Please read this manual carefully before use!

User manual!

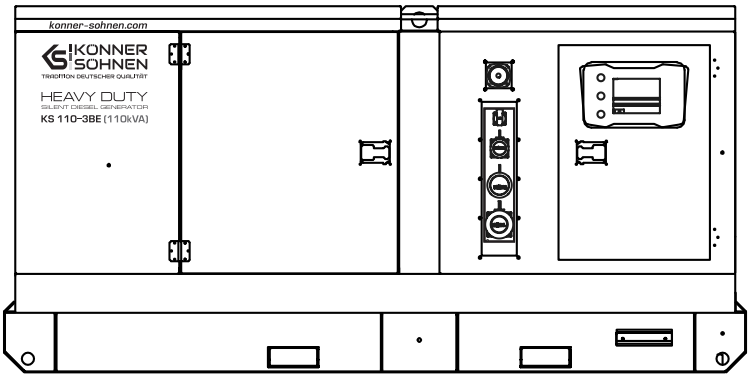
EN

TRADITION DEUTSCHER QUALITÄT

KÖNNER SÖHNEN

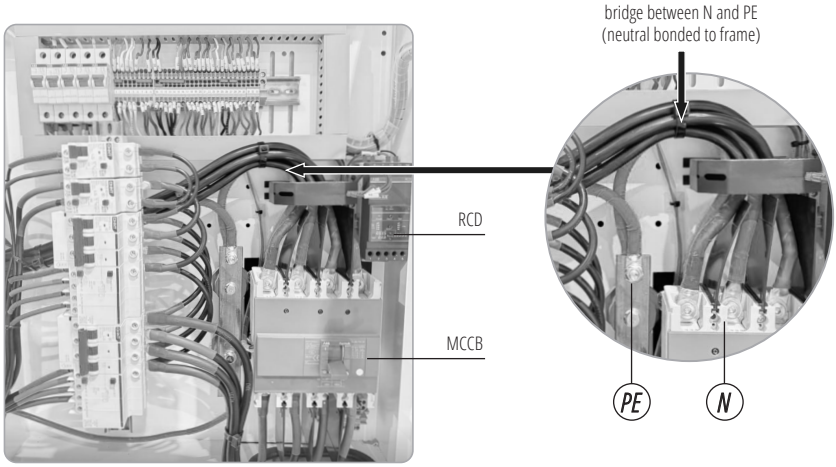
Diesel power plant

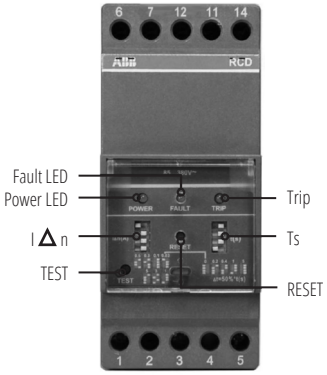
KS 22-3BE
KS 35-3BE
KS 50-3BE
KS 72-3BE
KS 110-3BE



ANNEX

Fig. 1





(I Δ n) Rated residual operating current Setting

I Δ n (amps)	0.03	0.1	0.3	0.5	1	3	5
DIP switch position							

(Ts) Trip Delay Time Setting

Ts (S)	0	0.2	0.4	1	5
DIP switch position					

NOTE! When the rated residual operating current I Δ n is set to 30 mA, the tripping delay time is automatically set to instantaneous tripping, and the tripping delay selector switch becomes ineffective.

Fig. 2

A.



B.



C.



D.



E.



F.



G.



H.



I.



J.



K.



L.



M.



N.



Q.

CIRCUIT BREAKER 16A CEE 7/3(230V)

CIRCUIT BREAKER 16A CEE 16/5(400V)

CIRCUIT BREAKER 32A CEE 32/3 (230V)

CIRCUIT BREAKER 32A CEE 32/5(400V)

CIRCUIT BREAKER 63A CEE 63/5(400V)

O.



P.



R.



S.

NEUTRAL BONDED TO FRAME

T.

COOLING WATER DRAIN

U.

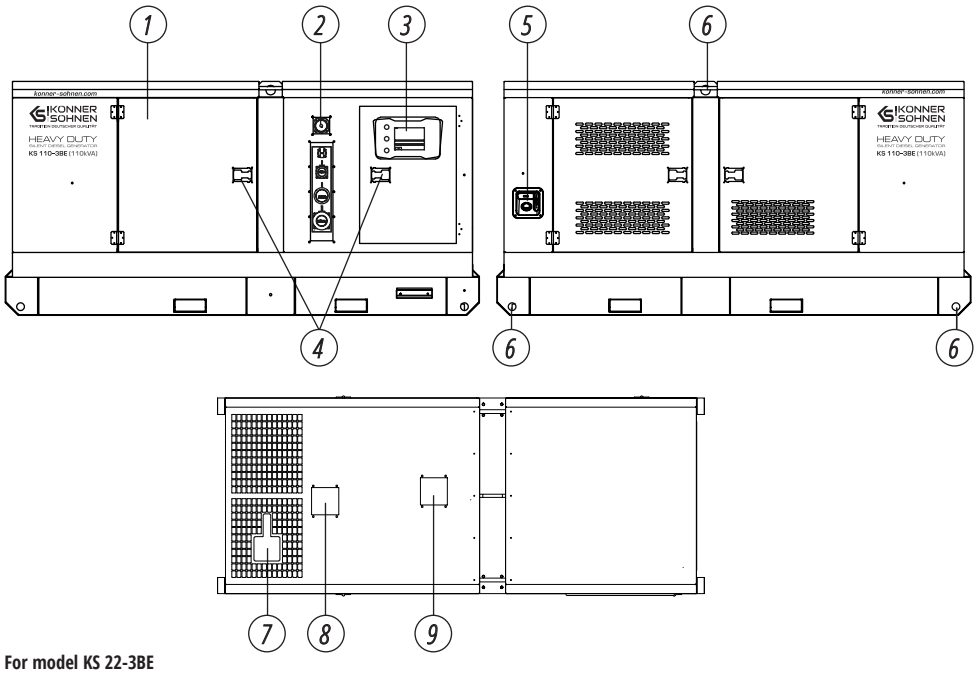
ENGINE OIL DRAIN

V.

FUEL DRAIN

Fig. 3

For models KS 35-3BE, KS 50-3BE, KS 72-3BE, KS 110-3BE



For model KS 22-3BE

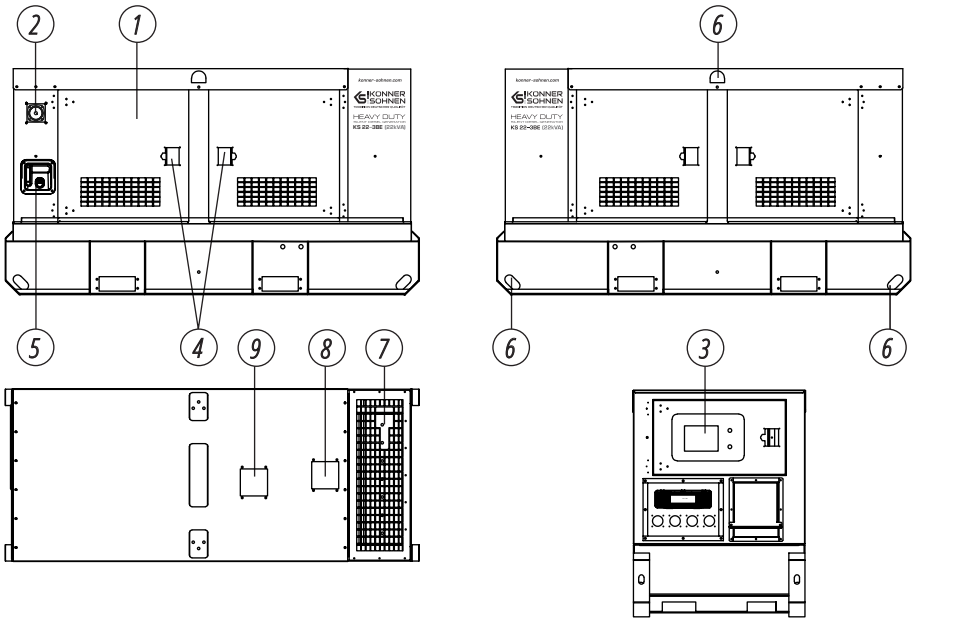
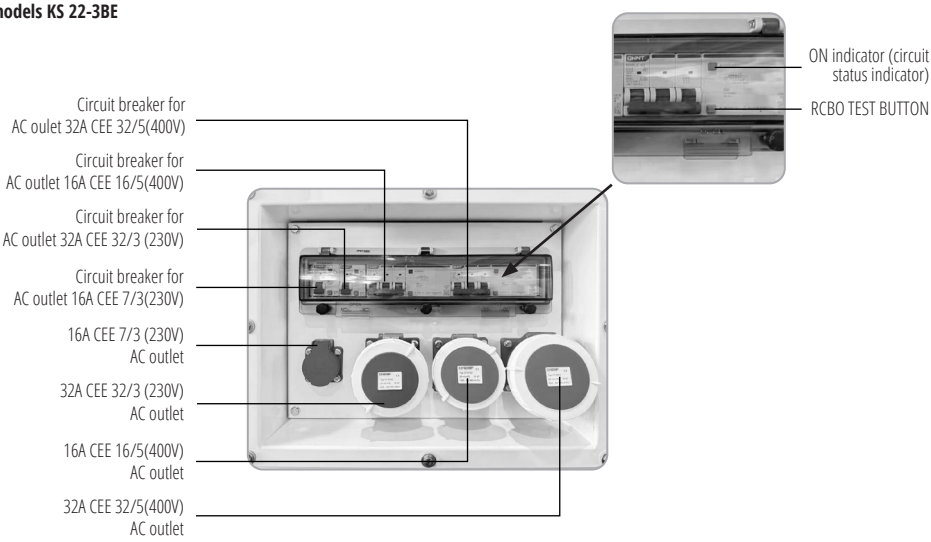


