Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Armored, Lead Sheath & Flame Retardant (Underground)

Cable construction:
Conductor: Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
Twisting: Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

Individual Screen: Aluminum backed Mylar tape (25μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).

Cabling: Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

Collective Screen: Aluminum Backed Mylar tape (25μm) is applied over assembly of individual screened pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).

Lead Sheath: Lead Alloy to EN50307.


Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.


Reference Standards as Applicable:
BS EN 50288-7 Basic Design (300 or 500V)
IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61304-2 Low Smoke Emission (only LSZH)
ICEA S-73-532/ Oil Resistance
IEC60811-404
UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:
Class 1 or 2 drain wires same as conductor size or any other size.
Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Multi Layer sheath & Flame Retardant (Underground)

**Cable Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CU/PE/ISCR/OSCR/AL/HDPE/PA</td>
<td>Flame Retardant PVC for Direct Buried (suitable for hydrocarbon resistance)</td>
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<tr>
<td>or DGST/PVC</td>
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<tr>
<td>CU/PVC/ISCR/OSCR/AL/HDPE/PA</td>
<td>Flame Retardant PVC for Direct Buried (suitable for hydrocarbon resistance)</td>
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<tr>
<td>or DGST/PVC</td>
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<td>CU/XLPE/ISCR/OSCR/AL/HDPE/PA</td>
<td>Flame Retardant PVC for Direct Buried (suitable for hydrocarbon resistance)</td>
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<td>or DGST/LSZH</td>
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<td>CU/FRXLPE/ISCR/OSCR/AL/HDPE/PA</td>
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<td>or DGST/LSZH</td>
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</table>

**Cable construction:**

- **Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
- **Insulation:** PVC (EN50290-2-21) / PE(EN50290-2-23) / XLPE & FRXLPE (EN50290-2-29) / HFFR-XLPE(EN50290-2-26).
- **Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.
- **Individual screen:** Aluminum backed Mylar tape (25μm) is applied over each pair with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.
- **Collective Screen & Multilayer Sheath:** An Aluminum (AL) Foil (0.20mm) coated on up side with a protective plastic coating (0.05mm) is applied longitudinally over the assembly to form laminated aluminum moisture barrier sheath. A stranded tinned copper drain wire of 0.5mm² (7x0.3mm) run longitudinally in contact with the Aluminum side of the Aluminum tape. A Black extruded bedding of High Density Polyethylene compound meeting the requirement of EN 50290-2-24, shall be applied over the Aluminum Foil and shall be bonded to the Aluminum Foil. Over the High Density Polyethylene bedding a protective sheath 0.3mm of Black Polyamide shall be extruded.
- **Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.
- **Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**

- BS EN 50288-7 Basic Design (300 or 500V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- IEC 60811-404 Oil Resistance
- UL 1581/ISO4892 UV/Sunlight resistance

**Note:** On special request available:-

- Class 1 or 2 drain wires same as conductor size or any other size.
- Flame retardant low smoke low halogen (LSLH) PVC.
- Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid shielding for enhanced electrostatic noise reduction.
- Vermic Impregnated, Anti termite and Anti Rodent. Environmental Criteria to EN50299-4-4.
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Armored & Flame Retardant (Outdoor Application)

**Cable Type**
- CU/PE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC
- CU/PE/ISCR/OSCR/PE/GSWA or DGST or GSWB/PVC
- CU/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
- CU/XLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC
- CU/XLPE/ISCR/OSCR/PE/GSWA or DGST or GSWB/PVC
- CU/XLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
- CU/FRXLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC
- CU/FRXLPE/ISCR/OSCR/PE/GSWA or DGST or GSWB/PVC
- CU/FRXLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH

**Application:**
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or conduit or external buried to connect electrical instrumentation and communication circuits and industrial process controls, refineries, oil, gas petrochemical plants.

**Operating temperature:**
- -15°C to +70°C &
- -15°C to +90°C

**Recommended Installation temperature:**
- 5°C to +50°C

**Minimum Bending Radius:**
12 X Cable Overall Diameter

**Cable construction:**
- **Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
- **Insulation:** PVC (EN50290-2-21) / PE (EN50290-2-23) / XLPE & FRXLPE (EN50290-2-29) / HFFR-XLPE (EN50290-2-26).
- **Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.
- **Individual screen:** Aluminum backed Mylar tape (25 μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
- **Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Inner Sheath:** Flame Retardant PVC (EN50290-2-22) / PE (EN50290-224) / LSZH (EN50290-2-27).
- **Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape or Galvanized steel wire braid (GSWB) to EN10257-1.
- **Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**
- BS EN 50288-7 Basic Design (300 or 500V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- IEEA S-73-532/ IEC60811-404 Oil Resistance
- UL 1581/ISO4892 UV /Sunlight resistance

**Note:** On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size. Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatic noise reduction. Vermic Impregnated, Anti termite and Anti Rodent. Environmental Criteria to EN50289-4-4.
Instrumentation Cable

Multi pair/triad/quad, Individual & Overall Screen, Unarmored & Flame Retardant (Indoor Application)

**Cable Type**
- CU/PE/ISCR/OSCR/PVC
- CU/PVC/ISCR/OSCR/PVC
- CU/XLPE/ISCR/OSCR/PVC
- CU/XLPE/ISCR/OSCR/LSZH
- CU/HFFR-XLPE/ISCR/OSCR/LSZH
- CU/FRXLPE/ISCR/OSCR/PVC
- CU/FRXLPE/ISCR/OSCR/LSZH

**Application:**
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or within buildings to connect electrical instrumentation and communication circuits and industrial process controls, refineries, oil and gas plants.

