°C | Ω/km | 1.91 | 1.2 | 0.868 | 0.641 | 0.443 | 0.32 |
| 4.2 | Insulation | 2.4/6/11 | 1.01 | 1.4 | 0.000 | 0.041 | 0.440 | 0,02 |
|) | Material | | Cross-l | inked Poly | ethylene to | IS 1425 | 5/95 Black | colour |
| ii) | Nominal thickness | mm | 1.2 | 1.2 | 1.2 | 1.5 | 1.5 | 1.5 |
| iii) | Nominal dia over insulation | mm | 7.7 | 8.8 | 9.9 | 11.7 | 13.4 | 15.3 |
| 5 | NEUTRAL CONDUCTOR | () () () () () () () () () () | - 445 | 05880 | 505/ | 7.1.20 | 100.747 | (\langle and a |
| 5.1 | Conductor | | | | | | | |
| i) | Material | | | Aluminiu | um to IS 8 | 130/84 H | 1 Grade | |
| i) | Nominal cross-sectional area | Sgmm | 16 | 25 | 35 | 50 | 70 | 95 |
| iii) | Flexibility class as per IS 8130 | 25010000 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 |
| iv) | Shape of conductor | | | | ded, comp | | | |
| v) | Max. DC resistance at 20°C | Ω/km | 1.91 | 1.2 | 0.868 | 0.641 | 0.443 | 0.32 |
| 5.2 | Insulation | 1.000 Man. | 1 57 647.5 | 0.000 | 10.500,000 | 00000000 | ACCULATION | |
| i) | Material | | Cross-linked Polyethylene to IS 14255/95, Black colour | | | | | |
| ii) | Nominal thickness | mm | 1.2 | 1.2 | 1.2 | 1.5 | 1.5 | 1,5 |
| iii) | Nominal dia over insulation | mm | 7.7 | 8.8 | 9.9 | 11.7 | 13.4 | 15.3 |
| 6 | MESSENGER CONDUCTOR (BARE) | | | | | | | |
| () | Material | | High Te | ensile galva | anized ste | el strand t | o IS 398 (Pa | art 2)/96 |
| ii) | Nominal cross-sectional area | Sqmm | 35 | 35 | 35 | 35 | 55 | 55 |
| iii) | Shape of conductor | | | | Stranded | Circular | | |
| iv) | Min. Breaking load | KN | 41 | 41 | 41 | 41 | 62 | 62 |
| v) | Approx. messenger diameter | mm | 7.8 | 7.8 | 7.8 | 7.8 | 9.5 | 9.5 |
| 7 | Number of Conductor | | | | | | | |
|) | Phase conductors | | 3 | 3 | 3 | 3 | 3 | 3 |
| ii) | Neutral conductor | | -1 | 1 | 1 | 1 | 1 | -1 |
| iii) | Bare Steel messenger | | 1 | 1_ | 1 | - 1 | 1 | 1. |
| 8 | Identification of Conductors | | | | | | | |
| i) | Phase conductors | By pro | viding one, | two & three | ee ridges | | | |
| ii) | Neutral conductor | By prov | viding four | ridges | SKI ONE THAT | | | |
| 9 | Assembly | | | & Neutri | | The state of the s | | |
| | | | | d Phase co | | | | |
| 10 | Approx Cable weight | Kg/km | 540 | 660 | 780 | 970 | 1370 | 1692 |
| 11 | Continuous current carrying capacity of cable when laid freely in air at 50oC ambient air temperature | Amps | 65 | 85 | 105 | 130 | 165 | 200 |
| 12 | Short circuit rating of conductor | KA | 1.5 | 2.4 | 3.3 | 4.7 | 6.6 | 9.0 |
| APE | for one second duration | 58.1 | 1765/ | 9,750 | 3500 | 5.00% | -14 | |





