EN

HYUNDAI

DIESEL GENERATOR

OPEN TYPE-DHY2500L/E DHY4000L/E DHY6000L/E/3
SILENT TYPE-DHY4000SE/3 DHY6000SE/3
WELDER TYPE-DHYW180AC DHYW190AC

USER MANUAL

REVIEW MANUAL CAREFULLY TO AVOID PERSONAL INJURY

MADE UNDER LICENSE OF HYUNDAI CORP. SEOUL, KOREA

PREFACE

Thank you for purchasing HYUNDAI diesel generator.

This operation manual will tell you how to operate and service your HYUNDAI diesel generator set propertly.

Please read this manual before using the generator set to ensure the proper operation. Follow the instructions to keep your generating set in in the best working conditions and extend the life of it. If any comments or problem please contact the place where you bought the generator set or also can contact the manufacturer directly (check contact formular in last page).

It is also strong recommend that you send the receipt form to the manufactures in order to register your product for future problems or complains.

All information in this publication is based on the latest product information available at the time of printing. ITC Power Co.ltd., reserves the right to make changes at any time without notice and without incurring any obligation. No part of this publication may be reproduced without written permission.

This manual deals with the general items for the HYUNDAI diesel generator set, however this manual may vary with the development of the product in the future.

This manual should be considered a permanent part of the generator and should remain with the generator if resold.

Please give special attention to the warnings and cautions. A safety message alerts you to potential hazards that could hurt you or others. Each safety message is preceded by a safety alert symbol and one of three words, DANGER, WARNING, or CAUTION.

These signal words mean:

⚠ DANGER You CAN be HURT if you don't follow instructions.

⚠ WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠ CAUTION You CAN be HURT if you don't follow instructions. Also the machine can be damage

Non respect the instructions explained in this user manual will avoid the guarantee of the generator set.

Contact Group ITC Power staff for any clarification about the use of the generator here explained. Contact details in the last page.

SAFETY INFORMATION

In order to ensure a safety use of the generator please follow the next safety instructions:

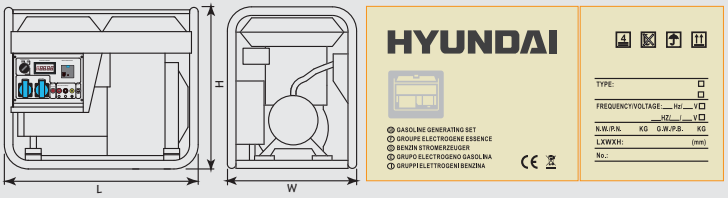
1. Check the outside of the generator in order to detect any apparent trouble.
2. The use or good quality oil and diesel is a must.
3. Storage should be in a dry place. Frost damage permanently your group. Drain your machine completely before storing in a dry hot place.
4. Check and clean filters regularly.
5. Make sure all subset of the machine are right.
6. Exhaust fumes contain carbon monoxide, a very dangerous gas, colorless and odorless, never use the generator in premises or areas closed. Make sure the group is installed in a location with adequate ventilation or equipped with a smoke extractor.
7. The exhaust temperature rises during the use of the group and still burning even after shutdown. Take care never to touch or move it to store before being on it is cool enough.
8. Repair your generator shall be made by a qualified person and trained for this purpose.
9. Do not smoke, do not flame or spark when operating or filling the tank, store the generator near flammable materials.
10. Store the group in a well ventilated area.
11. Never transport or store your generator in a horizontal or leaning of fuel leak and / or oil or will permanently damage your machine.
12. Never stop the generator when is load applied, be sure to disconnect any apparatus from the generating set prior start of prior stop.
13. Do not allow children to operate the engine. Keep children and pets away from the area of operation.
14. The engine and exhaust become very hot during operation. Keep the generating set at least 1.5 meter away from buildings and other equipment during operation. Keep flammable materials away, and do not place anything on the engine while it is running.
15. Gasoline is highly flammable and explosive. Turn engine off and let cool before refueling.
16. To avoid electric shocks or short circuit, do not touch the generating set when your hands are wet. This generating set is not water proof, so it should not be used in a place exposed to rain, snow or water spray. Use of the generating set in a wet place can cause short circuits and electric shock during operation.
17. The generating set must be grounded to prevent electrical shocks from from faulty appliances. Please connea lenght of heavy wires between the generating set ground terminal and a external ground source
18. Most applicance motors requiere more than their rated waltage for star-up, so follow recommendations of your dealer to choose the right power for your applicance.
19. Do not exceed the expecific current limit of any socket.
20. Do not connect directly the generating set to a household circuit.
18. No guarantee will be covered in case of non-compliance of start-up procedures and safety precautions.

CONTENTS

CONTENTS

1. MAIN TECHNICAL SPECIFICATIONS & DATA

1.1 Main technical specifications and data open type



Model	Product Size (mm)			Packaging Size (mm)			Package Material
	Length	Width	Height	Length	Width	Height	
DHY2500L	610	460	530	630	480	565	Carton
DHY4000L/E	680	460	560	710	480	600	Carton
DHY6000L/E	720	480	600	740	500	645	Carton
DHY6000L/E-3	720	480	600	740	500	645	Carton

