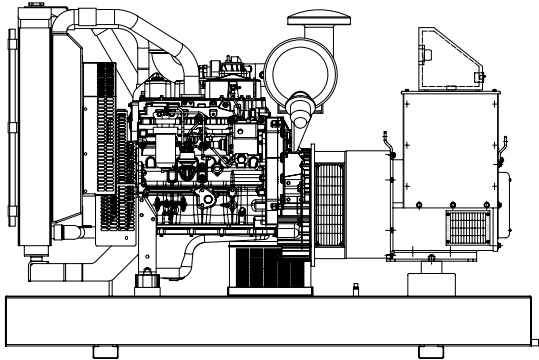




# MAQUINARIA IGSA POWER GENERATION SYSTEMS



**MODEL: GSIV20080S**  
**DIESEL ENGINE: IVECO**  
**MODEL: NEF45 TM1 TIER II**  
**CAPACITY: 80 KW 60 HZ**

RATINGS RANGE	
PRIME HP(KW)	STANDBY HP(KW)
115 (86)	127 (95)

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 TM1** TIER II

**5** Marathon or Stamford, Alternator.

**6** Control MEC310(Panel USC300).

**7** Radiator

**8** Base of structural steel.

## GENERAL FEATURES

- GENSET IGSA of **60 kW to 480V, 440V, 380V, 220V, 208V, 190VAC, 3P, 4W, 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.



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# ENGINE SPECIFICATION DATA MODEL NEF45 TM1

## Weight 500 Kg (1103 Lb)

General Data	
Model	NEF45 TM1
Basic engine	F4GE0485A*F600-504103289XY
Number of Cylinders	4
Firing order	1-3-4-2
Cylinder arrangement	In line
Valves per cylinder	2
Type	Diesel 4 stroke
Injection system	Direct
Induction System	Turbocharged aftercooled air/air
Bore. in.(mm)	4.09 / 104
Stroke. in.(mm)	5.19 / 132
Total Displacement-- gl (L)	1.18 / 4.5
Mean piston speed--ft/s (m/s)	2.41 / 7.9
Compression Ratio	17.5:1
Flywheel rotation	Anti clockwise viewed on flywheel
Flywheel housing	SAE 3
Flywheel	11 <sup>1</sup> / <sub>2</sub>
Moment of inertia	
Without flyweel-- Nm <sup>2</sup>	0.19
Flyweel only-- Nm <sup>2</sup>	0.69
BMEP gross	
Prime power-- bar/kPa	13.2/1319.9
Stand-by power-- bar/kPa	14.5/1451.9
Dry weight (including cooling package)—kg (Lb)	500 (1103)
Energy to coolant-- kcal/kWh	402.1
Energy to charge cooler-- kcal/kWh	140.3
Energy to radiation-- kcal/kWh	52
Dimensions L x W x H-- in (mm)	53.82x29.65x42.71 / 1367x753x1085
Performances	
Continuous Power (gross)—kWm / hpft	72.1 / 317.2
Prime power (gross)—kWm / hpft1	89.4 / 393.3
Stan-By power (gross)—kWm / hpft	98 / 431.2
Fan consumption – kWm / hpft	3.1 / 13.6
Continuous Power (net)—kWm / hpft	69 / 303.6
Prime power (net)—kWm / hpft	86.3 / 378.4
Stand-By Power (net)—kWm / hpft	94.9 / 417.5
Performance condition	
temperature-- °C / °F	≤40 / 104
altitude a.s.l—m/Ft	≤1000 / 3280
Derating	
temperature > T40°C/104°F %/5°C / 41°F	
altitude > 1000m / 3280 Ft %/500m	
Intake System	
Air consumption at 100% of load-- m <sup>3</sup> /h (kg/h)	731 (607)
Air intake restriction, clean filter-- kPa (mbar)	
Air intake restriction, dirty filter-- kPa (mbar)	5(50)
Air filter type	dry

Cooling System	
Type	Liquid
Recommended coolant	Water + 50% paraflu 11
Coolant capacity engine only	8.5
radiator and hoses	10
Coolant pump flow-- l/min / gal/min	123.91 / 32.73
Pressure cap setting-- kPa (bar)	70 (0.7)
Shutdown switch setting-- °C / °F	103 / 218
Maximum additional restriction—kPa / PSI	147 / 21.315
Air To Boil Prime Power-- °C / °F	55 / 131
Lubrication System	
Oil pump capacity	
max-- L	
min-- L	
Oil system capacity including filter-- gl (L)	3.4 / 12.8
Oil pressure at rated speed-- kPa	300-500 / 43.572.5
Oil temperature	
normal	
max	120
Engine angulatory	
longitudinal-- degrees	
transverse-- degrees	
Servicing interval-- hours	600
Oil specification	ACEA E3 / E5
Oil consumption-- %fuel	< 0.1
Exhaust System	
Gas flow at stand-by Power-- kg/h	
Max temperature at PRP (25°C / 77°F)-- °C / °F	474 / 885
Max allowable back pressure-- kPa (mbar)	
Exhaust gas temperature-- kcal/kWh	753.6
Fuel Consumption (l/h) (kg/hr)	
100 % Power	220 (23.3) (19.5)
80 % Power	220 (17.5) (14.7)
50 % Power	229 (12.1) (10.1)
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 / °F	-10 / -50
with air preheating-- °C / °F	-25 / 77



