

eXtended Fire Resistant, instrumentation cable BFOU-XFR(i) 150/250(300)V



eXtended Fire Resistant, flame retardant
halogen-free instrumentation cable. Mud
resistant

BFOU-XFR(i) 150/250(300)V MGT/EPR/EPR/TCWB/EVA

Operating temperature

: 90°C

Operating Voltage

: 150/250(300)V

Application

Fixed installation for instrumentation, communication, control and alarm systems in both EX- and safe areas, emergency and critical systems where requirement for fire resistance exists. Meets the mud resistant requirements in NEK TS 606:2009.

Cables have extended fire resistant (XFR) properties to IEC 60331-1&2 including water spray according to EN 50200 Annex E (90 minutes).

Standards applied

IEC 60092-376 (2003-05)

IEC 60228 class 2

IEC 60092-360

IEC 60092-360

IEC 60332-1-2

IEC 60332-3-22

IEC 60331-1,-2

EN 50200:2006 Annex E

IEC 60754-1,2

IEC 61034-1,2

- Design

- Conductor

- Insulation

- Sheath

- Flame Retardant

- Flame Retardant

- Fire Resistant

- Halogen Free

- Low Smoke

Construction

	Code Letter	
Conductor		Tinned annealed stranded circular copper (STCC), IEC 60228 class 2
Insulation	B	Mica-tape + EP-rubber, IEC 60092-360 (EPR)
Pair / Triple / Quad twisting		Color coded cores twisted together. Pairs/Triples are screened by copper backed polyester tape with tinned copper drain wire. Each pair/triple is wrapped with polyester tape to prevent electrical contact with adjacent pairs/triples. Pairs/triples are identified by numbered tape or by numbers printed directly on the insulated conductors.
Lay up / Shielding		Individually shielded pairs/triples/quads are laid up in concentric layers and wrapped with a PETP tape.
Inner covering	F	Flame retardant and halogen-free thermoplastic compound
Tape over inner covering		PET tape
Armour/screen	O	Tinned annealed copper wire braid
Tape over armour/screen		PET tape
Outer sheath	U	Flame retardant, halogen-free and mud resistant thermoset compound, SHF2 (IEC 60092-360)
Marking text		Eg. "meter" "year" DRAKA 01 BFOU-XFR(I) 250V 4PAIR 1.5mm ² FLEX - FLAME IEC 60092-376 EN 50200:2006 Annex E IEC 60331-1*) or IEC 60331-2*) IEC 60332-3-22
Manufacturing unit		DRAKA 01 = Draka Norsk Kabel
Outer sheath colour		Grey or Blue

*) IEC 60331-1 for cables with an overall diameter exceeding 20 mm and IEC 60331-2 for cables with an overall diameter not exceeding 20 mm