	Generator Model	DHY2500L/E	DHY4000L/E	DHY6000L/E	DHY6000L/E-3
Generator Set	Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60
	Rated Power	2 / 2.2 kW	3 / 3.3 kW	5 / 5.5 kW	6.3 / 6.9 kVA
	Max.Power	2.2 / 2.4 kW	3.3 / 3.6 kW	5.5 / 6.0 kW	6.9 / 7.6kVA
	Voltage (V)	230 / 120-240	230 / 120-240	230 / 120-240	400 / 120-240
	Current (A)	9.6 / 22	14.3 / 30	23.9 / 50	16.2 / 36
	Sockets	2x16A / XX	2x16A / XX	2x16A / XX	1x16A/3~ & 1x16A/1~/ XX*(1)*
	Display	LED4	LED4	LED4	LED4
	Fuel Tank Capacity (L)	14	14	14	14
	Running Time under 50% Load (hr.)	30 / 27	21 / 19	13 / 11.5	13
	Noise Level behind 7 Meters 50% Load (dBA)	76.9 / 77.2	77.1 / 77.4	77.5 / 78	77.5 / 78
	DC Output (V/A) *(2)*	12 / 8.3	12 / 8.3	12 / 8.3	12 / 8.3
	Battery (Ah)	17	17	36	36
Engine	Engine Type	Diesel	Diesel	Diesel	Diesel
	Engine	D200	D300	D400	D400
	Power Output (HP)	4.2	6	10	10
	Start Method	Manual / Elec. start	Manual / Elec. start	Manual / Elec. start	Manual / Elec. start
	Displacement (ml)	211	296	418	418
	Oil Capacity (L)	0.75	1.1	1.65	1.65
Alternator	Alternator	A2-1 / A2.2-1	A3-1 / A3.3-1	A5-1 / A5.5-1	A5-3 / A5.5-3
	Rated Power (kVA)	2 / 2.2	3 / 3.3	5 / 5.5	6.3 / 6.9
	Power Factor (Cosφ)	1	1	1	0.8
	Voltage Regulation	AVR	AVR	AVR	AVR
Log.data	N.G.(kg)	55/66	68/79	93/108	93/108
	G.W.(kg)	58/69	72/83	98/113	98/113
	Loading capacity 20/40/40HQ	164/340/340	108/222/293	102/213/281	102/213/281

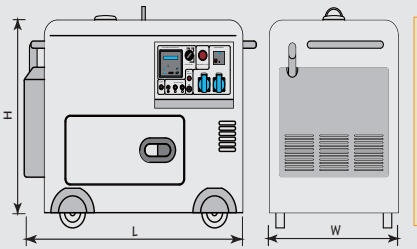
(1) Single phase socket thermal protected

(2) 100W max. output. 10A fuse protection

Values might vary without prior notice, for updated information please visit our web page

1. MAIN TECHNICAL SPECIFICATIONS & DATA

1.2 Main technical specifications and data soundproof type



Model	Product Size (mm)			Packaging Size (mm)			Package Material
	Length	Width	Height	Length	Width	height	
DHY4000SE	920	520	760	950	570	790	Carton
DHY6000SE	920	520	760	950	570	790	Carton
DHY6000SE-3	920	520	760	950	570	790	Carton

	Generator Model	DHY4000SE	DHY6000SE	DHY6000SE-3
Generator Set	Frequency (Hz)	50 / 60	50 / 60	50 / 60
	Rated Power	3 / 3.3 kW	5 / 5.5 kW	6.3 / 6.9 kVA
	Max.Power	3.3 / 3.6 kW	5.5 / 6.0 kW	6.9 / 7.6 kVA
	Voltage (V)	230 / 120,240	230 / 120,240	400 / 120,240
	Current (A)	14.3 / 30	23.9 / 50	16.2 / 36
	Sockets	2X16A / XX	2x16A / XX	1x16A/3~ & 1x16A/1~ / XX*(1)*
	Display	LED4	LED4	LED4
	Fuel Tank Capacity (L)	17	17	17
	Running Time under 50% Load (hr.)	23 / 21	16 / 14.5	16 / 14.5
	Noise Level behind 7 Meters 50% Load (dBA)	72 / 72.1	72.6 / 72.8	72.6 / 72.8
	DC Output (V/A) *(2)*	12 / 8.3	12 / 8.3	12 / 8.3
	Battery (Ah)	17	36	36
Engine	Engine Type	Diesel	Diesel	Diesel
	Engine	D300E	D400E	D400E
	Power Output (HP)	6	10	10
	Start Method	Elec. star	Elec. start	Elec. start
	Displacement (ml)	296	418	418
	Oil Capacity (L)	1.1	1.65	1.65
Alternator	Alternator	A3-1S / A3.3-1S	A5-1S / A5.5-1S	A5-3S / A5.5-3S
	Rated Power (kVA)	3 / 3.3	5 / 5.5	6.3 / 6.9
	Power Factor (Cosφ)	1	1	0.8
	Voltage Regulation	AVR	AVR	AVR
Log.data	N.G.(kg)	150	160	160
	G.W.(kg)	157	167	167
	Loading capacity 20/40/40HQ	68/144/144	68/144/144	68/144/144

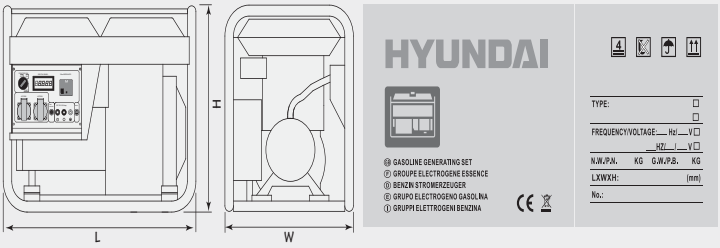
(1) Single phase socket thermal protected

(2) 100W max. output. 10A fuse protection

Values might vary without prior notice, for updated information please visit our web page

1. MAIN TECHNICAL SPECIFICATIONS & DATA

1.3 Main technical specifications and data welder type



Model	Product Size (mm)			Packaging Size (mm)			Package Material
	Length	width	height	Length	width	height	
DHYW180AC	720	530	580	740	550	610	Carton
DHYW190AC	720	530	580	740	550	610	Carton

