



DAEWOO

POWER PRODUCTS

DAGFS-15AC

Silent diesel generator



USER'S MANUAL

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Manufactured under license of Daewoo International Corporation, Korea

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1. OPERATION

NOTES FOR DIESEL GENERATOR SET OPERATION

Before operating diesel generator, please read the manual. Especially following points should be paid attention to for preventing the accident happened.

Preventing the fire

The engine fuel is light diesel. It is forbidden to adopt gasoline and kerosene etc. When the oil overflows, please use clean cloth to remove the oil. It is not permitted to have diesel generator near to gasoline, kerosene, match and inflammable material, because the temperature around the muffler is very high when the engine is operated. For the sake of better ventilation during the generator operation, the distance between diesel generator and the building should be more than 1.5 meters. The diesel generator should be operated on plain ground. Otherwise, the oil will overflow from diesel generator.

Preventing the suction of exhaust gas

For avoiding exhaust gas sucked by the person, the diesel generator will be not allowed to work under condition of worse ventilation, because exhaust gas emitted from the engine includes harmful CO.

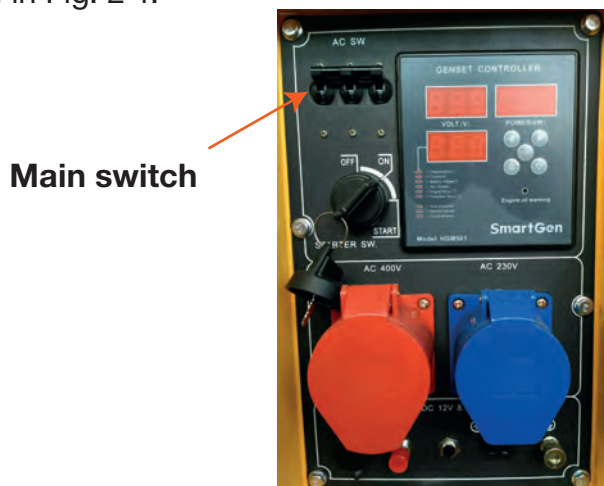
Preventing the damage by high-temperature parts

When diesel engine is working, it is not allowed to touch high-temperature parts, such as muffler and its shell etc.

Preventing the electric shock or short circuit

For avoiding the shock by electricity or short circuit, it is forbidden to touch with hand the alternator when working. Do not operate the generator in raining or foggy.

For preventing the shock by electricity, the grounding should be made with adoption of the wire, which of one end is connected with the grounding terminal of the generator and another end is connected with the device outside. The grounding terminal of the generator is on control panel, shown in Fig. 2-1.



REMARK: For many alternators, starting current is higher than rated current. So the Max. current of the socket should exceed starting current.

Fig 2-1

Other safety points

It is very important to know how to stop the generator and the functions of all switches. The untrained person is not permitted to operate the generator. The operator should wear safe clothes and shoes during working.

Charging the accumulator

The diesel generator has automatic charging function. The electrolytic liquid of the accumulator contains the sulfuric acid. For protecting the human being, should make suitable protection measurement.