**Operating temperature:**
- -15°C to +70°C &
- -15°C to +90°C

**Recommended Installation temperature:**
- 5°C to +50°C

**Minimum Bending Radius:**
12 X Cable Overall Diameter

**Cable construction:**

**Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

**Insulation:** PVC (EN50290-2-21) / PE (EN50290-2-23) / XLPE & FRXLPE (EN50290-2-25) / HFFR-XLPE (EN50290-2-26).

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Individual screen:** Aluminum backed Mylar tape (25μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).

**Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).

**Outer Sheath:** Flame Retardant PVC(EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**
- BS EN 50288-7 Basic Design (300 or 500V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- ICEA S-73-532/ Oil Resistance
- IEC60811-404 UL 1581/ISO4892 UV /Sunlight resistance

**Note:**
On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatitical noise reduction.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Armored, Lead Sheath & Fire Resistance (Underground)

**Cable construction:**

**Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

**Insulation:** MICA Impregnated Glass Tape + XLPE & FRXLPE (EN50290-2-29 /HFFR-XLPE (EN50290-2-26) or SR E12 (EN50363-1)

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Individual screen:** Aluminum backed Mylar tape (25 μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).

**Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25 μm) is applied over assembly of individual screened pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).

**Inner Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Lead Sheath:** Lead Alloy to EN50307.

**Bedding:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.

**Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**

- BS EN 50288-7: Basic Design (300 or 500V)
- IEC 60332-3: Flame Retardant (Category A, B or C according to Request)
- IEC60331-21/BS6387: Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13: Oxygen Index & Temperature Index
- IEC 60754-1: Halogen Acid Content
- IEC 60754-2: pH and Conductivity (only LSZH)
- IEC 61034-2: Low Smoke Emission (only LSZH)
- ICEA S-73-532: Oil Resistance
- IEC60811-404: UL 1581/ISO4892: UV /Sunlight resistance

**Note:** On special request available:-

- Class 1 or 2 drain wires same as conductor size or any other size.
- Flame retardant low smoke low halogen (LSLH) PVC, Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction, Vermin Impregnated, Anti termite and Anti Rodent. Environmental Criteria to EN50289-4-4.
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Multi Layer Sheath & Fire Resistance (Underground)

Cable Type
CU/MICA/XLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
CU/MICA/XLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH
CU/MICA/FRXLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
CU/MICA/FRXLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH
CU/MICA/HFFR-XLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DHST/LSZH
CU/SR/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
CU/SR/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH

Cable construction:
Conductor: Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
Insulation: MICA Impregnated Glass Tape + XLPE & FRXLPE (EN50290-2-29 /HFFR-XLPE (EN50290-2-26) or SR EI2 (EN50363-1)
Twisting: Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.
Individual screen: Aluminum backed Mylar tape (25 μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).
Cabling: Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
Collective Screen & Multilayer Sheath: An Aluminum (AL) Foil (0.20mm) coated on up side with a protective plastic coating (0.05mm) is applied longitudinally over the assembly to form laminated aluminum moisture barrier sheath. A stranded tinned copper drain wire of 0.5mm² (7x0.3mm) run longitudinally in contact with the Aluminum side of the Aluminum tape. A Black extruded bedding of High Density Polyethylene compound meeting the requirement of EN 50290-2-24, shall be applied over the Aluminum Foil and shall be bonded to the Aluminum Foil. Over the High Density Polyethylene bedding a protective sheath 0.3mm of Black Polyamide shall be extruded.
Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.

Application:
This is the alternative of lead sheath cables (known as environmental friendly). Fire Resistance/F&G Safe circuit cable can be used in cable tray or conduit or direct buried (suitable for hydrocarbon resistance) to connect electrical instrumentation and communication circuits and industrial process controls, reﬁneries, oil, gas and petrochemical plants. The multilayer protection has lower weight and smaller diameter compared to lead sheath with an excellent protection against corrosion and humidity.

Operating temperature:
-15°C to +90°C
Recommended Installation temperature:
-5°C to +50°C
Minimum Bending Radius:
20 X Cable Overall Diameter

Reference Standards as Applicable:
BS EN 50288-7 Basic Design (300 or 500V)
IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
IEC60331-21/BS6387 Fire Resistance/Protocols (C W Z)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61034-2 Low Smoke Emission (only LSZH)
ICEA S-73-532/ Oil Resistance
ICEA60811-404
UL 1581/ISO4892 UV/Sunlight resistance

Note:
- On special request available:-
  Class 1 or 2 drain wires same as conductor size or any other size.
  Flame retardant low smoke low halogen (LSLH) PVC.
  Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction.
  Vermir Impregnated, Anti termite and Anti Rodent.
  Environmental Criteria to EN50289-4-4.