TABLE 2A 1.1 KV AERIAL BUNCHED CABLES GENERALLY TO IS:14255

(Three phase and one insulated neutral conductor around bare steel messenger).

| | Phase Conductor | | 3x120 | 3x150 | 3x185 | 3x240 |
|-----------|---|----------|-----------------------|--------------------------------------|------------------|-----------------|
| | Neutral Conductor | | 1x120 | 1x150 | 1x185 | 1x240 |
| | Messenger Conductor | | 1x55 | 1x55 | 1x55 | 1x55 |
| 1 | Trade Name | | | | STAR | 2000 |
| 2 | Rated Voltage | Volts | 1100 | 1100 | 1100 | 1100 |
| 3 | Reference Standard | | | Generally to I | S 14255/1995 | |
| 1 | PHASE CONDUCTOR | | | | | |
| 1.1 | Conductor | | | 171 INV 51 182 | | 16 |
|) | Material | | | | 8130/84, H4 G | |
|) | Nominal cross-sectional area | Sqmm | 120 | 150 | 185 | 240 |
| i) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | | | | pacted circular | |
|) | Max. DC resistance at 20°C | Ω/km | 0.253 | 0.206 | 0.164 | 0.125 |
| 1.2 | Insulation | | | | . In expresse | Ar vo |
|) | Material | | | | to IS 14255/95, | |
|) | Nominal thickness | mm | 1.8 | 1.8 | 1.8 | 20 |
| ii) | Nominal dia over insulation | mm | 17.2 | 18.6 | 20.2 | 23.0 |
| 5 | NEUTRAL CONDUCTOR | | | | | |
| 5.1 | Conductor | | | with the transfer of the same of the | 20400004 114 6 | Yes also |
|) | Material | | | | 8 8130/84, H4 G | |
|) | Nominal cross-sectional area | Sqmm | 120 | 150 | 185 | 240 |
| ii) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Shape of conductor | 10000000 | | | ompacted Circu | |
| /) | Max. DC resistance at 20°C | Ω/km | 0.253 | 0.206 | 0.164 | 0.125 |
| 5.2 | Insulation | | 0 51 | | . 10 44055/05 | DI I |
|) | Material | 2227 | THE STATE OF COUNTY'S | | to IS 14255/95, | |
| i) ii) | Nominal thickness Nominal dia over insulation | mm | 1.8 | 1.8 18.6 | 1.8 | 2.0 |
| 3 | MESSENGER CONDUCTOR (BARE) | mm | 11.2 | 10.0 | 20.2 | 23.0 |
|) | Material | | High Tensil | e natvanized et | eel strand to IS | 308 /Part 2\/06 |
|) i) | Nominal cross-sectional area | Sqmm | 55 | 55 | 55 | 55 |
| ii) | Shape of conductor | Sqmiii | 50 | 100 | d Circular | 00 |
| v) | Min. Breaking load | KN | 62 | 62 | 62 | 62 |
| () | Approx. messenger diameter | mm | 9.5 | 9.5 | 9.5 | 9.5 |
| 7 | Number of Conductor | 1000 | 9.0 | 0.0 | 3.0 | 0.0 |
|) | Phase conductors | | 3 | 3 | 3 | 3 |
|) | Neutral conductor | | 1 | 1 | 1 | 31 |
| ii) | Bare Steel messenger | | 1 | 1 | 1 | 1 |
| 3 | Identification of Conductors | | | | | |
|): | Phase conductors | | I | By providing on | e, two & three r | idaes |
| i) | Neutral conductor | | | By providing for | | |
| 9 | Assembly | | | | ctors twisted | around Bar |
| | | | | | eeding 35 times | the diameter of |
| | | | | ise conductor | | |
| 10 | Approx Cable weight | Kg/km | 2040 | 2365 | 2800 | 3530 |
| 11 | Continuous current carrying | Amps | 235 | 270 | 315 | 380 |
| | capacity of cable when laid | | | | | |
| | freely in air at 50oC ambient | | | | | |
| | air temperature | | | | 45.5 | |
| 12 | Short circuit rating of conductor | KA. | 11.3 | 14.2 | 17.5 | 22.6 |





