

SENTRY-PRO POWER SYSTEMS

By Gillette Generators, Inc.

60 HZ MODEL
SP-620
UL-2200 LISTED

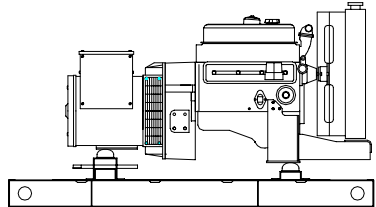
LIQUID COOLED LPG/NG ENGINE GENERATOR SET

KW POWER RATINGS RANGE FOR 60 HZ

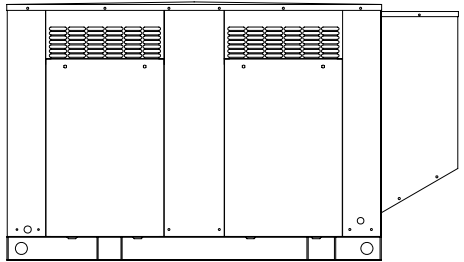
Model	STANDBY 130°C RISE		
	HZ	LPG	N.G.
SP-620-60 HERTZ	60	60/62	58/60

STANDARD FEATURES

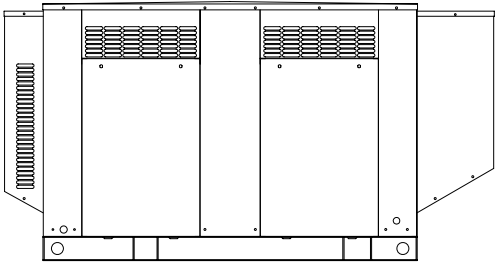
- All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.
- All generator sets meet NFPA-110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- All generators are UL-1446 and UL 2200 certified
- Solid state, frequency compensated voltage regulation is standard on all gen-sets.
- Electronic engine governor incorporates a throttle body actuator, which allows precise isochronous frequency regulation.
- A brushless rotating field generator design with shunt wound excitation system and connectable at 1 phase or a broad range of 3 phase voltages.
- SENTINEL "ULTIMATE" digital controller allows programming to basic engine functions in the field. Controller has stop-manual-auto mode and engine shutdowns, signaled by full text LCD indicators.
- Heavy Duty 100%-125% rated Circuit Breaker is standard on all gen-sets.
- All generator set control systems components and accessories provide a 1-year limited warranty at time of initial start-up. Generators and engines are governed by separate warranties.
- "OPEN" Generator Sets: There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Muffler and flexible exhaust hose are not supplied, as installation requirements are not known. However, these two items are available as optional equipment.
- "LEVEL 1" Aluminum Housing: Full weather protection and above average sound attenuation for normal applications. Residential grade muffler is standard.
- "LEVEL 2" Aluminum Housing: Full weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.



"OPEN" GEN-SET



"LEVEL 1" HOUSED GEN- SET



"LEVEL 2" HOUSED GEN-SET

GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	LIQUID PROPANE GAS FUEL		NATURAL GAS FUEL	
	L-N	L-L			130°C RISE STANDBY RATING		130°C RISE STANDBY RATING	
					KW/KVA	AMP	KW/KVA	AMP
SP-620-1-1	120	240	1	60	60/60	250	58/58	242
SP-620-3-2	120	208	3	60	62/77.5	215	60/75	208
SP-620-3-3	120	240	3	60	62/77.5	187	60/75	181
SP-620-3-4	277	480	3	60	62/77.5	93	60/75	90
SP-620-3-5	127	220	3	60	62/77.5	204	60/75	197

RATINGS: All single phase gen-sets are dedicated 4 lead windings, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead windings, rated at .8 power factor. 130°C "STANDBY RATINGS" are strictly for gen-sets that are used for back-up emergency power to a failed normal utility power source. This standby rating allows varying loads, with no overload capability, for the entire duration of utility power outage. All gen-set power ratings are based on temperature rise measured by resistance method as defined by MIL-STD 705C and IEEE STD 115, METHOD 6.4.4. All generators have class H (180°C) insulation system on both rotor and stator windings. All factory tests and KW/KVA charts shown above are based on 130°C (standby) R/R winding temperature, within a maximum 40°C ambient condition. Generators operated at standby power ratings must not exceed the temperature rise limitation for class H insulation system, as specified in NEMA MG1-22.40. Specifications & ratings are subject to change without prior notice.

APPLICATION AND ENGINEERING DATA FOR MODEL SP-620-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer..... Marathon Electric Generators
 Model & Type.....361CSL1613 4 Pole, 4 Lead, Single Phase
361PSL1602 4 Pole, 12 Lead re-connectable, Three Phase
 Exciter.....Brushless, shunt excited
 Voltage Regulator.....Solid State, HZ/Volts
 Voltage Regulation.....½%, No load to full load
 Frequency.....Field convertible, 60 HZ to 50 HZ
 Frequency Regulation.....½% (½ cycle, no load to full load)
 Unbalanced Load Capability.....100% of standby amps
 Total Stator and Load Insulation.....Class H, 180°C
 Temperature Rise.....130°C R/R, standby rating @ 40°C amb.
 1 Ø Motor Staring @ 30% Voltage Dip (240V).....128 kVA
 3 Ø Motor Staring @ 30% Voltage Dip (208-240V).....150 kVA
 3 Ø Motor Staring @ 30% Voltage Dip (480V).....200 kVA
 Bearing.....1, Pre-lubed and sealed
 Coupling.....Direct flexible disc
 Total Harmonic Distortion.....Max 3½% (MIL-STD705B)
 Telephone Interference Factor.....Max 50 (NEMA MG1-22)
 Deviation Factor.....Max 5% (MIL-STD 405B)
 Ltd. Warranty Period.....24 Months from date of start-up or
1000 hours use, first to occur.

GENERATOR FEATURES

- World Renown Marathon Electric Generator having UL-1446 certification.
- Full generator protection with **SENTINEL “ULTIMATE”** controller, having UL-508 certification.
- Automatic voltage regulator with over-excitation, under-frequency compensation, under-speed protection, and EMI filtering. Entire solid-state board is encapsulated for moisture protection.
- Generator power ratings are based on temperature rise, measured by resistance method, as defined in MIL-STD 705C and IEEE STD 115, Method 6.4.4.
- Power ratings will not exceed temperature rise limitation for class H insulation as per NEMA MG1-22.40.
- Insulation resistance to ground, exceeds 1.5 meg-ohm.
- Stator receives 2000 V. hi-potential test on main windings, and rotor windings receive a 1500 V. hi-potential test, as per MIL-STD 705B.
- Full amortisseur windings with UL-1446 certification.
- Complete engine-generator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-generator sets, before shipping.
- Self ventilating and drip-proof & revolving field design

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer..... General Motors
 Model and Type.....Ind. Power Train, Vortec, 5.7L, 4 cycle
 Aspiration.....Natural
 Cylinder Arrangement.....8 Cylinders, V-8
 Displacement Cu. In. (Liters).....350 (5.7)
 Bore & Stroke In. (Cm.).....4 x 3.48 (10.2 x 8.84)
 Compression Ratio.....9.1:1
 Main Bearings & Style.....5M 400 Copper Lead
 Cylinder Head.....Cast Iron
 Pistons.....High, Silicon Aluminum
 Crankshaft.....Nodular Iron
 Exhaust Valve.....Forged Steel
 Governor.....Electronic
 Frequency Reg. (no load-full load).....Isochronous
 Frequency Reg. (steady state).....± 1/4%
 Air Cleaner.....Dry, Replaceable Cartridge
 Engine Speed.....1800 rpm
 Piston Speed, ft/min (m./min).....1044 (318)
 Max Power, bhp (kwm) Standby /LPG.....108 (81)
 Max Power, bhp (kwm) Standby/NG.....100 (75)
 Ltd. Warranty Period.....12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type.....LPG or NAT. GAS, Vapor Withdrawal
 Fuel Pressure (kpa), in. H₂O*.....(1.74-2.74), 7”-11”
 Secondary Fuel Regulator.....NG or LPG Vapor System
 Auto Fuel Lock-Off Solenoid.....Standard on all sets
 Fuel Supply Inlet Line.....1” NPTF
 * Measured at gen-set fuel inlet, downstream of any dry fuel accessories.

FUEL CONSUMPTION

LP GAS: FT ³ /HR (M ³ /HR)	STANDBY
100% LOAD	330 (9.3)
75% LOAD	240 (7.0)
50% LOAD	195 (5.5)
LPG = 2500 BTU X FT³/HR = Total BTU/HR LPG Conversion: 8.50 FT³ = 1 LB. : 36.4 FT³ = 1 GAL.	

NAT. GAS: FT ³ /HR (M ³ /HR)	STANDBY
100% LOAD	800 (22.6)
75% LOAD	695 (20.0)
50% LOAD	500 (14.2)
NG = 1000 BTU X FT³/HR = Total BTU/HR	

OIL SYSTEM

Type..... Full Pressure
 Oil Pan Capacity qt. (L).....5.0 (4.7)
 Oil Pan Cap. W/ filter qt. (L).....6.5 (6.2)
 Oil Filter.....1, Replaceable Spin-On

ELECTRICAL SYSTEM

Ignition System.....Electronic
 Eng. Alternator and Starter:
 Ground.....Negative
 Volts DC.....12
 Max. Amp Output of Alternator.....70
 Recommended Battery to -18°C (0°F):.. 12 VDC, Size BCI# 24F
 Max Dimensions: ..10 3/4” lg X 6 3/4” wi X 9” hi, with standard round posts. Min. output at 600 CCA. Battery tray (max. dim. at 12”lg x 7”wi), hold down straps, battery cables, and battery charger, is furnished. Installation of (1) starting battery is required, with possible higher AMP/HR rating, as described above, if normal environment averages -13°F (-25°C) or cooler.

APPLICATION AND ENGINEERING DATA FOR MODEL SP-620-60 HZ

COOLING SYSTEM

Type of System Pressurized, closed recovery
 Coolant Pump Pre-lubricated, self-sealing
 Cooling Fan Type (no. of blades) Pusher (10)
 Fan Diameter inches (cm) 21" (533)
 Ambient Capacity of Radiator °F (°C) 125 (51.6)
 Engine Jacket Coolant Capacity Gal (L) 1.8 (6.8)
 Radiator Coolant Capacity Gal. (L) 5.2 (19.7)
 Maximum Restriction of Cooling Air Intake
 and discharge side of radiator in. H₂O (kpa)5 (.125)
 Water Pump Capacity gpm (L/min) 27 (100)
 Heat Reject Coolant: Btu/min (kw) 3200 (54.9)
 Low Radiator Coolant Level Shutdown Standard
 Note: Coolant temp. shut-down switch setting at 212°F (100°C) with 50/50
 (water/antifreeze) mix.

COOLING AIR REQUIREMENTS

Combustion Air, cfm (m³/min) 185 (5.2)
 Radiator Air Flow cfm (m³/min) 6000 (170)
 Heat Rejected to Ambient:
 Engine: kw (btu/min) 30.9 (1760)
 Alternator: kw (btu/min) 7.5 (430)

EXHAUST SYSTEM

Emissions LPG (NG); THC+NO_x : g/kW-hr 9.66 (7.72)
 Emissions LPG (NG); CO : g/kW-hr 29.61 (26.73)
 Emissions LPG (NG); bsfc : g/kW-hr 232.1 (229.4)
 Exhaust Outlet Size 2.5"
 Max. Back Pressure in. hg (KPA) 3.0 (10.2)
 Exhaust Flow, at rated kw: cfm (m³/min) 580 (16.5)
 Exhaust Temp., at rated kw: °F (°C) 1200 (649)
 Engines are EPA certified for LPG and Natural Gas.

SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 1 Encl.	Level 2 Encl.
Level 1, Residential Silencer.....	77	73	N/A
Level 2, Critical Silencer	74	69	67
Level 3, Hospital Silencer.....	72	67	65

Note: Open sets (no enclosure) has (3) optional silencer system choices due to unknown job-site applications. Level 1 enclosure has installed residential silencer with upgrade to critical or hospital grade silencer. Level 2 enclosure has installed critical silencer with upgrade to hospital silencer. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise at normal operation.

DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft. (305m) above 3000 ft.(914m) from sea level

DERATE GENERATOR FOR TEMPERATURE

2% per 10°F (5.6°C) above 85°F (29.4°C)

DIMENSIONS AND WEIGHTS

	Open Set	Level 1 Enclosure	Level 2 Enclosure
Length in (cm).....	78 (199)	94 (239)	102 (258)
Width in (cm).....	42 (107)	42 (107)	42 (107)
Height in (cm).....	38 (97)	53 (134)	53 (134)
1 Ø Net Weight lbs (kg)..	1931 (876)	2291 (1039)	2471 (1121)
1 Ø Ship Weight lbs (kg)	2031 (921)	2391 (1085)	2571 (1166)
3 Ø Net Weight lbs (kg)..	1891 (858)	2251 (1021)	2431 (1103)
3 Ø Ship Weight lbs (kg)..	1991 (903)	2351 (1066)	2531 (1148)

SENTINEL ULTIMATE DIGITAL MICROPROCESSOR CONTROLLER



SENTINEL ULTIMATE
 The “Ultimate” controller is an auto start mains (utility) failure module for single gen-set applications. This controller includes a backlit LCD display which continuously displays the status of the engine and generator at all times.

The “Ultimate” controller will also monitor speed, frequency, voltage, current, oil pressure, coolant temp., and fuel levels. These modules have been designed to display warning and shut down status. It also includes: (11) configurable inputs • (8) configurable outputs • voltage monitoring • mains (utility) failure detection • (250) event logs • configurable timers • automatic shutdown or warning during fault detection • remote start (on load) • engine preheat • advanced metering capability • hour meter • text LCD displays • protected solid state outputs • test buttons for: stop/reset • manual mode • auto mode • lamp test • start button • power monitoring (kWh, kVAr, kVAh, kVArh)

This controller includes the “Ultimate” in expansion features including RS232, RS484 (using MODBUS-RTU/TCP), direct USB connection with PC, expansion optioned using DSEnet for remote annunciation and remote relay interfacing for a distance of up to 3300FT. The controller software is freely downloadable from the internet and allows monitoring with direct USB cable, LAN, or by internet via the built in web interface.



Further expansion is available by adding the optional “WebNet” gateway interface module. This device will allow comprehensive monitoring of the generator via the cloud including identification, location, and status. Some advantages of this module include: reduced site visits and maintenance costs • remote fuel management • fault analysis • asset tracking • automatic system alerts • maximized system up-time.

STANDARD AND OPTIONAL FEATURES FOR MODEL SP-620-60HZ

STANDARD FEATURES

CONTROL PANEL:

- SENTINEL "ULTIMATE" digital microprocessor with logic allows programming in the field. Controller has:
- STOP-MANUAL-AUTO modes and automatic engine shutdowns, signaled by full text LCD indicators:
 - Low oil pressure
 - High engine temp
 - Low Radiator Level
 - Three auxiliary alarms
 - Battery fail alarm
 - Engine fail to start
 - Engine over speed
 - Engine under speed
 - Over & under voltage
- Also included is tamper-proof engine hour meter

ENGINE:

- Full flow oil filter • Air filter • Oil pump • Solenoid type starter motor • Hi-temp radiator • Jacket water pump
- Thermostat • Pusher fan and guard • Exhaust manifold
 - Residential Silencer • 12 VDC battery charging alternator
 - Flexible exhaust connector • "Isochronous" duty, electronic governor • Secondary dry fuel regulator • Dry fuel lock-off solenoid • Vibration isolators • Closed coolant recovery system with 50/50 water to anti-freeze mixture

AC GENERATOR SYSTEM:

- AC generator • Shunt excited • Brushless design • Circuit Breaker installed and wired to gen-set • Direct connection to engine with flex disc • Class H, 180°C insulation • Self ventilated • Drip proof construction • UL Certified

VOLTAGE REGULATOR:

- ½% Voltage regulation • EMI filter • Under-speed protection • Over-excitation protection • total encapsulation

DC ELECTRICAL SYSTEM:

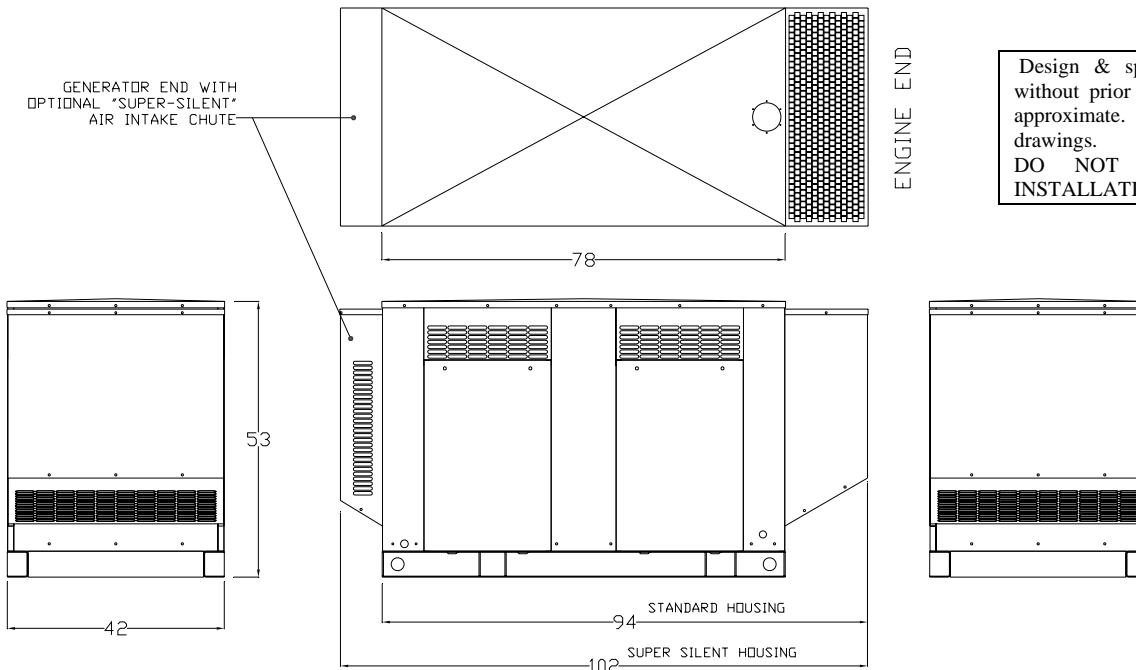
- Battery tray • Battery cables • Battery hold down straps
- 2-stage battery float charger with maintaining & recharging automatic charge stages

WEATHER/SOUND PROOF ALUMINUM HOUSING CORROSION RESISTANT PROTECTION CONSISTING OF:

- 9 Heated And Agitated Wash Stages.
- Zinc Phosphate Etching-coating Stage
- Final Baked On Enamel Powder Coat
- 18/8 Stainless Steel Hardware

ACCESSORY ITEMS

- Engine Coolant Heater with automatic 80°F on, 100°F off, thermostat
- Starting Battery Heater Blanket with automatic 60°F on, 80°F off, thermostat
- Battery Charger Upgrade, float type, 12 VDC at max. charge, with ammeter on charger.
- External Permanent Magnet Generator (PMG) for increased induction motor starting capacity on 1Ø or 3 Ø sets, and to meet NFPA-110 requirements.
- Exhaust Silencer Critical Grade or Hospital Grade (Replacing standard Residential Grade).
- All brushed type 304 stainless steel weather and sound deadening housing for coastal areas.
- DSE WebNet Gateway expansion module will allow communications with a host server via Ethernet and the DSE cloud connection for mapping static locations, real time instrumentation, control event log tables, and automatic system alerts via email.
- Remote Annunciator for up to (10) reporting functions. An additional relay expansion module, plus a second Annunciator adds another (10) reporting functions.



Design & specifications subject to change without prior notice. Dimensions shown are approximate. Contact Gillette for certified drawings.
DO NOT USE DIMENSIONS FOR INSTALLATION PURPOSES.

GM Industrial Engine Power by Power Solutions, Inc.



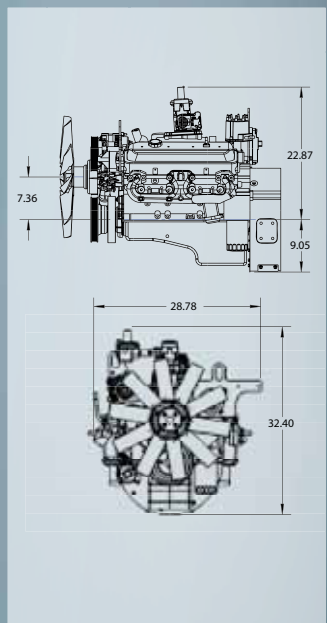
Feature/Benefits

- Designed to work with gasoline, liquid propane gas and natural gas.
- Nodular iron crankshaft has enlarged journal fillet radii for increased durability.
- World-class engine sealing system uses composite cylinder head gaskets with steel cores, a one-piece rear main crankshaft seal, a one-piece oil pan seal and moulded rocker cover seals.
- Hydraulic roller camshaft is optimized for maximum performance.
- Sintered powdered-metal exhaust valve seat inserts for enhanced durability.
- Exhaust valve rotators improve valve and valve seat durability.
- Positive inlet valve stem seals to control oil consumption.
- High Energy Ignition (HEI) distributor and coil and are standard.
- Common rear face on most GM industrial engines for easy hookup with housing.

Options

- Cast iron 4 barrel intake manifold is standard.
- An Electronic control Module (ECM) utilizing state-of-the-art hybrid technology and related hardware to optimize fuel and spark requirements is available
- Fuel options LPG, NG
- SAE 3 flywheel housing (cast iron)
- SAE flywheels
- Custom made flywheels for numerous applications
- Cooling fans
- Radiators
- Dry type industrial air cleaners (safety element air cleaners available)
- Electric governor systems available - High Output Camshaft

Power Solutions, Inc.