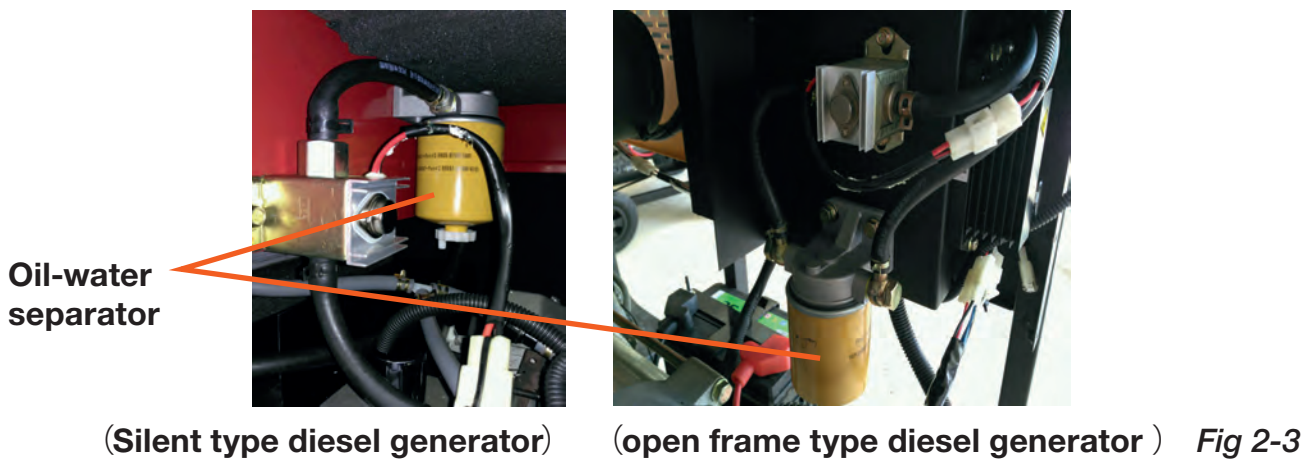
As the hydrogen resulting from the accumulator is of easy explosive gas, do not smoke when charging. It is not also permitted to make the spark around the accumulator.

Be sure that there is better ventilation for charging.

REMARK: It is not permitted to smoke or make the spark when filling in or at fuel storage. During adding the fuel, overflowing should be prevented. After completion of filling oil, should firmly retighten the tap of fuel tank.

Instruction of oil- water separator

When the diesel includes the water, the diesel generator is fit with oil/water separator to remove the water. Only screw down the tap of the separator with left direction to drain off the water, shown in Fig. 2-3



REMARK: After the water is drained off, must screw in the tap in right direction to avoid the diesel leakage.

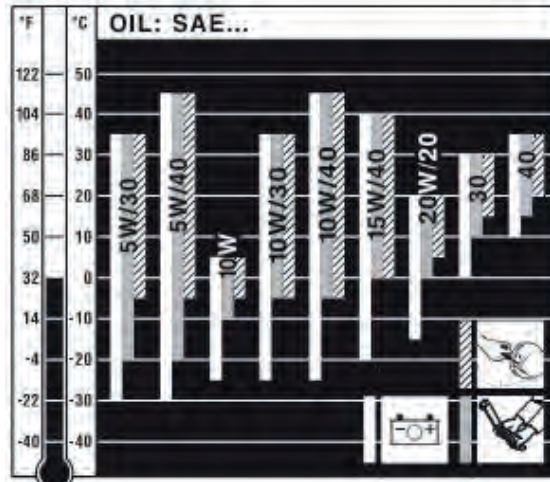
Filling in lube oil

- Lube oil quality

The qualified lube oil should meet following condition.

- ① ACEA-B2/E2 or higher-grade specification
- ② API-CD/CE/CF-4/CG-4 or higher-grade specification

Lube oil viscosity



Select lube oil viscosity based on ambient temperature when starting at cold temperature. It is very important to select the applicable engine oil for keep up the performance and life of the generating set. If inferior engine oil is used, or if your engine oil is not replaced periodically, the risk of piston seizure, piston ring sticking and accelerated wear of the cylinder liner, bearing and other moving components increases significantly. So the generating set life will be shortened. We recommend CC/CD oil classified by API. Choose the applicable viscosity oil according to the local ambient temperature.

20 hours at first	Every 100 hours for next three times	Every 200 hours
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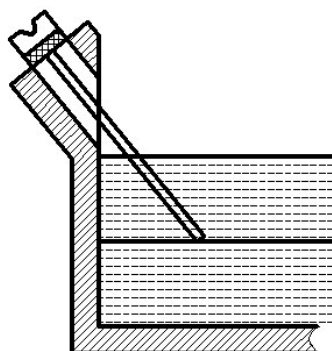
Interval for changing lube oil

When use inferior engine oil, the interval for changing lube oil will be shortened to every 150 hours running.