Core identification instrumentation cables

Pair - Black - Light Blue

Triple - Black - Light Blue - Brown

Quad - Black - Light Blue - Brown - Grey

Range and dimensions

Number of elements	No of cores in element	Cross section core, mm ²	Conductor Diameter, mm	Insulation Thickness, mm	Thickness Inner covering, mm	Diameter inner covering, mm	Diameter Braid Wire, mm	Mechanical cross-section of the braid, mm ²	Thickness Outer Sheath, mm	Diameter outer sheath, mm	Weight of Cable Approx. (Kg/Km)	Copper content Approx. (kg/km)
1	2	0.75	1.1	1	1.1	9.5 ± 0.5	0.2	5.3	1.1	12.5 ± 0.8	265	69
1	2	0.75	1.1	1	1.1	9.5 ± 0.5	0.2	5.3	1.1	12.5 ± 0.8	265	69
2	2	0.75	1.1	1	1.1	14.5 ± 0.8	0.3	11.9	1.3	18 ± 0.8	470	150
2	2	0.75	1.1	1	1.1	14.5 ± 0.8	0.3	11.9	1.3	18 ± 0.8	470	150
4	2	0.75	1.1	1	1.1	17 ± 0.8	0.3	13.6	1.4	21 ± 1	650	200
4	2	0.75	1.1	1	1.1	17 ± 0.8	0.3	13.6	1.4	21 ± 1	650	200
8	2	0.75	1.1	1	1.1	23.5 ± 1	0.3	17.8	1.6	27.5 ± 1	1060	308
8	2	0.75	1.1	1	1.1	23.5 ± 1	0.3	17.8	1.6	27.5 ± 1	1060	308
12	2	0.75	1.1	1	1.4	28 ± 1	0.3	20.4	1.7	32.5 ± 1.5	1450	400
12	2	0.75	1.1	1	1.4	28 ± 1	0.3	20.4	1.7	32.5 ± 1.5	1450	400
16	2	0.75	1.1	1	1.9	32.5 ± 1.5	0.3	22.9	1.8	37.5 ± 1.5	1940	491
16	2	0.75	1.1	1	1.9	32.5 ± 1.5	0.3	22.9	1.8	37.5 ± 1.5	1940	491
24	2	0.75	1.1	1	2.3	40.5 ± 2	0.4	40.7	2.1	46.5 ± 2	2950	799
24	2	0.75	1.1	1	2.3	40.5 ± 2	0.4	40.7	2.1	46.5 ± 2	2950	799
1	3	0.75	1.1	1	1.1	10.5 ± 0.8	0.2	5.3	1.1	13.5 ± 0.8	290	75
1	3	0.75	1.1	1	1.1	10.5 ± 0.8	0.2	5.3	1.1	13.5 ± 0.8	290	75
2	3	0.75	1.1	1	1.1	16 ± 0.8	0.3	11.9	1.4	19.5 ± 0.8	540	163
2	3	0.75	1.1	1	1.1	16 ± 0.8	0.3	11.9	1.4	19.5 ± 0.8	540	163
4	3	0.75	1.1	1	1.1	18.5 ± 0.8	0.3	15.3	1.4	22.5 ± 1	780	243
4	3	0.75	1.1	1	1.1	18.5 ± 0.8	0.3	15.3	1.4	22.5 ± 1	780	243
8	3	0.75	1.1	1	1.1	25 ± 1	0.3	20.4	1.7	29.5 ± 1	1320	386
8	3	0.75	1.1	1	1.1	25 ± 1	0.3	20.4	1.7	29.5 ± 1	1320	386
12	3	0.75	1.1	1	1.4	31 ± 1.5	0.3	22.9	1.8	36 ± 1.5	1830	503
12	3	0.75	1.1	1	1.4	31 ± 1.5	0.3	22.9	1.8	36 ± 1.5	1830	503
16	3	0.75	1.1	1	2.1	36 ± 1.5	0.3	25.4	1.9	41.5 ± 2	2480	621
16	3	0.75	1.1	1	2.1	36 ± 1.5	0.3	25.4	1.9	41.5 ± 2	2480	621
24	3	0.75	1.1	1	2.5	45 ± 2	0.4	45.2	2.2	51 ± 2.5	3730	1000
24	3	0.75	1.1	1	2.5	45 ± 2	0.4	45.2	2.2	51 ± 2.5	3730	1000
1	2	1.5	1.6	1	1.1	10.5 ± 0.8	0.2	5.3	1.1	13.5 ± 0.8	310	86
1	2	1.5	1.6	1	1.1	10.5 ± 0.8	0.2	5.3	1.1	13.5 ± 0.8	310	86
2	2	1.5	1.6	1	1.1	16 ± 0.8	0.3	13.6	1.4	20 ± 1	580	201
2	2	1.5	1.6	1	1.1	16 ± 0.8	0.3	13.6	1.4	20 ± 1	580	201
4	2	1.5	1.6	1	1.1	19 ± 0.8	0.3	15.3	1.5	23 ± 1	820	286
4	2	1.5	1.6	1	1.1	19 ± 0.8	0.3	15.3	1.5	23 ± 1	820	286
8	2	1.5	1.6	1	1.1	26 ± 1	0.3	20.4	1.7	30.5 ± 1.5	1360	472
8	2	1.5	1.6	1	1.1	26 ± 1	0.3	20.4	1.7	30.5 ± 1.5	1360	472
12	2	1.5	1.6	1	1.4	31.5 ± 1.5	0.3	22.9	1.9	36.5 ± 1.5	1910	633
12	2	1.5	1.6	1	1.4	31.5 ± 1.5	0.3	22.9	1.9	36.5 ± 1.5	1910	633
16	2	1.5	1.6	1	2.1	37 ± 1.5	0.4	36.2	2	42.5 ± 2	2700	899
16	2	1.5	1.6	1	2.1	37 ± 1.5	0.4	36.2	2	42.5 ± 2	2700	899
24	2	1.5	1.6	1	2.3	45.5 ± 2	0.4	45.2	2.3	51.5 ± 2.5	3810	1259
24	2	1.5	1.6	1	2.3	45.5 ± 2	0.4	45.2	2.3	51.5 ± 2.5	3810	1259