PSI Offers Turn-Key Certified and Non-Certified Engine Packages

Product Engineering Data

5.7L ENGINE

General Data

Type: 90 5.7L V8
Displacement: 350 cid (5736.50 cc)
Compression Ratio: 9.4:1
Valve Configuration: Pushrod Actuated Overhead Valves
Manufactured: Toluca, Mexico
Valve Lifters: Hydraulic Roller
Bore X Stroke: 4.00 x 3.48 in (101.60 mm x 88.39 mm)
Main Bearing Caps: 2-Bolt
Balance Method: External
Intake Manifold: Carburetor or Mixer
Oil Pan Capacity: 5 qt
Fuel Types: LPG or NG
Engine Rotation: Clockwise (from the front)
Paint Protection: Component Painted
Horsepower: 201 hp @ 3000 rpm (Gasoline), 151 hp @ 3000 rpm (LP and natural gas)
Torque: 320 lb-ft @ 2500 rpm (Gasoline), 272 lb-ft @ 2500 rpm (LP and natural gas)
Shipping Weight: 582 lb (264 kg)

Materials

Block: Cast Iron
Cylinder Head: Cast Iron
Intake Manifold: Cast Aluminum
Main Bearing Caps: Cast Iron
Crankshaft: Nodular Iron
Camshaft: Cast Iron
Pistons: High Silicon Content Aluminum
Exhaust Seat: Sintered Powdered Metal Insert

Engine Sealing System

One-piece viton rear main seal
 One-piece oil pan gasket
 Composite graphite cylinder head gaskets with stainless steel core
 Non-asbestos gaskets throughout

Fuel System Options

Closed-Loop Fuel System Kit Dual Fuel

LPG (Mixer, Throttle Body, Fuel Lock, Regulator)

LPG W/Governor (Same As Above w/Elec. Governor)

LPG W/Governor (Same As Above w/Velocity Governor)

LPG Carb

NG/LPG Carb Dual Fuel

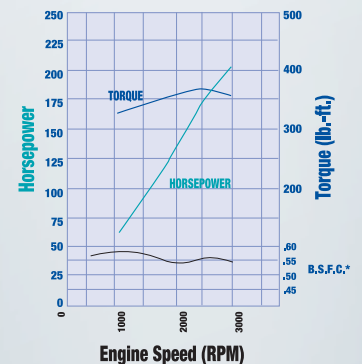
NG Carb

NG (Mixer, Throttle Body & Air Cleaner)

NG W/Governor (Same As Above w/Elec. Governor)

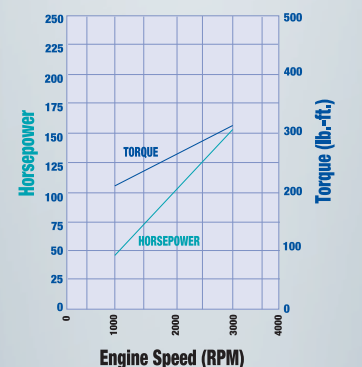
Three Way Catalyst Available

GASOLINE, FUEL INJECTION



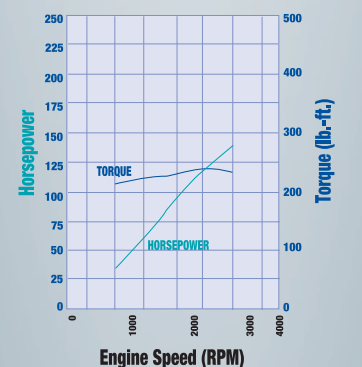
Power corrected to SAE J1995. Actual power levels may vary due to fuel system calibration, and design of induction and exhaust system

LP, CARBURETED



Power corrected to SAE J1995. Actual power levels may vary due to fuel system calibration, and design of induction and exhaust system

NATURAL GAS, CARBURETED



Power corrected to SAE J1995. Actual power levels may vary due to fuel system calibration, and design of induction and exhaust system



655 Wheat Lane, Wood Dale, IL 60191
 Telephone 630-350-9400
 Fax 630-350-9900
 www.psiengines.com



Information may vary with application. All specifications listed are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

MARATHON ELECTRIC GENERATORS TYPICAL SUBMITTAL DATA

Section 3660

Page 11

MODEL : 361CSL1613
BASE MODEL : 361CSL1613

Winding WC- 1613

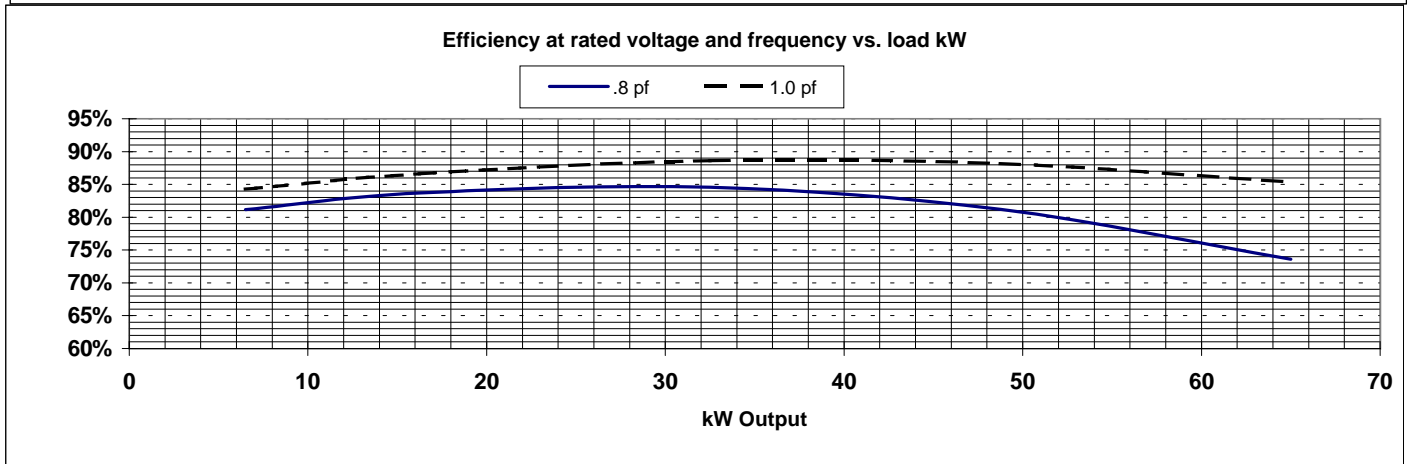
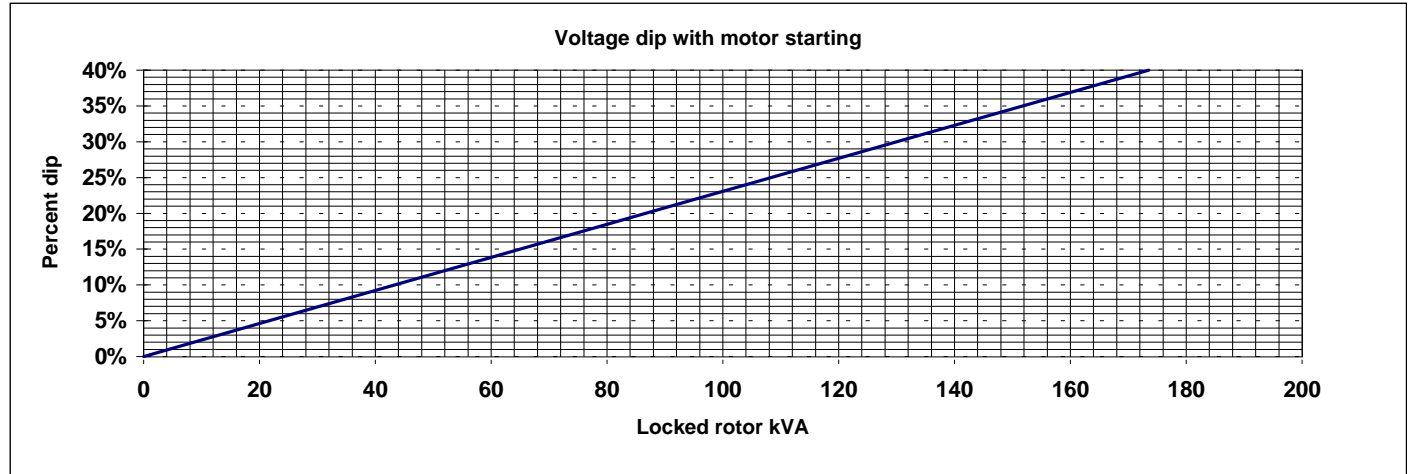
11/01/2001

Kilowatt ratings at kW (kVA)	1800 RPM		60 Hertz			4 LEADS		Dedicated single phase Drip-proof or Open Enclosure		
	Class B		Class F					Class H		
	80° C ∅ Continuous	90° C ∅ Lloyds	95° C ∅ ABS	105° C British Standard	105° C Continuous	130° C ∅ Standby	125° C British Standard	125° C Continuous	150° C ∅ Standby	
240-1	50 (50)	52 (52)	52 (52)	55 (55)	55 (55)	60 (60)	60 (60)	60 (60)	65 (65)	
240-8	38 (47.5)	40 (50)	40 (50)	43 (53.8)	43 (53.8)	47 (58.8)	47 (58.8)	47 (58.8)	50 (62.5)	
220-1	46 (46)	48 (48)	48 (48)	50 (50)	50 (50)	55 (55)	55 (55)	55 (55)	60 (60)	
220-8	36 (45)	38 (47.5)	38 (47.5)	41 (51.3)	41 (51.3)	45 (56.3)	45 (56.3)	45 (56.3)	47 (58.8)	

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

British Standard Rating per BS 5000

Submittal Data: 240 Volts*, 70.4 kW, 88 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 1 Phase			Submittal Data: 240 Volts*, 70.4 kW, 88 kVA, 0.8 P.F., 1800 RPM, 60 Hz, 1 Phase		
Mil-Std-705B			Mil-Std-705B		
Method	Description	Value	Method	Description	Value
301.1b	Insulation Resistance	>1.5 Meg	505.3b	Overspeed	2250 RPM
302.1a	High Potential Test		601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	5.0%
	Main Stator	1500 Volts	601.4a	L-L Harmonic Maximum - Single	5.0%
	Main Rotor	1500 Volts	601.1c	Deviation Factor	6.0%
	Exciter Stator	1500 Volts	--	Type	MAGNAPLUS
	Exciter Rotor	1500 Volts	--	Insulation	Class H
401.1a	Stator resistance - Line to Line		--	Coupling - Single Bearing	Flexible
	Dedicated connection	0.0369 Ohms	--	Amortisseur Windings	Full
	Rotor Resistance	0.926 Ohms	--	Exciter	Rotating
	Exciter Stator	23 Ohms	--	Voltage Regulator	SE350
	Exciter Rotor	0.135 Ohms	--	Voltage Regulation	1.00%
410.1a	No Load Exciter Field Amps at 240 Volts Line to Line	0.59 A DC	--	Cooling Air Volume	700 CFM





**MARATHON ELECTRIC
SYNCHRONOUS AC GENERATOR
TYPICAL SUBMITTAL DATA**

Basic Model 361CSL1602

Date: 6-1-00

Kilowatt ratings at		1800 RPM		60 Hertz		12 Leads			
kW (kVA)		3 Phase		0.8 Power Factor		Dripproof or Open Enclosure			
Voltage*	Class B	Class F					Class H		
	80° C ① Continuous	90° C ① Lloyds	95° C ① ABS	105° C † British Standard	105° C ① Continuous	130° C ① Standby	125° C † British Standard	125° C ① Continuous	150° C ① Standby
240/480	58 (73)	60 (75)	60 (75)	65 (81)	65 (81)	70 (88)	70 (88)	70 (88)	76 (95)
230/460	55 (69)	57 (71)	57 (71)	62 (77)	62 (77)	67 (83)	67 (83)	67 (83)	72 (90)
220/440	56 (70)	58 (72)	58 (72)	63 (79)	63 (79)	68 (85)	68 (85)	68 (85)	71 (89)
208/416	53 (66)	55 (69)	55 (69)	60 (75)	60 (75)	65 (81)	65 (81)	65 (81)	68 (85)
190/380	48 (60)	50 (62)	50 (62)	55 (69)	55 (69)	60 (75)	60 (75)	60 (75)	62 (78)

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

† Rating per BS 5000.

Submittal Data: 480 Volts, 75 kVA, 1800 RPM, 60 Hz, 3 Phase					
Mil-Std-705B			Mil-Std-705B		
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	601.4a	L-L Harmonic Maximum - Total (Distortion Factor)	3.5%
	Main Rotor	1500 Volts	601.4a	L-L Harmonic Maximum - Single	2.5%
	Exciter Stator	1500 Volts	601.1c	Deviation Factor	7.0%
	Exciter Rotor	1500 Volts	---	TIF (1960 Weightings)	<50
401.1a	Stator Resistance, Line to Line High Wye Connection	0.181 Ohms	Additional Prototype Mil-Std Methods are Available on Request.		
	Rotor Resistance	0.99 Ohms			
	Exciter Stator	23.5 Ohms			
	Exciter Rotor	0.12 Ohms			
410.1a	No Load Exciter Field Amps at 480 Volts Line to Line	0.6 A DC	--	Generator Frame	360
420.1a	Short Circuit Ratio	0.833	--	Type	Ext. Voltage Regulated, Brushless
421.1a	Xd Synchronous Reactance	1.714 pu	--	Insulation	Class H
422.1a	X2 Negative Sequence Reactance	0.136 pu	--	Coupling - Single Bearing	Flexible
423.1a	X0 Zero Sequence Reactance	0.034 pu	--	Amortisseur Windings	Full
425.1a	X'd Transient Reactance	0.114 pu	--	Cooling Air Volume	700 CFM
426.1a	X''d Subtransient Reactance	0.086 pu	--	Exciter	Rotating
427.1a	T'd Transient Short Circuit Time Constant	0.05 sec.	--	Voltage Regulator	SE350
428.1a	T''d Subtransient Short Circuit Time Constant	0.006 sec.	--	Voltage Regulation	1%
430.1a	T'do Transient Open Circuit Time Constant	0.73 sec.			
432.1a	Ta Short Circuit Time Constant of Armature Winding	0.012 sec.			