TABLE 3 11 KV(E) AERIAL BUNCHED CABLES GENERALLY TO IS:7098/PART - 2

(Three phase conductors around bare steel messenger).

| | Phase Conductor | \Rightarrow | 3x25 | 3X35 | 3X50 | 3X70 | 3X95 | 3X120 | 3X150 |
|-----|--------------------------------|---|----------|--------------------------------------|--|-------------|---|--|--|
| | Messenger Conductor | ⇒ | 1X35 | 1X35 | 1X35 | 1X55 | 1X55 | 1X55 | 1X55 |
| | Trade Name | | | | | UNISTAR | | | |
| | Rated Voltage | Kv | | | | 6.35/11 | | | |
| | Reference Standard | | | G | enerally t | o IS 7098 | 3 (Part 2) | /85 | |
| ž | PHASE CONDUCTOR | | | | | | | | |
| 1 | Conductor | | | | | | | | |
|) | Material | | | Alu | minium to | IS 8130 | /84, H4 C | Grade | |
|) | Nominal cross-sectional are | a Sqmm | 25 | 35 | 50 | 70 | 95 | 120 | 150 |
| i) | Flexibility class as per IS 81 | 30 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 | Class 2 |
| v) | Form of Conductor | | | 5 | Stranded | Compact | ed Circul | ar | |
| 1) | Max. DC resistance at 20°C | Ω/km | 1.2 | 0.868 | 0.641 | 0.443 | 0.32 | 0.253 | 0.206 |
| /i) | Approx conductor diameter | mm | 6.2 | 7.3 | 8.4 | 10.1 | 12.0 | 13.2 | 14.6 |
| .2 | Conductor Screen | | | | | | | | |
|) | Material & Type | | | E | xtruded | semi-con | ducting la | ayer | |
|) | Min. thickness | mm | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 1.3 | Insulation | | | | | | | | |
|) | Material | | Cros | ss-linked | Polyethy | lene to 15 | 7098 (P | art 2) / 8 | 5 |
|) | Nominal thickness | mm | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| 1.4 | Insulation screen (Non-Me | tallic) | | | | | | | |
|) | Metrial & Type | | | E | Extruded | semi-con | ducting la | ayer | |
| i) | Min. Thickness of extruded | layer mm | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 4.5 | Insulation screen (Metallic | :) | | | | | | | |
|) | Material & Type | 167 | | Copper | type app | olied helic | ally with | overlap | |
| i) | Approx. thickness of copper | tape mm | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 | 0.045 |
| 4.6 | Sheath | | | | | | | | |
|) | Material & Type | | | PVC Ty | pe ST2 | to IS 583 | 1/84, Blad | ck Colour | |
| i) | Nom. thickness | mm | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 1.7 | Approx. diameter of Power | core mm | 20.4 | 21.5 | 22.6 | 24.3 | 26.2 | 27.4 | 28.8 |
| 5 | Bare Messenger | | | | | | | | |
|) | Material | 100000000000000000000000000000000000000 | | | | steel strai | | | |
| i) | Nom. Cross Sectional Area | Sqmm | 35 | 35 | 35 | 55 | 55 | 55 | 55 |
| ii) | Form of conductor | | | | | ded Circ | | | |
| v) | Approx. breaking load | kn | 41 | 41 | 41 | 62 | 62 | 62 | 62 |
| () | Approx. messenger diameter | er mm | 7.8 | 7.8 | 7.8 | 9.5 | 9.5 | 9,5 | 9.5 |
| 3 | Number of Cores | | | 5257 | | 10 | | 91 | |
|) | Phase Conductor | | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| i) | Bare Messenger | | _1_ | 1 | 1 | 1 | .1 | 1 | 11 |
| 7 | Identification of Phase cond | uctor | | the second second second | and the last state of the last | ree ridge | of the facility of the state of the facility of | material and the second second | |
| 3 | Cable assembly | 7.00 | | CONTRACTOR OF THE PERSONS ASSESSMENT | Control of the Contro | up aroun | the desirable of the Autor Control of the Autor | The second liverage and the se | the state of the s |
| 9 | Approx weigh of cable | kg/km | 1590 | 1760 | 1940 | 2385 | 2490 | 3040 | 3370 |
| 10 | Continuous current carrying | 66 | 95 | 115 | 140 | 175 | 215 | 250 | 280 |
| | capacity cable when laid fre | | | | | | | | |
| | in air at 50°C ambient Air te | mp. | | | | | | | |
| 11 | Short circuit rating for one | | | | | | | | |
| | second duration | (0.00) | \$2705.1 | 19000 | 11.200 | 72.70 | 27.5 | 1775 | 50000 |
|) | Phase Conductor | KA | 2.4 | 3.3 | 4.7 | 6.6 | 9.0 | 11.3 | 14.2 |
| ii) | Copper Screen | Amp | 200 | 200 | 200 | 200 | 200 | 200 | 200 |

