

## Type P Instrument Pairs Signal Cable Individual + Overall Shield AL/PS tape (0.6/1kV) Fire Resistant



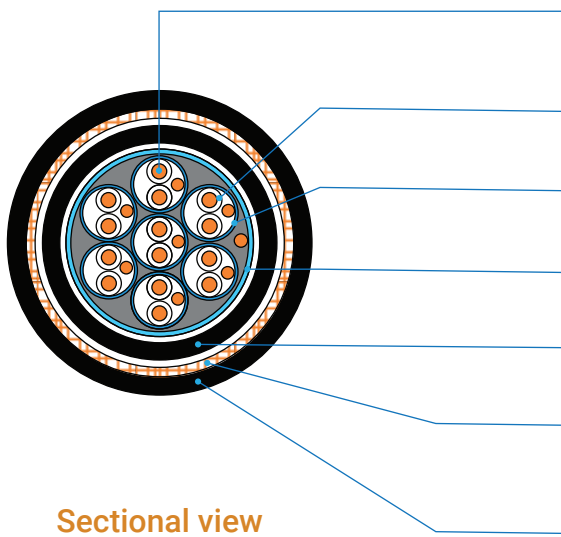
### CABLE DESIGNATION

0.6/1kV FS-TP(IS-OS)PN, FS-TP(IS-OS)PNB, FS-TP(IS-OS)PNBS

### APPLICATION STANDARD

|                     |                                                                |
|---------------------|----------------------------------------------------------------|
| Design guide        | IEEE 1580(2010) , UL 1309(2017)                                |
| Insulation material | IEEE 1580, Type P UL 1309, XI10                                |
| Sheath material     | IEEE 1580, Type N                                              |
| Flame retardant     | IEEE 1202 & IEC 60332-3 Category A                             |
| Fire resistance     | IEC 60331-21(90min),<br>IEC 60331-1,-2(120min), FS-type only   |
| Cold bend / impact  | CSA C22.2 NO. 2556(-40°C/-40°C)<br>(Formerly CSA C22.2 NO.0.3) |

## CONSTRUCTION



Sectional view

### Core identification

Colored insulation plus

Arabic number printing on the insulation

Each core color : pair \_ Black, White(or Red)

### Conductor

- Flexible stranded tinned annealed copper wires as per IEEE 1580
- A suitable separator tape(s) may be applied over the conductor

### Insulation

XLPO (Type P) as per IEEE 1580 & XLPO (XI10) as per UL 1309

### Individual shield

Polyester/aluminum tape (AL/PS tape) + Tinned copper drain wire

### Overall shield

Polyester/aluminum tape (AL/PS tape) + Tinned copper drain wire

### Jacket

Thermosetting Neoprene (Type N) as per IEEE 1580 & UL 1309

### Armor

- Braid of commercial bronze wires
- A suitable separator tape(s) may be applied under / over the armor

### Sheath

- Thermosetting Neoprene (Type N) as per IEEE 1580 & UL 1309
- Outer sheath color : Black

### Fire resisting layer(optional)

Mica/glass tape (FS Type cable only)

### Twisting

Two/Three Insulated cores shall be twisted together to form a pair / triad

### Cabling

- Individual shielded pairs / triads shall be cabled
- Flame retardant & non-hygroscopic fillers may be used
- Suitable tape(s) may be applied on the cabled core
- A Filler may be applied to obtain a circular Cable

