HELKAMA

Marine Cables 9/2011

Contents

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www.helkamabica.fi

HELKAMA — a true specialist in marine cables

Helkama is specializing in development and production of marine cables. Our experience in this field goes back more than thirty years. Our high technical quality has been achieved by continuous development work supported by our clients. In this catalogue we proudly present our most comprehensive range of marine cables.

We have chosen to produce only halogen-free cables. They remarkably improve the fire safety of the ships by not emitting toxic burning fumes or thick smoke. In addition no corrosive gases damaging the ship and its equipment are emitted in case of a fire. Using the latest technology we have been able to reduce cable weight and size to a minimum and still maintain quality as well as enabling easy and fast installation. The halogen free range of cables includes both flame-retardant (IEC 60332-3) and fire resistant (IEC 60331-21) cables. Helkama marine cables are approved by all major classification societies.

As a specialized and independent company, focusing on service, we have been able to grow steadily by quickly responding to our customers' needs. Our short delivery times, backed up by extensive stocks, enable us to deliver punctually and keep our clients satisfied. This remains our goal for the future, too.

ISO 9001
ISO 14001
DNV
CERTIFIED
ORGANISATION

Marine cable factory in Kaarina, Finland.

Type Approval Certificates for factories in Finland and China

	ABS		BV		CCS		DNV		GL		KRS		LRS		RMRS		NK		RINA		TC	
0,6/1kV	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**
LKM-HF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
LKM-HF FLEX	●	●	●			❍	●	●	●				●		●	●	❍		●	●		
LKSM-HF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
LKSM-HF FLEX	●	●	●			❍	●	●	●				●		●	●	❍		●	●		
LKSM-EMC	●	●	●				●		●				●		❍		❍		●	●		
LKAM-HF	●	●	●			●	●	●	●				●		❍		❍	●	❍	●		
LKEM-HF	●	●	●			❍	●	●	●		●	●	●		●	●	●	●	●	●		
LKM-FRHF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
LKSM-FRHF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
LKAM-FRHF	●	●	❍			●	❍		●						❍		❍	●	❍	●		
LKMM-HF	●	●	●			●	●	●	●		●	●	●		●	●	●	●	●	●		
LKMM-HF FLEX	●	●	●			●	●	●	●				●		●		❍		●	●		
LKMSM-HF	●	●	●			●	●	●	●		●	●	●		●		●	●	●	●		
LKMSM-HF FLEX	●	●	●				●	●	●				●		●		❍		●	●		
1,8/3kV	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**
LKSM-VFD	●	●	●				●		●				●		❍		❍		●			
250V	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**	**FI**	**CN**
LKM-HF	●	●	❍				❍		●				❍		❍		❍		❍			
LKSM-HF	●	●	●			●	●	●	●		●	●	●		❍		❍	●	●	●		
LKAM-HF	●	●	❍				❍		●				❍		❍		❍		❍			
LKM-FRHF	●	●	❍				❍		●				❍		❍		❍		❍			
LKSM-FRHF	●	●	❍				❍		●				❍		❍		❍		❍			
LKAM-FRHF	●	●	❍				❍		●				❍		❍		❍		❍			
RFE-HF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●		
RFE-HF(i)	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
RFA-HF	●	●	●		●	●	●	●	●				●		●	●	●	●	●	●		
RFA-HF(i)	●	●	●		●	●	●	●	●				●		●	●	●	●	●	●		
RFE-FRHF	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	
RFE-FRHF(i)	●	●	●		●	●	●	●	●		●	●	●		●	●	●	●	●	●		
RFA-FRHF	●	●	●			●	●	●	●				●		●	●	❍	●	●	●		
RFA-FRHF(i)	●	●	●			●	●	●	●				●		●	●	❍	●	●	●		

● Combined TAC for Finland and China
● ● Separate TAC for Finland and China
● ❍ Type Approval for Finland, pending for China
❍ ❍ Type Approval pending for Finland and China
● ☐ Type Approval only for Finland

Please check updated approval situation on www.helkamabica.fi

Marine cable factory in Shanghai, China.

LKM-HF Unarmoured power and control cable 0,6/1kV

DESIGN:	STANDARDS:
	IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- separator tape	
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKM-HF 0,6/1kV		Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
Part number Normal	G-type					
25638	27000	1x2,5	5,5	55	30	25
25640	27002	1x4	6,5	70	40	30
25642	27004	1x6	7,0	95	52	30
25644	27006	1x10	8,0	140	72	35
25646	27008	1x16	9,0	200	96	40
25648	27010	1x25	11,0	310	127	45
25650	27012	1x35	12,5	410	157	50
25652	27014	1x50	14,0	540	196	60
25654	27016	1x70	16,5	765	242	70
25656	–	1x95	18,5	1010	293	75
25658	27020	1x120	20,5	1280	339	85
25660	–	1x150	23,0	1590	389	95
25662	27024	1x185	25,5	1975	444	155
25664	–	1x240	28,5	2605	522	175
25666	–	1x300	31,5	3210	601	190
25670	–	2x1,5	8,5	80	20	35
25686	–	2x2,5	9,5	115	26	40
25702	–	2x4	10,5	155	34	45
25701	–	2x6	12,0	240	44	50
25717	–	2x10	14,0	360	61	60
25711	–	2x16	16,5	520	82	70
25671	25672	3x1,5	9,0	100	16	40
25688	25689	3x2,5	10,0	145	21	45
25703	25704	3x4	11,5	200	28	50
25705	25706	3x6	13,0	310	36	55
25707	25708	3x10	15,0	465	50	65
25709	25710	3x16	17,5	675	67	75
25712	25851	3x25	22,0	1025	89	90
25714	25852	3x35	24,5	1390	110	100
25716	25853	3x50	28,5	1860	137	175
25718	25854	3x70	33,5	2640	169	205
25720	25855	3x95	37,5	3500	205	230
25722	25856	3x120	42,0	4455	237	255
25724	25857	3x150	47,5	5515	272	285
25673	25674	4x1,5	10,0	135	16	40
25690	25691	4x2,5	11,0	180	21	45
25725	25726	4x4	12,5	260	28	55
25727	25728	4x6	14,0	385	36	60
25729	25730	4x10	16,5	585	50	70
25731	25699	4x16	19,5	865	67	80
25732	25700	4x25	24,5	1325	89	100
25733	25719	4x35	27,5	1785	110	165
25734	25721	4x50	31,5	2400	137	195
25735	25723	4x70	37,0	3390	169	225
25984	25985	4x95	42,5	4545	205	255
25879	–	4x120	47,0	5730	237	285
25676	25677	5x1,5	11,0	160	13	45
25692	25693	5x2,5	12,0	220	17	50
25864	25865	5x4	13,5	320	23	55
25866	25867	5x6	15,5	475	30	65
25868	25869	5x10	18,5	720	42	75
25870	25871	5x16	21,5	1050	56	90
26119	26120	5x25	27,0	1635	74	165
26121	26122	5x35	30,5	2200	92	185
25678	25679	7x1,5	11,5	200	12	50
25694	25695	7x2,5	13,5	285	16	55
25667	25668	10x1,5	15,0	290	11	60
25993	25994	10x2,5	17,0	410	14	70
25680	25681	12x1,5	15,5	335	10	65
25696	25874	12x2,5	17,5	465	13	70
25991	25992	14x1,5	16,5	380	10	70
25995	25996	14x2,5	18,5	535	13	75
25989	25990	16x1,5	17,0	430	9	70
25997	25998	16x2,5	19,5	605	12	80
25682	25683	19x1,5	18,5	495	9	75
25873	25872	19x2,5	20,5	690	11	85
25875	25876	24x1,5	22,0	635	8	90
25877	25878	24x2,5	24,5	900	10	100
25684	25685	27x1,5	22,0	700	8	90
26141	26142	27x2,5	25,0	990	10	155
25675	25687	37x1,5	25,0	920	7	100

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKM-HF FLEX Unarmoured power cable with flexible conductor 0,6/1kV

DESIGN:	STANDARDS:
	IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 5
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- separator tape	
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Note! This cable is not designed for movable or portable applications. Flexible conductor cables ease the installation in areas involving tight bending radius or high vibration.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

For details see general information section

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKM-HF FLEX 0,6/1kV		Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
Part number Normal	G-type					
25647	27009	1x16	9,0	185	94	40
25649	27011	1x25	11,5	290	123	50
25651	27013	1x35	12,5	385	153	50
25653	27015	1x50	14,5	540	196	60
25655	27017	1x70	17,0	750	240	70
25657	27019	1x95	19,5	975	284	80
25659	27021	1x120	21,5	1225	331	90
25661	27023	1x150	24,5	1545	381	100
25663	27025	1x185	27,0	1880	429	165
25665	27027	1x240	30,5	2495	507	185
26047	27029	1x300	33,0	3055	582	200
26054	–	2x16	16,5	490	80	70
26055	–	2x25	20,5	755	105	85
26056	–	2x35	23,0	1035	130	95
26057	–	2x50	27,5	1455	167	170
26058	–	2x70	31,5	1995	204	190
26071	26072	3x16	17,5	625	66	75
26073	26074	3x25	22,0	970	86	90
26075	26076	3x35	25,0	1325	107	100
26077	26078	3x50	29,5	1880	137	180
26079	26080	3x70	34,5	2615	168	210
26081	26082	3x95	40,0	3455	199	240
26083	26085	3x120	44,5	4365	232	270
26084	26086	3x150	50,5	5485	267	305
26087	26088	3x185	57,0	6800	300	345
26101	26102	4x16	19,5	800	66	80
26103	26104	4x25	24,5	1250	86	100
26105	26106	4x35	27,5	1695	107	170
26107	26108	4x50	33,0	2420	137	200
26109	26110	4x70	38,0	3350	168	230
26111	26112	4x95	44,5	4465	199	270
26113	26114	4x120	49,5	5590	232	300
26131	26132	5x16	21,5	970	55	90
26133	26134	5x25	27,5	1545	71	165
26135	26136	5x35	30,5	2100	89	185
26137	26138	5x50	37,0	2980	114	225
26139	26140	5x70	42,5	4175	139	260

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G16

LKMM-HF Unarmoured power cable with extruded filler 0,6/1kV

DESIGN:	STANDARDS:
1. Conductor	IEC 60092-353, design
- stranded copper conductor 1,5–10mm^2	IEC 60228, class 2
- stranded copper conductor 16–150mm^2	IEC 60228, class 5
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- extruded filler	
4. Sheath	
- black polyolefine plastic, SHF1	IEC 60092-359

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKMM-HF 0,6/1kV Part number Normal	G-type	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
27532	–	2x1,5	9,0	110	20	35
27534	–	2x2,5	10,0	155	26	40
27536	–	2x4	11,0	205	34	45
27538	–	2x6	12,5	285	44	50
27540	–	2x10	14,5	420	61	60
27543	–	2x16	18,5	630	80	75
27545	–	2x25	23,0	970	105	90
27547	–	2x35	25,5	1340	130	155
27549	–	2x50	30,0	1855	167	180
27551	–	2x70	34,0	2510	204	205
27564	27566	3x1,5	9,5	130	16	35
27568	27570	3x2,5	10,5	180	21	45
27572	27574	3x4	12,0	245	28	45
27576	27578	3x6	13,5	350	36	55
27580	27582	3x10	15,5	515	50	60
27585	27587	3x16	20,0	770	66	80
27589	27591	3x25	24,5	1170	86	100
27593	27595	3x35	27,0	1600	107	160
27597	27599	3x50	32,0	2220	137	190
27601	27603	3x70	37,0	3090	168	220
27605	27607	3x95	42,5	4055	199	255
27609	27611	3x120	47,0	5070	232	285
27613	27615	3x150	53,5	6425	267	320
27628	27630	4x1,5	10,5	165	16	40
27632	27634	4x2,5	11,5	215	21	45
27636	27638	4x4	13,0	305	28	50
27640	27642	4x6	14,5	420	36	60
27644	27646	4x10	17,5	635	50	70
27649	27651	4x16	21,5	935	66	85
27653	27655	4x25	27,0	1440	86	160
27657	27659	4x35	30,0	1955	107	180
27661	27663	4x50	35,5	2735	137	210
27665	27667	4x70	40,5	3790	168	245
27692	27694	5x1,5	11,5	195	13	45
27696	27698	5x2,5	12,5	255	17	50
27700	27702	5x4	14,5	360	23	55
27704	27706	5x6	16,5	515	30	60
27708	27710	5x10	19,0	770	42	75
27713	27715	5x16	24,0	1145	55	95
27717	27719	5x25	29,5	1750	71	175

