# HIPOWER®

# SafeGuard<sup>™</sup> DIESEL GENERATOR SET

# HFSG-60

#### 60Hz STANDBY UL2200 & CSA



VOLTAGE VAC	120/240V	120/208V	139/240V	277/480V	347/600V**
RATING	Standby	Standby	Standby	Standby	Standby
PHASE	1	3	3	3	3
PF	1.0	0.8	0.8	0.8	0.8
HZ	60	60	60	60	60
KW	59.5	60	60	60	60
KVA	59.5	75	75	75	75
AMPS	247	208	180	90	72
SKVA@30% VOLTAGE DIP	N/A	N/A	N/A	N/A	N/A

\*\* 600 Volt configuration not available as UL2200 certified generator

#### Description

HIPOWER<sup>®</sup> SafeGuard<sup>™</sup> generators are an efficient, reliable and versatile source of mobile electrical power. Designed to operate in the most extreme working conditions. All HIPOWER® SafeGuard<sup>™</sup> Generators combine an innovative design and the use of high quality materials that provide the user with the most dependable power that you can rely on for non-stop power with easy to operate controls. Powered by a radiator-cooled, industrial FPT Diesel engine, which meets current Environmental Protection Agency (EPA) TIER 3 exhaust emission regulations, driving a single bearing, four-pole, three-phase alternator, with IP23 protection. The Prime Power kVA rating for generator set is given with a 125 °C alternator winding temperature rise.

#### **HIPOWER®** Features and Benefits

**FPT Diesel Engine:** Long-life, heavy-duty, 4-cycle, direct injection engine for economy of operation and maximum reliability and durability. Capable of full rated load acceptance in one step.

Cooling: Radiator with belt driven pusher fan.

Air Filter: Heavy-duty replaceable element air-cleaner.

**Alternator:** Single bearing, rotating field, self-excited, self-ventilated, 12-wire re-connectable, and 4-wire dedicated for single phase version, 60Hz brushless alternator, Class H insulation. Automatic voltage regulator (AVR) providing close voltage regulation and skVA starting capability for electric motor loads. Certification: ISO 8528-5.

### **HIPOWER<sup>®</sup> Features and Benefits**

**Enclosure:** Fabricated in 11-gauge steel, powder coated with finish that exceeds 1000-hr salt spray test, minimum outside fasteners and four points lift. Vertical air discharge for quiet operation. Wide steel lockable access doors with seals, easy access for maintenance and service activities, lift off stainless steel hinges, corrosion resistant hardware and fasteners.

Exhaust: Low noise, steel residential-type exhaust silencer.

**Fuel Filtration**: Standard and secondary water separator with visible level on fuel filters.

**Controls:** Digital control panel with manual and automatic start and stop features. Many programmable automatic functions for local and remote controls with LED lights, tamper proof engine hour recorder. Load Connections: Covered distribution panel for easy access to cable power outlets, receptacles, lugs and Camloks.

Codes and Standards Compliances used where applicable



## 60kW/60Hz/STANDBY/1800RPM

Cera ၼ

#### APPLICATION DATA

ENGINE SPECIFICATION	
Manufacturer	FPT
Model	NEF45SM2X
EPA certified	Tier 3
Crankshaft speed	1,800 rpm
Туре	Diesel, 4-stroke
Injection	Direct
Aspiration	Turbocharged
Number of Cylinders	4
Cylinder arrangement	In-line
Displacement CID (liters)	275 (4.5)
Bore and Stroke ins (mm)	4.1x5.2 (104 X 132)
Nominal power	89.8 hp
Cooling	Liquid
Governor	Mechanical
Governor Regulation Class	ISO 8528 Part 1 Class G3
Frequency Regulation	Isochronous
Starting motor & alternator	12 volt
Compression ratio	17.5:1
Air cleaner type	Dry - light duty, single stage
Exhaust gas flow cu. ft./minute (cu.m. /minute)	487 (13.8)
Max. Exhaust temp at full load degrees °F (°C)	820 (438)
Max. permissible back pressure - ins H2O (kPA )	200 (50)
COOLING SYSTEM	
Engine cooling air flow - cu. ft./min (cu. m/min)	119.1 (3.37)
Alternator cooling flow - cu. ft./min (cu. m/min)	9.9 (0.281)
Total cooling air flow (engine + alternator + combustion) - cu. ft./min (cu. m/min)	133.64 (3.78)
Total cooling capacity - US gallons (liters)	4.88 (18.5)
Max. Operating Temperature °F (°C)	110 (43)
LUBRICATION SYSTEM	
Oil pan capacity - US gallons (liters)	2.59 (9.8)
Oil pan capacity with filter - US gallons (liters)	3.37 (12.8)
Oil cooler	Water - cooled
Recommended lubricating oil grade	ACEA E3-E5 - refer to owners manual
Oil consumption at full load	< 0.1% of fuel consumption
Oil pressure – psi (kPA)	46 (320)
ENGINE ELECTRICAL SYSTEM	
Starting motor voltage	12 volt
Cold Cranking Amps - minimum	92 Amp
Battery charging Alternantor	92 Amp 14V - 90 Amps
Battery capacity	640 Amps

