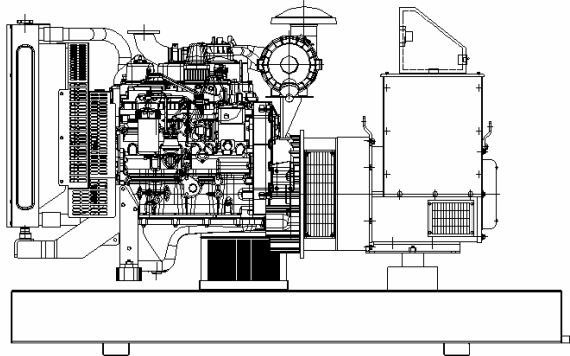




MAQUINARIA IGSA POWER GENERATION SYSTEMS



MODEL: GSIV20060S
DIESEL ENGINE: IVECO
MODEL: NEF45 SM2 TIER II
CAPACITY: 60 kW; 1800 RPM

RATINGS RANGE	
PRIME hp (kW)	STANDBY hp (kW)
87 (65)	97 (72)

Ratings in accordance with ISO 8528-standard reference conditions:

Air inlet temperature	25°C (77°F)
Pressure	1000 mbar (14.5psi)
Relative humidity	30%
Power factor	0.8

STANDARD FEATURES

Complete system designed and built at ISO9001 certified facility.

- Factory tested to design specifications at full load conditions.
- Fully engineered with a range of options and accessories.

1 IGSA Genset's are composed of 4 cylinders in line and four strokes diesel engine for industrial stationary applications. Those equipments are fully factory tested using a resistive load. (1) Hour ramp 100% load test.

2 The controls and accessories are selected to work together to achieve the maximum operational performance and security.

3 Exhaust gases silencer, and a section of flexible tube for connection purposes.

4 Engine **IVECO, NEF45 SM2. TIER II**

5 Marathon or Stamford Alternator.

6 Control MEC 310 (panel USC300).

7 Radiator

8 Base of structural steel.

GENERAL FEATURES

- IGSA GENSET of, **60 kW to 480V, 440V, 380V, 220V, 208V, 190VAC**, 3 Phase, 4 Wire, 60 Hertz, is composed by an internal engine four strokes coupling with the alternator, controls and accessories totally assembled and tested in factory.
- The controls and accessories of the Genset are selected to provide the maximum in efficiency and Security.
- The genset engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 2 nonroad emissions regulations.
- The generator set its components are tested factory-built, and production-tested.

ENGINE SPECIFICATION DATA MODEL NEF45 SM2

Weight 450 Kg (992.5 Lb)

General Data	
Model	NEF45 SM2
Basic engine type	F4GE0455A*F600-504103291XY
Number of Cylinders	4
Firing order	1-3-4-2
Cylinder arrangement	In line
Valves per cylinder	2
Cycle	Diesel 4 stroke
Injection system	Direct
Induction System	Turbocharged
Bore x Stroke--in.(mm)	4.1x5.2 (104 x132)
Total Displacement-- gl (L)	1.2 (4.5)
Mean piston speed--ft/s (m/s)	2.4 (7.9)
Compression Ratio	17.5:1
Flywheel rotation	Anti clockwise viewed on flywheel
Housing Flywheel	SAE 3
Flywheel	11"½
Moment of inertia	
Without flyweel-- Nm²	0.19 (66.2 lbin²)
Flyweel only-- Nm²	0.69 (240.4 lbin²)
BMEP gross	
Prime power-- bar/kPa	10/996.6
Stand-by power-- bar/kPa	11/1096.3
Dry weight (including cooling package)--kg (Lb)	450 (992.5)
Energy to coolant-- kcal/kWh	532.5
Energy to charge cooler-- kcal/kWh	----
Energy to radiation-- kcal/kWh	141
Dimensions L x W x H-- in (mm)	(1259x657x1016)
Performances	
Continuous Power (gross)-- kWm	54.4 (239.3 hpft)
Prime power (gross)-- kWm	67.4 (296.5 hpft)
Stan-By power (gross)-- kWm	74.0 (325.6 hpft)
Fan consumption -- kWm	2.2 (9.7 hpft)
Continuous Power (net)-- kWm	52.2 (229.7 hpft)
Prime power (net)-- kWm	65.2 (286.9 hpft)
Stand-By Power (net)-- kWm	71.8 (315.9 hpft)
Performance condition	
temperature-- °C	≤40 (≤ 104°F)
altitude a.s.l-- m	≤1000 (≤ 3281ft)
Derating	
temperature > T40°C (104°F) %/5°C (41°F)	
altitude > 1000m (3281ft) %/500m (1640.5ft)	
Intake System	
Air consumption at 100% of load-- m³/h (kg/h)	480(399) [16951 ft3/h (879.6lb/h)]
Air intake restriction, clean filter-- kPa (mbar)	
Air intake restriction, dirty filter-- kPa (mbar)	5(50) [0.87psi]
Air filter type	dry