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKSM-HF Armoured power and control cable 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor - stranded copper conductor	IEC 60228, class 2
2. Insulation - XLPE plastic	IEC 60092-351
3. Bedding - filler tape	
4. Armour - copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath - polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-HF 0,6/1kV Part number Normal	G-type	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
25740	27052	1x4	3,1	7,5	105	40	45
25742	27054	1x6	3,1	8,0	130	52	50
25744	27056	1x10	3,5	9,5	190	72	60
25746	27058	1x16	4,1	10,5	260	96	65
25748	27060	1x25	4,9	13,0	385	127	80
25750	27062	1x35	5,5	14,0	490	157	90
25752	27064	1x50	8,7	16,5	660	196	100
25754	27066	1x70	11,4	19,0	925	242	115
25756	27068	1x95	11,5	20,5	1175	293	125
25758	27070	1x120	14,5	22,5	1475	339	140
25760	27072	1x150	14,7	25,0	1780	389	155
25762	27074	1x185	15,2	28,0	2180	444	170
25764	27076	1x240	18,2	30,5	2820	522	185
25766	27078	1x300	18,7	34,0	3465	601	205
25770	–	2x1,5	3,8	9,5	130	20	60
25785	–	2x2,5	4,3	10,5	160	26	65
25801	–	2x4	4,9	12,0	210	34	75
25803	–	2x6	5,4	13,0	315	44	80
25805	–	2x10	8,7	15,5	480	61	95
25807	–	2x16	10,0	18,0	665	82	110
25809	–	2x25	14,5	22,5	1030	108	140
25811	–	2x35	14,7	25,0	1305	133	155
25813	–	2x50	18,1	29,0	1705	167	175
25815	–	2x70	18,7	33,5	2345	206	205
25817	–	2x95	22,2	37,5	3020	249	225
25772	25773	3x1,5	4,1	10,0	155	16	65
25786	25787	3x2,5	4,6	11,0	195	21	70
25802	25880	3x4	5,2	12,5	260	28	80
25804	25882	3x6	5,8	14,0	370	36	85
25806	25884	3x10	9,3	16,5	570	50	100
25808	25886	3x16	10,7	19,0	805	67	115
25810	25888	3x25	14,6	24,0	1240	89	145
25812	25890	3x35	15,0	27,0	1600	110	165
25814	25892	3x50	18,3	31,5	2125	137	190
25816	25894	3x70	22,0	36,0	2970	169	220
25818	25896	3x95	22,8	40,0	3825	205	240
25820	25897	3x120	37,8	45,0	4890	237	270
25822	25898	3x150	39,3	50,0	5970	272	305
25824	–	3x185	47,9	56,5	7500	311	340
25774	25775	4x1,5	4,5	11,0	180	16	70
25788	25789	4x2,5	5,0	12,5	240	21	75
25830	25831	4x4	5,8	13,5	320	28	85
25832	25833	4x6	8,8	15,5	475	36	95
25834	25835	4x10	10,3	18,0	695	50	110
25836	25837	4x16	11,9	21,5	1020	67	130
25838	25839	4x25	14,8	26,5	1540	89	160
25840	25841	4x35	18,1	29,5	2030	110	180
25842	25843	4x50	19,5	34,5	2675	137	210
25844	25845	4x70	22,6	40,0	3750	169	240
26005	26006	4x95	37,8	45,0	5050	205	270
26007	26008	4x120	39,3	50,0	6220	237	300
25776	25777	5x1,5	5,0	12,0	220	13	75
25790	25791	5x2,5	5,6	13,5	285	17	80
26011	26012	5x4	8,6	15,0	410	23	95
26013	26014	5x6	9,7	17,0	565	30	105
26015	26016	5x10	11,5	20,0	830	42	120
26017	26018	5x16	13,2	23,0	1210	56	140
26019	26020	5x25	18,1	29,0	1865	74	175
25778	25779	7x1,5	5,4	13,0	265	12	80
25792	25793	7x2,5	8,5	15,0	380	16	90
26025	26026	10x1,5	9,6	16,5	390	11	100
26033	26034	10x2,5	11,5	18,5	535	14	115
25780	25846	12x1,5	9,9	17,0	440	10	105
25794	25795	12x2,5	11,5	19,0	595	13	115
26027	26028	14x1,5	10,5	18,0	490	10	110
26035	26036	14x2,5	11,8	20,5	680	13	125
26030	26029	16x1,5	11,5	19,0	545	9	115
26037	26038	16x2,5	12,5	21,5	760	12	130
25782	25781	19x1,5	11,7	19,5	610	9	120
25796	25797	19x2,5	13,2	22,5	855	11	135
25828	25829	24x1,5	13,9	23,5	780	8	140
25798	25799	24x2,5	15,7	26,0	1080	10	160
25783	25847	27x1,5	14,1	24,0	845	8	145
25768	25769	27x2,5	16,1	27,0	1175	10	165
25784	25848	37x1,5	16,0	26,5	1085	7	160

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKSM-HF FLEX Armoured power cable with flexible conductor 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 5
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- filler tape	
4. Armour	
- copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Note! This cable is not designed for movable or portable applications. Flexible conductor cables ease the installation in areas involving tight bending radius or high vibration.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

For details see general information section

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-HF FLEX 0,6/1kV Part number Normal	G-type	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
26237	27059	1x16	4,1	10,5	240	94	65
26238	27061	1x25	4,9	13,0	360	123	80
26239	27063	1x35	5,5	14,0	460	153	90
26240	27065	1x50	8,7	17,0	650	196	105
26241	27067	1x70	11,4	19,0	885	240	115
26242	27069	1x95	11,5	21,5	1115	284	130
26243	27071	1x120	14,5	23,5	1405	331	145
26244	27073	1x150	14,7	26,5	1720	381	160
26245	27075	1x185	15,2	29,0	2065	429	180
26246	27077	1x240	18,2	32,5	2715	507	200
26247	27079	1x300	18,7	35,5	3300	582	215
26254	–	2x16	10,0	18,0	625	80	110
26255	–	2x25	14,5	23,0	985	105	140
26256	–	2x35	14,7	25,5	1240	130	155
26257	–	2x50	18,1	29,5	1700	167	180
26258	–	2x70	18,7	34,0	2270	204	205
26271	26272	3x16	10,7	19,0	750	66	115
26273	26274	3x25	14,6	24,5	1165	86	150
26275	26276	3x35	15,0	27,0	1505	107	165
26277	26278	3x50	18,3	32,0	2100	137	195
26279	26280	3x70	22,0	36,5	2850	168	220
26281	26282	3x95	22,8	42,0	3685	199	255
26283	26284	3x120	37,8	47,0	4745	232	285
26285	26286	3x150	39,3	53,0	5885	267	320
26287	26288	3x185	47,9	59,5	7265	300	360
26301	26302	4x16	11,9	21,0	945	66	130
26303	26304	4x25	14,8	27,0	1440	86	165
26305	26306	4x35	18,1	29,5	1900	107	180
26307	26308	4x50	19,5	35,5	2635	137	215
26309	26310	4x70	22,6	40,0	3590	168	245
26311	26312	4x95	37,8	47,0	4850	199	285
26313	26314	4x120	39,3	52,0	6010	232	315
–	–	4x150	48,2	59,0	7565	267	355
26331	26332	5x16	13,2	23,0	1070	55	140
26333	26334	5x25	18,1	29,5	1655	71	180

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G16

LKMSM-HF Armoured power cable with extruded filler 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor	
- stranded copper conductor 1,5–10mm^2	IEC 60228, class 2
- stranded copper conductor 16–150mm^2	IEC 60228, class 5
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- extruded filler	
4. Armour	
- copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath	
-black polyolefine plastic, SHF1	IEC 60092-359

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKMSM-HF 0,6/1kV Part number Normal	G-type	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
27232	–	2x1,5	4,9	11,5	195	20	70
27234	–	2x2,5	5,4	12,5	230	26	75
27236	–	2x4	6,0	14,0	290	34	85
27238	–	2x6	9,1	15,5	425	44	90
27240	–	2x10	10,7	17,5	580	61	105
27243	–	2x16	12,4	20,0	740	80	120
27245	–	2x25	15,4	24,5	1085	105	145
27247	–	2x35	17,1	27,0	1400	130	160
27249	–	2x50	20,2	31,0	1895	167	190
27264	27266	3x1,5	5,1	12,0	220	16	75
27268	27270	3x2,5	5,7	13,5	275	21	80
27272	27274	3x4	6,4	14,5	345	28	85
27276	27278	3x6	9,7	16,0	495	36	95
27280	27282	3x10	11,4	18,5	685	50	110
27285	27287	3x16	13,2	21,0	885	66	125
27289	27291	3x25	16,4	26,0	1320	86	155
27293	27295	3x35	18,2	28,5	1710	107	170
27297	27299	3x50	21,9	33,5	2345	137	200
27301	27303	3x70	25,4	38,5	3200	168	230
27305	27307	3x95	40,6	45,0	4270	199	270
27309	27311	3x120	44,8	49,0	5235	232	295
27313	27315	3x150	51,7	55,5	6610	267	335
27328	27330	4x1,5	5,6	13,0	260	16	80
27332	27334	4x2,5	6,3	14,0	320	21	85
27336	27338	4x4	9,5	16,0	430	28	95
27340	27342	4x6	10,6	17,5	590	36	105
27344	27346	4x10	12,5	20,0	830	50	120
27349	27351	4x16	14,5	23,0	1085	66	140
27353	27355	4x25	18,2	28,5	1605	86	170
27357	27359	4x35	20,2	31,5	2105	107	190
27361	27363	4x50	24,1	37,0	2875	137	220
27365	27367	4x70	45,7	43,0	4120	168	260
27369	27371	4x95	45,0	49,0	5245	199	295
27373	27375	4x120	51,2	55,0	6575	232	330
27392	27394	5x1,5	6,1	14,0	300	13	85
27396	27398	5x2,5	9,2	15,5	395	17	95
27400	27402	5x4	10,4	17,0	510	23	105
27404	27406	5x6	11,8	19,0	690	30	115
27408	27410	5x10	13,8	22,0	985	42	130
27413	27415	5x16	16,0	25,5	1300	55	152
27417	27419	5x25	20,1	31,0	1925	71	185

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKSM-EMC Armoured power and control cable with improved EMC screening 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor	
-stranded copper conductor 1,5-10mm^2	IEC 60228, class 2
-stranded copper conductor 16-150mm^2	IEC 60228, class 5
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- filler tape	
4. Screen	
- copper tape, coverage 100%	
5. Armour	
- copper wire braid, coverage > 90%	IEC 60092-350
6. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships.
Design to meet requirements for improved **EMC** screening properties.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)	
Maximum conductor temperature	+ **90 °C**	
Flame-retardant	**IEC 60332-1-2** **IEC 60332-3-22**	-test for single insulated wire and cable -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	
Transfer impedance	**IEC 61196-1**	(typical value 26dB over 1mΩ/m at 100MHz [20mΩ/m])

For details see general information section

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: See technical information section.
Cable with yellow/green protective earth (PE) conductor on request

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-EMC 0,6/1kV Part number	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approx-imate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
27480	2x1,5	3,6	10,0	140	20	60
27481	2x2,5	4,1	10,5	170	26	65
27482	2x4	4,6	12,0	240	34	70
27483	2x6	5,1	13,0	335	44	80
27484	2x10	8,5	16,0	525	61	95
27485	2x16	11,4	18,5	715	80	110
27486	2x25	12,4	23,0	1030	105	140
27487	2x35	14,7	25,5	1325	130	155
26861	3x1,5	3,8	10,5	170	16	60
26863	3x2,5	4,3	11,5	210	21	70
26865	3x4	5,0	12,5	280	28	75
26867	3x6	5,6	14,0	390	36	85
26869	3x10	8,9	16,5	620	50	100
26872	3x16	10,9	19,5	825	66	120
26874	3x25	14,6	24,5	1230	86	145
26876	3x35	15,1	27,0	1575	107	160
26878	3x50	18,3	32,0	2190	137	195
26880	3x70	22,0	36,5	2950	168	220
26882	3x95	22,9	42,0	3805	199	250
26884	3x120	37,9	47,0	4875	232	285
26886	3x150	39,4	53,0	6035	267	320
26942	4x1,5	4,3	11,0	200	16	65
26944	4x2,5	4,7	12,5	255	21	75
26946	4x4	5,5	13,5	335	28	80
26948	4x6	8,5	15,5	500	36	95
26950	4x10	9,9	18,5	750	50	110
26952	4x16	12,0	22,0	1010	66	130
26954	4x25	14,8	27,0	1495	86	160
26956	4x35	18,2	29,5	1955	107	180
26958	4x50	19,6	35,5	2700	137	215
26960	4x70	22,6	40,0	3655	168	240
26962	4x95	37,9	47,5	4915	199	285
26964	4x120	39,4	52,5	6070	232	315
26966	4x150	43,7	59,0	7580	267	355
27488	5x1,5	4,7	12,1	240	13	75
27495	7x1,5	5,1	13,1	285	12	80
27497	10x1,5	9,9	16,8	432	11	100
27499	12x1,5	10,0	17,2	473	10	100
25701	14x1,5	10,1	18,0	523	9	110
27503	16x1,5	10,7	21,4	780	12	115
27505	19x1,5	11,4	22,6	890	11	120
27507	24x1,5	13,6	23,4	835	8	140
27508	24x2,5	15,3	26,3	1125	11	155

LKSM-VFD Armoured power and control cable with improved EMC screening 1,8/3kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor - stranded copper conductor	IEC 60228, class 5
2. Insulation - XLPE plastic	IEC 60092-351
3. Bedding - filler tape	
4. Screen - copper tape, coverage 100%	
5. Armour - copper wire braid, coverage > 90%	IEC 60092-350
6. Sheath - polyolefine plastic, SHF1 - standard colour black, other colours on request	IEC 60092-359

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. Design to meet requirements for **V**ariable **F**requency **D**rivers (VFD). Suitable for voltage peaks up to 3kV.

