D.1 / E.1

Some Notes for Sizing Generators

- Too small a generator will cause voltage fluctuations and damage to the generator or equipment windings.
- Too large a generator will cause the engine to glaze and carbon up, due to engine loading.

Rule of Thumb

- **Note 1 D.O.L.** – Direct Online starting (high current starting).
- **Note 2 S.D.** – Star Delta (smooth starting med-high current).
- **Note 3** – A dummy load or extra load will need to be applied to avoid glazing once running.

1. One horsepower (1 hp) equals 0.75 kilowatt i.e. 20hp x 0.75 = 15kW
2. Warm generator up before applying load
3. Always engage load from largest to smallest
4. Have an electrician balance the load across all phases for single phase loads
5. When the motor is operating, after start, the requirement will be 1kva for 1hp i.e. 20hp – 20kva used when running.
6. Size the generator to run between 60-80% full load rating of generator
7. Amps available on a generator per phase = kva x 1.39. i.e. 20kva = 28amps/phase over 3 phases.

Electric Motor Size		Minimum Generator Req'd (KVA) by Starting Method		Run Power
HP	KW	D.O.L to KVA Size (Note 1)	S.D to KVA Size (Note 2)	KVA Used When Running (Note 3)
1	0.75	2.5	2	1
1.5	1.1	3.75	3	1.5
2	1.5	5	4	2
3	2.2	7.5	6	3
4	3	10	8	4
5	3.7	12.5	10	5
6	4.5	15	12	6
7.5	5.5	18.75	15	7.5
10	7.5	25	20	10
12.5	9.3	31.25	25	12.5
15	11	37.5	30	15
20	15	50	40	20
25	19.6	60.5	50	25
30	22	75	60	30
40	30	100	80	40
50	37	125	100	50
60	45	150	120	60
75	55	187.5	150	75
100	75	250	200	100
125	90	312.5	250	125
150	110	375	300	150
175	130	437.5	350	175
200	150	500	400	200
250	185	625	500	250
300	225	750	600	300
400	300	1000	800	400

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Emergency Power Source – Generator Purchase Opportunity

#4a
HiPower
Condition: New with warranty
Model HRJW 190 T4F
SKU 7572
152KW / 190KVA prime power rated
Mobile diesel tier 4F
Price $94,000
Link to https://www.globalpwr.com/?s=hrjw+190

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Emergency Power Source – Generator Purchase Opportunity

Model: JCB G220
Prime rating: 175KW
Rental Style on trailer
$135,600 quantity discounts available
175KW / 190KVA prime power rated
Lead time 2 weeks
Link to stock / SKUs
- https://www.globalpwr.com/?s=g220 https://www.globalpwr.com/?s=g220
Link to cut sheet - https://www.globalpwr.com/wp-content/uploads/cut-sheets/gps-jcb-rs-brochure.pdf

D.1 / E.1

Emergency Power Source – Generator Purchase Opportunity

HiPower HRJW 325
Condition: NEW
Qty. (5) SKU
260KW / 325KVA prime power rated
Mobile diesel tier 4F
Price $155,750
Link to SKU - https://www.globalpwr.com/?s=hrjw+325

SB 552 REQUIREMENTS

On September 23, 2021, the California legislature passed Senate Bill 5522 (SB 552)[1] to support planning and implementation of drought resiliency measures by counties and small water systems. SB 552 has four main resiliency areas:

- ***Implementation of water shortage contingency plans,***

- Implement resiliency infrastructure for small community water systems and K-12 schools that are non-community water systems,

- County planning requirements for domestic wells and state small water systems, and

- State Water Board and Department of Water Resource Tool development and coordination activities.

Under the infrastructure resiliency implementation, SB 552[2] specifically requires small water suppliers, defined as community water systems (CWS) serving 15 to 2,999 service connections and non-transient, non-community water systems that are K-12 schools, to implement the following drought resiliency measures, subject to funding availability:

1. No later than January 1, 2023, implement monitoring systems sufficient to detect production well groundwater levels: Drought and other weather-related conditions can influence well water levels. It is important to monitor and measure well water levels regularly to identify and diagnose well capacity issues before they result in a water outage or pump damage. There are many ways to measure static well levels. Systems may use electric sounders, an electric depth gauge, wetted tape, an airline method, etc.

2. Beginning no later than January 1, 2023, maintain membership in the California Water/Wastewater Agency Response Network (CalWARN)[3] or similar mutual aid organization: Mutual aid organizations, like CalWARN, usually provide assistance to water suppliers by responding and preparing for an emergency disaster. Failure to have mutual aid agreements prior to an emergency may make it difficult to obtain reimbursement for some types of emergency response activities. CalWARN membership is provided at no cost and members benefit from a variety of services, such as:

- A standard omnibus mutual assistance agreement and process for sharing emergency resources among signatories statewide.

- The resources to respond and recover more quickly from a disaster.

- A mutual assistance program consistent with other statewide mutual aid programs and the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS).

- A forum for developing and maintaining emergency contacts and relationships.

- New ideas from lessons learned in disasters.

3. **No later than January 1, 2024**, to ensure continuous operations during power failures, provide adequate backup electrical supply: a reliable backup generator is required

for any water system, without one, the system will be at risk of interrupted water supply for the customers during an unplanned power outage. Water suppliers need to be prepared for emergency power shutoffs by having a backup generator sized to fit their source capacity needs that is installed properly and maintained effectively. CalWARN Members Dashboard: https://www.calwarn.org/

4. **No later than January 1, 2027**, have at least one backup source of water supply, or a water system intertie, that meets current water quality requirements and is sufficient to meet average daily demand: Water systems dependent on a single source to meet their maximum day demand, need to have another source to provide emergency supply and ensure system redundancy during an emergency. Reliance on a single source to meet customer demand is an accessibility risk for a water system. The water system is at a higher risk of failure if their single source were to become contaminated, dry, collapses, or is taken out of service (i.e., for maintenance etc.).

5**. No later than January 1, 2032**, meter each service connection and monitor for water loss due to leakages: Metering service connections at individual households is an important drought mitigation measure because it allows a water system to monitor water usage, identify potential water loss (repair and replacement needs), and may also help customers reduce demand when needed.

6**. No later than January 1, 2032**, have source system capacity, treatment system capacity if necessary, and distribution system capacity to meet fire flow requirements (excluded from the Cost Assessment) An essential element to control and extinguish a fire is having an adequate water supply, storage capacity, and hydraulic pipeline network. A water system must explicitly consider fire flow requirements when sizing pipes, pumps, and storage tanks. For larger water systems, fire protection may have a marginal effect on sizing decisions, but for smaller water systems these requirements can correspond to a significant increase in the size of many essential water infrastructure components.