Number of elements	No of cores in element	Cross section core, mm ²	Conductor Diameter, mm	Insulation Thickness, mm	Thickness Inner covering, mm	Diameter inner covering, mm	Diameter Braid Wire, mm	Mechanical cross-section of the braid, mm ²	Thickness Outer Sheath, mm	Diameter outer sheath, mm	Weight of Cable Approx. (Kg/Km)	Copper content Approx. (kg/km)
										2.5		
1	3	1.5	1.6	1	1.1	11.5 ± 0.8	0.2	6	1.2	14.5 ± 0.8	360	108
1	3	1.5	1.6	1	1.1	11.5 ± 0.8	0.2	6	1.2	14.5 ± 0.8	360	108
2	3	1.5	1.6	1	1.1	17.5 ± 0.8	0.3	13.6	1.5	22 ± 1	680	230
2	3	1.5	1.6	1	1.1	17.5 ± 0.8	0.3	13.6	1.5	22 ± 1	680	230
4	3	1.5	1.6	1	1.1	21 ± 1	0.3	17.8	1.6	25 ± 1	1030	368
4	3	1.5	1.6	1	1.1	21 ± 1	0.3	17.8	1.6	25 ± 1	1030	368
8	3	1.5	1.6	1	1.1	28 ± 1	0.3	20.4	1.8	32.5 ± 1.5	1680	586
8	3	1.5	1.6	1	1.1	28 ± 1	0.3	20.4	1.8	32.5 ± 1.5	1680	586
12	3	1.5	1.6	1	1.6	35.5 ± 1.5	0.3	25.4	2	40.5 ± 2	2470	828
12	3	1.5	1.6	1	1.6	35.5 ± 1.5	0.3	25.4	2	40.5 ± 2	2470	828
16	3	1.5	1.6	1	2.3	41 ± 2	0.4	40.7	2.2	47 ± 2	3480	1171
16	3	1.5	1.6	1	2.3	41 ± 2	0.4	40.7	2.2	47 ± 2	3480	1171
24	3	1.5	1.6	1	2.7	51 ± 2.5	0.5	63.6	2.6	58 ± 2.5	5170	1781
24	3	1.5	1.6	1	2.7	51 ± 2.5	0.5	63.6	2.6	58 ± 2.5	5170	1781
1	2	2.5	2	1	1.1	11.5 ± 0.8	0.2	6	1.2	14.5 ± 0.8	360	114
1	2	2.5	2	1	1.1	11.5 ± 0.8	0.2	6	1.2	14.5 ± 0.8	360	114
2	2	2.5	2	1	1.1	17.5 ± 0.8	0.3	13.6	1.5	21.5 ± 1	660	242
2	2	2.5	2	1	1.1	17.5 ± 0.8	0.3	13.6	1.5	21.5 ± 1	660	242
4	2	2.5	2	1	1.1	20.5 ± 1	0.3	15.3	1.6	25 ± 1	970	367
4	2	2.5	2	1	1.1	20.5 ± 1	0.3	15.3	1.6	25 ± 1	970	367
8	2	2.5	2	1	1.1	28.5 ± 1	0.3	20.4	1.8	33 ± 1.5	1620	634
8	2	2.5	2	1	1.1	28.5 ± 1	0.3	20.4	1.8	33 ± 1.5	1620	634
12	2	2.5	2	1	2.3	36 ± 1.5	0.3	25.4	2	41.5 ± 2	2570	901
12	2	2.5	2	1	2.3	36 ± 1.5	0.3	25.4	2	41.5 ± 2	2570	901
16	2	2.5	2	1	2.3	40.5 ± 2	0.4	40.7	2.2	46.5 ± 2	3330	1268
16	2	2.5	2	1	2.3	40.5 ± 2	0.4	40.7	2.2	46.5 ± 2	3330	1268
1	3	2.5	2	1	1.1	12 ± 0.8	0.2	6	1.2	15.5 ± 0.8	410	137
1	3	2.5	2	1	1.1	12 ± 0.8	0.2	6	1.2	15.5 ± 0.8	410	137
2	3	2.5	2	1	1.1	19 ± 0.8	0.3	15.3	1.5	23 ± 1	790	305
2	3	2.5	2	1	1.1	19 ± 0.8	0.3	15.3	1.5	23 ± 1	790	305
4	3	2.5	2	1	1.1	22.5 ± 1	0.3	17.8	1.6	27 ± 1	1200	484
4	3	2.5	2	1	1.1	22.5 ± 1	0.3	17.8	1.6	27 ± 1	1200	484
8	3	2.5	2	1	1.3	30.5 ± 1.5	0.3	22.9	2	35.5 ± 1.5	2120	844
8	3	2.5	2	1	1.3	30.5 ± 1.5	0.3	22.9	2	35.5 ± 1.5	2120	844
12	3	2.5	2	1	2.6	40.5 ± 2	0.4	40.7	2.2	46.5 ± 2	3490	1328
12	3	2.5	2	1	2.6	40.5 ± 2	0.4	40.7	2.2	46.5 ± 2	3490	1328

