

FRHF-IXOSA 150/250V(300V)

Halogen free low smoke fire resistant instrumentation, control and telecommunication cable



Type Approval Certificates

- American Bureau of Shipping
- Bureau Veritas
- China Classification Society
- Det Norske Veritas
- Germanischer Lloyd
- Korean Register
- Lloyd's Register
- Nippon Kaiji Kyokai
- Registro Italiano Navale

Application

Fire resistant cables, designed for interconnection of all sorts of instrumentation and communication equipment including telephone equipments



Conductors

circular stranded copper class 2 acc. to IEC 60228

Fire Resistant Layer

mica tape

Insulation

cross-linked polyethylene HF XLPE-90°C acc. to IEC 60092-351

Filler

polypropylene yarn

Inner Covering

polyester tape

Screen/Armour

copper wire braiding as armour and shielding to achieve better EMI (Electro Magnetic Interference) performance

Outer Sheath

thermoplastic polyolefine halogen-free compound type SHF1 acc. to IEC 60092-359

Color of Outer Sheath

orange
(optional: blue color for intrinsically safe application)

Core Identification

- starting pair : red, white
- reference pair : blue, white
- uneven pair : black, white
- even pair : yellow, white

- Maximum conductor operating temperature : +90°C
- Lowest ambient temperature for fixed installation : -40°C
- Lowest installation temperature : -15°C
- Maximum short-circuit conductor temperature : +250°C
- Minimum bending radius : 6D (D is the overall diameter of the cable)

Test Performances

- Fire resistant : IEC 60331-1 (D >20mm²), IEC 60331-2 or IEC 60331-21 (D ≤20mm²)
- Flame retardant : IEC 60332-3-22 Category A
- Smoke emission : IEC 61034-2: transmittance values >60%
- Gases evolved during combustion : IEC 60754-1: <0,5% acid gas
IEC 60754-2: pH ≥4,3; conductivity ≤10 μSmm⁻¹

Standards

- Construction and Design : IEC 60228, IEC 60092-350, IEC 60092-376
- Materials : IEC 60092-351, IEC 60092-359



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No. of Pairs/Triples	Conductor Size	Nominal Outer Diameter	Maximum Conductor Resistance	Voltage Test (A.C)	Minimum Insulation Resistance	Approx. Cable Weight
No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩkm-20°C	kg/km
1 x 2	0.75	9.7	26.0	1.5	850	120
1 x *4	0.75	11.3	26.0	1.5	850	140
3 x *4	0.75	19.8	26.0	1.5	850	425
2 x 2	0.75	14.3	26.0	1.5	850	210
3 x 2	0.75	15.2	26.0	1.5	850	270
4 x 2	0.75	16.6	26.0	1.5	850	320
5 x 2	0.75	18.2	26.0	1.5	850	380
6 x 2	0.75	19.8	26.0	1.5	850	430
7 x 2	0.75	19.9	26.0	1.5	850	460
8 x 2	0.75	21.4	26.0	1.5	850	505
9 x 2	0.75	23.2	26.0	1.5	850	560
10 x 2	0.75	25.3	26.0	1.5	850	630
12 x 2	0.75	26.2	26.0	1.5	850	700
14 x 2	0.75	27.5	26.0	1.5	850	780
15 x 2	0.75	28.4	26.0	1.5	850	820
16 x 2	0.75	29.1	26.0	1.5	850	870
19 x 2	0.75	30.9	26.0	1.5	850	1005
20 x 2	0.75	31.7	26.0	1.5	850	1050
23 x 2	0.75	34.2	26.0	1.5	850	1180
24 x 2	0.75	36.7	26.0	1.5	850	1210
27 x 2	0.75	37.6	26.0	1.5	850	1320
30 x 2	0.75	38.9	26.0	1.5	850	1460
32 x 2	0.75	39.8	26.0	1.5	850	1520
33 x 2	0.75	40.5	26.0	1.5	850	1570
37 x 2	0.75	42.0	26.0	1.5	850	1670
44 x 2	0.75	47.4	26.0	1.5	850	2060
1 x 3	0.75	10.2	26.0	1.5	850	130
2 x 3	0.75	15.8	26.0	1.5	850	300
3 x 3	0.75	16.9	26.0	1.5	850	350
4 x 3	0.75	18.4	26.0	1.5	850	420
5 x 3	0.75	20.3	26.0	1.5	850	500
6 x 3	0.75	22.1	26.0	1.5	850	570
7 x 3	0.75	22.2	26.0	1.5	850	590
8 x 3	0.75	24.0	26.0	1.5	850	670
9 x 3	0.75	26.1	26.0	1.5	850	760
10 x 3	0.75	28.4	26.0	1.5	850	880
12 x 3	0.75	29.5	26.0	1.5	850	970
14 x 3	0.75	31.0	26.0	1.5	850	1060
15 x 3	0.75	31.9	26.0	1.5	850	1140
16 x 3	0.75	32.8	26.0	1.5	850	1200
19 x 3	0.75	34.8	26.0	1.5	850	1350
20 x 3	0.75	35.8	26.0	1.5	850	1360
23 x 3	0.75	39.0	26.0	1.5	850	1720
24 x 3	0.75	41.4	26.0	1.5	850	1870
27 x 3	0.75	42.4	26.0	1.5	850	1990
30 x 3	0.75	43.9	26.0	1.5	850	2130
32 x 3	0.75	44.9	26.0	1.5	850	2230
33 x 3	0.75	45.7	26.0	1.5	850	2300
37 x 3	0.75	47.7	26.0	1.5	850	2510
44 x 3	0.75	53.9	26.0	1.5	850	3080

