HUATONG
CABLE GROUP
Global Expert in Cable and Cabling System

Products Cataloque

Hebei Huatong Wires and Cables Group Co., Ltd.

Contents

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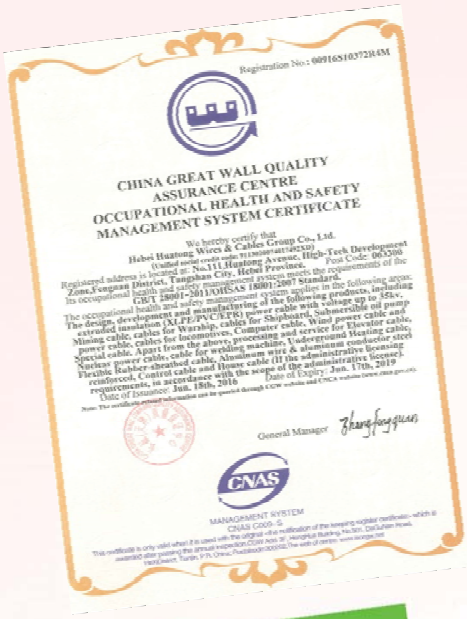


OHSAS18001:1999

ISO 9001:2008

ISO14001:2004

TUV PSB Certificate

SABS Certificate

UL Certificate

KEMA Certificate

Part A

Brief introduction of ESP cable

Submersible pump cable (ESP Cable) is used for the power cable of ESP units which is installed on land or offshore oil Wells.

The product manufactured by us has the characteristics of advanced technology, reliable quality. The main manufacturing equipment is included the ROYLE Φ90 plastic extruder, the rubber continuous vulcanizing process, the interlocked armoring machine made by CEECO, Canada, the continuous sintering process imported from GRILLER, Austria, the Nokia cross-linked cable process, the advanced continuous annealing process and tinned process, etc. Now, the cable and coil end lead wire for submersible oil pump or pump unit can be produced, with different types and specifications, the cross-section of conductor is 42mm^2(1AWG) and below. The cables can be applied with well temperature from 50℃ to 180℃, the max. Continuous working temperature of conductor is 204℃. Insulation material that can be used is as below: PP, EPR, polyimide-F46, fluoroplastics, XLPE, etc. The material of inner jacket includes NBR, compound of the neoprene and PVC, EPR, fluoroplastics, lea, etc. The outer sheath material is as the galvanized steel tape, stainless steel tape, etc. All kinds of cables for submersible oil pump can be developed according to the customer’s requirements.

Conductor dimension and DC resistance

Conductor diameter (Solid Copper) inch				Conductor resistance Ω/kft at 77F			
				Flat Cable		Round Cable	
Size	Min.	Nom.	Max.	Tin coated Max.	Bare Max.	Tin coated Max.	Bare Max.
8 AWG	0.1272	0.1285	0.1298	0.672	0.653	0.685	0.666
6 AWG	0.1604	0.1620	0.1636	0.422	0.411	0.43	0.419
5 AWG	0.1801	0.1819	0.1837	0.336	0.325	0.343	0.332
4 AWG	0.2023	0.2043	0.2063	0.266	0.258	0.271	0.263
2 AWG	0.2550	0.2576	0.2602	0.167	0.162	0.17	0.165
1 AWG	0.2864	0.2893	0.2922	0.133	0.129	0.136	0.132

Conductor diameter (Solid Copper) mm				Conductor resistance Ω/km at 25℃			
				Flat Cable		Round Cable	
Size	Min.	Nom.	Max.	Tin coated Max.	Bare Max.	Tin coated Max.	Bare Max.
8 AWG	3.23	3.26	3.30	2.205	2.142	2.247	2.185
6 AWG	4.07	4.11	4.16	1.385	1.348	1.411	1.375
5 AWG	4.57	4.62	4.67	1.102	1.066	1.125	1.089
4 AWG	5.14	5.19	5.24	0.873	0.846	0.889	0.863
2 AWG	6.48	6.54	6.61	0.548	0.531	0.558	0.541
1 AWG	7.27	7.35	7.42	0.436	0.423	0.446	0.433

