

MMJ-HF

Installation cable HF

450/750 V

Application

Installation cable for fixed installations indoors and outdoors. Not to be laid in soil nor directly in cast concrete. Can be embedded to the groove filled with plaster. UV-protected oversheath and core insulation. Installations must be in accordance with national regulations and rules of installations. The cable is halogen-free and flame-retardant according to CPR-class Dca-s2,d2,a2.



Design

Standards	SFS 5544, NEK 591
Reaction to fire	Dca-s2,d2,a2; EN 13501-6, EN 50575:2014+A1:2016
Conductor	Circular solid copper, EN/IEC 60228 class 1
Insulation	Polyethylene compound
Core Identification	2N: Blue, brown 3x: Brown, black, grey 3G/S: Yellow-green, blue, brown 4N: Blue, brown, black, grey 4G/S: Yellow-green, brown, black, grey 5N: Blue, brown, black, grey, black 5G/S: Yellow-green, blue, brown, black, grey
Inner covering	Extruded filling compound
Oversheath	UV-protected polyolefin compound, White

Temperature limits

Max. conductor temperature °C	70
Max. cond. temp. short circuit max. 5 s °C	160
Min. cable temperature during operation °C	-40
Min. cable temperature during handling °C	-15
Min. cable temperature during transport °C	-40

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Technical information	2x1,5 N	3x1,5 S	3x1,5	4x1,5 N	5x1,5 N	5x1,5 S	2x2,5 N	3x2,5 S	3x2,5	4x2,5 N
Product code	1145005	1145056	1145006	1145007	1145008	1145058	1145060	1145061	1145011	1145095
Nominal cross-sectional area of conductor mm ²	1,5	1,5	1,5	1,5	1,5	1,5	2,5	2,5	2,5	2,5
Nominal diameter of conductor mm	1,4	1,4	1,4	1,4	1,4	1,4	1,7	1,7	1,7	1,7
Nominal thickness of insulation mm	0,7	0,7	0,7	0,7	0,7	0,7	0,8	0,8	0,8	0,8
Nominal thickness of oversheath mm	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
Fire load MJ/m	1,665	1,837	1,837	2,119	2,544	2,544	2,072	2,299	2,299	2,675
Fire load kWh/m	0,463	0,510	0,510	0,589	0,707	0,707	0,576	0,639	0,638	0,743
Nominal cable diameter mm	9,720	10,130	10,130	10,850	12,050	12,050	10,880	11,380	11,380	12,250
Nominal cable weight kg/km	138,858	153,579	153,573	178,845	217,496	217,513	181,864	204,282	204,271	241,301
Nominal weight of copper kg/m	0,026	0,039	0,039	0,052	0,065	0,065	0,043	0,064	0,064	0,085
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	0,1	0,2	0,2	0,3	0,3	0,3	0,2	0,3	0,3	0,5
Minimum bending radii										
Minimum bending radius, handling mm	97	101	101	109	121	121	109	114	114	123
Minimum bending radius, final bending mm	29	30	30	33	36	36	33	34	34	37
Minimum bending radii										
During handling and installation, cable cm	10	10	10	11	12	12	11	11	11	12
In final installation, cable cm	3	3	3	3	4	4	3	3	3	4
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	12,1	12,1	12,1	12,1	12,1	12,1	7,41	7,41	7,41	7,41
Electrical values										
Minimum insulation resistance MΩ × km	0,011	0,011	0,011	0,011	0,011	0,011	0,01	0,01	0,01	0,01
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	23	23	23	23	23	23	31	31	31	31
three loaded conductor, conductor 70 °C A				19	19	19				26
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	22	22	22	22	22	22	30	30	30	30
three loaded conductor, conductor 70 °C A				18,5	18,5	18,5				25

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Technical information	5x2,5 S	5x2,5 N	2x4 N	3x4 S	4x4 S	5x4 S	2x6 N	3x6 S	4x6 S	5x6 S
Product code	1145063	1145013	1145019	1145066	1145067	1145068	1145020	1145071	1145072	1145073
Nominal cross-sectional area of conductor mm ²	2,5	2,5	4	4	4	4	6	6	6	6
Nominal diameter of conductor mm	1,7	1,7	2,6	2,6	2,6	2,6	3,2	3,2	3,2	3,2
Nominal thickness of insulation mm	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
Nominal thickness of oversheath mm	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
Fire load MJ/m	3,211	3,211	2,559	2,825	3,330	4,015	3,335	3,676	4,374	5,258
Fire load kWh/m	0,892	0,892	0,711	0,785	0,925	1,115	0,927	1,021	1,215	1,461
Nominal cable diameter mm	13,620	13,620	12,300	12,880	13,880	15,200	14,220	14,930	16,150	17,720
Nominal cable weight kg/km	293,345	293,340	248,382	284,708	342,870	414,678	339,610	391,293	475,580	574,278
Nominal weight of copper kg/m	0,106	0,106	0,071	0,107	0,143	0,178	0,106	0,160	0,213	0,267
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	0,6	0,6	0,4	0,6	0,8	1,0	0,6	0,9	1,2	1,5
Minimum bending radii										
Minimum bending radius, handling mm	136	136	123	129	139	152	142	149	162	177
Minimum bending radius, final bending mm	41	41	37	39	42	46	43	45	48	53
Minimum bending radii										
During handling and installation, cable cm	14	14	12	13	14	15	14	15	16	18
In final installation, cable cm	4	4	4	4	4	5	4	4	5	5
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	7,41	7,41	4,61	4,61	4,61	4,61	3,08	3,08	3,08	3,08
Electrical values										
Minimum insulation resistance MΩ × km	0,01	0,01	0,0077	0,0077	0,0077	0,0077	0,0065	0,0065	0,0065	0,0065
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	31	31	42	42	42	42	53	53	53	53
three loaded conductor, conductor 70 °C A	26	26				35		45	45	45
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	30	30	40	40	40	40	51	51	51	51
three loaded conductor, conductor 70 °C A	25	25				34		43	43	43