	Generator Model	DHYW180AC	DHYW190AC
Generator Set	Frequency (Hz)	50	50
	Rated Power	4.5 kW	2.5 kW *(1)*
	Max.Power	5 kW	2.8 kW
	Voltage (V)	230	230
	Rated welding current (A)	12	12
	Rated welding voltage (V)	180	190
	Display	LED4	LED4
	Fuel Tank Capacity (L)	14	14
	Running Time under 50% Load (hr.)	30	30
	Noise Level behind 7 Meters (dBA)	77.5	77.5
	DC Output (V/A) *(2)*	12 / 8.3	12 / 8.3
	Battery (Ah)	36	36
Engine	Engine Type	Diesel	Diesel
	Engine	D400	D400
	Power Output (HP)	10	10
	Start Mothod	Electrical start	Electrical start
	Displacement (ml)	418	418
	Oil Capacity (L)	1.65	1.65
Alternator	Alternator	A5W	A5W190
	Rated Power (kVA)	2.5	2.5
	Power Factor (Cosφ)	1	1
	Voltage Regulation	AVR	AVR
Log.data	N.W.(kg)	110	112
	G.W.(kg)	113	115
	Loading capacity 20/40/40HQ	102/213/281	102/213/281

(1) Can not use welding and power generation at the same time
Designed for professional use in welding
(2) 100W max. output. 10A fuse protection

D-diesel engine ***AC-welder set***

● ***Specifications are subject to continuous product delevopment***

1. MAIN TECHNICAL SPECIFICATIONS & DATA

1.4 Basic parameters

1.4.1 Provide of rated power under following conditions

Sea level (M)	Ambient temperature (°C)	Relative humidity
0	20	60%

table 1

1.4.2 Working reliable under the following conditions

Sea level (M)	Ambient temperature (°C)	Relative humidity
<1000	5-40	<90%

table 2

1.4.3 Working reliable under special conditions

For special conditions appliances the power of the generator must be correct according the bellow formala and table:

$$Ph = Pn \times K1 \times K2$$

Where:

Ph = Power on the requiered height

Pn = Nominal Power

K1 = 1 for use less than 12hr. Day / 0.9 for use over 12hr. Day

K2 = Coeficient according below table

HUMIDITY BETWEEN 0-50%

K2		TEMPERATURE (Celsius)									
		0	5	10	15	20	25	30	35	40	45
HEIGHT (m.)	0	-	-	-	-	1	0.98	0.96	0.94	0.92	0.89
	200	-	-	-	0.99	0.97	0.95	0.93	0.92	0.89	0.86
	400	-	1	0.98	0.96	0.94	0.92	0.9	0.89	0.87	0.84
	600	1	0.87	0.95	0.94	0.92	0.9	0.88	0.86	0.84	0.82
	800	0.97	0.94	0.93	0.91	0.89	0.87	0.85	0.84	0.82	0.79
	1000	0.94	0.92	0.9	0.89	0.87	0.85	0.83	0.81	0.79	0.77
	1500	0.87	0.85	0.83	0.82	0.8	0.79	0.77	0.75	0.73	0.71
	2000	0.81	0.79	0.77	0.76	0.74	0.73	0.71	0.7	0.68	0.65
	2500	0.75	0.74	0.72	0.71	0.69	0.67	0.65	0.64	0.62	0.6
	3000	0.69	0.68	0.66	0.65	0.63	0.62	0.61	0.59	0.57	0.55
	3500	0.64	0.63	0.61	0.6	0.58	0.57	0.55	0.54	0.52	0.5
	4000	0.59	0.58	0.56	0.55	0.53	0.52	0.5	0.49	0.47	0.46

HUMIDITY BETWEEN 50-100%

K2		TEMPERATURE (Celsius)									
		0	5	10	15	20	25	30	35	40	45
HEIGHT (m.)	0	1	1	1	1	0.99	0.96	0.94	0.91	0.88	0.84
	200	1	1	1	0.98	0.96	0.93	0.91	0.88	0.85	0.82
	400	1	0.99	0.97	0.95	0.93	0.9	0.88	0.85	0.82	0.79
	600	0.99	0.97	0.95	0.93	0.91	0.88	0.86	0.85	0.8	0.77
	800	0.96	0.94	0.92	0.9	0.88	0.85	0.83	0.8	0.77	0.74
	1000	0.93	0.91	0.89	0.87	0.85	0.83	0.81	0.78	0.75	0.72
	1500	0.87	0.85	0.83	0.81	0.79	0.77	0.75	0.72	0.69	0.66
	2000	0.8	0.79	0.77	0.75	0.73	0.71	0.69	0.66	0.63	0.6
	2500	0.74	0.73	0.71	0.7	0.68	0.65	0.63	0.61	0.58	0.55
	3000	0.69	0.67	0.65	0.64	0.62	0.6	0.58	0.56	0.53	0.5
	3500	0.63	0.62	0.61	0.59	0.57	0.55	0.53	0.51	0.48	0.45
	4000	0.58	0.57	0.56	0.54	0.52	0.5	0.48	0.46	0.44	0.41

table 3

1.4.4 Selection of the right power for the generator

To make the right selection of the generator power please note that many equipments have what is called a pick intensity when start up the machine. For that reason the nomimal power of the equipmet is not the same as the nominal power requiered. Please refer to the table bellow for reference but in any case if you have any doubt tyou can consult with your specialiced partner dealer, or also can contact the manufacturer for any clarification.

LOAD / MODEL	Home electric appliance, incandescent lamp.	Machine with rectifier type motor	Machine with capacitance starting type
	Projector, electric cooker, T.V., bulb, microwave.	Drilling machine, grinding machine	Water pump, air compressor.
DHY2500L/E	1760 W	733 W	1100 W
DHY4000L/E	2640 W	1100 W	1650 W
DHY4000SE			
DHY6000L/E/3	4400 W	1833 W	2750 W
DHY6000SE/3			

table 4

⚠ CAUTION Do not connect any equipment that exceed the values above mentioned.