Fig. 4

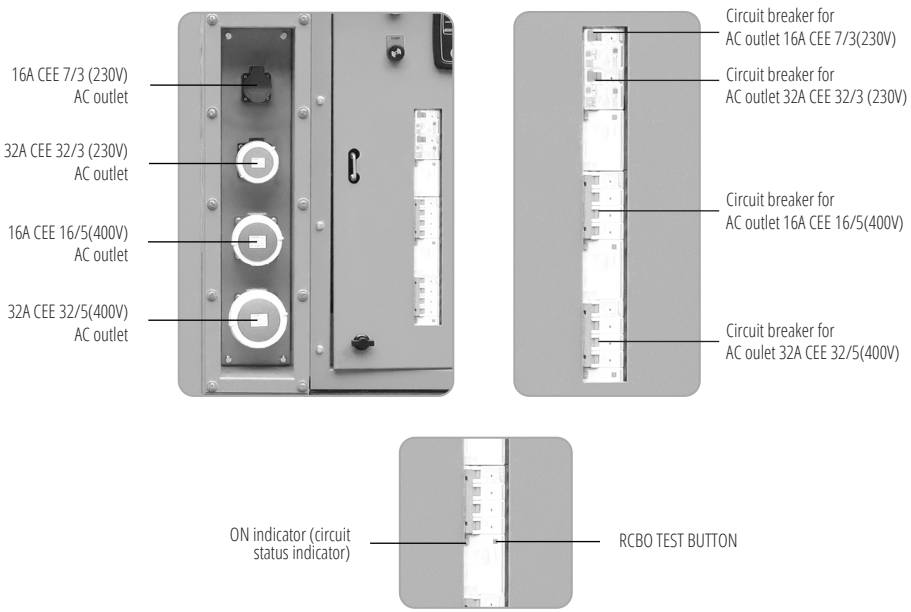


Fig. 5

For models KS 22-3BE



For model KS 35-3BE



For models KS 50-3BE, KS 72-3BE, KS 110-3BE

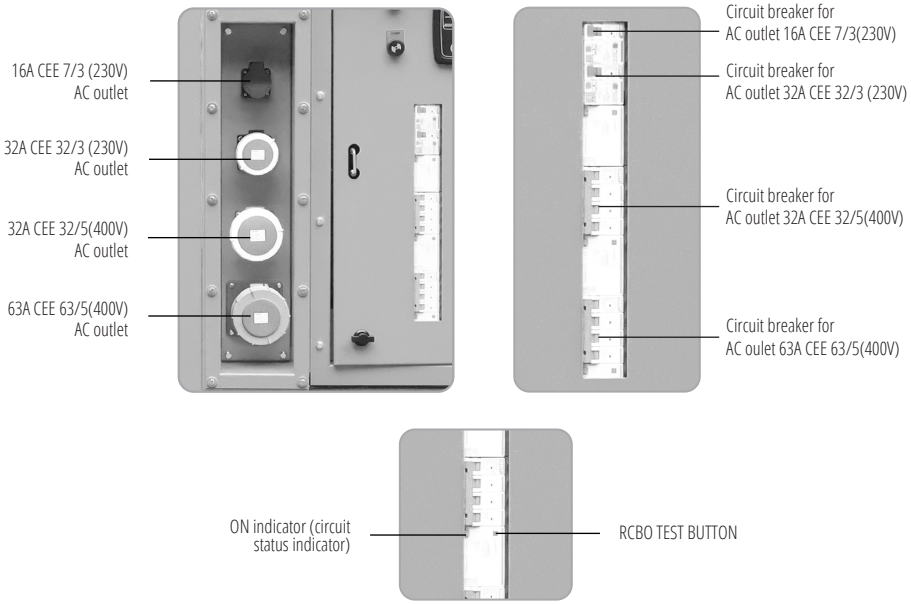


Fig. 6

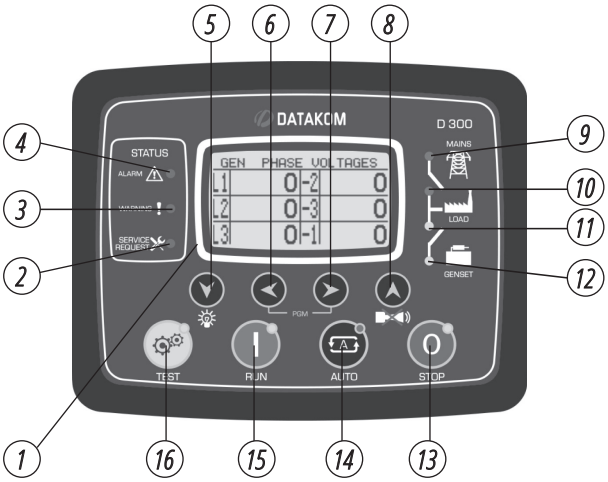


Fig. 7A

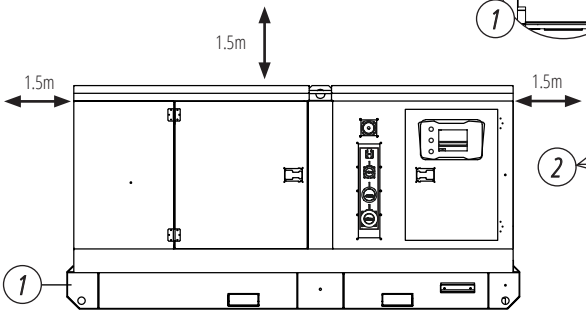


Fig 7B

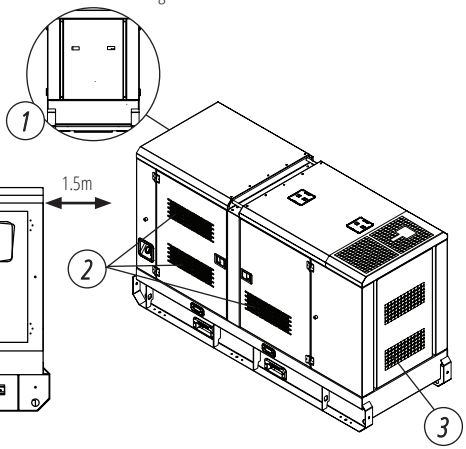


Fig. 8

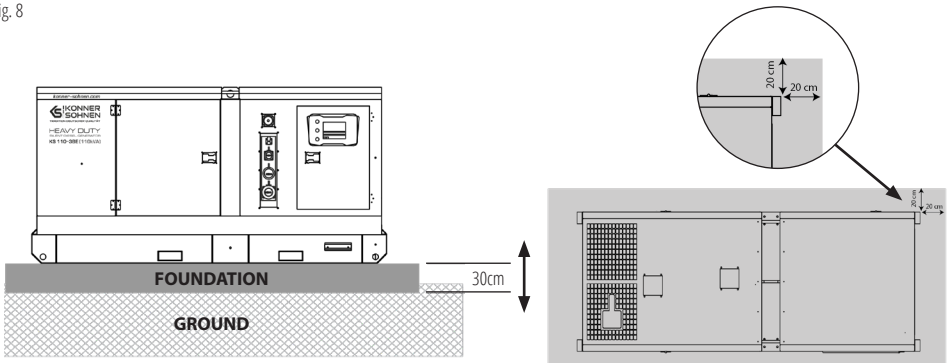


Fig.9



electrical fuel level sensor

Fig. 10A

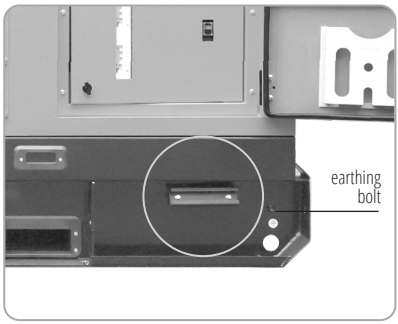


Fig. 10B

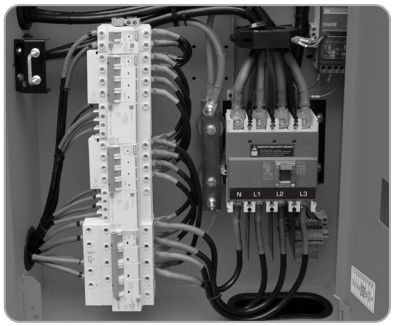
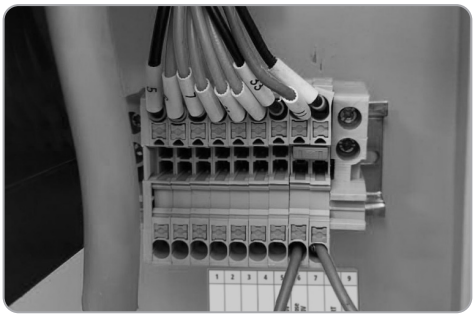