Lube oil level of engine

Opening for filling in lube oil

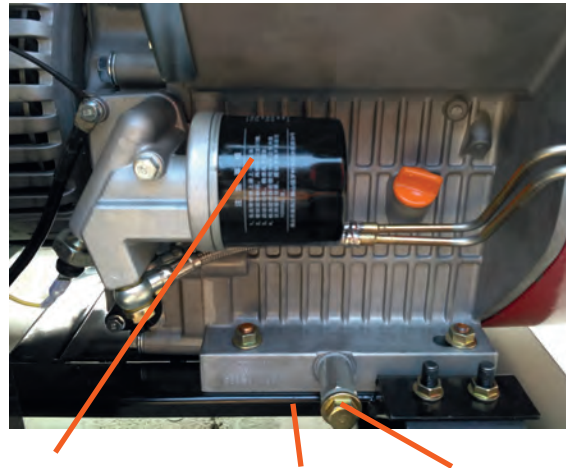
Put the generator on plain ground, then fill in lube oil through the opening of oil dipstick. When checking oil level, only screw the dipstick into the opening.



Upper level limit (H)

Lower level limit (L)

When starting the generator each time, should check oil level. If not being enough, should add the lube oil to the stipulated level. Draining off lube oil can be immediately done after engine stopped, because it is difficult to drain off the oil thoroughly when the engine is in cold state, shown in Fig. 2-4.



Lube oil fine filter Drain groove Drain bolt

Fig 2-4

Check air cleaner

Check the air cleaner of silent diesel generator sets

(1) Loosen the clipper to take out the cover of air cleaner for getting the element, shown in Fig. 2-5

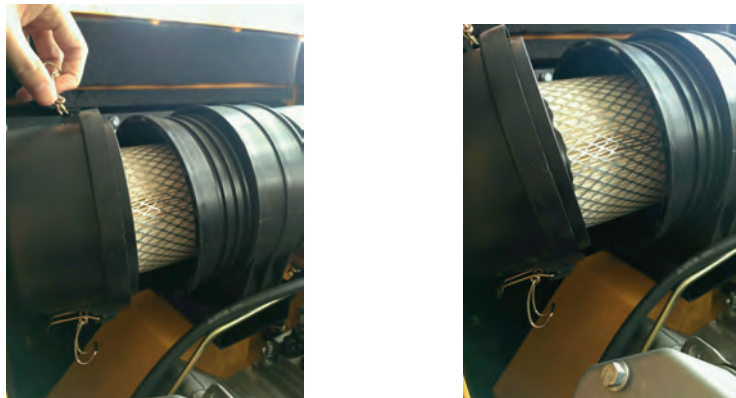


Fig 2-5 (Silent type diesel generator set)

Remark:

- 1) It is forbidden to clean the element with detergent.
- 2) When output power drops or exhaust gas is black, should change the element.
- 3) It is not permitted to start the generator without air cleaner. Otherwise, it will cause the generator to be worn easily.

(3) After installing the element, fit the cover of air cleaner and retighten the clipper firmly. pressure drops less than or equal to those given in table 1 below:

Check the air cleaner of open frame diesel generator sets

(1) Unscrew the bolt and take out side plate, shown in Fig. 2-6

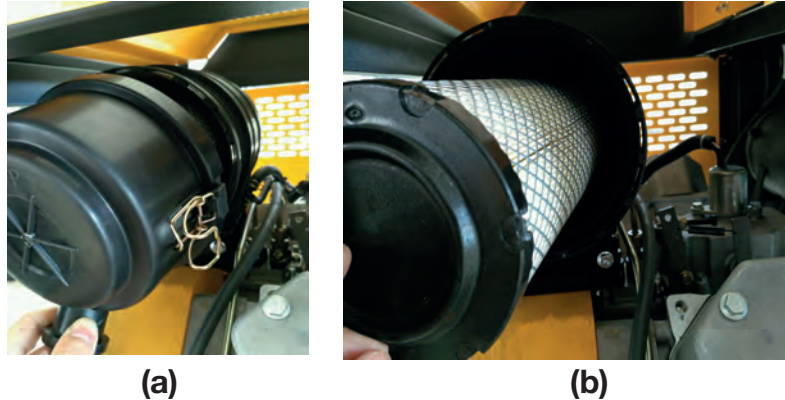


Fig 2-6 (Open frame diesel generator)

Remark:

- 1) It is forbidden to clean the element with detergent.
- 2) When output power drops or exhaust gas is black, should change the element.
- 3) It is not permitted to start the generator without air cleaner. Otherwise, it will cause the generator to be worn easily.