1.5 Name identification and name plate

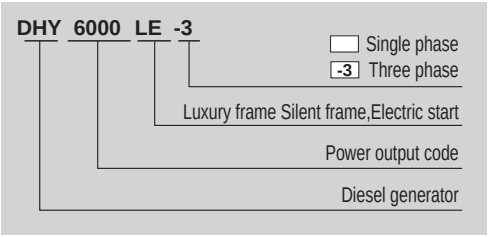
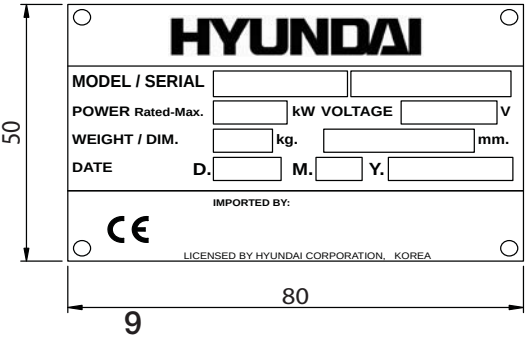


table 5

All products manufactured from ITC Power under license of HYUNDAI Corporation, include a name plate on the generator set in order to trace the production time and the model.

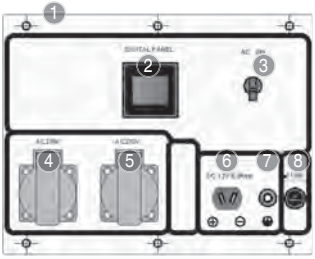
Fig.1 Name Plate
Soundproof type

Fig.2 Name Plate
Open type



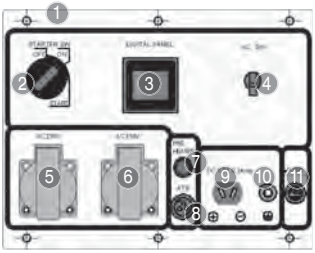
2. IDENTIFICATION OF THE PARTS

2.1.1 Control panel LED3 Manual start Open Type CPD41M/CPD42M



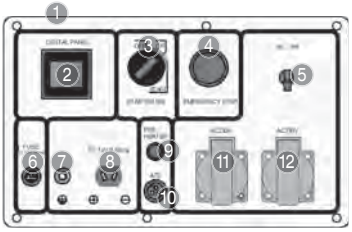
1 panel plate
2 LED3 display
3 thermal breaker
4 CPD41M Single phase socket
CPD42M Three phase socket
5 single phase socket
6 12V connector
7 earth connector
8 10A fuse

2.1.2 Control panel LED3 Electric start Open Type CPD41E/CPD42E



1 panel plate
2 key contactor
3 LED3 display
4 thermal breaker
5 CPD41E Single phase socket
CPD42E Three phase socket
6 single phase socket
7 pre heater push button
8 ATS connector
9 12V connector
10 earth connector
11 10A fuse

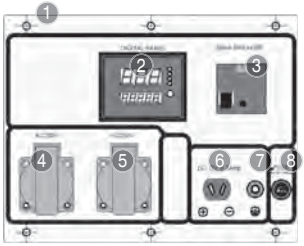
2.1.3 Control panel LED3 Electric start Silent type CPD43E/CPD44E



1 panel plate
2 LED3 display
3 key contactor
4 emergency stop button
5 thermal breaker
6 10A fuse
7 earth connector
8 12V connector
9 pre heater push button
10 ATS connector
11 CPD43E Single phase socket
CPD44E Three phase socket
12 single phase socket

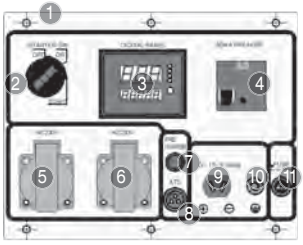
2. IDENTIFICATION OF THE PARTS

2.2.1 Control panel LED4 Manual start Open Type CPD11M/CPD12M



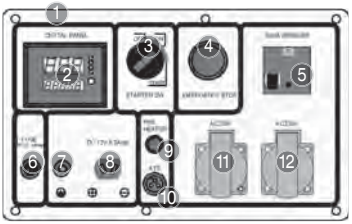
1 panel plate
2 LED4 display
3 CPD11M 1~.30mA leakage breaker
CPD12M 3~.30mA leakage breaker &
1~thermal breaker for 1~ socket
4 CPD11M Single phase socket
CPD12M Three phase socket
5 single phase socket
6 12V connector
7 earth connector
8 10A fuse

2.2.2 Control panel LED3 Electric start Open Type CPD11E/CPD12E



1 panel plate
2 key contactor
3 LED4 display
4 CPD11E 1~.30mA leakage breaker
CPD12E 3~ 30mA leakage breaker &
1~thermal breaker for 1~ socket
5 CPD11E Single phase socket
CPD12E Three phase socket
6 single phase socket
7 pre heater push button
8 ATS connector
9 12V connector
10 earth connector
11 10A fuse

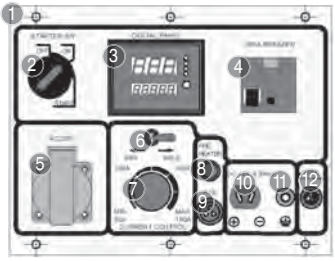
2.2.3 Control panel LED3 Electric start Silent type CPD14E/CPD15E