## Type P Instrument Pairs Signal Cable Individual + Overall Shield AL/PS tape (0.6/1kV) Fire Resistant

### 0.6/1kV FS-TP(IS-OS)PN, 0.6/1kV FS-TP(IS-OS)PNB, 0.6/1kV FS-TP(IS-OS)PNBS

| No. of Pairs | Conductor    | Thickness of Insulation | Thickness of Jacket | Thickness of Sheath | Unarmor          |                | Armor            |                | Armor and Sheath |                |
|--------------|--------------|-------------------------|---------------------|---------------------|------------------|----------------|------------------|----------------|------------------|----------------|
|              | Nominal Area |                         |                     |                     | Nom.Dia. Approx. | Weight Approx. | Nom.Dia. Approx. | Weight Approx. | Nom.Dia. Approx. | Weight Approx. |
| No.          | AWG          | mm/inch                 | mm/inch             | mm/inch             | mm/inch          | kg/km          | mm/inch          | kg/km          | mm/inch          | kg/km          |
| 2 P          | 18           | 0.76/0.030              | 1.52 / 0.060        | 2.03 / 0.080        | 15.8 / 0.622     | 280            | 17.6 / 0.693     | 440            | 22.1 / 0.870     | 650            |
| 3 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 16.9 / 0.665     | 340            | 18.7 / 0.736     | 520            | 23.2 / 0.913     | 740            |
| 4 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 18.0 / 0.709     | 410            | 19.8 / 0.780     | 600            | 24.3 / 0.957     | 830            |
| 5 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 20.2 / 0.795     | 500            | 22.0 / 0.866     | 710            | 26.5 / 1.043     | 970            |
| 6 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 22.7 / 0.894     | 630            | 24.5 / 0.965     | 860            | 29.0 / 1.142     | 1,150          |
| 7 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 22.7 / 0.894     | 680            | 24.5 / 0.965     | 910            | 29.0 / 1.142     | 1,190          |
| 8 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 24.2 / 0.953     | 760            | 26.0 / 1.024     | 1,010          | 30.5 / 1.201     | 1,310          |
| 10 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 27.3 / 1.075     | 930            | 29.1 / 1.146     | 1,210          | 33.6 / 1.323     | 1,540          |
| 12 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 28.4 / 1.118     | 1,050          | 30.2 / 1.189     | 1,340          | 34.7 / 1.366     | 1,680          |
| 14 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 29.5 / 1.161     | 1,170          | 31.3 / 1.232     | 1,470          | 35.8 / 1.409     | 1,830          |
| 16 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 31.7 / 1.248     | 1,330          | 33.5 / 1.319     | 1,650          | 38.0 / 1.496     | 2,030          |
| 18 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 33.2 / 1.307     | 1,470          | 35.0 / 1.378     | 1,800          | 39.5 / 1.555     | 2,200          |
| 20 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 33.9 / 1.335     | 1,580          | 35.7 / 1.406     | 1,920          | 40.2 / 1.583     | 2,320          |
| 24 P         |              |                         | 2.03 / 0.080        | 2.79 / 0.110        | 37.5 / 1.476     | 1,880          | 39.3 / 1.547     | 2,260          | 45.3 / 1.783     | 2,860          |
| 2 P          | 16           | 0.76/0.030              | 1.52 / 0.060        | 2.03 / 0.080        | 16.4 / 0.646     | 320            | 18.2 / 0.717     | 480            | 22.7 / 0.894     | 700            |
| 3 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 17.5 / 0.689     | 390            | 19.3 / 0.760     | 570            | 23.8 / 0.937     | 800            |
| 4 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 18.7 / 0.736     | 470            | 20.5 / 0.807     | 660            | 25.0 / 0.984     | 900            |
| 5 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 22.1 / 0.870     | 630            | 23.9 / 0.941     | 860            | 28.4 / 1.118     | 1,130          |
| 6 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 23.6 / 0.929     | 720            | 25.4 / 1.000     | 960            | 29.9 / 1.177     | 1,260          |
| 7 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 23.6 / 0.929     | 780            | 25.4 / 1.000     | 1,020          | 29.9 / 1.177     | 1,310          |
| 8 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 25.3 / 0.996     | 870            | 27.1 / 1.067     | 1,130          | 31.6 / 1.244     | 1,440          |
| 10 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 28.4 / 1.118     | 1,070          | 30.2 / 1.189     | 1,360          | 34.7 / 1.366     | 1,710          |
| 12 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 29.5 / 1.161     | 1,210          | 31.3 / 1.232     | 1,510          | 35.8 / 1.409     | 1,870          |
| 14 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 30.7 / 1.209     | 1,360          | 32.5 / 1.280     | 1,670          | 37.0 / 1.457     | 2,040          |
| 16 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 32.9 / 1.295     | 1,540          | 34.7 / 1.366     | 1,870          | 39.2 / 1.543     | 2,270          |
| 18 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 34.5 / 1.358     | 1,700          | 36.3 / 1.429     | 2,050          | 40.8 / 1.606     | 2,460          |
| 20 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 35.2 / 1.386     | 1,840          | 37.0 / 1.457     | 2,190          | 41.5 / 1.634     | 2,610          |
| 24 P         |              |                         | 2.03 / 0.080        | 2.79 / 0.110        | 39.1 / 1.539     | 2,200          | 40.9 / 1.610     | 2,590          | 46.9 / 1.846     | 3,220          |
| 2 P          | 14           | 0.76/0.030              | 1.52 / 0.060        | 2.03 / 0.080        | 17.6 / 0.693     | 390            | 19.4 / 0.764     | 570            | 23.9 / 0.941     | 800            |
| 3 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 18.9 / 0.744     | 490            | 20.7 / 0.815     | 690            | 25.2 / 0.992     | 930            |
| 4 P          |              |                         | 1.52 / 0.060        | 2.03 / 0.080        | 20.1 / 0.791     | 600            | 21.9 / 0.862     | 800            | 26.4 / 1.039     | 1,060          |
| 5 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 23.7 / 0.933     | 790            | 25.5 / 1.004     | 1,030          | 30.0 / 1.181     | 1,330          |
| 6 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 25.6 / 1.008     | 920            | 27.4 / 1.079     | 1,180          | 31.9 / 1.256     | 1,490          |
| 7 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 25.6 / 1.008     | 990            | 27.4 / 1.079     | 1,250          | 31.9 / 1.256     | 1,570          |
| 8 P          |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 27.3 / 1.075     | 1,120          | 29.1 / 1.146     | 1,400          | 33.6 / 1.323     | 1,730          |
| 10 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 30.6 / 1.205     | 1,370          | 32.4 / 1.276     | 1,680          | 36.9 / 1.453     | 2,050          |
| 12 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 31.9 / 1.256     | 1,570          | 33.7 / 1.327     | 1,890          | 38.2 / 1.504     | 2,270          |
| 14 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 33.1 / 1.303     | 1,760          | 34.9 / 1.374     | 2,100          | 39.4 / 1.551     | 2,490          |
| 16 P         |              |                         | 2.03 / 0.080        | 2.03 / 0.080        | 35.6 / 1.402     | 2,000          | 37.4 / 1.472     | 2,360          | 41.9 / 1.650     | 2,780          |
| 18 P         |              |                         | 2.03 / 0.080        | 2.79 / 0.110        | 37.3 / 1.469     | 2,220          | 39.1 / 1.539     | 2,590          | 45.1 / 1.776     | 3,190          |
| 20 P         |              |                         | 2.03 / 0.080        | 2.79 / 0.110        | 38.1 / 1.500     | 2,400          | 39.9 / 1.571     | 2,780          | 45.9 / 1.807     | 3,390          |
| 24 P         |              |                         | 2.03 / 0.080        | 2.79 / 0.110        | 42.3 / 1.665     | 2,870          | 44.1 / 1.736     | 3,300          | 50.1 / 1.972     | 3,970          |

**Note.** For outer diameter, it is applied to  $\pm 5\%$  manufacturing tolerance.