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# MARATHON ELECTRIC ALTERNATOR MODEL 362PSL1604

## weight 320 kg (706Lb)

Kilowatt ratings at		1800 RPM			60 Hertz		12 Leads standard 3 phase		
kW (kVA)		3 Phase			0.8 Power Factor		Dripproof or Open Enclosure		
Voltaje*	Class B	Class F					Class H		
				105° C / 221°F †			125° C / 257 °F †		
	80°C/176°F (1)	90°C/194°F(1)	95°C/203°F(1)	British Standard	105°C / 221°F Continuous	130°C/266°F(1) Standby	British Standard	125°C / 257°F Continuous	150°C/302°F(1) Standby
	Continuous	Lloyds	ABS						
480/240	75 (93.8)	77 (96.3)	77 (96.3)	84(105)	84(105)	90 (113)	90 (113)	90 (113)	95 (119)
460/230	72 (88.8)	73 (91.3)	73 (91.3)	80 (100)	80 (100)	86(108)	86(108)	86(108)	90 (113)
440/220	68 (85)	70 (87.5)	70 (87.5)	76 (95)	76 (95)	84 (105)	84 (105)	84 (105)	6189 (111)
416/208	65 (81.3)	67 (83.8)	67 (83.8)	72 (90)	72 (90)	80 (100)	80 (100)	80 (100)	85 (106)
380/190	60 (75)	60 (75)	60 (75)	65 (81.3)	65 (81.3)	72 (90)	72 (90)	72 (90)	77 (96.3)

(1) Rise by resistance method, Mil-Std-705, Method 680.1b.

† Rating per BS 5000.

Submittal Data: 480 Volts*, 80 kw, 100 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 3 Phase					
Mil-Std-705C			Mil-Std-705C		
Method	Description	Value	Method	Description	Value
301.1b	Insulation Resistance	> 1.5 Meg	505.3b	Overspeed	2250 RPM
302.1a	High Potential Test		507.1c	Phase Sequence CCW-ODE	ABC
	Main Stator	2000 Volts	508.1c	Voltage Balance L-L OR L-N	0.20%
	Main Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Total	3.5%
	Exciter Stator	1500 Volts		(Distortion Factor)	
	Exciter Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Single	2.5%
401.1a	Stator Resistance, Line to Line		601.1c	Deviation Factor	7.0%
	High Wye Connection	0.138 Ohms	--	TIF (1960 Weightings)	<50
	Rotor Resistance	1.05 Ohms	--	THF (IEC, BS & NEMA Weightings)	<2%
	Exciter Stator	23.5 Ohms	652.1a	Shaft Current	<0.1 ma
	Exciter Rotor	0.12 Ohms	--	Main Stator Capacitance to ground	@NA mdf
410.1a	No Load Exciter Field Amps at 480 Volts Line to Line	0.52 A DC	<b>Additional Prototype Mil-Std Methods are Available on Request.</b>		
420.1a	Short Circuit Ratio	0.634	--	Generator Frame	362
421.1a	Xd Synchronous Reactance	1.864 pu	--	Type	Magnaplus
422.1a	X2 Negative Sequence	0.148 pu	--	Insulation	Class H
			--	Coupling - Single Bearing	Flexible
423.1a	X0 Zero Sequence Reactance	0.038 pu	--	Amortisseur Windings	Full
425.1a	X'd Transient Reactance	0.127 pu	--	Cooling Air Volume	250 CFM
426.1a	X"d Subtransient Reactance	0.98 pu	--	Excitation Ext. Voltage Regulated, Brushless	
427.1a	T'd Transient Short Circuit Time Constant	0.05 sec.	--	Voltage Regulator	SE350
			--	Voltage Regulation	1%
428.1a	T"d Subtransient Short Circuit Time Constant	0.007 sec.	--	Cooling Air Volume	700 CFM
			--	Heat rejection rate	58 Btu s/min
430.1a	T'do Transient Open Circuit Time Constant	0.8 sec.	--	Full load current	120 amps
			--	Minimum Input hp required	119.7
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.1 sec.	--	Efficiency at rated load:	89.6 %
			--	Full load torque	349 Lb-ft

\* (3) Excitation support system or PMG required to sustain short circuit currents.

