TRADITIONELLE DEUTSCHE QUALITÄT

Please, read this manual carefully before use!

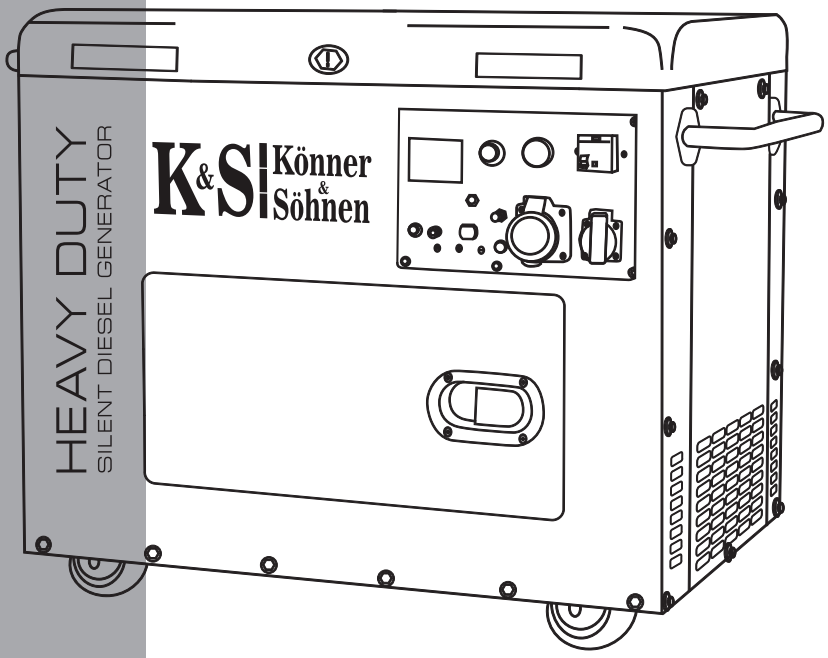
Owner's Manual

ENG

HEAVY DUTY

DIESEL GENERATOR

KS 9200HDE ATSR
KS 11-2DE ATSR
KS 13-1DEW 1/3 ATSR
KS 13-2 DEW ATSR
KS 13-2 DEW 1/3 ATSR
KS 14-1 DE ATSR
KS 14-2 DE ATSR
KS 14-2 DE 1/3 ATSR



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Abbreviations and acronyms:

KS	Electric generator
D	Diesel
E	Electric start
S	Soundproof housing
1/3	Single-and three-phase operation
HD	HEAVY DUTY

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1. PREFACE

Thank you for your purchase of **TM Könner & Söhnen** «HEAVY DUTY» series diesel generator.It is professional machinery with an increased service life and is therefore suitable for heavy-duty operation.
HEAVY DUTY series diesel generator engines have a service life of more than 3,000 operating hours subject to observance of the rules of generator operation and the maintenance schedule.
This manual contains safety instructions, a description of the use and commissioning of **Könner & Söhnen** generators and procedures for their maintenance.

The generator manufacturer may make some modifications that may not be reflected in this manual.
The manufacturer reserves the right to make changes in the product design, configuration and construction. The images and drawings in this manual are for reference only and may differ from the actual components and inscriptions on the products.

Contact information that you are free to use in case of any problems can be found at the end of this manual. All information in this manual is correct to the best of our knowledge and belief at the date of its publication.

IMPORTANT!

In order to ensure equipment integrity and avoid possible injuries, we recommend that you read this manual before operating the generator.

NOTE!

Do not operate single-phase and three-phase circuit breakers at the same time to prevent electrical shock and avoid damage to your electrical devices and the generator!
(Circuit breakers are shown in Figs. 3 and 4)

The current list of service centers can be found on the official importer's website:
www.ks-power.de/en/

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2. SAFETY PRECAUTIONS FOR DIESEL GENERATOR OPERATION

Read this manual carefully
before operating the generator.

WORK AREA

- Do not use the generator near flammable gases, liquids or dust. During operation of the generator, its exhaust system becomes very hot. This may cause fire or explosion of these materials.
- The work area work should have adequate lighting and be clean
- Keep unauthorized persons, children and animals away from the running generator.

ELECTRICAL SAFETY

- The generator produces electricity that can cause electric shock in the event of failure to observe safety precautions.
- Avoid operating the generator in high-humidity environments. Do not allow moisture to enter the generator, as this increases the risk of electric shock.
- Avoid direct contact with grounded surfaces (pipes, radiators, etc.).
- Be careful when working with the power cord. Replace it immediately in case of damage, as damaged power cord increases the risk of electric shock.
- All generator connections to the mains supply must be carried out by a certified electrician in accordance with all electrical codes and regulations.
- Connect the electric generator to the protective ground before operation.
- Do not connect/disconnect the generator to/from power consumers while standing in water, on wet or damp soil.
- Do not touch live parts of the generator.
- Only connect the generator to the power consumers that correspond to the electrical specifications and power rating of the generator.
- Keep all electrical equipment dry and clean. Replace damaged or worn wiring. Worn, damaged, or rusted terminals must be replaced as well.

PERSONAL SAFETY

- Do not operate the generator when you are tired or under the influence of potent drugs, alcohol or medication. During operation, inattention can cause serious injury.
- Avoid inadvertent start-up. Make sure the power switch is set to OFF when turning off the generator.
- Make sure there are no foreign objects on the generator when it is turned on.
- Always keep proper footing and balance when starting the generator.
- Do not overload the generator, use it for its intended purpose only.
- Do not operate the generator in areas with poor ventilation. Exhaust gases contain poisonous carbon monoxide, which is life threatening!

OPERATING AND MAINTAINING THE GENERATOR

- Prior to checking the generator before operation, make sure it is placed on a flat, level surface and the engine switch is in the OFF position.
- Check the connection of moving parts, inspect for damaged parts that affect the operation of the generator. Eliminate damage before use.
- Use only recommended oils and fuels for maintenance and repair. The use of other oils, consumables and spare parts deprives you of the right to warranty service.
- The generator must be maintained by trained and qualified personnel only. For the nearest service center, please contact your local dealer or refer to the current list of service centers on the importer's official website:

www.ks-power.de/en/

- Store the generator in a dry, well-ventilated area if you are not using it.

IMPORTANT!

The generator runs on automotive diesel fuel. Do not use gasoline, kerosene, fuel oil as fuel. Diesel fuel type should correspond the operating season.

NOTE!

Do not operate single-phase and three-phase circuit breakers at the same time to prevent electrical shock and avoid damage to your electrical devices and the generator!

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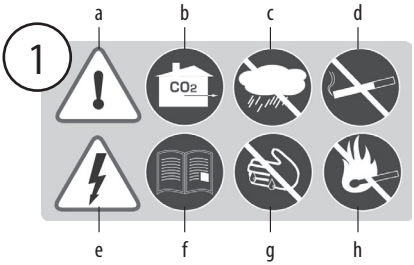
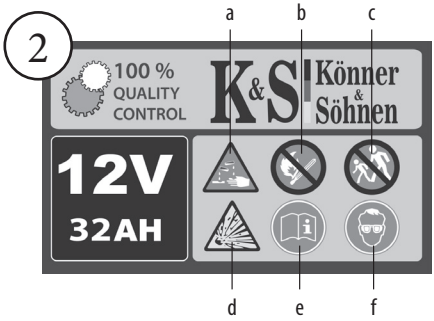
3. SAFETY SYMBOLS

DESCRIPTION OF SAFETY SYMBOLS WHEN OPERATING THE GENERATOR



a. Be careful when operating the device! Observe the safety instructions in this manual.
b. Operate the generator only in well-ventilated indoor spaces or outdoors. Exhaust gases contain CO2, whose vapors are life threatening.
c. Do not operate or store the device in high-humidity environments.
d. Do not smoke while operating the generator!
e. The device generates electricity.
Observe safety precautions to avoid electric shock.
f. Read this owner's manual carefully before operating the device.
g. Do not touch the generator with wet or dirty hands.
h. Observe fire safety regulations, do not operate the generator near open flame.
i. Do not touch! The generator dampener becomes hot during operation.



a. Wear protective rubber gloves when handling the battery. The battery contains a dangerous acid electrolyte. If electrolyte comes into contact with skin or face, rinse immediately with plenty of water and seek medical advice.
b. Do not operate the generator near open flame.
c. Keep children away from the generator work area.
d. Note! The battery releases explosive hydrogen while charging!
e. Read this owner's manual carefully before operating the device.
f. Wear safety goggles when operating the battery.