#### HIMOINSA POWER SYSTEMS, INC.

Codes and Standards Compliances used where applicable

16600 S. Theden Street, Olathe, KS 66062 Tel: 913 495 5557 | Fax: 913 495 5575 **www. hipowersystems.com** 



## APPLICATION DATA

FUE.SYSTEM       Recommende fuel     2 - ULSD       Recommende fuel, m, min. D mmin.)     0.19 ( 9)       Fuel supply file, min. D mmin.)     0.19 ( 9)       Max. Iff, fuel pump. type, m (ft)     185 ( 6)       Fuel filter     Replaceable Element       FUEL COMPSUITION     Standby Power Fasting       10% load - US gallons/hour     4.57       75% load - US gallons/hour     3.42       50% load - US gallons/hour     2.28       75% load - US gallons/hour     2.28       76% load - US gallons/hour     3.412       76% load - US gallons/hour     2.28       76% load - US gallons/hour     2.28       76% load - US gallons/hour     3.412       76% load - US gallons/hour     2.28       76% load - US gallons/hour     7.417       76% load - US gallons/hour     7.417  <		
Fuel supply line, min. ID mm(in.)     0.19 ( 9)       Fuel return line, min. ID, mm (in.)     0.19 ( 9)       Max. lift, fuel pump, type, m (ft)     185 ( 6)       Fuel filter     Replaceable Element       FUEL COMPSUNTION     Standary Power Rating       100% load - US gailons/hour     4.57       75% load - US gailons/hour     3.42       50% load - US gailons/hour     2.28       20% load - US gailons/hour (liters)     -       ALTERNATOR SPECIFICATION     Marufacturer       Marufacturer     STAMFORD       Marufacturer     STAMFORD       Model     UC1224F - UC1224F - UC1224F - UC1224F       Voltages     120/208V - 277/480 - 120/2140V - 347/600V       Alternator Type     Four pole, rotating field       Excitation System     Bushless.       Power factor     0.8 / 10       Number of leads     12/240V - 347/600V       Stator Fitch     0.8 / 10       Stator Fitch     0.8 / 10       Stator Fitch     12/21       Stator Fitch     12/21       Stator Fitch     12/21       Stator Fitch     12/240V - 6	FUEL SYSTEM	
Fuel return line,min. ID, mm (in.)     0.19 ( 9 )       Max. Lift, fuel pump, type, m (tt)     186 ( 6 )       Fuel filter     Replaceable Element       FUEL COMPSUITION     Standby Power Rating       100% load - US gallons/hour     4.57       75% load - US gallons/hour     2.42       50% load - US gallons/hour (liters)     2.28       25% load - US gallons/hour (liters)     -       ALTERNATOR SPECIFICATION     TOP (Litze + UC1224	Recommended fuel	# 2 - ULSD
Max. lift, fue jump, type, m (th)     185 ( 6 )       Fuel filter     Replaceable Element       FUEL COMPSUNTION     Standby Power Rating       100% load - US gallons/hour     4.57       57% load - US gallons/hour     3.42       50% load - US gallons/hour (iters)     -       ALTERNATOR SPECIFICATION     2.28       Manufacturer     STAMFORD       Model     UC1224F - UC1224E - UC1224F - UC1224E       Voltage     120/208V - 277/480 - 120/240V - 347/600V       Atternator Type     Four pole, rotating field       Power factor     88 / 10       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/8       Insulation     Class H       Vindings - Temperature Rise     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/8       Insulation     Class H       Vindings - Temperature Rise     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Enclosure (IEC-34-S)     Ignel, sealed       Coupling     Feable disc       Anortisseur windings     Full  V	Fuel supply line, min. ID mm(in.)	
Fuel filter     Replaceable Element       FUEL COMPSUNTION     Standby Power Rating       100% load - US gallons/hour     4.57       5% load - US gallons/hour     3.42       50% load - US gallons/hour     2.28       50% load - US gallons/hour (liters)     -       ALTERNATOR SPECIFICATION     -       Manufacturer     STAMFORD       Model     UC1224F - UC1224F - UC1224F       Votages     120/208V - 277/480 - 120/240V - 347/600V       Alternator Type     Four pole, rotating field       Excitation System     Brushless.       Power factor     0.8 / 1.0       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Insulation     Class H       Windings - Temperature Rise     12540° C       Enclosure (EC-34-S)     IP23       Bearing     Single, seald       Coupling     Full       Autiseur windings     Full       Votage regulation - no load to full load with AS480 AVR     1%       TIF     <50	Fuel return line,min. ID, mm (in.)	0.19(9)
FUELCOMPSUNTION   Standay Power Pating     100% load - US gallons/hour   4.57     75% load - US gallons/hour   3.42     50% load - US gallons/hour   2.28     50% load - US gallons/hour (liters)   2.28     25% load - US gallons/hour (liters)   3.42     Atternator SPECIFICATION   50% load - UC1224F - UC12	Max. lift, fuel pump, type, m (ft)	1.85 ( 6 )