Note:

Copper tape screen has been designed for earth fault current of 200 Amp. for 1 second duration. However if required it can be suitably redesigned to meet specific requirement if any.





TABLE 3 A 11 KV(E) AERIAL BUNCHED CABLES GENERALLY TO IS:7098/PART - 2

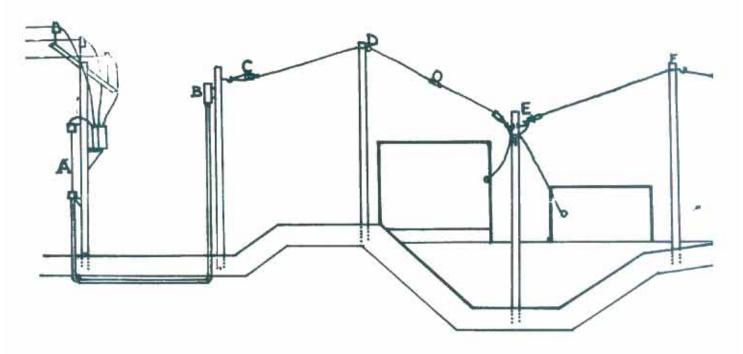
(Three phase conductors around bare steel messenger).

| | Phase Conductor | | 3x185 | 3x240 | 3×300 | | |
|--------------|-----------------------------------|--------|--|---------------------------|--|--|--|
| | Messenger Conductor | | 1x90 | 1x90 | 1x90 | | |
| | Trade Name | | | UNISTAR | | | |
| | Rated Voltage | Kv | | 6.35/11 | | | |
| | Reference Standard | | Gene | erally to IS 7098 (Part 2 |) / 85 | | |
| | PHASE CONDUCTOR | | | | | | |
| 1 | Conductor | | | | | | |
|) | Material | | Alu | minium to IS 8130/84, I | H4 Grade | | |
| i) | Nominal cross-sectional area | Sqmm | 185 | 240 | 300 | | |
| ii) | Flexibility class as per IS 8130 | | Class 2 | Class 2 | Class 2 | | |
| V) | Form of Conductor | | | Stranded Compacter C | ircular | | |
| 1) | Max. DC resistance at 20°C | Ω/km | 0.164 | 0.125 | 0.1 | | |
| /i) | Approx conductor diameter | mm | 16.2 | 18.6 | 20.6 | | |
| 1.2 | Conductor Screen | | | | | | |
|) | Material & Type | | E | truded semi-conducting | g laver | | |
| i) | Min. thickness | mm | 0.3 | 0.3 | 0.3 | | |
| 1.3 | Insulation | 1,000 | 200 | | O.F. | | |
|) | Material | | Cross-linker | Polyethylene to IS 709 | 98 (Part 2) / 85 | | |
| i) | Nominal thickness | mm | 3.6 | 3.6 | 3.6 | | |
| 4.4 | Insulation screen (Non-Metallic) | 1,000 | 37 | | 200 | | |
| i) | Metrial & Type | | E | truded semi-conductin | o laver | | |
| i) | Min. Thickness of extruded layer | mm | 0.3 | 0.3 | 0.3 | | |
| 4.5 | Insulation screen (Metallic) | | 0.0 | 50.50 | 0.0 | | |