Abbreviation:
CU = Copper
PVC = Polyvinyl Chloride
XLPE = Cross Linked Polyethylene
FRXLPE = Flame Retardant Cross Linked Polyethylene
HFFR-XLPE = Halogen Free Flame Retardant Cross Linked Polyethylene
LSZH = Low Smoke Zero Halogen
ISCR = Individual Screen
OSCR = Overall Screen
PA = Polyamide
HDPE = High Density Polyethylene
GSWA= Galvanized Steel Wire Armor
DGST= Double Galvanized Steel Tape
### Instrumentation Cable
#### Multi pair/triad/quad, Individual & Overall Screen, Armored & Fire Resistance (Outdoor Application)

#### Cable Type
- **CU/MICA/XLPE/ISCR/PVC/GSWA or DGST or GSWB/PVC**
- **CU/MICA/XLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH**
- **CU/MICA/FRXLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC**
- **CU/MICA/HFFR-XLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC**
- **CU/MICA/HFFR-XLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH**
- **CU/SR/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC**
- **CU/SR/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH**

#### Application:
- Fire Resistance/F&G Safe circuit cable can be used in cable ladder rack or tray in the open air exposed to direct sunlight or conduit or external buried to connect electrical instrumentation and communication circuits and industrial process controls, refineries, oil, gas petrochemical plants.

#### Operating temperature:
- -15°C to +90°C

#### Recommended Installation temperature:
- -5°C to +50°C

#### Minimum Bending Radius:
- 12 X Cable Overall Diameter

#### Cable construction:
- **Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
- **Insulation:** MICA Impregnated Glass Tape + XLPE & FRXLPE (EN50290-2-29 / HFFR-XLPE (EN50290-2-26) or SR EI2 (EN50363-1)
- **Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.
- **Individual screen:** Aluminum backed Mylar tape (25 μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
- **Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Inner Sheath:** Flame Retardant PVC (EN50290-2-22) / PE (EN50290-224) / LSZH (EN50290-2-27).
- **Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape or Galvanized steel wire braid (GSWB) to EN10257-1.
- **Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

#### Reference Standards as Applicable:
- BS EN 50288-7 Basic Design (300 or 500V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- IEC60331-21/BS6387 Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- IEC60811-404 Oil Resistance
- UL 1581/ISO4892 UV /Sunlight resistance

#### Note:
- On special request available:-
- Class 1 or 2 drain wires same as conductor size or any other size.
- Flame retardant low smoke low halogen (LSLH) PVC.
- Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid shielding for enhanced electrostatistical noise reduction.
- Vermín Impregnated, Anti termite and Anti Rodent.
- Environmental Criteria to EN50289-4-4.

### Abbreviation:
- **CU = Copper**
- **PVC = Polyvinyl Chloride**
- **XLPE = Cross Linked Polyethylene**
- **FRXLPE = Flame Retardant Cross Linked Polyethylene**
- **HFFR-XLPE = Halogen Free Flame Retardant Cross Linked Polyethylene**
- **LSZH = Low Smoke Zero Halogen**
- **ISCR= Individual Screen**
- **OSCR = Overall Screen**
- **GSWA= Galvanized Steel Wire Armor**
- **DGST= Double Galvanized Steel Tape**
- **GSWB= Galvanized Steel Wired Braid**
### Instrumentation Cable

**Multi pair/triad/quad, Individual & Overall Screen, Unarmored & Fire Resistance (Indoor Application)**

<table>
<thead>
<tr>
<th>Cable Type</th>
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<td>CU/SR/ISCR/OSCR/LSZH</td>
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**Cable construction:**

**Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

**Insulation:** MICA Impregnated Glass Tape + XLPE & FRXLPE (EN50290-2-29 /HFFR-XLPE (EN50290-2-26) or SR EI2 (EN50363-1)

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Individual screen:** Aluminum backed Mylar tape (25μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).

**Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).

**Outer Sheath:** Flame Retardant PVC(EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**

- BS EN 50288-7: Basic Design (300 or 500V)
- IEC 60332-3: Flame Retardant (Category A, B or C according to Request)
- IEC60331-21/BS6387: Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13: Oxygen Index & Temperature Index
- IEC 60754-1: Halogen Acid Content
- IEC 60754-2: pH and Conductivity (only LSZH)
- IEC 61034-2: Low Smoke Emission (only LSZH)
- ICEA S-73-532/: Oil Resistance
- IEC60811-404: Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction.
Instrumentation Cable
Single/Multi pair/triad/quad, Overall Screen, Braided Armored & Fire Resistance (Offshore Application)

**Cable construction:**

**Conductor:** Tinned coated annealed copper conductor according to IEC 60228, stranded class 2 / flexible class 5.

**Insulation:** MICA Impregnated Glass Tape + EPR Type GP4 to BS 7655-1.2.

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Cabling:** Required numbers of individually twisted pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25 μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

**Inner Sheath:** Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6.

**Armor:** Galvanized Steel Wire Braid (GSWB) to EN10257-1 applied over inner sheath.

**Outer Sheath:** Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6

**Reference Standards as Applicable:**

- BS 7917: Basic Design (150/250V)
- IEC 60332-3: Flame Retardant (Category A, B or C according to Request)
- IEC60331-21/BS6387: Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13: Oxygen Index & Temperature Index
- IEC 60754-1: Halogen Acid Content
- IEC 60754-2: pH and Conductivity
- IEC 61034-2: Low Smoke Emission
- ICEA S-73-532/IEC60811-404: Oil Resistance
- UL 1581/ISO4892: UV /Sunlight resistance

**Note:** On special request available:-
Class 2 or 5 drain wires same as conductor size or any other size.
Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.