Polypropylene (PP) insulation resistance and leakage current at 60F/15.6℃

Conductor specification and structure AWG	Conductor diameter mils	with insulation thickness 75 Mils		with insulation thickness 90 Mils	
		Insulation resistance ≥ MΩ·kft	Leakage current ≤ μA/kV/kft	Insulation resistance ≥ MΩ·kft	Leakage current ≤ μA/kV/kft
6-1	162	13235	0.08	15051	0.07
4-1	204	11092	0.09	12693	0.08
4-7	232	10018	0.10	11500	0.08
2-1	258	9194	0.11	10581	0.09
2-7	292	8303	0.12	9584	0.10
1-1	289	8375	0.12	9664	0.10
1-7	328	7532	0.13	8716	0.11

Conductor specification and structure AWG	Conductor diameter mm	with insulation thickness 1.9mm		with insulation thickness 2.3mm	
		Insulation resistance ≥ MΩ·km	Leakage current ≤ μA/kV/km	Insulation resistance ≥ MΩ·km	Leakage current ≤ μA/kV/km
6-1	4.11	4034	0.26	4588	0.23
4-1	5.18	3381	0.30	3869	0.26
4-7	5.89	3053	0.33	3505	0.26
2-1	6.54	2802	0.36	3225	0.30
2-7	7.42	2531	0.39	2921	0.33
1-1	7.34	2553	0.39	2946	0.33
1-7	8.33	2296	0.43	2657	0.36

EPDM insulation resistance and leakage current at 60F/15.6℃

Conductor specification and structure AWG	Conductor diameter mils	with insulation thickness 75 Mils		with insulation thickness 90 Mils	
		Insulation resistance ≥ MΩ·kft	Leakage current ≤ μA/kV/kft	Insulation resistance ≥ MΩ·kft	Leakage current ≤ μA/kV/kft
6-1	162	5294	0.19	6021	0.17
4-1	204	4437	0.23	5077	0.20
4-7	232	4007	0.25	4600	0.22
2-1	258	3678	0.27	4233	0.24
2-7	292	3321	0.30	3833	0.26
1-1	289	3350	0.30	3866	0.26
1-7	328	3013	0.34	3486	0.29

Conductor specification and structure AWG	Conductor diameter mm	with insulation thickness 1.9mm		with insulation thickness 2.3mm	
		Insulation resistance ≥ MΩ·km	Leakage current ≤ μA/kV/km	Insulation resistance ≥ MΩ·km	Leakage current ≤ μA/kV/km
6-1	4.11	4034	0.26	4588	0.23
4-1	5.18	3381	0.30	3869	0.26
4-7	5.89	3053	0.33	3505	0.26
2-1	6.54	2802	0.36	3225	0.30
2-7	7.42	2531	0.39	2921	0.33
1-1	7.34	2553	0.39	2946	0.33
1-7	8.33	2296	0.43	2657	0.36

Voltage test for the finished product

Cable rated voltage kV	DC voltage test kV/min	AC voltage test kV/min
3	27/5	9/1
4	31/5	11/1
5	35/5	13/1

Conversion form between cross section and AWG for conductors

AWG	Cross section mm^2	Conductor diameter mm
7	10.55	3.665
6	13.30	4.115
5	16.77	4.621
4	21.15	5.189
2	33.63	6.544
1	42.41	7.348

PP insulated and NBR sheathed, galvanized steel tape armoring, round cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 96℃ (205 F)

Standard: PAI RP11S5, PAI RP11S6, and IEEE1019

Voltage: 3KV

Product Code	Conductor specification			Nominal PP insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6PP3NBRGR	6	13	4.12	0.075	1.9	0.06	1.52	1.016	25.80	0.85	1.26
4PP3NBRGR	4	20	5.19	0.075	1.9	0.06	1.52	1.106	28.10	0.96	1.43
2PP3NBRGR	2	33	6.54	0.075	1.9	0.06	1.52	1.220	31.00	1.34	2.00
1PP3NBRGR	1	42	7.35	0.075	1.9	0.06	1.52	1.287	32.70	1.61	2.40