1 panel plate
2 LED4 display
3 key contactor
4 emergency stop button
5 CPD14E 1~.30mA leakage breaker
CPD15E 3~ 30mA leakage breaker &
1~thermal breaker for 1~ socket
6 10A fuse
7 earth connector
8 12V connector
9 pre heater push button
10 ATS connector
11 CPD43E Single phase socket
CPD44E Three phase socket
12 single phase socket

2. IDENTIFICATION OF THE PARTS

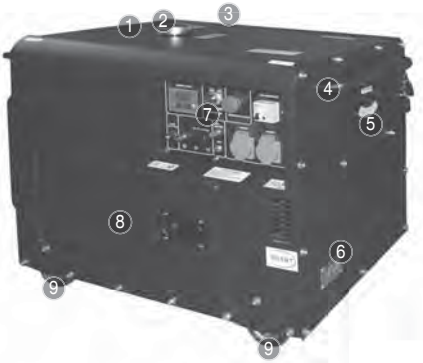
2.3.1 Control panel LED4 Welder Type



1 panel plate
2 key contactor
3 LED4 display
4 Thermal breaker
5 Single phase socket
6 Welder/Power switch, only for model DHYW190AC
7 Intensity regulator
8 pre heater push button
9 ATS connector
10 12V connector
11 earth connector
12 10A fuse

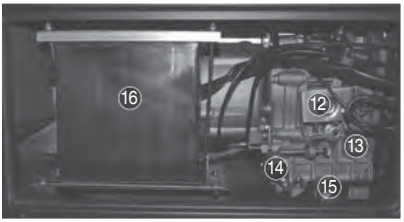
2. IDENTIFICATION OF THE PARTS

2.3 Identification of the parts soundproof type



1 fuel level indicator
2 fuel cap
3 lift hook
4 handle
5 air filter cover
6 name plate
7 control panel
8 door for maintenance
9 wheels

3 hook
4 handle
9 wheels
10 muffler output
11 AVR door access

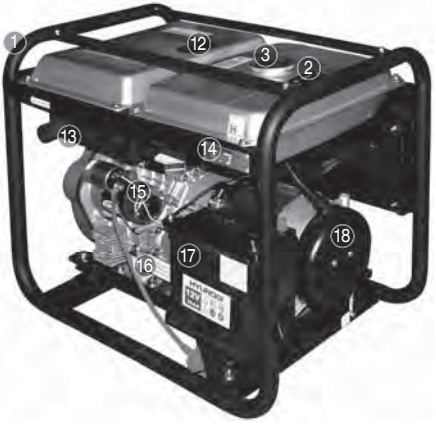


12 speed handler
13 oil dipstick
14 oil prime filter
15 oil drain screw
16 battery

2. IDENTIFICATION OF THE PARTS

2.4 Identification of the parts open type

1 frame
2 fuel level indicatior
3 fuel cap
4 air filter
5 recoil starter
6 injection pump
7 speed handler
8 oil refill / Oil dipstick
9 oil filter
10 oil drainage
11 control panel



2 fuel level indicator
3 fuel cap
12 decompressor acces
13 muffler
14 name plate
15 starter motor
16 oil refil / oil dipstick
17 battery

3. OPERATION OF DIESEL GENERATING SET

3.1 Notes of operating diesel generating set

Please follow the next notes in order not to get hurt or damage the generating set.

⚠ WARNING

⚠ CAUTION

3.1.1 Preventing of 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.

⚠ WARNING

3.1.2 Preventing the suction of exhaust gas

Too avoiding exhaust gas sucked by the person, the diesel generator will be not allowed to work under condition of bad ventilation, because exhaust gas emitted from the engine includes harmful CO_2.

⚠ DANGER

3.1.3 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.

⚠ WARNING

3.1.4 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 or close to any water spray. For preventing the shock by electricity, the grounding should be made, 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.

⚠ CAUTION

3.1.5 Other safety points

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

⚠ DANGER

3.1.6 Charging the battery

The diesel generator has automatic charging function. The electrolytic liquid of the battery contains the sulfuric acid. For protecting the human being, should make suitable protection measurement. As the hydrogen resulting from the battery is of easy explosive gas, do not smoke when charging. It is not also permitted to make the spark around the battery. Be sure that there is better ventilation for charging.

3. OPERATION OF DIESEL GENERATING SET

3.2 Preparation before starting

Fig.3 fuel fill
Soundproof type

Fig.4 fuel fill
Open type

3.2.1 Selection of the fuel

Only adopt light diesel.Fill in the diesel to fuel tank at full level.

a) Open type:

Fuel tank	14 L

b) Silent type:

Fuel tank	17 L

3.2.2 Filling in lube oil

3.2.2.1 Lube oil quality: The qualified lube oil should meet following condition.

ACEA-B2/E2 or higher-grade specification.

API-CD/CE/CF-4/CG-4 or higher-grade specification.

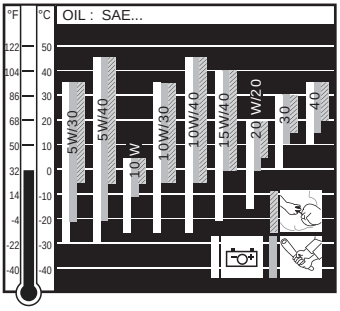
If adopting inferior lube oil, should change the lube oil after every 100 hour operation.

Fig.5 oil fill
Soundproof type

Fig.6 oil fill
open type

3.2.2.2 Lube oil viscosity

Select lube oil viscosity based on ambient temperature when starting at cold temperature.



3.2.2.3 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.

⚠ CAUTION

It is very important to pay attention to lube oil quality, because it will affect the performance & reliability of the engine. If using inferior lube oil or lube oil with impurity or not changing lube oil at fixed time, it will cause the piston to be clipped and make the parts easily worn out, such as cylinder, bearing, and other moving parts. The engine life will be greatly shortened.