**Abbreviation:**

CU = Copper  
EPR = Ethylene Propylene Rubber  
SW4 = Thermosetting Compound  
OSCR = Overall Screen  
GSWB = Galvanized Steel Wired Braid
**Instrumentation Cable**

**Single/Multi pair/triad/quad, Overall Screen, Unarmored & Fire Resistance (Offshore Application)**

**Cable Type**

CU/MICA/EPR/OSCR/SW4
CU/MICA/EPR/OSCR/SW4

**Application:**

Fire Resistance/F&G Safe circuit cable can be used control, instrumentation and propulsion circuits in ship and on mobile and fixed offshore tray/ladder unit.

**Operating temperature:**

-20°C to +90°C

**Recommended Installation temperature:**

-5°C to +50°C

**Minimum Bending Radius:**

8 X Cable Overall Diameter

**Cable construction:**

**Conductor:** Tinned coated annealed copper conductor according to IEC 60228, stranded class 2 / flexible class 5.

**Insulation:** MICA Impregnated Glass Tape + EPR Type GP4 to BS 7655-1.2.

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Cabling:** Required numbers of individually twisted pairs/triads/quad are assembled with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

**Outer Sheath:** Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6

**Reference Standards as Applicable:**

- BS 7917: Basic Design (150/250V)
- IEC 60332-3: Flame Retardant (Category A, B or C according to Request)
- EC60331-21/BS6387: Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13: Oxygen Index & Temperature Index
- IEC 60754-1: Halogen Acid Content
- IEC 60754-2: pH and Conductivity
- IEC 61034-2: Low Smoke Emission
- ICEA S-73-532: Oil Resistance
- IEC60811-404: UV /Sunlight resistance
- UL 1581/ISO4892: UV /Sunlight resistance

**Abbreviation:**

- CU = Copper
- EPR = Ethylene Propylene Rubber
- SW4 = Thermosetting Compound
- OSCR = Overall Screen

**Note:** On special request available:-
Class 2 or 5 drain wires same as conductor size or any other size.
Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Braided Armored & Fire Resistance (Offshore Application)

Cable Type
CU/MICA/EPR/ISCR/OSCR/SW4/GSWB/SW4
CU/MICA/EPR/ISCR/OSCR/SW4/GSWB/SW4

Application:
Fire Resistance/F&G Safe circuit cable can be used control, instrumentation and propulsion circuits in ship and on mobile and fixed offshore unit.

Operating temperature:
-20°C to +90°C

Recommended Installation temperature:
-5°C to +50°C

Minimum Bending Radius:
8 X Cable Overall Diameter

Cable construction:

Conductor: Tinned coated annealed copper conductor according to IEC 60228, stranded class 2 / flexible class 5.

Insulation: MICA Impregnated Glass Tape + EPR Type GP4 to BS 7655-1.2.

Twisting: Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

Individual screen: Aluminum backed Mylar tape (25 μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

Cabling: Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

Collective Screen: Aluminum Backed Mylar tape (25μm) is applied over assembly of individual screened pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

Inner Sheath: Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6.

Armor: Galvanized Steel Wire Braid (GSWB) to EN10257-1 applied over inner sheath.

Outer Sheath: Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6

Reference Standards as Applicable:
BS 7917 Basic Design (150/250V)
IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
EC60331-21/BS6387 Fire Resistance/Protocols (C W Z)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity
IEC 61034-2 Low Smoke Emission
ICEA S-73-532/ Oil Resistance
IEC60811-404 UV /Sunlight resistance
UL 1581/ISO4892 Environmental Criteria to EN50289-4.4.

Note: On special request available:-
Class 2 or 5 drain wires same as conductor size or any other size.
Anti termite and Anti Rodent.

Abbreviation:
CU = Copper
EPR = Ethylene Propylene Rubber
SW4 = Thermosetting Compound
ISCR = Individual Screen
OSCR = Overall Screen
GSWB= Galvanized Steel Wired Braid
Instrumentation Cable
Multi pair/triad/quad, Individual & Overall Screen, Unarmored & Fire Resistance (Offshore Application)

**Cable Type**
CU/EPR/ISCR/OSCR/SW4
CU/EPR/ISCR/OSCR/SW4

**Application:**
Fire Resistance/F&G Safe circuit cable can be used control, Instrumentation and propulsion circuits in ship and on mobile and fixed offshore tray/ladder unit.

**Operating temperature:**
-20°C to +90°C

**Recommended Installation temperature:**
-5°C to +50°C

**Minimum Bending Radius:**
8 X Cable Overall Diameter

**Cable construction:**

**Conductor:** Tinned coated annealed copper conductor according to IEC 60228, stranded class 2 / flexible class 5.

**Insulation:** MICA Impregnated Glass Tape + EPR Type GP4 to BS 7655-1.2.

**Twisting:** Two/three/four insulated conductors are uniformly twisted to form a pair/triad/quad.

**Individual screen:** Aluminum backed Mylar tape (25μm) is applied over each pair/triad/quad with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

**Cabling:** Required numbers of individually screened pairs/triads/quad are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

**Collective Screen:** Aluminum Backed Mylar tape (25μm) is applied over assembly of individual screened pairs/triads/quad with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm) to confine the electric field and to limit the external electrical influences.