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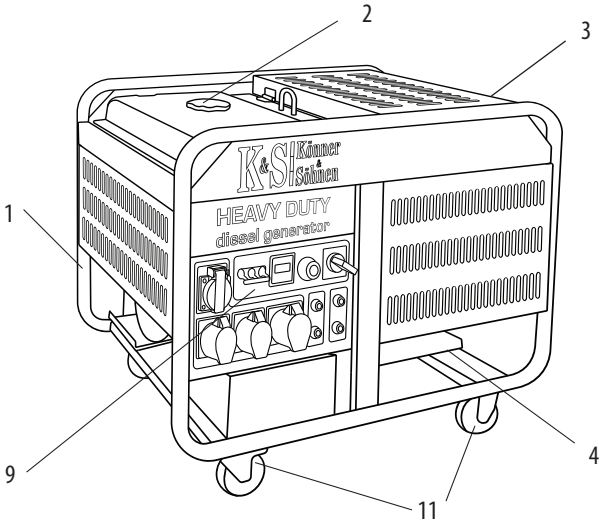
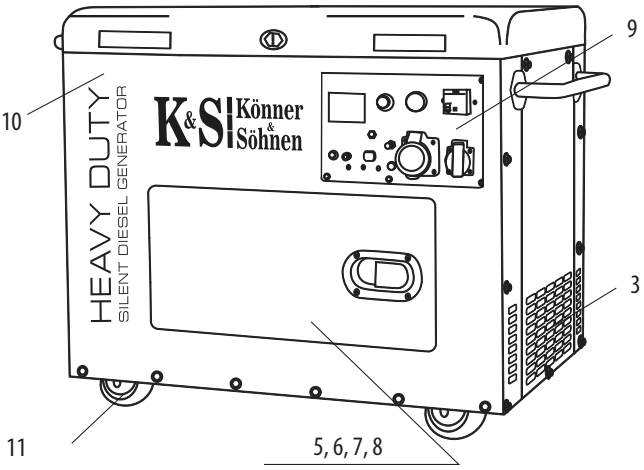
4. DIESEL GENERATOR OVERVIEW AND COMPONENTS

Model KS 13-1DEW 1/3 ATSR, KS 14-1DE ATSR 1/3 ATSR

Fig. 1



Model KS 9200 HDE ATSR, KS 11-2DE ATSR



1. Reinforced frame
2. Fuel tank
3. Damper
4. Anti-vibration mounts
5. Fuel filter
6. Oil filter
7. Oil dipstick
8. Oil drain valve
9. Control panel
10. Soundproof anti-vandal housing
11. Transport kit

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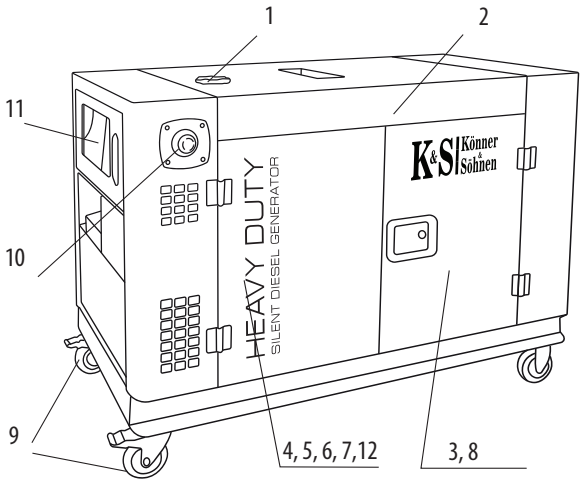
Model KS 13-2DEW ATSR, KS 13-2DEW 1/3ATSR,
KS 14-2DE ATSR, KS 14-2DE 1/3ATSR

Fig. 2



1. Fuel tank
2. Soundproof anti-vandal housing
3. Fuel filter
4. Air filter
5. Oil filter
6. Oil dipstick
7. Oil drain hole
8. Battery
9. Transport kit
10. Engine emergency stop button
11. Control panel
12. Coolant drain hole

IMPORTANT!

The manufacturer reserves the right to make changes in the product design, configuration and construction. Illustrations in this manual are for reference only and may differ from actual components and inscriptions on the products.

5. SCOPE OF SUPPLY

1. Generator
2. Packaging
3. Owner's manual
4. Accessories

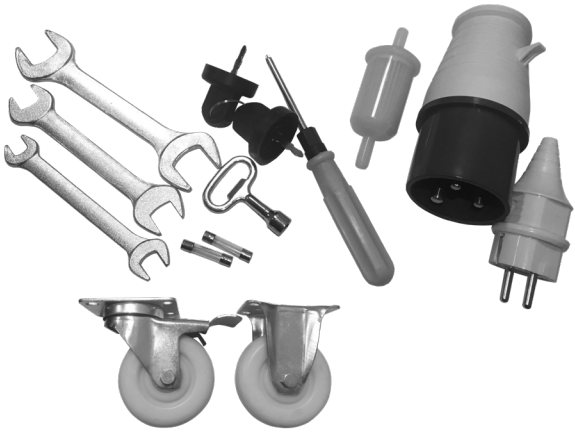
ACCESSORIES

Depending on the generator model, accessories may have different configuration

For models KS 9200 HDE ATSR, KS 11-2 DE ATSR:

- Screwdriver;
- Portable plugs (plugs correspond to the number, power and voltage of the generator outlets);
- 2 x start keys;
- Top cover key;
- Fuel filter;
- Fuses;
-10x12 mm open end wrench;
- 4x17 mm open end wrench;
- 13x16 mm open end wrench;
- Set of screws;
- Wheels (4 pcs).

Fig. 3



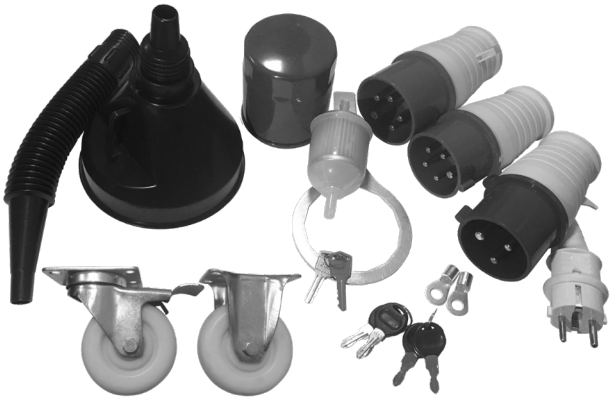
For models KS 13-1 DEW 1/3 ATSR, KS 13-2 DEW ATSR, KS 13-2 DEW 1/3 ATSR:

- Oil filter key;
- Air filter;
- Fuel filter;
- Oil filter;
- 2x start keys;
- Door keys;
- Portable plugs (plugs correspond to the number, power and voltage of the generator outlets);
- Fuel and oil drain funnel;
- Set of screws;
- Wheels (4 pcs)

For models KS 14-1 DE ATSR, KS 14-2 DE ATSR, KS 14-2 DE 1/3ATSR:

- Portable plugs (plugs correspond to the number, power and voltage of the generator outlets);
- 2x start keys;
- Fuel filter;
- Oil filter;
- Fuel and oil drain funnel;
- Stationary terminals;
- Oil filter key;
- Door keys;
- Set of screws;
- Wheels (4 pcs).