⚠ CAUTION

3.2.2.4 Interval for changing lube oil:

First time	30 hours
Next three times	50 hours
Later Every	100 hours

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.

3.2.3. Check the air cleaner

The interval of checking the air filter and clean or replace it depend if used in dusty emviroments we recommend as follow:

Clean	100 hours
Replace	500 hours

The process of cleaning the filter element is just with pressure water, do not use chemical or detergents.

The Air filter must be complete dry before install again in the machine.

Fig.7 Untight screw of air filter cover

Fig.8 Air filter element

Fig.9 two parts air filter element

Fig.10 cover air filter soundproof

Fig.11 air filter soundproof

a) Open type:

A.1 Untight the screw from the cover

A.2 Remove the cover

A.3 Remove the Air filter element

A.4 Clean or replace the air filter element

A.5 Place the air filter element again in its original position

A.6 Tight all screw that fix the air element

A.7 Place the cover of the air filter and tight the screw.

b) Silent type:

B.1 Remove the cover shown in Fig.10

B.2 Process as the Open type (A.1 to A.7)

B.3 Place the cover

B.4 Tight the screws

IT IS FORBIDEN TO RUN THE GENERATOR WITHOUT AIR CLEANER.

⚠ CAUTION

⚠ CAUTION

Fig.12 30mA leakage breaker Single phase off


Fig.13 30mA leakage breaker Three phase off


Fig.14 air purge over inlet pipe


Fig.15 air purge over fuel injection pump


Fig.16 oil dipstick on diesel engine

3.2.4. Checking the generator load

Unplug any power from the generator, like lamp and motor etc.

Before starting the generator, must turn off main switch (off position of the thermal or leakage breaker). If not in this position, it is very dangerous for the generator to be started with the load.

DO NOT START THE GENERATOR WITH LOAD

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

3.2.5. Checking the fuel piping

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.

This operation should be made only on the first start up or after the long term storage process or after changing the fuel filter.

3.3 Checking and operating the engine

3.3.1 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. Not need to tight the oil dipstick to check the oil level. Must be check without screw the dipstick

3.3.2 Operation in trial

For new engine, it is necessary to have 30 hour running-in operation initially

A Avoiding over-load

During the trial operation, should prevent over-load in order not to damage the engine

B Changing lube oil at fixed period

Change it after initial 30 hours operation. Refer to operation manual paragraph 4.1.1

Fig.17 speed handler at RUN position

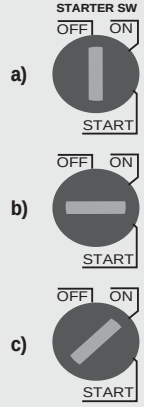
Fig.18 speed handler at STOP position

Fig.19 decompressor

⚠ CAUTION

Fig.12 30mA leakage breaker Single phase off

Fig.13 30mA leakage breaker Three phase off



3. OPERATION OF DIESEL GENERATING SET

3.4 Starting & operating the generator

3.4.1 Preparation before starting

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

Connect battery electrode as when deliver are not connected

3.4.2 Starting

3.4.2.1 Manual start

a) Place the circuit or leakage breaker to the off/lower position so no electric power will be given by the machine

b) Pull the starter grip lightly until you feel resistance and them relase it.

c) Press the decompressor on the top of the cylinder head in order to reduce the pressure in the cylinder and make easyer pull.

d) Pull briskly

f) Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the starter

g) After 3 minutes running the machine move the circuit or thermal-breaker to the on/upeer position

h) You machine is ready to be used

NOTE 1: If after 3 or 4 attempts the engine does not starts means that there is air in the fuel circuit, please refer to point 3.2.5 in order to purge the air.

NOTE 2: Be sure that the circuit or leakage breaker is set in the off position, otherwise the machine can be damage

NOTE 3: Do not adjust fuel quantity controller or speed limiter (having adjusted before delivery). Otherwise, the performance of the engine will be affected.

3.4.2.2 Electric start

a) Insert the key to OFF position

b) Turn the key to START position clockwise

c) After starting successfuly, remove the hand from the key to make the key go back to the ON position automatically.

d) If failed to start within 10 seconds holding in START position, please wait 15 seconds for next starting. If starting motor works too long, the battery will drop to because the motor to be blocked. During the operation, let the key be in ON position.

e) After 3 minutes running the machine move the circuit or thermal-breaker to the on/upeer position

f) You machine is ready to be used

NOTE 1: If after 3 or 4 attempts the engine does not starts means that there is air in the fuel circuit, please refer to point 3.2.5 in order to purge the air.

NOTE 2:Be sure that the circuit or leakage breaker is set in the off postion, otherwise the machine can be damage

NOTE 3: Do not adjust fuel quantity controller or speed limiter (having adjusted before delivery). Otherwise, the performance of the engine will be affected.

3.4.2.2 Remote control Start

Fig.20 remote control

a) Place the circuit or leakage breaker to the off/lower position so no electric power will be given by the machine

b) Leave the Key contactor in OFF position

c) Push the button on the remote control with open lock figure to start the generator

d) The generator will start automaticly.

e) After 3 minutes running the machine move the circuit or thermal-breaker to the on/upeer position

f) You machine is ready to be used

NOTE 1: If after 3 or 4 attempts the engine does not starts means that there is air in the fuel circuit, please refer to point 3.2.5 in order to purge the air.

NOTE 2: Be sure that the circuit or leakage breaker is set in the off postion, otherwise the machine can be damage

NOTE 3: Do not adjust fuel quantity controller or speed limiter (having adjusted before delivery). Otherwise, the performance of the engine will be affected.

3.4.3 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. Black means the engine is working abnormal or on overload. White means the mix of air and fuel is not right

3.5 Adding load

a) Add the load according to stipulated data. Please refer to table 4 for detailed loaded data.