**Outer Sheath:** Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6

**Reference Standards as Applicable:**
- BS 7917 Basic Design (150/250V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- EC60331-21/BS6387 Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity
- IEC 61034-2 Low Smoke Emission
- ICEA S-73-532/ Oil Resistance
- IEC60811-404
- UL 1581/ISO4892 UV/Sunlight resistance

**Note:** On special request available:-
Class 2 or 5 drain wires same as conductor size or any other size. Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Control Cable
Multicore Fire Retardant (Offshore Application)

Cable Type
- CU/MICA/EPR/SW4
- CU/MICA/EPR/SW4
- CU/MICA/EPR/SW4/GSWB/SW4
- CU/MICA/EPR/SW4/GSWB/SW4

Cable construction:
Conductor: Tinned coated annealed copper conductor according to IEC 60228, stranded class 2 / flexible class 5.
Insulation: MICA Impregnated Glass Tape + EPR Type GP4 to BS 7655-1.2.
Cabling: Required numbers of cores are assembled in concentric with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
Inner Sheath: Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6.
Armor: Galvanized Steel Wire Braid (GSWB) to EN10257-1 applied over inner sheath.
Outer Sheath: Thermosetting Low Smoke Zero Halogen, Enhanced Oil Resistance Compound Type SW4 to BS 7655-2.6

Application:
Fire Resistance/F&G Safe circuit cable can be used for electrical control & Instruments apparatus for secondary switching of remote control regulator, starter, automation, protective relays and solenoid valve in ship and on mobile and fixed offshore unit.

Operating temperature:
- 20°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
8 X Cable Overall Diameter

Reference Standards as Applicable:
- BS 7917 Basic Design (600/1000V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- EC60331-21/BS6387 Fire Resistance/Protocols (C W Z)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity
- IEC 61034-2 Low Smoke Emission
- ICEA S-73-532/ Oil Resistance
- IEC60811-404
- UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:- Anti termite and Anti Rodent. Environmental Criteria to EN50289-4-4.
Foundation Field Bus Cable
Multi pair Individual & Overall Screen, Armored, Lead Sheath & Flame Retardant (Underground)

Cable Type
CU/XLPE/ISCR/OSCR/PVC/LC/PVC/GSWA or DGST/PVC
CU/XLPE/ISCR/OSCR/LSZH/LC/LSZH/GSWA or DGST/LSZH
CU/FRXLPE/ISCR/OSCR/PVC/LC/PVC/GSWA or DGST/PVC
CU/FRXLPE/ISCR/OSCR/LSZH/LC/LSZH/GSWA or DGST/LSZH

Application:
Can be used in cable tray or conduit or external buried & underground ducts (suitable for hydrocarbon resistance) for trunk & spures, fieldbus and superior interference immunity system to industrial process controls, refineries, oil, gas and petrochemical plants.

Cable construction:
Conductor: Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
Insulation: XLPE / FRXLPE (EN50290-2-29).
Twisting: Two insulated conductors are uniformly twisted to form a pair.
Individual screen: Aluminum backed Mylar tape (25 μm) is applied over each pair with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm). (Note applicable for single pair).
Cabling: Required numbers of individually screened pairs are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
Collective Screen: Aluminum Backed Mylar tape (25μm) is applied over assembly of individual screened pairs with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
Lead Sheath: Lead Alloy to EN50307.
Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.

Reference Standards as Applicable:
BS EN 50288-7 Basic Design 300V
FF-844 FS 1.2 H1 Technical Characteristics
IEC 61158-2 Type-A Flame Retardant (Category A, B or C according to Request)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61034-2 Low Smoke Emission (only LSZH)
IECA S-73-532/ Oil Resistance
IEC60811-404
UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.

Abbreviation:
CU = Copper
PV = Polyvinyl Chloride
XLPE = Cross Linked Polyethylene
FRXLPE = Flame Retardant Cross Linked Polyethylene
LSZH = Low Smoke Zero Halogen
ISCR = Individual Screen
OSCR = Overall Screen
LC = Lead Compound
GSWA = Galvanized Steel Wire armored
DGST = Double Galvanized Steel Tape
Foundation Field Bus Cable
Multi pair, Individual & Overall Screen, Multi Layer sheath & Flame Retardant (Underground)

Cable Type
CU/XLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
CU/XLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH
CU/FRXLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
CU/FRXLPE/ISCR/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH

Application:
This is the alternative of lead sheath cables (known as environmental friendly) and can be used in cable tray or conduit or direct buried (suitable for hydrocarbon resistance) for trunk & spures, fieldbus and superior interference immunity system to industrial process controls, refineries, oil, gas and petrochemical plants. The multilayer protection has lower weight and smaller diameter compared to lead sheath with an excellent protection against corrosion and humidity.

Operating temperature:
- 15°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
20 X Cable Overall Diameter

Cable construction:
Conductor: Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

Insulation: XLPE / FRXLPE (EN50290-2-29).

Twisting: Two insulated conductors are uniformly twisted to form a pair.

Individual screen: Aluminum backed Mylar tape (25μm) is applied over each pair with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm).
(Note applicable for single pair).

Cabling: Required numbers of individually screened pairs are assembled with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.