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Technical information	2x10 N	3x10 S	4x10 S	5x10 S	2x16 N	3x16 S	4x16 S	5x16 S	2x25 N	3x25 S
Product code	1145075	1145076	1145077	1145078	1145080	1145081	1145082	1145083	1145085	1145086
Nominal cross-sectional area of conductor mm ²	10	10	10	10	16	16	16	16	25	25
Nominal diameter of conductor mm	4,1	4,1	4,1	4,1	5,0	5,0	5,0	5,0	6,0	6,0
Nominal thickness of insulation mm	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,2	1,2
Nominal thickness of oversheath mm	1,5	1,5	1,6	1,7	1,6	1,6	1,7	1,7	1,6	1,7
Fire load MJ/m	4,711	5,223	6,380	7,643	5,889	6,463	7,948	9,180	8,085	9,091
Fire load kWh/m	1,309	1,451	1,772	2,123	1,636	1,795	2,208	2,550	2,246	2,525
Nominal cable diameter mm	16,980	17,880	19,640	21,570	19,280	20,340	22,370	24,410	22,780	24,300
Nominal cable weight kg/km	500,406	582,056	720,615	864,644	688,871	813,412	1017,477	1206,141	1008,603	1221,536
Nominal weight of copper kg/m	0,173	0,260	0,346	0,433	0,276	0,413	0,549	0,689	0,447	0,671
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	1,0	1,5	2,0	2,5	1,6	2,4	3,2	4,0	2,5	3,8
Minimum bending radii										
Minimum bending radius, handling mm	170	179	196	216	193	203	224	244	228	243
Minimum bending radius, final bending mm	51	54	59	65	58	61	67	73	68	73
Minimum bending radii										
During handling and installation, cable cm	17	18	20	22	19	20	22	24	23	24
In final installation, cable cm	5	5	6	6	6	6	7	7	7	7
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	1,83	1,83	1,83	1,83	1,15	1,15	1,15	1,15	0,727	0,727
Electrical values										
Minimum insulation resistance MΩ × km	0,0065	0,0065	0,0065	0,0065	0,005	0,005	0,005	0,005		
Current ratings										
Cables in air (25 °C)										
two loaded conductor, conductor 70 °C A	73	73	73	73	98	98	98	98	124	124
three loaded conductor, conductor 70 °C A			62	62			83	83		
Cables in air (30 °C)										
two loaded conductor, conductor 70 °C A	70	70	70	70	94	94	94	94	119	119
three loaded conductor, conductor 70 °C A			60	60			80	80		

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Technical information	4x25 S	5x25 S
Product code	1145087	1145088
Nominal cross-sectional area of conductor mm ²	25	25
Nominal diameter of conductor mm	6,0	6,0
Nominal thickness of insulation mm	1,2	1,2
Nominal thickness of oversheath mm	1,7	1,8
Fire load MJ/m	10,995	13,675
Fire load kWh/m	3,054	3,799
Nominal cable diameter mm	26,580	29,770
Nominal cable weight kg/km	1520,225	1876,789
Nominal weight of copper kg/m	0,891	1,114
Maximum forces during installation when pulling by		
Max. pulling force by pulling-eye kN	5,0	6,3
Minimum bending radii		
Minimum bending radius, handling mm	266	298
Minimum bending radius, final bending mm	80	89
Minimum bending radii		
During handling and installation, cable cm	27	30
In final installation, cable cm	8	9
DC resistance		
Max. DC resistance of conductor at 20 °C Ω/km	0,727	0,727
Current ratings		
Cables in air (25 °C)		
two loaded conductor, conductor 70 °C A	124	124
three loaded conductor, conductor 70 °C A		105
Cables in air (30 °C)		
two loaded conductor, conductor 70 °C A	119	119
three loaded conductor, conductor 70 °C A		101