(2) After installing the element, fit the cover of air cleaner and retighten the clipper firmly.

Checking the alternator

Turn off main switch for unloading, like lamp and motor etc.

Before starting the generator, must turn off main switch. If not in this position, it is very dangerous for the generator to be started with the load.

The alternator should be grounded correctly to prevent the shock by electricity.

The fuel and lube oil have been removed prior to delivery. When filling in the fuel, should check whether there is the air in the piping before starting. If existing, should drain off the air by unscrewing on fuel pump till no air bubbling comes out from the diesel, then retighten the screw again

Checking & operating the engine

Checking lube oil level

Check lube oil level prior to each starting. If the engine works under lack of lube oil, oil temperature will rise quickly and the engine will be clipped. If the engine works under enough lube oil, it is very easy to make lube oil burn, resulting in speed increasingly to damage the engine. Hence, it is very important to ensure that oil level is between upper limit and lower limit in oil dipstick.

(Screw the dipstick, the oil level should be between the upper and lower level limit, shown in Fig2—2.3.2)

Operation in trial

For new engine, it is necessary to have 20 hour running-in operation initially.

(1) Avoiding over-load

During the trial operation, should prevent over-load.

(2) Changing lube oil at fixed period

Change it after initial 20 hours operation and refer to 2-2.3.1 afterwards.

Starting the generator

2-4.1 Preparation before starting

(1) Turn fuel switch to “ON” position.

(2) Put speed handler of the engine at “RUN” position.

2-4.2 Starting

(1) Insert the key to “OFF” position.

(2) Put the speed handler to “RUN” position

(3) Turn the key to “START” position clockwise.

(4) After starting successfully, remove the hand from the key to make the key be “ON” position automatically.

(5) If failed to start 10 seconds later, please wait 15 seconds for next starting.

REMARK: If starting motor works too long, the voltage of the accumulator will drop to cause the motor to be blocked. During the operation, let the key be in “ON” position.

(6) If the control panel is intelligent type, also please refer to its manual

When it is difficult to start the engine in cold temperature, the engine need to be equipped with glow plug. (Please require specially when buy engine).

It is very important to retighten oil dipstick firmly before starting.

Otherwise the engine parts will be worn out by rain, dust and other impurities.

Accumulator

If the accumulator is of liquid-added type, should check the electrolytic level every month.

When the level is at lower position, the engine can not be started.

Hence it is necessary to add the distillatory water to stipulated limit.

If the electrolytic level is high, the liquid will overflow to corrode the parts nearby.

It is very important to keep the electrolytic level within stipulated level

During the operation, the generator can automatically charge the accumulator. If the generator is used for stand-by application, should charge the accumulator.



Fig 2-7

If the accumulator is of valve-controlled lead-acid type, it will be charged if necessary.

Do not let two terminals contact with each other, which will make the circuit short.

Operating the generator

- Operating the engine.

A) Start the engine

B) Preheat the engine for three minutes without load.

C) Do not alter fuel quantity controller or speed limiter (having adjusted before delivery).

Otherwise, the performance of the engine will be affected,

- Make the inspection during the operation.

A) Check whether there is abnormal sound or strong vibration.

B) Check whether the engine works out of order.

C) Check the color of exhaust gas: black or too white.

If any of them mentioned above happens, should stop the generator and then contact with local dealer or our company directly.

Adding the load

- Load

Add the load according to stipulated data.

- AC application

A) When starting the generator, should keep the indicating light on to observe work condition.

B) The generator should be run at rated speed (Put the speed handler to "RUN" position.).

Otherwise, the voltage, frequency and power will be lower than rated limit, shown in 1-1Main technical specification and data.