Cooling System	
Type	Liquid
Recommended coolant	Water + paraflu 50%
engine only	8.5
radiator and hoses	10
Coolant pump flow-- l/min	123.91 (32.7gal/min)
Pressure cap setting-- kPa (bar)	70 (0.7) [10.15]
Shutdown switch setting-- °C	103 (217.4°F)
Maximum additional restriction-- Pa	147 (0.02psi)
Air To Boil Prime Power-- °C	56 (132.8°F)
Lubrication System	
Oil sump capacity	
max-- L	
min-- L	
Oil system capacity including filter-- gl (L)	3.4 (12.8)
Oil pressure at rated speed-- kPa	300-500 (43.5-72.5psi)
Oil temperature	
normal	
max	120
Engine angulatory	
longitudinal-- degrees	25°
transverse-- degrees	25°
Servicing interval-- hours	650
Oil specification	ACEA E3 / E5
Oil consumption-- %fuel	< 0.1
Exhaust System	
Gas flow at stand-by Power--Lb/h (kg/h)	917.5 (416)
Max temperature at PRP (25°C 77°F)-- °C(°F)	750°F (399)
Max allowable back pressure-- kPa (mbar)	6 (60) [0.87psi]
Exhaust gas temperature-- kcal/kWh	741.2
Fuel Consumption l/h (kg/h) [gal/h] lb/h	
100 % Power	17.3 (14.5) [4.57] 32
80 % Power	13.0 (10.9) [3.43] 24
50 % Power	9.0 (7.60) [2.38] 16.8
Electric System	
Voltage (negative to ground)-- V	12
Starter motor power-- kW	3
Number of teeth on stater motor	10
Number of teeth on flywheel	125
Starting batteries	
recommended capacity-- Ah 1x	100
Discharge current-- Amp	650
Alternator	
Voltage-- V	14
Charge-- Amp	90
Cold Starting	
Without air preheating-- °C	-10 (14°F)
with air preheating-- °C	-25 (-13°F)



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STAMFORD ELECTRIC ALTERNATOR MODEL UCI224E

Weight 311Kg (685.5 Lb)

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.		
A.V.R.	MX321	MX341	
VOLTAGE REGULATION	(+/- 0.5%)	(+/- 1.0%)	WITH 4 ENINE GOVERNING
SUSTAINED SHORT CIRCUIT	REFERENT TO SHOT CIRCUIT DECREMENT CURRENT		

INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.101 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	0.69 Ohms at 22°C (71.6°F)							
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N. refer to factory for others							
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6312 - 2RS. (ISO)							
BEARING NON-DRIVE END	BALL. 6309 - 2RS. (ISO)							
WEIGHT COMP. GENERATOR WEIGHT WOUND STATOR WEIGHT WOUND ROTOR WR ² INERTIA SHIPPING WEIGHTS in a crate PACKING CRATE SIZE	1 BEARING				2 BEARING			
	311 kg		685.6 lb		330 kg		727.5lb	
	103 kg		227.1lb		103 kg		227.1lb	
	95.89 Kg		211.4lb		87.52 kg		192.9lb	
	0.4999 kgm ²		11.9 lbft ²		0.4882 kgm ²		11.6 lbft ²	
	334 kg		736.3lb		351 kg		773.8lb	
	105 x 57 x 96 (cm)		41.3x22.4x37.8 (in)		105 x 57 x 96 (cm)		41.3x22.4x37.8(in)	
TELEPHONE INTERFERENCE	50 Hz				60 Hz			
COOLING AIR	THF<2%				TIF<50			
	0.216 m ³ /sec 458 cfm				0.261 m ³ /sec 595 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
KVA BASE RATING FOR	60	60	60	50	67.5	70	72.5	75
RECTANCE VALUES								
X _d DIR. AXIS SYNCHRONOUS	2.48	2.24	2.06	1.79	3.0	2.16	2.64	2.50
X' _d DIR. AXIS TRANSIENT	0.19	0.17	0.16	0.14	0.22	0.20	0.19	0.10
X'' _d DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	0.06	0.15	0.14	0.13	0.13
X _q QUAD. AXIS REACTANCE	1.13	1.02	0.90	0.02	1.38	1.28	1.21	1.15
X'' _q QUAD. AXIS SUBTRANSIENT	0.14	0.13	0.12	0.10	0.14	0.13	0.12	0.12
X _L LEAKAGE REACTANCE	0.03	0.03	0.07	0.06	0.09	0.08	0.08	0.08
X ₂ NEGATIVE SEQUENCE	0.13	0.12	0.11	0.09	0.14	0.13	0.12	0.12
X ₀ ZERO SEQUENCE	0.11	0.10	0.09	0.08	0.09	0.08	0.06	0.08
REACTANCES ARE SATURATED				VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED				
T' _d TRANSIENT TIME CONST.	0.28 s							
T'' _d SUB-TRANSTIME CONST.	0.007 s							
T' _{do} O.C. FIELD TIME CONST.	0.7 s							
T _a ARMATURE TIME CONST.	0.008 s							
SHORT CIRCUIT RATIO	1/X _d							

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Standby Ratings: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046/1, BS5514, AS2789, and DIN 6271. Prime Power Ratings: Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for a 12 hour period. Ratings are in accordance with ISO-8528/1, overload power in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. GENERAL GUIDELINES FOR DERATION: Altitude: Derate 1.3% per 100 m (328 ft.) elevation above 1500 m (5000 ft.). Temperature: Derate 1.0% per 10°C (18°F) temperature above 45°C (77°F).



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CONTROLLER FOR GENSET: CONTROL MEC 310 PANEL USC300

The Generator Controller MEC 310 is a microprocessor-based control unit containing all necessary functions for protection and control of a power generator. Besides the control and protection of the diesel engine it contains a full 3-phase AC voltage and current measuring circuit. The unit is equipped with an LCD display presenting all values and alarms.



- USC 300C Unit Mount Control Panel, Black Nema 1 enclosure c/w rubber mounts
- MEC 310 Microprocessor Based Engine Generator Controller
- Graphic Display 128 X 64 pixels (STN) Super Twisted Nematic
- Digital AC Metering:
 - 3-Phase Volts (Phase to Phase and Phase to Neutral),
 - 3-Phase Amps
 - Frequency
 - kW, kVAR, KVA, pF, kWhr
- AC Protective Relaying:
 - 27/59 Under/Over Voltage
 - 32 Reverse Power
 - 51 Time Overcurrent
 - 81 O/U Under/Over Frequency
- Digital gauge display:
 - Oil Pressure (sender required by others)
 - Coolant Temperature (sender required by others)
 - Fuel Level (sender required by others)
 - Hourmeter
 - Tachometer
- 5 digital inputs for alarms / shutdowns
- Dedicated Output Contacts - Engine Crank; Run (30 VDC / 6 Amps)
- Three Programmable Output Contacts (30 VDC / 1 Amps)
- Event Logging (30 events)
- Pushbuttons:
 - Emergency Stop
 - Manual Start and Stop
 - Manual/Auto/Test
 - Lamp Test
 - Horn Silence
- Indicating Lights:
 - Common Alarm
 - Generator Ready (Voltage and Frequency Normal)