Collective Screen & Multilayer Sheath: An Aluminum (AL) Foil (0.20mm) coated on up side with a protective plastic coating (0.05mm) is applied longitudinally over the assembly to form laminated aluminum moisture barrier sheath. A stranded tinned copper drain wire of 0.5mm² (7x0.3mm) run longitudinally in contact with the Aluminum side of the Aluminum tape. A Black extruded bedding of High Density Polyethylene compound meeting the requirement of EN 50290-2-24, shall be applied over the Aluminum Foil and shall be bonded to the Aluminum side of the Aluminum tape. A Black extruded bedding of High Density Polyethylene beding a protective sheath 0.3mm of Black Polyamide shall be extruded.

Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.


Reference Standards as Applicable:
BS EN 50288-7 Basic Design 300V
FF-844 FS 1.2 H1 Technical Characteristics
IEC 61158-2 Type-A Flame Retardant (Category A, B or C according to Request)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61034-2 Low Smoke Emission (only LSZH)
ICEA S-73-532 Oil Resistance
IEC60811-404 UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size. Flame retardant low smoke low halogen (LSLH) PVC. Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction. Vermillion Impregnated, Anti termite and Anti Rodent. Environmental Criteria to EN50289-4-4.
Multi pair/triad/quad, Individual & Overall Screen, Armored & Flame Retardant (Outdoor Application)

**Cable Type**
- CU/XLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC
- CU/XLPE/ISCR/OSCR/PE/GSWA or DGST or GSWB/PVC
- CU/XLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
- CU/FRXLPE/ISCR/OSCR/PVC/GSWA or DGST or GSWB/PVC
- CU/FRXLPE/ISCR/OSCR/PE/GSWA or DGST or GSWB/PVC
- CU/FRXLPE/ISCR/OSCR/LSZH/GSWA or DGST or GSWB/LSZH

**Application:**
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or conduit or external buried for trunk & spures, fieldbus and superior interference immunity system to industrial process controls, refineries, oil, gas petrochemical plants.

**Operating temperature:**
- 15°C to +90°C

**Recommended Installation temperature:**
- -5°C to +50°C

**Minimum Bending Radius:**
12 X Cable Overall Diameter

**Cable construction:**
- **Conductor:** Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
- **Insulation:** XLPE / FRXLPE (EN50290-2-29).
- **Twisting:** Two insulated conductors are uniformly twisted to form a pair.
- **Individual screen:** Aluminum backed Mylar tape (25 μm) is applied over each pair with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm). (Note applicable for single pair).
- **Cabling:** Required numbers of individually screened pairs are assembled with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.
- **Collective Screen:** Aluminum Backed Mylar tape (25 μm) is applied over assembly of individual screened pairs with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
- **Inner Sheath:** Flame Retardant PVC (EN50290-2-22) / PE (EN50290-224) / LSZH (EN50290-2-27).
- **Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape or Galvanized steel wire braid (GSWB) to EN10257-1.
- **Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

**Reference Standards as Applicable:**
- BS EN 50288-7 Basic Design 300V
- FF-844 FS 1.2 H1 Technical Characteristics
- IEC 61158-2 Type-A Flame Retardant (Category A, B or C according to Request)
- IEC 60332-3-3 Oxygen Index & Temperature Index
- ASTM D 2863-13 Halogen Acid Content
- IEC 60754-1 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- IEC 61034-2 Oil Resistance
- IEC60811-404 US 1581/ISO4892 UV /Sunlight resistance
- IEC 60754-2 Vermin Impregnated, Anti termite and Anti Rodent.
- Environmental Criteria to EN50289-4-4.

**Note:** On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatic noise reduction.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Foundation Field Bus Cable
Multi pair/triad/quad, Individual & Overall Screen, Unarmored & Flame Retardant (Indoor Application)

Cable Type
- CU/XLPE/ISCR/OSCR/PVC
- CU/XLPE/ISCR/OSCR/LSZH
- CU/FRXLPE/ISCR/OSCR/PVC
- CU/FRXLPE/ISCR/OSCR/LSZH

Application:
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or within buildings for trunk & spures, fieldbus and superior interference immunity system to industrial process controls, refineries, oil and gas plants.

Operating temperature:
- 15°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
12 X Cable Overall Diameter

Cable construction:

Conductor: Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

Insulation: XLPE / FRXLPE (EN50290-2-29).

Twisting: Two insulated conductors are uniformly twisted to form a pair.

Individual screen: Aluminum backed Mylar tape (25μm) is applied over each pair with an overlap of 25% with metallic side down in contact with a stranded tinned copper drain wire of 0.5mm² (7x0.3mm). (Note applicable for single pair).

Cabling: Required numbers of individually screened pairs are assembled with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

Collective Screen: Aluminum Backed Mylar tape (25μm) is applied over assembly of individual screened pairs with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).


Reference Standards as Applicable:
- BS EN 50288-7 Basic Design 300V
- FF-844 FS 1.2 H1 Technical Characteristics
- IEC 61158-2 Type-A Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- ICEA S-73-532/ Oil Resistance
- IEC60811-404 IEC80181-404 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Flame retardant low smoke low halogen (LSLH) PVC.
Copper Mylar Tape shielding/Annealed or Plain Copper Wire braid Shielding for enhanced electrostatistical noise reduction.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.