|) | Material & Type | | Copper tape applied helically with overlap | | | | |
| í) | Approx. thickness of Copper Tape | mm | 0.045 | 0.045 | 0.045 | | |
| 4.6 | Sheath | ****** | 0.590000 | | 5.5 | | |
|) | Material & Type | | PVC Type ST2 to IS 5831/84, Black Colour | | | | |
| i) | Nom. thickness | mm | 2.2 | 2.2 | 2.2 | | |
| 4.7 | Approx. diameter of Power core | mm | 30.8 | 33.2 | 35.2 | | |
| 5 | Bare Messenger | 11011 | 00.0 | 50.2 | 50.2 | | |
|) | Material | | High Tensile gal | anized steel strand to I | S 398 (Part2) / 9 | | |
| i) | Nom. Cross Sectional Area | Sqmm | 90 | 90 | 90 | | |
| ii) | Form of conductor | Squiin | 30 | Stranded Circular | 30 | | |
| v) | Approx. breaking load | kn | 103 | 103 | 103 | | |
| v) | Approx. messenger diameter | mm | 12.3 | 12.3 | 12.3 | | |
| 6 | Number of Cores | 1000 | 12.0 | 12.0 | 12,0 | | |
|) | Phase Conductor | | 3 | 3 | 3 | | |
| | Bare Messenger | | 1 | 1 | 1 | | |
| ii) 7 | Identification of Phase conductor | | Ryona | two & three ridges on | nuter sheath | | |
| В | Cable assembly | | | ctor laid up around the | The state of the s | | |
| 9 | Approx weigh of cable | kg/km | 4160 | 4820 | 5515 | | |
| 10 | Continuous current carrying | Amps | 325 | 400 | 445 | | |
| U | capacity cable when laid freely | Amps | 323 | 400 | 443 | | |
| | in air at 50°C amb ent Air temp. | | | | | | |
| 11 | | | | | | | |
| 55 | Short circuit rating for one | | | | | | |
| ₈ | second duration | KA. | 47.5 | 20.0 | 00.0 | | |
|) | Phase Conductor | KA | 17.5 | 22.6 | 28.3 | | |
| i) | Copper Screen | Amp | 200 | 200 | 200 | | |

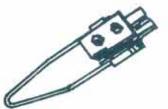
Note:

Copper tape screen has been designed for earth fault current of 200 Amp, for 1 second duration. However if required it can be suitably redesigned to meet specific requirement if any.