Fig. 4



6. GENERATOR SPECIFICATIONS

Model	KS 9200HDE ATSR	KS 11-2DE ATSR
Voltage (V)	230	230
Maximum power (kW)	6.8	8.0
Nominal power (kW)	6.5	7.5
Frequency (Hz)	50	50
Current, A (max.)	29.57	34.78
Outlets	1x32A (230 V), 1x16A (230 V)	
Emergency stop button	-	+
Display	operating hours, frequency, voltage	
Noise level Lpa/Lwa (dB)	64/89	64/89
Output 12 V (A)	12/8.3	12/8.3
Engine model	KS 540HD	KS 690HD
Engine type	diesel powered one-cylinder, four-stroke air-cooled	
Engine power (HP)	14	15
Crankcase volume (cm3)	1.65	2.2
Engine olume (cm3)	531	668
Power output controller	Intelligent AVR	
Engine start	Electric	Electric
Power factor (cosφ)	1	1
Battery (Ah)	30	36
ATS output (universal 6-pin)	+	+
Net dimensions (L*W*H) (mm)	890x520x690	1100x600x750
Gross dimensions (L*W*H) (mm)	950x565x750	1150x650x850
Net weight (kg)	170	216
Gross weight (kg)	180	230
Protection class	IP23M	
Nominal voltage tolerance - max. 10%		

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GENERATOR SPECIFICATIONS

Model	KS 13-1DEW 1/3 ATSR		KS 13-2DEW ATSR	KS 13-2DEW 1/3 ATSR	
Voltage (V)	230	400	230	230	400
Maximum power	8.1 kW	11.25 kVA	9.0 kW	8.1 kW	11.25 kVA
Nominal power	7.7 kW	10.63 kVA	8.5 kW	7.7 kW	10.63 kVA
Frequency (Hz)	50		50	50	
Current, A (max.)	36.96	16.26	39.13	36.96	16.26
Outlets	1x32A (230V) 1x16A (230V) 1x32A (400V) 1x16A (400V)		1x63A (230V) 1x32A (230V) 2x16A (230V) Contact strip	1x32A(230V) 1x16A(230V) 1x32A(400V) 1x16A(400V) Contact strip	
Emergency stop button	+		+	+	
Display	operating hours, frequency, voltage		SmartGen multifunction digital control unit		
Noise level Lpa/Lwa (dB)	73/98		67/92	67/92	
Output 12V (A)	+		-	-	
Engine model	KS 820HD		KS 820HD	KS 820HD	
Engine type	diesel powered two-cylinder, four-stroke air-cooled				
Engine power (HP)	18		18	18	
Crankcase volum, l	3,3		3,3	3,3	
Engine volume (cm3)	794		794	794	
Coolant volume, l	3,5		3,5	3,5	
Power output controller	Intelligent AVR				
Engine start	Electric		Electric	Electric	
Power factor (cosφ)	1	0,8	1	1	0,8
Battery (Ah)	45		45	45	
ATS output (universal 6-pin)	+		+	+	
Net dimensions (L*W*H) (mm)	1050x640x700		1250x650x760	1250x650x760	
Gross dimensions (L*W*H) (mm)	1100x680x820		1300x700x880	1300x700x880	
Net weight (kg)	210		310	310	
Gross weight (kg)	240		345	345	
Protection class	IP23M				
Nominal voltage tolerance - max. 10%					

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GENERATOR SPECIFICATIONS

Model	KS 14-1DE ATSR	KS 14-2DE ATSR	KS 14-2DE 1/3 ATSR	
Voltage (V)	230	230	230	400
Maximum power	11.0 kW	11.0 kW	10.0 kW	13.75 kVA
Nominal power	10.5 kW	10.5 kW	9.5 kW	13.1 kVA
Frequency (Hz)	50	50	50	
Current, A (max.)	47.83	47.83	43.48	19.87
Outlets	1x63A (230V) 1x32A (230V) 2x16A (230V)	1x63A (230V) 1x32A (230V) 2x16A (230V) Contact strip	1x32A(230V) 1x16A(230V) 1x32A(400V) 1x16A(400V) Contact strip	
Emergency stop button	+	+	+	
Display	operating hours, frequency, voltage	SmartGen multifunction digital control unit		
Noise level Lpa/Lwa (dB)	74/99	68/93	68/93	
Output 12 V (A)	+	-	-	
Engine model	KS 1020HD	KS 1020HD	KS 1020HD	
Engine type	diesel powered two-cylinder, four-stroke air-cooled			
Engine power (HP)	21	21	21	
Crankcase volume, l	2,8	2,8	2,8	
Engine volume, (cm3)	997	997	997	
Power output controller	Intelligent AVR			
Engine start	Electric	Electric	Electric	
Power factor (cosφ)	1	1	1	0,8
Battery (Ah)	45	45	45	
ATS output (universal 6-pin)	+	+	+	
Net dimensions (L*W*H) (mm)	1050x640x700	1250x650x760	1250x650x760	
Gross dimensions (L*W*H) (mm)	1100x680x820	1300x700x880	1300x700x880	
Net weight (kg)	220	320	320	
Gross weight (kg)	240	345	345	
Protection class	IP23M			
Nominal voltage tolerance - max. 10%				

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To ensure reliability and increase the engine service life, peak powers may be slightly limited by circuit breakers.

The optimal operating conditions are ambient temperature of 17-25 °C, barometric pressure of 0.1 MPa (760 mm Hg), and relative humidity of 50-60%. Under these environmental conditions, the generator can provide maximum performance in terms of the declared specifications.

In the event of deviations from these environmental indicators, the generator performance may vary.

Please note that in order to preserve the long service life of the generator, continuous loads of more than 80% of the nominal power are not recommended.

7. TERMS OF USE OF DIESEL GENERATOR

It is recommended to ground the generator before operating it for the first time. Before starting the device, remember that the total power of the connected power consumers should not exceed the nominal power of the generator.

TYPES OF POWER CONSUMERS AND START-UP CURRENT

There are two types of power consumers (electrical devices connected to the generator): active and reactive. Active power consumers include all power consumers whose power input is converted into heat (heaters).

Reactive power consumers include all power consumers equipped with an electric motor. When starting an engine, start-up currents occur briefly whose magnitude is based on the engine design and purpose of electrical appliance. The magnitude of occurring start-up currents should be considered when selecting a generator.

Most electrical appliances have a start-up current ratio of 2-3. This means that the operation of such appliances requires a generator, the power of which is 2-3 times the power of the connected power consumer. Power consumers such as compressors, pumps, washing machines have the highest start-up current ratio.

To avoid electric shock due to poor-quality electrical appliances or improper use of electricity, the generator must be earthed using a high-quality insulated conductor.

NOTE!

Do not operate single-phase and three-phase circuit breakers at the same time to prevent electrical shock and avoid damage to your electrical devices and the generator!

8. CHECK BEFORE GETTING STARTED

CHECKING THE FUEL LEVEL

1. Unscrew the fuel cap and check the fuel level in the tank.
2. Fill the fuel tank to the fuel filter level.
3. Tighten the fuel cap securely.

IMPORTANT!

Wipe up spilled fuel immediately with a clean, dry, soft cloth, as the fuel may harm painted surfaces or plastic parts.

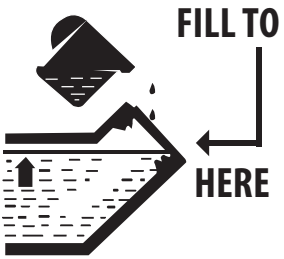
Fuel tank volume: see specifications table.

CHECKING THE OIL LEVEL

The generator is transported free of motor oil. Do not start the engine until it is filled with sufficient amount of motor oil.

Fig. 5

1. Unscrew the oil dipstick and wipe it out with a clean cloth.
2. Insert the dipstick without screwing it in.
3. Check the oil level by a mark on the oil dipstick.
4. Add oil if its level is below the mark on the oil dipstick.
5. Screw on the dipstick.



Recommended motor oil: SAE 10W30, SAE 10W40.
Recommended motor oil grade: API Service SG type or higher.
Motor oil quantity: see specifications table.

CHECKING THE COOLANT LEVEL

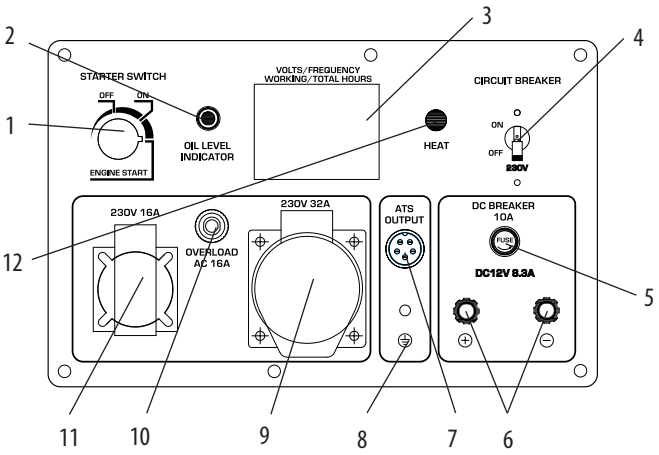
Before the first start of the generator, fill the coolant through the dedicated hole on the top of the station. Change the coolant every 2 years, unless otherwise specified in the coolant specifications. If you have any questions, contact the manufacturer's authorized representative or an authorized dealer in your area.