* Number of cores



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No. of Pairs/Triples	Conductor Size	Nominal Outer Diameter	Maximum Conductor Resistance	Voltage Test (A.C)	Minimum Insulation Resistance	Approx. Cable Weight
No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩ-km-20°C	kg/km
1 x 2	1.0	10.1	18.8	1.5	850	136
1 x *4	1.0	11.4	18.8	1.5	850	240
2 x 2	1.0	14.9	18.8	1.5	850	260
3 x 2	1.0	15.9	18.8	1.5	850	320
4 x 2	1.0	17.3	18.8	1.5	850	360
5 x 2	1.0	19.1	18.8	1.5	850	420
6 x 2	1.0	20.7	18.8	1.5	850	480
7 x 2	1.0	20.8	18.8	1.5	850	520
8 x 2	1.0	22.5	18.8	1.5	850	575
9 x 2	1.0	24.4	18.8	1.5	850	620
10 x 2	1.0	26.5	18.8	1.5	850	695
12 x 2	1.0	27.6	18.8	1.5	850	810
14 x 2	1.0	29.0	18.8	1.5	850	890
15 x 2	1.0	29.8	18.8	1.5	850	950
16 x 2	1.0	30.6	18.8	1.5	850	990
19 x 2	1.0	32.5	18.8	1.5	850	1225
20 x 2	1.0	33.4	18.8	1.5	850	1270
23 x 2	1.0	36.5	18.8	1.5	850	1480
24 x 2	1.0	38.6	18.8	1.5	850	1530
27 x 2	1.0	39.6	18.8	1.5	850	1630
30 x 2	1.0	41.0	18.8	1.5	850	1770
32 x 2	1.0	41.9	18.8	1.5	850	1850
33 x 2	1.0	42.7	18.8	1.5	850	1900
37 x 2	1.0	44.5	18.8	1.5	850	2070
44 x 2	1.0	50.2	18.8	1.5	850	2540
1 x 3	1.0	10.6	18.8	1.5	850	150
2 x 3	1.0	16.6	18.8	1.5	850	330
3 x 3	1.0	17.7	18.8	1.5	850	420
4 x 3	1.0	19.3	18.8	1.5	850	470
5 x 3	1.0	21.3	18.8	1.5	850	560
6 x 3	1.0	23.2	18.8	1.5	850	640
7 x 3	1.0	23.3	18.8	1.5	850	680
8 x 3	1.0	25.2	18.8	1.5	850	760
9 x 3	1.0	27.4	18.8	1.5	850	870
10 x 3	1.0	29.9	18.8	1.5	850	1010
12 x 3	1.0	31.0	18.8	1.5	850	1110
14 x 3	1.0	32.6	18.8	1.5	850	1230
15 x 3	1.0	33.6	18.8	1.5	850	1320
16 x 3	1.0	34.5	18.8	1.5	850	1380
19 x 3	1.0	37.0	18.8	1.5	850	1660
20 x 3	1.0	38.1	18.8	1.5	850	1730
23 x 3	1.0	41.1	18.8	1.5	850	1990
24 x 3	1.0	43.6	18.8	1.5	850	2150
27 x 3	1.0	44.7	18.8	1.5	850	2300
30 x 3	1.0	46.3	18.8	1.5	850	2470
32 x 3	1.0	47.3	18.8	1.5	850	2590
33 x 3	1.0	48.2	18.8	1.5	850	2670
37 x 3	1.0	50.1	18.8	1.5	850	2890
44 x 3	1.0	56.6	18.8	1.5	850	3550

