



# Horlick Company, Inc.

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## 50SH Model Motor-Generator Set 60-50 Hz Frequency Converter



### Features

*Precise 50 Hz output frequency*  
*Common frame design*  
*Low audible noise*  
*Easy to operate*  
*Exceptional MTBF*  
*Minimal maintenance required*

### Description

Horlick 50SH Model motor-generator sets consist of a 12-pole, synchronous motor and a 10-pole, synchronous generator mounted on a common shaft. These units run at 600 RPM and deliver an output frequency of precisely 50 Hz from no-load to full-load. 50SH Model motor-generator sets are rated for continuous duty and they provide a clean source of 50 Hz power isolated from switching transients, voltage fluctuations and power line noise. They have high overload capability and are most commonly utilized in military applications where a rugged and reliable 60-50 Hz frequency converter is required. Alternatively, they are also utilized in American manufacturing facilities to provide a source of precise 50 Hz power for large-scale operations. They are dependable in harsh environments and are ideally suited for applications where continuous run time is a necessity.

Horlick 50SH Model motor-generator sets are designed to be installed inside where a 75-80 dBA noise level is acceptable. As an option, 50SH Model motor-generator sets can be mounted in a weather-resistant enclosure, a sound-reduced enclosure, a cargo container or a trailer. Each 50SH Model motor-generator set is equipped with a standard control system that is either wall-mounted or free standing. The components in the control system perform the functions necessary to operate, monitor and protect the system



### Specifications

#### Motor

- Brushless synchronous, 600 RPM, 12-pole
- Continuous duty, Class F insulation, open drip-proof
- Selection of 60 Hz, 3-phase input voltages to include: 208V, 230V or 460V

#### Generator

- Brushless synchronous, 600 RPM, 10-pole
- Continuous duty, Class F insulation, open drip-proof
- Selection of 50 Hz output voltages to include: 120/208V, 220/380V or 277/480V, 3-phase
- Rated at 0.8 power factor to insure proper handling of inductive loads

#### Mechanical Construction

- Motor and generator mounted on common shaft
- Reinforced steel frame
- Precision machined and dynamically balanced rotor

#### Standard Control Systems

Each motor-generator set is equipped with a separate wall-mounted or floor-standing control panel. The standard package includes the following components:

#### Motor Controls

- Motor starter with adjustable overload
- Start-Stop push buttons with terminal strip for remote start/stop
- Control power transformer with fusing
- Variable transformer for power factor control, with protective relay for motor out-of-step and field failure protection
- Analog meter package to include ammeter and run time meter
- Pilot lights to indicate "Motor Run" and "60 Hz Line Energized"

#### Generator Controls

- Analog meter package to include voltmeter, ammeter and frequency meter
- Voltmeter and ammeter phase selector switches (3-phase systems)
- Voltage regulator,  $\pm 1\%$  regulation accuracy, with automatic buildup and rheostat for control of regulated voltage
- Output circuit breaker, molded case, to protect generator against short circuit or prolonged overload
- Pilot light to indicate "50 Hz Load On"
- Over voltage protection package to include output circuit breaker shunt trip

### Performance Characteristics

- **Voltage regulation:**  $\pm 1\%$  from no-load to full-load at rated power factor
- **Voltage steady state stability:**  $\pm 0.5\%$  from no-load to full-load at rated power factor
- **Voltage adjustment range:**  $\pm 10\%$  in stepless increments of nominal output voltage
- **Frequency regulation:** Precise 50 Hz output from no-load to full-load
- **Voltage transient:** When a full-load at rated power factor is applied or released, the resultant instantaneous droop or overshoot will not exceed 30% of preset value
- **Voltage recovery time:** After a full-load is applied or released, the output voltage will return to the regulation band within 500 milliseconds
- **Harmonic distortion:** Less than 3% max. total distortion factor and less than 2.5% max. single-phase when measured line-to-line
- **Ambient operating conditions:** Temperature at 40°C, relative humidity at 95%
- **Duty cycle:** Motor-generator set and controls are rated for continuous duty

### Motor-Generator Options

- Weather-resistant, NEMA 3R enclosure
- Oversized generator to support motor-starting transients
- Thermal bearing and winding protection
- Input disconnect or circuit breaker
- Input phase protection relay
- Generator reconnection switch to allow selection of multiple output voltages
- Digital meter package
- Remote meter package with start/stop controls

**50SH Model  
Three Phase Output Ratings**

Model	Generator Rating at 0.8 PF		Output Current at 120/208V	Output Current at 220/380V	Motor Rating	Motor Starting Method
	KVA	KW	A	A		
50SH-203	25	20	69	38	30 HP	Wye-delta
50SH-253	31.3	25	87	48	40 HP	Wye-delta
50SH-303	37.5	30	104	57	50 HP	Wye-delta
50SH-403	50	40	139	76	60 HP	Wye-delta
50SH-503	62.5	50	174	95	75 HP	Wye-delta
50SH-603	75	60	208	114	100 HP	Wye-delta
50SH-803	93.8	75	261	143	125 HP	Wye-delta
50SH-1003	125	100	347	190	150 HP	Wye-delta
50SH-1253	156	125	434	238	200 HP	Wye-delta
50SH-1503	188	150	521	285	250 HP	Wye-delta
50SH-1753	219	175	608	333	300 HP	Wye-delta
50SH-2003	250	200	695	380	300 HP	Wye-delta
50SH-2503	313	250	868	475	400 HP	Wye-delta
50SH-3003	375	300	1042	570	500 HP	Wye-delta
50SH-3503	438	350	1216	666	550 HP	Wye-delta
50SH-4003	500	400	1390	761	600 HP	Wye-delta
50SH-4503	563	450	1563	856	700 HP	Wye-delta
50SH-5003	625	500	1737	951	750 HP	Wye-delta
50SH-5503	688	550	1911	1046	850 HP	Wye-delta
50SH-6003	750	600	2084	1141	1000 HP	Wye-delta
50SH-6503	813	650	2258	1236	1000 HP	Wye-delta
50SH-7003	875	700	2432	1331	1100 HP	Wye-delta
50SH-7503	938	750	2605	1426	1250 HP	Wye-delta
50SH-8003	1000	800	2779	1521	1250 HP	Wye-delta
50SH-9003	1125	900	3126	1711	1350 HP	Wye-delta
50SH-10003	1250	1000	3474	1901	1500 HP	Wye-delta
50SH-11003	1375	1100	3821	2092	1650 HP	Wye-delta
50SH-12003	1500	1200	4169	2282	1800 HP	Wye-delta