POWERINK
Power Systems

WCS Series

WCS150 / WCS150S

Features:

- Excitation system: self-excited (AREP and PMG are optional)
- ATS (automatic transfer switch) receptacle
- Lockable battery isolator switch
- Stainless galvanized zinc plates with strong corrosion resistance
- Vibration isolators between the engine/alternator and base frame
- Integrated wiring design
- Base fuel tank for at least 8 hours running
- Equipped with an industrial muffler
- Engine oil pump
- 50℃ radiator
- Top lifting and steel base frame with forklift holes
- Drainage for fuel tank
- Complete protection functions and safety labels
- IP44 (soundproof sets), IP54 (control system)
- Water jacket preheater, oil heater and double air cleaner, etc. are available.

Output Ratings

Generating Set Model	Prime	Standby
WCS150/S	136kVA/109kW	150kVA/120kW

Ratings at 0.8 power factor.

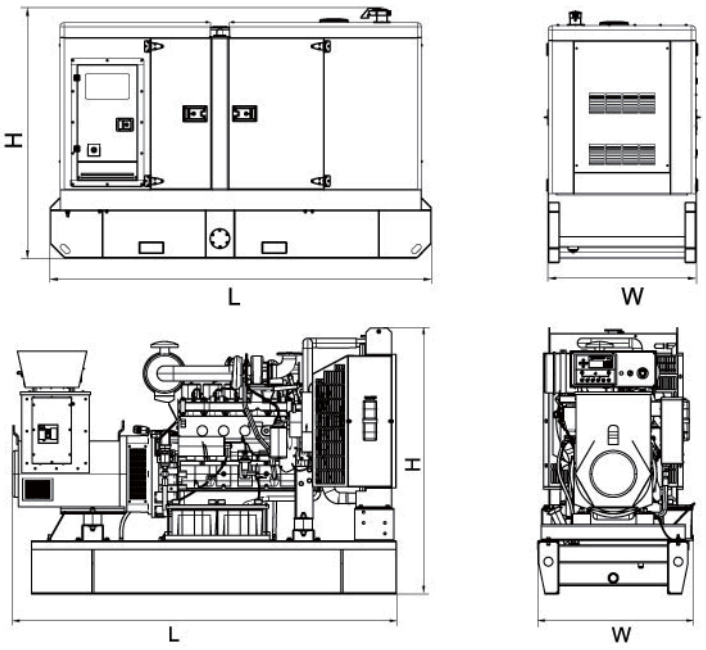
Ratings and Performance Data

Engine Make & Model:		QSB5-G6
Alternator Model:		UCI274E
Alternator Brand:		STAMFORD
Control System:		PLC-920 / PLC-7420
Noise Level@7m:		63.9-74.7
Frequency & Phase:		50Hz & 3PH
Engine Speed: RPM		1500
Structure Type:	WCS150	A
	WCS150S	R
Fuel Tank Capacity: L	WCS150	305
	WCS150S	300
Fuel Consumption: l/h	at 100% load	29.5
	at 75% load	24.7

Dimensions and Weights

Generating Set Model	Length (L) mm (in)	Width (W) mm (in)	Height (H) mm (in)	Dry kg (lb)
WCS150	2090	910	1610	1380
WCS150S	3350	1150	1750	2030

Dry = With Lube Oil Wet = With Lube Oil and Coolant



Also available in the following voltages: 415/240V-380/220V-220/127V-200/115V;
ESP: Standby Power Standby duty, operation under variable load, without over load;
PRP: Prime Power-Continuous duty operation, under variable load 24/24h-10% over load permissible 1 hour/12 hours;
The data is only for your reference but not for use of sales.

M: Mechanical speed governor, E/ECU: Electronic speed governor;
NA: Naturally aspirated, TC: Turbocharged, TCA: Turbocharged and air-air aftercooled. TCW: Water-cooled Turbocharged;
The weights are approximate and without fuel .

POWERINK Power Systems

WCS Series

WCS150 / WCS150S

Engine model: QSB5-G6

General Engine Data

Type			Four cycle; Inline; 4 Cylinder	
Aspiration			Turbocharged and Charge Air Cooled	
Bore x Stroke	4.21 x 4.88	in	107 x 124	mm
Displacement	272	in3	4.5	L
Compression Ratio			17.3:1	
Approximate engine weight (dry)	776	lbm	352	kg
Approximate engine weight (wet)	818	lbm	371	kg
Moment of Inertia of Rotating Components				
with FW 9857 Flywheel	6	in-lbf-sec**2	0.7	kg-m**2
with FW 9878 Flywheel	11	in-lbf-sec**2	1.2	kg-m**2
Center of Gravity				
from front face of block				
above crankshaft centerline	6.4	in	163	mm