Be sure to charge the battery before operating the models equipped with electric starters. Charge the battery with an optional charger (not included), or allow the generator to operate at 50% load for at least one hour when operating for the first time.

9. CONTROL PANEL

Control panel for model KS 9200HDE ATSR

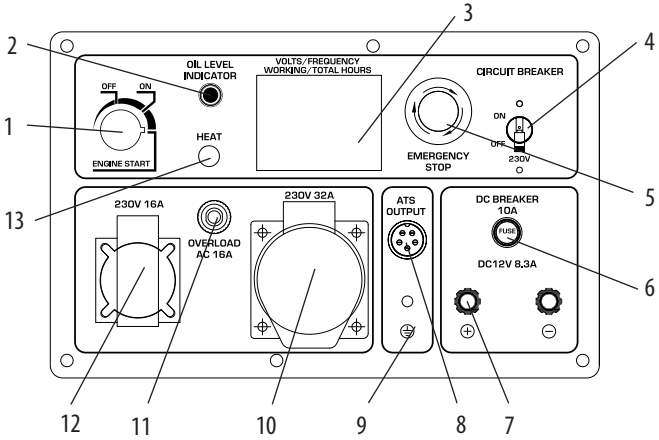
Fig. 6



1. Start switch
2. Oil level indicator
3. LED-display
4. Circuit breakers
5. Fuse for 12 V connector
6. 12V/8A DC outlet
7. ATS output (universal 5-pin)
8. Grounding connector
9. 230 V 1*32 A outlet
10. Circuit breaker for 16 A outlets
11. 230 V 1*16 A outlet
12. Air heater

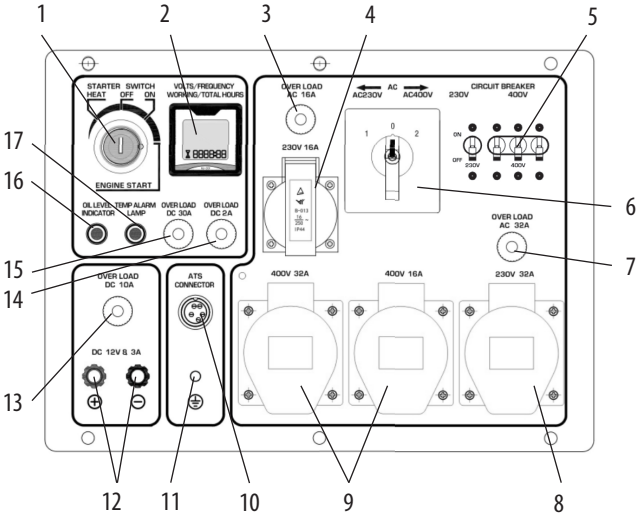
Control panel for model KS 11-2DE ATSR

Fig. 7



1. Start switch
2. Oil level indicator
3. LED-display
4. Circuit breakers
5. Engine emergency stop button
6. Fuse for 12 V connector
7. 12A/8A DC terminals
8. ATS output (universal 5-pin)
9. Grounding connector
10. 230 V 1*32 A outlet
11. Circuit breaker for 16 A outlets
12. 230 V 1*16 A outlet
13. Air heater

Control panel for model KS 13-1DEW 1/3ATSR Fig. 8



1. Start switch
2. LED-display
3. Circuit breaker for 16 A outlet (230V)
4. 230 V 16A outlet
5. Circuit breakers
6. VTS system (single-/three-phase switch (position 1 - 230 V, position 0 (OFF) - disabled, position 2 - 400 V)
7. Circuit breaker for 32 A outlet (230V)
8. 230 V 32A outlet
9. 400 V 1*16 A, 1*32 A outlets
10. ATS output
11. Grounding connector
12. 12V/8A DC terminals
13. Fuse for 12 V connector
14. 2A - start system fuse
15. 30A - main fuse of the engine electrical system
16. Oil level indicator
17. Engine overtemperature indicator

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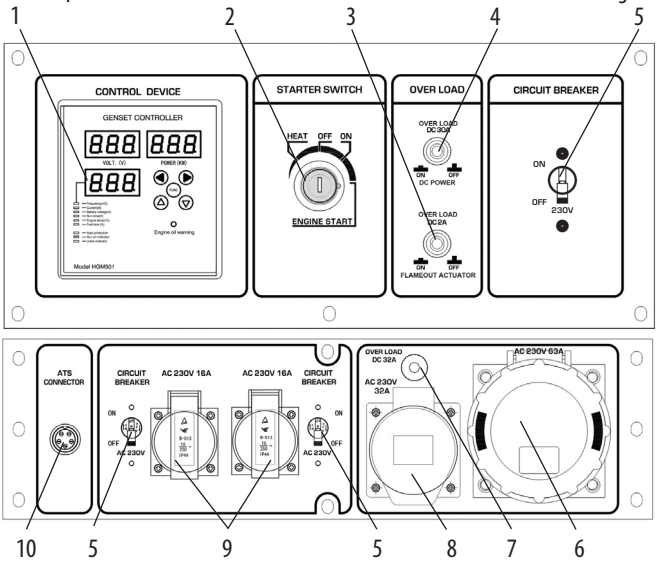
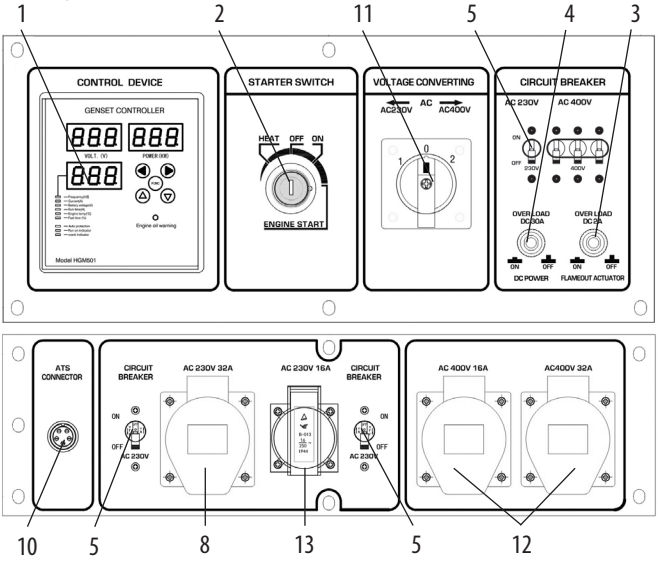
Control panel for model KS 13-2DEW ATSR

Fig. 9



Control panel for model KS 13-2DEW 1/3 ATSR



1. Multifunction control unit
2. Start switch
3. 2A - start system fuse
4. 30A - main fuse of the engine electrical system
5. Circuit breakers
6. 230 V 63A outlet
7. Circuit breaker for 32 A outlet (230V)
8. 230 V 32A outlet
9. 230 V 2*16A outlets
10. ATS output
11. VTS system (single-/three-phase switch (position 1 - 230 V, position 0 (OFF) - disabled, position 2 - 400 V)
12. 400 V 1*16 A, 1*32 A outlets
13. 230 V 16A outlet

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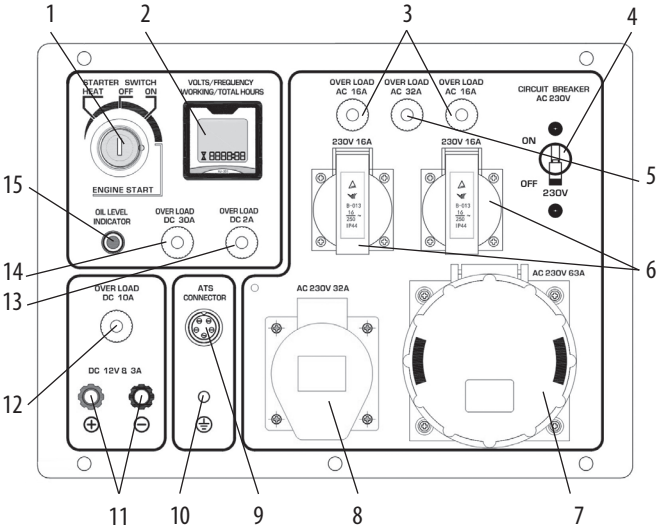
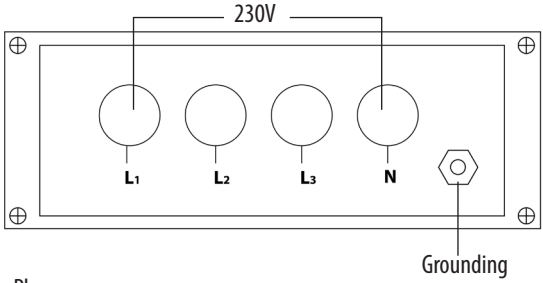
Control panel for model KS 14-1DE ATSR