Fig. 11A



control contacts for external operation

Fig. 11B

1	2	3	4	5	6	7	8	9
Mains N	Mains R	Mains S	Mains T	Generator ATS Close 90 – N AC230V	MAINS ATS Close 90 – N AC230V	GEN N	REMOTE START	GND

Fig. 12A



Fig. 12B

Fig. 12C

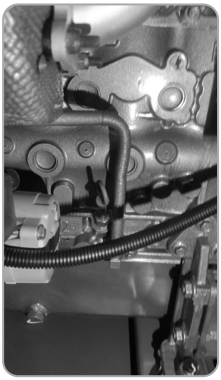
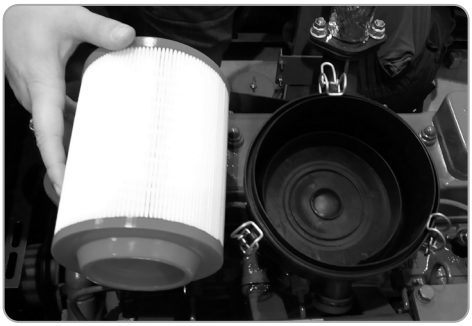


Fig. 12D



Fig. 13



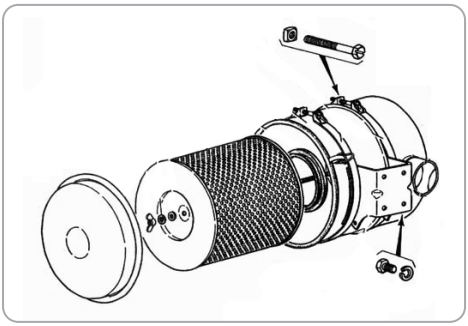
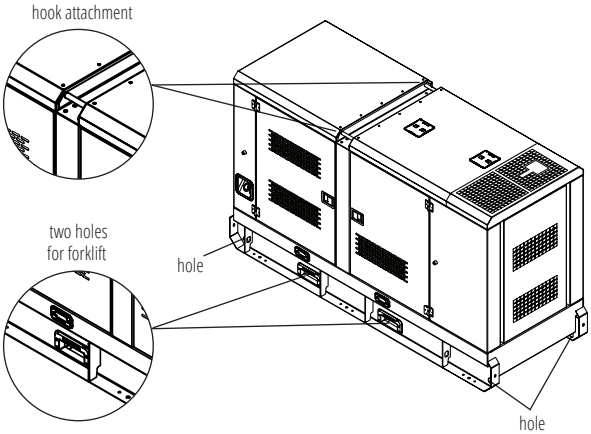
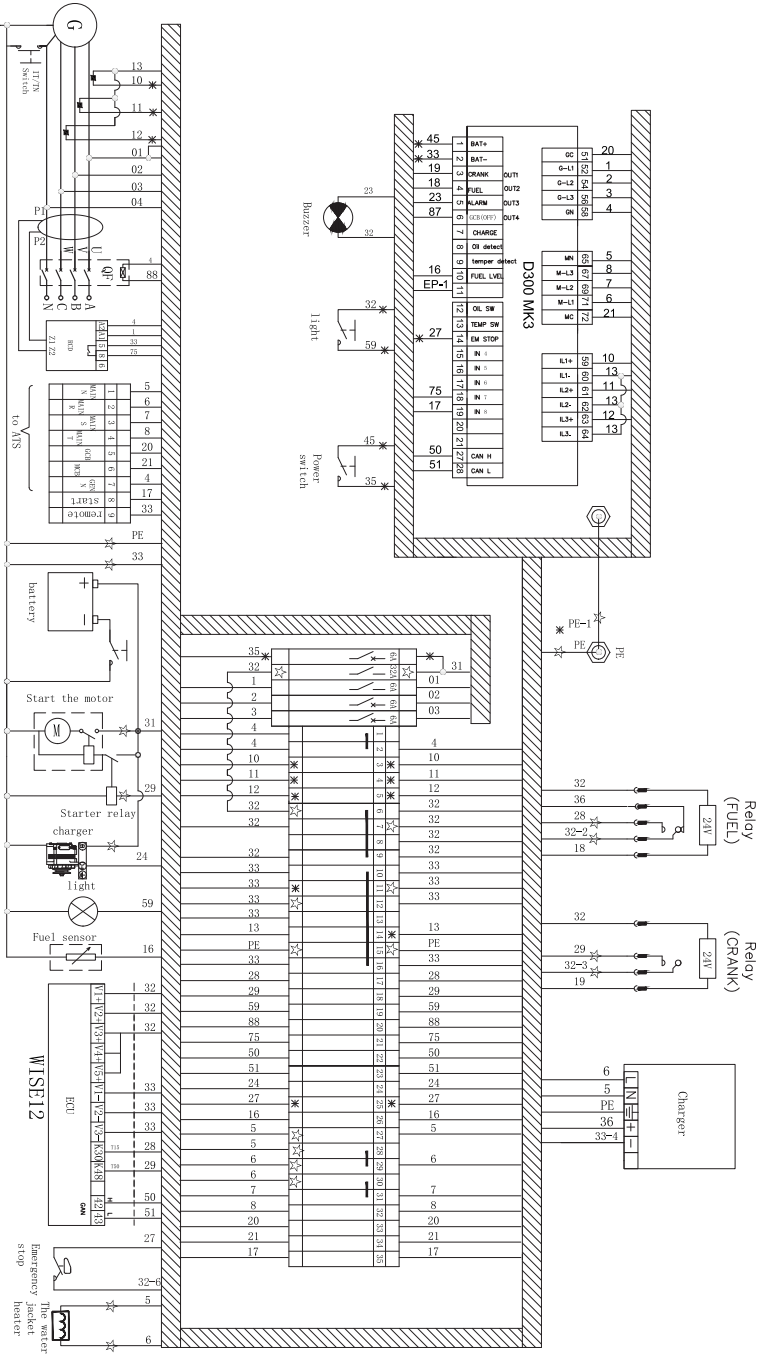