Main characteristics

Rated voltage	**1,8/3kV (3,6kV)**	
Maximum conductor temperature	+ **90 °C**	
Flame-retardant	**IEC 60332-1-2**	-test for single insulated wire and cable
	IEC 60332-3-22	-test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	
Transfer impedance	**IEC 61196-1**	(typical value 26dB over 1mΩ/m at 100MHz [20mΩ/m])

For details see general information section

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: See technical information section. Cable with yellow/green protective earth (PE) conductor on request

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-VFD 1,8/3kV Part number	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approx-imate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm	Note
26920	1x16	5,5	14,0	355	94	85	1)
26922	1x25	8,5	16,0	495	123	95	1)
26924	1x35	9,3	17,0	625	153	105	1)
26926	1x50	10,3	19,0	795	196	115	1)
26928	1x70	11,3	20,5	995	240	125	1)
26930	1x95	12,5	23,5	1280	284	140	1)
26932	1x120	13,6	25,5	1525	331	150	1)
26934	1x150	14,7	27,5	1830	381	165	1)
26936	1x185	15,8	29,5	2165	429	180	1)
26938	1x240	17,6	33,0	2800	507	200	1)
26940	1x300	18,9	35,0	3365	582	210	1)
26871	3x16	16,4	26,5	1165	66	160	
26873	3x25	16,9	29,5	1525	86	180	
26875	3x35	18,7	32,5	1910	107	195	
26877	3x50	28,8	37,0	2580	137	225	
26879	3x70	32,0	41,0	3395	168	245	
26881	3x95	35,4	46,5	4295	199	280	1)
26883	3x120	38,6	50,5	5200	232	305	1)
26885	3x150	42,0	55,0	6255	267	330	1)
26887	3x185	45,5	60,0	7475	300	360	1)
26893	3x95+3x16	35,4	46,5	4655	199	280	2)
26895	3x120+3x25	38,6	50,5	5755	232	305	2)
26897	3x150+3x25	42,0	55,0	6825	267	330	2)

NOTE!

1) = Protective earth (PE) rules are not fulfilled.
(PE rules, for cables over 16mm^2 the PE-conductor have to be half of main conductor and min. 16mm^2. This according to IEC 60092-352, Electrical installations in ships –Choice and installation of electrical cables)

2 = Three additional protective earth (PE) conductors.
Protective earth (PE) rules are fulfilled.

LKAM-HF Screened power and control cable 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Screen	
- drain wire of tinned copper 1,0mm^2 (in all sizes)	
- aluminium polyester tape, coverage 100%	IEC 60092-350
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour black, other colours on request	

Flame-retardant	●
Fire-resistant	○
Halogen-free	●
Low smoke emission	●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKAM-HF 0,6/1kV		Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
Part number Normal	G-type					
27102	–	2x1,5	9,0	100	20	55
27104	–	2x2,5	9,5	130	26	60
27106	27107	3x1,5	9,5	125	16	55
27108	27109	3x2,5	10,5	160	21	60
27110	27111	4x1,5	10,0	150	16	60
27112	27113	4x2,5	11,0	195	21	65
27114	27115	5x1,5	11,0	175	13	65
27116	27117	5x2,5	12,5	240	17	75
27118	27119	7x1,5	12,0	220	12	70
27120	27121	7x2,5	13,5	300	16	80
27140	27141	10x1,5	15,5	310	11	90
27142	27143	10x2,5	17,5	430	14	105
27122	27123	12x1,5	16,0	350	10	95
27124	27125	12x2,5	18,0	495	13	105
27144	27145	14x1,5	16,5	395	10	100
27146	27147	14x2,5	18,5	565	13	110
27148	27149	16x1,5	17,5	450	9	105
27150	27151	16x2,5	19,5	635	12	120
27126	27127	19x1,5	18,5	510	9	110
27128	27129	19x2,5	21,0	740	11	125
27130	27131	24x1,5	22,0	650	8	130
27132	27133	24x2,5	25,0	930	10	150
27134	27135	27x1,5	22,5	710	8	135
27138	27139	27x2,5	25,5	1025	10	150
27155	27156	32x1,5	23,5	825	7	140
27157	27158	32x2,5	26,5	1195	9	160
27136	27137	37x1,5	25,0	935	7	150
27152	27153	37x2,5	28,5	1355	9	170

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKEM-HF Switchboard wire 0,6/1kV

DESIGN:	STANDARDS:
1. Conductor	
- stranded flexible copper conductor	IEC 60228, class 5
2. Insulation	
- HF90 plastic	IEC 60092-351
- standard colour black, other colours on request	

IEC 60092-353, design

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed wiring in switchboards, control panels and other enclosures.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Cable type, cable size, voltage and manufacturer's name

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKEM-HF 0,6/1kV Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
25120	1x0,75	2,7	14	14	15
25121	1x1,0	2,8	17	17	15
25122	1x1,5	3,1	21	22	15
25124	1x2,5	3,6	32	30	15
25125	1x4	4,1	45	39	20
25126	1x6	4,7	63	50	20
25128	1x10	5,7	103	71	25
25130	1x16	6,7	154	94	30
25132	1x25	8,6	244	123	35
25134	1x35	9,7	334	153	40
25136	1x50	11,9	476	196	50
25138	1x70	13,7	671	240	55
25165	1x95	16,2	887	284	65
25166	1x120	18,2	1125	331	75
25167	1x150	20,8	1424	381	85
25168	1x185	23,3	1753	429	95
25169	1x240	26,8	2357	507	110
25070	1x300	28,9	2900	582	120

LKM-FRHF Fire-resistant unarmoured power and control cable 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor - stranded copper conductor	IEC 60228, class 2
2. Insulation - Mica tape - XLPE plastic	IEC 60092-351
3. Bedding - separator tape	
4. Sheath - polyolefine plastic, SHF1 - standard colour orange, other colours on request	IEC 60092-359

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKM-FRHF 0,6/1kV Part number Normal	G-type	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
28132	–	2x1,5	9,0	90	20	55
28134	–	2x2,5	10,5	125	26	65
28136	–	2x4	11,5	165	34	70
28138	–	2x6	13,0	260	44	75
28140	–	2x10	15,0	385	61	90
28142	–	2x16	17,5	550	82	105
28144	–	2x25	21,5	825	108	130
28162	28163	3x1,5	9,5	115	16	60
28164	28165	3x2,5	11,0	160	21	65
28166	28167	3x4	12,5	220	28	75
28168	28169	3x6	14,0	330	36	85
28170	28171	3x10	16,0	485	50	95
28172	28173	3x16	18,5	705	67	110
28174	28175	3x25	23,0	1060	89	135
28176	28177	3x35	25,5	1425	110	155
28178	28179	3x50	29,5	1905	137	175
28180	28181	3x70	34,5	2685	169	205
28202	28203	3x95	38,5	3540	205	230
28182	28183	4x1,5	11,0	150	16	65
28184	28185	4x2,5	12,0	200	21	75
28186	28187	4x4	13,5	280	28	80
28188	28189	4x6	15,0	405	36	90
28190	28191	4x10	18,0	610	50	105
28192	28193	4x16	20,5	900	67	125
28194	28195	4x25	25,5	1365	89	155
28196	28197	4x35	28,5	1820	110	170
28198	28199	4x50	32,5	2450	137	195
28200	28201	4x70	38,0	3430	169	230
28204	28205	4x95	43,5	4570	205	260
28212	28213	5x1,5	12,0	185	13	70
28214	28215	5x2,5	13,0	240	17	80
28216	28217	7x1,5	13,0	230	12	80
28218	28219	7x2,5	14,5	315	16	90
28240	28241	10x1,5	16,5	330	11	100
28242	28243	10x2,5	18,5	450	14	110
28220	28221	12x1,5	17,5	380	10	105
28222	28223	12x2,5	19,5	510	13	115
28244	28245	14x1,5	18,5	430	10	110
28246	28247	14x2,5	20,5	590	13	125
28248	28249	16x1,5	19,5	485	9	115
28250	28251	16x2,5	21,5	670	12	130
28224	28225	19x1,5	20,5	565	9	125
28226	28227	19x2,5	23,0	765	11	135
28228	28229	24x1,5	24,5	725	8	145
28230	28231	24x2,5	27,5	995	10	165
28232	28233	27x1,5	25,0	795	8	150
28236	28237	27x2,5	28,0	1095	10	170
28234	28235	37x1,5	28,0	1050	7	170
28238	28239	37x2,5	31,5	1450	9	190

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKSM-FRHF Fire-resistant armoured power and control cable 0,6/1kV

DESIGN:	STANDARDS: IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	EC 60092-351
3. Bedding	
- separator tape	
4. Armour	
- copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-FRHF 0,6/1kV		Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
Part number Normal	G-type						
28572	–	1x4	3,1	8,0	115	40	45
28574	–	1x6	3,1	8,5	140	52	50
28576	–	1x10	3,5	10,0	195	72	60
28578	–	1x16	4,0	11,0	265	96	65
28580	–	1x25	4,9	13,0	380	127	80
28582	–	1x35	5,5	14,0	485	157	85
28584	–	1x50	8,7	16,0	655	196	95
28586	–	1x70	11,4	18,5	905	242	110
28588	–	1x95	11,5	20,5	1155	293	120
28590	–	1x120	14,5	22,5	1465	339	135
28592	–	1x150	14,7	25,0	1770	389	150
28594	–	1x185	15,2	27,5	2160	444	165
28596	–	1x240	18,2	30,5	2820	522	185
28598	–	1x300	18,7	33,5	3450	601	200
28602	–	2x1,5	3,8	10,5	140	20	65
28604	–	2x2,5	4,3	11,5	170	26	70
28606	–	2x4	4,9	13,0	225	34	75
28608	–	2x6	5,4	14,0	340	44	85
28610	–	2x10	8,7	16,5	505	61	100
28612	–	2x16	10,0	19,0	690	82	115
28614	–	2x25	14,5	23,5	1055	108	140
28616	–	2x35	14,7	26,0	1325	133	155
28618	–	2x50	18,1	29,5	1715	167	175
28620	–	2x70	18,7	34,0	2325	206	205
28622	28623	3x1,5	4,1	11,0	170	16	65
28624	28625	3x2,5	4,6	12,0	210	21	75
28626	28627	3x4	5,2	13,5	280	28	80
28628	28629	3x6	5,7	15,0	395	36	90
28630	28631	3x10	9,3	17,5	595	50	105
28632	28633	3x16	10,7	20,0	835	67	120
28634	28635	3x25	14,6	25,0	1260	89	150
28636	28637	3x35	15,0	28,0	1605	110	165
28638	28639	3x50	18,3	31,5	2130	137	190
28640	28641	3x70	22,0	36,5	2920	169	220
28691	28692	3x95	22,8	40,5	3775	205	245
28693	---	3x120	37,8	45,5	4875	237	275
28642	28643	4x1,5	4,5	12,0	200	16	70
28644	28645	4x2,5	5,0	13,5	255	21	80
28646	28647	4x4	5,7	14,5	335	28	90
28648	28649	4x6	8,8	16,5	505	36	100
28650	28651	4x10	10,3	19,5	725	50	115
28652	28653	4x16	11,9	22,5	1035	67	135
28654	28655	4x25	14,8	27,5	1535	89	165
28656	28657	4x35	18,1	30,5	2000	110	185
28658	28659	4x50	19,5	35,0	2635	137	210
28660	28661	4x70	22,4	40,0	3620	169	240
28703	28704	4x95	37,8	46,0	4895	205	275
28662	28663	5x1,5	5,0	13,5	245	13	80
28664	28665	5x2,5	5,6	14,5	305	17	85
28666	28667	7x1,5	5,4	14,5	295	12	85
28668	28669	7x2,5	8,6	16,0	410	16	95
28723	28724	10x1,5	9,6	18,0	430	11	110
28725	28726	10x2,5	11,7	20,0	570	14	120
28670	28671	12x1,5	9,9	19,0	490	10	115
28672	28673	12x2,5	11,8	21,0	635	13	125
28727	28728	14x1,5	11,7	20,0	555	10	120
28729	28730	14x2,5	11,9	22,5	730	13	135
28731	28732	16x1,5	11,8	21,0	615	9	125
28733	28734	16x2,5	12,5	23,5	815	12	140
28674	28675	19x1,5	11,8	22,0	680	9	130
28676	28677	19x2,5	13,2	24,5	920	11	145
28678	28679	24x1,5	13,9	26,0	875	8	155
28680	28681	24x2,5	15,7	29,0	1165	10	175
28682	28683	27x1,5	14,1	26,5	945	8	160
28686	28687	27x2,5	16,1	29,5	1265	10	175
28684	28685	37x1,5	16,0	29,5	1220	7	180
28688	28689	37x2,5	18,1	33,0	1660	9	200

