

Definitions:

Volts - Unit of electric pressure in a circuit. (similar to water pressure in psi)

Amps - Unit of volume for electrons (electric current) flowing in a circuit. (similar to gpm of water)

Power - Energy required to perform "Work".

Volt-Ampere - A unit of electric power equal to the product of one volt x one ampere = 1.0 VA.

Kilovolt-ampere - (1000 VA) The "Apparent" Power rating of the generator. (Power supplied)
(Rating when Amps & Volts are out of sync due to a 3 phase inductive load)

Kilowatt - (1000 Watts) The "Real" Power a prime mover (engine) must supply. (Power actually Used)

Power Factor (PF) - the ratio of real power (kW) to apparent power (kVA) (ie. 20kW/25kVA = 0.8 PF)

Hertz - A unit of frequency equal to one sine wave per second. 50 or 60 sine waves per second = 50 or 60 Hertz. Note: Changing the engine speed will change the generator frequency (Hertz).

Formulas:

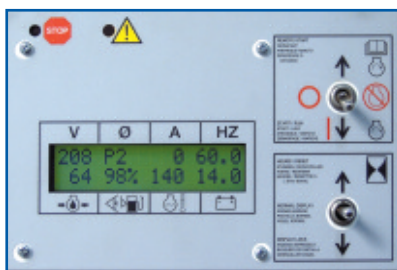
Key: I = Amps; V = Volts; PF = Power Factor; hp = Horse Power; kW = Kilowatt; kVA = Kilovolt Amps

Watts = Volts x Amps, Amps = Watts / Volts, Volts = Watts / Amps, kW = 1.341 hp

To Obtain	1 Phase (PF= 1.0)	3 Phase (PF= 0.8)
kW	$\frac{V \times I \times PF}{1000}$	$\frac{1.732 \times V \times I \times PF}{1000}$
kVA	$\frac{V \times I}{1000}$	$\frac{1.732 \times V \times I}{1000}$
Amps when kW is known	$\frac{kW \times 1000}{V \times PF}$	$\frac{kW \times 1000}{1.732 \times V \times PF}$
Amps when kVA is known	$\frac{kVA \times 1000}{V}$	$\frac{kVA \times 1000}{1.732 \times V}$

Information to gather for proper sizing of generator

- Determine the type of load(s) that will be connected to the Generator (ie. resistive, motor, non-linear)
- Determine the total Wattage of the load
- Determine the system voltage and phases (ie: 120/240v single phase, 120/208v 3 phase, 277/480 3 phase)
- Determine the total motor starting kVA (if any)
- Select a generator that can supply enough wattage to Start and Run the load



Wacker Corporation

N92 W15000 Anthony Ave.
Menomonee Falls, WI 53051-1504
Phone: 800-770-0957 (USA)
Phone: 877-977-0775 (Canada)
www.wackergroup.com

Mobile Generator Sizing Chart



WACKER Model	Generator Rating		3 Phase Amps @ 0.8 pf (Inductive)**				1 Phase (Zig-Zag)		
	kW	kVA	208 V	240 V	460 V	480 V	120 V	240 V	kW
G25 Prime	19.5	24	67	58	30	29	133	67	16.0
G25 Stand By *	20	25	69	60	31	30	140	70	16.8
G50 Prime	38	48	133	115	60	58	267	133	32.0
G50 Stand By *	42	53	147	128	67	64	293	147	35.
G70 Prime	58	72	200	173	90	87	400	200	48.0
G70 Stand By *	63	79	219	190	99	95	433	217	52.0
G85 Prime	67	84	233	202	105	101	467	233	56.0
G85 Stand By *	74	92	255	221	115	111	513	257	61.6
G125 Prime	98	122	339	293	153	147	606	303	72.7
G125 Stand By *	109	136	378	328	171	164	642	321	77.0
G160 Prime	128	160	444	385	201	192	646	323	77.5
G160 Stand By *	141	176	492	426	222	213	688	344	82.6

*To operate at "Stand-by" rating, the Engine/Generator Controller needs reprogramming.

** For 3 Phase Resistive Load, Amps will be less @ 1.0 pf)

Note: Power values are determined at maximum ambient temperature of 117 degrees F

Typical Motor Running and Starting Data with WACKER Generator Model Number

HP	Run kW	Run kVA	Start kVA	Model # *	HP	Run kW	Run kVA	start kVA	Model # ***
1.0	1.1	1.3	13.0	G25	25	20.5	22.8	139.0	G70
2	1.9	2.2	19.0	G25	30	25.2	28.0	166.0	G70
3.0	2.9	3.2	25.0	G25	40	33.3	37.0	221.0	G85
5.0	4.6	5.2	35.0	G25	50	43.5	48.0	276.0	G160
7.5	6.7	7.5	48.0	G25	60	49.5	55.0	336.0	---
10.0	8.8	9.8	62	G25	75	64.0	71.0	419	---
15.0	13.2	14.7	88	G50	100	85.0	94.0	552	---
20.0	16.7	18.6	112	G50	125	108.0	119.0	698	---

Generator model is for "direct" line motor start. A soft start motor controller will allow a smaller generator model to be used.

Consult with motor controller manufacturer for actual sKVA reduction. A "wye-delta" soft start typically reduces sKVA to 36% of direct start.

WACKER Model	G25	G50	G70	G85	G125	G160
Prime kW	20	38	58	67	98	128
dBA at 7 meters (23')	63	66	66	66	68	69
Engine Manufacturer	Isuzu	Deere	Deere	Deere	Deere	Deere
Engine Model	4LE2	4045D	4045T	4045T	6068T	6068H
Fuel consumption gal / hr (Full Load)	1.8	3.3	4.6	5.6	7.7	9.8
Fuel tank capacity - Single wall	60	89	89	89	245	245
Run time - hrs (Low fuel shut down)	25%	124.4	66.3	56.0	46.4	91.7
	50%	62.2	41.1	30.0	26.2	50.9
	75%	41.5	29.3	21.2	17.8	35.3
	100%	31.1	23.2	16.5	13.6	27.4

Max Starting kVA (30% voltage dip)

Model	Starting kVA
G25	67
G50	134
G70	201
G85	235
G125	225
G160	330

Features, specifications and data are subject to change without notice. This sheet has been provided as a guide only and is intended to be used as a quick rule-of-thumb reference sheet. **Yellow shaded areas** denote the calculations using the mecc alte alternator, other calculations refer to the Marathon alternator. Consult your WACKER Owner's Manual and the NEC Code book for information verification.

3 Phase Motor Starting Code Letters

Code Letter *	Max Locked Rotor kVA per HP
D	4.00 - 4.50
E	4.50 - 5.00
F	5.00 - 5.60
G	5.60 - 6.30
H	6.30 - 7.10
J	7.10 - 8.00

*For starting kVA for 3 Phase motors

Multiply Motor Horse Power by the Highest Value Associated with the NEMA 3 Phase Starting Code Letter (See table) ie: 20hp 3Ph Motor, NEMA Code G, $20 \times 6.3 = 126$ Starting kVA Looking at WACKER sKVA chart, chose the G50 at 134 sKVA.