Fig. 14

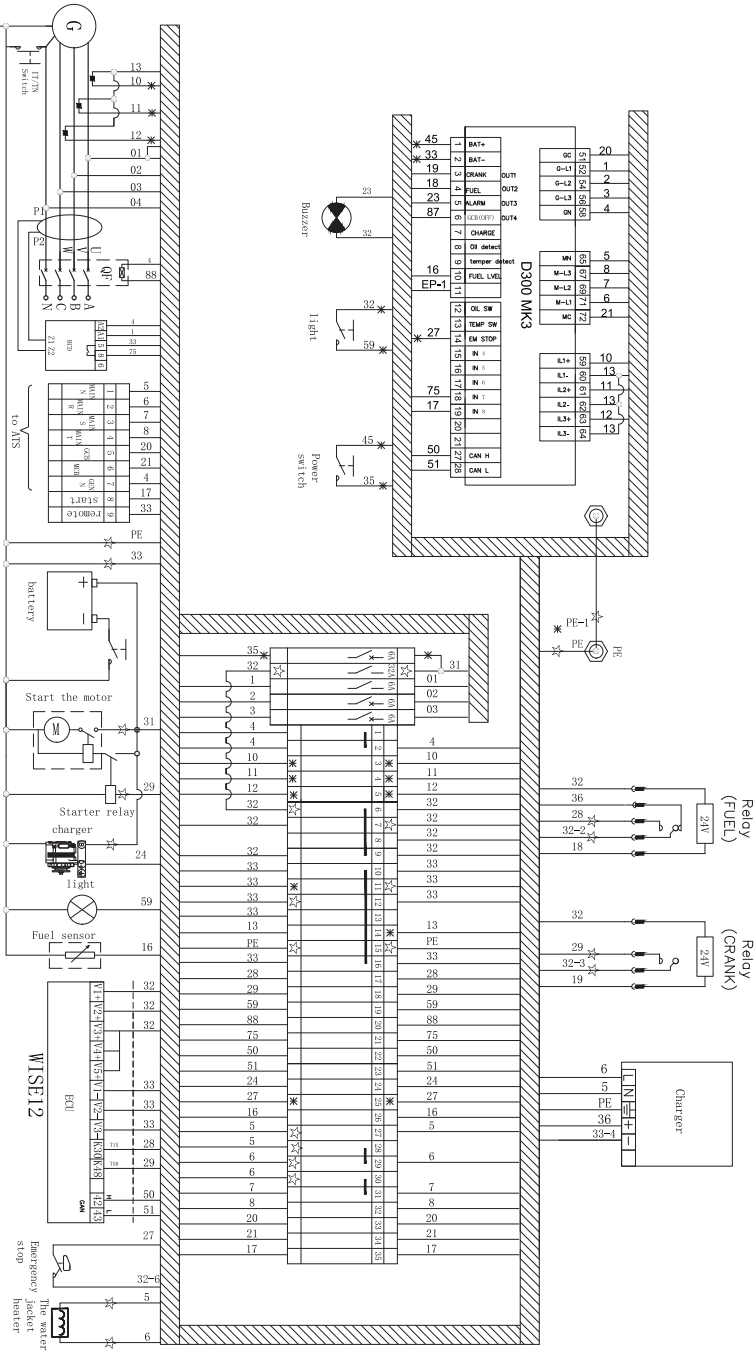




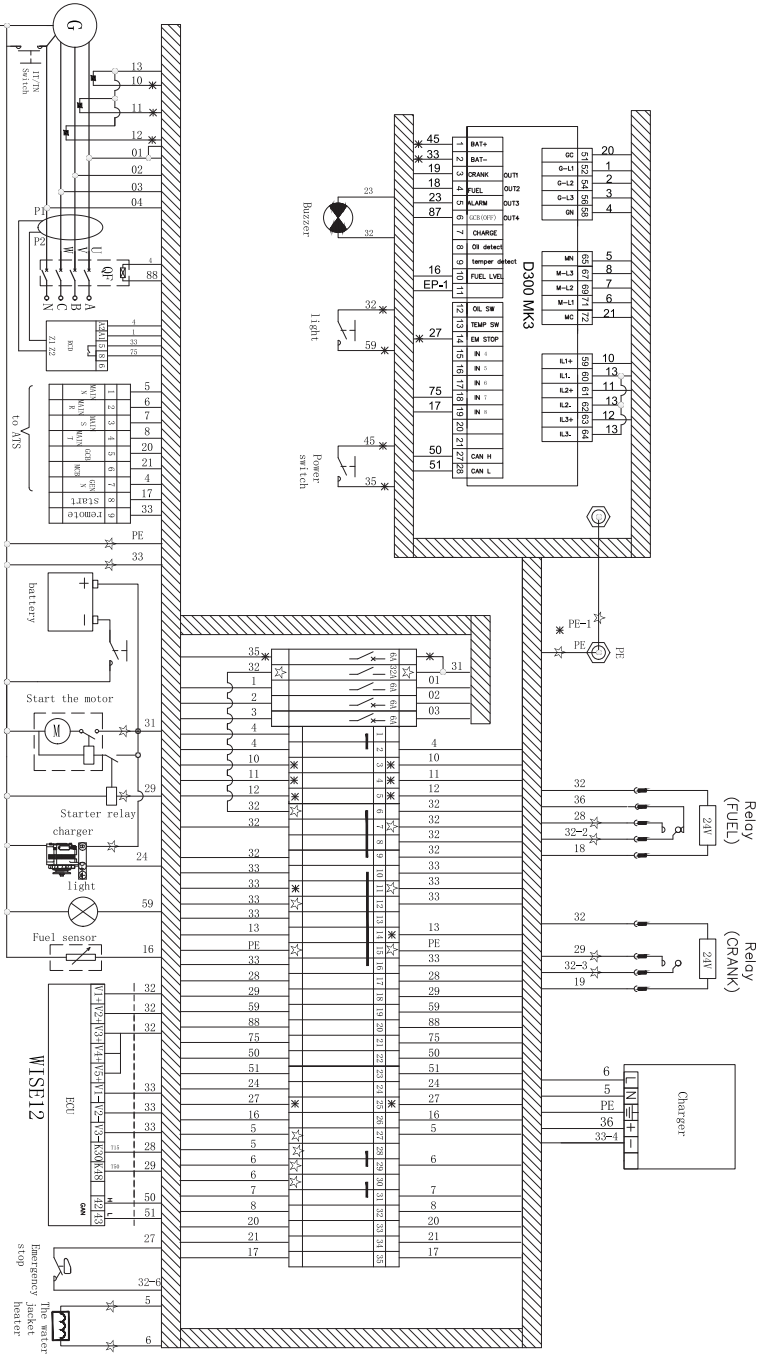
Electrical diagram for model KS 22-3BE



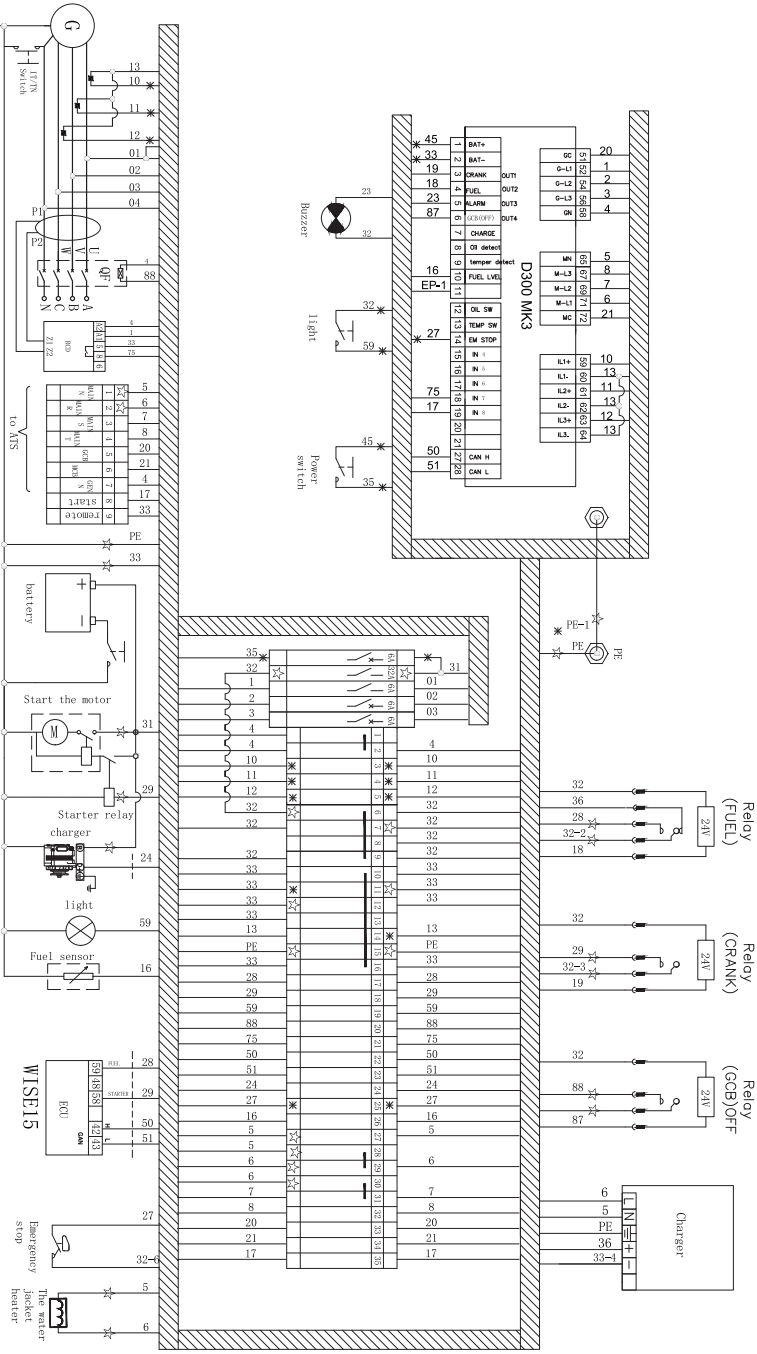
Electrical diagram for model KS 35-3BE



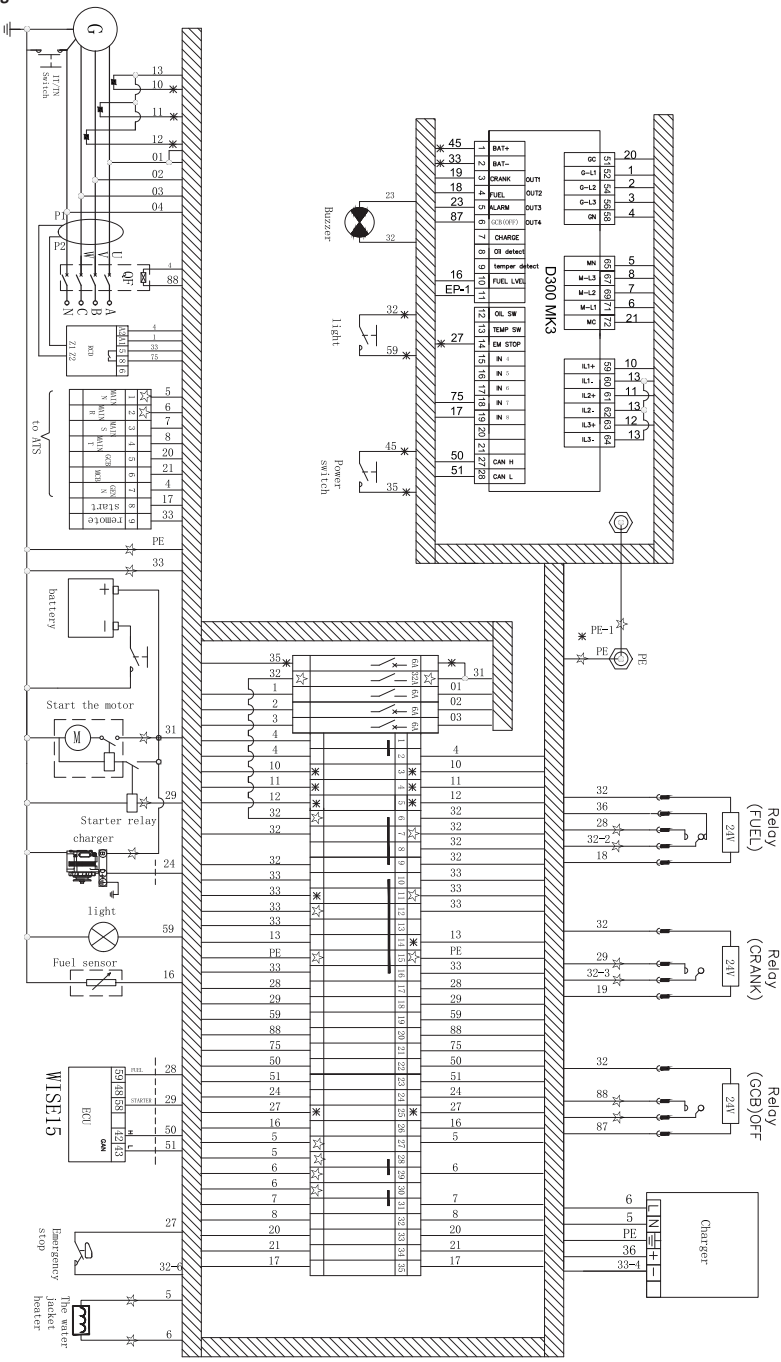
Electrical diagram for model KS 50-3BE



Electrical diagram for model KS 72-3BE



Electrical diagram for model KS 110-3BE



INTRODUCTION

Thank you for choosing **Könner & Söhnen®** products. This manual provides a brief description of safety requirements, setup procedures, and operating instructions. More information is available in the support section at:
konner-sohnen.com/pages/instructions
You can also download the manual by scanning the QR code or by visiting the official importer's website at
www.konner-sohnen.com

| Please, read this manual before use!

