Inverter Overcurrent and Cable Sizing - Courtesy of Kyocera Solar

Brand	Model	Max. Continuous Power (Watts)	Voltage	Max. Input Amps* DC	Min. Overcurrent Protection (Breaker/Fuse)	Min. Cable Size** (In conduit)	Min. Cable Size** (In free air)
XANTREX	PORTAWATTZ 600	600	12	80	80	#4	#8
	PORTAWATTZ 1000	800	12	107	110	#2	#4
	PORTAWATTZ 1750	1500	12	201	200	#3/0	#1
	PORTAWATTZ 3000	2500	12	334	350	350 MCM	#3/0
	PROSINE 1000-12	1000	12	134	150	#1	#3
	PROSINE 1800-12	1800	12	241	250	#4/0	#1/0
	PROSINE 2000-12	2000	12	267	350	250 MCM	#2/0
	PROSINE 2500-12	2500	12	334	350	350 MCM	#3/0
	PROSINE 2500-24	2500	24	167	175	#2/0	#2
	PROSINE 3000-12	3000	12	400	400	500 MCM	#4/0
	PROSINE 3000-24	3000	24	200	200	#3/0	#1
	UX612[2]	600	12	80	80	#2	#2
	UX1112[2]	1100	12	147	150	#2/0	#2/0
	UX1412[2]	1400	12	187	200	#4/0	#4/0
	DR1512[2]	1500	12	201	200	#4/0	#4/0
	DR2412[2]	2400	12	321	350	#4/0	#4/0[1]
	DR1524[2]	1500	24	100	100	#2/0	#2/0
	DR2424[2]	2400	24	160	175	#2/0	#2/0
	DR3624[2]	3600	24	241	250	#4/0	#4/0[1]
	SW2524[2]	2500	24	167	175	#2/0	#2/0
	SW2548[2]	2500	48	84	100	#2/0	#2/0
	SW4024[2]	4000	24	267	250	#4/0	#4/0[1]
	SW4048[2]	4000	48	134	150	#2/0	#2/0
	SW5548[2]	5500	48	184	200	#4/0	#4/0
OutBack	FX 2012[2]	2000	12	202	250/300	#4/0	#4/0
	FX 2524[2]	2500	24	101	175/200	#2/0	#2/0
	FX 3048[2]	2500	48	63	100/110	#2	#2
	VFX 2812[2]	2800	12	282	250/300	#4/0	#4/0
	VFX 3524[2]	3500	24	176	250/300	#4/0	#4/0
	VFX 3648[2]	3600	48	91	175/200	#2/0	#2/0
	GTFX 2524	2500	24	126	175/200	#4/0	#4/0
	GTFX 3048	3000	48	76	100/110	#2/0	#2/0
	GVFX 3524	3500	24	176	250/300	#4/0	#4/0
	GVFX 3648	3600	48	91	175/200	#2/0	#2/0

* The maximum input current is calculated by multiplying the inverter's maximum continuous power output by 1.25 and then dividing by 0.85 and the lowest voltage that the inverter will operate at (11V for a 12V unit, 22V for a 24V unit and 44V for a 48V unit). For example, a SW4024 is a 24V unit with a 4000W continuous output so you would multiply 4000W by 1.25 to get 5000W. You would then divide 5000W by the lowest inverter efficiency of 0.85 to get 5882.4W and then divide that by the lowest inverter voltage of 22 volts to get 267 amps. We downsize the overcurrent protection to 250 amps for the SW4024 so that we can still use #4/0 AWG cables.

* With OutBack inverters, the full power efficiency should be calculated with a lowest expected full power efficiency factor of 0.90 instead of 0.85 as used with the other brands of inverters.

[2]The cable size is the same for free air as in conduit. This preserves the performance of the inverter (motor starting surge) and maximizes the conversion efficiency of the system.

** Minimum cable sizes are for 90° C rated cable from NEC Tables 310-16 & 310-17. Also refer to NEC articles 240-3b and 240-6a for proper sizing of overcurrent protection devices. Cable sizes are good up to 10' of one way distance. If you use "free air" size cable in conduit, the NEC requires that you use double conductors (two positive and two negative cables). Multiply the rated cable ampacity by 0.8 for parallel conductors.

Smaller cable sizes than those listed here may be used as long as the overcurrent protection is reduced as well. We typically sell #2, #2/0 and #4/0 AWG inverter cables that should be matched with 110A, 175A and 250A overcurrent protection devices respectively. Using larger cables is perfectly acceptable, but you might run into problems fitting them into various disconnects and fuse blocks. MCM stands for "thousands of circular mils" and it represents the cross sectional area of cables larger than #4/0 AWG. See NEC Table 8 "Conductor Properties" for details.

[1]Cable is sized for 10 feet total length. From 10 feet to 20 feet total length, double the recommended wire size.

[2]Cable sizes are recommended by the manufacturer for inverter performance, i.e. surging, ripple and voltage drop. For that reason, cable size given is the same for conduit and free air.