C) When voltage indicating on control panel reaches $\pm 10\%$ of rated limit, can add the load.

D) Following table shows load usage.

REMARK: Do not start more than two machines in the same time. Only start them one by one. Do not use floodlights with other machines meanwhile.

DC application

DC terminal output is 12V 8.3A. Red terminal refer to the positive poles of battery. It is can also for load with rated voltage at 12V and charge 12V battery.

A) When adopting automatic-type accumulator, must disconnect the wire from the cathode of the accumulator when charging.

B) Starting diesel generator.

C) Connect charging wire between accumulator terminal and generator anode. Pay attention to the anode and cathode. Otherwise, it will make the generator and accumulator be damaged.

When charging big capacity accumulator, the charging current should be less than 8A.

Otherwise, the fuse will burn.

D) During charging the accumulator will make inflammable gas. So do not let the spark, flame and cigarette be around it. For avoiding the spark near the accumulator, connect charging wire with the accumulator at first before charging and first disconnect from the generator after

breaking down.

E) Charge the accumulator under the place with better ventilation. Before charging, open the accumulator cover. If electrolytic temperature is over 45°C should break down charging.

REMARK: When the accumulator is connected with generator DC terminals, do not try to start the engine in car or in vessel.

2. MAINTENANCE

Maintenance at fixed period

For the generator works in order, maintenance at fixed period is very important. The diesel generator is consisted of diesel engine, alternator, control panel, frame etc. Please read relative manual for the maintenance.

Before maintaining the generator, stop the engine. The surrounding condition of the generator is of better ventilation, because engine exhaust includes harmful CO.

After stopping the generator, clean it immediately to prevent the corrosion and to remove the sediment.

Item	interval	every day	20 h	100 h	200 h	500 h	every year or 1000 h
Check the fuel		○					
Clean fuel tank						○	
Check oil leakage		○					
Check each fastening						● (retighten cylinder head bolt)	
Change lube oil			○ (first time)	○ (next three times)	○		
Clean the element of cleaner		(shorten the interval in normal dust condition)				○ (change)	
Clean fuel filter				○		○ (change)	○ (change)
Check fuel pump						●	
Check the injector						●	
Check fuel pipe						● (change if necessary)	
Adjust intake/exhaust valve clearance			● (first time)				
Grind intake/exhaust valve							●
Change piston ring							●
Check the electrolytic voltage of accumulator		(every month)					

REMARK: The mark “●” indicates special spanner to be used. Please contact RUNSUN local dealer.

- Change lube oil (20 hours for first time and 100 hours for next three times and 200 hours for normal operation.)

Loosen oil-drained plug located at the bottom of cylinder block when the engine is at hot state. After removing used lube oil, screw in the plug and add the stipulated oil.

- Change the element of air cleaner

Do not clean the element with the detergent.

Time interval	500 h
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Change fuel filter

Often clean fuel filter to ensure that the engine can deliver maximum power

Time interval	500 h
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A) Close fuel switch

B) Change the element with loosening the covers of oil/water separator.◦

- Re-checking bolt retightened moment of cylinder head with special tool, shown in engine manual.

- Check the injector and fuel pump

- Adjust the clearance of intake / exhaust valves

- Grind the intake / exhaust valves

- Change piston rings

Need special tool and the protection should be paid attention to.

- Check the electrolytic and charge the accumulator

The 12V accumulation, used in the engine, will consume the electrolytic due to charging and discharging continuously. Check the accumulator before starting. The distillatory water can be added to stipulated limit if necessary. If the accumulator is damaged, exchange it in time.

Check the electrolytic of the accumulator	Once a month
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Long-term storage

When the generator is not operated for more than three months, it should be stored. After the storage for six months, be restored again as follows.

A) Drain off the fuel and lube oil.

B) Remove the dust and the oily.

C) Clean the crankcase and gear chamber with diesel and kerosene. Then drain off them.

D) Inject rust-proofed oil or lube oil without water (heat the lube oil to about 120°C till no foam exists. into crankcase at stipulated level. Then run the engine for three minutes to splash the oil to the surface of all moving parts. Last drain off the oil after engine stopped.

