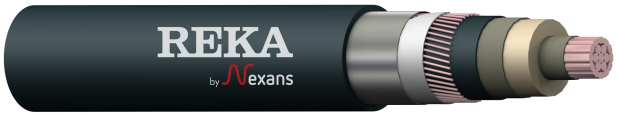
HXCMK-HF D / TSLI-Cu D 12/20 (24) kV 1-core CWS

Medium voltage cable



12/20 (24) kV

Application

Medium-voltage cable for fixed installations indoors and outdoors. May be buried directly in soil. 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	HD 620 10 M & K & F, SS 424 14 16, SFS 5636
Reaction to fire	Dca-s2,d2,a2; EN 13501-6, EN 50575:2014+A1:2016
Conductor	Circular stranded copper, EN/IEC 60228 class 2
Conductor screen	Semiconducting cross-linked polyethylene XLPE
Insulation	Cross-linked polyethylene XLPE
Insulation screen	Semiconducting cross-linked polyethylene XLPE
Inner covering	Semiconducting tape
Metal screen	Layer of helically wound copper wires
Oversheath	UV-protected halogen-free polyolefin compound , Black
Longitudinal watertightness	A lapped layer of water swellable tape applied under metal screen and over with an open-helix
Transverse watertightness	Polyethylene laminated aluminium foil bonded to the sheath

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

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Technical information	1x50/16 CWS	1x70/16 CWS	1x95/25 CWS	1x120/25 CWS	1x150/25 CWS	1x185/35 CWS	1x240/35 CWS	1x300/35 CWS	1x400/35 CWS	1x500/35 CWS
Product code	**1181679**	**1181680**	**1181681**	**1181682**	**1181683**	**1181684**	**1181685**	**1181686**	**1181687**	**1181688**
Nominal cable diameter mm	28	30	32	33	34	37	39	42	44	47
Nominal cable weight kg/km	1113	1363	1732	2007	2292	2778	3392	4005	5015	6095
Nominal weight of copper kg/km	561	745	1056	1275	1520	1925	2439	2954	3861	4806
Nominal diameter of conductor mm	8,2	9,9	11,6	13,0	14,2	16,0	18,4	20,6	23,2	26,3
Nominal thickness of conductor screen mm	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Nominal Insulation thicness mm	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5
Nominal diameter over the insulation without insulation screen mm	19,4	21,1	22,8	24,2	25,4	27,2	29,6	31,8	34,4	37,5
Nominal thickness of insulation screen mm	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Nominal size of metal screen mm²	16	16	25	25	25	35	35	35	35	35
Nominal diameter over metal screen mm	23,1	24,8	27,1	27,9	29,1	31,5	33,9	36,1	38,1	41,2
Nominal thickness of oversheath mm	1,8	1,9	1,9	2,0	2,0	2,1	2,2	2,3	2,4	2,5
Fire load										
Fire load MJ/m	18,212	20,328	22,343	24,140	25,585	28,045	31,297	34,429	37,796	42,115
Fire load kWh/m	5,059	5,647	6,206	6,706	7,107	7,790	8,694	9,564	10,499	11,698
Maximum forces during installation when pulling by										
Max. pulling force by pulling-eye kN	5,0	7,0	9,5	12,0	15,0	18,5	20,0	20,0	20,0	20,0
Max. pulling force by pulling-stocking kN	0,8	1,1	1,4	1,8	2,3	2,8	3,6	4,5	6,0	7,5
Minimum bending radii										
Minimum bending radius, handling mm	419	447	481	497	515	553	592	628	661	711
Minimum bending radius, final bending mm	293	313	337	348	360	387	414	440	463	497
Minimum bending radii										
During handling and installation, cable cm	42	45	48	50	51	55	59	63	66	71
In final installation, cable cm	29	31	34	35	36	39	41	44	46	50
Minimum bending radii										
During handling and installation, cable m	0,42	0,45	0,48	0,50	0,52	0,55	0,59	0,63	0,66	0,71
In final installation, cable m	0,29	0,31	0,34	0,35	0,36	0,39	0,41	0,44	0,46	0,50
DC resistance										
Max. DC resistance of conductor at 20 °C Ω/km	0,387	0,268	0,193	0,153	0,124	0,0991	0,0754	0,0601	0,0470	0,0366
Maximum DC resistance at 20 °C, metal screen Ω/km	1,15	1,15	0,727	0,727	0,727	0,524	0,524	0,524	0,524	0,524