0% load - US gallons/hour 9.42   75% load - US gallons/hour 9.42   50% load - US gallons/hour 2.28   50% load - US gallons/hour (liters) -   ALTERNATOR SPECIFICATION   Model UC1224F - UC1224E - UC1224F - UC1224E   Voltages 120/208V - 277/480 - 120/240V - 347/600V   Alternator Type Four pole, rotating field   Excitator Type 818/10   Number of leads 12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)   Stator Pitch 2/3   Insulation Class H   Windings - Temperature Rise 129/240° C   Excitation System 129/240° C   Bearing Single, sealed   Coupling Fear partice Rise   Anore of leads Full   Voltage requirements of most industrial and commercial applications   TiF 5/0   Rackor Frequency Emissions compliance Keats requirements of most industrial and commercial applications   Tine harmonics 5% maximum	Fuel filter	Replaceable Element
3.42     3.42       5% lead - US gallons/hour     2.28       5% lead - US gallons/hour (itters)     -       ALTERNATOR SPECIFICATION     STAMFORD       Manufacturer     STAMFORD       Model     UCI224F - UCI224F - UCI224F - UCI224F       Voltages     120/208V - 277/480 - 120/240V - 347/600V       Atternator Type     Four pole, rotating field       Excitation System     Bushless.       Power factor     0.8/1.0       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Insulation     Leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Vindings - Temperature Rise     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Undings - Temperature Rise     Isolation       Enclosure (IEC-34-S)     Ip23       Bearing     Single, sealed       Coupling     Full       Anortseour windings     Full       Voltage requirements of most industrial and commercial applications       Ratio Frequency Emissions compliance     Keats requirements of most industrial and commercial app	FUEL COMPSUNTION	Standby Power Rating
50% load - US gallons/hour     2.28       50% load - US gallons/hour (liters)     -       ALTERNATOR SPECIFICATION     STAMFORD       Manufacturer     STAMFORD       Model     UCI224F - UCI224F - UCI224F - UCI224F       Voltages     120/208V - 277/480 - 120/240V - 347/600V       Alternator Type     Four pole, rotating field       Excitation System     Brushless.       Power factor     0.8 / 10       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Insulation     Cleas H       Windings – Temperature Rise     12/240° C       Enclosure (IEC-34-S)     IP23       Bearing     Single, sealed       Coupling     Feixble disc       Amortisseur windings     Full       Voltage regulation – no load to full load with AS480 AVR     1%       TiF     <50	100% load – US gallons/hour	4.57
ATEENATOR SPECIFICATION   -     ALTERNATOR SPECIFICATION   STAMFORD     Mondacturer   STAMFORD     Model   UCI224F - UCI224E - UCI224F - UCI224F     Voltages   120/208V - 277/490 - 120/240V - 347/600V     Alternator Type   Four pole, rotating field     Excitation System   Brushless.     Power factor   0.8/ 1.0     Number of leads   12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)     Stator Pitch   0.8/ 1.0     Number of leads   12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)     Stator Pitch   0.8/ 1.0     Number of leads   12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)     Stator Pitch   0.8/ 1.0     Insulation   Class H     Vindings – Temperature Rise   125/40° C     Enclosure (IEC-34-S)   IP23     Bearing   Single, sealed     Coupling   Full     Voltage regulation – no load to full load with AS480 AVR   1%     TIF   <50	75% load - US gallons/hour	3.42
Atternation       Manufacturer     STAMFORD       Model     UC1224F - UC1224F - UC1224F       Voltages     120/2089 - 277/480 - 120/240Y - 347/600V       Atternator Type     Four pole, rotating field       Excitation System     Brushless.       Power factor     0.8 / 1.0       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Insulation     Class H       Windings – Temperature Rise     12/40° C       Enclosure (IEC-34-S)     IP23       Bearing     Single, sealed       Coupling     Full       Voltage regulation – no load to full load with AS480 AVR     1 %       TIF     <50	50% load - US gallons/hour	2.28
MandracturerSTAMFORDModelUCl224F - UCl224E - UCl224E - UCl224EVoltages120/208V - 277/480 - 120/240V - 347/600VAlternator TypeFour pole, rotating fieldExcitation System08/10Power factor08/10Number of leads12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)Stor Pitch2/3InsulationCless HVindings - Temperature Rise12/40° CEnclosure (IEC-34-S)12/91BearingSingle, sealedCouplingFullVoltage regulation - no lead to full leads vith AS480 AVR1%TIF<50	25% load - US gallons/hour (liters)	-
Model     VCI224F - UCI224F - UCI224F - UCI224E     VCI224F - UCI224F - UCI224F - UCI224F     VCI224F - UCI224F - UCI224F - UCI224F     VCI224F - UCI224F - UCI224F - UCI224F - UCI224F     VCI224F - UCI224F - UCI224F - UCI224F - UCI224F - UCI224F     VCI224F - UCI224F - UCI224F - UCI224F - UCI224F - UCI224F - UCI224F     VCI224F - UCI224F - UCI24F	ALTERNATOR SPECIFICATION	