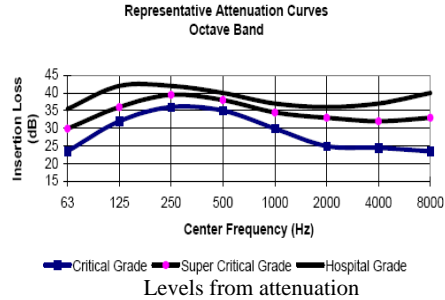
FEATURES

- Electrical Rating:**
- Single or three phase, 600VAC maximum, 50/60HZ, 4 wire
 - 12 or 24Vdc (nominal) supply, negative ground.
 - Dedicated Output Contacts - Engine Crank; Run (30 VDC / 6 Amps)
 - Three Programmable Output Contacts (30 VDC / 1 Amps)
- Enclosure:**
- Black Nema 1 enclosure c/w rubber mounts
- Engine Senders:**
- Oil pressure (1/8" NPT), Temperature (1/4"NPT) (Supplied loose for engine mounting).
- Requirements:**
- Exceeds requirements of CSA 282 and NFPA 110 Level.

OPTIONAL SILENCER ACCORDING TO THE APPLICATION

Silencer with different levels from attenuation

- Critical Grade
- Super Critical Grade
- Hospital Grade



DOCUMENTATION AND OTHERS

- Manual of operation and maintenance.
- Spare parts.
- Maintenance.
- Consulting.

MISCELLANEOUS EQUIPMENT

- Batteries of 12 VDC with cables for battery connection with the engine.

GENSET OPTIONS

Control Panel

USC 300C Control Panel is standard on all units see page 4 of spec sheet for standard features.

Another Type _____

Fuel system

- Fuel Water Separator
- Day tank
- Auxiliary fuel pump
- Sub Base mounted Fuel Tank
 - Single Wall
 - Double Wall
 - UL listed
 - 150 L (39.6 gal)
 - 250 L (66 gal)

Diesel Fuel Tank

- 500 L (132 gal)
- 1000 L (264.1 gal)
- 5000 L (1320.8 gal)

Exhaust System

- Critical Grade
- Super Critical Grade
- Hospital Grade

Engine Electrical system

- Battery
 - Lead-Acid
 - NiCad
- Battery Rack
- Battery Charger Automatic

Generator

- Breaker in the alternator

OPTIONAL ACCESSORIES AVAILABLE FOR THE EQUIPMENT

Vibration isolation

- Rigid Spring Mounting
- Resilient Mounting

Filters

- Air Filter for Medium Dust Environments
- Air Filter of Heavy Dust Environments

Drain

- Oil drain Extension

Enclosures

- Sound Attenuated
- Weather Proof
- Stainless steel cover
- Trailer Mounting
- Interior lights Ac or DC

Heaters

- Jacket Water Heater
- Crankcase Oil Heater

Insulation Blankets

- Features:
(Temperature to 1260°C (2300°F), Non-Combustible, Highly Resistant to Vibration, Oil, Fuel, Grease, and Moisture Resistant Exterior, Personal Protection

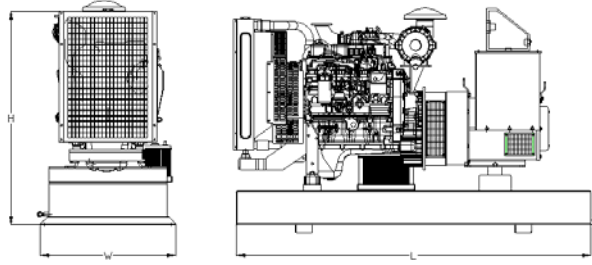
Notes



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DIMENSIONS



LENGTH	WIDTH	HEIGHT
mm (in)	mm (in)	mm (in)
2000 (78.7)	800 (31.5)	1300 (51.2)

NOTE: General configuration not to be used for installation. See general dimension drawing for detail.

SERVICES

- Development of the project.
- Development of engineering.
- Equipment's Installation.
- Engineering for special applications.
- Synchronies with utility network or more Gensets.
- Attention and technical support.

INSTALLATION OPTIONS OF THE GENSET

- On-Site.
- Acoustic Enclosure.
- ISO Container.
- Trailer.