The manufacturer reserves the right to make changes that may not be reflected in this manual, including:

- 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 for technical support is provided on the official website. All information in this manual is correct to the best of our knowledge at the time of publication. The current list of service centers can be found on the official importer's website at **www.konner-sohnen.com**

⚠ ATTENTION – DANGER! Failure to follow the recommendations marked with this sign may lead to serious injury or death of the operator or third parties.

⚠ IMPORTANT! Useful information while operating the machine.

SAFETY INFORMATION

It is prohibited to use the power plant in premises that are not specifically designed or prepared for its operation. Place the power plant on a flat, hard surface, away from flammable liquids/gases (at a distance of not less than 3m). Install the power plant at a distance of not less than 1.5m from the front control panel and not less than 1.5m on each side, including the upper part of the power plant. Keep unauthorized persons, children, and animals away from the work area. Wear safety shoes and gloves.

⚠ ATTENTION – DANGER! When installing the power plant, pay attention to the capacity of electrical appliances and their starting current, which may be several times higher than the rated current. The power plant cannot run in overload conditions when starting consumers with an inrush current higher than the power plant's maximum output.

Diesel power plants from from Könner & Söhnen are equipped with a main overload (MCCB) and adjustable main leakage protection (RCD) (Fig. 1).

Generator sockets have their own circuit breakers (RCBOs or MCBs) connected downstream of the main switch (MCCB).

If you want to feed the entire generator output (e.g., to a building's) into an external distribution board, you must connect the cable to the output of the main switch (MCCB unit) and set the required tripping current and response time to the RCD (residual current device) suitable for the external distribution board. The selectivity rule must be observed. Tripping current and delay time can be set on the RCD using DIP switches.

(I △ n) Rated residual operating current Setting

I △ n (amps)	0.03	0.1	0.3	0.5	1	3	5
DIP switch position							

(Ts) Trip Delay Time Setting

Ts (S)	0	0.2	0.4	1	5
DIP switch position					

⚠ **NOTE!** When the rated residual operating current I Δ n is set to 30 mA, the tripping delay time is automatically set to instantaneous tripping, and the tripping delay selector switch becomes ineffective.

Residual risks

Despite all design and safety measures applied to this power plant set, certain residual risks may still remain during its operation.

Noise exposure

The guaranteed sound power level of this diesel power plant does not exceed the limits established by Directive 2000/14/EC and applicable EU regulations.
However, prolonged exposure to noise, even within permitted limits, may cause discomfort or fatigue.

Recommendation: When working close to the running power plant for extended periods, use approved hearing protection and avoid staying unnecessarily near the noise source.

Vibration risk

The diesel power plant is equipped with vibration-isolating mounts to reduce transmission of vibration to surrounding structures.
Nevertheless, continuous or improper operation may lead to operator discomfort or health effects associated with long-term vibration exposure (such as hand-arm vibration syndrome).

Recommendation: Operate the power plant only on its vibration-damping supports and avoid prolonged contact with vibrating components.

Environmental hazards

During fuel filling, oil change, or maintenance, spilled oil or fuel may cause environmental contamination.

⚠ **WARNING! Prevent any fuel or oil from entering soil, sewage systems, or water sources.**

In case of leakage or accidental spill, stop the engine immediately, collect the liquid with approved absorbent material, and dispose of it according to local environmental regulations.

ELECTRICAL SAFETY

⚠ **ATTENTION – DANGER! The device generates electricity. Follow safety precautions to avoid electric shock.**

⚠ **IMPORTANT! The power plant is configured to operate as a TN system by default. The power plant can be configured as either an IT or TN system, depending on the application requirements. Earthing and additional protective measures, such as insulation monitoring or protection against accidental contact (residual current device), must be provided based on the application and the system used.**

The power plant produces electricity that may lead to an electric shock while neglecting compliance regulations. All connections of the power plant to the network must be made by a certified electrician in accordance with all electrical rules and regulations. Connect the power plant to the protective ground (fig. 10A) before operation. Wires with damaged or spoiled insulation should be replaced. You should also replace worn, damaged or rusty contacts.

⚠ **IMPORTANT! It is forbidden to connect to the power plant devices that can generate current pulses and direct energy towards the power plant (voltage stabilizers, devices with electronic brakes, on-grid and hybrid inverters, etc.).**

⚠ **IMPORTANT! Using device for other purposes deprives the right for free warranty.**

⚠ **ATTENTION – DANGER! Be careful. Do not operate the power plant if you are tired, under the influence of drugs or alcohol. Inattention may cause a serious injury.**

⚠ **ATTENTION – DANGER! The power plant runs on automotive diesel fuel and conforms to European quality standards not lower than EN 590 emission standard. Do not use gasoline, kerosene,or fuel oil as fuel. The diesel fuel type should correspond to the operating season.**

Using low-grade fuel may result in reduced performance or engine failure. Do not add any chemical additives to diesel fuel, and do not mix diesel fuel with used engine oil or fuel oil.

Diesel fuel characteristics	Region of use
EN590:96	European Union
BS 2869-A1 or A2	Great Britain

Keep the fuel tank and refueling accessories clean and neat, and ensure that no foreign objects/debris get into the fuel tank when refueling the power plant. Sulfur content should not exceed 0.5% (less than 0.05% is recommended). Sediment and water content in fuel should not exceed 0.05%. A cetane number of at least 45 must be ensured. For example, biodiesel fuel, which is known under the B5 brand, is permitted. This type of fuel should contain no more than 5% of fatty acid methyl esters (FAME) and 95% of mineral diesel fuel.

Engine emergency stop button

Do not use the engine emergency stop button to normally stop the power plant! It should only be used if absolutely necessary.

- During normal engine operation, the button must be in the extended position.
- Pressing the emergency stop button will cause the engine to stop.
- The engine will not start if this button is locked. To unlock the button, turn it clockwise.



⚠ IMPORTANT! The engine emergency stop button is intended for emergency situations only.

⚠ ATTENTION – DANGER! Do not start the power plant until the problem that caused the emergency shutdown is identified and eliminated.

Fire safety



Keep a suitable fire extinguisher nearby when operating or servicing the diesel power plant.

Use only extinguishers suitable for flammable liquids and electrical equipment, such as:

- CO_2 (carbon dioxide) extinguishers
- Foam extinguishers (AFFF type)

Do not use water-based extinguishers on fuel or electrical fires.

Ensure personnel are trained in the proper use of fire extinguishers.

Each time you start the power plant, inspect the battery cables to prevent sparking, which can lead to a fire. The batteries must be kept clean. Use the recommended cables and connections during power plant operation.

Fuel and fumes associated with the operation of power plant equipment can be flammable and potentially explosive. Safety regulations require that fully charged fire extinguishers be kept within easy reach of the power plant.

⚠ ATTENTION – DANGER! Always start and use the diesel power plant set in a well-ventilated area. It is prohibited to use the power plant in an unprepared room (without calculated supply ventilation or a properly designed exhaust gas removal system).

⚠ SAFETY SYMBOLS DECRYPTION

Fig. 2A

1. Be careful when operating the device! Observe the safety instructions in this manual.
2. Operate the power plant only in properly prepared rooms or outdoors. Exhaust gases contain carbon monoxide (CO), which is poisonous and may be fatal.
3. Moving parts can cause severe injury!
4. Do not smoke while operating the power plant!
5. The device generates electricity. Observe safety precautions to avoid electric shock.
6. Read this owner's manual carefully before operating the device.
7. Do not touch the power plant with wet or dirty hands.
8. Observe fire safety regulations, and do not operate the power plant near open flame.

⚠ ATTENTION – DANGER! Electrolyte is an acid. The electrolyte can cause burns. Do not allow electrolytes to get on the skin and into the eyes. Always wear safety glasses during battery maintenance. Wash your hands after touching the batteries or their connections. It is recommended to use mittens.

Fig. 2B Replace air filter every 1000 working hours. Replaace twice as often in excessively dusty conditions.

