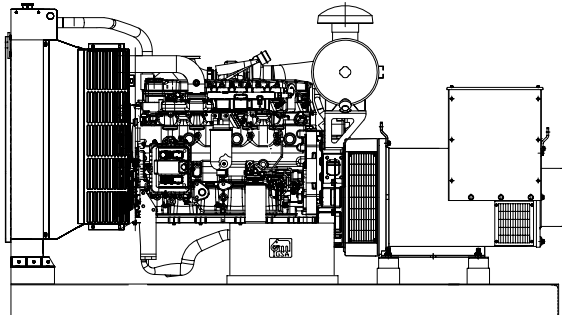




MAQUINARIA IGSA POWER GENERATION SYSTEMS



MODEL: GSIV20200S
DIESEL ENGINE: IVECO
MODEL: NEF60 TE2
CAPACITY: 200 KW 60 HZ, TIER II

RATINGS	RANGE
PRIME hp (kW)	STANDBY hp (kW)
261 (195)	288 (215)

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 6 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, **NEF60 TE2 (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 **200 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 generator set its components are tested factory-built, and production-tested.
- The genset engine is certified by the Environmental Protection Agency (EPA) to conform to Tier 2 nonroad emissions regulations.
- Electronic engine controls manage the engine (isochronous)
- Integrated complete system control and monitoring (EDC 7)

ENGINE SPECIFICATION DATA MODEL NEF60 TE2

Weight 630 Kg (1389.5 Lb)

General Data	
Model	NEF60 TE2
Basic engine type	F4AE0865A*F101-504078621XY
Number of Cylinders	6
Firing order	1-5-3-6-2-4
Cylinder arrangement	In line
Valves per cylinder	4
Cycle	Diesel 4 stroke
Injection system	Direct common rail
Induction System	Turbocharged aftercooled air/air
Bore --in.(mm)	4.0 / 102
Stroke--in.(mm)	4.8 / 120
Total Displacement-- gal (L)	1.29 (5.9)
Mean piston speed--lb (m/s)	2.19 (7.2)
Compression Ratio	17.5:1
Flywheel rotation	Anti clockwise viewed on flywheel
Flywheel housing	SAE 3
Flywheel	11"½
Moment of inertia	
Without flyweel-- Nm ²	3.04
Flyweel only-- Nm ²	6.96
BMEP gross	
Prime power-- bar/kPa	22.1/2208.5
Stand-by power-- bar/kPa	24.3/2429.4
Dry weight (including cooling package)--kg (Lb)	630 (1389.5)
Energy to coolant-- kcal/kWh	411
Energy to charge cooler-- kcal/kWh	139
Energy to radiation-- kcal/kWh	50
Dimensions L x W x H-- in (mm)	67.4x31.3x48.4 (1713x796x1230)
Performances	
Continuous Power (gross)-- kWm	164.5 / 723.7
Prime power (gross)-- kWm	203.6 / 895.8
Stan-By power (gross)-- kWm	223.6 / 983.8
Fan consumption -- kWm	8.6 / 37.8
Continuous Power (net)-- kWm	156 / 686.3
Prime power (net)-- kWm	195 / 857.9
Stand-By Power (net)-- kWm	215 / 945.9
Performance condition	
temperature-- °C / °F	≤40 / 104
altitude a.s.l--m / ft	≤1000 / 3280.84
Derating	
temperature > T40°C %/5°C / 41 °F	
altitude > 1000m %/500m	
Intake System	
Air consumption at 100% of load-- m ³ /h (ft ³ /h)	808 (28534.25)
Air intake restriction, clean filter-- kPa (PSI)	2(0.29)
Air intake restriction, dirty filter-- kPa (PSI)	5(0.725)
Air filter type	dry

Cooling System	
Type	Liquid
Recommended coolant	Water + 50% paraflu 11
engine only	10.5
radiator and hoses	33
Coolant pump flow-- l/min gal/min	45 (11.89)
Pressure cap setting-- kPa (bar)	70 (0.7)
Shutdown switch setting-- °C / °F	103 / 218
Maximum additional restriction--kPa / psi	196 / 28.42
Air To Boil Prime Power-- °C / °F	52 / 126
Lubrication System	
Oil sump capacity	
max--gal/L	0.6 (15.0)
min-- gal L	0.3 (8.0)
Oil system capacity including filter--Gal/ L	0.7 (17.0)
Oil pressure at rated speed--kPa / psi	300-500/43.5-72.5
Oil temperature	
Normal	
Max	120
Engine angulatory	
longitudinal--degrees	35°
transverse--degrees	35°
Servicing interval--hours	600
Oil specification	ACEA E3 / E5
Oil consumption-- %fuel	< 0.1
Exhaust System	
Gas flow at stand-by Power--lb/h (kg/h)	2245 (1018)
Max temperature at PRP (25°C 77°F)-- °C / °F	566 / 1051
Max allowable back pressure-- kPa (mbar)	5 (50)
Exhaust gas temperature-- kcal/kWh	675
Fuel Consumption (l/h) (kg/hr)	
100 % Power	(48.0) (206.1)
80 % Power	(38.9) (208.9)
50 % Power	(24.2) (207.9)
Electric System	
Voltage (negative to ground)-- V	12
Stater motor power--kW / hp	3 / 4.02
Number of teeth on stater motor	10
Number of teeth on flywheel	125
starting batteries	
recommended capacity-- Ah 1x	185
Discharge current-- Amp	1200
Alternator	
Voltage-- V	14
Charge-- Amp	90
Cold Starting	
Without air preheating-- °C / °F	-10 / 14
with air preheating-- °C / °F	-25 /-13