Fig. 10



1. Start switch
2. LED-display
3. Circuit breaker for 16A outlets (230V)
4. Circuit breakers
5. Circuit breaker for 32 A outlet (230V)
6. 230 V 2*16A outlets
7. 230 V 63A outlet
8. 230 V 32A outlet
9. ATS output
10. Grounding connector
11. 12V/8A DC terminals
12. Fuse for 12 V connector
13. 2A - start system fuse
14. 30A - main fuse of the engine electrical system
15. Oil level indicator

Contact strip for models:
KS 13-2DEW ATSR , KS 13-2DEW 1/3 ATSR
KS 14-2DE ATSR, KS 14-2DE 1/3 ATSR



1. L - Phase
2. N - Neutral

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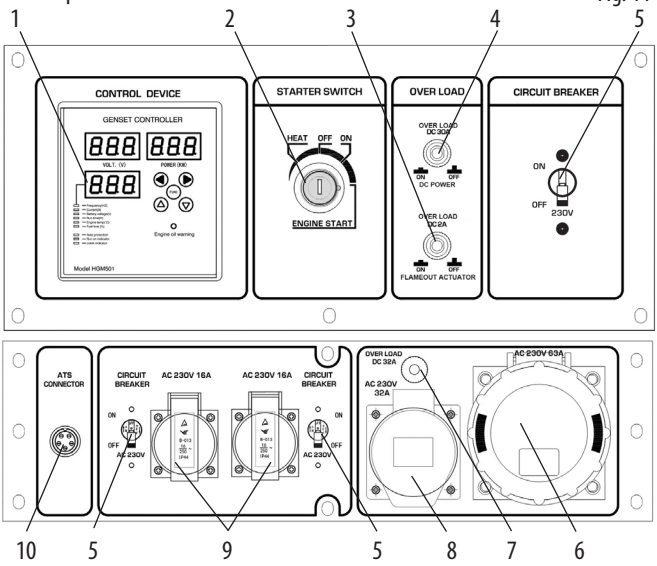
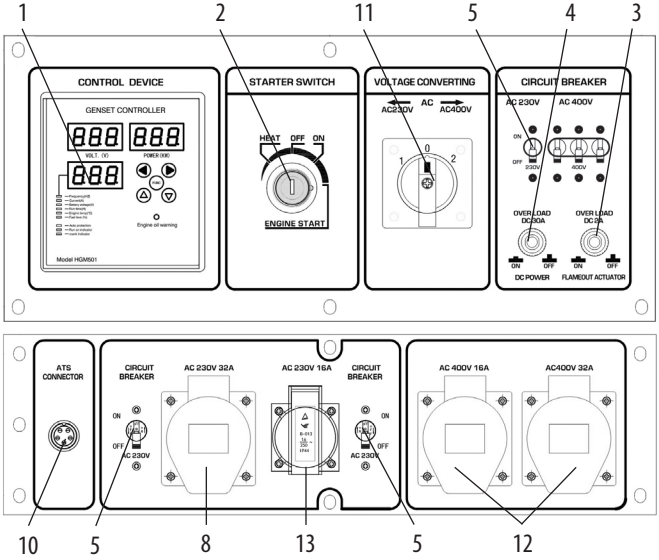
Control panel for model KS 14-2DE ATSR

Fig. 11



Control panel for model KS 14-2DE 1/3 ATSR



1. Multifunction control unit
2. Start switch
3. 2A - start system fuse
4. 30A - main fuse of the engine electrical system
5. Circuit breakers
6. 230 V 63A outlet
7. Circuit breaker for 32 A outlet (230V)
8. 230 V 32A outlet
9. 230 V 2*16A outlets
10. ATS output
11. VTS system (single-/three-phase switch (position 1 - 230 V, position 0 (OFF) - disabled, position 2 - 400 V)
12. 400 V 1*16 A, 1*32 A outlets
13. 230 V 16A outlet

10. LED-display

for models KS9200HDE ATSR, KS13-1DEW-1/3 ATSR, KS14-1DE ATSR.

The LED display is equipped with a backlight to control the generator operation in the dark. The liquid crystal system has a protective glass that protects the internal parts from moisture and dust. The LED display shows:

1) generator voltage level in volts (V);
2) generator frequency (Hz);
3) total operating hours of the generator (hours:minutes). Given these values, the generator owner can timely prepare for the next technical inspection.

Fig. 12

11. SMARTGEN MULTIFUNCTION CONTROL UNIT

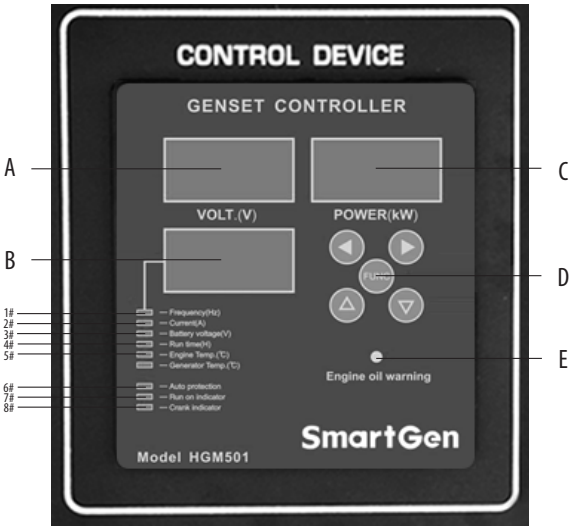
The SMART GEN HGM501 multifunction control unit is a smart digital controller that combines digital and intelligent functions to monitor and protect the generator set. It also implements start/stop, data measurement, alarm display, shutdown protection of the generator set and other functions. The controller is equipped with LED indicators; it is reliable and easy to use.

The HGM501 generator set controller has a microprocessor that enables to accurately measure multiple parameters that can be configured using the front panel of the controller.

The controller has a compact modular design, fireproof enclosure made of ABS plastic. Protection class - IP42.

11.1. PERFORMANCE AND FEATURES OF SMARTGEN MULTIFUNCTION CONTROL UNIT

Fig. 13



A - Voltage display
B - Multifunction display
C - Power display
D - Function switching
E - Low oil pressure indicator

KEY FEATURES:

1. Digital display (A) shows the total supply voltage;

2. Multifunction display (B) shows current, frequency, battery voltage, total operating hours (maximum 999 hours), engine temperature (for models KS 13-2DEW ATSR, KS 13-2DEW 1/3 ATSR);;

3. Controller protects the engine from over- and undervoltage, under- and overfrequency, overload and overtemperature;

4. Indicator (E) indicates low oil pressure, in which case the engine immediately turns off;

5. Parameters displayed can be adjusted by pressing the touch buttons (UP, DOWN, LEFT, RIGHT);

6. All the parameters can be set using the front panel, which is simple and user-friendly.

11.2. DESCRIPTION OF TOUCH BUTTONS OF SMARTGEN MULTIFUNCTION CONTROL UNIT

Button	Function	Description
	FUNCTION	1. In the settings menu, pressing this button enters or confirms the settings; 2. During normal operation, press the button to switch to frequency display; 3. If the alarm is turned off, press and hold down the button for 1 second to reset the alarm.
	UP / SCROLL	1. When setting the parameters, pressing this button increases the set value; 2. During normal operation, press this button to switch to the upper LED.
	DOWN / SCROLL	1. When setting the parameters, pressing this button decreases the set value; 2. During normal operation, press this button to switch to the bottom LED.
	LEFT	1. When setting the parameters, pressing this button returns to the previous menu; 2. During normal operation, press this button to switch to the bottom LED.
	RIGHT	1. When setting the parameters, press this button to go to the next menu. 2. During normal operation, press this button to switch to the bottom LED.

11.3. SETTING THE OPERATION MODE

The controller has two control modes: automatic and manual. You can choose only one of two operating modes. By changing the operation mode, the controller supports completely the previous control mode, and then performs the new mode control procedure in accordance with the current situation.

START-UP PROCEDURE

To turn on the controller and then start the generator, turn the starter key from the OFF position to the ON position. To start the engine, set the starter key to START. After starting the engine, release the starter key.