Fig. 2C Do not touch internal terminals, wiring or connections while machine is operating! Turn power off before servicing! Before connecting this power plant to any building's electrical system, a licensed electricial must install isolation (transfer) switch!

Fig. 2D Moving parts can cause severe injury! Do not operate with open doors! Stop engine before servicing!

Fig. 2E Please don't touch! The working surface heats up when running the power plant.

Fig. 2F Lifting hook mounting point.

Fig. 2G Maintenance information in the local language can be found in the "Maintenance" section.

Fig. 2H Danger! Never open when hot! Hot coolant will scald you!

Fig. 2I The power plant runs on automotive diesel fuel. Do not use gasoline, kerosene, fuel oil as fuel.

Fig. 2G Caution! Automatic start of equipment

Fig. 2K Coolant drain valve

Fig. 2L Warning – Hot liquid.

Fig. 2M Warning! High voltage. Risk of electric shock.

Fig. 2N Grounding.

Fig. 2O Do not cover the engine or exhaust. Blocking airflow can lead to overheating and potential damage.

Fig. 2P Indicates the noise level.

Fig. 2Q Indicates the circuit breaker used to protect the electrical system from overload or short circuit.

Fig. 2R Generator main output breaker warning label.

Fig. 2S Indicates that the power plant's neutral is electrically connected (bonded) to the frame. Ensures proper grounding and electrical safety.

Fig. 2T Indicates the location of the cooling water drain point used for emptying the cooling system.

Fig. 2U Indicates the engine oil drain point used for emptying the engine oil.

Fig. 2V Indicates the fuel drain point used for emptying fuel from the system.

MAIN OVERVIEW (fig.3)

1. Soundproof housing
2. Emergency switch engine
3. Control panel
4. Access door to the control panel and internal elements of the power plant is locked with a key
5. Electrical fuel level sensor
6. Holes for vehicle fasteners
7. Exhaust pipe
8. Coolant filler cap
9. Oil filling hole cover

Fig.4

There is a LED light switch on the control panel. The LED lamp is installed inside the diesel power plant housing, which facilitates maintenance. The lighting is powered by a 12V battery and can work when the power plant is turned off.

Fig.5

Sockets are located outside the housing and RCD circuit breakers are located under the control panel.

Control panel (Fig.6)

1. Graphic LCD screen

Fault condition indicators:

2. Service request indicator
3. Warning indicator
4. Shutdown alarm indicator

5. Next screen in the same group. LAMP TEST is conducted while button is pressed
6. Previous display group
7. Next display group
8. Previous screen in the same group. ALARM Mute

Power supply system status diagram:

9. Mains available indicator
10. Mains contactor ON indicator
11. Genset contactor ON indicator
12. Genset available indicator

13. STOP mode button with indicator
14. AUTO mode button with indicator
15. Power plant start mode button (RUN) with indicator
16. TEST mode button with indicator

Description of touch buttons of control unit

Button	Function	Description
	**TEST MODE**	Conducts testing of the power plant set. Selects TEST mode. The genset runs and takes the load.
	**STARTING THE POWER PLANT**	Start the power plant in manual mode or in test mode. Selects RUN mode.
	**AUTOMATIC MODE**	Pressing this button puts the controller in automatic control mode. Selects AUTO mode. The genset runs when necessary and takes the load.
	**STOP / CANCEL**	Stop the power plant operation in automatic / manual mode; reset the emergency message; press this button again to stop the power plant immediately. Selects OFF mode. The genset stops.

Fault status indicators:

Indicator	Function	Description
	**ALARM**	LED illuminates when a fault alarm is triggered, resulting in a system shutdown, or when the load shedding mode is LED illuminates.
	**WARNING**	LED illuminates when a warning condition exists.
	**SERVICE REQUEST**	LED illuminates when at least one of the service counters has expired.

Power supply system status indicators

Each LED illuminates when the related mode is selected, either locally or remotely.

Indicator	Function	Description
	**MAINS AVAILABLE**	This LED illuminates GREEN when all mains phase voltages and the mains frequency are within limits. If LED illuminates, the mains phase rotation order must also be right. When any digital input is defined as Remote Start, this LED will reflect the status of the input. When a Simulate Mains signal is present, then the mains status will become “available”. When a Force to Start signal is present, then the mains status will become “not available”.
	**MAINS CONTACTOR ON**	LED illuminates when the mains contactor is activated.

	**GENSET CONTACTOR ON**	LED illuminates when the genset contactor is activated.
	**GENSET AVAILABLE**	This LED illuminates on when all genset phase voltages and the genset frequency are within limits. If LED illuminates, the genset phase rotation order is correct.

⚠ WARNING! If a Remote Start input is defined, then the Mains LED will reflect the input status. Simulate Mains and Force to Start signals will also affect this LED.

Display screen organization

The unit measures a large number of electrical and engine parameters. The display of the parameters is organized as PARAMETER GROUPS and items in a group.

Navigation between different groups is made with ◀ and ▶ buttons.

Each depression of the ▶ button will cause the display to switch to the next group of parameters. After the last group, the display will switch to the first group.

Each depression of the ◀ button will cause the display to switch to the previous group of parameters. After the first group, the display will switch to the last group.

Navigation inside a groups is made with ▼ and ▲ buttons.

Each depression of the ▼ button will cause the display to switch to the next parameter in the same group. After the last parameter, the display will switch to the first parameter.

Each depression of the ▲ button will cause the display to switch to the previous parameter in the same group. After the first parameter, the display will switch to the last parameter.

GENSET PARAMETERS: Genset voltages, currents, kW, kVA, kVAr, pf etc...

ENGINE PARAMETERS: Analog sender readings, rpm, battery voltage, engine hours, etc...

MAINS PARAMETERS: Mains voltages, currents, kW, kVA, kVAr, pf etc... Mains currents and power parameters are displayed only when CT Selection is made as LOAD SIDE. Otherwise mains current and power related parameters will not be displayed.

SCOPEMETER DISPLAY: This group display waveforms of voltages and currents as an oscilloscope. All Ph-N and Ph-Ph voltages as well as phase currents are available. This feature is especially useful for investigating harmonics caused by complex loads.

GRAPHICAL HARMONIC ANALYSIS RESULTS: This group displays harmonic composition of voltages and currents. All Ph-N and Ph-Ph voltages as well as phase currents are available. This feature is especially useful to investigate the harmonic caused by complex loads. Only harmonics above 2% are represented in the graphics because of the display resolution. In order to see all harmonic levels please use the Alphanumerical Harmonic Analysis Results.

ALPHANUMERICAL HARMONIC ANALYSIS RESULTS: This group displays harmonic composition of voltages and currents with 0.1% resolution. All Ph-N and Ph-Ph voltages as well as phase currents are available. This feature is especially useful to investigate the harmonic caused by complex loads.

ALARM DISPLAY: This group displays all existing alarms, one screen per alarm. When there is no more alarm to display it will show "END OF ALARM LIST".

GSM MODEM PARAMETERS: Signal strength, counters, communication status, IP addresses etc...

ETHERNET PARAMETERS: Ethernet connection status, counters, IP addresses etc...

STATUS & COUNTERS GROUPS: This group includes various parameters like genset status, service counters, date-time, firmware version etc...

Indicator lights on the controller

The controller has three indicators on the left: ALARM, WARNING, and SERVICE REQUEST.

ALARM (CRITICAL FAILURE): Indicates a critical fault with the engine or power plant. In such cases, the controller automatically stops the engine to prevent damage.

The cause of the failure is displayed on the controller's screen.

Typical critical failures include:

- Emergency stop triggered by pressing the red "Emergency STOP" button on the power plant housing
- Low oil pressure
- Coolant temperature exceeding limits
- Low coolant level
- Excessive engine RPM
- Critical power plant overload

WARNING (NON-CRITICAL FAILURE): Indicates a non-critical fault or warning that does not result in the power plant's shutdown.

SERVICE REQUEST (MAINTENANCE REQUEST): Indicates that scheduled maintenance is required.

The controller is programmed for:

- 1st maintenance: After 50 operating hours or 6 months
- 2nd maintenance: After 250 operating hours or 12 months

The indicator will remain on until the engineer performing the maintenance resets the reminder through the engineering menu (ENGINE) using a password.

This indicator does not stop the power plant's operation; it simply reminds the user that maintenance is due.