E) Inject rust-proofed oil or lube oil without water into intake manifold and then rotate the engine rapidly. Last make intake/exhaust valve be at close state.

F) Dismantle cylinder head cover and brush rock arm etc. with a few rust-proofed oil or lube oil without water.

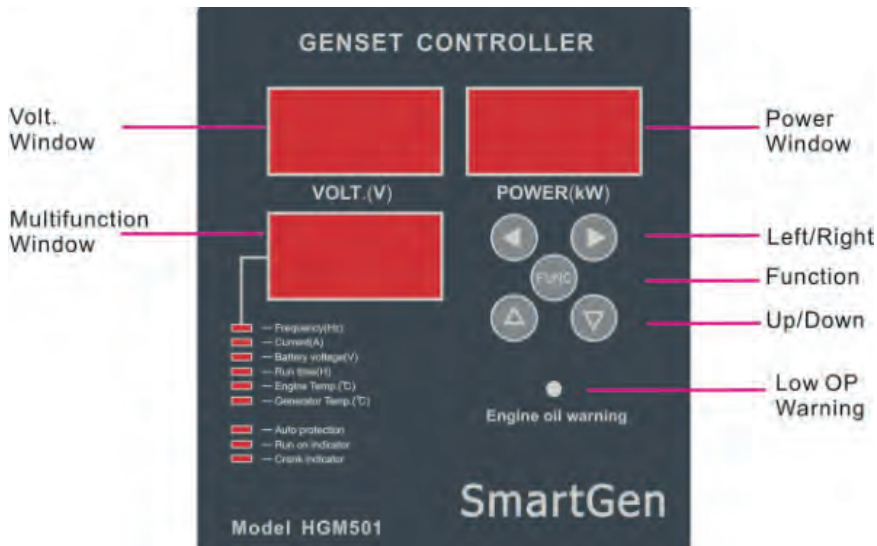
- G) Wrap air cleaner and muffler with wet-proofed paper to prevent the dust and moisture going in.
- H) Remove the dust and the oily on the frame and control panel.
- I) Take out the key
- J) The generator should be stored at a place with better ventilation, clean, dry and no corrosive material nearby.

3. TROUBLE SHOOTING AND REMEDY

	Causes	Remedies
No start of the engine	Insufficient fuel	Fill in the fuel
	Fuel switch not at "OPEN" position	Put fuel switch handler to "OPEN" position.
	No spray on injector or a little quantity	Repair and adjust the injector
	Speed control rod not at "RUN" position	Set control rod to "RUN" position
	Check lube oil lever	The level between upper mark "H" and lower mark "L"
	Dirt on the nozzle	Clean the nozzle
	No electricity in accumulator	Charge or change the accumulator
	Air in the oil circuit	See Fig 4-2
No output of generator	Not turn on the circuit breaker	Turn to "CLOSE" position
	Worse contact of the socket	Adjust the socket
	Not reach rated speed of the engine	According the stipulation
Voltage too low	Not reach rated speed of the engine	Set speed control rod to operation position.
	Check AVR	Adjust the resistance clockwise
Automatic stop after a certain time of operation	(1) lack of the fuel (2) lack of lube oil (3) voltage too low/too high (4) frequency too low/too high (5) over-current	Repair according to relative alarming of control panel

If the generate can not deliver the output after checking, please contact with RUNSUN company or local dealer.

4. INSTRUCTION FOR CONTROL PANEL FUNCTION AND OPERATION MANUAL



	FUNCTION	<ol style="list-style-type: none"> 1. In configuration menu, pressing this button enters setting or confirms; 2. During normal operation, press this button to switch to frequency display; 3. In case of alarm shutdown, pressing and holding the button for 1 second will reset the alarm.
	UP/SCROLL	<ol style="list-style-type: none"> 1. During parameter configuration, pressing this button increases the set value; 2. During normal operation press this button to switch to the upper LED.
	DOWN/SCROLL	<ol style="list-style-type: none"> 1. During parameter configuration pressing the button decreases the set value; 2. During normal operation the button switches to the lower LED.
	LEFT	<ol style="list-style-type: none"> 1. During parameter configuration pressing this button will return to the previous menu; 2. During normal operation press this button to switch to the next (upper) LED.
	RIGHT	<ol style="list-style-type: none"> 1. During parameter configuration press this button to enter the next menu.

START/STOP OPERATION

STARTING PROCEDURE

In stop mode turn the starter key from OFF to ON position to power on the controller, then change the starter key position to START to begin cranking; after the engine fires, release the starter key, and voltage, power and frequency windows will show the real measured values. Press or button to switchover between indicators 1#-6# and multifunctional window will show corresponding settings. Press button to return to the frequency window. LED indicators state:

- 1# Frequency (Hz)
- 2# Current (A)
- 3# Battery voltage (V)
- 4# Run time (H)
- 5# Engine temp.(°C)
- 6# Generator temp.(°C)
- 7# Auto protection If on, auto protection is enabled; if not,it is disabled.
- 8# Run on indicator Fuel relay output indicator
- 9# Crank indicator Start output indicator
- 10# Engine oil warning Low oil pressure indicator

NOTE: Before starting the engine please make sure that all the parameter settings are correct.
NOTE“Engine oil warning”indicator operates according to the oil pressure switch. Before the start of the gen-set, the light must be on; if it is not, it means that oil pressure switch or its return circuit is faulty; in this case please do not proceedbefore clearing up the problem.

STOPPING PROCEDURE

1) Auto stop

If auto protection condition occurs, the system will be stopped automatically;
During normal running of the gen-set, if low oil pressure signal is detected, the set will be stopped.

2) Manual stop

Under any circumstances, if starter key is turned from ON to OFF position,it will lead to shut-down.

AUTO PROTECTION

In auto protection mode, except for low oil pressure protection, all the other protections (voltage, frequency, overload, temperature) are active.

1) Voltage protection

When the limits of rated voltage are exceeded by $\pm 10\%$, Voltage LED starts flashing; after 7 seconds delay in case of under voltage or 3 seconds delay in case of over voltage, alarm shutdown is initiated. After that voltage LED continues to flash and shows pre-alarm value.

2) Frequency protection

50Hz : (45~55)Hz

60Hz : (55~65)Hz

When the set value is exceeded, frequency LED starts flashing; after 7 seconds delay in case of under frequency and 3 seconds delay in case of over frequency, alarm shutdown is initiated. After that frequency LED continues to flash and shows pre-alarm value.

3) Overload protection

If the set value is exceeded by 5% or less, alarm will not be initiated;

If the set value is exceeded by more than 5%, power LED will start flashing;

If the set value is exceeded by 5-7.5% and continuous for more than 3 hours, then alarm shutdown will be initiated;

If the set value is exceeded by 7.5-10% and continues for more than 1 hours, alarm shutdown will be initiated;

and shows pre-alarm value.

4) Low oil pressure protection

Irrespective of whether auto protection mode is enabled or not, low oil pressure will lead to automatic disconnection of oil circuit;

5) High engine temperature protection

If engine temperature exceeds 108 , LED window starts flashing; after 7 second delay, protection begins; LED window continues to flash and shows pre-protection value (for air-cooled engine);

6) High generator temperature protection

When generator temperature exceeds 95 , LED window starts flashing; after 7 second delay, protection begins; LED window continues to flash and shows pre-protection value;

7) Battery voltage protection

Battery voltage protection is enabled irrespective of whether auto protection mode is enabled or not and whether gen-set is running. If battery voltage value is lower than 8V or higher than 16.5V, LED display or indicator starts flashing, but shutdown protection is not initiated.

NOTE: During Safety On delay, protection is disabled; after Safety On Delay, when voltage, frequency, overload, high temperature protection is initiated, fuel output deactivates.

5. TECHNICAL DATA

DAGFS-15AC

SILENT TYPE DIESEL GENERATOR SET

Model	DAGFS-15AC	Power	11 kW
Engine Model	CD292F	Power	13.8 KVA
Rated speed	3000 rpm	Standby Power	12 kW
Frequency	50 Hz	Standby Power	15 KVA
Phase/Voltage	3 phase/ 380 V	Net weight	300 kg
Rated Current	20.9 A	Size	1250x650x760 mm

DETAILS OF ENGINE

Engine Model	CD292F	Cylinder N°	4
Displacement	0.997 L	Bore and Stroke	2L 92x75mm
Rated Power	18 kW	Volume of Oil	13 L
Rated Power	22.5 KVA	Combustion	Direct injection
Fuel Consumption	4.1 L/H	Starting system	Electric start
Governor	Machinery Governor	Type	Self excitation, constant voltage, field rotating

EC DECLARATION OF CONFORMITY

FUJIAN EPOS ELECTRIC MACHINERY CO.LTD

Model: DAGFS-15AC

Brand: **DAEWOO**

We GBR Corp. LTD, Room 1002, 10/F., David House, 8-20 Nanking Street, Jordan, Kowloon, Hong Kong, China, declare under our sole responsibility that this product is in conformity and accordance with the following standards and regulations.

The undersigned is responsible for the compilation of technical documentation.

With this declaration of compliance we certify that articles :FUJIAN EPOS ELECTRIC MACHINERY CO.LTD are complying the rules of Machinery Directive EN 60204-1:2018; EN ISO 12100:2010; EN ISO 8528-13:2016EN 55012:2007/A1:2009; EN IC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019; EN 55012:2007/A 1:2009

The DAEWOO Products authorized representative declares that these products described under "technical data" are in compliance with:

Machinery Directive EN 60204-1:2018; EN ISO 12100:2010; EN ISO 8528-13:2016EN 55012:2007/A1:2009; EN IC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019; EN 55012:2007/A 1:2009

Signature and Stamp on undersigned responsible.
Date: 28-7-2022
GBR Corporation Ltd.
15/F. 100 Queen's Road Central, Central, Hong Kong

Signature



WARRANTY CARD

Product model	Date of sale
Serial number	Company
Username	Client's signature

The product is in good conditions and fully complete. Read and agree the terms of the warranty.

GUARANTEE

The warranty period starts from the date of sale of the products and covers 2 years for all power products.

During the warranty period, free failures caused due to the use of poor-quality materials in the production and manufacturer workmanship admitted fault are removed. The guarantee comes into force only when warranty card and cutting coupons are properly filled. The product is accepted for repair in its pure form and full completeness.

WARRANTY DOES NOT COVER

- Mechanical damage (cracks, chips, etc.) and damage caused by exposure to aggressive media, foreign objects inside the unit and air vents, as well as for damage occurred as a result of improper storage (corrosion of metal parts);
- Failures caused by overloading or product misuse, use of the product for other purposes. A sure sign of overload products is melting or discoloration of parts due to the high temperature, simultaneous failure of two or more nodes, teaser on the surfaces of the cylinder and the piston or destruction of piston rings. Also, the warranty does not cover failure of the automatic voltage regulator due to incorrect operation;
- Failure caused by clogging of the fuel and cooling systems;
- Wearing parts (carbon brushes, belts, rubber seals, oil seals, shock absorbers, springs, clutches, spark plugs, mufflers, nozzles, pulleys, guide rollers, cables, recoil starter, chucks, collets, removable batteries, filters and safety elements, grease, removable devices, equipment, knives, drills, etc.);
- Electrical cables with mechanical and thermal damage;
- Product opened or repaired by a non-authorized service center.
- Prevention, care products (cleaning, washing, lubrication, etc.), installation and configuration of the product;
- Natural wear products (production share);
- Failures caused by using the product for the needs related to business activities;
- If the warranty card is empty or missing seal (stamp) of the Seller;
- The absence of the holder's signature on the warranty card.

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Product _____ Model _____ Company _____ Date of sale _____	Product _____ Model _____ Company _____ Date of sale _____	Product _____ Model _____ Company _____ Date of sale _____
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