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

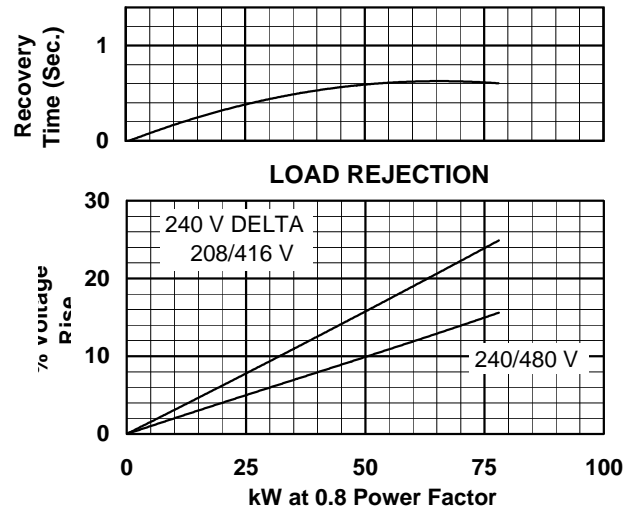
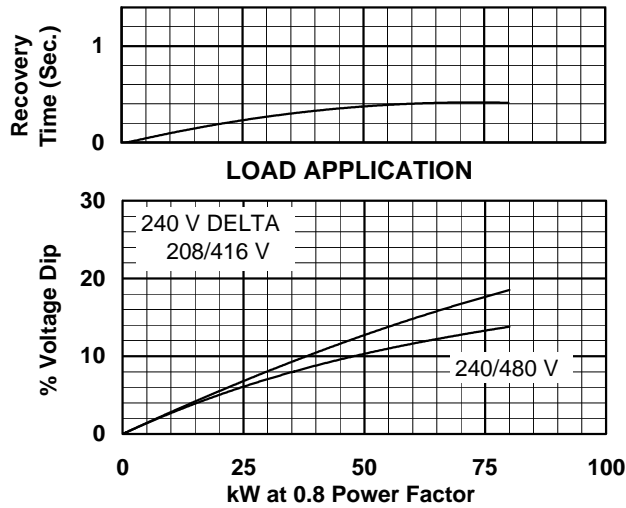


**MARATHON ELECTRIC
SYNCHRONOUS AC GENERATOR
TYPICAL DYNAMIC CHARACTERISTICS**

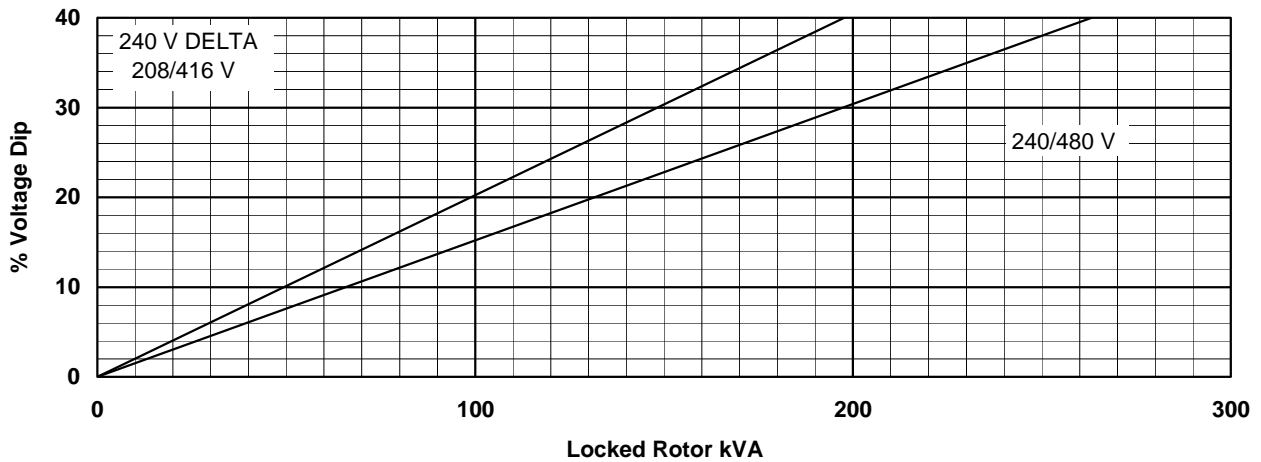
Basic Model 361CSL1602

Date: 4-27-05

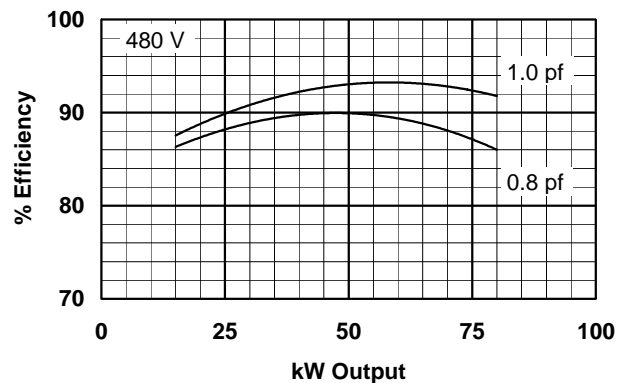
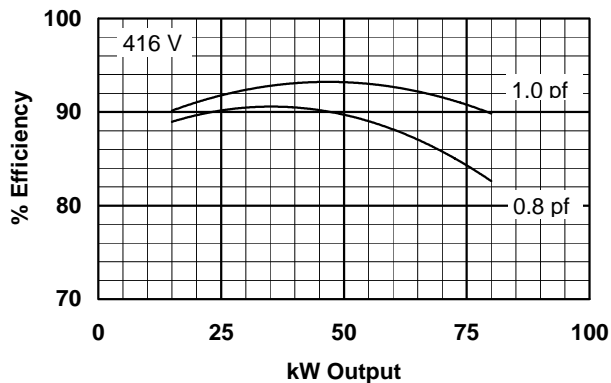
60 HERTZ



TYPICAL MOTOR STARTING CHARACTERISTICS



TYPICAL GENERATOR EFFICIENCY



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

DSE7410/20

AUTO START & AUTO MAINS FAILURE MODULES

FEATURES

The DSE7410 is an Auto Start Control Module and the **DSE7420** is an Auto Mains (Utility) Failure Control Module suitable for a wide variety of single, diesel or gas, gen-set applications.

A sophisticated module monitoring an extensive number of engine parameters, the DSE74xx will announce warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LED, remote PC, audible alarm and via SMS text alerts. The module includes RS232, RS485 & Ethernet ports as well as dedicated terminals for system expansion.

The DSE7400 Series modules are compatible with electronic (CAN) and non-electronic (magnetic pick-up/alternator sensing) engines and offer a comprehensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry paralleling requirements.

The modules can be easily configured using the DSE Configuration Suite Software. Selected front panel editing is also available.

ENVIRONMENTAL TESTING STANDARDS

ELECTRO-MAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY

BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE

BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz @ +/-7.5 mm,
8 Hz to 500 Hz @ 2 gn

HUMIDITY

BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C @ 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C @ 93% RH 48 Hours

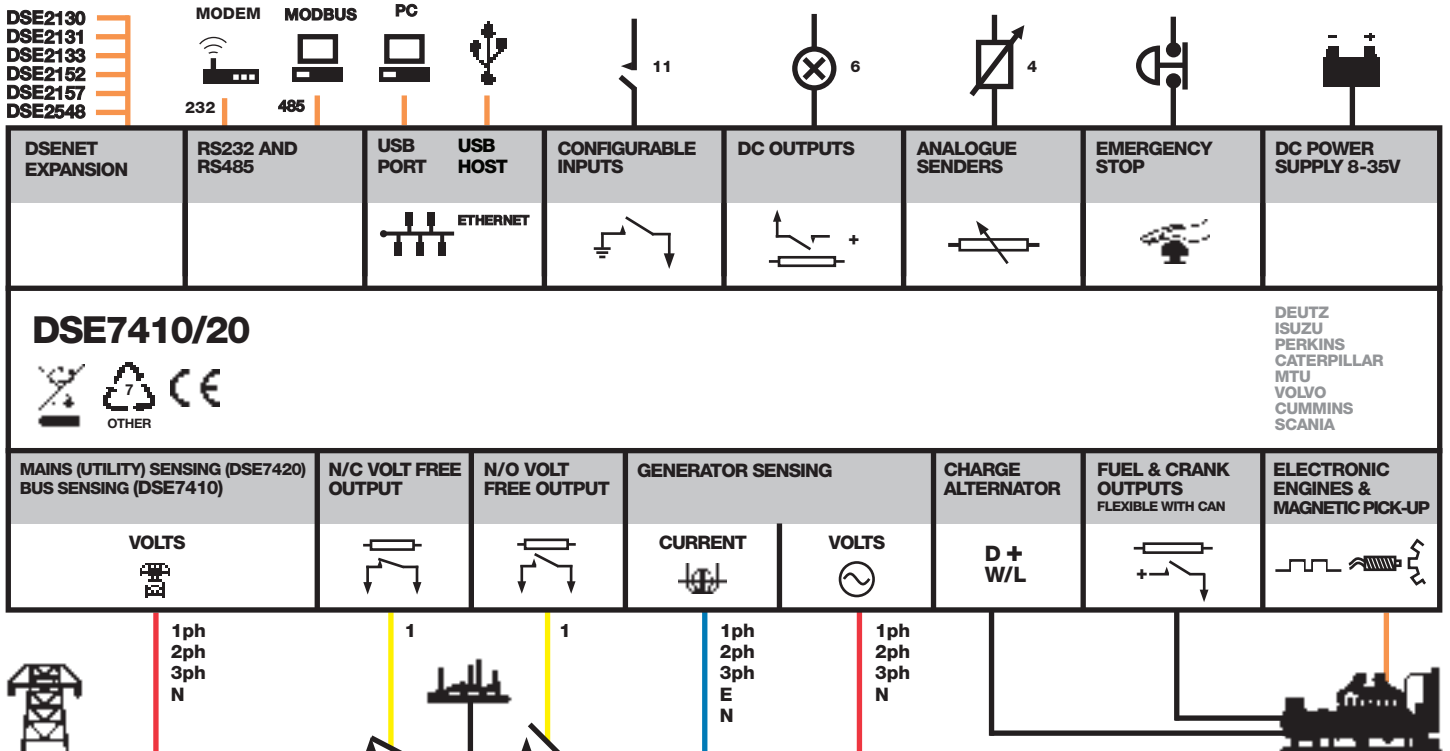
SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15 gn in 11 ms

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS



DSE7410/20

AUTO START & AUTO MAINS FAILURE MODULES

FEATURES



DSE7420

DSE7410



KEY FEATURES

- Configurable inputs (11)
- Configurable outputs (8)
- Voltage measurement
- Mains (utility) failure detection
- Dedicated load test button
- kW overload alarms
- Comprehensive electrical protection
- RS232, RS485 & Ethernet remote communications
- Modbus RTU/TCP
- PLC functionality
- Multi event exercise timer
- Back-lit LCD 4-line text display
- Multiple display languages
- Automatic start/Manual start
- Audible alarm
- Fixed and flexible LED indicators
- Event log (250)
- Engine protection
- Fault condition notification to a designated PC
- Front panel mounting
- Protected front panel programming
- Configurable alarms and timers
- Configurable start and stop timers