COMPONENTS OF SET

1. Diesel power plant
2. Operating instructions
3. Product passport
4. Test report

SPECIFICATIONS

Model	KS 22-3BE	KS 35-3BE	KS 50-3BE	KS 72-3BE	KS 110-3BE
Max Power (ESP)	22 kVA	35 kVA	50 kVA	72 kVA	110 kVA
Max Power (ESP)	18 kW	28 kW	40 kW	57 kW	88 kW
Rated Apparent power (PRP)	20 kVA	32 kVA	45 kVA	65 kVA	100 kVA
Rated Active power (PRP)	16 kW	26 kW	36 kW	52 kW	80 kW
Voltage	230V/400V	230V/400V	230V/400V	230V/400V	230V/400V
Frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Power factor	cos φ 0.8	cos φ 0.8	cos φ 0.8	cos φ 0.8	cos φ 0.8
Number of phases	3	3	3	3	3
Current (max.)	32 A	51 A	72 A	103 A	159 A
Current (rated)	29 A	47 A	65 A	94 A	144 A
Insulation class	H				
ENGINE CHARACTERISTICS					
Engine type	diesel powered four-cylinder, four-stroke water-cooled				
Engine model	4M08G4D3/5	4M08G8D3/5	4M08G10D3/5	4M10G2D3/5	4M10G6D3/5
Engine speed	1500 rpm				
Output power	25 kW/HP	33 kW/HP	36.8 kW/HP	60 kW/HP	96 kW/HP
Engine cylinder volume	3,17 cm^3	3,17 cm^3	3,17 cm^3	4,088 cm^3	4,088 cm^3
4 line cylinder	4 l	4 l	4 l	4 l	4 l
Engine speed monitoring system	ECU engine speed control				
Engine WATER heater	equipped				
GENERAL CHARACTERISTICS					
Alternator model	KSA184E	KSA184H	KSA224D	KSA224F	KSA274C
Controller	Datakom D300				
Fuel tank volume	80 l	133 l	153 l	207 l	220 l
Fuel consumption at 50% of load*	2.3 l/h	3.6 l/h	4.8 l/h	6.5 l/h	10 l/h
Crankcase volume	11 l	9 l	10 l	11 l	11.5 l
Coolant volume	11 l	9 l	11.8 l	17.5 l	18 l
Housing	noise - proof, moisture-proof, metal, all-weather, vandal-proof				
Housing coating	galvanized + powder coating				
Battery	80 Ah	80 Ah	80 Ah	120 Ah	120 Ah
Battery charger	built-in				
ATS connection	+	+	+	+	+
Power output controller	AVR				
Protection class	IP23	IP23	IP23	IP23	IP23
Outlets	16A CEE 7/3 (230V) 32A CEE 32/3 (230V) 16A CEE 16/5 (400V) 32A CEE 32/5 (400V)	16A CEE 7/3 (230V) 32A CEE 32/3 (230V) 16A CEE 16/5 (400V) 32A CEE 32/5 (400V)	16A CEE 7/3 (230V) 32A CEE 32/3 (230V) 32A CEE 32/5 (400V) 63A CEE 63/5 (400V)	16A CEE 7/3 (230V) 32A CEE 32/3 (230V) 32A CEE 32/5 (400V) 63A CEE 63/5 (400V)	16A CEE 7/3 (230V) 32A CEE 32/3 (230V) 32A CEE 32/5 (400V) 63A CEE 63/5 (400V)
Net dimensions (L×W×H)	2200×950×1250 mm	2188×900×1280 mm	2288×950×1280 mm	2688×1080×1280 mm	2688×1080×1280 mm
Net weight	914 kg	955 kg	1056 kg	1356 kg	1438 kg

Rating definitions (ISO 8528)

ESP - Emergency Standby Power:
It is the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 h of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output over 24 h of operation shall not exceed 70 % of the ESP.

PRP - Prime Power:
It is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturer. The permissible average power output over 24 h of operation shall not exceed 70 % of the prime power.

*Fuel consumption depends on many factors, such as load, fuel quality, season, altitude, technical condition of the power plant.

The optimum operating conditions are ambient temperature of 17°C – 25°C, barometric pressure of 0.1 MPa (760 mm Hg), and relative humidity of 50 – 60%. Under such ambient conditions, the power plant can guarantee maximum performance in terms of the stated specifications. In case of deviations from the above ambient values, the performance of the power plant can be different.

If the power plant is used as the main power source, the total long-term load must not exceed 80% of the rated power of the station.

EC Declaration of Conformity

Nr. 276

Manufacturer:	DIMAX INTERNATIONAL GmbH
Address:	Flinger Broich 203, 40235 Duesseldorf, Germany

We DIMAX INTERNATIONAL GmbH, hereby declare under our sole responsibility that specified below products is in conformity with the relevant Union harmonisation legislation.

Product:	Diesel power plant
Type / Model:	KS 22-3BE, KS 35-3BE, KS 50-3BE, KS 72-3BE, KS 110-3BE
Applied EC Directives:	2006/42/EC Machinery Directive 2014/30/EC Electromagnetic compatibility Directive (EMC) 2000/14/EC Noise Directive
Applied Standards:	EN ISO 8528-13:2016 EN55012:2007+A1:2009, IEC 61000-6-2, EN IEC 61000-6-4 EN ISO 3744:2010 EN ISO 8528-10:2022
Issued date:	2026-08-31
Place of issue:	Duesseldorf
Director:	Fomin P.

DIMAX
International GmbH
Flinger Broich 203 40235 Düsseldorf
Ust-ID DE296177274
koenner-soennen.com
P. Fomin

CE

This diesel power plant is intended for stationary industrial installation and operation in accordance with Directive (EU) 2015/2193 (Medium Combustion Plant Directive). The unit is designed for permanent installation on a fixed foundation and is not intended for portable or mobile use.

REACH Regulation (EC) No. 1907/2006

The manufacturer confirms that this product complies with the requirements of the REACH Regulation concerning the restriction of substances of very high concern (SVHC). We confirm that supplied parts comply with REACH Regulation (EC) 1907/2006 and contain no SVHC above 0.1%
Based on information received from component suppliers, no SVHC are present in concentrations exceeding the limits defined by the regulation.
This declaration is made on the basis of self-assessment and supplier statements.

RoHS Directive 2011/65/EU

This product contains electrical and electronic components that are subject to the RoHS Directive 2011/65/EU.

Based on information and test reports provided by component suppliers, the manufacturer confirms that these components comply with RoHS Directive 2011/65/EU.
This generator set is intended for stationary installation and use as a standby power source. When installed and operated as a stationary combustion plant, it shall be used in accordance with the applicable national regulations implementing Directive (EU) 2015/2193 (Medium Combustion Plant Directive), where applicable.

INSTALLATION AND USE OF DIESEL POWER PLANT

According to the safety regulations, diesel power plants must only be installed, maintained and repaired by a service dealer or other competent, qualified electrician or installation technician who has information about the standards, regulations, and requirements for the arrangement of diesel power plants and holds all the

necessary certifications to perform such work.

The operator must be a qualified specialist in working with power plants.

⚠ **ATTENTION – DANGER! It is necessary to take into account the restriction of access to the power plant by unauthorized persons.**

Diesel power plants can be installed in a specially equipped place, both indoors and outdoors.

For any method of location, it is necessary to provide:

- grounding of the power plant;
- normal, unhindered flow of incoming air and appropriate removal of carbon monoxide. In any case, do not block the air intake and exhaust, as this has a serious impact on power plant operation

Power plant ventilation grilles

Fig. 7A

- Distance to the wall is at least 1.5 meters
- Distance to the ceiling is at least 1.5 meters

Fig. 7B The illustration is schematic; the placement of the ventilation openings may differ in the actual product depending on the housing in which the power plant is supplied.

1. Fresh air intake hole on the side of the power plant.
2. Fresh air intake holes on the casing door.
3. Hot air outlet opening

Do not allow the power plant to operate in a room where flammable gases may be drawn into the air intake system.

⚠ **ATTENTION – DANGER! Never cover the openings of the fence or drain air that passes through the electrical protective cover of the power plant.**

Earthing bolt (fig. 10A)

Depending on the network, the power plant's earthing bolt must be connected either to the equipotential bonding bar (IT system) or to the earthing (TN system).

⚠ **ATTENTION – DANGER! Power plant grounding is not a guaranteed protection against electric shock!**



INDOOR POWER PLANT PLACEMENT CONDITIONS

Foundation and vibration isolation:

1. When installing a diesel power plant indoors, check the relevant building codes for the building structure and its foundation regarding the possibility of such installation. They must withstand the total weight of the power plant, the weight of additional equipment and fuel reserves, as well as withstand the load that occurs during the plant operation.
2. The floor must be properly prepared, level, able to withstand the total load, and have anti-vibration properties.
3. If moisture can enter the room where the power plant will be built, a reinforced concrete foundation should be equipped at a level higher than the floor, the height of which should exceed the possible level of flooding.

Ventilation:

Special attention should be paid to the free space around the power plant and sufficient access to fresh air (Fig. 7). The room must be of sufficient size and provide an adequate airflow, calculated for each engine by a specialist before the power plant installation.

- Free access to all its parts for performing maintenance or repair work;
- Sufficient ventilation and fresh air supply to cool the engine and remove carbon monoxide.

⚠ **IMPORTANT! The engine exhaust contains combustion products that are harmful to health. Be sure to remove power plant exhaust outside.**

Usually, the opening for fresh air access is located in the lower part of the premise wall; in this case, air will circulate around the entire power plant.

⚠ **WARNING! In regions with high solar activity, it is recommended to avoid direct sunlight exposure on the power plant to prevent overheating when operating under load.**



CONDITIONS FOR DIESEL POWER PLANT PLACING OUTSIDE

Foundation and vibration isolation (fig. 8):

When installing a diesel power plant outside, a properly prepared reinforced concrete foundation must provide a rigid support, prevent vibration, and withstand the load that occurs during the operation of the plant. The foundation must have a depth of at least 300mm, and a width and length greater than 400mm for the

size of the power plant (200mm on each side). The foundation should be placed 200mm above ground level.

- The total height of the foundation must be at least 30 cm. The foundation should be placed 20cm above ground level.
- The foundation should be 20cm wider than the perimeter of the power plant on each side.

Ventilation:

When choosing an installation location, please note that the power plant is a source of hot gases.

The power plant installed outside must be located at a distance of at least 1.5 meters from the nearest building. The power plant must be located in accordance with the rules and local legislation.

