FRHF-XCMK / BFSI

Copper power cable FRHF

0,6/1 (1,2) kV

FlameRex

Application

Fire-resistant power cable for fixed installations indoors and outdoors. May be buried directly in soil. For locations where safety requires the operation of alarm, control, signalling and energy circuits also during a fire. The conductor insulation must be protected against UV-radiation. Installations must be in accordance with national regulations and rules of installations. No requirement for CPR-classification.

Design

Standards	SFS 5547, HD 604 5 D
Conductor	1,5-6 mm² circular solid copper, EN/IEC 60228 class 1 10-25 mm² circular stranded copper, EN/IEC 60228 class 2 35-240 mm² sector shaped stranded copper, EN/IEC 60228 class 2
Insulation	Cross-linked polyethylene XLPE and mica-tape
Core Identification	Blue, brown Brown, black, grey Blue, brown, black, grey
Inner covering	Extruded filling compound
Metal screen	Copper wires and copper tape
Oversheath	UV-protected polyolefin compound, Orange

Temperature limits

Max. conductor temperature °C	90
Max. cond. temp. short circuit max. 5 s °C	250
Min. cable temperature during operation °C	-50
Min. cable temperature during handling °C	-15
Min. cable temperature during transport °C	-25

Additional information

IEC 60331-21 Fire-resistant, 180 min.
IEC 60331-1, -2 EN 50200, EN 50362 Fire-resistant with shock, 90 min.
EN/IEC 60332-3-24 Flame retardant in a bunch, Category C
EN/IEC 61034 Low smoke density
EN/IEC 60754 Halogen-free, non-corrosive

Technical information	2x1,5/1,5	2x2,5/2,5	2x4/4	2x6/6	2x10/10	2x16/16	2x25/16	2x35/16	3x1,5/1,5	3x2,5/2,5
Product code	**1146810**	**1146811**	**1146812**	**1146813**	**1146814**	**1146815**	**1146816**	**1146817**	**1146819**	**1146820**
Nominal cross-sectional area of conductor mm²	1,5	2,5	4	6	10	16	25	35	1,5	2,5
Nominal thickness of insulation mm	0,7	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,7	0,7
Nominal size of metal screen mm²	1,5	2,5	4	6	10	16	16	16	1,5	2,5
Nominal thickness of oversheath mm	1,8	1,8	1,8	1,8	1,8	1,8	1,8	1,8	1,8	1,8
Fire load MJ/m	2,221	2,463	2,957	3,461	4,546	5,529	7,689	8,321	2,522	2,795
Fire load kWh/m	0,617	0,684	0,821	0,962	1,263	1,536	2,136	2,312	0,701	0,776
Nominal cable diameter mm	12,270	13,030	14,650	16,090	18,870	21,430	25,560	26,580	12,950	13,770
Nominal cable weight kg/km	200,338	245,439	332,037	433,854	622,290	866,125	1193,433	1401,710	223,223	276,684
Nominal weight of copper kg/m	0,040	0,066	0,109	0,164	0,266	0,424	0,595	0,756	0,053	0,088
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	0,0	0,0	0,1	0,1	0,3	0,4	0,7	1,0	0,0	0,1
Max. pulling force by pulling-stocking kN	0,0	0,1	0,1	0,2	0,4	0,6	1,0	1,4	0,0	0,1
Minimum bending radii										
During handling and installation, cable cm	15	16	18	19	23	26	31	32	16	17
In final installation, cable cm	10	11	12	14	16	18	21	22	11	12
Minimum bending radii										
During handling and installation, cable m	0,15	0,16	0,18	0,19	0,23	0,26	0,31	0,32	0,15	0,17
In final installation, cable m	0,10	0,11	0,12	0,14	0,16	0,18	0,21	0,22	0,11	0,12
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	12,1	7,41	4,61	3,08	1,83	1,15	0,727	0,524	12,1	7,41
Maximum DC resistance at 20 °C, metal screen Ω/km	12,1	7,41	4,61	3,08	1,83	1,15	1,15	1,15	12,1	7,41