Electrical values instrumentation cables

Type	Capacitance, approx. (nF/km)	Inductance, approx. (mH/km)	Resistance at 20°C, max. (Ohm/km)	L/R ratio, (microH/Ohm)
Shielded pair 0,75 mm ²	65	0,94	26,3	17,9
Shielded triple 0,75 mm ²	65	0,94	26,3	17,9
Shielded pair 1,5 mm ²	80	0,84	12,9	32,6
Shielded triple 1,5 mm ²	80	0,84	12,9	32,6
Shielded pair 2,5 mm ²	100	0,77	8,02	48
Shielded triple 2,5 mm ²	100	0,77	8,02	48

Ordering information

New Part number	Old Part number	Description	Sheath Colour	Stock item	EAN No. DNK	EL No.
	822300	BFOU-XFR(I) 1PAIR 0.75mm ²	GREY	-	7021528223002	-
	822301	BFOU-XFR(I) 1PAIR 0.75mm ²	BLUE	-	7021528223019	-
	822306	BFOU-XFR(I) 2PAIR 0.75mm ²	GREY	-	7021528223064	-
	822307	BFOU-XFR(I) 2PAIR 0.75mm ²	BLUE	-	7021528223071	-
	822318	BFOU-XFR(I) 4PAIR 0.75mm ²	GREY	-	7021528223187	-
	822319	BFOU-XFR(I) 4PAIR 0.75mm ²	BLUE	-	7021528223194	-
	822330	BFOU-XFR(I) 8PAIR 0.75mm ²	GREY	-	7021528223309	-
	822331	BFOU-XFR(I) 8PAIR 0.75mm ²	BLUE	-	7021528223316	-
	822336	BFOU-XFR(I) 12PAIR 0.75mm ²	GREY	-	7021528223361	-
	822337	BFOU-XFR(I) 12PAIR 0.75mm ²	BLUE	-	7021528223378	-
	822342	BFOU-XFR(I) 16PAIR 0.75mm ²	GREY	-	7021528223422	-
	822343	BFOU-XFR(I) 16PAIR 0.75mm ²	BLUE	-	7021528223439	-
	822348	BFOU-XFR(I) 24PAIR 0.75mm ²	GREY	-	7021528223484	-
	822349	BFOU-XFR(I) 24PAIR 0.75mm ²	BLUE	-	7021528223491	-
	822360	BFOU-XFR(I) 1TRIP 0.75mm ²	GREY	-	7021528223606	-
	822361	BFOU-XFR(I) 1TRIP 0.75mm ²	BLUE	-	7021528223613	-
	822366	BFOU-XFR(I) 2TRIP 0.75mm ²	GREY	-	7021528223668	-
	822367	BFOU-XFR(I) 2TRIP 0.75mm ²	BLUE	-	7021528223675	-
	822378	BFOU-XFR(I) 4TRIP 0.75mm ²	GREY	-	7021528223781	-
	822379	BFOU-XFR(I) 4TRIP 0.75mm ²	BLUE	-	7021528223798	-
	822390	BFOU-XFR(I) 8TRIP 0.75mm ²	GREY	-	7021528223903	-
	822391	BFOU-XFR(I) 8TRIP 0.75mm ²	BLUE	-	7021528223910	-
	822396	BFOU-XFR(I) 12TRIP 0.75mm ²	GREY	-	7021528223965	-
	822397	BFOU-XFR(I) 12TRIP 0.75mm ²	BLUE	-	7021528223972	-
	822402	BFOU-XFR(I) 16TRIP 0.75mm ²	GREY	-	7021528224023	-
	822403	BFOU-XFR(I) 16TRIP 0.75mm ²	BLUE	-	7021528224030	-