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKAM-FRHF Fire-resistant screened power and control cable 0,6/1kV

DESIGN:	STANDARDS:
	IEC 60092-353, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape - XLPE plastic	IEC 60092-351
3. Screen	
- drain wire of tinned copper 1,0mm^2 (in all sizes)	
- aluminium polyester tape, coverage 100%	IEC 60092-350
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed.
If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**AC 0,6/1kV (1,2kV)** **DC 0,9/1,5kV** (if voltage to earth does not exceed 0,9kV)
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: see technical information section

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKAM-FRHF 0,6/1kV		Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
Part number Normal	G-type					
28741	–	2x1,5	9,5	115	20	60
28742	–	2x2,5	10,5	140	26	65
28743	28744	3x1,5	10,5	140	16	60
28745	28746	3x2,5	11,5	175	21	70
28747	28748	4x1,5	11,0	165	16	65
28749	28750	4x2,5	12,5	215	21	75
28751	28752	5x1,5	12,0	200	13	75
28753	28754	5x2,5	13,5	270	17	80
28755	–	7x1,5	13,5	250	12	80
28763	–	12x1,5	17,5	400	10	105
28767	–	14x1,5	18,5	450	10	110
28769	–	14x2,5	20,5	625	13	125
28771	–	16x1,5	19,5	515	9	120
28773	–	16x2,5	22,0	700	12	130
28775	–	19x1,5	20,5	580	9	125
28777	–	19x2,5	23,5	820	11	140
28779	–	24x1,5	24,5	740	8	145
28781	–	24x2,5	27,5	1035	10	165
28783	–	27x1,5	25,0	810	8	150
28785	–	27x2,5	28,0	1140	10	170

G-type is with yellow/green earth conductor and marking on sheath is, for example, 3G1,5

LKM-HF

Unarmoured control and instrumentation cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Bedding	
- separator tape	
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour grey, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended..

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKM-HF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
26365	2x0,75	6,5	50	11,3	25
26366	3x0,75	7,0	60	9,8	30
26367	4x0,75	7,5	75	8,9	30
26368	5x0,75	8,0	85	8,3	30
26369	7x0,75	8,5	110	7,4	35
26370	10x0,75	11,0	160	6,6	45
26371	12x0,75	11,5	180	6,2	45
26372	14x0,75	12,0	200	5,9	50
26373	16x0,75	13,0	235	5,6	50
26374	19x0,75	13,5	265	5,3	55
26375	20x0,75	14,5	285	5,2	60
26376	24x0,75	16,0	335	4,9	65
26377	27x0,75	16,5	365	4,7	65
26378	32x0,75	17,0	415	4,5	65
26379	37x0,75	18,0	470	4,3	70

Other sizes on request.

LKSM-HF Armoured control and instrumentation cable 250V

DESIGN:	STANDARDS: IEC 60092-376, design
1. Conductor - stranded copper conductor	IEC 60228, class 2
2. Insulation - XLPE plastic	IEC 60092-351
3. Bedding - separator tape	
4. Armour - drain wire copper (in all sizes) - copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath - polyolefine plastic, SHF1 - standard colour grey, other colours on request	IEC 60092-359

Flame-retardant	●
Fire-resistant	○
Halogen-free	●
Low smoke emission	●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-HF 250V Part number	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
27779	2x0,5	3,1	7,0	80	8,7	40
27780	3x0,5	3,1	7,5	85	7,6	45
27781	4x0,5	3,1	8,0	95	6,9	45
27782	5x0,5	3,2	8,5	110	6,4	50
27783	7x0,5	3,5	9,0	125	5,8	55
27784	10x0,5	4,6	11,5	180	5,1	70
27785	12x0,5	4,8	11,5	195	4,8	70
27786	14x0,5	5,1	12,0	215	4,6	70
27787	16x0,5	5,5	12,5	235	4,4	75
27788	19x0,5	5,8	13,5	265	4,1	80
27789	20x0,5	6,1	14,0	285	4,1	85
27790	24x0,5	6,8	15,5	325	3,8	90
27791	27x0,5	6,9	15,5	345	3,7	95
27792	32x0,5	9,9	16,5	420	3,5	100
27793	37x0,5	10,9	18,0	470	3,3	105
26402	2x0,75	3,6	7,5	90	11,3	45
26403	3x0,75	3,6	7,5	100	9,8	45
26404	4x0,75	3,6	8,5	115	8,9	50
26405	5x0,75	4,1	9,5	140	8,3	55
26407	7x0,75	4,1	10,0	165	7,4	60
26410	10x0,75	5,1	12,5	220	6,6	75
26412	12x0,75	5,3	12,5	245	6,2	75
26414	14x0,75	5,6	13,0	270	5,9	80
26416	16x0,75	6,1	14,0	300	5,6	85
26419	19x0,75	6,3	14,5	330	5,3	85
26420	20x0,75	11,0	18,0	455	5,2	110
26424	24x0,75	11,7	17,0	450	4,9	100
26427	27x0,75	11,7	17,5	485	4,7	105
26432	32x0,75	11,8	18,0	545	4,5	110
26437	37x0,75	11,9	19,5	605	4,3	115

Other sizes on request.

LKAM-HF Screened control and instrumentation cable 250V

DESIGN:	STANDARDS: IEC 60092-376, design
1. Conductor - stranded copper conductor	IEC 60228, class 2
2. Insulation - XLPE plastic	IEC 60092-351
3. Screen - drain wire of tinned copper - aluminium polyester tape, coverage 100%	IEC 60092-350
4. Sheath - polyolefine plastic, SHF1 - standard colour grey, other colours on request	IEC 60092-359

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed.
If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

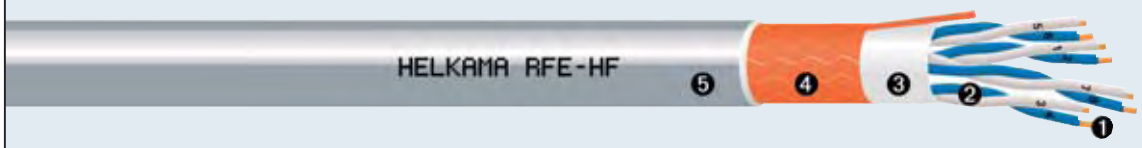
Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKAM-HF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
26382	2x0,75	6,5	55	11,3	25
26383	3x0,75	7,0	65	9,8	30
26384	4x0,75	7,5	80	8,9	30
26385	5x0,75	8,0	95	8,3	30
26386	7x0,75	9,0	120	7,4	35
26387	10x0,75	11,5	165	6,6	45
26388	12x0,75	12,0	190	6,2	45
26389	14x0,75	12,5	215	5,9	50
26390	16x0,75	13,0	240	5,6	50
26391	19x0,75	13,5	270	5,3	55
26392	20x0,75	17,0	345	5,2	70
26393	24x0,75	16,0	340	4,9	65
26394	27x0,75	16,5	370	4,7	65
26395	32x0,75	17,0	430	4,5	70
26396	37x0,75	18,5	485	4,3	75

Other sizes on request.

RFE-HF Armoured instrumentation and communication cable 250V



DESIGN:	STANDARDS: IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Twisted pair	
- two insulated cores twisted together to form a pair See next page for Quad	
4. Armour	
- drain wire copper (in all sizes)	
- copper wire braid, coverage > 94%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour grey, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Electrical data:

	0,5mm²	0,75mm²	1,5mm²	Unit
Loop resistance of pair, max. / +20°C	80	52	24,4	ohm/km
Pair capacitance, nom. / 800Hz	55	50	60	nF/km
Loop inductance, nom.	0,6	0,6	0,7	mH/km
Insulation resistance / +20°C	≥1500	≥1500	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

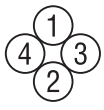
RFE-HF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20362	1x2x0,5	7,0	85	45
20364	2x2x0,5 Quad	8,0	105	50
20363	2x2x0,5	10,5	130	60
20366	4x2x0,5	11,5	175	70
20368	7x2x0,5	14,0	245	85
20369	8x2x0,5	14,5	270	85
20370	10x2x0,5	17,0	355	100
20371	12x2x0,5	17,5	390	105
20372	14x2x0,5	18,5	440	110
20373	16x2x0,5	19,5	485	120
20374	19x2x0,5	21,0	545	125
20376	24x2x0,5	23,5	670	140
20378	37x2x0,5	28,0	930	170
20382	1x2x0,75	7,5	95	45
20384	2x2x0,75 Quad	9,0	125	55
20383	2x2x0,75	11,0	155	65
20386	4x2x0,75	12,5	215	75
20388	7x2x0,75	15,5	330	90
20389	8x2x0,75	16,0	375	95
20390	10x2x0,75	18,5	440	110
20391	12x2x0,75	19,0	490	115
20392	14x2x0,75	20,5	565	125
20393	16x2x0,75	21,5	620	130
20394	19x2x0,75	23,5	715	140
20396	24x2x0,75	26,0	860	155
20398	32x2x0,75	29,5	1100	175
20490	1x2x1,5	9,5	135	60
20491	2x2x1,5 Quad	11,0	190	65
20492	2x2x1,5	14,0	235	85
20493	4x2x1,5	17,0	375	100
20494	7x2x1,5	20,0	545	120
20495	8x2x1,5	21,5	625	130
20496	10x2x1,5	24,5	760	145
20497	12x2x1,5	25,5	855	155
20498	14x2x1,5	27,0	960	165
20499	19x2x1,5	31,0	1230	185
20500	24x2x1,5	35,0	1530	210
20501	32x2x1,5	39,5	1950	235

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....

(Quad)cable is built up as a star quad
with the following identification

1 core white
2 core blue
3 core white
4 core blue



RFE-HF (i) Armoured and pair screened instrumentation and communication cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Twisted pair & pair screen	
- two insulated cores twisted together to form a pair	
- plastic coated aluminium tape and a tinned copper drain wire	
4. Bedding	
- filler tape	
5. Armour	
- drain wire copper (in all sizes)	
- copper wire braid, coverage > 94%	IEC 60092-350
6. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour grey, other colours on request	

Flame-retardant	●
Fire-resistant	○
Halogen-free	●
Low smoke emission	●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Electrical data:

	0,75mm²	1,5mm²	Unit
Loop resistance of pair, max. / +20°C	52	24,4	ohm/km
Pair capacitance, nom. / 800Hz	70	90	nF/km
Loop inductance, nom.	0,6	0,7	mH/km
Insulation resistance / +20°C	≥1500	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

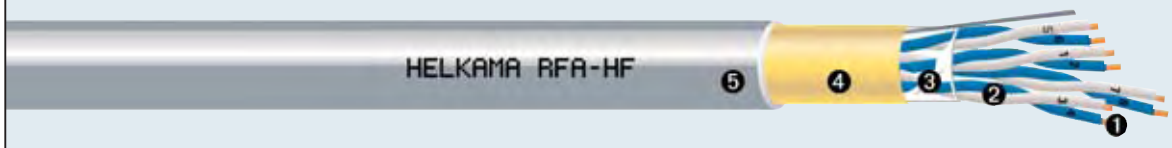
HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

RFE-HF(i) 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
22006	1x2x0,75	7,5	95	45
22008	1x4x0,75	9,0	140	55
22010	2x2x0,75	11,5	170	70
22012	4x2x0,75	13,0	240	75
22014	7x2x0,75	15,5	375	95
22016	8x2x0,75	16,5	420	100
22018	10x2x0,75	19,0	520	115
22020	12x2x0,75	20,0	585	120
22022	14x2x0,75	21,0	650	125
22024	19x2x0,75	24,0	835	145
22026	24x2x0,75	27,0	1035	160
22050	1x2x1,5	10,0	145	60
22052	1x4x1,5	11,0	200	65
22054	2x2x1,5	14,5	255	85
22056	4x2x1,5	17,0	415	100
22058	7x2x1,5	20,0	610	120
22060	8x2x1,5	22,0	700	130
22062	10x2x1,5	25,0	855	150
22064	12x2x1,5	26,0	965	155
22066	14x2x1,5	28,0	1105	165
22068	19x2x1,5	32,0	1440	190

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....
The pairs are also covered by a numbered tape (1, 2, 3, 4, 5....)