\* Voltage refers to wye (star) connection, unless otherwise specified.

\*\* Not supplied as standard equipment.



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## STAMFORD ELECTRIC ALTERNATOR MODEL UCI224G weight 383 kg (845 Lb.)

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

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	0.056 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	0.94 Ohms at 22°C / 77°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	1 BEARING 383 kg / 845 lb				2 BEARING 400 kg / 882 lb			
WEIGHT WOUND STATOR	139 kg / 307 lb				139 kg / 307 lb			
WEIGHT WOUND ROTOR	126.75 Kg / 280 lb				118.39 kg / 261 lb			
WR <sup>2</sup> INERTIA	0.7138 k/gm <sup>2</sup> / 16.9 lb/ft <sup>2</sup>				0.6818 kgm <sup>2</sup> / 16.2 lb/ft <sup>2</sup>			
SHIPPING WEIGHTS in a crate	404 kg / 891 lb				420 kg / 926 lb			
PACKING CRATE SIZE	105 x 57 x 96 (cm) 42x23x38 (in)				105 x 57 x 96 (cm) 42x23x38 (in)			
TELEPHONE INTERFERENCE	50 Hz THF<2%				60 Hz TIF<50			
COOLING AIR	0.216 m <sup>3</sup> /sec 458 cfm				0.281 m <sup>3</sup> /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								
RECTANCE VALUES	85	85	85	79	93.8	97.5	100	100
X <sub>d</sub> DIR. AXIS SYNCHRONOUS	2.43	2.20	2.04	1.59	2.66	2.47	2.32	2.21
X' <sub>d</sub> DIR. AXIS TRANSIENT	0.18	0.17	0.16	0.13	0.20	0.19	0.17	0.17
X'' <sub>d</sub> DIR. AXIS SUBTRANSIENT	0.13	0.12	0.11	0.09	0.14	0.13	0.12	0.12
X <sub>q</sub> QUAD. AXIS REACTANCE	1.12	1.01	0.94	0.78	1.22	1.13	1.06	1.01
X'' <sub>q</sub> QUAD. AXIS SUBTRANSIENT	0.17	0.15	0.14	0.12	0.16	0.14	0.13	0.12
X <sub>L</sub> LEAKAGE REACTANCE	0.07	0.06	0.05	0.06	0.08	0.07	0.07	0.07
X <sub>2</sub> NEGATIVE SEQUENCE	0.18	0.14	0.13	0.11	0.16	0.14	0.13	0.12
X <sub>0</sub> ZERO SEQUENCE	0.11	0.10	0.09	0.08	0.11	0.10	0.10	0.09
REACTANCES ARE SATURATED				VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED				
T' <sub>d</sub> TRANSIENT TIME CONST.	0.03 s							
T'' <sub>d</sub> SUB-TRANSTIME CONST.	0.005 s							
T' <sub>do</sub> O.C. FIELD TIME CONST.	0.75 s							
T <sub>a</sub> ARMATURE TIME CONST.	0.07 s							
SHORT CIRCUIT RATIO	1/X <sub>d</sub>							

**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 hours 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 25°C (104°F).



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## CONTROLLER FOR GENSET: MEC310

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)

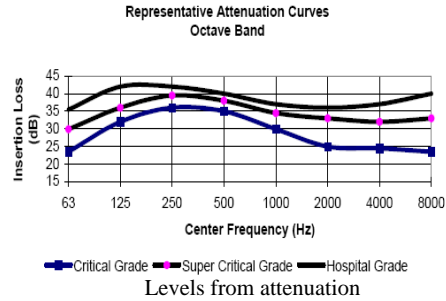
## FEATURES

- 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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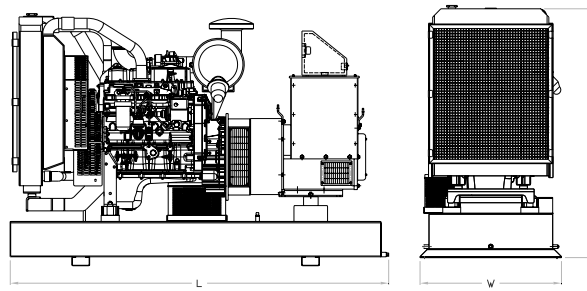
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## DIMENSIONS



LENGTH	WIDTH	HEIGHT
MM(IN)	MM(IN)	MM(IN)
2000 (78.7)	800 (31)	1300 (51)

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