	822408	BFOU-XFR(I) 24TRIP 0.75mm ²	GREY	-	7021528224085	-
	822409	BFOU-XFR(I) 24TRIP 0.75mm ²	BLUE	-	7021528224092	-
	822700	BFOU-XFR(I) 1PAIR 1.5mm ²	GREY	-	7021528227000	-
	822701	BFOU-XFR(I) 1PAIR 1.5mm ²	BLUE	-	7021528227017	-
	822706	BFOU-XFR(I) 2PAIR 1.5mm ²	GREY	-	7021528227062	-
	822707	BFOU-XFR(I) 2PAIR 1.5mm ²	BLUE	-	7021528227079	-
	822718	BFOU-XFR(I) 4PAIR 1.5mm ²	GREY	-	7021528227185	-
	822719	BFOU-XFR(I) 4PAIR 1.5mm ²	BLUE	-	7021528227192	-
	822730	BFOU-XFR(I) 8PAIR 1.5mm ²	GREY	-	7021528227307	-
	822731	BFOU-XFR(I) 8PAIR 1.5mm ²	BLUE	-	7021528227314	-
	822736	BFOU-XFR(I) 12PAIR 1.5mm ²	GREY	-	7021528227369	-
	822737	BFOU-XFR(I) 12PAIR 1.5mm ²	BLUE	-	7021528227376	-
	822742	BFOU-XFR(I) 16PAIR 1.5mm ²	GREY	-	7021528227420	-
	822743	BFOU-XFR(I) 16PAIR 1.5mm ²	BLUE	-	7021528227437	-
	822748	BFOU-XFR(I) 24PAIR 1.5mm ²	GREY	-	7021528227482	-
	822749	BFOU-XFR(I) 24PAIR 1.5mm ²	BLUE	-	7021528227499	-
	822760	BFOU-XFR(I) 1TRIP 1.5mm ²	GREY	-	7021528227604	-
	822761	BFOU-XFR(I) 1TRIP 1.5mm ²	BLUE	-	7021528227611	-
	822766	BFOU-XFR(I) 2TRIP 1.5mm ²	GREY	-	7021528227666	-
	822767	BFOU-XFR(I) 2TRIP 1.5mm ²	BLUE	-	7021528227673	-
	822778	BFOU-XFR(I) 4TRIP 1.5mm ²	GREY	-	7021528227789	-
	822779	BFOU-XFR(I) 4TRIP 1.5mm ²	BLUE	-	7021528227796	-
	822790	BFOU-XFR(I) 8TRIP 1.5mm ²	GREY	-	7021528227901	-
	822791	BFOU-XFR(I) 8TRIP 1.5mm ²	BLUE	-	7021528227918	-
	822796	BFOU-XFR(I) 12TRIP 1.5mm ²	GREY	-	7021528227963	-
	822797	BFOU-XFR(I) 12TRIP 1.5mm ²	BLUE	-	7021528227970	-
	822802	BFOU-XFR(I) 16TRIP 1.5mm ²	GREY	-	7021528228021	-
	822803	BFOU-XFR(I) 16TRIP 1.5mm ²	BLUE	-	7021528228038	-
	822808	BFOU-XFR(I) 24TRIP 1.5mm ²	GREY	-	7021528228083	-
	822809	BFOU-XFR(I) 24TRIP 1.5mm ²	BLUE	-	7021528228090	-
	828900	BFOU-XFR(I) 1PAIR 2.5mm ²	GREY	-	7021528289008	-
	828901	BFOU-XFR(I) 1PAIR 2.5mm ²	BLUE	-	7021528289015	-
	828906	BFOU-XFR(I) 2PAIR 2.5mm ²	GREY	-	7021528289060	-
	828907	BFOU-XFR(I) 2PAIR 2.5mm ²	BLUE	-	7021528289077	-
	828918	BFOU-XFR(I) 4PAIR 2.5mm ²	GREY	-	7021528289183	-