The voltage, power and frequency displays will show the actual readings. Press the  or  button to switch between indicators 1# - 6# and the multifunction display will show the corresponding settings. Press the button to return to the frequency display.

LED status:

1# Frequency, Hz
2# Current, A
3# Battery voltage, V
4# Operating hours (H)
5# Engine temperature, °C
6# Automatic protection
7# Operation indicator
8# Start indicator
9# Low oil pressure indicator

NOTE: Before starting the engine, make sure all parameter settings are correct

NOTE: Before starting the generator set, the low oil pressure indicator will turn on for a few seconds; if this is not the case, the oil pressure switch or its return circuit might be faulty; in this case, please do not continue operation until the problem is resolved.

POWER-OFF PROCEDURE

1) Automatic power-off

If the automatic protection status is turned on, the system will be automatically stopped;

If a low oil pressure signal is detected for 2 seconds during normal operation of the generator set, the device will be stopped.

2) Manual power-off

Turning the starter key from the ON position to the OFF position powers off the device in any case.

11.4. AUTOMATIC PROTECTION

In automatic protection mode, in addition to protection against low oil pressure, all other protections (over- and undervoltage, under- and overfrequency, overload and overtemperature) are active.

PROTECTION AGAINST VOLTAGE VARIATIONS

When the nominal voltage limits are exceeded by ±10%, the voltage LED starts to flash; after a 7-second delay at undervoltage or a 3-second delay at overvoltage, an emergency shutdown will be triggered. After that, the voltage LED continues to flash and shows the previous alarm.

FREQUENCY

PROTECTION 50

Hz: (45-55) Hz

60 Hz: (55-65) Hz

If the set value is exceeded, the frequency LED starts to flash; after a 7-second delay at underfrequency or a 3-second delay at overfrequency, an emergency shutdown will be triggered. After that, the frequency LED continues to flash and shows the previous alarm.

OVERLOAD PROTECTION

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

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

If the set value is exceeded by 5%-7.5% and lasts for more than 3 hours, an emergency shutdown will be triggered;

If the set value is exceeded by 7.5%-10% and lasts for more than 1 hour, an emergency shutdown will be triggered;

If the set value is exceeded by more than 10% and lasts for more than the preset value of the overload protection delay, an emergency shutdown will be triggered (by default: 30 sec);

After the emergency shutdown is triggered, the power LED continues to flash and shows the pre-alarm value.

LOW OIL PRESSURE PROTECTION

Regardless of whether the automatic protection mode is enabled or not, the generator set will turn off if a low oil pressure status lasts for more than 2 seconds.

GENERATOR OVERHEAT PROTECTION

If the generator temperature exceeds 95 °C, the LED will start to flash; after a 7-second delay the protection is triggered; the LED continues to flash and shows the values of the previous protection. Not available in the generator models described in this manual.

BATTERY VOLTAGE PROTECTION

Battery voltage protection is enabled regardless of whether the automatic protection mode is enabled or not and whether the generator set is running or not. If the battery voltage is lower than 8 V or higher than 16.5 V, the gas discharge display or the LED display will start to flash, but no safety shutdown will be triggered.

12. GETTING STARTED

Before starting the engine, make sure that the power rating of power consumers matches that of the generator. Do not exceed the nominal power of the generator.

Do not connect any devices before you start the engine!

IMPORTANT!

Do not change the controller settings in terms of the amount of fuel or speed governor (this adjustment was made at the factory). Otherwise, this may result in changes in the engine operation or its failure. Any modifications to the generator will make the warranty null and void!

ATTENTION - DANGER!

In the power supply mode, the generator should operate no longer than 30 minutes in the range from nominal to maximum power.

In practice, there are different options for supplying electricity, and different rules for connecting it. The decision on how to properly connect the equipment in each individual case must be made by a certified electrician who performs the installation. The manufacturer is not responsible for incorrect installation, and is not responsible for any material and physical damage that may result from improper installation or operation of the equipment.

ELECTRIC START

- Do not connect any power consumers to the generator before you start the engine.
- Connect the terminals to the battery and observe the correct polarity: "plus" to "plus", "minus" to "minus".
- Set the engine emergency switch (Fig. 4) to the START position (ON) for models KS 9200HDE ATSR, KS 11-2DE ATSR.
- For models KS 13-2DEW ATSR, KS13-2DEW 1/3 ATSR, KS 14-2DE ATSR, KS 14-2DE 1/3 ATSR, both fuses (2A and 30A) on the generator control panel must be in the "ON" position.
- Set the start key to ON.
- Turn the key clockwise to the START position.
- After a successful start, release the key and it will automatically return to the ON position.
- If the engine does not start after pressing and holding down the key in the START position for 5 seconds, try again in 15 seconds. Lengthy operation of the engine start system may discharge the battery. When the generator is running, leave the key in the ON position.
- If you hear no engine start sound when starting the engine, check the position of the 2A fuse (it should be in the "ON" position).
- If the display or SmartGen controller does not light up when starting the engine, check the position of the 30A fuse (it should be in the "ON" position).
- After three minutes of the generator operation, switch the circuit breaker (emergency switch) to the upper position (ON).

 **IMPORTANT!** 

If the engine does not start after three or four attempts, air might have penetrated the fuel system. Remove air from the fuel system (drain diesel fuel together with excess air).

 **ATTENTION - DANGER!** 

The generator is not intended for continuous operation at maximum power. Operation in this mode significantly reduces the engine life of the generator. In peak power supply mode, the generator can only be used for a short time to start equipment, which has higher starting currents at the time of start (starting of motors or other electrical appliances)

Before connecting any devices to the generator, make sure that they are in good working order. If the connected device suddenly stopped or failed, immediately de-energize the device using the emergency switch, disconnect the device and check it out.

 **IMPORTANT!** 

Disconnect all devices before stopping the generator! Do not stop the generator if it has any devices connected to it.
This may disable the generator!

Starting with an electric starter in the cold season

If the air temperature is less than +5 °C, use the "Warm-up" function at startup. - Turn the ignition key to ON position and push the heating button HEAT (for models KS 9200HDE ATSR, KS 11-2DE ATSR). Hold it and turn the ignition key to START position for models KS 13-2DEW ATSR, KS 13-2DEW 1/3 ATSR, KS 14-2DE ATSR, KS 14-2DE 1/3 ATSR set the start key to "HEAT" for a few seconds and then to "START".

STARTING THE GENERATOR USING THE ATS UNIT:

When starting the generator in automatic or manual mode using the ATS unit (automatic transfer switch), the start key on the generator control panel must be in the "OFF" position.

 **IMPORTANT!** 

Hold the start key button in the "Warm-up" position for no more than 10 seconds, so as not to damage the glow plugs.

Use care when the generator is running:

- You may use the generator, if the voltage meter displays the value 230±10% for a single-phase generator and 400V±10% for a three-phase generator (50 Hz).
- Check the voltmeter and stop the generator if the value is too high.
- Only connect to a DC outlet to charge the battery. When charging batteries, pay attention to the correct polarity (plus/+ to plus/+, minus/- to minus/-).
- First connect the charging cable to the battery and only then to the generator. The generator should only be connected to the mains outlet by a skilled electrician. Connection errors can cause serious damage to equipment.
- Do not use 12 V voltage together with 230 V (400 V for three-phase generators).

To stop the engine, proceed as follows:

1. Set the circuit breaker (safety switch) on the generator control panel to the down position (OFF), stop all power consuming devices connected to the generator.
2. Let the generator run at no load for 3 minutes for alternator to be cooled.
3. In case of electric start, turn the key to OFF position.
4. For all types of diesel generators there is an emergency stop emergency switch engine. Use it in case of emergency only.

COMMISSIONING

In the first 20 operating hours of the generator, the following requirements should be met:

1. During commissioning, do not connect power consumers, the power of which exceeds 50% of the nominal (operating) power of the device.
2. Be sure to change the oil after the first 20 operating hours. It is better to drain oil while the engine is still hot after operation to ensure quick and complete oil draining.

 **IMPORTANT!** 

During generator operation, motor oil can be very hot. Be careful to avoid burns.

CONNECTING POWER CONSUMERS

After starting the engine, make sure the voltmeter readings correspond to the nominal (at 50 Hz 230V ±10% for single-phase units and 400 ±10% for threephase).

Diesel generator is suitable for 230 V power consumers (single-phase generators) and 400 V power consumers (three-phase generators). Mode switching is allowed only when no power consumers are connected.

USING AS A THREE-PHASE GENERATOR:

The three-phase diesel generator should have the power distributed to all three phases, and the power must be balanced at all phases. The load on 1 phase should not exceed 1/3 of the total power of the generator at the same load on each phase. The permissible phase unbalance should not exceed 20%.

If only 1 phase or 2 phases are loaded, the generator will fail. The total power and total current at all three phases must not exceed the normal load and amperage of the generator.

 **IMPORTANT!** 

Failure to comply with these requirements may damage the primary and secondary windings and the AVR unit.

 **IMPORTANT!** 

If the overload has resulted in automatic operation of the generator circuit breaker, reduce the load. Repeated power-on of the generator is possible 5 minutes after shutdown.

13. MAINTENANCE

Maintenance work listed in section “Maintenance” should be performed on a regular basis. If you cannot perform maintenance work on your own, please contact the authorized service center to request the required maintenance work.

 **IMPORTANT!** 

УThe manufacturer shall not be liable for any damage caused by failure to perform maintenance work.

Such damage also includes:
- Damage resulting from the use of non-original spare parts;
- Corrosive damage and other effects of improper storage of equipment;
- Damage caused by maintenance work performed by unskilled technicians.

Observe the instructions in this manual!
The generator must be maintained, operated and stored in accordance with the instructions in this manual. The manufacturer shall not be liable for damage and loss caused by failure to comply with safety and maintenance regulations.

This primarily applies to the
- Use of lubricants, fuels and motor oils not authorized by the manufacturer;
- Tampering with the product design;
- Misuse of equipment;
- Indirect losses caused by operation of the product with defective parts.

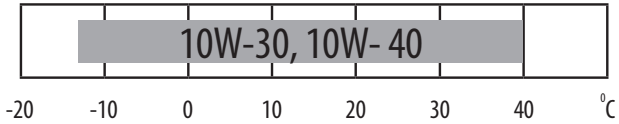
14.RECOMMENDED MAINTENANCE SCHEDULE

Node	Service type	Every start	Commissioning (first 20 hours)	Each 3 months or after 50 working hrs	Each 6 months or after 100 working hrs
Motor oil	Check the level	V			
	Replace KS 9200HDE ATSR KS 11-2DE ATSR		V	V	
	Replace KS 13-1DEW 1/3 ATSR KS 13-2 DEW ATSR KS 13-2 DEW 1/3 ATSR KS 14-1 DE ATSR KS 14-2 DE ATSR KS 14-2 DE 1/3 ATSR		V		V
Air filter	Check/Clean out	V	V	V	
	Replace				V
Oil filter	Clean out KS 9200HDE ATSR KS 11-2DE ATSR		V	V	
	Replace KS 13-1DEW 1/3 ATSR KS 13-2 DEW ATSR KS 13-2 DEW 1/3 ATSR KS 14-1 DE ATSR KS 14-2 DE ATSR KS 14-2 DE 1/3 ATSR		V		V
Fuel tank	Check the level	V			
	Check/Clean out		V		V
Fuel filter	Check/Clean out		V	V	
	Replace				V

15. RECOMMENDED OILS

Motor oil significantly affects the engine performance and is the main factor that determines its service life. Use motor oil intended for diesel powered four-stroke engines that comply with API CF Grade SAE 10W-30.

Motor oils with a different grade shown in the table can be used only if the average ambient temperature in your area does not fall outside the specified temperature range. SAE and API viscosity grade can be found on the container label.



Replacing or adding motor oil

If the oil level drops, fresh oil must be added to ensure proper operation of the generator. Check the oil level according to the maintenance schedule.

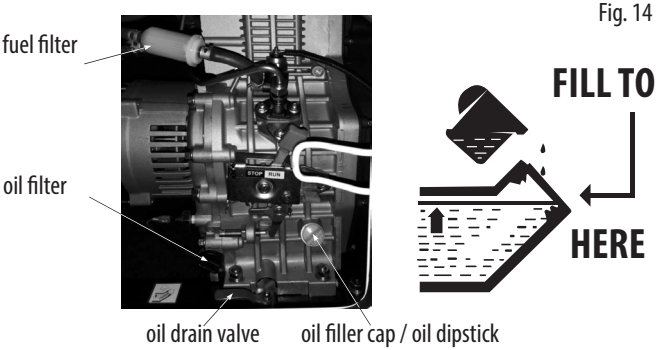
To drain oil, proceed as follows:

1. Place an oil drain tray under the engine.
2. Open the oil drain valve on the engine below the dipstick cap.
3. Wait for the oil to drain.
4. Close the valve.

To add oil, proceed as follows:

1. Make sure the generator is mounted on a flat, level surface
2. Unscrew the dipstick cap on the engine.
3. Use a funnel to fill the crankcase with the recommended motor oil. The funnel is not included. After filling, the oil level should be close to the top of the oil filler.

Fig. 14



Use only recommended oils and fuels for maintenance and repair purposes. The use of other oils, consumables and spare parts deprives you of the right to warranty service.

16. AIR FILTER MAINTENANCE

Air filter should be checked for contamination from time to time. Regular maintenance of the air filter is necessary to maintain sufficient air flow in the carburetor. The maintenance intervals should be shorter when operating the generator in dusty environments.

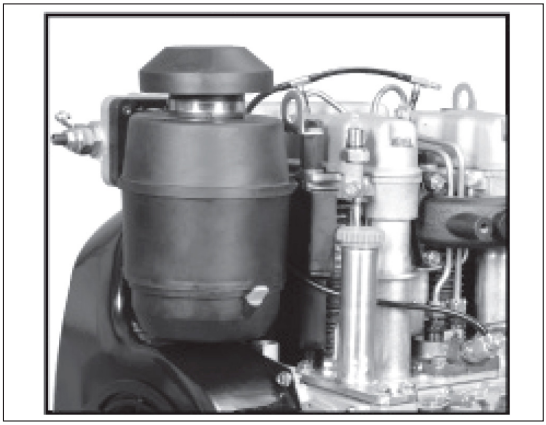
ATTENTION - DANGER!

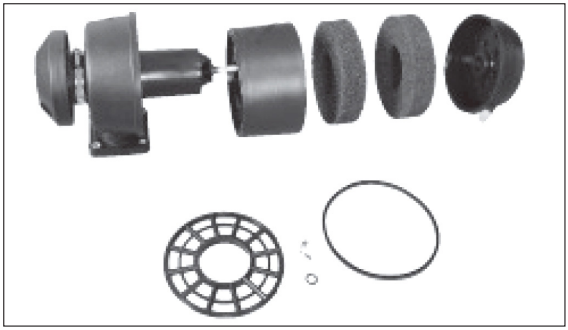
Do not start the engine with without the air filter or filter element. Otherwise, ingress of dirt and dust will cause rapid wear of engine parts. In this case, failure is not subject to warranty repair.

IMPORTANT!

The air filter must be replaced every 100 hours of operation of the generator (in conditions of increased pollution every 20 hours).

Fig. 15





17. FUEL FILTER REPLACEMENT AND CLEANING

Diesel generator from **TM Könner & Söhnen** uses two types of fuel filters. They prevent contaminants in diesel fuel from penetrating the engine.

Coarse fuel filter

Coarse fuel filter should be cleaned every 500 operating hours after the potential ingress of solid particles in the filter. Never use water to clean the filter.

1. Unscrew the fuel cap.
2. Remove the fuel filter.
3. Clean the filter with diesel fuel.
4. Replace the filter in the fuel tank.

Fuel filter in the fuel line

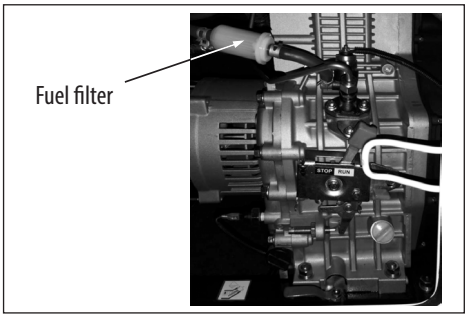
This filter must be changed every 250 operating hours. It is located under the fuel tank on the fuel hose through which fuel enters the engine from the tank.

To replace it:

1. Loosen the metal brackets of the hose that is located next to the fuel tank to drain the fuel into the container.
2. Drain the fuel into a dedicated container.
3. Loosen the metal brackets on both sides of the fuel filter.
4. Remove the filter.
5. Install a new filter according to the arrow shown on it. Insert the filter in the direction of fuel flow.
6. Tighten the brackets on the fuel hose.