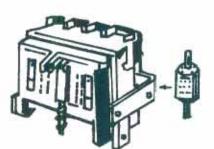
C. Dead end clamp



D. Suspension Clamp with running out Device



A. Riser



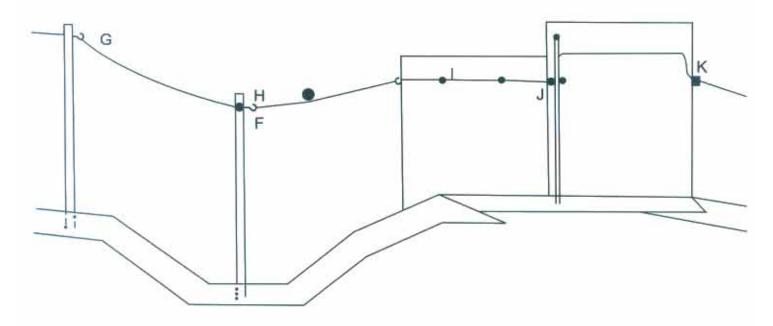




E. Insulation piercing connector



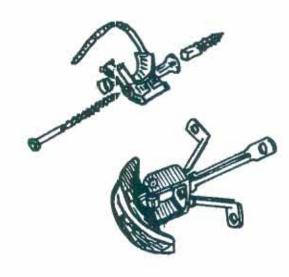




G. Dead end clamp



H. Suspension Clamp



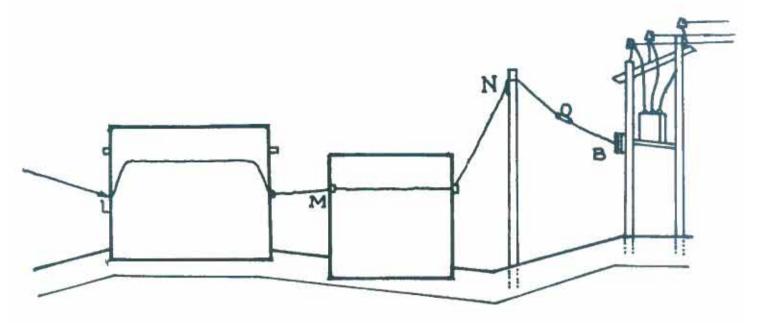
I. Distance nail

J. Cable protection



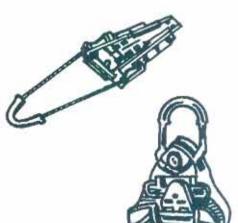
K. Hook plates





L. Dead end clamp

N. Suspension Clamp



O. Tension splice connector



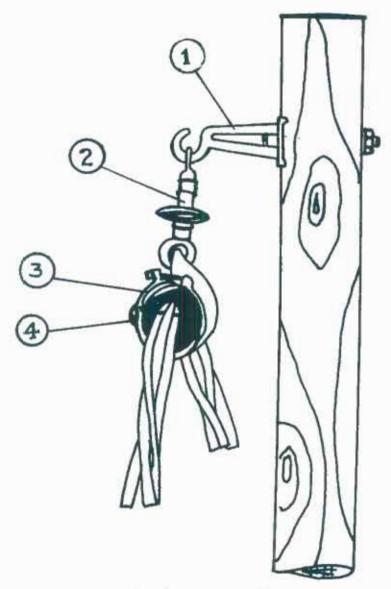
M. Universal brackets







Suspension construction Straight lines

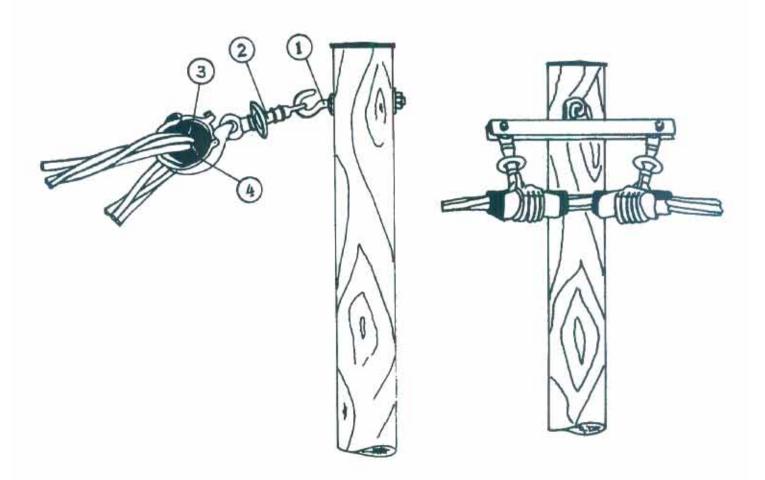


It consists of

- 1. Suspension hook.
- 2. Insulator
- Suspension clamp.
 Rubber insert.