RFA-HF Screened instrumentation and communication cable 250V



DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor - stranded copper conductor	IEC 60228, class 2
2. Insulation - XLPE plastic	IEC 60092-351
3. Twisted pair - two insulated cores twisted together to form a pair See next page for Quad	
4. Screen - drain wire tinned copper - aluminium polyestercopper tape coverage 100%	IEC 60092-350
5. Sheath - polyolefine plastic, SHF1 - standard colour grey, other colours on request	IEC 60092-359

Flame-retardant	●
Fire-resistant	○
Halogen-free	●
Low smoke emission	●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Electrical data	**0,5mm²**	**0,75mm²**	**Unit**
Loop resistance of pair, max. / +20°C	80	52	ohm/km
Pair capacitance, nom. / 800Hz	55	50	nF/km
Loop inductance, nom.	0,6	0,6	mH/km
Insulation resistance / +20°C	≥1500	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

RFA-HF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20910	1x2x0,5	6,0	45	35
20912	2x2x0,5 Quad	7,0	65	40
20914	2x2x0,5	9,0	75	55
20916	4x2x0,5	10,5	120	65
20918	7x2x0,5	12,5	175	75
20920	8x2x0,5	13,5	200	80
20922	10x2x0,5	15,5	245	95
20924	12x2x0,5	16,0	280	95
20926	14x2x0,5	17,5	315	105
20928	16x2x0,5	18,0	350	110
20930	19x2x0,5	20,0	410	120
20932	24x2x0,5	22,0	515	135
20934	32x2x0,5	25,5	665	150
20936	37x2x0,5	27,0	745	160
20970	1x2x0,75	6,5	55	40
20972	2x2x0,75 Quad	7,5	80	45
20974	2x2x0,75	10,0	100	60
20976	4x2x0,75	11,5	150	70
20978	7x2x0,75	14,0	225	85
20980	8x2x0,75	15,0	260	90
20982	10x2x0,75	17,0	320	100
20984	12x2x0,75	18,0	365	105
20986	14x2x0,75	19,0	415	115
20988	16x2x0,75	20,5	480	125
20990	19x2x0,75	22,0	555	130
20992	24x2x0,75	24,5	680	145

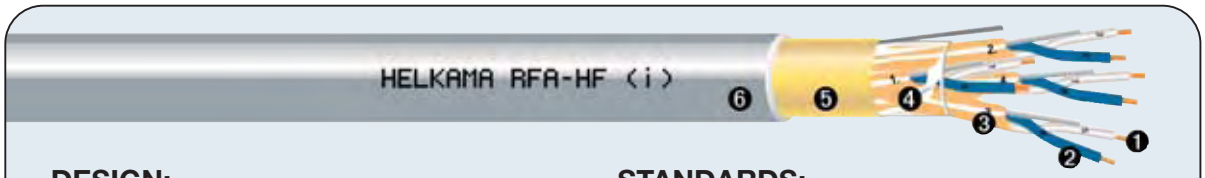
Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....

(Quad)cable is built up as a star quad
with the following identification

1 core white
2 core blue
3 core white
4 core blue

RFA-HF (i) Collectively and pair screened instrumentation and communication cable 250V



DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- XLPE plastic	IEC 60092-351
3. Twisted pair & pair screen	
- two insulated cores twisted together to form a pair	
- plastic coated aluminium tape and a tinned copper drain wire	
4. Bedding	
- separator tape	
5. Collective screen	
- drain wire tinned copper	IEC 60092-350
- aluminium polyester tape, coverage 100%	
6. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour grey, other colours on request	

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Electrical data

	0,5mm²	0,75mm²	Unit
Loop resistance of pair, max. / +20°C	80	52	ohm/km
Pair capacitance, nom.	55	70	nF/km
Loop inductance, nom.	0,6	0,6	mH/km
Insulation resistance / +20°C	≥1500	≥1500	Mohm*km

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

RFA-HF(i) 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20940	2x2x0,5	9,5	95	55
20942	4x2x0,5	11,0	145	65
20944	7x2x0,5	13,0	220	80
20946	8x2x0,5	14,0	245	85
20948	10x2x0,5	16,0	305	95
20950	12x2x0,5	16,5	350	100
20952	14x2x0,5	17,5	395	105
20954	16x2x0,5	19,0	450	115
20956	19x2x0,5	20,0	520	120
20958	24x2x0,5	22,5	655	135
21059	2x2x0,75	10,0	115	60
21061	4x2x0,75	12,0	180	70
21063	7x2x0,75	14,5	275	85
21065	8x2x0,75	15,0	310	90
21067	10x2x0,75	17,5	380	105
21069	12x2x0,75	18,0	440	110
21071	14x2x0,75	19,5	520	120
21073	16x2x0,75	21,0	580	125
21075	19x2x0,75	22,5	680	135
21077	24x2x0,75	25,0	840	150

Other sizes on request.

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....
The pairs are covered by a numbered tape (1, 2, 3, 4, 5....)

LKM-FRHF Fire-resistant unarmoured control and instrumentation cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	IEC 60092-351
3. Bedding	
- separator tape	
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKM-FRHF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
22406	2x0,75	8,5	65,0	11,3	35,0
22407	3x0,75	9,0	80,0	9,8	35,0
22408	4x0,75	10,0	110,0	8,9	40,0
22409	5x0,75	11,0	130,0	8,3	45,0
22410	7x0,75	11,5	160,0	7,4	45,0
22411	10x0,75	15,0	225,0	6,6	60,0
22412	12x0,75	15,5	255,0	6,2	60,0
22413	14x0,75	16,5	295,0	5,9	65,0
22414	16x0,75	17,5	330,0	5,6	70,0
22415	19x0,75	18,0	375,0	5,3	75,0
22416	20x0,75	19,0	410,0	5,2	75,0
22417	24x0,75	21,5	475,0	4,9	85,0
22418	27x0,75	22,0	520,0	4,7	85,0
22419	32x0,75	23,0	615,0	4,5	90,0
22420	37x0,75	25,0	695,0	4,3	100,0

Other size on request.

LKSM-FRHF Fire-resistant armoured control and instrumentation cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	EC 60092-351
3. Bedding	
- separator tape	
4. Armour	
- drain wire copper (in all sizes)	
- copper wire braid, coverage > 90%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

HELKAMA Tel. +358 2 410 8700, fax +358 2 410 8750, www.helkamabica.fi

LKSM-FRHF 250V Part number	Number of conductors & cross-section n x mm²	Cross-section of armour mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
22436	2x0,75	3,6	9,0	105	11,3	55
22437	3x0,75	3,9	9,5	125	9,8	60
22438	4x0,75	4,4	11,0	160	8,9	65
22439	5x0,75	4,9	11,5	185	8,3	70
22440	7x0,75	5,4	12,5	220	7,4	75
22441	10x0,75	7,1	16,0	300	6,6	95
22442	12x0,75	7,3	16,0	330	6,2	95
22443	14x0,75	7,8	17,0	370	5,9	100
22444	16x0,75	11,3	18,5	445	5,6	110
22445	19x0,75	11,9	19,5	495	5,3	115
22446	20x0,75	12,9	20,5	545	5,2	125
22447	24x0,75	14,3	22,5	615	4,9	135
22448	27x0,75	14,6	23,0	665	4,7	140
22449	32x0,75	15,3	23,5	740	4,5	140
22450	37x0,75	16,7	26,0	860	4,3	155

Other size on request.

LKAM-FRHF Fire-resistant screened control and instrumentation cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape - XLPE plastic	IEC 60092-351
3. Screen	
- drain wire of tinned copper - aluminium polyester tape, coverage 100%	IEC 60092-350
4. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant ●
Fire-resistant ●
Halogen-free ●
Low smoke emission ●

Application: For fixed installation in most areas and on open deck in ships, especially when lightweight cables are needed.
If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21** series
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Core identification: black numbers on white base

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

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LKAM-FRHF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Current Rating A at +45°C	Min. bending radius fixed installation mm
22466	2x0,75	8,5	70	11,3	50
22467	3x0,75	9,0	85	9,8	55
22468	4x0,75	10,0	115	8,9	60
22469	5x0,75	11,0	135	8,3	65
22470	7x0,75	11,5	165	7,4	70
22471	10x0,75	15,0	230	6,6	90
22472	12x0,75	15,5	260	6,2	95
22473	14x0,75	16,5	300	5,9	100
22474	16x0,75	17,5	340	5,6	105
22475	19x0,75	18,0	380	5,3	110
22476	20x0,75	19,5	415	5,2	115
22477	24x0,75	21,5	480	4,9	130
22478	27x0,75	22,0	525	4,7	130
22479	32x0,75	23,0	620	4,5	140
22480	37x0,75	25,0	700	4,3	150

Other size on request.

RFE-FRHF Fire-resistant armoured instrumentation and communication cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	IEC 60092-351
3. Twisted pair	
- two insulated cores twisted together to form a pair See next page for Quad	
4. Armour	
- drain wire (in all sizes)	
- copper wire braid, coverage > 94%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

- **Flame-retardant**
- **Fire-resistant**
- **Halogen-free**
- **Low smoke emission**

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**
Maximum conductor temperature	+ **90 °C**
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21**
Halogen-free	**IEC 60754** series
Smoke emission	**IEC 61034** series

Electrical data

	0,75mm²	1,5mm²	Unit
Loop resistance of pair, max. / +20°C	52	24,4	ohm/km
Pair capacitance, nom. / 800Hz	45	55	nF/km
Loop inductance, nom.	0,6	0,7	mH/km
Insulation resistance / +20°C	≥1500	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

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RFE-FRHF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20520	1x2x0,75	9,5	115	55
20522	2x2x0,75 Quad	11,0	170	65
20524	2x2x0,75	14,0	210	85
20526	4x2x0,75	16,5	330	100
20528	7x2x0,75	20,0	470	120
20530	8x2x0,75	21,0	515	125
20532	10x2x0,75	24,5	640	145
20534	12x2x0,75	25,5	710	150
20536	14x2x0,75	27,0	810	165
20538	19x2x0,75	31,0	1025	185
20540	24x2x0,75	34,5	1260	205
20575	1x2x1,5	10,5	155	65
20577	2x2x1,5 Quad	12,0	220	70
20579	2x2x1,5	16,0	315	95
20581	4x2x1,5	18,5	430	110
20583	7x2x1,5	22,5	655	135
20585	8x2x1,5	24,0	725	145
20587	10x2x1,5	27,5	880	165
20589	12x2x1,5	29,0	1010	175
20591	14x2x1,5	30,5	1135	185
20593	16x2x1,5	33,0	1290	195

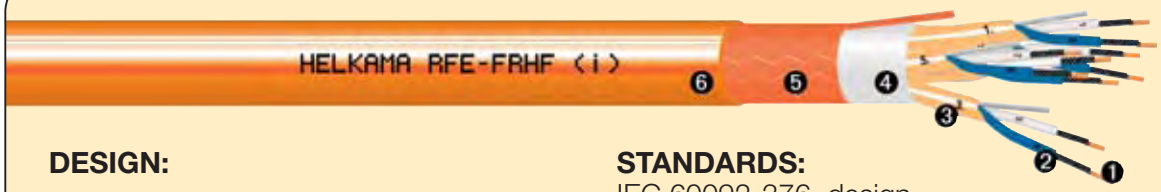
Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....

(Quad)cable is built up as a star quad
with the following identification

1 core	white
2 core	blue
3 core	white
4 core	blue

RFE-FRHF (i) Fire-resistant armoured and pair screened instrumentation and communication cable 250V



DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	IEC 60092-351
3. Twisted pair & pair screen	
- two insulated cores twisted together to form a pair	
- plastic coated aluminium tape and a tinned copper drain wire	
4. Bedding	
- filler tape	
5. Armour	
- drain wire copper	
- copper wire braid, coverage > 94%	IEC 60092-350
6. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant
Fire-resistant
Halogen-free
Low smoke emission

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**	
Maximum conductor temperature	+ **90 °C**	
Flame-retardant	**IEC 60332-1-2**	-test for single insulated wire and cable
	IEC 60332-3-22	-test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21**	
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	

Electrical data

	0,75mm²	1,5mm²	Unit
Loop resistance of pair, max. / +20°C	52	24,4	ohm/km
Pair capacitance, nom. / 800Hz	55	75	nF/km
Loop inductance, nom.	0,6	0,7	mH/km
Insulation resistance / +20°C	≥1500	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

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RFE-FRHF(i) 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20546	1x2x0,75	9,5	125	55
20548	1X4X0,75	11,0	175	65
20550	2x2x0,75	14,5	225	85
20552	4x2x0,75	17,0	355	100
20554	7x2x0,75	20,0	510	120
20556	8x2x0,75	22,0	585	130
20558	10x2x0,75	25,0	710	150
20560	12x2x0,75	26,0	800	155
20562	14x2x0,75	27,5	910	165
20564	19x2x0,75	32,0	1175	190
20566	24x2x0,75	35,0	1425	210
20568	32x2x0,75	41,0	1945	245
20603	1x2x1,5	10,5	165	65
20604	1X4X1,5	12,0	225	75
20605	2x2x1,5	16,5	320	100
20607	4x2x1,5	19,0	475	115
20609	7x2x1,5	23,0	720	135
20611	8x2x1,5	24,5	805	145
20613	10x2x1,5	28,0	985	165
20615	12x2x1,5	29,5	1145	175
20617	14x2x1,5	31,5	1290	190
20619	16x2x1,5	33,5	1450	200
20621	19x2x1,5	36,0	1665	215

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....
The pairs are also covered by a numbered tape (1, 2, 3, 4, 5....)

