

INSTRUMENTATION CABLE



APPLICATION

- ◆ Suitable for operating voltage 300 V and temperature 70°C
- ◆ For sensitive transmission of Analog and Digital signals in instruments and control systems.
- ◆ Suitable for indoor and outdoor installations including wet location and also in conduits
- ◆ Fully protected from external electromagnetic noise that affect signals
- ◆ Good signal protection between pairs.
- ◆ For use in alarm circuits, audio systems, intercom, energy measurements
- ◆ For use in process control equipments, microprocessor based instrument circuits, Analog to Digital (A/D) converters
- ◆ Suitable for temperatures -30°C to +70°C under stationary conditions
- ◆ Suitable for temperatures -5°C to +50°C under flexing conditions
- ◆ Not suitable for direct connection to low impedance source like public mains electricity system-
- ◆ Maximum bending radius 8 x overall diameter.
- ◆ Unarmoured cables are recommended for indoor and Armoured cables for outdoor use, including underground
- ◆ Option to select the flexibility class to meet the application and origin of use.
- ◆ Excellent fire Protection properties for safe use

PRODUCT RANGE

- ◆ BS 5308 Part 1 – Type 1 Unarmoured cable with Polyethylene insulation & PVC Sheath - 2 to 50 pairs
- ◆ BS 5308 Part 2 – Type 1 Unarmoured cable with PVC insulation & PVC Sheath - 2 to 50 pairs
- ◆ BS 5308 Part 1 – Type 2 Armoured cable with Polyethylene insulation & PVC Sheath - 2 to 50 pairs
- ◆ BS 5308 Part 2 – Type 2 Armoured cable with PVC insulation & PVC Sheath - 2 to 50 pairs
- ◆ Generally to BS 5308 Part 1 and 2 with Zero halogen Flame Retardant Sheath

INSTRUMENTATION CABLE

CONSTRUCTION

| | |
|----------------------------------|---|
| Conductor - | - Electrolytic grade high conductive annealed plain or tinned copper conductor either solid, stranded & flexible to IS : 8130 / IEC 60228 |
| Insulation | - PVC / Polyethylene insulation |
| Cores & Pair identification | - Black and white insulation with number printing , or BS 5308, or any other mutually agreed colour schemes |
| Pairing | - Twisted cores with consistent lay length to minimize the cross talk either in pairs or triads |
| Screening of pairs | - Where designed, pairs individually are screened with Aluminium Mylar tape with 100% coverage |
| Drain wire | - Annealed Tinned stranded copper wire in continuous contact with Aluminium screen longitudinally. |
| Pairs laying with binder | - Grouped with suitable lay , with or without fillers to get round construction and bind with mylar tape . |
| Collective screening | - Individually screened pairs are screened with Aluminium Mylar tape with 100% coverage. |
| Drain wire for Collective screen | - Annealed Tinned stranded copper wire in continuous contact with Aluminium screen longitudinally. |
| Bedding | - With suitable materials like PVC, PE, ZHFR, FRLS to form a bedding for Armouring |
| Armouring | - Single layer of galvanized round steel wires or galvanized steel strips / formed wires |
| Outer sheath | - PVC / HR/ FR/ FRLS/ ZHFR material to meet the specific flame & other environmental requirements including UV resistance. |

CONDUCTOR

| Size | Solid Construction | Stranded Construction | Flexible Construction |
|--------|--------------------|-----------------------|-----------------------|
| Sq. mm | Class 1 | Class 2 | Class 5 |
| 0.5 | 1/0.8 mm | 7/0.3 mm | 16/0.2 mm |
| 0.75 | 1/0.98 mm | 7/0.37 mm | 24/0.2 mm |
| 1 | 1/1.13 mm | 7/0.43 mm | 32/0.2 mm |
| 1.5 | 1/1.38 mm | 7/0.53 mm | 30/0.25 mm |
| 2.5 | 1/1.78 mm | 7/0.67 mm | 50/0.25 mm |

ELECTRICAL CHARACTERISTICS

| | | | |
|--------------------------|--------------------------------|---------------------------------|---------------------------------|
| Capacitance | - BS 5308 Part 1 & 2 | Dielectric constant | - BS 5308 Part 1 & 2 & IS: 5608 |
| Characteristic impedance | - IEC 189 / BS 5308 Part 1 & 2 | Inductance | - VDE 0816 / BS 5308 Part 1 & 2 |
| Conductor Resistance | - BS 6360 / IEC 60228 | Mutual capacitance | - BS 5308 Part 1 & 2 & IS: 5608 |
| Cross talk / attenuation | - VDE 0815 | Volume resistivity at room temp | - BS 5308 Part 1 & 2 & IS: 5608 |

* Standards where ever mentioned refers to the latest version with up to date amendments

FLAME / FIRE RESISTANCE PERFORMANCE

| | | |
|--|--------------------|--|
| Flame test on single cable | Meets IEC 60332-1 | No propagation |
| Fire Resistance test on bunched cables | Meets IEC 60332-3 | Fulfills Cat C, Cat B, Cat A requirements |
| Halogen acid gas evolution | Meets IEC 60754- 1 | < 0.5% for ZHFR and < 20% for FR-LSH cables |
| Corrosive gases | Meets IEC 60754- 2 | pH - >4.3 and Conductivity < 100 μS/cm |
| Toxicity index | Meets IEC 60754- 2 | Max 5% |
| Oxygen Index | Meets ASTM D 2863 | Min 29% |
| Temperature Index | Meets ASTM D 2863 | Min 250 deg C |
| Smoke density | Meets ASTM D 2843 | Max 20% for ZHFR and Max 40% for FR-LSH cables |

Note: Fire survival cable with fire proof tape on conductor, meeting the circuit integrity test as per IEC 60331 can also be supplied.



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