Fig.17 speed handler at RUN position

b) The generator should be running at rated speed (leave the speed handler to “RUN” position). Otherwise, the voltage, frequency and power will be lower than rated limit, shown in point 1.1 and 1.2

c) When voltage indicating on control panel reaches ±10% of rated limit, can add the load.

d) When connected with the generator, all kinds of machineries should be by order.

If improper operation, the generator will work out of order. At this time turn of the circuit thermal or leakage breaker them shut off the generator switch in time to unload and then check the problem. If it is overload, should reduce the load. Then start the generator again a few minutes later. If the indicating of voltage meter is low or high for a period of more than 10 seconds, must stop the generator for checking.

e) Overload protection. According to the model there is an accurate overload protection over the measurement of the ampere, LED4 equipment. When overload occurs the 30mA leakage breaker switch to off position. Means that overload has occurred. In that case reduce the load and turn the 30mA meakage breaker to the On or upper position. No need to restart the generator.

NOTE 1: Do not start more than two machines in the same time. Only start them one by one.

NOTE 2: Do not use floodlights with other machines meanwhile.

Fig.18 speed handler at STOP position

3.6 Stopping the generator

a) Before stopping the generator stop any machine connected.

b) Move the thermal of 30mA leakage breaker to the lower position so the generator is not giving power.

c) Let the generator run for at least 3 min. without load in orther to cool it down.

d) Stop the generator

- Manual start: Release the speed controller from RUN to STOP position by pressing on the side of it.
- Electric start: Turn the key to the off position
- Remote control: Push the lock open key on the remote controller.

e) For Soundproof generator there is an emergency stop button on the control panel used to stop the generator in case of emergency. Use it only in case of emergency as if stop the generator with load can damage the AVR.

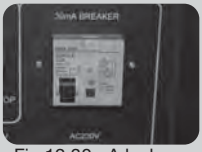


Fig.12 30mA leakage breaker Single phase off

Fig.13 30mA leakage breaker Three phase off

3. OPERATION OF DIESEL GENERATING SET

3.7 Battery

a) The standard battery is maintenance free type, no need to add any liquid.

b) During the operation, the generator can automatically charge the battery.

c) If the generator is used for stand-by application, should remove the battery.

d) If the voltage battery is too low, the generator will be difficult to start. Please charge the battery by charger before starting the generator.

NOTE 1: Do not start more than two machines in the same time, Only start them one by one.

Fig.21 LED3

Fig.22 LED4

3.8 Control panel

There are two kind of control panels, LED3 and LED4 type:

LED3: This control panel has protection for the overload under thermal breaker.

The LED display is giving information of the voltage, running hours, frequency.

LED4: The main feature of this display is the protection of the overload over the measurement of the current.

Once the display is receiving power will show the different information of the generator performance.

By pressing the MODE key will display the information according Voltage, current, Power and frequency

Protection settings: The LED4 display can settle different values for the protection of the generator, default setting from factory can be modified but is not recommentd to do.

3.9 Welding process

Connect the welding cables to the generator

Be sure the cables are not cross

Select the desired intensity in the control panel.

Weld the desired parts.

Note:

DO NOT USE ELECTRODE WITH DIAMETER OVER 4mm.

4. MAINTENANCE OF DIESEL GENERATOR

4.1 Maintenance of diesel generator

For the generator works in order it is very important to perform the maintenance at fixed period.

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. Please perform the maintenance in a well ventilated area as the gases and the exhaust can be harmful.

4.1.1 Change lube oil

To perform the changing of the oil it is recommend to run the engine at least for 15 min. in order to warm the oil so will be much more easy to drain it.

The oil of the engine must be change after the first 30 hours of running and them every 50 hours for the next three time and them every 100 hours.

Please do not through the oil to normal rubbish can, deposit the used oil in the appropite oil bin.

Interval for changin the lube oil:

First time	30 hours
Next three times	50 hours
Later Every	100 hours

Fig.23 drain oil open type

Fig.24 prime oil filter screw

Fig.25 prime oil filter

Fig.26 oil dipstick

OPEN TYPE GENERATOR:

a) Place a vessel bellow the oil-drain plug

b) Open the oil dipstick

c) Remove the oil drain plug

d) Let the oil complete flow out of the engine

e) Remove prime oil filter

f) Clean the prime oil filter with a brush and diesel

REPLACE PRIME OIL FILTER EVERY 500 hours

g) Screw the oil drain plug

h) Place the prime oil filter in the engine and tight the screw, be sure the o-ring is not damage

i) Fill the engine with new oil. (for oil selection please refer to point 3.2.2 of this user manual) (for oil capacity please refer to point 1.1 of this user manual)

j) Check oil level of the engine, to do so check mark on the oil dipstick. Do not need to tight the oil dipstick to check level.

k) Tight oil dipstick. Be sure the o-ring is not damage

Fig.27 drain oil soundproof type

SILENT TYPE GENERATOR:

a) Place a vessel bellow the oil-drain plug

b) Open the oil dipstick

c) Remove the oil drain plug

d) Let the oil complete flow out of the engine

e) Remove prime oil filter

Fig.28 prime oil filter in engine

f) Clean the prime oil filter with a brush and diesel

REPLACE PRIME OIL FILTER EVERY 500 hours

Fig.25 prime oil filter

g) Screw the oil drain plug

h) Place the prime oil filter in the engine and tight the screw, be sure the o-ring is not damage

i) Fill the engine with new oil. (for oil selection please refer to point 3.2.2 of this user manual) (for oil capacity please refer to point 1.1 of this user manual)

Fig.26 oil dipstick

j) Check oil level of the engine, to do so check mark on the oil dipstick. Do not need to tight the oil dipstick to check level.

k) Tight oil dipstick. Be sure the o-ring is not damage

4.1.2 Change/clean the element of air cleaner

Change or clean the air filter element at the metion period time, in enviroments dusties or with high humidity is recomended to perform this maintenance more often. If generator reduces the power output or shows black smoke please proceed to clean or replace the air filter element. There is optional a oil bath air filter for very dusties enviroments. Please ask your dealer for details.