Check the position of the fuel filter, it should be located in the most upright position.

Fig. 16



18. BATTERY MAINTENANCE AND CHARGING

For **TM Könner & Söhnen** models with electric start, check the battery voltage from time to time. The battery used in the generator should have a voltage of 12 V; if the voltage is lower, charge the battery using an external charger.
To avoid battery discharge, it is recommended to run the generator for 30 minutes at least once a month. If the generator will not be used for a long time, disconnect the battery from the terminals. The battery supplied with the generator requires no supplementary maintenance and activation.

19. GENERATOR STORAGE

The generator must be stored in a dry, well-ventilated area that is free from dust. Keep away from children.

IMPORTANT!

The generator must always be ready for use. Any malfunctions in the generator must be repaired before placing the generator in storage.

Generator long-term storage
If the generator will not be used for a long time, it is recommended to:
- Drain the fuel into the tank.
- Drain the motor oil.
- Pull the manual starter until a slight resistance is felt so that the inlet and drain valves get closed.
- Remove the negative terminal of the battery (for models with electric start only).
- Clean the generator from dirt and dust.

When starting the generator after long-term storage, proceed as above in the reverse order.

IMPORTANT!

Please note that multiple unsuccessful attempts to start the generator using the electric start may discharge the batteries; therefore, be sure to fully charge the battery before operation.

20. TROUBLESHOOTING

Fault	Probable cause	Remedy
Engine will not start	Engine switch set to OFF	Set the engine switch to ON
	Fuel tank is empty	Add fuel
	Engine contains dirty or old fuel	Replace fuel in the engine
	Low oil level	Add fresh oil to the recommended level
Reduced engine power / troubled engine start	Fuel tank is dirty	Clean the fuel tank
	Air filter is dirty	Replace the air filter
	Water or air in the fuel line	Bleed the fuel line
Engine overheating	Cooling fins are contaminated	Clean the cooling fins
	Air filter is dirty	Replace the air filter
Engine starts, but no output voltage	Circuit breaker tripped	Set the circuit breaker to ON
	Connection cables of poor quality	Check cables for normal operation; replace, if extension cable is used
	Faulty connected device	Try connecting another device
Generator works, but does not support connected electrical devices	Device overload	Try to connect fewer devices
	Short circuit of one of the connected devices	Try disconnecting the faulty device
	Air filter is dirty	Replace the air filter
	Insufficient engine speed	Contact the service center

NOTE!

Do not operate single-phase and three-phase circuit breakers at the same time to prevent electrical shock and avoid damage to your electrical devices and the generator!
(Circuit breakers are shown in Figs. 3 and 4)

Fault	Probable cause
Controller does not respond to power-on	Check start battery
Low oil warning after crank release	Check oil pressure sensor and wiring
Emergency shutdown during operation	Check the appropriate switch and wiring according to the information on the display.
Unable to start	Check fuel return circuit and wiring Check start battery
Engine starter does not respond	Check starter wiring Check start battery

TRADITIONELLE DEUTSCHE QUALITÄT

21. AVERAGE POWER CONSUMPTION OF DEVICES

Iron	Power (W)
Hair dryer	500-1100
Coffee machine	450-1200
Electric cooker	800-1500
Toaster	800-1800
Heater	600-1500
Vacuum cleaner	1000-2000
Radio	400-1000
Grill	50-250
Oven	1200-2300
Fridge	1000-2000
TV set	100-150
Perforator	100-400
Drill	600-1400
Freezer	400-800
Grinder	100-400
Circular saw	300-1100
Crank gear	750-1600
Jigsaw	650-2200
Planer	250-700
Compressor	400-1000
Water pump	750-3000
Bench saw	750-3900
Electric mower	1800-4000
Electric motors	750-3000
Fans	550-5000
High pressure unit	750-1700
Air conditioner	2000-4000
Кондиціонер	1000-5000

K&S Könner & Söhnen

WARRANTY TERMS:

HEAVY DUTY diesel generators are covered by an extended warranty of up to two years or 3,000 operating hours (whichever comes first) subject to paid technical service at an authorized service center one year after purchase or after 1,500 operating hours (whichever comes first). Product delivery for after-sales service shall be borne by the buyer. Maintenance charges are determined by an authorized service center based on the results of diagnostics. The warranty period of up to two years applies only if the warranty card has an entry of the planned maintenance. If the planned maintenance has not been carried out, the warranty will period be 1 year.

Within the warranty period, the product owner is entitled to free repair of the defective product due to defect in workmanship or materials used in production. Warranty service can be carried out only in authorized service centers specified in the warranty card or on the official importer's website www.ks-power.com.ua. The product is accepted for repair .

WARRANTY DOES NOT COVER:

- If the user has failed to comply with the instructions in this manual.
- If the product features damaged or missing identification stickers or labels, serial numbers, etc.
- If product malfunction was due to improper transportation, storage and maintenance.
- In case of mechanical damages (cracks, chips, impact and fall marks, deformation of housing, power cord, plug or any other components), including those resulting from the freezing of water (ice formation), provided there are foreign objects inside the unit.
- If the product has been improperly installed and connected to the mains supply or misused.
- If the claimed malfunction cannot be diagnosed or demonstrated.
- If proper operation of the product can be restored following cleaning from dust and dirt, appropriate adjustment, maintenance, oil change, etc.
- If the product is used for business related purposes.
- If faults are detected, which have been caused by product overload. Signs of overload are molten or discolored parts as a result of high temperatures, damaged cylinder or piston surfaces, degraded piston rings or connecting rod bushes.
- The warranty does not cover the failure of the product automatic voltage regulator due to careless handling or mishandling.
- If faults are detected, which have been caused by instability of the user's power grid.
- If there are faults caused by contamination or fouling such as contamination of the fuel, oil or cooling system.
- If electrical cables or plugs show signs of mechanical or thermal damage.
- In the event of foreign liquids and objects, metal chips, etc. inside the product.
- If the malfunction is caused by the use of non-original spare parts and materials, oils, etc.
- If there are two or more faulty units that are not interconnected.
- If the damage was caused by natural factors such as dirt, dust, humidity, high or low temperature, natural disasters.
- To quick-wear parts and components (spark plugs, nozzles, pulleys, filter and safety elements, batteries, removable devices, belts, rubber seals, clutch springs, axles, manual starters, oils, gear).
- To preventive maintenance (cleaning, greasing, washing), installation and adjustment.
- If the product was tampered with, independently repaired or modified.
- In case of malfunctions resulting from normal wear and tear as a result of long-term use (end of life).
- If product operation was not stopped and continued after detecting a malfunction.
- Batteries supplied with equipment are covered by a warranty of three months.

EC Declaration of Conformity

Nr. 046

The following products have been tested by us with the listed standards and found in compliance with the European Community Machinery Directive 2006/42/EC, Electromagnetic compatibility Directive (EMC) 2014/30/EC.

Manufacturer: DIMAX INTERNATIONAL GmbH
Address: Hauptstr. 134, 51143 Cologne, Germany

Product: Diesel generators "Könner & Söhnen"

Type / Model: KS 9200HDE ATSR, KS 11-2DE ATSR, KS 13-1 DEW 1 /3 ATSR, KS 13-2 DEW ATSR, KS 13-2 DEW 1/3 ATSR, KS 14-1 DE ATSR, KS 14-2 DE ATSR, KS 14-2 DE 1/3 ATSR.

The statement is based on a single evaluation of above mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab. logo. The manufacturer should ensure that all product in series production are in conformity with the product sample detalied in this report. The applicant should hold the whole technical report at disposal of the competent all the right.

Applied EC Directives: 2006/42/EC Machinery Directive
2014/30/EC Electromagnetic compatibility Directive (EMC)

Applied Standards: EN ISO 8528-13:2016, IEC 60034-1:2010, EN 55012:2007+A1:2009, EN ISO 12100:2010, BS EN ISO/IEC 17065:2012.

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We DIMAX INTERNATIONAL GmbH hereby declare that specified above conforms covering European Parliament and Council Directives, 2006/42/EC of 17 May 2006 Machinery Directive, Electromagnetic compatibility Directive (EMC) 2014/30/EC of 26 February 2014. The CE mark above can be used under the responsibility of manufacturer. After completion of an EC declaration of Conformity and compliance with all relevant EC directives.

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