

Conductor Design Data

Annealed Copper Conductors—Nickel Plated (NPC), Silver Plated (SPC), and Tin Plated (TPC)

AWG Size	Conductor area (Circular Mils)		K-Value	Stranding (# of Strands x Strand AWG)	Nominal Dia. of Individual Strands	Diameter of Stranded Conductor						Max. Resistance @ 20 ° C (Ω / 1000 feet)		
	Nominal	Minimum				Minimum			Maximum			SPC	NPC	TPC
						Small Diameter	General Purpose	Maximum	Small Diameter	General Purpose	Maximum			
						SPC	NPC & TPC	SPC	NPC & TPC	SPC	NPC	TPC		
30	112	102	.770	7x38	.0040	.0105	.0134	.0124	.0134	100.7	110.7	108.4		
28	175	161	1.05	7x36	.0050	.0135	.0164	.0154	.0164	63.8	67.9	68.6		
26	304	275	1.34	19x38	.0040	.0175	.0204	.0204	.0214	38.4	42.2	41.3		
24	475	434	1.18	19x36	.0050	.0225	.0244	.0254	.0264	24.3	25.9	26.2		
22	754	694	1.87	19x34	.0063	.0285	.0314	.0324	.0334	15.1	16.0	16.2		
20	1,216	1,127	1.34	19x32	.0080	.0365	.0394	.0404	.0414	9.19	9.77	9.88		
18	1,900	1,770	1.34	19x30	.0100	.0455	.0484	.0504	.0514	5.79	6.10	6.23		
16	2,426	2,261	1.19	19x29	.0113	.0515	.0554	.0574	.0584	4.52	4.76	4.81		
14	3,831	3,570	1.38	19x27	.0142	.0645	.0694	.0724	.0734	2.88	3.00	3.06		
12	6,038	5,672	1.67	19x25	.0179	.0815	.0864	.0904	.0924	1.81	1.89	1.92		
12	5,874	5,473	1.26	37x28	.0126	.0835	.0874	.0894	.0904	1.90	1.98	2.02		
10	9,354	8,716	1.35	37x26	.0159	.1060	.1100	.1120	.1140	1.19	1.24	1.26		
8	16,983	16,645	2.29	133x29	.0113	.1580	.1660	.1690	.1730	.658	.694	.701		
6	26,818	26,284	2.31	133x27	.0142	.1980	.2080	.2130	.2170	.418	.436	.445		
4	42,615	41,767	2.55	133x25	.0179	.2500	.2630	.2680	.2740	.264	.275	.280		
2	66,500	64,981	3.21	665x30	.0100	.3200		.3400	.3400	.170	.177	.183		
1	81,700	79,878	2.89	817x30	.0100	.3660		.3800	.3800	.139	.144	.149		
1/0	104,500	102,126	3.24	1,045x30	.0100	.3950		.4250	.4250	.108	.113	.116		
2/0	133,000	130,059	3.15	1,330x30	.0100	.4400		.4750	.4750	.085	.089	.091		
3/0	166,500	162,795	3.09	1,665x30	.0100	.5000		.5400	.5400	.068	.071	.071		
4/0	210,900	206,213	3.32	2,109x30	.0100	.5650		.6050	.6050	.054	.056	.056		

Allowable number of missing strands: AWG 30–4: 0; AWG 2–1: 2; AWG 1/0–2/0: 3; AWG 3/0: 4; AWG 4/0: 5. • **Elongation, % min:** AWG 30–24: 6; AWG 22–4/0: 10.

Nominal values are for information only, and are not requirements. Dimensions in inches.