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MARATHON ELECTRIC ALTERNATOR MODEL 363PSL1607

weight 427.5 kg (943Lb)

Kilowatt ratings at 1800 RPM		60 Hertz					12 Leads standard 3 phase			
kW (kVA)		3 Phase			0.8 Power Factor		Dripproof or Open Enclosure			
Voltage	Class B			Class F			Class H			
	80°C/176°F (1)	90°C/194°F(1)	95°C/203°F(1)	105° C / 221°F†	105°C / 221°F	130°C/266°F(1)	125° C / 257°F†	125°C / 257°F	150°C/302°F(1)	
	Continuous	Lloyds	ABS	British Standard	Continuous	Standby	British Standard	Continuous	Standby	
240/480	165 (206)	180 (225)	186 (233)	200 (250)	200 (250)	215 (269)	205 (256)	211 (264)	225 (281)	
230/460	170 (213)	185(231)	190 (238)	200 (250)	200 (250)	220 (275)	205 (256)	215 (269)	255 (281)	
220/440	172 (185)	185 (231)	191 (239)	200 (250)	200 (250)	220 (275)	205 (256)	212 (265)	226 (283)	
208/416	170 (213)	108 (225)	183 (229)	191 (239)	191 (239)	210 (263)	197 (246)	202 (253)	217(271)	
190/380	156 (195)	165 (206)	177 (213)	176 (220)	176(220)	191 (236)	182 (228)	185 (231)	200 (250)	

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

† Rating per BS 5000.

Submittal Data: 240/480 Volts, 250kVA, 1800 RPM, 60 Hz, 3 Phase

Mil-Std-705B			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	0.2%
	Main Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Total	5.0%
	Exciter Stator	1500 Volts		(Distortion Factor)	
	Exciter Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Single	3.0%
401.1a	Stator Resistance, Line to Line High Wye Connection	0.0371	601.1c	Deviation Factor	5.0%
Ohms			--	TIF (1960 Weightings)	<50
	Rotor Resistance	1.679 Ohms	--	THF (IEC, BS & NEMA Weightings)	<2%
	Exciter Stator	18.5 Ohms	652.1a	Shaft Current	<0.1 ma
	Exciter Rotor	0.116 Ohms	--	Main Stator Capacitance to ground	0.011 mdf
410.1a	No Load Exciter Field Amps At 480 Volts Line to Line	0.68 A DC	Additional Prototype Mil-Std Methods are Available on Request.		
420.1a	Short Circuit Ratio	0.53	--	Generator Frame	431
421.1a	Xd Synchronous Reactance	2.766 pu	--	Type	ext. voltage regulated,
422.1a	X2 Negative Sequence	0.188 pu	brushless		
423.1a	X0 Zero Sequence Reactance	0.037 pu	--	Insulation	Class H
425.1a	X'd Transient Reactance	0.141 pu	--	Coupling - Single Bearing	Flexible
426.1a	X" d Subtransient Reactance	0.138 pu	--	Amortisseur Windings	Full
427.1a	T'd Transient Short Circuit		--	Cooling Air Volume	1200 CFM
	Time Constant	0.061 sec.	--	Exiter	Rotating
428.1a	T" d Subtransient Short Circuit		--	Voltage Regulator	SE350
	Time Constant	0.019 sec.	--	Voltage Regulation	1%
430.1a	T'do Transient Open Circuit		--	Sensing	1 phase
	Time Constant	1.02 sec.			
432.1a	Ta Short Circuit Time				
	Constant of Armature Winding	0.019 sec.			

* (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 UCI274H

weight 629 kg (1381 Lb)