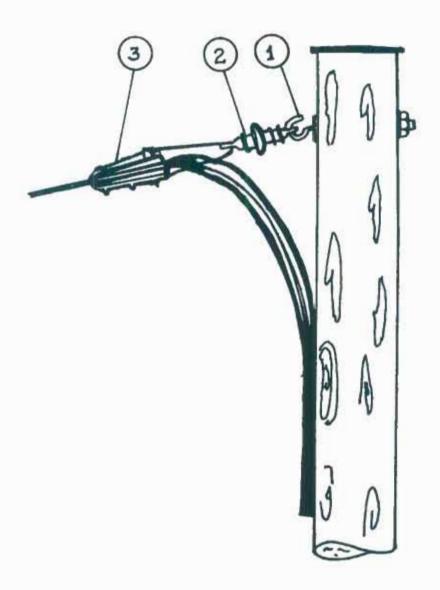
Suspension Construction Angles up to 90°



- 1. Connection Plate
- 2. Insulatar
- 3. Suspension Clamp (2 pcs)
- 4. Rubber Insert (2 pcs)



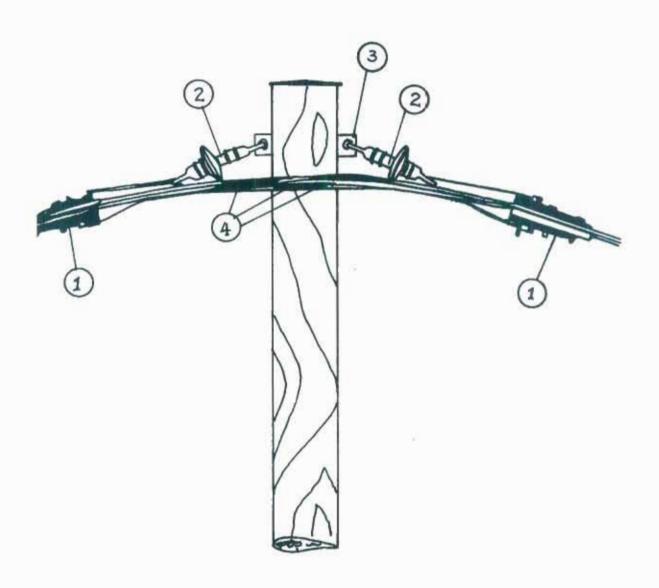
Dead. End Construction



- 1. Steel hook
- 2. Insulator
- 3. Dead end clamp



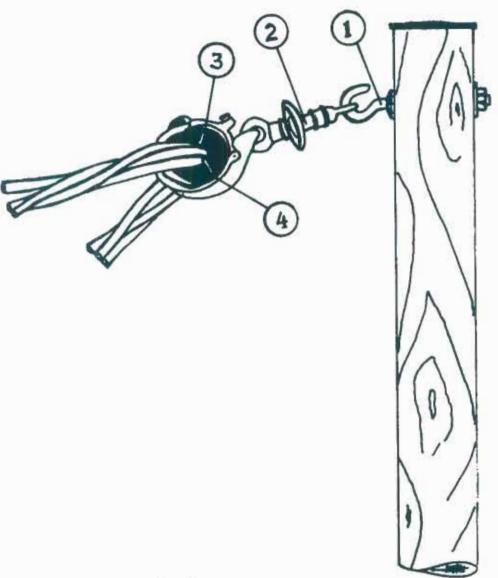
Jointing Construction



- 1. Dead-end clamp (2 pcs)
- 2. Insulator (2 pcs)
 3. Fork Plate (2 pcs)
- 4. Cable joing (3 pcs)



Suspension Construction Angles UP to 60°



- 1. Steel hook
- 2. Insulator
- 3. Suspension Clamp
- 4. Rubber insert