TERMS OF DIESEL POWER PLANT USE

Before starting the pre-operation test, make sure that the power plant is on a flat, horizontal surface and the circuit breaker is in the "OFF" position.

Pre-launch checks (for all management systems)

To ensure the maximum service life of the power plant, always inspect it before starting up. To do this, you need to check:

- Fasteners and belts. Repair or replace worn belts, loose fasteners, and connections.
- Protective covers of the fan and exhaust system must be securely fastened.
- Keep the engine and all components of the station clean.
- If you notice a leak of coolant, grease, or fuel, find the source and fix the problem. Do not use the power plant until the problem is resolved.
- Accumulation of grease and/or oil on the engine is a fire hazard. Keep them clean. Do not allow contact with electronic/electrical components.
- Make sure that the engine cooling system pipes are securely and properly installed. Check if there are any cracks or liquid leaks on them.
- Check the engine oil level and coolant level - top up if necessary.
- Make sure to use the fluid types and specifications specified in this manual.

⚠ WARNING!

- **To avoid injury or burns, do not remove the radiator cap or any other cooling system component when the station is hot or running.**
- **Add coolant to the radiator slowly so that the air has time to escape, to avoid the formation of an airlock in the engine. Always top up the liquid when the engine is cold.**
- **Check the condition and tension of the engine cooling fan belts - tighten them if necessary. Before tightening the fan belts, disconnect the negative wire (-) from the battery to avoid accidental engine start.**
- **Check the battery terminals for corrosion and clean them if necessary.**
- **Check the control panel and power plant for dust and dirt - clean if necessary.**
- **Clear the space around the power plant of any dangerous objects that may interfere with the operator or cause injury. Make sure that the cooling air intakes are clean.**
- **Periodically drain condensate from the sump tanks of the exhaust system, if they are installed.**
- **If the liquid collection tray is provided by the support frame structure, it must be inspected, and the accumulation of liquid (fuel, oil, coolant, rainwater, or condensate) must be drained and disposed of in accordance with local norms and regulations.**
- **Make sure that the main power switch of the alternator is in the "OFF" position.**

⚠ IMPORTANT! Before starting the device, keep in mind that the total power of connected consumers does not exceed the rated power of the power plant.

BEFORE STARTING

The power plant may contain remnants of technical fluids after passing testing and configuration work.

⚠ IMPORTANT! Each time you start the power plant, be sure to check the oil, fuel level and coolant!

Be sure to make the following preparations for the station's operation before starting the station's operation:

1. Check for fuel in the tank. The generator is equipped with an electrical fuel level sensor (Fig.9). A green indicator shows that the fuel level is sufficient for normal operation. If the indicator turns red, it means the fuel level is low and the tank must be refilled.
2. Check the oil level.

a) Remove the oil dipstick and wipe it clean.
b) Insert the dipstick.
c) Pull out again and check the oil level on the dipstick mark.
d) Oil level should be in the middle between the MAX and MIN labels. It is recommended to maintain the oil level close to the MAX mark. Do not overfill the oil above the permitted level.



3. Check the coolant level. Before starting the power plant for the first time, pour the coolant through the hole at the top of the plant. Replace the coolant every 2 years, unless otherwise specified in the fluid specification. If you have any questions, please contact an authorized representative of the manufacturer or an authorized dealer in your area.
4. Check the battery charge. If necessary, charge the battery with an external charger (not included), or let the power plant run for more than an hour at a load of at least 30% at the first start-up.

⚠ **IMPORTANT! The diesel fuel type should correspond to the operating season.**

⚠ **IMPORTANT! If the power slant is in automatic mode at startup and connected to the mains, the battery is recharged from the built-in charger.**

If the diesel power plant remains unused and the external power supply is disconnected, recharge the battery every 2-3 months using an external charger.

GETTING STARTED

Before starting the engine, make sure that the rated power of the power consumers matches the power of the power plant. Do not exceed the nominal power of the power plant. **Do not connect any devices before starting the engine!**

If the power plant is used as the main power source, the total long-term load must not exceed 80% of the rated power of the diesel power plant.

⚠ **WARNING! It is forbidden to load the power plant above the max power!**

⚠ **WARNING! Do not connect the load to the power plant before starting the engine and entering operating mode.**

Equipment connection must always be carried out by a certified electrician responsible for the installation and electrical connection of the equipment according to local laws and regulations. The manufacturer assumes no liability for improper connection of the equipment or for any material or physical damage that may result from improper installation, connection or operation of the equipment.

Terminals connection

The power cables should be routed through the dedicated opening located at the bottom of the housing beneath the control panel door, secured with the clamping plate (Fig. 10A), and connected to the four-pole protective circuit breaker (Fig. 10B).

Automatic mode

1. Press  to activate the automatic power plant control mode. The LED indicator that lights up next to the button indicates the selected control mode.
2. The power plant is controlled in a pre-programmed automatic mode. When the parameters of the external electrical network deviate from the norm (increased or decreased voltage, increased or decreased frequency, phase loss, incorrect phase sequence), the monitoring timer turns on and the display starts counting down. If during this period of time, the parameters of the external electrical network are restored to normal, the signal for automatic engine start is canceled.
3. After receiving the start signal, the start delay timer starts, and preheating will occur for - 10 seconds, indicated by the LED (optional function).
4. One second after that, the starter is triggered and the engine starts. If the engine does not start during the start attempt, the starter takes a break of 10 seconds. Three consecutive automatic engine start attempts are performed, and the start sequence is repeated.

⚠ **WARNING! In case of three unsuccessful attempts to start the engine, the system notifies about the detected problem by using an indicator.**

5. Devices to the power plant must be connected one after another, from the device with the maximum power to the device with the minimum power; the total power of the connected devices must not exceed the rated power of the power plant.
6. When the parameters of the external power grid return to normal, the controller executes the power plant shutdown program and switches to standby and monitoring mode.

Manual mode

1. Click  to start the engine. An LED indicator that lights up next to the button indicates the selected control mode.

⚠ **IMPORTANT! If the engine does not start after three or four attempts, it may mean that the fuel tank is running out of fuel. Check the fuel level in the tank according to the values on the indicator.**

2. The controller performs diagnostics of the power plant systems' operation. If any malfunction is detected, the controller will notify of the detected problem.
3. You can use the power plant if the controller does not detect any deviations within three minutes and notifies about the detected problem.
4. Allow the power plant to run without a load for 5 minutes in the warm season and 10 minutes in the cold season. This will ensure reliable and trouble-free operation of the station.

⚠ **WARNING! It is forbidden to load the power plant above the max power!**

⚠ **IMPORTANT! The load of a three-phase diesel power plant must be distributed over all three phases, and the load on all phases must be balanced and evenly distributed.**

⚠ **IMPORTANT! Failure to follow these instructions may lead to damage to the rotor and stator windings, the AVR unit and is not covered by the warranty.**

⚠ IMPORTANT! If the power plant circuit breaker is triggered as a result of overloading, reduce the load. Re-switching of the power plant is possible in 5 minutes after shutdown.

⚠ WARNING! Disconnect all devices before stopping the power plant! Do not stop the power plant if there are connected devices. This can disable the power plant!

⚠ IMPORTANT! On the housing near the control panel, there is an emergency engine switch button. It should be used only in case of an emergency.

To stop the engine, proceed as follows:

1. Turn off all devices connected to the power plant.

2. Allow the power plant to run for 3 minutes without a load to allow the alternator to cool down.

3. Press the red STOP button on the IR controller  to stop the power plant in manual/automatic mode.

4. For immediate power plant shutdown in manual/automatic mode. Click  again.

⚠ IMPORTANT! For emergency shutdown, press the emergency stop button.

Control contacts for external control

The terminal block for external control connection has two types of connections: for controlling an external ATS and for controlling the generator using an external device via dry contacts. Contacts 1–6 are intended for connection to an external ATS, while contacts 7–8 are intended for connection to an external "dry contact". Fig. 11A shows the terminal block for connecting signal wires, and Fig. 11B shows the connector pinout.

Control contacts for external operation via dry contacts

The control contacts on the power plant are a set of terminals (fig. 11) designed for integration with external automation, monitoring, and remote-control systems.

⚠ WARNING! Control is carried out through so-called "dry contacts".

A dry contact is a standard switch (relay) that has no internal power source. It can be in two states:

Closed: The contact connects two wires, allowing the signal to pass through.

Open: The contact breaks the circuit, interrupting the signal.

The key feature is that it does not supply voltage itself, but only opens or closes the circuit in which the voltage is provided by the power plant's controller. This makes it universal and safe for connecting any type of equipment.

Function implemented via external control contacts

REMOTE START/STOP

- **Operating Principle:** An external device closes a specific pair of contacts on the power plant to issue a start command. As long as the contacts remain closed, the power plant continues to run. Once the contacts open, the power plant performs a shutdown procedure.
- **Applications:** Automatic start when the main power grid fails via an ATS (Automatic Transfer Switch); start command from a solar inverter; manual start using a remote push button; start/stop control by an automatic control device equipped with dry contacts operating according to its programmed logic.

By default, the control pair is configured as follows: closing the contacts starts the power plant, opening them stops it.

The system can be reconfigured to the opposite logic: opening the contacts starts the power plant, closing them stops it.

⚠ WARNING! It is strictly forbidden to apply any voltage to the CONTROL TERMINAL contacts. