MULTIPHASE POWER

EP Series

WPS10 / WPS10S

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
- IP54 (soundproof sets), IP56 (control system)
- Water jacket preheater, oil heater and double air cleaner, etc. are available.

Output Ratings

Generating Set Model	Prime	Standby
WPS10/S	9kVA/7kW	10kVA/8kW

Ratings at 0.8 power factor.

Ratings and Performance Data

Engine Make & Model:		403A-11G1
Alternator Model:		ECP28-2VS/4
Alternator Brand:		MECC
Control System:		PLC-920 / PLC-7420
Noise Level@7m:		/
Circuit Breaker Type:		/
Frequency & Phase:		50Hz & 3PH
Engine Speed: RPM		1500
Structure Type:	WPS10	D
	WPS10S	RS
Fuel Tank Capacity: L	WPS10	73
	WPS10S	100
Fuel Consumption: l/hr (100% Load)	Prime	/
	Standby	/

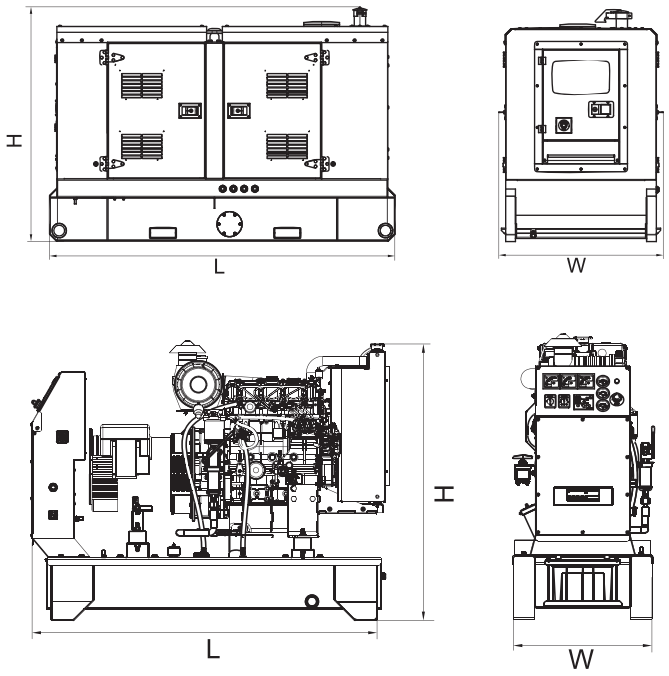
Also available in the following voltages: 415/240V-380/220V-220/127V-200/115V;
ESP: Standby Power Standby duty, operation under variable load, without over load;
PRP: Prime Power-Continuous duty operation, under variable load 24/24h-10% over load permissible 1 hour/12 hours;
The data is only for your 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.

Dimensions and Weights

Generating Set Model	Length (L) mm (in)	Width (W) mm (in)	Height (H) mm (in)	Dry kg (lb)	Wet kg (lb)
WPS10	1357	600	1085	384	/
WPS10S	1932	928	1308	648	/

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



MULTIPHASE POWER

EP Series

WPS10 / WPS10S

Engine model: 403A-11G1

Cooling system

Radiator

-face area ... ... .0.147 m²
-rows and materials . ... 2 rows, Aluminium
-matrix density and material ... ... 14.5 fins/inch Aluminium
-width of matrix ... ...334 mm
-height of matrix... ... ... 440 mm
-pressure cap setting... ... ... 90 kPa
Estimated cooling air flow reserve... ... ...0.125 kPa

Fan

-diameter . ...320 mm
-drive ratio 1.285:1
-number of blades 6
-material... ... ... Plastic
-type. ... ... Pusher

Coolant

Total system capacity
-with radiator ... ... 5.2 litres
-without radiator... ... ... 1.9 litres
Maximum top tank temperature... ... ... .112°C
Max static pressure head on pump . ... .30.4 kPa
Temperature rise across engine.. ... ... TBA°C
Max permissible external system resistance... ... ... .TBA kPa
Thermostat operation range ... ... 75 - 87°C
Recommended coolant: 50% anti freeze / 50% water. For complete details of recommended coolant specifications, refer to the Operation and Maintenance Manual for this engine model

Duct allowance

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow		
Ambient clearance 50% Glycol	**Duct allowance Pa**	**m³/sec**
53°C	0	0.67
46°C	125	0.44

Electrical system

-alternator ... ... 15 amps, 12 V
-starter motor... ... ... 1.1 kW, 12 V
Minimum cranking speed. ... ... 150 rev/min

Cold start recommendations

Minimum starting temperature	Grade of engine lubricating oil	Battery specifications			
		BS3911 Cold start amps	SAEJ537 Cold cranking amps	No. of batteries needed	Commercial ref number
°C					
0	20W	340	540	1	069
-15	10W	340	540	1	069
-20	5W	420	590	1	072

Note: Additional information for battery and cable limits can be found in Chapter 6 of the 400 Series Engine Sales Manual.

Exhaust system

Maximum back pressure... ... ... 10.2 kPa
Exhaust outlet size
-horizontal . ... 34 mm
-vertical . ... 40 mm

Fuel system

Type of injection ... ... Indirect injection
Fuel injection pump... ... ... Cassette type
Fuel injector .. .. Pintle nozzle
Nozzle opening pressure .. ..14.7 MPa
Maximum particle size .. .. 25 microns

Fuel lift pump

-type.. ... ... mechanical (camshaft driven)
-flow/hour .. .. .63 litres/hr
-pressure... ... ... 10 kPa
Maximum suction head. ... ... 0.8 m
Maximum static pressure head. ... ... 3 m
Governor type .. .. Mechanical

Fuel specification

USA Fed Off Highway - EPA2D 89.330-96
Europe Off Highway - CEC RF-06-99
Note: For further information on fuel specifications and restrictions, refer to the OMM Fuels section for this engine model

Fuel consumption

Power rating			
g/kWh (litres/hr)			
110%	**100%**	**75%**	**50%**
261 (2.9)	252 (2.6)	258 (2.0)	286 (1.5)

Induction system

Maximum air intake restriction

-clean filter. ... ... .3.0 kPa
-dirty filter .. .. .6.4 kPa
-air filter type . ... Dry element type

Lubrication system

Lubricating oil capacity

Maximum sump capacity... ... ... 4.4 litres
Total system.. ... ... 4.9 litres
Minimum sump capacity ... ... 3.4 litres
Maximum engine operating angles
-front up, front down, right side or left side ... ... 35° continuous

Lubricating oil pressure

- minimum oil pressure.. ... ... 120 kPa
-relief valve opens. ... ...304 - 500 kPa
-at maximum no-load speed.. ... ... TBA
Normal oil temperature.. ... ... 125°C
oil flow at rated speed ... ... 6.6 litres/min.

MULTIPHASE POWER

EP Series

WPS10 / WPS10S

Alternator model: ECP28-2VS/4

Electrical Characteristics										
Frequency		Hz	50				60			
Voltage (series star)		V	380	400	415	440	415	440	460	480
Rated power class H		kVA	11	11	11	/	11,5	12,4	13,2	13,2
		kW	8,8	8,8	8,8	/	9	9,9	10,6	10,6
Rated power class F		kVA	10	10	10	/	10,5	11	12	12
		kW	8	8	8	/	8,4	9	9,6	9,6
Regulation with		DSR	±1 % with any power factor and speed variations between -5% +30%							
Insulation class			H							
Execution			Brushless							
Stator winding			12 ends							
Rotor			without damping cage							
Efficiencies class H	4/4	%	86,1	86,2	85,9	/	86,6	87,1	87,2	87,3
(see graph. for details)	3/4	%	86,2	86,5	86,4	/	87	87,2	87,4	87,6
	2/4	%	83,7	83,8	83,8	/	84,5	84,6	84,7	84,8
	1/4	%	80,9	80,8	80,6	/	81,6	81,4	81,5	81,8