Engine Mounting

Maximum Bending Moment at Rear Face of Block	1,000	lb-ft	1,356	N-m

Exhaust System

Maximum back pressure at Standby Power	3	in-Hg	10	kPa

Air Induction System

Maximum Intake Air Restriction				
with Dirty Filter Element	25	in H2O	6	kPa
with Normal Duty Air Cleaner and Clean Filter Element	15	in H2O	4	kPa

Cooling System

Coolant Capacity				
Engine	9	quarts	8.5	L
Minimum pressure cap rating at sea level	15	psi	103	kPa
Maximum static head of coolant above crankshaft centerline	60	ft	18.3	m
Jacket Water Circuit Requirements				
Maximum Coolant Friction Head External to Engine - 1,500/1,800 RPM	5 / 5	psi	34.5 / 34.5	kPa
Maximum Coolant Temperature (Max Top Tank Temp) for standby/prime power	233 / 225	deg F	112 / 107	deg C
Thermostat (Modulating) Range	180 - 203	deg F	82 - 95	deg C
Charge Air Cooler Requirements				
Maximum Intake Manifold Temperature Differential (Ambient to IMT) (IMTD) - 1,500/1,800 RPM	45 / 45	delta deg F	25 / 25	delta deg C
Maximum allowable pressure drop across charge air cooler and OEM CAC piping (IMPD) - 1,500/1,800 RPM	2.5 / 4	in-Hg	8 / 14	kPa
Maximum Intake Manifold Temperature for Engine Protection	210	deg F	99	deg C

Lubrication System

Oil Pressure				
@ Minimum low idle	10	psi	69	kPa
@ Governed speed	50 - 72	psi	344.7 - 496.4	kPa
Maximum Oil Temperature	280	deg F	138	deg C
Oil Capacity with OP 9458 Oil Pan: Low-High	2.4 - 2.9	gal	9.1 - 11	L
Total System Capacity (with Combo Filter)	3.2	gal	12.1	L

Fuel System

Type Injection System			Bosch Electronic	
Maximum fuel supply restriction at fuel pump inlet				
with clean fuel filter element(s) at maximum fuel flow	5	in-Hg	17	kPa
with dirty fuel filter element(s) at maximum fuel flow	10	in-Hg	35	kPa
Maximum fuel inlet temperature	158	deg F	70	deg C
Maximum supply fuel flow	25	gal/hr	95	L/hr
Maximum return fuel flow	14	gal/hr	53	L/hr

POWERINK Power Systems

WCS Series

WCS150 / WCS150S

Engine model: QSB5-G6

Electrical System

	12 V	24 V
System voltage		
Minimum Recommended Battery Capacity		
cold soak at 10 deg C (50 deg F) and above		
cold soak at 0 to 10 deg C (32 to 50 deg F)	1,300 CCA	650 CCA
cold soak at -18 to 0 deg C (0 to 32 deg F)	1,300 CCA	650 CCA
Maximum starting circuit resistance	0.001 Ohm	0.002 Ohm

Cold start capability

Unaided Cold Start		
Minimum cranking speed		120 RPM
Minimum ambient temperature for unaided cold start	10 deg F	-12.2 deg C
Aided Cold Start		
Minimum ambient temperature with coolant and lube heater only	10 deg F	-12 deg C
Cold starting aids available		Block Heater
Min Amb Temp for NFPA 110 Cold Start (90 deg F min coolant temp)	32 deg F	0 deg C

Performance Data

All data is based on:

- Engine operating with fuel system, water pump, lubricating oil pump, air cleaner and exhaust silencert included are battery charging alternator, fan, and optional driven components.
- Engine operating with fuel corresponding to grade No. 2-D per ASTM D975.
- ISO 3046, Part 1, Standard Reference Conditions of:

Barometric Pressure :	100 kPa (29.53 in Hg)	Air Temperature:	25 °C (77 °F)
Altitude:	110 m (361 ft)	Relative Humidity:	30%

Steady State Stability Band at any constant load (+/-)	0.25 %
Estimated Free Field Sound Pressure Level of a Typical Generator Set; 1,800 RPM	88 dBa
Exhaust Noise at Rated 1 m Horizontally From Centerline of Exhaust Pipe Outlet Upwards at 45%; 1,800 RPM	109 dBa