- Five key menu navigation
- Front panel editing with PIN protection
- 3 configurable maintenance alarms
- CAN and magnetic pick-up/Alt. sensing
- Fuel usage monitor and low fuel alarms
- Charge alternator failure alarm
- Manual speed control (on compatible CAN engines)
- Manual fuel pump control
- "Protections disabled" feature
- Reverse power protection
- Power monitoring (kW h, kV Ar, kV A h, kV Ar h)
- Load switching (load shedding and dummy load outputs)
- Automatic load transfer (DSE7420)
- Unbalanced load protection
- Independent earth fault trip
- Fully configurable via DSE Configuration Suite PC software
- Configurable display languages
- Remote SCADA monitoring via DSE Configuration Suite PC software

- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- Additional display screens to help with modem diagnostics
- DSENet® expansion
- Integral PLC editor

KEY BENEFITS

- RS232, RS485 & Ethernet can be used at the same time
- DSENet® connection for system expansion
- PLC functionality
- Five step dummy load support
- Five step load shedding support
- High number of inputs and outputs
- Worldwide language support
- Direct USB connection to PC
- Ethernet monitoring
- USB host
- Data logging & trending

RELATED MATERIALS

TITLE

DSE7410 Installation Instructions
DSE7420 Installation Instructions
 DSE74xx Quick Start Guide
 DSE74xx Operator Manual
 DSE74xx PC Configuration Suite Manual

PART NO'S

053-085
 053-088
 057-162
 057-161
 057-160

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
 8 V to 35 V Continuous

CRANKING DROPOUTS

Able to survive 0 V for 50 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries

MAXIMUM OPERATING CURRENT

260 mA at 12 V, 130 mA at 24 V

MAXIMUM STANDBY CURRENT

120 mA at 12 V, 65 mA at 24 V

CHARGE FAIL/EXCITATION RANGE

0 V to 35 V

OUTPUTS

OUTPUT A (FUEL)

15 A DC at supply voltage

OUTPUT B (START)

15 A DC at supply voltage

OUTPUTS C & D

8 A AC at 250 V AC (Volt free)

AUXILIARY OUTPUTS E,F,G,H,I & J

2 A DC at supply voltage

GENERATOR

VOLTAGE RANGE

15 V to 333 V AC (L-N)

FREQUENCY RANGE

3.5 Hz to 75 Hz

MAINS (UTILITY) (DSE7420)

VOLTAGE RANGE

15 V to 333 V AC (L-N)

FREQUENCY RANGE

3.5 Hz to 75 Hz

BUS (DSE7410)

VOLTAGE RANGE

15 V to 333 V AC (L-N)

FREQUENCY RANGE

3.5 Hz to 75 Hz

MAGNETIC PICK UP

VOLTAGE RANGE

+/- 0.5 V to 70 V

FREQUENCY RANGE

10,000 Hz (max)

DIMENSIONS

OVERALL

240 mm x 172 mm x 57 mm
 9.4" x 6.8" x 2.2"

PANEL CUTOUT

220 mm x 160 mm
 8.7" x 6.3"

MAXIMUM PANEL THICKNESS

8 mm
 0.3"

STORAGE TEMPERATURE RANGE

-40 °C to +85 °C

DEEP SEA ELECTRONICS PLC UK

Highfield House, Hunmanby Industrial Estate, Hunmanby YO14 0PH
TELEPHONE +44 (0) 1723 890099 **FACSIMILE** +44 (0) 1723 893303
EMAIL sales@deepseapl.com **WEBSITE** www.deepseapl.com

DEEP SEA ELECTRONICS INC USA

3230 Williams Avenue, Rockford, IL 61101-2668 USA
TELEPHONE +1 (815) 316 8706 **FACSIMILE** +1 (815) 316 8708
EMAIL sales@deepseausa.com **WEBSITE** www.deepseausa.com

Tmax-Molded Case Circuit Breakers

T1 100A Frame

AC Circuit Breakers & Switches

DC Circuit Breakers & Switches

1, 3 and 4 Poles

Higher performances in less space

Field Installable Accessories



Dimensions 3P Fixed Version 5.12H x 3.00W x 2.76D

Compliance with Standards

UL 489

CSA C22.2 No.5.1

IEC 60947-2

Standards

EC directive:

– “Low Voltage Directives” (LVD) no. 73/23 EEC

– “Electromagnetic Compatibility Directive” (EMC) no.89/336 EEC

The ABB Quality System complies with the international ISO 9001 - 2000 Standard (model for quality assurance in design, development, construction, and installation and service) and with the equivalent European EN ISO 9001 and Italian UNI EN ISO 9001 Standards

Interrupting ratings (RMS sym. kAmps)

	T1	
Continuous Current Rating	100A	100A
Number of Poles	1	3-4
	B	N
AC		
240V		50
277V	18	
347V	14	
480V		22
600Y/347V		10
DC		
250V 2 poles in series		25
500V 3 poles in series		25

Please Note: 15 A 1P 10Kaic @ 347Vac, 3p 14Kaic @ 480Y/277Vac, 3p 35Kaic @ 240Vac



Company Quality Systems and Environmental Systems

The new Tmax series has a hologram on the front, obtained using special anti-imitation techniques, which guarantees the quality and that the circuit breaker is an original ABB product.

Attention to protection of the environment and to health and safety in the work place is another priority commitment for ABB and, as confirmation of this, the company environmental management system has been certified by RINA in 1997, in conformity with the international ISO 14001 Standard. This certification has been integrated in 1999 with the Management System for Health and Safety in the workplace, according to OHSAS 18001 (British Standards), obtaining one of the first certification of integrated management System, QES (Quality, Environment,

Safety) issued by RINA. ABB - the first industry in the electro-mechanical section in Italy to obtain this recognition - thanks to a revision of the production process with an eye to ecology has been able to reduce the consumption of raw materials and waste from processing by 20%. ABB's commitment to safeguarding the environment is also shown in a concrete way by the Life Cycle Assessments of its products carried out directly by the ABB Research and Development in collaboration with the ABB Research Center. Selection of materials, processes and packing materials is made optimizing the true environmental impact of the product, also foreseeing the possibility of its being recycled.

Mounting

Fixed

Connections

Pressure-type terminals for bare copper cables

Trip Unit

TMF thermo magnetic trip units, with fixed thermal and magnetic threshold ($I_3 = 10 \times I_n$);

Weight (lbs) 2.34

Auxiliary Devices for Indication and Control

- Auxiliary contacts - AUX
- Undervoltage release - UVR
- Shunt trip - SOR
- Terminal covers
- Flange handle mechanism
- Direct rotary handle - RHD
- Through the door rotary handle
- Solenoid operator
- Key lock - KLF
- Early auxiliary contact - AVE
- Front terminal for copper cable - FC CU
- Front extended terminal - EF
- Phase separators
- Residual current release (IEC Only)
- Mechanical interlock



ABB Inc.

1206 Hatton Road
Wichita Falls, TX 76302
For more information and
the location of your local
field office please go to
www.abb-control.com

Tmax-Molded Case Circuit Breakers

T3 225A Frame

AC Circuit Breakers and Switches

DC Circuit Breakers and Switches

3 and 4 Pole

Motor Circuit Protectors

Higher Performances in Less Space

Field Installable Accessories



Dimensions 3P Fixed Version 5.9H x 4.13W x 2.76D

Compliance with Standards

UL 489

CSA C22.2 No.5.1

IEC 60947-2

Standards

EC directive:

- "Low Voltage Directives" (LVD) no. 73/23 EEC

- "Electromagnetic Compatibility Directive" (EMC) no.89/336 EEC

The ABB Quality System complies with the international ISO 9001 - 2000 Standard (model for quality assurance in design, development, construction, and installation and service) and with the equivalent European EN ISO 9001 and Italian UNI EN ISO 9001 Standards

Interrupting ratings (RMS sym. kAmps)		T3	
Continuous Current Rating		225A	
Number of Poles		3-4	
		N	S
AC			
	240V	50	65
	480V	25	35
	600Y / 347V	10	10
DC			
	250V 2 poles in series	25	35
	500V 3 poles in series	25	35

Company Quality Systems and Environmental Systems

The new Tmax series has a hologram on the front, obtained using special anti-imitation techniques, which guarantees the quality and that the circuit breaker is an original ABB product.

Attention to protection of the environment and to health and safety in the work place is another priority commitment for ABB and, as confirmation of this, the company environmental management system has been certified by RINA in 1997, in conformity with the international ISO 14001 Standard. This certification has been integrated in 1999 with the Management System for Health and Safety in the workplace, according to OHSAS 18001 (British Standards), obtaining one of the first certification of integrated management System, QES (Quality, Environment,

Safety) issued by RINA. ABB - the first industry in the electro-mechanical section in Italy to obtain this recognition - thanks to a revision of the production process with an eye to ecology has been able to reduce the consumption of raw materials and waste from processing by 20%. ABB's commitment to safeguarding the environment is also shown in a concrete way by the Life Cycle Assessments of its products carried out directly by the ABB Research and Development in collaboration with the ABB Research Center. Selection of materials, processes and packing materials is made optimizing the true environmental impact of the product, also foreseeing the possibility of its being recycled.

Mounting

Fixed
Plug-in

Connections

Busbar connection or compression lugs
Pressure-type terminals for bare cables
Rear connections

Trip Unit

TMF thermo magnetic trip units, with fixed thermal and magnetic threshold ($I_3 = 10 \times I_n$);

Weight (lbs)	5.45
---------------------	------

Auxiliary Devices for Indication and Control

- Auxiliary contacts - AUX
- Undervoltage release - UVR
- Shunt trip - SOR
- Terminal covers
- Front for lever operating mechanism - FLD
- Direct rotary handle - RHD
- Solenoid operator
- Key lock - KLF
- Early auxiliary contact - AUE
- Transmitted rotary handle - RHE
- Front terminal for copper cable - FC Cu
- Front extended terminal - EF
- Front terminal for copper-aluminum - FC CuAl
- Front extended spread terminal - ES
- Distribution lugs
- Rear orientated terminal - R
- Phase separators
- Residual current release (IEC Only)



ABB Inc.

1206 Hatton Road
Wichita Falls, TX 76302
For more information and
the location of your local
field office please go to
www.abb-control.com

Tmax-Molded Case Circuit Breakers

T4 250A Frame

AC Circuit Breakers and Switches

DC Circuit Breakers and Switches

3 and 4 Pole

Motor Circuit Protectors

Higher Performances in Less Space

Field Installable Accessories and Trip Units



Dimensions 3P Fixed Version 8.07H x 4.13W x 4.07D

Compliance with Standards

UL 489

CSA C22.2 No.5.1

IEC 60947-2

Standards

EC directive:

- "Low Voltage Directives" (LVD) no. 73/23 EEC

- "Electromagnetic Compatibility Directive" (EMC) no.89/336 EEC

The ABB Quality System complies with the international ISO 9001 - 2000 Standard (model for quality assurance in design, development, construction, and installation and service) and with the equivalent European EN ISO 9001 and Italian UNI EN ISO 9001 Standards

Interrupting ratings (RMS sym. kAmps)

T4

Continuous Current Rating

250A

Number of Poles

3-4

		N	S	H	L	V
AC						
	240V	65	100	150	200	200
	480V	25	35	65	100	150
	600V	18	25	35	65	100
DC*						
	500V 2 poles in series	25	35	50	65	100
	600V 3 poles in series	16	25	35	50	65

*Thermo Magnetic Trip Only



Company Quality Systems and Environmental Systems

The new Tmax series has a hologram on the front, obtained using special anti-imitation techniques, which guarantees the quality and that the circuit breaker is an original ABB product.