Voltages     120/208V - 277/480 - 120/240V - 347/600V       Alternator Type     Four pole, rotating field       Excitation System     Brushless.       Power factor     0.8 / 1.0       Number of leads     12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)       Stator Pitch     2/3       Insulation     Class H       Vindings - Temperature Rise     125/40° C       Ectosure (IEC-34-S)     IP23       Bearing     Single, sealed       Coupling     Full       Anortisseur windings     Full       Voltage regulation - no load to full load with AS480 AVR     ± 1%       TF     <50	Manufacturer	STAMFORD
Alternator Type   Four pole, rotating field     Excitation System   Brushless.     Power factor   0.8 / 1.0     Number of leads   12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)     Stator Pitch   2/3     Insulation   Class H     Windings - Temperature Rise   125/40° C     Enclosure (IEC-34-S)   IP23     Bearing   Single, sealed     Coupling   Feukible disc     Anortisseur windings   Full     Vitage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Model	UCI224F - UCI224E - UCI224F - UCI224E
Excitation SystemBrushless.Power factor0.8 / 1.0Number of leads12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)Stator Pitch2/3InsulationClass HWindings - Temperature Rise125/40° CEnclosure (IEC-34-S)IP23BearingSingle, sealedCouplingFlexible discAmortisseur windingsFullVitage regulation - no load to full load with AS480 AVR± 1%TIF<50	Voltages	120/208V - 277/480 - 120/240V - 347/600V
Power factor0.8/10Number of leads12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)Stator Pitch2/3InsulationClass HWindings - Temperature Rise125/40° CEnclosure (IEC-34-S)IP23BearingSingle, sealedCouplingFlexible discAmortisseur windingsFullVotage regulation - no load to full load with AS480 AVR± 1%TIF<50	Alternator Type	Four pole, rotating field
Number of leads   12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)     Stator Pitch   2/3     Insulation   Class H     Windings – Temperature Rise   12 /40° C     Enclosure (IEC-34-S)   IP23     Bearing   Single, sealed     Coupling   Flexible disc     Amortisseur windings   Full     Voltage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Excitation System	Brushless.
Stator Pitch2/3InsulationClass HWindings –Temperature Rise125/40° CEnclosure (IEC-34-S)IP23BearingSingle, sealedCouplingFlexible discAmortisseur windingsFullVoltage regulation – no load to full load with AS480 AVR± 1%TIF<50	Power factor	0.8 / 1.0
Insulation     Class H       Nindings – Temperature Rise     125/40° C       Enclosure (IEC-34-S)     IP23       Bearing     Single, sealed       Coupling     Flexible disc       Amortisseur windings     Full       Voltage regulation – no load to full load with AS480 AVR     ± 1%       TIF     <50	Number of leads	12 leads, reconnectable (Three phase) - 4 leads dedicated (Single phase)
NotationEncloseWindings – Temperature Rise125/40° CEnclosure (IEC-34-S)IP23BearingSingle, sealedCouplingFlexible discAmortisseur windingsFullVoltage regulation – no load to full load with AS480 AVR± 1%TIF<50	Stator Pitch	2/3
Enclosure (IEC-34-S)IP23BearingSingle, sealedCouplingFlexible discAmortisseur windingsFullVoltage regulation – no load to full load with AS480 AVR± 1%TIF<50	Insulation	Class H
Bearing   Single, sealed     Coupling   Flexible disc     Amortisseur windings   Full     Voltage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Windings – Temperature Rise	125/40° C
Coupling   Flexible disc     Amortisseur windings   Full     Voltage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Enclosure (IEC-34-S)	IP23
Amortisseur windings   Full     Voltage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Bearing	Single, sealed
Voltage regulation – no load to full load with AS480 AVR   ± 1%     TIF   <50	Coupling	Flexible disc
TIF <50	Amortisseur windings	Full
Radio Frequency Emissions compliance   Meets requirements of most industrial and commercial applications     Line harmonics   5% maximum     STANDARD ACCESSORIES   • Main line ABB UL listed circuit breaker for overload protection	Voltage regulation - no load to full load with AS480 AVR	± 1%
Line harmonics 5% maximum   STANDARD ACCESSORIES • Main line ABB UL listed circuit breaker for overload protection	TIF	<50
STANDARD ACCESSORIES     • Radiator with pusher fan     • Main line ABB UL listed circuit breaker for overload protection	Radio Frequency Emissions compliance	Meets requirements of most industrial and commercial applications
Radiator with pusher fan Main line ABB UL listed circuit breaker for overload protection	Line harmonics	5% maximum
	STANDARD ACCESSORIES	
Control Panel CEM7 (See over for details) Heated Control Panel	Radiator with pusher fan	Main line ABB UL listed circuit breaker for overload protection
	Control Panel CEM7 (See over for details)	Heated Control Panel