		Standby Power		Prime Power	
Governed Engine Speed	RPM	1,800	1,500	1,800	1,500
Engine Idle Speed	RPM	700 - 900	700 - 900	700 - 900	700 - 900
Gross Engine Power Output	hp (kW)	208 (155)	193 (144)	183 (136)	171 (128)
Brake Mean Effective Pressure	psi (kPa)	336 (2,317)	371 (2,558)	296 (2,041)	330 (2,275)
Piston Speed	ft/min (m/s)	1,464 (7.4)	1,220 (6.2)	1,464 (7.4)	1,220 (6.2)
Friction Horsepower	hp (kW)	16 (12)	10 (8)	16 (12)	10 (8)
Engine Jacket Water Flow at Stated Friction Head external to Engine					
- 5 psi Friction Head	gpm (L/min)	39 (148)	30 (114)	39 (148)	30 (114)
- Maximum Friction Head	gpm (L/min)	35 (132)	25 (95)	35 (132)	25 (95)
Engine Data					
Intake Air Flow	ft3/min (L/s)	368 (174)	319 (151)	370 (175)	313 (148)
Intake Manifold Pressure	in-Hg (kPa)	66 (223)	67 (226)	65 (219)	64 (216)
Exhaust Gas Temp - Dry Stack	deg F (deg C)	982 (528)	991 (533)	913 (489)	896 (480)
Exhaust Gas Flow	ft3/min (L/s)	903 (426)	789 (372)	861 (406)	721 (340)
Air to Fuel ratio		21.3:1	20:1	23.7:1	22.4:1
Heat Rejection to Ambient	BTU/min (kW)	890 (16)	819 (14)	802 (14)	720 (13)
Heat Rejection to Jacket Coolant	BTU/min (kW)	2,873 (51)	2,752 (48)	2,521 (44)	2,403 (42)
Heat Rejection to Exhaust	BTU/min (kW)	7,746 (136)	7,050 (124)	7,068 (124)	5,994 (105)
Heat Rejection to Fuel*	BTU/min (kW)	21 (0.4)	21 (0.4)	18 (0.3)	15 (0.3)
ATA CAC					
Heat Rejection to Aftercooler	BTU/min (kW)	1,899 (33)	1,630 (29)	1,894 (33)	1,569 (28)
Charge Air Flow	lb/min (kg/min)	26 (12)	22 (10)	26 (12)	22 (10)
Turbocharger Compressor Outlet	in-Hg (kPa)	70 (236)	70 (236)	69 (233)	67 (226)
Turbocharger Compressor Outlet	deg F (deg C)	421 (216)	425 (218)	417 (214)	410 (210)

*This is the maxiumum heat rejection, not specified to the load listed.

WCS150 / WCS150S

Alternator model: UCI274E

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.		
A.V.R.	MX321	MX341	
VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)		

CONTROL SYSTEM	SELF EXCITED		
A.V.R.	SX460	AS440	
VOLTAGE REGULATION	± 1.0 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT		

INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.0317 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.34 Ohms at 22°C							
EXCITER STATOR RESISTANCE	20 Ohms at 22°C							
EXCITER ROTOR RESISTANCE	0.091 Ohms PER PHASE AT 22°C							
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)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	492 kg				511 kg			
WEIGHT WOUND STATOR	180 kg				180 kg			
WEIGHT WOUND ROTOR	167.51 kg				156.55 kg			
WR² INERTIA	1.3271 kgm^2				1.2765 kgm^2			
SHIPPING WEIGHTS in a crate	525 kg				539 kg			
PACKING CRATE SIZE	123 x 67 x 103(cm)				123 x 67 x 103(cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	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 REACTANCE VALUES	140	140	140	N/A	160	167.5	167.5	178.8
Xd DIR. AXIS SYNCHRONOUS	2.34	2.11	1.96	-	2.68	2.51	2.29	2.25
X'd DIR. AXIS TRANSIENT	0.21	0.19	0.18	-	0.25	0.23	0.21	0.21
X"d DIR. AXIS SUBTRANSIENT	0.14	0.13	0.12	-	0.17	0.16	0.15	0.14
Xq QUAD. AXIS REACTANCE	1.53	1.38	1.28	-	1.74	1.63	1.49	1.46
X"q QUAD. AXIS SUBTRANSIENT	0.18	0.16	0.15	-	0.22	0.21	0.19	0.18
X_L LEAKAGE REACTANCE	0.08	0.08	0.07	-	0.09	0.08	0.08	0.08
X_2 NEGATIVE SEQUENCE	0.16	0.14	0.13	-	0.19	0.18	0.16	0.16
X_0 ZERO SEQUENCE	0.10	0.09	0.08	-	0.11	0.10	0.09	0.09

WCS150 / WCS150S

Control System
PLC-920 (Optional)

PowerLink PLC-920 generator controllers integrating digital, intelligent and network techniques are used as the automatic control systems for diesel generators. It can carry out functions including pre-alarm, warning & electrical trip, fail monitoring and controls etc.