RFA-FRHF Fire-resistant screened instrumentation and communication cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	IEC 60092-351
3. Twisted pair	
- two insulated cores twisted together to form a pair See next page for Quad	
4. Screen	
- drain wire tinned copper	
- aluminium polyester tape coverage 100%	IEC 60092-350
5. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant
Fire-resistant
Halogen-free
Low smoke emission

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**	
Maximum conductor temperature	+ **90 °C**	
Flame-retardant	**IEC 60332-1-2**	-test for single insulated wire and cable
	IEC 60332-3-22	-test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21**	
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	

For details see general information section

Electrical data	**0,75mm²**	**Unit**
Loop resistance of pair, max. / +20°C	52	ohm/km
Pair capacitance, nom. / 800Hz	45	nF/km
Loop inductance, nom.	0,6	mH/km
Insulation resistance / +20°C	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

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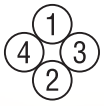
RFA-FRHF 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20635	1x2x0,75	8,5	75	50
20637	2x2x0,75 Quad	10,0	120	60
20639	2x2x0,75	13,0	135	80
20641	4x2x0,75	15,5	215	90
20643	7x2x0,75	18,5	330	110
20645	8x2x0,75	20,0	380	120
20647	10x2x0,75	23,0	480	140
20649	12x2x0,75	24,0	545	145
20651	14x2x0,75	25,5	620	155
20653	16x2x0,75	27,5	700	165
20655	19x2x0,75	29,5	805	175
20657	24x2x0,75	33,5	1030	200
20657	27x2x0,75	35,0	1135	210
21521	1x2x1,5	9,0	100	55

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....

(Quad)cable is built up as a star quad
with the following identification

1 core	white
2 core	blue
3 core	white
4 core	blue



RFA-FRHF (i) Fire-resistant collectively and pair screened instrumentation and communication cable 250V

DESIGN:	STANDARDS:
	IEC 60092-376, design
1. Conductor	
- stranded copper conductor	IEC 60228, class 2
2. Insulation	
- Mica tape	
- XLPE plastic	IEC 60092-351
3. Twisted pair & pair screen	
- two insulated cores twisted together to form a pair	
- plastic coated aluminium tape and a tinned copper drain wire	
4. Bedding	
- separator tape	
5. Collective screen	
- drain wire tinned copper	
- aluminium polyester tape coverage 100 %	IEC 60092-350
6. Sheath	
- polyolefine plastic, SHF1	IEC 60092-359
- standard colour orange, other colours on request	

Flame-retardant
Fire-resistant
Halogen-free
Low smoke emission

Application: For fixed installation in most areas and on open deck in ships. If the cable is exposed to direct sun light protective covering or cable with black outer sheath is recommended.

Main characteristics

Rated voltage	**150/250V (300V)**	
Maximum conductor temperature	+ **90 °C**	
Flame-retardant	**IEC 60332-1-2**	-test for single insulated wire and cable
	IEC 60332-3-22	-test for bunched wires and cables, category A
Fire-resistant	**IEC 60331-21**	
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	

For details see general information section

Electrical data	**0,75mm²**	**Unit**
Loop resistance of pair, max. / +20°C	52	ohm/km
Pair capacitance, nom. / 800Hz	55	nF/km
Loop inductance, nom.	0,6	mH/km
Insulation resistance / +20°C	≥1500	Mohm*km.

Minimum recommended installation temperature -15 °C
Lowest operation temperature -40 °C

Identification: Lot number, cable type, cable size, voltage, temperature, standards, production month, manufacturer's name and meter marking printed on the sheath

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RFA-FRHF(i) 250V Part number	Number of conductors & cross-section n x mm²	Nominal outer diameter mm	Approximate weight kg/km	Min. bending radius fixed installation mm
20667	2x2x0,75	13,5	155	80
20669	4x2x0,75	15,5	245	95
20671	7x2x0,75	18,5	380	110
20673	8x2x0,75	20,0	430	120
20675	10x2x0,75	23,5	545	140
20677	12x2x0,75	24,5	625	145
20679	14x2x0,75	26,0	725	155
20681	16x2x0,75	28,0	810	165
20683	19x2x0,75	30,0	945	180
20685	24x2x0,75	34,0	1205	205
21553	2x2x1,5	15,0	215	90
21555	4x2x1,5	17,5	350	105

Core identification

Each pair white - blue. Cores numbered 1, 2, 3, 4, 5....
The pairs are also covered by a numbered tape (1, 2, 3, 4, 5....)

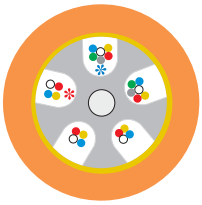
FXMSU Optical fibre indoor/outdoor cable

Cable construction:

1. **Central element glass fibre, 1,5 mm**
2. **PP-slotted core, 6,0 mm**
3. **Optical fibres, 250 µm**
4. **Swellable tape**
5. **Rip cord**
6. **UV-protected and halogen free sheath**

Flame-retardant ●
Fire-resistant ○
Halogen-free ●
Low smoke emission ●

- non-metallic
- networks in marine applications
- Fibres: 250 µm SM or MM fibres
- 4 - 48 fibres



Cable characteristics:

Maximum pulling force	500	N	EN 187000 method 501
Crush strength / 100 mm (plate)	4000	N	EN 187000 method 504
Crush strength / 25 mm (mandrel)	650	N	EN 187000 method 504
Impact strength	25	J	EN 187000 method 505
Sheath marking	Cable type, manufacturer's name, manufacturing number and time, length marking in meter		
Minimum installation temperature	-15 °C		
Operating temperature range	-45...+70 °C		
Longitudinal water tightness	EN 187000 method 605B		
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables, category A		
Halogen-free	**IEC 60754** series		
Smoke emission	**IEC 61034** series		

✳. Slotted core cables have blue and red marker threads for the first and last slot respectively.

For details see general information section

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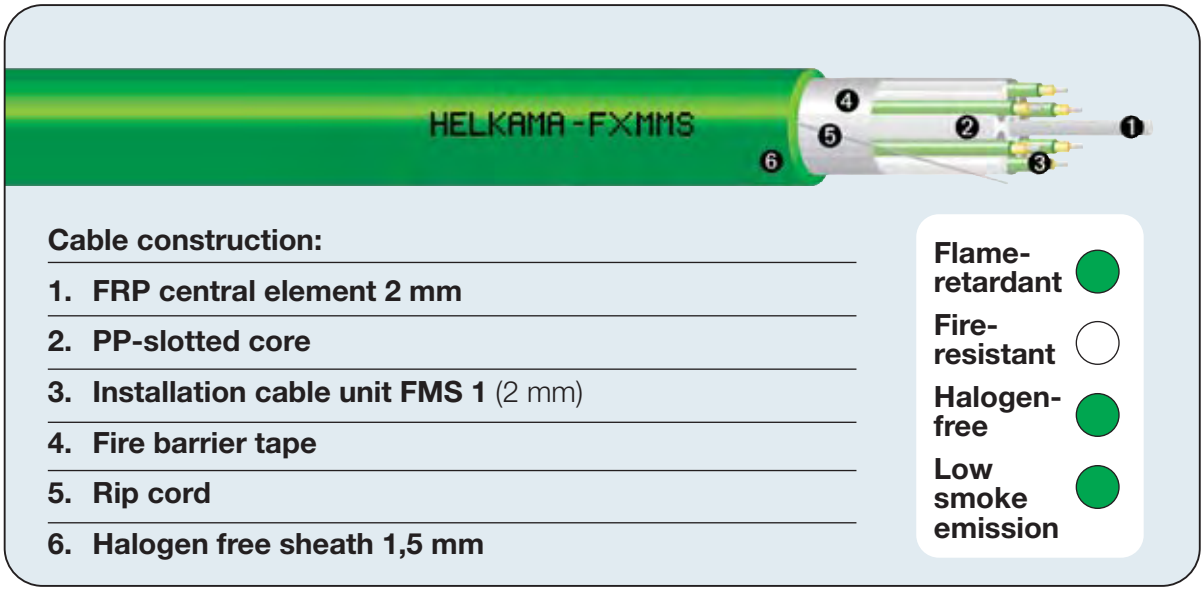
FXMSU

Part number	Cable and number of fibres	Diameter of slotted core, mm	Nominal outer diameter, mm	Approximate weight, kg/km	Minimum bending radius	
					during installation, mm	final installation, mm
10001	FXMSU 1X4SML (L)	6	9,4	75	140	100
10022	FXMSU 1X6SML (L)					
10024	FXMSU 2X6SML (L)					
10028	FXMSU 4X6SML (L)					
14384	FXMSU 1X4OM3L (L)					
14386	FXMSU 2X4OM3L (L)					
14388	FXMSU 3X4OM3L (L)					
14398	FXMSU 4X6OM3L (L)					
14404	FXMSU 1X4GKL (L)					
14406	FXMSU 1X6GKL (L)					
14408	FXMSU 2X4GKL (L)					
14410	FXMSU 3X4GKL (L)					
14412	FXMSU 4X4GKL (L)					
14416	FXMSU 4X6GKL (L)					
14420	FXMSU1X4SML+1X4GKL (L)					
14422	FXMSU1X4SML+2X4GKL (L)					
14424	FXMSU2X4SML+2X4GKL (L)					
14426	FXMSU1X6SML+3X4GKL (L)					
14428	FXMSU2X6SML+3X4GKL (L)					
14449	FXMSU1X4SML+1X4OM3 (L)					
14450	FXMSU1X4SML+2X4OM3L (L)					
14451	FXMSU2X4SML+2X4OM3L (L)					
14454	FXMSU1X6SML+3X4OM3L (L)					
14455	FXMSU2X6SML+3X4OM3L (L)					

Other fiber combinations on request

FXMMS Optical fibre installation cable

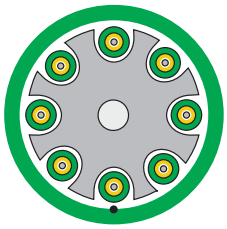


Cable construction:

1. **FRP central element 2 mm**
2. **PP-slotted core**
3. **Installation cable unit FMS 1** (2 mm)
4. **Fire barrier tape**
5. **Rip cord**
6. **Halogen free sheath 1,5 mm**

Flame-retardant
Fire-resistant
Halogen-free
Low smoke emission

- For tray installation
- Fibres: 2–8 SM or MM fibres, 900 µm
- Connectors can be mounted directly to the fibres



Cable characteristics:

Maximum pulling force	1500 N	EN 187000 method 501
Crush strength / 100 mm (plate)	4000 N	EN 187000 method 504
Crush strength / 25 mm (mandrel)	750 N	EN 187000 method 504
Impact strength, R = 300 mm	30 J	EN 187000 method 505
Sheath marking	Cable type, manufacturer's name, manufacturing number and time, length marking in meter	
Minimum bending radius	195 mm during installation, 130 mm in final bending	
Nominal cable diameter	13.1 mm	
Cable weight	142 kg/km	
Minimum installation temperature	-15 °C	
Operating temperature range	-45...+70 °C	
Flame-retardant	**IEC 60332-1-2** -test for single insulated wire and cable **IEC 60332-3-22** -test for bunched wires and cables category A	
Halogen-free	**IEC 60754** series	
Smoke emission	**IEC 61034** series	

For details see general information section

Cable and number of fibres	Diameter of slotted core, mm	Nominal outer diameter, mm	Approximate weight, kg/km	Minimum bending radius	
				during installation, mm	final installation, mm
FXMMS 2-4	7,5	10,7	102	160	110
FXMMS 6-8	9,7	13,1	142	195	130

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FXMMS

Part number	Cable and number of fibres	Diameter of slotted core, mm	Nominal outer diameter, mm	Approximate weight, kg/km	Minimum bending radius	
					during installation, mm	final installation, mm
10810	FXMMS 2SMT (2MM)	7,5	10,7	102	160	110
10812	FXMMS 4SMT (2MM)	7,5	10,7	102	160	110
10814	FXMMS 6SMT (2MM)	9,7	13,1	142	195	130
10816	FXMMS 8SMT (2MM)	9,7	13,1	142	195	130
13747	FXMMS 2GKT (2MM)	7,5	10,7	102	160	110
13748	FXMMS 4GKT (2MM)	7,5	10,7	102	160	110
13749	FXMMS 6GKT (2MM)	9,7	13,1	142	195	130
13750	FXMMS 8GKT (2MM)	9,7	13,1	142	195	130
13872	FXMMS 2OM3T (2MM)	7,5	10,7	102	160	110
13874	FXMMS 4OM3T (2MM)	7,5	10,7	102	160	110
13876	FXMMS 6OM3T (2MM)	9,7	13,1	142	195	130
13878	FXMMS 8OM3T (2MM)	9,7	13,1	142	195	130