Voltage: 5KV

Product Code	Conductor specification			Nominal PP insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6PP5NBRGR	6	13	4.12	0.09	2.3	0.06	1.52	1.098	27.90	0.94	1.40
4PP5NBRGR	4	20	5.19	0.09	2.3	0.06	1.52	1.189	30.20	1.17	1.74
2PP5NBRGR	2	33	6.54	0.09	2.3	0.06	1.52	1.303	33.10	1.50	2.23
1PP5NBRGR	1	42	7.35	0.09	2.3	0.06	1.52	1.374	34.90	1.73	2.58

Part F

PP insulated and NBR sheathed, galvanized steel tape armoring, flat cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 96℃ (205 F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1019

Voltage: 3KV

Product Code	Conductor specification			Nominal PP insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6PP3NBRGF	6	13	4.12	0.075	1.9	0.05	1.3	0.57x1.42	14.36x36.00	0.87	1.30
4PP3NBRGF	4	20	5.19	0.075	1.9	0.05	1.3	0.61x1.54	15.43x39.20	1.08	1.60
2PP3NBRGF	2	33	6.54	0.075	1.9	0.05	1.3	0.66x1.70	16.80x43.20	1.41	2.10
1PP3NBRGF	1	42	7.35	0.075	1.9	0.05	1.3	0.69x1.80	17.60x45.67	1.61	2.40

Voltage: 5KV

Product Code	Conductor specification			Nominal PP insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6PP5NBRGF	6	13	4.12	0.09	2.3	0.05	1.3	0.60x1.51	15.20x38.40	0.92	1.37
4PP5NBRGF	4	20	5.19	0.09	2.3	0.05	1.3	0.64x1.64	16.20x41.60	1.13	1.68
2PP5NBRGF	2	33	6.54	0.09	2.3	0.05	1.3	0.69x1.80	17.60x45.70	1.44	2.14
1PP5NBRGF	1	42	7.35	0.09	2.3	0.05	1.3	0.72x1.89	18.40x48.10	1.65	2.45

EPDM insulated and NBR sheathed, galvanized steel tape armoring, round cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 140℃(285 F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1018

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3NBRGR	6	13	4.12	0.075	1.9	0.06	1.52	1.073	27.25	0.87	1.30
4EP3NBRGR	4	20	5.19	0.075	1.9	0.06	1.52	1.164	29.56	1.08	1.60
2EP3NBRGR	2	33	6.54	0.075	1.9	0.06	1.52	1.280	32.50	1.41	2.10
1EP3NBRGR	1	42	7.35	0.075	1.9	0.06	1.52	1.347	34.21	1.61	2.40

Voltage: 5KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5NBRGR	6	13	4.12	0.09	2.3	0.06	1.52	1.15	29.10	1.08	1.6
4EP5NBRGR	4	20	5.19	0.09	2.3	0.06	1.52	1.24	31.40	1.31	1.95
2EP5NBRGR	2	33	6.54	0.09	2.3	0.06	1.52	1.35	34.30	1.67	2.48
1EP5NBRGR	1	42	7.35	0.09	2.3	0.06	1.52	1.42	36.00	1.90	2.83

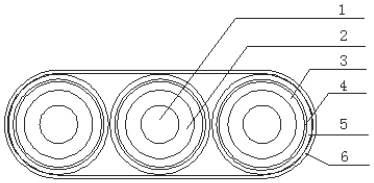
Part H

EPDM insulated and NBR sheathed, galvanized steel tape armoring, flat cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 140℃(285 F)

Standard: PAI RP11S5,PAI RP11S6 and IEEE1018



1. Conductor 2.EPDM 3.NBR 4.F4 film 5, Nylon fabric 6. Galvanized steel tape

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3NBRGF	6	13	4.12	0.075	1.9	0.05	1.3	0.57x1.42	14.36x36.00	0.79	1.17
4EP3NBRGF	4	20	5.19	0.075	1.9	0.05	1.3	0.61x1.54	15.43x39.20	0.99	1.47
2EP3NBRGF	2	33	6.54	0.075	1.9	0.05	1.3	0.66x1.70	16.80x43.20	1.29	1.92
1EP3NBRGF	1	42	7.35	0.075	1.9	0.05	1.3	0.69x1.80	17.60x45.67	1.49	2.22