Technical information	2x1,5/1,5	2x2,5/2,5	2x4/4	2x6/6	2x10/10	2x16/16	2x25/16	2x35/16	3x1,5/1,5	3x2,5/2,5
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	23	31	42	53	73	98	124	154	23	31
three loaded conductor, conductor 70 °C A									19	26
two loaded conductor, conductor 90 °C A	27	37	51	66	89	120	155	192	27	37
three loaded conductor, conductor 90 °C A									24	33
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	22	30	40	51	70	94	119	148	22	30
three loaded conductor, conductor 70 °C A									18,5	25
two loaded conductor, conductor 90 °C A	26	36	49	63	86	115	149	185	26	36
three loaded conductor, conductor 90 °C A									23	32
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 65 °C A	26	35	46	57	77	100	130	160	26	35
Cables in the ground (20 °C and 2,5 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 90 °C A	27	35	46	58	77	100	129	155	23	30
Maximum thermal short circuit current during 1 s										
Phase (initial 65 °C, final 250 °C) kA	0,2	0,3	0,6	0,9	1,6	2,5	3,9	5,5	0,2	0,3
Phase (initial 90 °C, final 250 °C) kA	0,2	0,3	0,5	0,8	1,4	2,3	3,6	5,0	0,2	0,3
Metal screen (initial 80 °C, final 250 °C) kA	0,2	0,4	0,6	0,9	1,5	2,4	2,4	2,4	0,2	0,4

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Technical information	3x4/4	3x6/6	3x10/10	3x16/16	3x25/16	3x35/16	3x50/25	3x70/35	3x95/50	3x120/70
Product code	**1146821**	**1146822**	**1146823**	**1146824**	**1146825**	**1146826**	**1146827**	**1146828**	**1146829**	**1146830**
Nominal cross-sectional area of conductor mm²	4	6	10	16	25	35	50	70	95	120
Nominal thickness of insulation mm	0,7	0,7	0,7	0,7	0,9	0,9	1,0	1,1	1,1	1,2
Nominal size of metal screen mm²	4	6	10	16	16	16	25	35	50	70
Nominal thickness of oversheath mm	1,8	1,8	1,8	1,8	1,8	1,8	1,8	1,9	2,1	2,2
Fire load MJ/m	3,406	3,807	5,012	6,635	8,321	7,702	10,199	13,198	14,144	16,920
Fire load kWh/m	0,946	1,058	1,392	1,843	2,311	2,140	2,833	3,666	3,929	4,700
Nominal cable diameter mm	15,660	16,780	19,740	22,500	26,420	26,210	30,120	33,820	37,150	40,090
Nominal cable weight kg/km	386,196	489,737	705,888	1009,497	1374,544	1481,933	2087,805	2888,385	3652,398	4653,298
Nominal weight of copper kg/m	0,145	0,218	0,352	0,562	0,816	1,056	1,493	2,093	2,903	3,725
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	0,1	0,2	0,4	0,7	1,1	1,5	2,2	3,1	4,2	5,4
Max. pulling force by pulling-stocking kN	0,2	0,3	0,6	0,9	1,5	2,1	3,0	4,2	5,7	7,2
Minimum bending radii										
During handling and installation, cable cm	19	20	24	27	32	31	36	41	45	48
In final installation, cable cm	13	14	17	19	22	22	25	28	31	34
Minimum bending radii										
During handling and installation, cable m	0,19	0,20	0,24	0,27	0,32	0,32	0,36	0,41	0,45	0,48
In final installation, cable m	0,13	0,14	0,17	0,19	0,22	0,22	0,25	0,28	0,31	0,34
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	4,61	3,08	1,83	1,15	0,727	0,524	0,387	0,268	0,193	0,153
Maximum DC resistance at 20 °C, metal screen Ω/km	4,61	3,08	1,83	1,15	1,15	1,15	0,727	0,524	0,387	0,268

Technical information	3x4/4	3x6/6	3x10/10	3x16/16	3x25/16	3x35/16	3x50/25	3x70/35	3x95/50	3x120/70
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	42	53	73	98	124	154	187	241	293	341
three loaded conductor, conductor 70 °C A	35	45	62	83	105	131	159	204	248	287
two loaded conductor, conductor 90 °C A	51	66	89	120	155	192	234	301	366	426
three loaded conductor, conductor 90 °C A	44	56	78	104	132	164	200	256	310	360
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	40	51	70	94	119	148	180	232	282	328
three loaded conductor, conductor 70 °C A	34	43	60	80	101	126	153	196	238	276
two loaded conductor, conductor 90 °C A	49	63	86	115	149	185	225	289	352	410
three loaded conductor, conductor 90 °C A	42	54	75	100	127	158	192	246	298	346
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 65 °C A	46	57	77	100	130	160	190	240	285	325
Cables in the ground (20 °C and 2,5 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 90 °C A	39	49	65	84	107	129	153	188	226	257
Maximum thermal short circuit current during 1 s										
Phase (initial 65 °C, final 250 °C) kA	0,6	0,9	1,6	2,5	3,9	5,5	7,8	10,9	14,9	18,8
Phase (initial 90 °C, final 250 °C) kA	0,5	0,8	1,4	2,3	3,6	5,0	7,2	10,0	13,6	17,2
Metal screen (initial 80 °C, final 250 °C) kA	0,6	0,9	1,5	2,4	2,4	2,4	3,7	5,2	7,4	10,4