* Number of cores



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No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩ-km-20°C	kg/km
1 x 2	1.5	11.1	12.8	1.5	850	145
1 x *4	1.5	12.7	12.8	1.5	850	310
2 x 2	1.5	16.7	12.8	1.5	850	320
3 x 2	1.5	17.8	12.8	1.5	850	390
4 x 2	1.5	19.4	12.8	1.5	850	430
5 x 2	1.5	21.4	12.8	1.5	850	500
6 x 2	1.5	23.3	12.8	1.5	850	560
7 x 2	1.5	23.4	12.8	1.5	850	585
8 x 2	1.5	25.4	12.8	1.5	850	645
9 x 2	1.5	27.5	12.8	1.5	850	710
10 x 2	1.5	30.0	12.8	1.5	850	785
12 x 2	1.5	31.2	12.8	1.5	850	960
14 x 2	1.5	32.8	12.8	1.5	850	1100
15 x 2	1.5	33.8	12.8	1.5	850	1170
16 x 2	1.5	34.7	12.8	1.5	850	1270
19 x 2	1.5	37.2	12.8	1.5	850	1395
20 x 2	1.5	38.3	12.8	1.5	850	1440
23 x 2	1.5	41.3	12.8	1.5	850	1790
24 x 2	1.5	43.8	12.8	1.5	850	1970
27 x 2	1.5	45.0	12.8	1.5	850	2100
30 x 2	1.5	46.6	12.8	1.5	850	2290
32 x 2	1.5	47.6	12.8	1.5	850	2400
33 x 2	1.5	48.5	12.8	1.5	850	2460
37 x 2	1.5	50.6	12.8	1.5	850	2690
44 x 2	1.5	57.2	12.8	1.5	850	3320
1 x 3	1.5	11.8	12.8	1.5	850	180
2 x 3	1.5	18.6	12.8	1.5	850	400
3 x 3	1.5	19.9	12.8	1.5	850	530
4 x 3	1.5	21.7	12.8	1.5	850	580
5 x 3	1.5	24.0	12.8	1.5	850	710
6 x 3	1.5	26.2	12.8	1.5	850	820
7 x 3	1.5	26.3	12.8	1.5	850	860
8 x 3	1.5	28.5	12.8	1.5	850	980
9 x 3	1.5	31.0	12.8	1.5	850	1120
10 x 3	1.5	33.8	12.8	1.5	850	1300
12 x 3	1.5	35.1	12.8	1.5	850	1440
14 x 3	1.5	37.4	12.8	1.5	850	1680
15 x 3	1.5	38.5	12.8	1.5	850	1790
16 x 3	1.5	39.6	12.8	1.5	850	1870
19 x 3	1.5	42.0	12.8	1.5	850	2140
20 x 3	1.5	43.2	12.8	1.5	850	2240
23 x 3	1.5	46.7	12.8	1.5	850	2580
24 x 3	1.5	49.5	12.8	1.5	850	2800
27 x 3	1.5	50.8	12.8	1.5	850	3010
30 x 3	1.5	52.7	12.8	1.5	850	3240
32 x 3	1.5	53.8	12.8	1.5	850	3400
33 x 3	1.5	54.8	12.8	1.5	850	3500
37 x 3	1.5	57.0	12.8	1.5	850	3800
44 x 3	1.5	64.5	12.8	1.5	850	4690