Fig.9 two parts air filter element

	Clean (everytime perform the oil change)	Replace
First time	30 hours	100 hours
Next three times	50 hours	500 hours
Later Every	100 hours	500 hours

4. MAINTENANCE OF DIESEL GENERATOR

Fig.7 Untight screw of air filter cover

Fig.8 Air filter element

Fig.9 two parts air filter element

Fig.10 cover air filter soundproof

Fig.11 air filter soundproof

OPEN TYPE GENERATOR

a) Remove the screw on the outside of the air filter cover

b) Remove the screw on the filter element

c) Remove the filter element

d) Clean or replace according the maintenance scheudle

e) Never clean the filter element with detergent

f) Be sure the air filter element is dry enought before place again in the engine

g) Tight the screw on the air filter element

h) Place the air filter cover and tight the screw

SILENT TYPE GENERATOR

a) Remove the metal cover on the canopy

b) Remove the screw on the outside of the air filter cover

c) Remove the screw on the filter element

d) Remove the filter element

e) Clean or replace according the maintenance scheudle

f) Never clean the filter element with detergent

g) Be sure the air filter element is dry enought before place again in the engine

h) Tight the screw on the air filter element

i) Place the air filter cover and tight the screw

j) Place the metal cover and tight the screw to fix the cover to the canopy.

4.1.3 Change/clean fuel filter

The generator set has two fuel filters to prevent the impurity of the diesel to reach the engine.

Fig.29 prime fuel filter soundproof type

4.1.3.1 FUEL TANK PRIME FUEL FILTER

This fuel filter must be clean everytime we apppreciate some solid parts on it. But at least every 500 hours must be remove and clean with diesel. Never use water to clean any fuel filter

a) Remove fuel tank cap

b) Take out the prime fuel filter

c) clean it with diesel fuel

d) place the prime fuel filter again in the fule tank

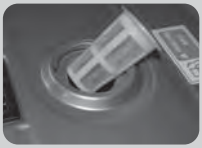


Fig.30 prime fuel filter open type

4.1.3.2 IN LINE FUEL FILTER

This fuel filter must be replace everytime we change the air filter

First time	100 hours
Next three times	500 hours
Later Every	500 hours

Fig.31 IN LINE fuel filter

Fig.32 arrow of direction detail

OPEN TYPE GENERATOR

The fuel filter is placed below the fuel tank, in the hose that goes from the fuel tank to the engine.

a) Remove the metal brackets from the hose on the injection valve side in order to drain the fuel in the tank.

b) Drain the fuel in the fuel tank

c) Remove the metal brackets from the hose on both side of the filter

d) Remove the fuel filter

e) Place the new fuel filter and pay attention to the arrow shown on the filter as this filters must be install in the right direction

f) Tight the brackets on the hose

g) Drain the air in the fuel hose according point 3.2.5

SILENT TYPE GENERATOR

The fuel filter is placed below the fuel tank, in the hose that goes from the fuel tank to the engine.

a) Open the side door in order to access tot he fuel filter

Fig.32 arrow of direction detail

b) Remove the metal brackets from the hose on the injection valve side in order to drain the fuel in the tank.

c) Drain the fuel in the fuel tank

d) Remove the metal brackets from the hose on both side of the filter

e) Remove the fuel filter

f) Place the new fuel filter and pay attention to the arrow shown on the filter as this filters must be install in the right direction

g) Tight the brackets on hose

h) Drain the air in the fuel hose according point 3.2.5

4.1.4 Check the electrolytic and charge the battery

In the generators models with Electric Start the voltage of the batery must be check in order to be sure that the battery is not running out.

Check the voltage of the battery	Once a month

The battery used in the generator is a 12V battery but the normal voltage of it must be over 13V. If voltage is lower than 12V please proceed to recharge the battery with an external battery charger.

In order not to run out of battery we recommend to perform at least one start up per week during 30 minutes.

If the generator is not going to be used for longer period please desconect the battery from the terminal on the battery.

The battery include in the generator is a maintenance free type so do not need to add the electrolyte

4.1.5 General maintenance

Never incline your generator during the transport when there is oil in the engine. Non respect of this premise will damage seriously the engine.

We do recomend to clean the generator after each use and before long time storage.

Make a visual control of the generator so all the screws and all the parts as during the use of the generator and because of the vibrations of the machine some parts can be lose.

5. LONG TIME STORAGE

When generator is not going to be used for longer period we recommned to perform the next operations:

a) Drain the diesel on the fuel tank

b) Drain the oil in the engine

c) Pull the recoil starter until the position that feel resistance so the intake and exhaust valves will be closed.

d) In the models with electric start remove the connection from the battery electrode

e) Clean the generator from dust and dirty

When the generator must start again please proceed as explain before in point 3 of this user manual

NOTE: After long time storage the battery could be empty, please proceed to recharge before use

6. TROUBLE SHOOTING AND REMEDY

Causes		Remedies
No start of the engine	Insufficient fuel	Fill in the fuel
	Air in fuel circuit	Purge air in fuel circuit
	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"
	Dirty on the nozzle	Clean the nozzle
	No electricity in battery	Charge or change the battery
No output of generator	Not turn on the switch	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

7. GUARANTEE

This generators are guaranteed for any failure or defect of fabrication for a period of 1 year or 1000 hours. Non respect of the instructions in this user manual will avoid the guarantee.

8. NOTES

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