Reactances (f. l.cl. F)	Xd		216,1	195	181,2	/	227,3	218,0	212,3	195
	Xd'		18,95	17,1	15,89	/	19,93	19,12	18,62	17,1
	Xd"		13,52	12,2	11,33	/	14,22	13,64	13,28	12,2
	Xq		78,7	71	66,0	/	82,8	79,4	77,3	71
	Xq'		78,7	71	66,0	/	82,8	79,4	77,3	71
	Xq"		26,6	24	22,3	/	28,0	26,8	26,1	24
	$_2$		17,17	15,5	14,40	/	18,07	17,33	16,88	15,5
	X_0		3,88	3,5	3,25	/	4,08	3,91	3,81	3,5
Short Circuit Ratio	Kcc		0,58	0,62	0,68	/	0,42	0,52	0,58	0,62
Time Constants	Td'		0,05							
	Td"		0,022							
	Tdo'		0,91							
	α		0,018							
Short Circuit Current Capacity		%	>300				>320			
Excitation at no load		Amp.	0,6	0,7	0,8	/	0,4	0,45	0,5	0,6
Excitation at full load		Amp.	2,3	2,4	2,6	/	2,3	2,4	2,4	2,5
Overload (long-term)		%	1 hour in a 6 hours period 110% rated load							
Overload per 20 sec.		%	300							
Stator Winding Resistance (20°C)		Ω	0,582							
Rotor Winding Resistance (20°C)		Ω	1,032							
Exciter Resistance (20 °C)		Ω	Rotor : 0,417				Stator : 10,60			
Heat dissipation at f.l.cl.H		W	1421	1409	1444	/	1424	1469	1550	1536
Telephone Interference			THF < 2 %				TIF < 45			
Radio interference			EN61000-6-3 EN61000-6-1. For others standards apply to factory							
Waveform Distors.(THD) at f. load		LL/LN %	2 / 2							
Waveform Distors.(THD) at no load		LL/LN %	3,7 / 3,7							

Mechanical characteristics		
Protection		IP 23 (other protection on request)
DE bearing		6309-2RS
NDE bearing		6207-2RS
Weight of wound stator assembly	kg	25
Weight of wound rotor assembly	kg	13,3
Weight of complete generator	kg	89
Maximun overspeed	rpm	2250
Unbalanced magnetic pull at f.l.cl.F	kN/mm	3

MULTIPHASE POWER

EP Series

WPS10 / WPS10S

Control System
PLC-920 (Optional)

Multiphase Power 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.

FEATURES

- Parameter configuration via RS-232 serial communication;
- Log last 50 events & alarm information with measured values;
- Statistics records;
- Remote start/stop;
- Speed sensing from alternator voltage or magnetic pickup;
- Configurable 3 inputs and 6 outputs;
- ECU powers, ECU stop, STOP or fuel solenoid selection;
- Automatic transfer switching control and engine control;
- Adjustable start, load and stop timers.

SPECIFICATION

- Dimensions: 111mm*81mm*61mm
- Protection: IP65 at front panel
- Operating temperature: -20℃ to 70℃
- Max. Operating current is 360mA
- Sender measurement: 0 to 1300 ohm
- Panel cut-out: 81mm*70mm
- Weight: approximately 0.3kg
- DC battery supply voltage: 8 to 32Vdc
- CT secondary: 5A
- Accuracy: 1%FS, resolution: 1 ohm

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
- Battery high
- Maintenance
- Over current
- Short circuit
- Engine stop
- Can bus
- Charge alternator
- Fail monitoring
- Emergency stop
- Multiple engage fail
- Failed to start
- Low oil pressure
- High temperature
- Speed failure
- Voltage
- Charging fail
- Shutdown
- Warning
- Controls
- Fuel and stop solenoid
- ECU power and stop
- Starter motor
- Automatic generator start
- Preheat
- External alarm horn
- Engine cooling
- Idle mode

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	3Phase-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

MULTIPHASE POWER

EP Series

WPS10 / WPS10S

Control System

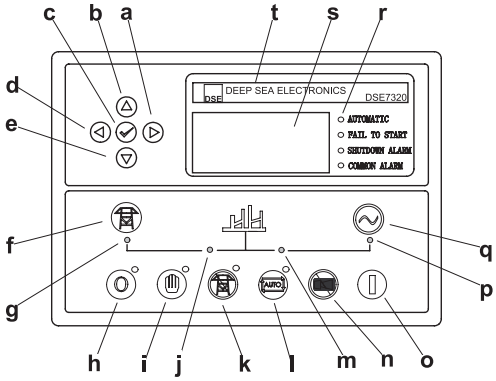
Digital, intelligent control system allows easier operation.

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

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