USING APPROPRIATELY SIZED EXTENSION CORDS FOR YOUR MOTOR

By David Briggs, Sr. Controls Engineer at CLIMAX - September 2021

Portable machine tools are frequently used in remote locations, sometimes requiring the use of a long extension cord to bring electrical power to your machine. Using an appropriately sized extension cord not only avoids the risk of overheating the cord but will also help your machine to run better. Undersized power cables can cause voltage drop, making your machine draw more current, run slower, and heat up faster. To select an extension cord with the correct size conductors, you must know the load (amps) that your machine will draw and the required length of the cord. The below selection charts are for a variety of single-phase and three-phase voltages.

SINGLE-PHASE LOADS

120 Volt Single-Phase AC Loads

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
5	600			360 (160)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

240 Volt Single-Phase AC Loads

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10800	200 (61)	125 (38)				
50	12000	175 (53)	100 (31)				

THREE-PHASE LOADS

230 Volt 3-Phase AC Loads

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
5	2.0			740 (225)	475 (144)	286 (87)	280 (88)
7	2.8		850 (260)	530 (161)	340 (103)	204 (62)	204 (62)
10	4.0	941 (287)	600 (182)	370 (113)	237 (72)	143 (43)	143 (44)
15	6.0	627 (191)	398 (121)	247 (75)	158 (480)	95 (29)	95 (29)
20	8.0	470 (143)	289 (91)	185 (56)	118 (36)	71 (22)	
25	9.9	376 (114)	239 (73)	148 (45)	95 (29)		
30	11.9	314 (96)	200 (61)	123 (37)			
35	13.9	270 (82)	171 (52)	106 (32)			
40	15.9	235 (72)	150 (46)				
45	17.9	209 (64)	132 (40)				
50	19.9	188 (54)					
55	21.9	171 (52)					
60	23.9	156 (48)					

380 Volt 3-Phase AC Loads

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
5	3.3				750 (230)	453 (138)	291 (89)
7	4.6			837 (255)	537 (164)	324 (99)	209 (64)
10	6.6		946 (288)	586 (172)	377 (115)	227 (69)	146 (45)
15	9.9	994 (303)	630 (192)	390 (190)	251 (77)	151 (46)	98 (30)
20	13.1	746 (227)	473 (144)	293 (89)	188 (57)	113 (35)	
25	16.4	596 (181)	378 (115)	234 (72)	151 (56)		
30	19.7	497 (151)	315 (96)	195 (60)			
35	23.0	426 (130)	270 (82)	167 (51)			
40	26.3	372 (114)	237 (72)				
45	29.6	331 (101)	210 (64)				

380 Volt 3-Phase AC Loads (Continued)

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
50	32.9	298 (91)					
55	36.2	279 (83)					
60	39.4	249 (76)					

460 Volt 3-Phase AC Loads

Current / Amperes	Load / Watts	Maximum Allowable Cord Length ft (m) for conductor size (AGW)*					
		4	6	8	10	12	14
5	4.0				911 (278)	589 (167)	354 (108)
7	5.6			1013 (309)	651 (198)	392 (120)	253 (77)
10	8.0		1145 (350)	710 (216)	456 (139)	274 (84)	177 (54)
15	11.9	1200 (366)	763 (233)	473 (144)	304 (93)	193 (56)	118 (36)
20	15.9	902 (275)	573 (175)	355 (108)	228 (69)	137 (42)	
25	19.9	722 (220)	458 (140)	284 (86)	182 (56)		
30	23.9	601 (184)	381 (116)	236 (72)			
35	27.9	516 (157)	327 (100)	202 (62)			
40	31.8	451 (138)	286 (87)				
45	35.8	401 (122)	254 (78)				
50	39.8	361 (110)					
55	43.8	328 (100)					
60	47.7	300 (92)					

The cable lengths and allowable ampacity shown in the charts are averages as determined from the National Electric Code NFPA 70 Ver 2011 Section 400.5 for Type SJO, SJOOW, SOOW, SJEOW, SEOOW, STOOW, and similar cables. Section 400.5 for Type SJO, SJOOW, SOOW, SJEOW, SEOOW, STOOW, and similar cables. Allowable ampacity may vary due to temperature, cable type, and other variables. Cable Lengths shown are base on a calculated 2% voltage drop over the length of the cable. Longer runs may be permissible if a greater voltage drop can be tolerated.

About the Author: *David Briggs is the Senior Controls Engineer at CLIMAX, the world's foremost manufacturer of portable machining, welding, and valve testing equipment. For the past 20 years, David has been working closely with on-site machinists, helping them to be successful in their most challenging projects.*

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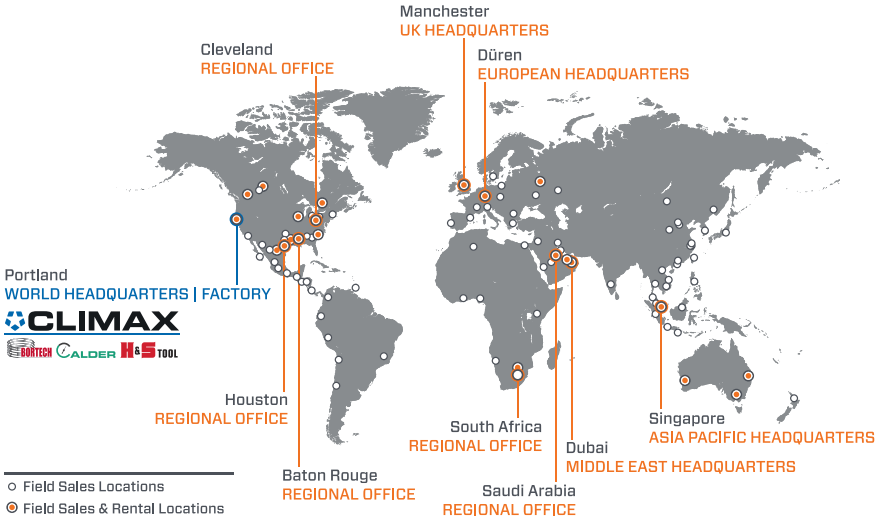

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