High-Strength Copper Alloy Conductors—Nickel Plated (NPA) and Silver Plated (SPA)

AWG Size	Conductor area (Circular Mils)		K-Value	Stranding (# of Strands x Strand AWG)	Nominal Dia. of Individual Strands	Diameter of Stranded Conductor						Max. Resistance @ 20 ° C (Ω / 1000 feet)		
	Nominal	Minimum				Minimum			Maximum			Minimum Break Strength (pounds)	SPA	NPA
						Small Diameter	General Purpose	Maximum	Small Diameter	General Purpose	Maximum			
						SPA	NPA	SPA	NPA	SPA	NPA			
30	112	102	.770	7x38	.0040	.0105	.0134	.0124	.0134	5.20	129.6	117.4		
28	175	161	1.05	7x36	.0050	.0135	.0164	.0154	.0164	8.20	79.0	74.4		
26	304	275	1.34	19x38	.0040	.0175	.0204	.0204	.0214	14.2	49.4	44.8		
24	475	434	1.18	19x36	.0050	.0225	.0244	.0254	.0264	22.4	30.1	28.4		
22	754	694	1.87	19x34	.0063	.0285	.0314	.0324	.0334	35.8	18.6	17.5		
20	1,216	1,127	1.34	19x32	.0080	.0365	.0404	.0404	.0414	58.1	11.4	10.7		
18	1,900	1,770	1.34	19x30	.0100	.0465	.0467	.0504	.0514	90.3	6.79	6.43		
16	2,426	2,261	1.19	19x29	.0113	.0515	.0530	.0574	.0584	115	5.16	4.90		

Allowable number of missing strands: All sizes: 0 • **Elongation, % min:** All sizes: 6.

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27 Percent Nickel-Coated Conductors—Copper (NHC) and High-Strength Copper Alloy (NHA)

AWG Size	Conductor area (Circular Mils)		K-Value	Stranding (# of Strands x Strand AWG)	Nominal Dia. of Individual Strands	Diameter of Stranded Conductor		Max. Resistance @ 20° C (Ω / 1000 feet)	
	Nominal	Minimum				Minimum	Maximum	NHC	NHA
22	754	694	1.87	19x34	.0063	.0290	.0330	23.7	25.6
20	1,216	1,127	1.34	19x32	.0080	.0365	.0415	14.6	15.3
18	1,900	1,770	1.34	19x30	.0100	.0455	.0520	9.14	9.59
16	2,426	2,261	1.19	19x29	.0113	.052	.061	6.85	7.30
14	3,831	3,570	1.38	19x27	.0142	.065	.074	4.32	
12	6,038	5,672	1.67	19x25	.0179	.082	.094	2.78	
10	9,880	8,716	1.35	49x27	.0142	.123	.129	1.68	
8	16,983	16,645	2.29	133x29	.0113	.158	.179	.936	
6	26,818	26,284	2.31	133x27	.0142	.198	.218	.591	
4	42,615	41,767	2.55	133x25	.0179	.250	.272	.375	
2	66,500	64,981	3.21	665x30	.0100	.320	.345	.241	
1	81,700	79,878	2.89	817x30	.0100	.355	.384	.196	
1/0	104,500	102,126	3.24	1,045x30	.0100	.395	.432	.153	
2/0	133,000	130,059	3.15	1,330x30	.0100	.440	.490	.120	
3/0	166,500	162,795	3.09	1,665x30	.0100	.500	.548	.096	
4/0	210,900	206,213	3.32	2,109x30	.0100	.565	.615	.077	

Allowable number of missing strands: AWG 22-4: 0; AWG 2-1: 2; AWG 1/0-2/0: 3; AWG 3/0: 4; AWG 4/0: 5.

Elongation, % min: NHA, AWG 22-16: 6; NHC, all sizes: 10.

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Type KPH, KPS, KNH, and KNS Thermocouple Conductors

AWG Size	Conductor area (Circular Mils)		Stranding (# of Strands x Strand AWG)	Nominal Dia. of Individual Strands	Diameter of Stranded Conductor		Max. Resistance @ 20° C (Ω / 1000 feet)			
	Nominal	Minimum			Minimum	Maximum	KPH and KPS		KNH and KNS	
22	754	694	19x34	.0063	.029	.033	Min.	Max.	Min.	Max.
20	1,216	1,127	19x32	.0080	.037	.041	546.7	604.3	228.2	252.3
18	1,900	1,770	19x30	.0100	.046	.051	339.2	375.0	141.5	156.5
16	2,426	2,261	19x29	.0113	.052	.058	217.0	240.0	90.5	100.2
14	3,831	3,570	19x27	.0142	.065	.073	169.7	187.7	70.6	78.2
							107.6	119.0	44.9	49.7

Allowable number of missing strands: All sizes: 0.

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