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No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩ-km-20°C	kg/km
1 x 2	2.5	12.1	7.86	1.5	850	180
2 x 2	2.5	18.3	7.86	1.5	850	390
3 x 2	2.5	19.5	7.86	1.5	850	510
4 x 2	2.5	21.4	7.86	1.5	850	560
5 x 2	2.5	23.6	7.86	1.5	850	670
6 x 2	2.5	25.8	7.86	1.5	850	780
7 x 2	2.5	25.9	7.86	1.5	850	820
8 x 2	2.5	28.0	7.86	1.5	850	930
9 x 2	2.5	30.5	7.86	1.5	850	1070
10 x 2	2.5	33.2	7.86	1.5	850	1230
12 x 2	2.5	34.5	7.86	1.5	850	1360
14 x 2	2.5	36.8	7.86	1.5	850	1630
15 x 2	2.5	37.9	7.86	1.5	850	1720
16 x 2	2.5	38.9	7.86	1.5	850	1810
19 x 2	2.5	41.3	7.86	1.5	850	2030
20 x 2	2.5	42.5	7.86	1.5	850	2130
23 x 2	2.5	45.9	7.86	1.5	850	2450
24 x 2	2.5	48.6	7.86	1.5	850	2650
27 x 2	2.5	49.9	7.86	1.5	850	2850
30 x 2	2.5	51.7	7.86	1.5	850	3060
32 x 2	2.5	52.9	7.86	1.5	850	3220
33 x 2	2.5	53.9	7.86	1.5	850	3310
37 x 2	2.5	56.2	7.86	1.5	850	3630
44 x 2	2.5	63.6	7.86	1.5	850	4470
1 x 3	2.5	12.8	7.86	1.5	850	230
2 x 3	2.5	20.4	7.86	1.5	850	520
3 x 3	2.5	21.8	7.86	1.5	850	690
4 x 3	2.5	23.9	7.86	1.5	850	750
5 x 3	2.5	26.5	7.86	1.5	850	920
6 x 3	2.5	29.0	7.86	1.5	850	1080
7 x 3	2.5	29.1	7.86	1.5	850	1150
8 x 3	2.5	31.6	7.86	1.5	850	1330
9 x 3	2.5	34.3	7.86	1.5	850	1520
10 x 3	2.5	37.9	7.86	1.5	850	1840
12 x 3	2.5	39.4	7.86	1.5	850	2050
14 x 3	2.5	41.5	7.86	1.5	850	2280
15 x 3	2.5	42.7	7.86	1.5	850	2420
16 x 3	2.5	43.9	7.86	1.5	850	2540
19 x 3	2.5	46.6	7.86	1.5	850	2890
20 x 3	2.5	48.0	7.86	1.5	850	3030
23 x 3	2.5	51.8	7.86	1.5	850	3480
24 x 3	2.5	55.0	7.86	1.5	850	3760
27 x 3	2.5	56.5	7.86	1.5	850	4060
30 x 3	2.5	58.6	7.86	1.5	850	4390
32 x 3	2.5	59.8	7.86	1.5	850	4620
33 x 3	2.5	61.0	7.86	1.5	850	4770
37 x 3	2.5	63.4	7.86	1.5	850	5200
44 x 3	2.5	71.8	7.86	1.5	850	6370