FUNCTION

Pre-Alarm
- Engine temperature
- Oil pressure
- Over/under voltage
- Over/under frequency
- Over/under speed

Warning & Electrical trip
- Over current
- Short circuit

Error
- Over/under speed
- Speed loss
- Battery low voltage
- Battery high voltage
- Maintenance
- Over current
- Short circuit
- Engine stop
- CAN bus
- Charge alternator

Controls
- Fuel and stop solenoid
- ECU power and stop
- Starter motor
- Automatic generator start
- Preheat
- External alarm horn
- Engine cooling
- Idle mode

Fail monitoring
- Emergency stop
- Multiple engage fail
- Failed to start
- Low oil pressure
- High temperature
- Speed failure
- Voltage
- Charging fail
- Shutdown
- Warning

FEATURES

- Largest back-lit icon display in its class
- Extremely efficient power save mode
- 3 configurable analogue/digital inputs
- Configurable staged loading outputs
- 15 events log
- LCD alarm indication
- Configurable remote start input
- Power factor measurement for 3 phases
- 3 phase Load current measurement
- 3 phase alternator voltage measurement
- Configurable 4 inputs and 8 outputs
- Engine run-time scheduler
- Engine hours counter
- Automatic start control
- CAN and alternator speed sensing in one variant
- Active, Reactive, Apparent power measurement
- Fully configuration via the fascia or PC using USB communication
- Motoring Engine Speed, Coolant Temperature, Oil Pressure and Fuel Level

SPCIFICATION

- Dimensions: 140mm*113mm*43mm
- Panel cut-out: 118mm*92mm
- Protection: IP65 at front panel
- Weight: approximately 0.16kg
- Operating temperature: -30℃ to 70℃
- DC battery supply voltage: 8 to 35V
- Max. operating current: 85mA at 12V
  96mA at 24V
- CT secondary: 5A
- Flexible sensor measurement:
  Full scale: 480ohm;
  Accuracy: ±2%FS; Resolution: 1%

Control System function list

		MODEL	PLC-920	PLC-7420
General accessory		AVR	●	●
		Electronic Governing	×	×
		Glow plug control	●	●
		Cycle Cranking	●	●
		(MODBUS) Networking	×	●
		Fault History	●	●
Operator Interface		manual start/stop	●	●
		Auto/remote start	●	●
		Regular Test	●	●
		Auto operation LED	●	●
		Manual operation LED	●	●
		Common Shutdown LED	●	●
		Common warning LED	●	●
		Fail to start LED	●	●
		Emergency stop(local)	●	●
		Alphanumeric screen	●	●
		Remote start input active LED	×	●
		Alarm reset	●	●
Measurement and Instrumentation	Engine	Oil pressure	●	●
		Water Temperture	●	●
		Engine Speed	●	●
		Hours Run	●	●
		Number of Starts	●	●
		Battery Voltage	●	●
		Coolant Temperature	●	●
	Alternator	3PhaseL-L Voltage&Frequency	●	●
		3phase Current	●	●
		Frequency	●	●
		kWh	●	●
		Apparent Power	●	●
		Active Power and Reactive Power	●	●
		Power Factor	●	●
		Per PhasekW, kWr	●	●
		Per Phase kVA	●	●
		Phase Voltage	●	●
		Output Power	×	●
	Mains Expression	Grid Line Voltage	×	●
		Grid Phase Voltage	×	●
		Grid Frequency	×	●
Shutdown Protection and Indication	Engine	Low Fuel Level	●	●
		High Fuel Level	×	○
		Low Oil Pressure	●	●
		High Water Temperature	●	●
		Failure to Stop	●	●
		Failure to Start	●	●
		Controlable start circles/times	×	●
		Overspeed	●	●
	Alternator	Under&Over Voltage	●	●
		Under&Over Frequency	●	●
		Overcurrent	●	●
		Earth Leakage	○	○
		Reverse Power	×	×
		Reverse kWr	×	×
Threshold Warning&Indication		Low Oil Pressure	●	●
		Low Water Temperature	○	○
		High Water Temperature	●	●
		Low Water Level	●	●
		Low/High Battery Voltage	●	●
		Failure to Charge	●	●
		Overcurrent	●	●
		Overload	●	●
		Genset Under/Over Voltage	●	●
		Genset Under/Over Frequency	●	●
		under/over Speed	●	●
		High Engine Temperature	●	●
		Earth Leakage	○	●
Paralleling Capability		Synchroscope(Independent Bus)	×	×
		Active and Reactive Power Control	×	×
		Synchroscope(Shared Bus)	×	×
		Synchronization Dector	×	×
		Peak Lopping	×	×
Power Transfer Function		Automatic Transfer	○	●
		Hard Closed Transition	●	●
		Soft Closed Transtion	×	×
		Gen/Mains Breaker	×	●
		Gen/Mains Breaker Status Protection	×	●
		Speed/Voltage Control	×	×
		Power Indication	×	●
		Fuel&solenoid Valve Control	●	●
		Startor Control	●	●
		Preheating	○	○
		Mains Transfer Switch (Standard)	×	●
		Mains Transfer Switch (Emergency)	×	●
Environment		Operating Temperature (-40℃-70℃)	●	●
		Ambient Temperature (-25℃-45℃)	●	●
		Humidity≤80%	●	●
Monitoring Function		Grid Over/Under Voltage Control	×	●
		Grid Over/Under Frequency Control	×	●
		Remote Start Output(Load/No-load)	●	●
		Optional Relay Output	●	●
		Remote Telecom Control with All Functions	×	●
		Engine Instrument Monitoring	●	●
		Alternator Output Instrument Monitoring	●	●
		Connection Point with All-around Setting For 6 Users	●	●
		3 Users Input Connection Point	●	●
		LCD Light Control of Low Light Operation Environment	●	●
		Safe PIN Code	●	●
		RS232/485 Interface	×	●
		Language Selection Multi-Language Function	●	●