Cabled optical fibres characteristics

Fibre coating:	L = 250 µm ± 10 µm T = 900 µm ± 50 µm

Single mode fibre	**10/125 µm**	**SM / OS2 (ITU-T G.652.D)**
Fibre type		SML 250µm±10µm SMT 900µm±50µm
Mode field diameter (MFD)	1310 nm	9,3 +/- 0,5 µm
Mode field eccentricity -Installation cables		≤ 1,0 µm ≤ 0,5 µm
Cladding diameter - Installation cables		125 +/- 2 µm 125 +/- 1 µm
Cladding ellipticity		≤ 2 %
Fibre attenuation	1310 nm 1550 nm	≤ 0,40 dB/km ≤ 0,25 dB/km
Zero dispersion range		1300...1324 nm
Dispersion coefficient - Dispersion at	 1550 nm	≤ 0,093 ps/nm^2/km ≤ 18 ps/nm/km
Cut-off wavelength - Installation cables		≤ 1260 nm 1180...1250 nm
Polarization mode dispersion		≤ 0,5 ps/√km
Proof test		1 % / 1 sec
Fibre identification		6 colour system according to SFS 5648

Multi mode fibre	**50/125 µm**	**OM3**
Fibre type		OM3L 250µm±10µm OM3T 900µm±50µm
Core diameter		50 +/- 3 µm
Core ellipticity		≤ 6 %
Core eccentricity		≤ 3 µm
Cladding diameter		125 +/- 2 µm
Cladding ellipticity		≤ 2 %
Fibre attenuation	850 nm 1300 nm	≤ 2,7 dB/km ≤ 0,8 dB/km
Bandwidth	850 nm 1300 nm 850 nm	≥ 1500 MHz x km (LED) ≥ 500 MHz x km (LED) ≥ 2000 MHz x km (Laser)
Numerical aperture, NA		0,200 +/- 0,015
Fibre identification		6 colour system according to SFS 5648

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Multi mode fibre	**62,5/125 µm**	**GK / OM1**
Fibre type		GKL 250µm±10µm GKT 900µm±50µm
Core diameter		62,5 +/- 3 µm
Core ellipticity		≤ 6 %
Core eccentricity		≤ 3 µm
Cladding diameter		125 +/- 2 µm
Cladding ellipticity		≤ 2 %
Fibre attenuation	850 nm	≤ 3,5 dB/km
	1300 nm	≤ 1,0 dB/km
Bandwidth	850 nm	≥ 200 MHz x km
	1300 nm	≥ 500 MHz x km
Numerical aperture, NA		0,275 +/- 0,015
Fibre identification		6 colour system according to SFS 5648

GENERAL INFORMATION

Insulation material:

The following designations are used for insulation materials in this catalog. All materials are halogen-free.

XLPE stands for cross-linked poly-ethylene compound. It has excellent mechanical and electrical characteristics.

Sheathing material:

The designation SHF1 stands for thermoplastic compound. This material is halogen-free, highly flame-retardant and has low smoke emission.

Definition of terms:

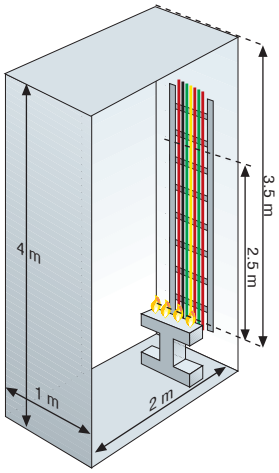
Flame-retardant
To be flame-retardant, the cables must withstand the test specified in IEC standard 60332-3 or IEC 60332-1. Flame-retardant cables do not propagate fire, and are self-extinguishing.

IEC 60332-3 is the test for bunched wires and cables and has three categories A, B and C, defined by different limits for flammable material and burning times. Burning time describes how long the burner is directed towards the bunch of cables. The requirement for passing the test is that after the burner has been removed the cables must extinguish themselves. Burning may not occur more than 2.5 m from the burner as shown in the figure.

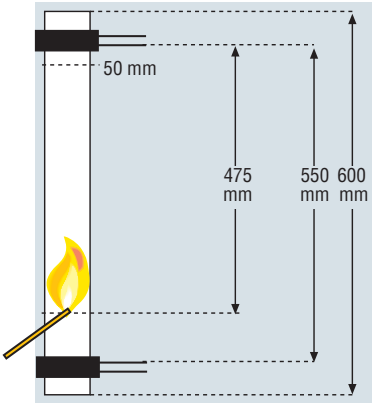
Category	Amount of burning material	Burning time
A	7 litres/m	40 min
B	3,5 litres/m	40 min
C	1,5 litres/m	20 min

All Helkama cables comply with the most severe requirements of category A.

Test on bunched cables IEC 60332-3
Burning is allowed up to max. 2.5 meters from the burner within specified time.



IEC 60332-1 is the test for single insulated wire and cable. Test procedure and requirements according to the picture below.



Min. 50 mm of the cable, measured from the upper support, must remain unburned after the specified time.

Halogen-free
Halogen-free refers to the absence of halogens, such as chlorine and fluorine, and is determined on the basis of halogen content and the acidity of gases of a cable.

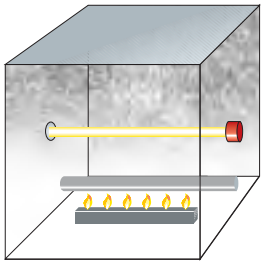
IEC 60754-1 determines the halogen content of the material. To meet the requirements as halogen-free the halogen content of the material may not exceed 0,5 % or 5 mg/g.

IEC 60754-2 determines the degree of acidity of gases evolved during combustion. The limit values are 4,3 for pH and 10 mikroS for conductivity.

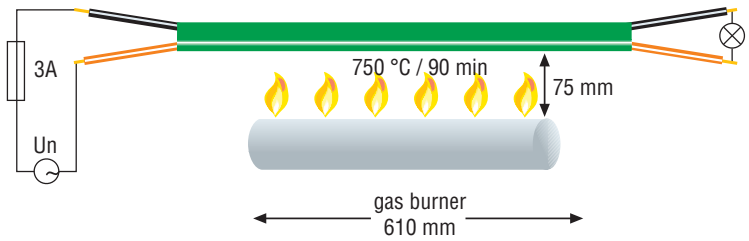
Smoke emission
Smoke emission refers to visibility in a fire. The greater the light transmittance, the better the visibility. When tested in accordance with **IEC 61034-1** (test method) and **IEC 61034-2** (test requirements) the smoke emission of a cable during fire must not exceed the following values.

27m³ cube smoke chamber

Requirements:
60 % light transmittance

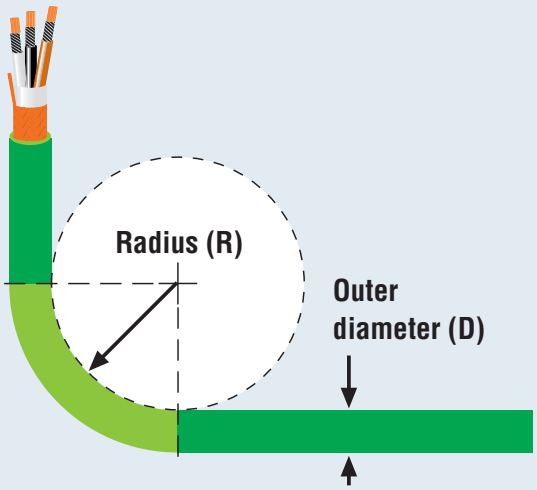


Fire-resistant
To be classified as fire-resistant the cables must withstand the test specified in standard **IEC 60331-21**. The cables must operate for a minimum of 90 minutes while the burner is directed towards the cable as shown below. Helkama fire-resistant cables are also flame-retardant.



BENDING RADIUS

Recommended minimum bending radius, (R) :



LKM-HF	During installation	R = 6x D	< 25mm
LKMM-HF	During installation	R = 9x D	> 25mm
LKEM-HF	Fixed installation	R = 4x D	< 25mm
	Fixed installation	R = 6x D	> 25mm

LKSM-HF LKSM-EMC LKSM-VFD LKMSM-HF LKAM-HF LKM-FRHF LKSM-FRHF LKAM-FRHF RFE-HF RFE-HF(i) RFA-HF RFA-HF(i) RFE-FRHF RFE-FRHF(i) RFA-FRHF RFA-FRHF(i)	During installation Fixed installation	R = 9x D R = 6x D

DIAMETER TOLERANCE

Cable outer diameter, mm.	Tolerance
1 – 10	±0,5mm
10,1 – 20	±1,0mm
20,1 – 30	±1,5mm

Cable outer diameter, mm.	Tolerance
30,1 – 40	±2,0mm
40,1 – 50	±2,5mm
50,1 – 60	±3,0mm

CORE IDENTIFICATION (according to HD 308 S2)

0,6/1kV	Normal type	G-type (with earth conductor)
1-core	BK	
2-cores	BN BU	
3-cores	BN BK GY	Y/G BU BN
4-cores	BU BN GY BK	Y/G BN GY BK
5-cores	1 2 3 4 5	Y/G BU BN GY BK
7-cores and above	1 2 3 4 5 6 7	Y/G 1 2 3 4 5 6
	Black numbers on white base	Black numbers on white base Last core yellow/green.

BU = Blue, **BN** = Brown, **BK** = Black, **GY** = Grey, **Y/G** = Yellow/Green

250V	○ a	● b
Pair number		
1	1	2
2	3	4
3	5	6
4	7	8
5	9	10
6	11	12
etc.		

CURRENT RATING

"Current rating (A) at an ambient temperature of 45°C according to the standard IEC 60092-352 0,6/1 kV +90°C marine cables."

Current carrying capacities in continous service at maximum rated conductor temperature of +90°C.

For continuous service. Continuous service for a cable is to be considered as a current-carrying service (with constant load) having a duration longer than three times the thermal time constant of the cable, i.e. longer than the critical duration(see short time duty).

For class 2 conductor cables

Size N	1	2	3	4	5	7	10	12	14	16	19	24	27	37
Factor, n	1	0,85	0,7	0,7	0,58	0,52	0,46	0,44	0,41	0,40	0,37	0,35	0,33	0,30
1,5 mm²	23	20	16	16	13	12	11	10	9	9	9	8	8	7
2,5 mm²	30	26	21	21	17	16	14	13	12	12	11	11	10	9
4 mm²	40	34	28	28	23	–	–	–	–	–	–	–	–	–
6 mm²	52	44	36	36	30	–	–	–	–	–	–	–	–	–
10 mm²	72	61	50	50	42	–	–	–	–	–	–	–	–	–
16 mm²	96	82	67	67	56	–	–	–	–	–	–	–	–	–
25 mm²	127	108	89	89	–	–	–	–	–	–	–	–	–	–
35 mm²	157	133	110	110	–	–	–	–	–	–	–	–	–	–
50 mm²	196	167	137	137	–	–	–	–	–	–	–	–	–	–
70 mm²	242	206	169	169	–	–	–	–	–	–	–	–	–	–
95 mm²	293	249	205	205	–	–	–	–	–	–	–	–	–	–
120 mm²	339	288	237	237	–	–	–	–	–	–	–	–	–	–
150 mm²	389	331	272	272	–	–	–	–	–	–	–	–	–	–
185 mm²	444	377	311	311	–	–	–	–	–	–	–	–	–	–
240 mm²	522	444	365	365	–	–	–	–	–	–	–	–	–	–
300 mm²	601	511	421	421	–	–	–	–	–	–	–	–	–	–

For class 5 conductor cables

Size N	1	2	3	4	5
Factor, n	1	0,85	0,7	0,7	0,58
16mm²	94	80	66	66	55
25mm²	123	105	86	86	–
35mm²	153	130	107	107	–
50mm²	196	167	137	137	–
70mm²	240	204	168	168	–
95mm²	284	241	199	199	–

For class 5 conductor cables

Size N	1	2	3	4	5
Factor, n	1	0,85	0,7	0,7	0,58
120mm²	331	281	232	232	–
150mm²	381	324	267	267	–
185mm²	429	365	300	300	–
240mm²	507	431	355	355	–
300mm²	582	495	407	407	–

Ambient temperature	+35°C	+40°C	**+45°C**	+50°C	+55°C	+60°C	+65°C	+70°C	+75°C	+80°C
Correction factor	1,10	1,05	**1,00**	0,94	0,88	0,82	0,74	0,64	0,58	0,47

SHORT CIRCUIT CURRENT

Maximum permissible short circuit current.
0,6/1 kV +90°C marine cables.