Attention to protection of the environment and to health and safety in the work place is another priority commitment for ABB and, as confirmation of this, the company environmental management system has been certified by RINA in 1997, in conformity with the international ISO 14001 Standard. This certification has been integrated in 1999 with the Management System for Health and Safety in the workplace, according to OHSAS 18001 (British Standards), obtaining one of the first certification of integrated management System, QES (Quality, Environment,

Safety) issued by RINA. ABB - the first industry in the electro-mechanical section in Italy to obtain this recognition - thanks to a revision of the production process with an eye to ecology has been able to reduce the consumption of raw materials and waste from processing by 20%. ABB's commitment to safeguarding the environment is also shown in a concrete way by the Life Cycle Assessments of its products carried out directly by the ABB Research and Development in collaboration with the ABB Research Center. Selection of materials, processes and packing materials is made optimizing the true environmental impact of the product, also foreseeing the possibility of its being recycled.

Mounting

Fixed
Plug-in
Drawout

Connections

Busbar connection or compression lugs
Pressure-type terminals for bare cables
Rear connections

Trip Unit

TMF thermo magnetic trip units, with fixed thermal and magnetic threshold ($I_3 = 10 \times I_n$);

TMD (up to 50 A) thermo magnetic trip units with adjustable thermal threshold ($I_1 = 0.7 \dots 1 \times I_n$) and fixed magnetic threshold ($I_3 = 10 \times I_n$).

TMA thermo magnetic trip units, with adjustable thermal threshold ($I_1 = 0.7 \dots 1 \times I_n$) and adjustable magnetic threshold ($I_3 = 5 \dots 10 \times I_n$).

PR221DS, PR222DS/P and PR222DS/PD-A electronic trip unit

Weight (lbs)	6.18
---------------------	------

Auxiliary Devices for Indication and Control

- Auxiliary contacts - AUX
- Undervoltage release - UVR
- Shunt trip - SOR
- Terminal covers
- Front for lever operating mechanism - FLD
- Direct rotary handle - RHD
- Stored energy motor operator - MOE
- Key lock - KLF
- Early auxiliary contact - AUE
- Transmitted rotary handle - RHE
- Front terminal for copper cable - FC Cu
- Front extended terminal - EF
- Front terminal for copper-aluminum - FC CuAl
- Front extended spread terminal - ES
- Distribution lugs
- Rear orientated terminal - R
- Phase separators
- Residual current release (IEC Only)



ABB Inc.

1206 Hatton Road
Wichita Falls, TX 76302
For more information and
the location of your local
field office please go to
www.abb-control.com

Tmax-Molded Case Circuit Breakers

T5 400A and 600A Frame

AC Circuit Breakers and Switches

DC Circuit Breakers and Switches (400A Only)

3 and 4 Pole

Motor Circuit Protectors

Higher Performances in Less Space

Field Installable Accessories and Trip Units



Dimensions 3P Fixed Version 8.07H x 5.51W x 4.07D

Compliance with Standards

UL 489

CSA C22.2 No.5.1

IEC 60947-2

Standards

EC directive:

- "Low Voltage Directives" (LVD) no. 73/23 EEC

- "Electromagnetic Compatibility Directive" (EMC) no.89/336 EEC

The ABB Quality System complies with the international ISO 9001 - 2000 Standard (model for quality assurance in design, development, construction, and installation and service) and with the equivalent European EN ISO 9001 and Italian UNI EN ISO 9001 Standards

Interrupting ratings (RMS sym. kAmps)

T5

Continuous Current Rating

400-600A

Number of Poles

3-4

		N	S	H	L	V
AC						
240V		65	100	150	200	200
480V		25	35	65	100	150
600V		18	25	35	65	100
DC* (400 A only)						
500V	2 poles in series	25	35	50	65	100
600V	3 poles in series	16	25	35	50	65

*Thermo Magnetic Trip Only



Company Quality Systems and Environmental Systems

The new Tmax series has a hologram on the front, obtained using special anti-imitation techniques, which guarantees the quality and that the circuit breaker is an original ABB product.

Attention to protection of the environment and to health and safety in the work place is another priority commitment for ABB and, as confirmation of this, the company environmental management system has been certified by RINA in 1997, in conformity with the international ISO 14001 Standard. This certification has been integrated in 1999 with the Management System for Health and Safety in the workplace, according to OHSAS 18001 (British Standards), obtaining one of the first certification of integrated management System, QES (Quality, Environment,

Safety) issued by RINA. ABB - the first industry in the electro-mechanical section in Italy to obtain this recognition - thanks to a revision of the production process with an eye to ecology has been able to reduce the consumption of raw materials and waste from processing by 20%. ABB's commitment to safeguarding the environment is also shown in a concrete way by the Life Cycle Assessments of its products carried out directly by the ABB Research and Development in collaboration with the ABB Research Center. Selection of materials, processes and packing materials is made optimizing the true environmental impact of the product, also foreseeing the possibility of its being recycled.

Mounting

Fixed
Plug-in
Drawout

Connections

Busbar connection or compression lugs
Pressure-type terminals for bare cables
Rear connections

Trip Unit

TMA thermo magnetic trip units, with adjustable thermal threshold ($I_1 = 0.7 \dots 1 \times I_n$) and adjustable magnetic threshold ($I_3 = 5 \dots 10 \times I_n$).

PR221DS, PR222DS/P and PR222DS/PD-A electronic trip unit

Weight (lbs)	8.55
---------------------	------

Auxiliary Devices for Indication and Control

- Auxiliary contacts - AUX
- Undervoltage release - UVR
- Shunt trip - SOR
- Terminal covers
- Front for lever operating mechanism - FLD
- Direct rotary handle - RHD
- Stored energy motor operator - MOE
- Key lock - KLF
- Early auxiliary contact - AUE
- Transmitted rotary handle - RHE
- Front terminal for copper cable - FC Cu
- Front extended terminal - EF
- Front terminal for copper-aluminum - FC CuAl
- Front extended spread terminal - ES
- Distribution lugs
- Rear orientated terminal - R
- Phase separators
- Residual current release (IEC Only)



ABB Inc.

1206 Hatton Road
Wichita Falls, TX 76302
For more information and
the location of your local
field office please go to
www.abb-control.com

GUEST® Genset Chargers



Guest chargers are proven performers in genset applications. For specific application information, or if you are developing a new product, be sure to consult with the Guest applications engineering team to ensure the correct charger is specified.

Genset Chargers

MODEL	TOTAL AMPS	OUT-PUTS	AMPS PER OUTPUT	BATTERY SYSTEM	INPUT VOLTAGE	AC	DC	DIMENSIONS	WT. (LBS)	AGENCY LISTING
2602A-12	2	1	2	12V	100 - 130 50/60Hz	6' w/ Connect- Charge plug	4' w/ ring terminals	2.9" x 5.1" x 1.5"	2	UL
2602A-12-B (bulk)										
2605A-1-24RT-01 (bulk pack only) (1)	5	1	5	24V	100 - 130 50/60Hz	6' SJT 18-3 w/ Connect- Charge plug	6' SJT 18-3 w/ ring terminals	7.4" x 6.3" x 2.4"	4.5	UL
2608A-B-01 (bulk pack only) (1)	6	1	6	12V	100 - 130 50/60Hz	6' cable w/ molded plug rated -40 to 105C	4' w/ ring terminals rated -40 to 105C	3.5" x 6.4" x 2.3"	4	UL
2610A	10	2	5/5	12V+12V	100 - 130 50/60Hz	Studs	Studs	5.5" x 7.8" x 2.4"	5.6	-
2610A-B (bulk)										UL (bulk only)

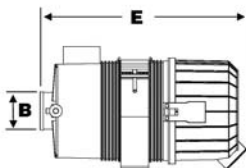
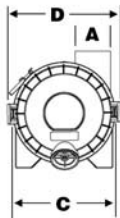
(1) 2-stage charging



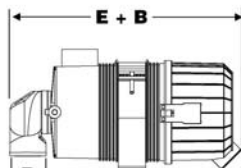
Individual agency listings as shown in product chart.

Plastic Magna Seal Air Cleaners

Internal or External Evacuator Valve
High Strength Polymer
Working Temp -40c to +80c (-40F to 176F)
Design Compatibility with other Manufacturers
Industry Standard elements
Can be Mounted Vertical or Horizontal



**Type 1
Straight Outlet**



**Type 2
90° Outlet**

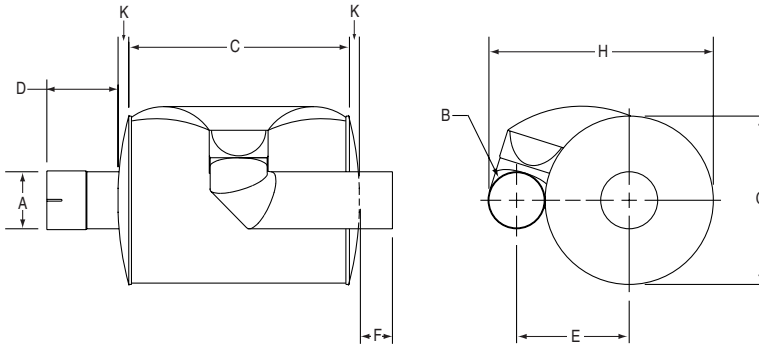
Air Cleaner Assembly

Model Number	Part Number	Type	Initial Restriction						A		B		C		D		E	
			6" H2O CFM	6" H2O M3m	8" H2O CFM	8" H2O M3m	10" H2O CFM	10" H2O M3m	OD Inlet inch	OD Inlet mm	OD Outlet inch	OD Outlet mm	inch	mm	inch	mm	inch	mm
2s-FW-E1	68110	1	75	2.1	90	2.5	105	3.0	2.00	51	1.75	45	4.8	122	6.14	156	8.98	228
2s-FW-E2	68111	1	65	1.8	75	2.1	85	2.4	2.00	51	1.75	45	4.80	122	6.14	156	8.98	228
2s-FW-E1-90	68103	2	63	1.7	73	2.0	82	2.3	2.00	51	1.75	45	4.80	122	6.14	156	10.43	265
2s-FW-E2-90	68107	2	53	1.5	63	1.8	71	2.0	2.00	51	1.75	45	4.80	122	6.14	156	10.43	265
2-FW-E1	68120	1	100	2.8	115	3.3	130	3.7	2.00	51	2.00	51	5.75	146	7.09	180	13.39	340
2-FW-E2	68130	1	90	2.5	105	3.0	115	3.3	2.00	51	2.00	51	5.75	146	7.09	180	13.39	340
2-FW-E1-90	68116	2	88	2.4	102	2.9	113	3.2	2.00	51	2.00	51	5.75	146	7.09	180	14.96	380
2-FW-E2-90	68127	2	77	2.2	92	2.6	103	2.9	2.00	51	2.00	51	5.75	146	7.09	180	14.96	380
2.5-FW-E1	68132	1	150	4.2	175	5.0	195	5.5	2.50	63.5	2.50	63.5	6.89	175	8.15	207	14.13	359
2.5-FW-E2	68133	1	145	4.1	165	4.7	185	5.2	2.50	63.5	2.50	63.5	6.89	175	8.15	207	14.13	359
2.5-FW-E1-90	68131	2	134	3.8	156	4.4	175	5.0	2.50	63.5	2.50	63.5	6.89	175	8.15	207	16.22	412
2.5-FW-E2-90	68134	2	127	3.6	148	4.2	168	4.7	2.50	63.5	2.50	63.5	6.89	175	8.15	207	16.22	412
3-FW-E1	68140	1	160	4.5	190	5.4	210	5.9	3.00	76	3.00	76	7.24	184	8.58	218	14.57	370
3-FW-E2	68150	1	150	4.2	170	4.8	190	5.4	3.00	76	3.00	76	7.24	184	8.58	218	14.57	370
3-FW-E1-90	68140-2	2	154	4.4	181	5.1	196	5.6	3.00	76	3.00	76	7.24	184	8.58	218	17.80	452
3-FW-E2-90	68150-2	2	138	4.0	162	4.6	182	5.2	3.00	76	3.00	76	7.24	184	8.58	218	17.80	452
3.75-FW-E1	68160	1	250	7.1	290	5.4	325	9.2	3.75	95	3.50	89	8.35	212	9.72	247	15.63	397
3.75-FW-E2	68170	1	225	6.4	260	7.4	280	7.9	3.75	95	3.50	89	8.35	212	9.72	247	15.63	397
3.75-FW-E1-90	68157	2	212	6.0	250	7.1	277	7.8	3.75	95	3.50	89	8.35	212	9.72	247	18.5	470
3.75-FW-E2-90	68167	2	188	5.3	220	6.2	250	7.1	3.75	95	3.50	89	8.35	212	9.72	247	18.5	470
4.5-FW-E1	68175	1	375	10.6	425	12.0	475	13.5	4.50	114	4.00	102	10.60	268	11.9	302	19.13	486
4.5-FW-E2	68175-1	1	325	9.2	375	10.6	425	12.0	4.50	114	4.00	102	10.60	268	11.9	302	19.13	486
6-FW-E1	68178	1	600	17.0	685	19.4	770	21.8	6.00	152	5.00	127	12.20	309	13.54	344	22.00	560
6-FW-E2	68179	1	500	14.2	565	16.0	630	17.8	6.00	152	5.00	127	12.20	309	13.54	344	22.00	560
7-FW-E1	68182	1	800	22.7	910	25.8	1060	30.0	7.00	178	6.00	152	15.50	394	16.80	427	21.50	545
7-FW-E2	68185	1	710	20.1	830	23.5	960	27.2	7.00	178	6.00	152	15.50	394	16.80	427	21.50	545