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Technical information	1x50/16 CWS	1x70/16 CWS	1x95/25 CWS	1x120/25 CWS	1x150/25 CWS	1x185/35 CWS	1x240/35 CWS	1x300/35 CWS	1x400/35 CWS	1x500/35 CWS
AC resistance of phase conductor, screen circuit closed										
Conductor temperature 40 °C Ω/km	0,4176	0,2894	0,2087	0,1657	0,1346	0,1080	0,0829	0,0668	0,0534	0,0430
Conductor temperature 65 °C Ω/km	0,4556	0,3157	0,2276	0,1807	0,1467	0,1176	0,0902	0,0726	0,0578	0,0463
Conductor temperature 70 °C Ω/km	0,4632	0,3209	0,2314	0,1837	0,1491	0,1196	0,0916	0,0737	0,0587	0,0470
Conductor temperature 90 °C Ω/km	0,4936	0,3420	0,2465	0,1956	0,1588	0,1273	0,0975	0,0783	0,0622	0,0497
Inductance per phase										
In flat formation, free space between cables equal to one cable diameter	0,61	0,59	0,57	0,56	0,54	0,54	0,52	0,51	0,50	0,49
mH/km	0,43	0,40	0,39	0,37	0,36	0,35	0,34	0,33	0,31	0,30
In trefoil formation, cables touching each other mH/km										
Electrical values										
Calculated operation capacitance µF/km	0,17	0,19	0,21	0,23	0,24	0,27	0,30	0,32	0,35	0,39
Calculated charging current with main voltage A/km	0,6	0,7	0,8	0,8	0,9	1,0	1,1	1,2	1,3	1,4
Calculated earth fault current with main voltage A/km	1,8	2,0	2,3	2,5	2,6	2,9	3,2	3,5	3,9	4,3
Current ratings										
Cables in air (25 °C)										
Flat, conductor 90 °C, open screen A	265	340	410	470	520	615	725	820	1000	1150
Flat, conductor 90 °C, closed screen A	235	320	380	430	480	535	615	685	785	870
Trefoil, conductor 90 °C, open screen A	255	300	360	420	480	545	640	730	870	985
Trefoil, conductor 90 °C, closed screen A	250	295	355	410	465	535	620	705	835	940
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m										
Flat, conductor 65 °C, open screen A	225	280	330	375	425	475	545	620	720	810
Flat, conductor 65 °C, closed screen A	220	270	315	345	385	425	485	530	590	645
Flat, conductor 90 °C, open screen A	265	330	390	440	500	560	640	730	850	955
Flat, conductor 90 °C, closed screen A	260	315	370	415	455	500	570	625	695	760
Trefoil, conductor 65 °C, open screen A	205	255	295	340	385	435	500	570	645	725
Trefoil, conductor 65 °C, closed screen A	205	255	295	335	380	425	485	545	625	695
Trefoil, conductor 90 °C, open screen A	240	300	350	400	455	510	590	670	760	855
Trefoil, conductor 90 °C, closed screen A	240	300	350	395	450	500	570	640	735	815
Maximum thermal short circuit current during 1 s										
Phase (initial 90 °C, final 250 °C) kA	7,1	10,0	13,5	17,1	21,4	26,4	34,2	42,8	57,1	71,4
Metal screen (initial 80 °C, final 250 °C) kA	2,4	2,4	3,7	3,7	3,7	5,2	5,2	5,2	5,2	5,2

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Technical information	1x630/35 CWS	1x630/50 CWS
Product code	**1181689**	**1181690**
Nominal cable diameter mm	52	52
Nominal cable weight kg/km	7580	7703
Nominal weight of copper kg/km	6107	6226
Nominal diameter of conductor mm	30,0	30,0
Nominal thickness of conductor screen mm	0,5	0,5
Nominal Insulation thicness mm	5,5	5,5
Nominal diameter over the insulation without insulation screen mm	41,4	41,4
Nominal thickness of insulation screen mm	0,5	0,5
Nominal size of metal screen mm²	35	50
Nominal diameter over metal screen mm	45,1	45,7
Nominal thickness of oversheath mm	2,6	2,6
Fire load		
Fire load MJ/m	48,269	48,333
Fire load kWh/m	13,408	13,426
Maximum forces during installation when pulling by		
Max. pulling force by pulling-eye kN	20,0	20,0
Max. pulling force by pulling-stocking kN	8,5	8,5
Minimum bending radii		
Minimum bending radius, handling mm	773	781
Minimum bending radius, final bending mm	541	547
Minimum bending radii		
During handling and installation, cable cm	77	78
In final installation, cable cm	54	55
Minimum bending radii		
During handling and installation, cable m	0,77	0,78
In final installation, cable m	0,54	0,55
DC resistance		
Max. DC resistance of conductor at 20 °C Ω/km	0,0283	0,0283
Maximum DC resistance at 20 °C, metal screen Ω/km	0,524	0,387

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Technical information	1x630/35 CWS	1x630/50 CWS
AC resistance of phase conductor, screen circuit closed		
Conductor temperature 40 °C Ω/km	0,0350	0,0350
Conductor temperature 65 °C Ω/km	0,0375	0,0375
Conductor temperature 70 °C Ω/km	0,0380	0,0380
Conductor temperature 90 °C Ω/km	0,0400	0,0400
Inductance per phase		
In flat formation, free space between cables equal to one cable diameter mH/km	0,48	0,48
In trefoil formation, cables touching each other mH/km	0,29	0,29
Electrical values		
Calculated operation capacitance µF/km	0,44	0,44
Calculated charging current with main voltage A/km	1,6	1,6
Calculated earth fault current with main voltage A/km	4,8	4,8
Current ratings		
Cables in air (25 °C)		
Flat, conductor 90 °C, open screen A	1300	1300
Flat, conductor 90 °C, closed screen A	960	960
Trefoil, conductor 90 °C, open screen A	1115	1115
Trefoil, conductor 90 °C, closed screen A	1035	1035
Cables in the ground (15 °C and 1,0 K.m/W), Installation depth 0,7 m		
Flat, conductor 65 °C, open screen A	900	900
Flat, conductor 65 °C, closed screen A	700	700
Flat, conductor 90 °C, open screen A	1060	1060
Flat, conductor 90 °C, closed screen A	825	825
Trefoil, conductor 65 °C, open screen A	805	805
Trefoil, conductor 65 °C, closed screen A	755	755
Trefoil, conductor 90 °C, open screen A	950	950
Trefoil, conductor 90 °C, closed screen A	890	890
Maximum thermal short circuit current during 1 s		
Phase (initial 90 °C, final 250 °C) kA	90,0	90,0
Metal screen (initial 80 °C, final 250 °C) kA	5,2	7,4

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