Voltage: 5KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal NBR sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5NBRGF	6	13	4.12	0.09	2.3	0.05	1.3	0.60x1.51	15.20x38.40	0.92	1.37
4EP5NBRGF	4	20	5.19	0.09	2.3	0.05	1.3	0.64x1.64	16.20x41.60	1.05	1.56
2EP5NBRGF	2	33	6.54	0.09	2.3	0.05	1.3	0.69x1.80	17.60x45.70	1.38	2.06
1EP5NBRGF	1	42	7.35	0.09	2.3	0.05	1.3	0.72x1.89	18.40x48.10	1.57	2.33

EPDM insulated and sheathed, galvanized steel tape armoring, round cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 204℃(400F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1018

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3EPGR	6	13	4.12	0.075	1.9	0.06	1.52	1.07	27.25	0.87	1.3
4EP3EPGR	4	20	5.19	0.075	1.9	0.06	1.52	1.16	29.56	1.08	1.6
2EP3EPGR	2	33	6.54	0.075	1.9	0.06	1.52	1.28	32.5	1.41	2.1
1EP3EPGR	1	42	7.35	0.075	1.9	0.06	1.52	1.35	34.21	1.61	2.4

Voltage: 5KV

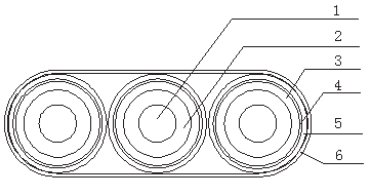
Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5EPGR	6	13	4.12	0.09	2.3	0.06	1.52	1.15	29.10	1.08	1.6
4EP5EPGR	4	20	5.19	0.09	2.3	0.06	1.52	1.24	31.40	1.31	1.95
2EP5EPGR	2	33	6.54	0.09	2.3	0.06	1.52	1.35	34.30	1.67	2.48
1EP5EPGR	1	42	7.35	0.09	2.3	0.06	1.52	1.42	36.00	1.90	2.83

EPDM insulated and sheathed, galvanized steel tape armoring, flat cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 204℃(400F)

Standard: PAI RP11S5,PAI RP11S6 and IEEE1018



1. Conductor 2.EPDM 3.EPDM 4.F4 film 5. Nylon fabric 6. Galvanized steel tape

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3EPGF	6	13	4.12	0.075	1.9	0.05	1.3	0.57x1.42	14.36x36.00	0.79	1.17
4EP3EPGF	4	20	5.19	0.075	1.9	0.05	1.3	0.61x1.54	15.43x39.20	0.99	1.47
2EP3EPGF	2	33	6.54	0.075	1.9	0.05	1.3	0.66x1.70	16.80x43.20	1.29	1.92
1EP3EPGF	1	42	7.35	0.075	1.9	0.05	1.3	0.69x1.80	17.60x45.67	1.49	2.22

Voltage: 5KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5EPGF	6	13	4.12	0.09	2.3	0.05	1.3	0.60x1.51	15.20x38.40	0.92	1.37
4EP5EPGF	4	20	5.19	0.09	2.3	0.05	1.3	0.64x1.64	16.20x41.60	1.05	1.56
2EP5EPGF	2	33	6.54	0.09	2.3	0.05	1.3	0.69x1.80	17.60x45.70	1.38	2.06
1EP5EPGF	1	42	7.35	0.09	2.3	0.05	1.3	0.72x1.89	18.40x48.10	1.57	2.33

EPDM insulated, Lead and EPDM sheath, galvanized steel tape armoring, round cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 232℃(450F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1018

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Lead sheath thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter										
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3LDEPGR	6	13	4.12	0.067	1.7	0.03	0.75	0.06	1.52	1.13	28.61	1.36	2.03
4EP3LDEPGR	4	20	5.19	0.067	1.7	0.03	0.75	0.06	1.52	1.22	30.92	1.64	2.44
2EP3LDEPGR	2	33	6.54	0.067	1.7	0.03	0.75	0.06	1.52	1.33	33.82	2.03	3.02
1EP3LDEPGR	1	42	7.35	0.067	1.7	0.03	0.75	0.06	1.52	1.40	35.57	2.28	3.40