New Part number	Old Part number	Description	Sheath Colour	Stock item	EAN No. DNK	EL No.
	828919	BFOU-XFR(I) 4PAIR 2.5mm ²	BLUE	-	7021528289190	-
	828930	BFOU-XFR(I) 8PAIR 2.5mm ²	GREY	-	7021528289305	-
	828931	BFOU-XFR(I) 8PAIR 2.5mm ²	BLUE	-	7021528289312	-
	828936	BFOU-XFR(I) 12PAIR 2.5mm ²	GREY	-	7021528289367	-
	828937	BFOU-XFR(I) 12PAIR 2.5mm ²	BLUE	-	7021528289374	-
	828942	BFOU-XFR(I) 16PAIR 2.5mm ²	GREY	-	7021528289428	-
	828943	BFOU-XFR(I) 16PAIR 2.5mm ²	BLUE	-	7021528289435	-
	828960	BFOU-XFR(I) 1TRIP 2.5mm ²	GREY	-	7021528289602	-
	828961	BFOU-XFR(I) 1TRIP 2.5mm ²	BLUE	-	7021528289619	-
	828966	BFOU-XFR(I) 2TRIP 2.5mm ²	GREY	-	7021528289664	-
	828967	BFOU-XFR(I) 2TRIP 2.5mm ²	BLUE	-	7021528289671	-
	828978	BFOU-XFR(I) 4TRIP 2.5mm ²	GREY	-	7021528289787	-
	828979	BFOU-XFR(I) 4TRIP 2.5mm ²	BLUE	-	7021528289794	-
	828990	BFOU-XFR(I) 8TRIP 2.5mm ²	GREY	-	7021528289909	-
	828991	BFOU-XFR(I) 8TRIP 2.5mm ²	BLUE	-	7021528289916	-
	828996	BFOU-XFR(I) 12TRIP 2.5mm ²	GREY	-	7021528289961	-
	828997	BFOU-XFR(I) 12TRIP 2.5mm ²	BLUE	-	7021528289978	-

Installation recommendations

Minimum Bending Radius during Installation	Minimum Bending Radius Fixed Installed	Maximum Tensile Load During Installation	Minimum Installation Temperature
8 x D	6 x D	50 N /mm ²	-20°C