OPTIONAL ACCESSORIES			
Battery with Cables	Anti-Condensation Heater		
Battery Blanket	Water Jacket heater		
• 6 Amp Battery charger, 12VDC	• 24h - ULC142 fuel tank		
• Fuel Tank raiser			





#### **CONTROL SYSTEMS STANDARD FEATURES - Generator Digital Control Panel**

HIPOWER<sup>®</sup> Control Panel: Hipower digital controller with auto and manual start capability. Digital readout for: volts between each phase & neutral, volts between phases, amps per phase, frequency, kW and kVA power, power factor, KW hour with accumulation by day, month and year, fuel reserve, oil pressure, coolant temperature, battery volts and charging alternator volts, engine speed, hours running. Engine alarms for high coolant temperature, low oil pressure, emergency stop activated, battery charging failure, low coolant level, low fuel level, over-speed, under-speed and low battery volts.

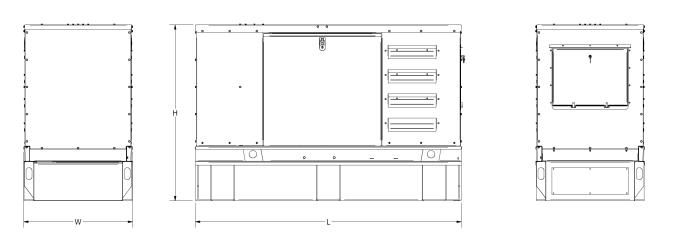
Engine alarms included: High coolant temperature, low oil pressure, low coolant level, unexpected shutdown, low fuel level, stop failure, low battery voltage, battery charging alternator failure, over-speed, under-speed, start failure and emergency stop. Support of engines with ECU (J1939, Modbus and other proprietary interfaces); alarm codes displayed in text form.



Alternator alarms included: Overload, unbalanced voltage, over voltage, under voltage, over frequency, under frequency, short circuit and reverse power.

#### DIMENSIONS, WEIGHTS & SOUND LEVELS

#### ENCLOSED SET



CONFIGURATION	Fuel Tank Data (Standard)		Generator Data *				
	Run Time Hours	Capacity (Gals)	L = Length	W = Width	H = Height	Weight Ibs	dBA
Enclosed Set	24*	110*	100″	36″	47" - (62"*)	2635 - (3535*)	73

\* Optional 24h ULC142 fuel tank



**Intertek** Conforms to UL STD 2200 Certified to CSA STD C22.2#100 Certified to CSA STD C22.2#14

#### HIMOINSA POWER SYSTEMS, INC.

Codes and Standards Compliances used where applicable

