

Application

Type P instrumentation cable with individually shielded pairs is a flexible offshore and marine instrumentation cable to IEEE 1580, dual certified to UL 1309 / CSA 245 as Type X110 and rated 0.6/1 kV at +110 °C. Each pair of soft annealed, flexible stranded tinned copper conductors with XLPO insulation is twisted with a bare tinned drain wire and shielded with a polyester-backed aluminium foil, under a black arctic-grade thermosetting jacket. It is designed for the demanding environments of offshore drilling and energy production facilities: the high strand count makes the cable flexible, easy to install and resistant to vibration. It is available unarmoured, armoured with a bronze basket-weave braid (B) or armoured and sheathed (BS); only the armoured and sheathed construction is suitable for Class I Division 1 and Zone 1. Individually shielded triads are covered on a separate sheet.



CONSTRUCTION

Conductor	Soft annealed flexible stranded tinned copper acc. to IEEE 1580 Table 11; 19 strands in 18, 16 and 14 AWG.
Insulation	Cross-linked, flame-retardant polyolefin (XLPO), meeting the requirements for Type P of IEEE 1580 and Type X110 of UL 1309 / CSA 245.
Pairs	Each pair twisted with a bare tinned copper drain wire and shielded with polyester-backed aluminium foil tape, 100 % coverage. Pair-to-pair isolation plus an overall shield is provided.
Core identification	Each pair black/white.
Jacket	Black, arctic-grade, flame-retardant thermosetting compound, resistant to oil, abrasion, chemicals and sunlight, meeting UL 1309 / CSA 245 and IEEE 1580. Blue jacket or blue stripe for intrinsically safe circuits on request.
Armour (B and BS)	Basket-weave wire armour acc. to IEEE 1580 and UL 1309 / CSA 245; bronze as standard, tinned copper on request.
Sheath (BS)	Black, arctic-grade, flame-retardant thermosetting compound over the armour, resistant to oil, drilling mud, abrasion, chemicals and sunlight, meeting UL 1309 / CSA 245 and IEEE 1580. A sheath resistant to ester-based drilling mud acc. to NEK 606 is available.

ELECTRICAL & THERMAL PROPERTIES

Rated voltage Uo/U	0.6/1 kV.
Standard	IEEE 1580 Type P; UL 1309 / CSA 245 Type X110; conductors acc. to IEEE 1580 Table 11.
Max. conductor temperature	+110 °C.
Classification society ratings	ABS +100 °C, DNV +95 °C, Lloyd's Register +95 °C, Transport Canada +95 °C.
Cold durability	Exceeds the CSA cold bend and cold impact tests (-40 °C / -35 °C).
Flame-retardant	Acc. to IEC 60332-3 Category A and IEEE 1202.
Hazardous areas	Suitable for use in Class I Division 1 and Zone 1 environments in the armoured and sheathed (BS) construction only. NEC Article 337 additionally requires termination with fittings listed for the location.
Approvals	American Bureau of Shipping (ABS); Det Norske Veritas (DNV); Lloyd's Register of Shipping (LRS); Transport Canada; United States Coast Guard; UL listed as marine shipboard cable; CSA listed as marine shipboard cable.
Reaction to fire (CPR)	Outside the scope of EN 50575 (shipboard / offshore cable; not a construction product for permanent installation in construction works).

INSTALLATION DATA

Min. bending radius, unarmoured	6 × outer diameter (IEEE 45).
Min. bending radius, armoured (B)	8 × outer diameter (IEEE 45).
Min. bending radius, armoured and sheathed (BS)	8 × outer diameter (IEEE 45 and IEC 60092).

DIMENSIONS & TECHNICAL DATA

Elements × size: number of pairs × 2 conductors × conductor size. Three constructions: unarmoured, armoured (B, bronze braid as outer layer) and armoured and sheathed (BS, bronze braid with an overall sheath).