TS Residential Grade - TR Model

Typical Insertion Loss 22-28 dB(A) *



Features

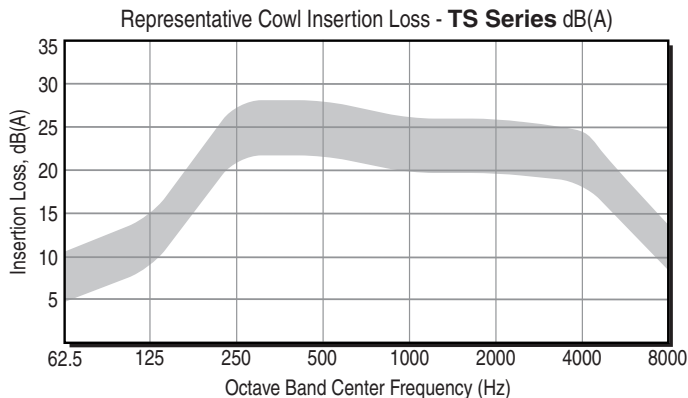
- Compact Spiral Chamber Design
- Premium Silencing
- Low Back Pressure
- Low Weight
- Aluminized Steel Construction
Maximum Temp: 1200 °F (650 °C)
- Standard High-Temperature Finish
- All MIG Welded Construction
- Steel Wool and Mesh Liner
- Slip-fit Connections Standard

Options

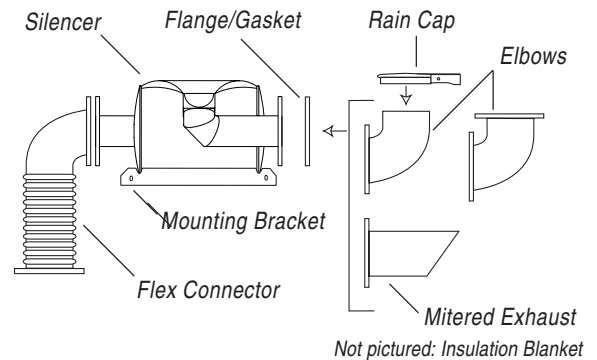
- Factory Customization Available
- 316L Stainless Steel Construction
- Reverse Flow
- Inlet/Outlet Configurations
- 125/150# A.N.S.I. Flange Connections
- Male/Female N.P.T. Connections
- Exterior Finishes
- Complete line of Accessories and Mounting Brackets

*Actual insertion loss value may vary by application.
All measurements in inches unless otherwise noted.

COWL Model No.	COWL Part No.	Inlet A dia. (I.D.)	Outlet B dia. (O.D.)	C	D	E	F	G	H	K	Approximate Weight
TS15TR	TS15TRS000	1.50	1.50	5.24	2.50	4.34	2.07	7.18	8.68	0.50	11 lbs
TS20TR	TS20TRS000	2.00	2.00	7.24	3.50	4.59	2.07	7.18	9.18	0.50	15 lbs
TS25TR	TS25TRS000	2.50	2.50	8.24	3.50	5.66	2.07	8.81	11.31	0.50	20 lbs
TS30TR	TS30TRS000	3.00	3.00	9.24	5.25	7.41	2.07	11.81	14.81	0.75	32 lbs
TS35TR	TS35TRS000	3.50	3.50	11.49	5.25	7.66	2.26	11.81	15.31	0.75	38 lbs
TS40TR	TS40TRS000	4.00	4.00	15.49	5.25	7.91	2.35	11.81	15.81	0.75	47 lbs
TS45TR	TS45TRS000	4.50	4.50	12.49	5.00	10.28	2.57	16.06	20.56	1.00	66 lbs
TS50TR	TS50TRS000	5.00	5.00	16.49	5.00	10.53	2.57	16.06	21.06	1.00	74 lbs
TS60TR	TS60TRS000	6.00	6.00	22.49	5.00	11.03	2.57	16.06	22.06	1.00	94 lbs
TS70TR	TS70TRS000	8.00	8.00	15.35	6.55	15.00	3.97	22.00	30.00	1.45	105 lbs
TS80TR	TS80TRS000	8.00	8.00	24.27	6.55	15.00	3.97	22.00	30.00	1.45	162 lbs
TS100TR	TS100TRS000	10.00	10.00	30.08	6.25	19.00	2.62	28.00	38.00	1.75	268 lbs
TS120TR	TS120TRS000	12.00	12.00	36.08	5.75	22.50	3.71	33.00	45.00	2.25	380 lbs



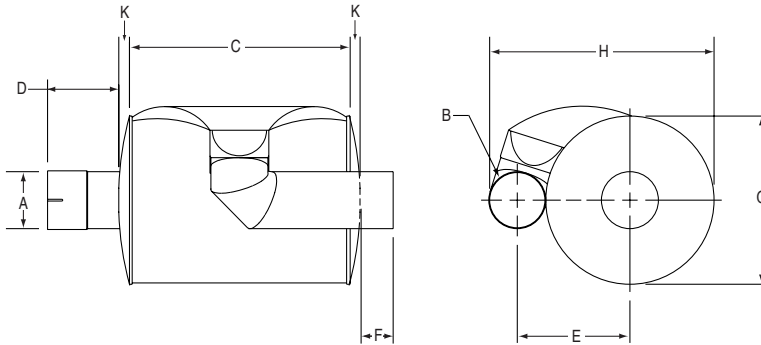
Engine Exhaust Silencer & Accessories





TXS Critical Grade - TR Model

Typical Insertion Loss 28-33 dbA*



Features

- Compact Spiral Chamber Design
- Premium Silencing
- Low Back Pressure
- Low Weight
- Aluminized Steel Construction
Maximum Temp: 1200 °F (650 °C)
- Standard High-Temperature Finish
- All MIG Welded Construction
- Steel Wool and Mesh Liner
- Slip-fit Connections Standard

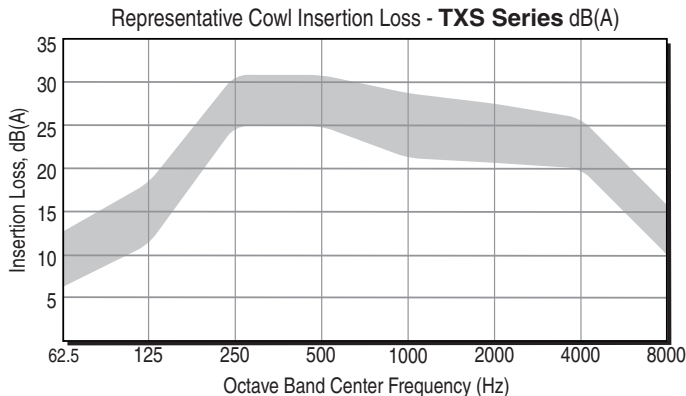
Options

- Factory Customization Available
- 316L Stainless Steel Construction
- Reverse Flow
- Inlet/Outlet Configurations
- 125/150# A.N.S.I. Flange Connections
- Male/Female N.P.T. Connections
- Exterior Finishes
- Complete line of Accessories and Mounting Brackets

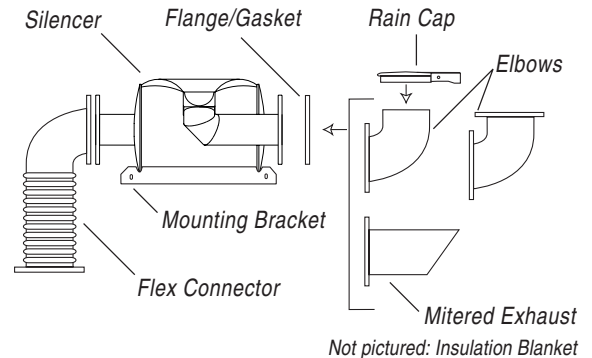
*Actual insertion loss value may vary by application.
All measurements in inches unless otherwise noted.

COWL Model No.	COWL Part No.	Inlet A dia. (I.D.)	Outlet B dia. (O.D.)	C	D	E	F	G	H	K	Approximate Weight
TXS15TR	TXS15TRS000	1.50	1.50	5.24	2.50	5.19	2.07	8.81	10.38	0.50	14 lbs
TXS20TR	TXS20TRS000	2.00	2.00	7.24	3.50	5.41	2.07	8.81	10.81	0.50	19 lbs
TXS25TR	TXS25TRS000	2.50	2.50	8.24	3.25	7.16	1.82	11.81	14.31	0.75	32 lbs
TXS30TR	TXS30TRS000	3.00	3.00	9.24	5.00	9.53	2.07	16.06	19.06	1.00	52 lbs
TXS35TR	TXS35TRS000	3.50	3.50	11.49	5.00	9.78	2.07	16.06	19.56	1.00	63 lbs
TXS40TR	TXS40TRS000	4.00	4.00	15.49	5.00	10.03	2.07	16.06	20.06	1.00	77 lbs
TXS45TR	TXS45TRS000	4.50	4.50	12.49	4.55	11.94	1.46	19.38	23.88	1.45	81 lbs
TXS50TR	TXS50TRS000	5.00	5.00	16.49	4.55	12.19	2.12	19.38	24.38	1.45	98 lbs
TXS60TR	TXS60TRS000	6.00	6.00	22.49	4.55	12.69	2.05	19.38	25.38	1.45	137 lbs
TXS70TR	TXS70TRS000	8.00	8.00	15.41	6.55	17.25	3.97	26.50	34.50	1.45	147 lbs
TXS80TR	TXS80TRS000	8.00	8.00	24.33	6.55	17.25	3.97	26.50	34.50	1.45	227 lbs
TXS100TR	TXS100TRS000	10.00	10.00	30.08	6.25	22.00	2.62	34.00	44.00	1.75	375 lbs
TXS120TR	TXS120TRS000	12.00	12.00	36.08	5.75	26.00	3.71	40.00	52.00	2.25	532 lbs

