

CARRIER GENERATOR SET

MODEL 69UG15-050S

TECHNICAL SPECIFICATION

Date: 9 March 2009

Specification: UG69003

Revision: F





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Dimensional Drawings (98-02510 rev -)	Attached



GENERAL DESCRIPTION -

The Carrier Transicold model 69UG15 diesel generator set is designed to provide highly reliable unattended continuous operation for all refrigerated ocean going container units in both over-the-road and rail transport modes. Generator sets are shipped complete and ready to operate. Fueling and connection of battery leads must be completed before first use.

This model 69UG15 is designed to mount to a variety of ISO container chassis with I beam centers of 36-38 inch (91-96 cm) center-line separation and 10 inch (24.4 cm) minimum height. The frame and integral fuel tank are of steel construction. The frame is made from fabricated steel (as opposed to tubular stock) to improve weld joint strength, reduce load stresses, and minimize corrosion

DESIGN GUIDELINES

Although there are no international design criteria specific to Generator Sets, the 69UG15 is designed to parallel ISO 1496. In addition the 69UG15 meets all U.S. Department of Transportation regulations.

OPERATING CONDITIONS

Over the Road and Rail transport environments around the world.

Shock – Components able to withstand sustained shocks of 3g's in the horizontal direction and 6 g's in the vertical.

Vibration - +/- 2 g's (peak) or 4g (peak to peak) vertical and Front-to-back, 0.75 g side to side.

Ambient temperature range:

1. Structure.....-40 to +52°C (-40 to +125°F)
2. Operation - Start-26 to +52°C (-15 to +125°F)
- Run-40 to +52°C (-40 to +125°F)

Functionality - The UG provides a full 15 kW output to eliminate shutdown due to high power draw over loading the engine.



ENGINE	
Manufacturer	Kubota
Model	V2203L-DI (Tier 4 Interim Compliant, Direct Injection)
Type	Vertical, water cooled, 4 cycle diesel, Electronic Speed Control
Number of Cylinders	4
Bore x Stroke	83 x 102.4mm (3.26 x 4.03 in.)
Total Displacement	2216 cc (135.2 cu.in.)
Combustion Chamber	Direct Injection
Horsepower	32 hp@1800 rpm continuous 27 hp@1800 rpm (altitude 3000ft/914m)
Kilowatt	23.9 kW@1800 rpm continuous 20 kW@1800 rpm (altitude 3000ft/914m)
Torque	14 kg-meters (101 foot-pounds)
Firing Order	1-3-4-2
Injection Pump	Bosch "K" type mini pump
Governor	Centrifugal ball mechanical/ Electronic Governor
Injection Nozzle	Special Bosch Nozzle
Injection Timing (pressurized)	2.5 ±0.75 deg B.T.D.C.
Compression Ratio	21.5:1
Starting Motor	12v/ 2.5kW
Low Ambient Starting Aid	Intake Air Heater in Air Intake Manifold
Intake Air Heater Amperage	42 Amps @ 12 VDC
Fuel Requirements	
Summer	Diesel No. 2-ASTM/D975.667
Winter	Diesel No. 1-Nos. 1-D or 2-D
Operating Water Temperature (normal)	180 – 200 deg F (82-93 deg C)
LUBRICATION SYSTEM	
Lubricating Oil	
Specification	Heavy Duty API service classification CD (DS)
Capacity	16.3 liters, 16.0 U.S. quarts (includes filter)
Grade	10W30 Base # 10 or above
Oil Pressure	35-60 PSI (3.3 - 5.2 kg/sq. cm)
Oil Level Indicator	Dipstick in oil pan
ENGINE	
Manufacturer	Kubota
Model	V2203L-DI (Tier 4 Interim Compliant, Direct Injection)



GENERATOR	Lima - Marathon
Output	15.0 Kilowatt 18.75 KVA
Rating	Continuous Duty, 0.8 power factor, 460 VAC
	3 phase, 60 hertz
	1.2 Horsepower/kW starting, code G
Type	Brush-less, rotating field, statically excited
	self-regulated, drip-proof design
Index of Protection "IP" classification	IP 44
Insulation	
Rotor	Wet wound, Thermo setting epoxy - class "H"
Stator	Wet wound, Thermo setting epoxy - additional
	Polybutadiene coating - class "F"
Temperature	Rise per MG1-122.40
	NEMA Std. MG1-1972
Bearings and Lubrication	Double-sealed Heavy Duty 6308 ball bearing
	100,000 hours B-10 life
	Integral Anti-rotation O-ring
	Chevron SRI #2 grease
PROTECTIVE DEVICES	
Low Oil Pressure Safety Switch (LOP)	Engine will not run/start unless pressure is maintained
Setting	Opens @ 18 PSI (1.095 sq. cm) Auto-reset
Water Temperature Switch (HWT)	Opens @ 230 deg F (110 deg C) Auto-reset
Excessive Current Draw by:	
Main Alternator	Circuit Breaker (CB-1) Trips @26 Amps (460 VAC)
Electronic Governor Module (EG)	Fuse (F1, F2, F3) Breaks @10 Amps Replace Fuse
Fuel Heater (FH)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
High Water Temperature (HWT)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Safety Relay (SR)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Total Time Meter (TT)	Circuit Breaker (CB-2) Trips @30 Amps Auto-reset
Intake Air Heater circuit	Circuit Breaker (CB-3) Trips @50 Amps Auto-reset
Battery Charger	Circuit Breaker (CB-5) Trips @ 3 Amps manual-reset
UNIT PHYSICAL DATA	
Weights	
Battery	63 lb/ 28.6 kg
Main Alternator	280 lb/127kg
Engine (dry)	434 lb/197 kg (approx.)
Unit	1555 lb/705 kg
Size	
Height	31.4 in/ 79.8 cm
Length	51.9 in/ 132.0 cm
Depth	61.0 in/155.0 cm
Hood	9.5 in/24.1cm