● Standard ○ Optional × Impossible

POWERINK
Power Systems

WCS Series

WCS150 / WCS150S

Control System

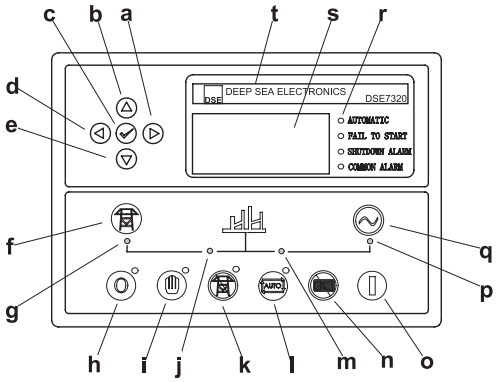
Digital, intelligent control system allows easier operation.

PLC-7420

PLC-7420 is an advanced control module based on micro-processor, containing all necessary functions for protection of the genset and the breaker control. It can monitor the mains supply, breaker control. and automatically start the engine when the mains is abnormal. Accurately measure various operational parameters and display all values and alarms information on the LCD. In addition, the control module can automaticallyshut down the engine and indicate the engine failure.

FEATURES

- Microprocessor control, with high stability and credibility
- Monitoring and measuring operational parameters of the mains supply and genset
- Indicating operation status, fault conditions, all parameters and alarms
- Multiple protections; multiple parameters display, like pressure, temp. etc.
- Manual, automatic and remote work mode selectable
- Real time clock for time and date display, overall runtime display, 250 log entries
- Overall power output display
- Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
- Communication with PC via RS485 OR RS232 interface, using MODBUS protocol



Control Panel

a Button (next page)
b Button (increase value / previous item)
c Button (accept)
d Button (previous page)
e Button (decrease value / next item)
f Button (transfer the load to the mains supply, when in Manual mode only)
g Mains supply available LED
h Stop / Reset button
i Manual button (Manual control mode)
j Mains supply on load LED
k Test button (Test mode)
l Auto button (Auto mode)
m Genset on load LED
n Mute/Lamp test button
o Start button (Manual)
p Genset available LED
q Button (transfer the load to the genset, when in Manual mode only)
r Alarm LED (4 alarm items)
s LCD display
t Control module name

WCS150 / WCS150S

Optional

Engine	Alternator	Generator Set	Fuel System	Canopy
• Water Jacket Preheater • Oil Preheater	• Winding Temperature Measuring Instrument • Alternator Preheater • PMG • Anti-damp and anti-corrosion treatment • Anti-condensation heater	• Tools with the machine	• Low fuel level alarm • Automatic fuel feeding system • Fuel T-valves	• Trailer

Lubricating System	Exhaust System	Cooling System	Control Panel	Voltages
• Oil with the machine	• Protection board from hotness	• Front heat protection • Coolant (-30°C)	• Remote control panel • PLC-920 • PLC-7420 • ATS	• 415/240V • 400/230V • 380/220V • 220/127V • 200-115V