Elements × size	Unarmoured Ø (mm)	Unarmoured (kg/km)	Armoured (B) Ø (mm)	Armoured (B) (kg/km)	Armoured and sheathed (BS) Ø (mm)	Armoured and sheathed (BS) (kg/km)
1 × 2 × 18 AWG	8.5	85	9.8	222	13.6	225
2 × 2 × 18 AWG	13.2	208	14.4	332	18.3	438
3 × 2 × 18 AWG	14.8	263	16.0	402	19.8	740
4 × 2 × 18 AWG	15.9	315	17.1	603	20.8	830
5 × 2 × 18 AWG	16.9	382	18.2	534	22.6	752
7 × 2 × 18 AWG	19.3	455	20.6	641	25.8	881
8 × 2 × 18 AWG	19.9	509	21.1	696	26.1	903
10 × 2 × 18 AWG	24.5	696	25.8	930	30.9	1518
12 × 2 × 18 AWG	25.1	793	26.4	1030	32.0	1621
16 × 2 × 18 AWG	27.8	984	29.0	1255	34.0	1972
18 × 2 × 18 AWG	31.2	1155	32.5	1448	37.8	1810
24 × 2 × 18 AWG	36.6	1426	37.9	1777	44.7	2327
1 × 2 × 16 AWG	9.0	101	10.3	246	14.2	247
2 × 2 × 16 AWG	14.8	283	16.1	420	20.0	746
3 × 2 × 16 AWG	16.0	327	17.3	476	22.2	830
4 × 2 × 16 AWG	16.5	369	17.7	515	22.7	999
5 × 2 × 16 AWG	18.2	445	19.4	625	23.7	805
7 × 2 × 16 AWG	20.6	543	21.8	735	26.3	949
8 × 2 × 16 AWG	22.5	667	23.7	877	28.3	1077
10 × 2 × 16 AWG	26.2	1135	27.4	1095	32.7	1819
12 × 2 × 16 AWG	27.1	939	28.3	1202	33.3	1509
16 × 2 × 16 AWG	29.8	1199	31.1	1561	35.5	1841
18 × 2 × 16 AWG	32.0	1341	33.2	1655	38.2	1960
20 × 2 × 16 AWG	33.4	1505	34.7	1819	40.2	2174
24 × 2 × 16 AWG	37.4	1667	38.7	2025	44.6	2508
1 × 2 × 14 AWG	9.8	129	11.1	222	15.0	287
2 × 2 × 14 AWG	16.1	393	17.4	543	22.3	808
3 × 2 × 14 AWG	17.0	518	18.3	558	20.6	667
4 × 2 × 14 AWG	18.7	482	20.0	655	25.2	1189
5 × 2 × 14 AWG	19.6	583	20.9	766	26.2	1009
7 × 2 × 14 AWG	23.6	786	24.9	1006	30.1	1289
8 × 2 × 14 AWG	24.3	816	25.6	1095	30.0	1356
10 × 2 × 14 AWG	28.4	1051	29.6	1319	34.3	1603
12 × 2 × 14 AWG	30.6	1266	31.9	1543	36.8	1897

Electrical values per conductor size

Size	Equivalent c.s.a. (mm ²)	No. of strands	Cond. R @20°C (Ω/km)	Capacitance (nF/km)	Inductance (mH/km)
18 AWG	0.96	19	23.7	91.9	0.722
16 AWG	1.32	19	14.8	105.0	0.656
14 AWG	2.08	19	9.35	121.4	0.623

Outer diameters and weights are nominal manufacturer values and are subject to a ±5 % manufacturing tolerance. The equivalent c.s.a. per size is the manufacturer's value for its stranded conductor, not the nominal AWG cross-section (18 AWG: 19 strands of 0.0100 inch, 0.96 mm²; nominal 0.82 mm²). In several sizes the diameters or weights do not rise with the number of pairs (for example 5 × 2 × 16 AWG BS is lighter than 4 × 2, and 3 × 2 × 14 AWG BS thinner and lighter than 2 × 2); these figures are reproduced as published. All values are indicative and non-binding.