Technical information	3x150/70	3x185/95	3x240/120	4x1,5/1,5	4x2,5/2,5	4x4/4	4x6/6	4x10/10	4x16/16	4x25/16
Product code	**1146831**	**1146832**	**1146833**	**1146835**	**1146836**	**1146837**	**1146838**	**1146839**	**1146840**	**1146841**
Nominal cross-sectional area of conductor mm²	150	185	240	1,5	2,5	4	6	10	16	25
Nominal thickness of insulation mm	1,4	1,6	1,7	0,7	0,7	0,7	0,7	0,7	0,7	0,9
Nominal size of metal screen mm²	70	95	120	1,5	2,5	4	6	10	16	16
Nominal thickness of oversheath mm	2,3	2,5	2,7	1,8	1,8	1,8	1,8	1,8	1,8	1,8
Fire load MJ/m	20,320	26,859	32,373	3,086	3,423	3,905	4,381	5,821	7,029	9,810
Fire load kWh/m	5,645	7,461	8,992	0,857	0,951	1,085	1,217	1,617	1,952	2,725
Nominal cable diameter mm	43,300	50,460	55,610	14,380	15,300	16,730	17,980	21,260	24,170	28,670
Nominal cable weight kg/km	5538,700	7143,555	9246,360	276,014	341,966	447,254	573,169	832,149	1177,879	1662,708
Nominal weight of copper kg/m	4,473	5,697	7,494	0,066	0,109	0,180	0,272	0,438	0,700	1,038
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	6,7	8,3	10,8	0,0	0,1	0,2	0,3	0,6	0,9	1,5
Max. pulling force by pulling-stocking kN	8,5	8,5	8,5	0,1	0,2	0,3	0,4	0,8	1,2	2,0
Minimum bending radii										
During handling and installation, cable cm	52	61	67	17	18	20	22	26	29	34
In final installation, cable cm	36	42	47	12	13	14	15	18	20	24
Minimum bending radii										
During handling and installation, cable m	0,52	0,61	0,67	0,17	0,18	0,20	0,22	0,26	0,29	0,34
In final installation, cable m	0,36	0,42	0,47	0,12	0,13	0,14	0,15	0,18	0,20	0,24
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	0,124	0,0991	0,0754	12,1	7,41	4,61	3,08	1,83	1,15	0,727
Maximum DC resistance at 20 °C, metal screen Ω/km	0,268	0,193	0,153	12,1	7,41	4,61	3,08	1,83	1,15	1,15

Technical information	3x150/70	3x185/95	3x240/120	4x1,5/1,5	4x2,5/2,5	4x4/4	4x6/6	4x10/10	4x16/16	4x25/16
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	394	451	535	23	31	42	53	73	98	124
three loaded conductor, conductor 70 °C A	332	379	447	19	26	35	45	62	83	105
two loaded conductor, conductor 90 °C A	492	564	667	27	37	51	66	89	120	155
three loaded conductor, conductor 90 °C A	415	474	560	24	33	44	56	78	104	132
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	379	434	514	22	30	40	51	70	94	119
three loaded conductor, conductor 70 °C A	319	364	430	18,5	25	34	43	60	80	101
two loaded conductor, conductor 90 °C A	473	542	641	26	36	49	63	86	115	149
three loaded conductor, conductor 90 °C A	399	456	538	23	32	42	54	75	100	127
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 65 °C A	370	420	480	26	35	46	57	77	100	130
Cables in the ground (20 °C and 2,5 K.m/W), Installation depth 0,7 m										
Cables in the ground, conductor 90 °C A	287	324	375	23	30	39	49	65	84	107
Maximum thermal short circuit current during 1 s										
Phase (initial 65 °C, final 250 °C) kA	23,5	28,9	37,5	0,2	0,3	0,6	0,9	1,6	2,5	3,9
Phase (initial 90 °C, final 250 °C) kA	21,5	26,5	34,3	0,2	0,3	0,5	0,8	1,4	2,3	3,6
Metal screen (initial 80 °C, final 250 °C) kA	10,4	14,1	17,8	0,2	0,4	0,6	0,9	1,5	2,4	2,4