Abbreviation:
CU = Copper
PVC = Polyvinyl Chloride
XLPE = Cross Linked Polyethylene
FRXLPE = Flame Retardant Cross Linked Polyethylene
LSZH = Low Smoke Zero Halogen
ISCR = Individual Screen
OSCR = Overall Screen
Control Cable
Multicore Overall Screen, Armored, Lead Sheath & Flame Retardant (Underground)

Cable construction:
Conductor: Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
Insulation: PVC (EN50290-2-21) / XLPE & FRXLPE (EN50290-2-29 / HFFR-XLPE (EN50290-2-26).
Cabling: Required numbers cores are assembled in concentric lay with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
Collective Screen: Aluminum Backed Mylar Tape (AMT) / Copper Backed Mylar Tape (CMT) (25 μm) is applied over assembly with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
Lead Sheath: Lead Alloy to EN50307.
Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.

Application:
Can be used in conduit or external buried & underground ducts (suitable for hydrocarbon resistance) to connect electrical control & Instruments apparatus for secondary switching of remote control regulator, starter, automation, protective relays and solenoid valve at refineries, oil, gas and petrochemical plants.

Operating temperature:
- 15°C to +70°C &
- 15°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
20 X Cable Overall Diameter

Cable Type
CU/PVC/OSCR/PVC/LC/PVC/GSWA or DGST/PVC
CU/XLPE/OSCR/PVC/LC/PVC/GSWA or DGST/PVC
CU/XLPE/OSCR/LSZH/LC/LSZH/GSWA or DGST/LSZH
CU/FRXLPE/OSCR/PVC/LC/PVC/GSWA or DGST/PVC
CU/FRXLPE/OSCR/LSZH/LC/LSZH/GSWA or DGST/LSZH
CU/HFFRXLPE/OSCR/LSZH/LC/LSZH/GSWA or DGST/LSZH

Abbreviation:
CU = Copper
PVC = Polyvinyl Chloride
XLPE = Cross Linked Polyethylene
FRXLPE = Flame Retardant Cross Linked Polyethylene
HFFR XLPE = Halogen Free Flame Retardant Cross Linked Polyethylene
LSZH = Low Smoke Zero Halogen
OSCR = Overall Screen
LC = Lead Compound
GSWA = Galvanized Steel Wire armored
DGST = Double Galvanized Steel Tape

Reference Standards as Applicable:
IEC60502-1 Basic Design (600/1000V)
IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61034-2 Low Smoke Emission (only LSZH)
ICEA S-73-532/ Oil Resistance
IEC60811-404
UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Plain/tinned copper wire braid shielding for inductive or capacitive or eddy-current interference reduction.
Flame retardant low smoke low halogen (LSLH) PVC.
Vermin Impregnated, Anti termite and Anti Rodent. Environmental Criteria to EN50289-4-4.
Control Cable
Multicore Overall Screen, Multi Layer sheath & Flame Retardant (Underground)

Cable Type
- CU/PVC/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
- CU/XLPE/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
- CU/XLPE/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH
- CU/FRXLPE/OSCR/AL/HDPE/PA/GSWA or DGST/PVC
- CU/FRXLPE/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH
- CU/HFFR-XLPE/OSCR/AL/HDPE/PA/GSWA or DGST/LSZH

Cable construction:
- **Conductor:** Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
- **Insulation:** PVC (EN50290-2-21) / XLPE & FRXLPE (EN50290-2-29 / HFFR-XLPE(EN50290-2-26).
- **Cabling:** Required numbers cores are assembled in concentric lay with non-hygrosopic filler and the assembly is wrapped with a polyester binder tape.
- **Collective Screen & Multilayer Sheath:** An Aluminum (AL) Foil (0.20mm) coated on up side with a protective plastic coating (0.05mm) is applied longitudinally over the assembly to form laminated aluminum moisture barrier sheath. A stranded tinned copper drain wire of 0.5mm2 (7x0.3mm) run longitudinally in contact with the Aluminum side of the Aluminum tape. A Black extruded bedding of High Density Polyethylene compound meeting the requirement of EN 50290-2-24, shall be applied over the Aluminum Foil and shall be bonded to the Aluminum Foil. Over the High Density Polyethylene bedding a protective sheath 0.3mm of Black Polyamide shall be extruded.
- **Armor:** A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape (DGST) to EN10257-1.
- **Outer Sheath:** Flame Retardant PVC (EN50290-2-22) / LSZH (EN50290-2-27).

Application:
This is the alternative of lead sheath cables (known as environmental friendly) and can be used in conduit or external buried & underground ducts (suitable for hydrocarbon resistance) to connect electrical control & Instruments apparatus for secondary switching of remote control regulator, starter, automation, protective relays and solenoid valve at refineries, oil, gas and petrochemical plants.

- **Operating temperature:** -15°C to +70°C & -15°C to +90°C
- **Recommended Installation temperature:** -5°C to +50°C
- **Minimum Bending Radius:** 20 X Cable Overall Diameter

**Note:** On special request available:-
- Class 1 or 2 drain wires same as conductor size or any other size.
- Flame retardant low smoke low halogen (LSLH) PVC
- Vermin Impregnated, Anti termite and Anti Rodent.