UNIT PHYSICAL DATA (cont'd)	
Sound Level Output	Overall sound pressure rating level rating = 75 dB(A) per DIN 8958 (1) (5-point average at 7 meters)
Electrical	
General	Address system of wire marking on all wiring. Control wires to be white, power wires to be red, ground wires to be green and/or green with yellow stripe. All wire is Tin-plated copper.
Power Receptacle	CEE-17, ISO 1496-2, Rated 32 amps @ 440V
MATERIALS AND COATINGS	
Materials	
Hardware	ASTM type 300 stainless steel, corrosion resistant cadmium or zinc plated steel
Hood and Removable Panels	Fabricated from aluminum sheet
Frame components	Both cold and hot rolled sheet steel (ASTM 569)
Coatings	
Aluminum Parts	Chemical cleaning Chromate conversion coating, Top coat of electrostatically applied TGIC (triglycidylisocyanurate) powder paint (CTD Cloud White) oven bake cure, post cure thickness range 1.8 - 5 mils
Steel Structural Frame and Fuel Tank	Chemical cleaning Chromate conversion coating, Base coat of electrostatically applied TGIC (triglycidylisocyanurate) zinc rich powder paint, oven bake cure, post cure thickness range 1.8 - 5 mils Top coat of electrostatically applied TGIC (triglycidylisocyanurate) powder paint (CTD Cloud White) oven bake cure, post cure thickness range 1.8 - 5 mils
UNIT MOUNTING	
Standard Chassis Mounting	Unit is hard mounted directly to the container chassis I-beams. Attachment to the chassis is achieved by clamping the I-beam flanges on both sides in four (4) separate locations using ¾-10 SAE Grade 5 bolts. Bolts coated with Kolene (0.5-0.6 mils). All hardware and plates are captivated.



ACCESSORIES		
Battery		
Type		Interstate Maintenance Free (or equivalent)
Rating		190 Min. reserve capacity (25 amps @ 80 F/27 C)
Cold Cranking		700 amps @ 0 deg F/32 deg C
Battery Charger		
Type		Solid State Marine Duty
Input		210-250 VAC +/- 10%, 47-63 Hz, 2 Amps
Output		13.6 VDC, 25 amps for 20 mins
		13.6 VDC, 13 amps continuous
Protection		Safety contactor - reverse polarity.
		Rating of SCR - 55Amps
		Rating of internal bridge rectifier - 50Amps
Filters		
Lubricating Oil		Full-flow, spin-on (Carrier P/N 30-00323-00)
Air		Heavy duty "cartridge style" media with cyclonic filtration and pressure differential indicator
Fuel		Canister type/water drain (Carrier P/N 30-01101-50)
Radiator Coil		
Type		Copper tube, aluminum fin, steel tubesheet
Unit Capacity (including engine)		6.0 quarts/ 5.7 liters (includes overflow bottle)
Anti-freeze		50/50 mix protection to -34 deg F (-37 deg C)
Protective Coating		Patented acrylic electrocoat
Water Pump Belt		Poly V self tensioning (Carrier # 50-60330-03) neoprene with polyamide cord
Cooling Fan		
Type		Aerodynamic propeller
Size		6 blade, 15" (381 mm) diameter
Material		Polypropylene
Gauges		
Hourmeter	Type	Digital, 12 Volt
	Range	100,000 hours
Water Temperature	Type	Dial Indicating, electric sender
	Range	100-240 deg F (38-116 deg C)
Ammeter	Type	Dial Indicating
	Range	plus/minus 60 amps
Oil Pressure	Type	Dial Indicating, electric sender
	Range	1-100 psi
Exhaust system		
Muffler		Stainless Steel
Exhaust piping		Stainless steel
Fuel Tank		
Type		Integral – steel - with ball check valve (used for draining water or contaminants) anti-siphon screen and fusible brass cap.
Capacity		Fill - 52 US gallons/196 liters Draw - 50 gallons/189 liters



Revision Log

Revision	Date	Comments	Approval
Original	20, Nov. 2000		JPG
A	20, June 2001	Updated layout all sheets	JPG
B	13, June 2003	Revised Weight – Sheet 5	JPG
C	1, Nov 2005	Updated air filter feature - sheet 7	JPG
D	1, August 2008	Updated engine to Tier 4i compliant – sheet 4 Changes to protective devices to include Electronic governor module and Air intake heater circuit – Sheet 5 Updated Weights – engine – Sheet 5 Updated Battery Type – Interstate Sheet 7	CM
E	12, Nov. 2008	Updated Weight –Sheet 5 Updated Sound output level – sheet 6	CM
F	9, Mar 2008	Corrected Unit length to match drawing– sheet 5	CM