TXS-TR



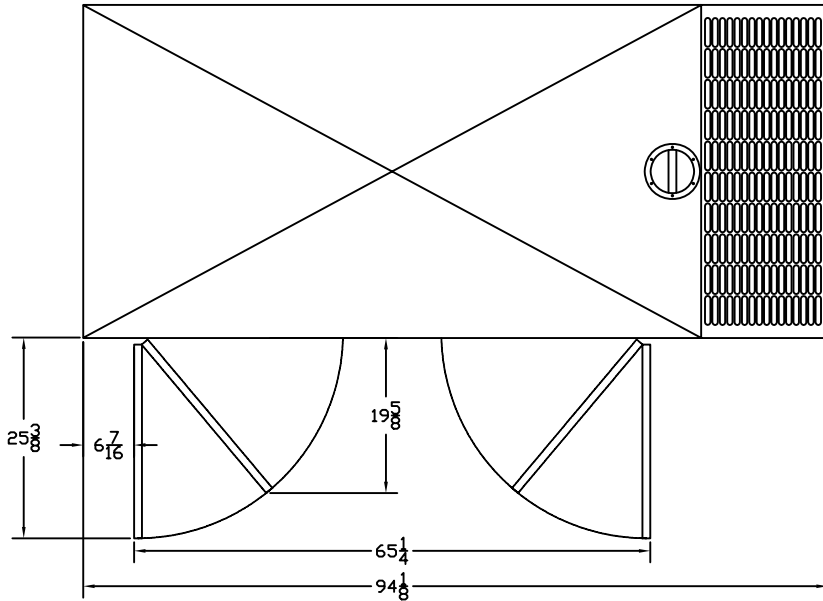
Engine Exhaust Silencer & Accessories



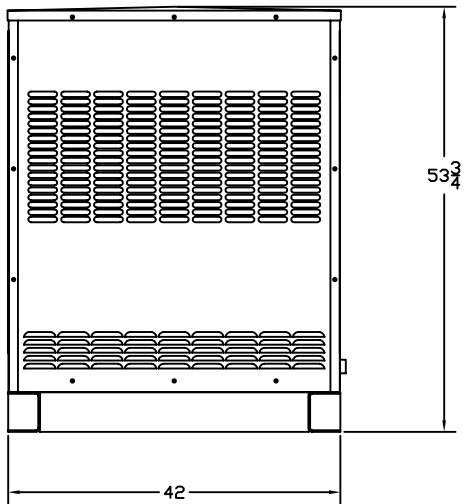
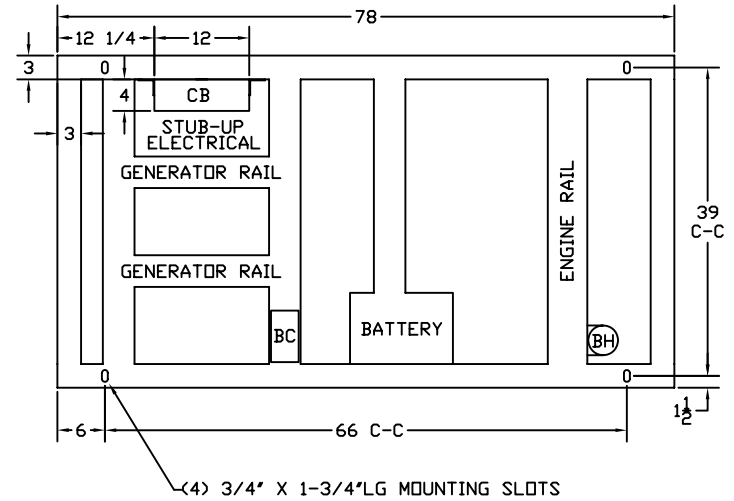
OUTLINE DIMENSIONS FOR 41 THRU 62 KW STANDARD ENCLOSURE (HINGED DOORS)

TOP VIEW

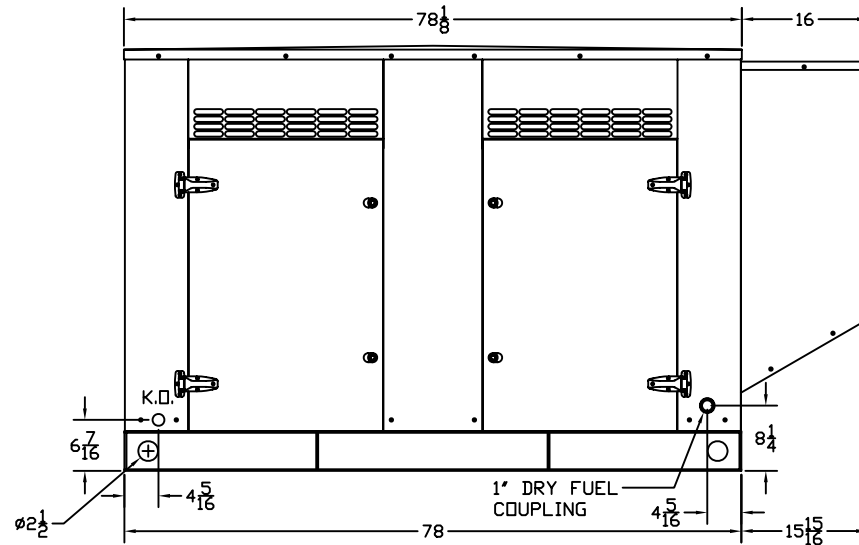
(GEN-SET HAS (4) DOORS, (2) SHOWN OPEN ARE TYPICAL FOR BOTH SIDES)



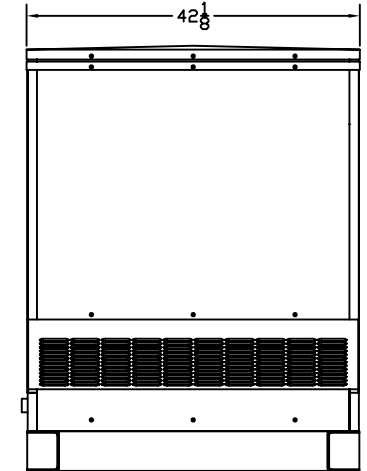
FRAME VIEW



GENERATOR END VIEW



SIDE VIEW

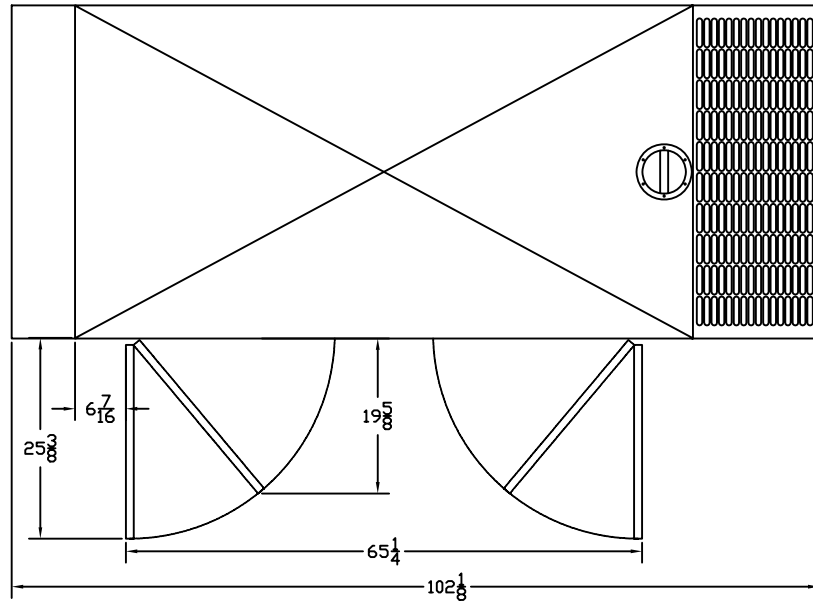


RADIATOR END VIEW

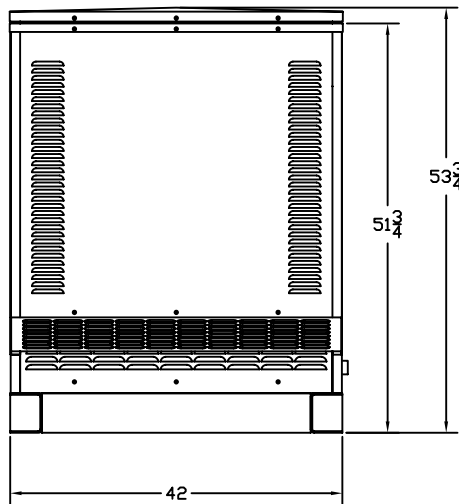
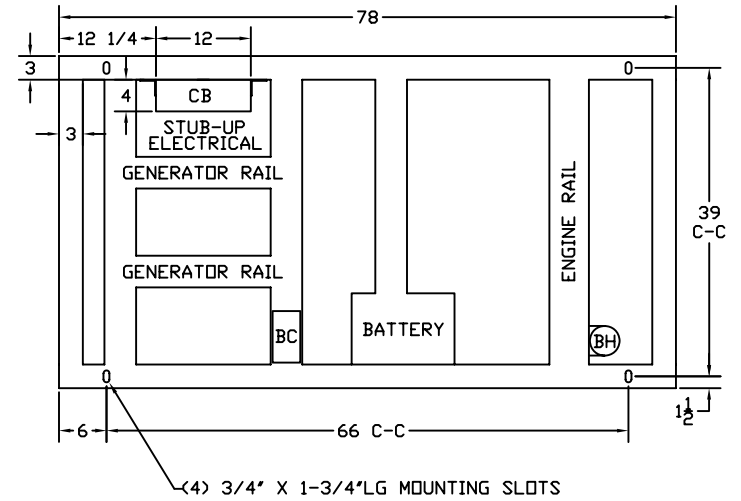
OUTLINE DIMENSIONS FOR 41 THRU 62 KW SUPER-SILENT ENCLOSURE (HINGED DOORS)

TOP VIEW

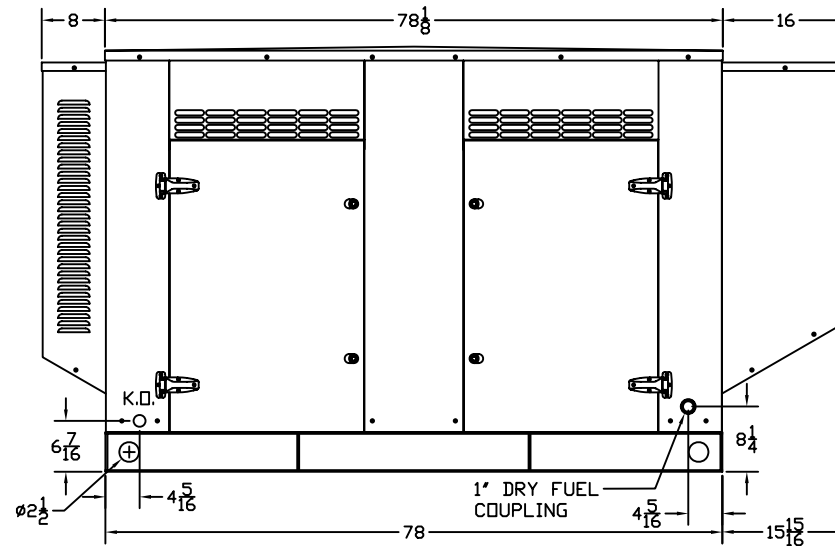
(GEN-SET HAS (4) DOORS, (2) SHOWN OPEN ARE TYPICAL FOR BOTH SIDES)



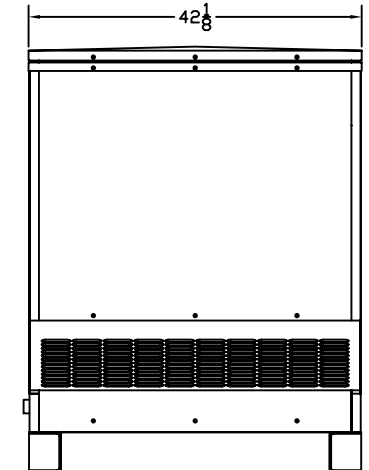
FRAME VIEW



GENERATOR END VIEW



SIDE VIEW



RADIATOR END VIEW