**Reference Standards as Applicable:**
- IEC60502-1: Basic Design (600/1000V)
- IEC 60332-3: Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13: Oxygen Index & Temperature Index
- IEC 60754-1: Halogen Acid Content
- IEC 60754-2: pH and Conductivity (only LSZH)
- IEC 61034-2: Low Smoke Emission (only LSZH)
- IEC A-73-532: Oil Resistance
- IEC60811-404: UV /Sunlight resistance

Abbreviation:
- CU = Copper
- PVC = Polyvinyl Chloride
- XLPE = Cross Linked Polyethylene
- FRXLPE = Flame Retardant Cross Linked Polyethylene
- HFFR-XLPE = Halogen Free Flame Retardant Cross Linked Polyethylene
- LSZH = Low Smoke Zero Halogen
- OSCR = Overall Screen
- PA = Polyamide
- HDPE = High Density Polyethylene
- GSWA = Galvanized Steel Wire Armor
- DGST = Double Galvanized Steel Tape

Environmental Criteria to EN50289-4-4.
Control Cable

Multicore Overall Screen, Armored & Flame Retardant (Outdoor Application)

Cable Type
CU/PE/OSCR/PVC/GSWA or DGST or GSWB/PVC
CU/PE/OSCR/PE/GSWA or DGST or GSWB/PVC
CU/PE/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
CU/PVC/OSCR/PVC/GSWA or DGST or GSWB/PVC
CU/XLPE/OSCR/GSWA or DGST or GSWB/PVC
CU/XLPE/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
CU/XLPE/OSCR/GSWA or DGST or GSWB/PVC
CU/XLPE/OSCR/LSZH/GSWA or DGST or GSWB/LSZH
CU/FRXLPE/OSCR/GSWA or DGST or GSWB/PVC
CU/FRXLPE/OSCR/LSZH/GSWA or DGST or GSWB/LSZH

Cable construction:
Conductor: Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.
Insulation: PVC (EN50290-2-21) / XLPE & FRXLPE (EN50290-2-29 / HFFR-XLPE (EN50290-2-26).
Cabling: Required numbers cores are assembled in concentric lay with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.
Collective Screen: Aluminum Backed Mylar Tape (AMT) / Copper Backed Mylar Tape (CMT) (25 μm) is applied over assembly with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).
Armor: A single layer of Galvanized steel wire armor (GSWA) or Double galvanized steel tape or Galvanized steel wire braid (GSWB) to EN10257-1.

Application:
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or conduit or external buried to connect electrical control & instruments apparatus for secondary switching of remote control regulator, starter, automation, protective relays and solenoid valve at refineries, oil and gas and petrochemical plants

Operating temperature:
- 15°C to +70°C &
- 15°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
12 X Cable Overall Diameter

Reference Standards as Applicable:
IEC60502-1 Basic Design (600/1000V)
IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
ASTM D 2863-13 Oxygen Index & Temperature Index
IEC 60754-1 Halogen Acid Content
IEC 60754-2 pH and Conductivity (only LSZH)
IEC 61034-2 Low Smoke Emission (only LSZH)
ICEA S 73-532/ Oil Resistance
IEC60811-404 UL 1581/ISO4892 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Plain/tinned copper wire braid shielding for inductive or capacitive or eddy-current interference reduction.
Flame retardant low smoke low halogen (LSLH) PVC.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.
Control Cable

Multicore Overall Screen, Unarmored & Flame Retardant (Indoor Application)

Cable Type
- CU/XLPE/OSCR/PVC
- CU/XLPE/OSCR/LSZH
- CU/FRXLPE/OSCR/PVC
- CU/FRXLPE/OSCR/LSZH

Application:
Can be used in cable ladder rack or tray in the open air exposed to direct sunlight or within buildings to connect electrical control & instruments apparatus for secondary switching of remote control regulator, starter, automation, protective relays and solenoid valve at refineries, oil, gas and petrochemical plants.

Operating temperature:
- -15°C to +70°C &
- -15°C to +90°C

Recommended Installation temperature:
- 5°C to +50°C

Minimum Bending Radius:
12 X Cable Overall Diameter

Cable construction:

Conductor: Plain/Tinned coated annealed copper conductor according to IEC 60228, solid class 1 / stranded class 2 / flexible class 5.

Insulation: PVC (EN50290-2-21) / XLPE & FRXLPE (EN50290-2-29 / HFFR-XLPE (EN50290-2-26).

Cabling: Required numbers cores are assembled in concentric lay with non-hygroscopic filler and the assembly is wrapped with a polyester binder tape.

Collective Screen: Aluminum Backed Mylar Tape (AMT) / Copper Backed Mylar Tape (CMT) (25 μm) is applied over assembly of with an overlap of 25% with metallic side down in contact with a stranded annealed tinned copper drain wire of 0.5mm² (7x0.3mm).

Outer Sheath: Flame Retardant PVC(EN50290-2-22) / LSZH (EN50290-2-27)

Reference Standards as Applicable:
- IEC60502-1 Basic Design (600/1000V)
- IEC 60332-3 Flame Retardant (Category A, B or C according to Request)
- ASTM D 2863-13 Oxygen Index & Temperature Index
- IEC 60754-1 Halogen Acid Content
- IEC 60754-2 pH and Conductivity (only LSZH)
- IEC 61034-2 Low Smoke Emission (only LSZH)
- ICEA S-73-532 Oil Resistance
- IEC60811-404 UV /Sunlight resistance

Note: On special request available:-
Class 1 or 2 drain wires same as conductor size or any other size.
Plain/tinned copper wire braid shielding for inductive or capacitive or eddy-current interference reduction.
Flame retardant low smoke low halogen (LSLH) PVC.
Vermin Impregnated, Anti termite and Anti Rodent.
Environmental Criteria to EN50289-4-4.