Technical information	4x35/16	4x50/25	4x70/35	4x95/50	4x120/70	4x150/70	4x185/95	4x240/120
Product code	**1146842**	**1146843**	**1146844**	**1146845**	**1146846**	**1146847**	**1146848**	**1146849**
Nominal cross-sectional area of conductor mm²	35	50	70	95	120	150	185	240
Nominal thickness of insulation mm	0,9	1,0	1,1	1,1	1,2	1,4	1,6	1,7
Nominal size of metal screen mm²	16	25	35	50	70	70	95	120
Nominal thickness of oversheath mm	1,8	1,9	2,1	2,2	2,3	2,5	2,7	2,9
Fire load MJ/m	9,592	12,263	14,716	17,421	20,265	25,291	34,026	39,808
Fire load kWh/m	2,664	3,406	4,088	4,839	5,629	7,025	9,452	11,058
Nominal cable diameter mm	28,580	33,210	35,490	40,820	44,370	48,750	56,550	61,940
Nominal cable weight kg/km	1880,757	2553,251	3458,196	4619,066	5782,365	7016,563	9080,633	11657,246
Nominal weight of copper kg/m	1,368	1,913	2,697	3,729	4,770	5,769	7,307	9,660
Maximum forces during installation when pulling by								
Max. pulling force by pulling-eye kN	2,1	3,0	4,2	5,7	7,2	9,0	11,1	14,4
Max. pulling force by pulling-stocking kN	2,8	4,0	5,6	7,6	8,5	8,5	8,5	8,5
Minimum bending radii								
During handling and installation, cable cm	34	40	43	49	53	59	68	74
In final installation, cable cm	24	28	30	34	37	41	48	52
Minimum bending radii								
During handling and installation, cable m	0,34	0,40	0,43	0,49	0,53	0,58	0,68	0,74
In final installation, cable m	0,24	0,28	0,30	0,34	0,37	0,41	0,47	0,52
DC resistance								
Max. DC resistance of conductor at 20 °C Ω/km	0,524	0,387	0,268	0,193	0,153	0,124	0,0991	0,0754
Maximum DC resistance at 20 °C, metal screen Ω/km	1,15	0,727	0,524	0,387	0,268	0,268	0,193	0,153

Technical information	4x35/16	4x50/25	4x70/35	4x95/50	4x120/70	4x150/70	4x185/95	4x240/120
Current ratings								
Cables in air (25 °C)								
two loaded conductor, conductor 70 °C A	154	187	241	293	341	394	451	535
three loaded conductor, conductor 70 °C A	131	159	204	248	287	332	379	447
two loaded conductor, conductor 90 °C A	192	234	301	366	426	492	564	667
three loaded conductor, conductor 90 °C A	164	200	256	310	360	415	474	560
Cables in air (30 °C)								
two loaded conductor, conductor 70 °C A	148	180	232	282	328	379	434	514
three loaded conductor, conductor 70 °C A	126	153	196	238	276	319	364	430
two loaded conductor, conductor 90 °C A	185	225	289	352	410	473	542	641
three loaded conductor, conductor 90 °C A	158	192	246	298	346	399	456	538
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m								
Cables in the ground, conductor 65 °C A	160	190	240	285	325	370	420	480
Cables in the ground (20 °C and 2,5 K.m/W), Installation depth 0,7 m								
Cables in the ground, conductor 90 °C A	129	153	188	226	257	287	324	375
Maximum thermal short circuit current during 1 s								
Phase (initial 65 °C, final 250 °C) kA	5,5	7,8	10,9	14,9	18,8	23,5	28,9	37,5
Phase (initial 90 °C, final 250 °C) kA	5,0	7,2	10,0	13,6	17,2	21,5	26,5	34,3
Metal screen (initial 80 °C, final 250 °C) kA	2,4	3,7	5,2	7,4	10,4	10,4	14,1	17,8