Based on formula:

$$I_k = 226 \quad X \quad \frac{S}{\sqrt{t}} \quad X \quad \sqrt{\ln \frac{234 + Tk}{234 + Tb}}$$

Formula 1:

$$I_k = 146 \quad X \quad \frac{S}{\sqrt{t}}$$

Ik = Maximum permissible short circuit current.
S = Cross-section of the conductor in mm².
t = Duration of the short circuit in s.
Tk = Maximum rated conductor temperature, short circuit, °C
Tb = Maximum rated conductor temperature, normal, °C

Formula 1: For 0,6/1kV cable with XLPE or HF90 with maximum operating temperature of +90°C (Tb) and short circuit temperature of +250°C (Tk).

Cross-section of the conductor in mm²	Duration of the short circuit in s.					
	0,2	**0,5**	**1**	**2**	**3**	**10**
1,5	0,5	0,3	0,2	0,2	0,1	0,1
2,5	0,8	0,5	0,4	0,3	0,2	0,1
4	1,3	0,8	0,6	0,4	0,3	0,2
6	2,0	1,2	0,9	0,6	0,5	0,3
10	3,3	2,1	1,5	1,0	0,8	0,5
16	5,2	3,3	2,3	1,7	1,3	0,7
25	8,2	5,2	3,7	2,6	2,1	1,2
35	11,4	7,2	5,1	3,6	3,0	1,6
50	16,3	10,3	7,3	5,2	4,2	2,3
70	22,9	14,5	10,2	7,2	5,9	3,2
95	31,0	19,6	13,9	9,8	8,0	4,4
120	39,2	24,8	17,5	12,4	10,1	5,5
150	49,0	31,0	21,9	15,5	12,6	6,9
185	60,4	38,2	27,0	19,1	15,6	8,5
240	78,4	49,6	35,0	24,8	20,2	11,1
300	97,9	61,9	43,8	31,0	25,3	13,9
	Short circuit current in kA					

SHORT TIME DUTY

Short time duty according to the standard IEC 60092-352 0,6/1 kV +90°C marine cables.

If a cable is intended to supply motor or equipment operating for periods of half an hour or one hour, its current rating given in table "current rating", may be increased using the relevant correction factors given by formula:

$$\text{correction factor} = \sqrt{\frac{1,12}{1-\exp(-t_s/T)}}$$

(t_s = service time, min. **T** = Time constant, min.)

$$T = 0,245 \times d^{1,35}$$

(**d** = Overall diameter of the cable, mm.)

Overall diameter of the cable, mm.	Service time, min.		Time constant, min.	Critical duration, min.
	30	60	T	3x T
1	1,058	1,058	0,245	0,735
2	1,058	1,058	0,625	1,87
3	1,058	1,058	1,08	3,24
4	1,058	1,058	1,59	4,78
5	1,058	1,058	2,15	6,46
6	1,058	1,058	2,75	8,26
7	1,058	1,058	3,39	10,2
8	1,059	1,058	4,06	12,2
9	1,059	1,058	4,76	14,3
10	1,061	1,058	5,48	16,5
20	1,126	1,066	14,0	41,9
30	1,255	1,105	24,2	72,5
40	1,403	1,173	35,6	107
50	1,554	1,254	48,2	145
60	1,705	1,341	61,6	185
	Correction factor.			

Intermittent service

Correction factor for intermittent service according to the standard IEC 60092-352

The correction factor given hereby has been roughly calculated for periods of 10 min, of which 4 min are with a constant load and 6 min without load.

Intermittence period = 10min.
Intermittence ratio = 40%.

$$Fi = \sqrt{\frac{1-\exp(-10/T)}{1-\exp(-4/T)}}$$

Overall diameter of the cable, mm.	Correction factor.
1	1,000
2	1,001
3	1,012
4	1,042
5	1,083
6	1,127
7	1,170
8	1,208
9	1,242
10	1,273
20	1,433
30	1,490
40	1,518
50	1,534
60	1,544

SHORT CIRCUIT FACTORS

Short circuit factors for single (1) core cables

Cross-section of the conductor in mm^2	Duration of the short circuit in s.				
	0,2	0,5	1	2	3
1,5	23,3	14,7	10,4	7,4	6,0
2,5	27,2	17,2	12,2	8,6	7,0
4	32,6	20,6	14,6	10,3	8,4
6	38,4	24,3	17,2	12,1	9,9
10	46,0	29,1	20,6	14,5	11,9
16	55,0	34,8	24,6	17,4	14,2
25	65,3	41,3	29,2	20,6	16,9
35	73,7	46,6	33,0	23,3	19,0
50	85,9	54,3	38,4	27,2	22,2
70	95,2	60,2	42,6	30,1	24,6
95	106,9	67,6	47,8	33,8	27,6
120	115,2	72,9	51,5	36,4	29,8
150	127,2	80,4	56,9	40,2	32,8
185	137,3	86,8	61,4	43,4	35,4
240	150,7	95,3	67,4	47,6	38,9
300	166,0	105,0	74,2	52,5	42,9

Short circuit factors for two (2) core cables

Cross-section of the conductor in mm^2	Duration of the short circuit in s.				
	0,2	0,5	1	2	3
1,5	27,2	17,2	12,2	8,6	7,0
2,5	32,6	20,6	14,6	10,3	8,4
4	38,4	24,3	17,2	12,1	9,9
6	45,6	28,8	20,4	14,4	11,8
10	54,4	34,4	24,3	17,2	14,0
16	64,5	40,8	28,8	20,4	16,7
25	77,7	49,2	34,8	24,6	20,1
35	84,6	53,5	37,9	26,8	21,9
50	98,9	62,6	44,2	31,3	25,5
70	114,3	72,3	51,1	36,1	29,5
95	–	–	–	–	–
120	–	–	–	–	–
150	–	–	–	–	–
185	–	–	–	–	–
240	–	–	–	–	–
300	–	–	–	–	–

Short circuit factors for three (3) and four (4) core cables

The conductor in mm^2	Duration of the short circuit in s.				
	0,2	0,5	1	2	3
1,5	32,6	20,6	14,6	10,3	8,4
2,5	38,9	24,6	17,4	12,3	10,0
4	45,0	28,5	20,1	14,2	11,6
6	54,4	34,4	24,3	17,2	14,0
10	65,3	41,3	29,2	20,6	16,9
16	78,0	49,3	34,9	24,7	20,1
25	91,7	58,0	41,0	29,0	23,7
35	108,8	68,8	48,7	34,4	28,1
50	120,9	76,5	54,1	38,2	31,2
70	134,4	85,0	60,1	42,5	34,7
95	151,3	95,7	67,7	47,8	39,1
120	163,2	103,2	73,0	51,6	42,1
150	181,4	114,7	81,1	57,4	46,8
185	198,0	125,2	88,6	62,6	51,1
240	214,7	135,8	96,0	67,9	55,4
300	236,0	149,3	105,5	74,6	60,9

Short circuit factors for cables with a core no. from five (5) to thirtyseven (37)

The conductor in mm^2	Duration of the short circuit in s.				
	0,2	0,5	1	2	3
5x1,5	35,0	22,1	15,6	11,1	9,0
5x2,5	45,3	28,7	20,3	14,3	11,7
5x4	52,2	33,0	23,4	16,5	13,5
5x6	65,3	41,3	29,2	20,6	16,9
5x10	74,2	46,9	33,2	23,5	19,2
5x16	93,3	59,0	41,7	29,5	24,1
7x1,5	40,8	25,8	18,3	12,9	10,5
7x2,5	51,0	32,3	22,8	16,1	13,2
10x1,5	44,5	28,2	19,9	14,1	11,5
10x2,5	58,3	36,9	26,1	18,4	15,1
12x1,5	49,0	31,0	21,9	15,5	12,6
12x2,5	62,8	39,7	28,1	19,9	16,2
14x1,5	49,0	31,0	21,9	15,5	12,6
14x2,5	62,8	39,7	28,1	19,9	16,2
16x1,5	54,4	34,4	24,3	17,2	14,0
16x2,5	68,0	43,0	30,4	21,5	17,6
19x1,5	54,4	34,4	24,3	17,2	14,0
19x2,5	74,2	46,9	33,2	23,5	19,2
24x1,5	61,2	38,7	27,4	19,4	15,8
24x2,5	81,6	51,6	36,5	25,8	21,1
27x1,5	61,2	38,7	27,4	19,4	15,8
27x2,5	81,6	51,6	36,5	25,8	21,1
37x1,5	70,0	44,2	31,3	22,1	18,1
37x2,5	90,7	57,4	40,6	28,7	23,4

VOLTAGE DROP

Cable types: LKM-HF, LKSM-HF, LKAM-HF, LKM-FRHF, LKSM-FRHF (Cables with class 2 conductor)

Size	Resistance at +20°C ohm/km	Resistance at +90°C ohm/km	Voltage reduction mV/Am *)	Resistance at +45°C ohm/km	Current rating A **)	Voltage reduction mV/m ***)
1,5 mm²	12,1	15,4	30,9	13,3	23	0,61
2,5 mm²	7,41	9,45	18,9	8,14	30	0,49
4 mm²	4,61	5,88	11,8	5,06	40	0,41
6 mm²	3,08	3,93	7,85	3,38	52	0,35
10 mm²	1,83	2,33	4,67	2,01	72	0,29
16 mm²	1,15	1,47	2,93	1,26	96	0,24
25 mm²	0,727	0,927	1,85	0,798	127	0,20
35 mm²	0,524	0,668	1,34	0,575	157	0,18
50 mm²	0,387	0,493	0,99	0,425	196	0,16
70 mm²	0,268	0,342	0,68	0,294	242	0,14
95 mm²	0,193	0,246	0,49	0,212	293	0,12
120 mm²	0,153	0,195	0,39	0,168	339	0,11
150 mm²	0,124	0,158	0,32	0,136	389	0,10
185 mm²	0,0991	0,1264	0,25	0,1088	444	0,096
240 mm²	0,0754	0,0961	0,19	0,0828	522	0,086
300 mm²	0,0601	0,0766	0,15	0,0660	601	0,078

Cable types: LKM-HF FLEX, LKSM-HF FLEX, LKEM-HF (Cables with class 5 conductor)

Size	Resistance at +20°C ohm/km	Resistance at +90°C ohm/km	Voltage reduction mV/Am *)	Resistance at +45°C ohm/km	Current rating A **)	Voltage reduction mV/m ***)
0,75mm²	26,0	33,2	66,3	28,6	14	0,80
1,0mm²	19,5	24,9	49,7	21,4	17	0,73
1,5mm²	13,3	17,0	33,9	14,6	22	0,64
2,5mm²	7,98	10,18	20,4	8,76	30	0,53
4mm²	4,95	6,31	12,6	5,44	39	0,42
6mm²	3,30	4,21	8,42	3,62	50	0,36
10mm²	1,91	2,44	4,87	2,10	71	0,30
16mm²	1,21	1,54	3,09	1,33	94	0,25
25mm²	0,780	0,995	1,99	0,857	123	0,21
35mm²	0,554	0,706	1,41	0,608	153	0,19
50mm²	0,386	0,492	0,98	0,424	196	0,17
70mm²	0,272	0,347	0,69	0,299	240	0,14
95mm²	0,206	0,263	0,53	0,226	284	0,13
120mm²	0,161	0,205	0,41	0,177	331	0,12
150mm²	0,129	0,164	0,33	0,142	389	0,11
185mm²	0,106	0,135	0,27	0,116	444	0,10
240mm²	0,0801	0,102	0,20	0,088	522	0,09
300mm²	0,0641	0,082	0,16	0,070	601	0,08

Cable types: LKSM-HF 250V, RFE-HF, RFE-HF(i), RFA-HF, RFA-HF(i), RFE-FRHF, RFE-FRHF(i), RFA-FRHF, RFA-FRHF(i)

Size	Resistance at +20°C ohm/km	Maximum conductor temperature, °C	Resistance at +45°C ohm/km	Voltage reduction mV/Am at +45°C	Resistance at +90°C ohm/km	Voltage reduction mV/Am at +90°C
0,5 mm²	40,4	90	44,4	88,7	51,5	103,0
0,75 mm²	26,0	90	28,6	57,1	33,2	66,3
1,5 mm²	12,8	90	14,1	28,1	16,3	32,6

*) at +90°C

**) For continuous service (single core, ambient temperature +45°C)

***) at maximum current rating for continuous service at +45°C

HELKAMA

HELKAMA BICA OY

Lakimiehenkatu 4
FI-20780 KAARINA
Finland

Tel. +358 2 410 8700
Fax +358 2 410 8750

firstname.lastname@helkamabica.fi

Helkama Bica (Shanghai) Co., Ltd.

Plot 1-2, MinHang Export Processing Zone
No. 3111 Huan Cheng West Road
Fengxian District, Shanghai 201401,
China

Tel. +86 21 3365 5333,
Fax +86 21 3365 5331

sales@helkamabica.fi

www.helkamabica.fi

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