SIEMENS

Generator Sizing Guide

Onsite Estimating Sheet

Contractor _____
Email _____
Phone _____ Fax _____
Job Name _____
Date_____ Location _____

VOLTAGE ☐ 120/240 1ø ☐ 120/208 3ø ☐ 277/480 3ø
TYPE ☐ Natural Gas ☐ LP Vapor LPV)
ELEC. SERVICE ☐ 100 Amp ☐ 200 Amp ☐ 400 Amp
☐ 600 Amp ☐ Other_____

Before installation contact local jurisdiction to confirm all requirements are met. Jurisdictions may vary. Siemens recommends contacting local authorities prior to installation.

Loads: Look for heavy building loads such as refrigeration, air conditioning, pumps or UPS systems.

Use the following for sizing and determining generator kW.

Table 6

Motor Load Table (refer to Table 1)

Device	HP	RA	LRA	kW Running (= HP)	Starting kW ①

① Starting kW for HP < 7.5 starting kW = HP x 3
Starting kW for HP > 7.5 starting kW = HP x 2
Starting kW for loading with no listed HP, calculate HP based on running amps in the chart on the right.

Table 7

Non-Motor Load Table (refer to Table 2)

Device	Amps	kW

Recommended Generator Size _____ Refer to Generator Sizing Instructions on other side of this sheet.

QT Upgrade Required
These applications require an upgrade from the QT Series:
NEC 695 Fire Pumps
NEC 700 Emergency Systems
NFPA 20 Fire Pumps
NFPA 99 Healthcare
NFPA 110 Emergency Systems

Reference Codes
Related Codes and Standards:
NEC 225 Branch Circuits and Feeders
NEC 240 Overcurrent Protection
NEC 250 Grounding
NEC 445 Generators
NEC 701 Legally Required Standby
NEC 702 Optional Standby
NFPA 37 Installation and Use of Stationary Engines
NFPA 54 National Fuel Gas Code
NFPA 58 LP Gas Code

To Calculate kW (refer to page 2 for shortcut)	
120 V 1ø	Amps x 120/1000 = kW
240 V 1ø	Amps x 240/1000 = kW
208 V 3ø	Amps x 208 x √3 x PF/1000 = kW
240 V 3ø	Amps x 240 x √3 x PF/1000 = kW
480 V 3ø	Amps x 480 x √3 x PF/1000 = kW

PF is application power factor (worst case 1.0)
Typical application power factor is 0.95.

Resources in Sizing Guide
Surge Capability Chart – References running amps of units and LRA
Propane Tank Sizing Chart – Measures fuel consumption of generator units
Motor Load Reference Guide – Reference guide for basic motor loads
Non-Motor Load Reference Guide – Reference guide for non-motor loads
Fuel Piping Sizing Chart – Assists in calculating adequate pipe size for natural gas and propane
UPS – Generator Compatibility

UPS Information
1.5 x kVA rating for a filtered system
3 – 5 x kVA rating for an unfiltered system
Siemens recommends you refer to the Siemens UPS Generator Compatibility sheet and notify the manufacturer of the UPS system to assist in your installation.

Transfer Switch Availability
SR6ST – 100 and 200 Amp service entrance rated
RTS – 100, 200, 400 Amp
SR6SI switch only works with R100 controller.
XT 6XR – 100, 150, 200, 300, 400, 600, 800 Amp
HTS switch only works with H100 controller. Avail. in NEMA 1, NEMA 3R and NEMA 12. Refer to Seimens product catalog for the appropriate transfer switch.

INSTALL NOTES:
1. Suggested concrete pad minimum thickness of 4" with 12" overhang on all sides. Fiberglass pad included with air-cooled products.
2. Consult manual for installation recommendations.
3. Consult local authority having jurisdiction for local requirements.

SIEMENS

Generator Sizing Guide

Onsite Estimating Sheet

Generator Sizing Instructions:
There is not a single correct sizing solution. The instructions below identify multiple methods that, when mixed with good judgment, should result in a moderately sized generator. Remember to consider load growth, seasonality, and effects of starting motors.

When motors start, they create a current surge that step loads the generator. As a result of this step loading, the generator will experience a voltage dip. After selecting a generator, reference the generator's surge capability using Table 3. Verify that the generator voltage dip is adequate for the application. Most commercial applications should be limited to 15% voltage dip and residential applications should be limited to 30% voltage dip.

Some commercial applications utilize one or multiple uninterruptible power supplies (UPS) to backup critical loads. Please read sizing guidelines for this load type.

Measurement Method
Use a clamp-on amp meter or power analyzer to measure facility load levels. The measurement should be made at peak load levels. Size the generator 25% larger than the peak measured load. Verify motor and UPS load compatibility.
Measured Amps = _____

Billing History Method
Many commercial customers have a utility rate structure that has a peak demand charge. Using a year's worth of electric bills, size the generator 25% larger than the largest peak demand. Verify motor and UPS load compatibility.
Peak Demand = _____

Load Summation Method
1) Enter all motors loads expected to run during peak load levels into Table 6. Reference Table 1 for typical motor sizes and electrical requirements.

2) Enter all non-motor loads expected to run during peak load levels into Table 7. Reference Table 2 for typical residential loads and rules of thumb.

3) Sum the running motor load data but do not include the largest motor that is cycling. Add to this value the non-motor load data and the starting kW for the largest cycling motor.

Motor running load total (minus largest cycling motor):		_____ kW	(Ref. Table 6)
Motor starting load from largest cycling motor:	+	_____ kW	(Ref. Table 6)
Non-motor load total:	+	_____ kW	(Ref. Table 7)
Total (above items):	=	_____ kW	
Select generator (Total x 1.25)		_____ kW	

4) Verify voltage dip compatibility using generator Surge Capability Table 3. Verify UPS compatibility using sizing guidelines provided.

Initial Estimate and Cross Check Methods
These methods are for initial estimates and cross checks only. Size the generator using one of the above methods.

Estimate based on 60% service size:
240 Volts, 1Ø: _____ amps x .15 = _____ kW
208 Volts, 3Ø: _____ amps x .22 = _____ kW
480 Volts, 3Ø: _____ amps x .50 = _____ kW

Estimate Based on Square Footage
Fast food, convenience stores, restaurants, grocery stores = 50 kW + 10 watts / sq. ft.
Other commercial = 30 kW + 5 watts / sq. ft.
Square footage = _____
Estimated kW = _____

LP
LPG: 8.55 ft.3/lb., 4.24 lbs./gal., 2500 btu/ft.3
LPG: 36 ft.3 = 1 gal.

Natural Gas
1 cubic foot = 1,000 BTUs
1 therm = 100,000 BTUs
Gas consumption = 13,000-16,000 btu per kW/hr.

Pressure
1 inch mercury = 13.61 inches Water Column
1 inch Water Column = 0.036 psi
5-14 inches water column = 0.18 psi to 0.50 psi

Air Conditioning
1 hp per 1 ton
1 ton = 12,000 btu

Rule of Thumb
For 480 volt systems kW x 1.5 = Amps
For 208 volt systems kW x 3.5 = Amps
For 240 volt single phase systems kW x 4 = Amps