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No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩ-km-20°C	kg/km
2	0.75	9.6	26.0	1.5	850	150
3	0.75	10.1	26.0	1.5	850	190
4	0.75	10.9	26.0	1.5	850	230
5	0.75	11.9	26.0	1.5	850	250
6	0.75	12.9	26.0	1.5	850	300
7	0.75	12.9	26.0	1.5	850	320
8	0.75	14.3	26.0	1.5	850	420
9	0.75	15.3	26.0	1.5	850	470
10	0.75	16.6	26.0	1.5	850	520
12	0.75	17.1	26.0	1.5	850	580
14	0.75	18.0	26.0	1.5	850	650
15	0.75	18.4	26.0	1.5	850	690
16	0.75	18.9	26.0	1.5	850	730
19	0.75	19.9	26.0	1.5	850	830
20	0.75	20.5	26.0	1.5	850	870
23	0.75	21.9	26.0	1.5	850	990
24	0.75	23.2	26.0	1.5	850	1060
27	0.75	23.6	26.0	1.5	850	1140
30	0.75	24.6	26.0	1.5	850	1250
32	0.75	25.0	26.0	1.5	850	1320
33	0.75	25.5	26.0	1.5	850	1360
37	0.75	26.5	26.0	1.5	850	1480
44	0.75	29.6	26.0	1.5	850	1770
2	1.0	10.0	18.8	1.5	850	170
3	1.0	10.5	18.8	1.5	850	230
4	1.0	11.4	18.8	1.5	850	240
5	1.0	12.4	18.8	1.5	850	290
6	1.0	13.5	18.8	1.5	850	340
7	1.0	13.5	18.8	1.5	850	370
8	1.0	15.0	18.8	1.5	850	480
9	1.0	16.0	18.8	1.5	850	540
10	1.0	17.4	18.8	1.5	850	610
12	1.0	17.9	18.8	1.5	850	680
14	1.0	18.8	18.8	1.5	850	770
15	1.0	19.3	18.8	1.5	850	810
16	1.0	19.8	18.8	1.5	850	860
19	1.0	20.9	18.8	1.5	850	980
20	1.0	21.5	18.8	1.5	850	1030
23	1.0	23.0	18.8	1.5	850	1160
24	1.0	24.4	18.8	1.5	850	1240
27	1.0	24.8	18.8	1.5	850	1360
30	1.0	25.8	18.8	1.5	850	1480
32	1.0	26.3	18.8	1.5	850	1560
33	1.0	26.8	18.8	1.5	850	1610
37	1.0	27.9	18.8	1.5	850	1760
44	1.0	31.2	18.8	1.5	850	2060



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No. of Cores	Conductor Size	Nominal Outer Diameter	Maximum Conductor Resistance	Voltage Test (A.C)	Minimum Insulation Resistance	Approx. Cable Weight
No.s	mm ²	mm	Ω/km-20°C	kV/5min	MΩkm-20°C	kg/km
2	1.5	11.0	12.1	1.5	850	210
3	1.5	11.6	12.1	1.5	850	280
4	1.5	12.7	12.1	1.5	850	310
5	1.5	14.3	12.1	1.5	850	440
6	1.5	15.5	12.1	1.5	850	510
7	1.5	15.5	12.1	1.5	850	550
8	1.5	16.7	12.1	1.5	850	630
9	1.5	17.9	12.1	1.5	850	700
10	1.5	19.5	12.1	1.5	850	790
12	1.5	20.1	12.1	1.5	850	880
14	1.5	21.2	12.1	1.5	850	1000
15	1.5	21.7	12.1	1.5	850	1060
16	1.5	22.3	12.1	1.5	850	1120
19	1.5	23.5	12.1	1.5	850	1300
20	1.5	24.2	12.1	1.5	850	1360
23	1.5	26.0	12.1	1.5	850	1550
24	1.5	27.6	12.1	1.5	850	1650
27	1.5	28.1	12.1	1.5	850	1790
30	1.5	29.2	12.1	1.5	850	1920
32	1.5	29.8	12.1	1.5	850	2020
33	1.5	30.4	12.1	1.5	850	2090
37	1.5	31.6	12.1	1.5	850	2300
44	1.5	35.4	12.1	1.5	850	2760
2	2.5	12.0	7.86	1.5	850	260
3	2.5	12.7	7.86	1.5	850	370
4	2.5	14.3	7.86	1.5	850	470
5	2.5	15.6	7.86	1.5	850	570
6	2.5	17.0	7.86	1.5	850	670
7	2.5	17.0	7.86	1.5	850	730
8	2.5	18.3	7.86	1.5	850	830
9	2.5	19.7	7.86	1.5	850	930
10	2.5	21.5	7.86	1.5	850	1050
12	2.5	22.2	7.86	1.5	850	1190
14	2.5	23.3	7.86	1.5	850	1360
15	2.5	23.9	7.86	1.5	850	1440
16	2.5	24.6	7.86	1.5	850	1520
19	2.5	26.0	7.86	1.5	850	1770
20	2.5	26.8	7.86	1.5	850	1860
23	2.5	28.8	7.86	1.5	850	2080
24	2.5	30.5	7.86	1.5	850	2220
27	2.5	31.1	7.86	1.5	850	2420
30	2.5	32.4	7.86	1.5	850	2660
32	2.5	33.0	7.86	1.5	850	2810
33	2.5	33.7	7.86	1.5	850	2900
37	2.5	35.0	7.86	1.5	850	3200
44	2.5	39.7	7.86	1.5	850	4010