Voltage: 5KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Lead sheath thickness		Nominal EPDM sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter										
	AWG	mm^2	mm	inch	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5LDEPGR	6	13	4.12	0.075	1.9	0.03	0.75	0.06	1.52	1.20	30.50	1.42	2.12
4EP5LDEPGR	4	20	5.19	0.075	1.9	0.03	0.75	0.06	1.52	1.29	32.78	1.74	2.59
2EP5LDEPGR	2	33	6.54	0.075	1.9	0.03	0.75	0.06	1.52	1.41	35.70	2.09	3.11
1EP5LDEPGR	1	42	7.35	0.075	1.9	0.03	0.75	0.06	1.52	1.47	37.43	2.35	3.50

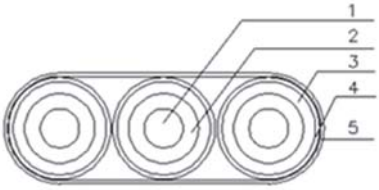
Part L

EPDM insulated, Lead sheathed and galvanized steel tape armoring, flat cable for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 232℃(450F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1018



1.Conductor 2.EPDM 3. Lead 4. Glass fiber 5. Galvanized steel tape

Voltage: 3KV

Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal Lead sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP3LDGF	6	13	4.12	0.067	1.7	0.03	0.76	0.52x1.29	13.14x32.72	1.14	1.7
4EP3LDGF	4	20	5.19	0.067	1.7	0.03	0.76	0.56x1.41	14.21x35.93	1.41	2.1
2EP3LDGF	2	33	6.54	0.067	1.7	0.03	0.76	0.61x1.57	15.56x40.00	1.75	2.6
1EP3LDGF	1	42	7.35	0.067	1.7	0.03	0.76	0.64x1.67	16.37x42.41	2.02	3.0

Voltage: 5KV

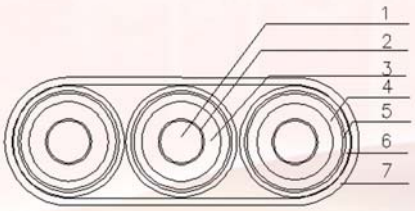
Product Code	Conductor specification			Nominal EPDM insulation thickness		Nominal Lead sheath thickness		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
6EP5LDGF	6	13	4.12	0.075	1.9	0.03	0.76	0.49x1.34	12.54x34.00	1.24	1.85
4EP5LDGF	4	20	5.19	0.075	1.9	0.03	0.76	0.58x1.46	14.61x37.13	1.50	2.23
2EP5LDGF	2	33	6.54	0.075	1.9	0.03	0.76	0.63x1.61	15.96x41.00	1.86	2.77
1EP5LDGF	1	42	7.35	0.075	1.9	0.03	0.76	0.66x1.72	16.80x43.60	2.11	3.14

Polyimide- EPDM insulated lead sheathed, MONEL steel tape armoring, lead wire for submersible oil pump

Product description: Mainly used to provide power for ESP

Max continuous working temperature: 232℃(450F)

Standard: PAI RP11S5, PAI RP11S6 and IEEE1018



1.Conductor 2.Polyimide 3.EPDM 4.Lead 5.F4 film 6.Ppolyamide yarns 7.Monel

Voltage: 5KV

Product Code	Conductor specification			Dia. above Insulation		Dia. above lead sheath		Overall diameter ≤		Calculated weight	
	Conductor size		outer diameter								
	AWG	mm²	mm	inch	mm	inch	mm	inch	mm	Lb/ft	Kg/m
8KK5EPLDMF	8	8	3.26	0.20	5.10	0.25	6.27	0.34x0.86	8.61x21.82	0.62	0.92
7KK5EPLDMF	7	10	3.66	0.22	5.47	0.26	6.67	0.35x0.91	9.01x23.02	0.69	1.02
6KK5EPLDMF	6	13	4.12	0.23	5.93	0.28	7.13	0.37x0.96	9.47x24.4	0.77	1.15
5KK5EPLDMF	5	16	4.62	0.30	7.63	0.36	9.03	0.45x1.19	11.37x30.1	1.05	1.57
4KK5EPLDMF	4	20	5.19	0.32	8.20	0.38	9.60	0.47x1.25	11.94x31.81	1.18	1.76
3KK5EPLDMF	2	33	6.54	0.33	8.35	0.38	9.75	0.48x1.27	12.09x32.26	1.38	2.06