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

INSULATION SYSTEM PROTECTION	CLASS H IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.0155 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.82 Ohms at 22°C / 72°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. 6315 - 2RS. (ISO)							
BEARING NON-DRIVE END	BALL. 6310 - 2RS. (ISO)							
WEIGHT COMP. GENERATOR	1 BEARING			2 BEARING				
WEIGHT WOUND STATOR	626 kg / 1381 lb			641 kg / 1413 lb				
WEIGHT WOUND ROTOR	253 kg / 558 lb			253 kg / 557.8 lb				
WR² INERTIA	227.53 Kg / 502 lb			216.57 kg / 477.5 lb				
SHIPPING WEIGHTS in a crate	1.9349 kgm ² / 0.4 lb ft ²			1.8843 kgm ² / 0.39lb ft ²				
PACKING CRATE SIZE	659 kg / 1453 lb			673 kg / 1484 lb				
TELEPHONE INTERFERENCE	50 Hz			60 Hz				
COOLING AIR	THF<2%			TIF<50				
	0.514 m ³ /sec 1090 cfm			0.617 m ³ /sec 1308 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	200	200	200	N/A	237.5	245	245	255
RECTANCE VALUES								
X_d DIR. AXIS SYNCHRONOUS	2.11	1.91	1.77	-	2.50	2.31	2.11	2.02
X'_d DIR. AXIS TRANSIENT	0.18	0.16	0.15	-	0.21	0.19	0.18	0.17
X''_d DIR. AXIS SUBTRANSIENT	0.12	0.11	0.10	-	0.14	0.13	0.12	0.11
X_q QUAD. AXIS REACTANCE	1.28	1.15	1.07	-	1.53	1.41	1.29	1.23
X''_q QUAD. AXIS SUBTRANSIENT	0.17	0.15	0.14	-	0.20	0.18	0.17	0.16
XL LEAKAGE REACTANCE	0.08	0.08	0.07	-	0.10	0.09	0.08	0.08
X2 NEGATIVE SEQUENCE	0.13	0.12	0.11	-	0.16	0.15	0.13	0.13
X0 ZERO SEQUENCE	0.08	0.08	0.07	-	0.10	0.09	0.08	0.08
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED								
T'_d TRANSIENT TIME CONST.	0.042 s							
T''_d SUB-TRANSTIME CONST.	0.012 s							
T'_{do} O.C. FIELD TIME CONST.	1.1 s							
T_a ARMATURE TIME CONST.	0.012 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 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 2000 m (6560 ft.). Temperature: Derate 1.0% per 10°C (18°F) temperature above 40°C (104°F).



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CONTROLLER FOR GENSET: MEC 310

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)

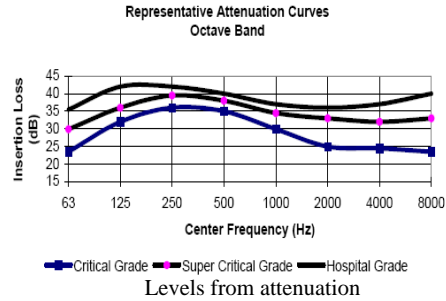
FEATURES

- 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

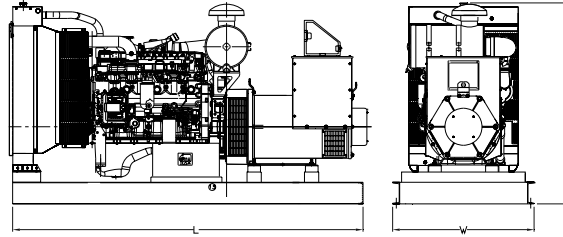
MISCELLANEOUS EQUIPMENT

- 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	
<input type="checkbox"/>	Fuel Water Separator
<input type="checkbox"/>	Day tank
<input type="checkbox"/>	Auxiliary fuel pump
<input type="checkbox"/>	Sub Base mounted Fuel Tank
<input type="checkbox"/>	Single Wall
<input type="checkbox"/>	Double Wall
<input type="checkbox"/>	UL listed
<input type="checkbox"/>	150 L (39.6 gal)
<input type="checkbox"/>	250 L (66 gal)
Diesel Fuel Tank	
<input type="checkbox"/>	500 L (132 gal)
<input type="checkbox"/>	1000 L (264.1 gal)
<input type="checkbox"/>	5000 L (1320.8 gal)
Exhaust System	
<input type="checkbox"/>	Critical Grade
<input type="checkbox"/>	Super Critical Grade
<input type="checkbox"/>	Hospital Grade
Engine Electrical system	
<input type="checkbox"/>	Battery
<input type="checkbox"/>	Lead-Acid
<input type="checkbox"/>	NiCad
<input type="checkbox"/>	Battery Rack
<input type="checkbox"/>	Battery Charger Automatic
Generator	
<input type="checkbox"/>	Breaker in the alternator

OPTIONAL ACCESSORIES AVAILABLE FOR THE EQUIPMENT	
Vibration isolation	
<input type="checkbox"/>	Rigid Spring Mounting
<input type="checkbox"/>	Resilient Mounting
Filters	
<input type="checkbox"/>	Air Filter for Medium Dust Environments
<input type="checkbox"/>	Air Filter of Heavy Dust Environments
Drain	
<input type="checkbox"/>	Oil drain Extension
Enclosures	
<input type="checkbox"/>	Sound Attenuated
<input type="checkbox"/>	Weather Proof
<input type="checkbox"/>	Stainless steel cover
<input type="checkbox"/>	Trailer Mounting
<input type="checkbox"/>	Interior lights Ac or DC
Heaters	
<input type="checkbox"/>	Jacket Water Heater
<input type="checkbox"/>	Crankcase Oil Heater
Insulation Blankets	
<input type="checkbox"/>	Features: (Temperature to 1260°C (2300°F), Non-Combustible, Highly Resistant to Vibration, Oil, Fuel, Grease, and Moisture Resistant Exterior, Personal Protection
Notes	

DIMENSIONS



LENGTH	WIDTH	HEIGHT
MM(IN)	MM(IN)	MM(IN)
2526 (99.4)	1000 (39.4)	1418 (55.8)

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

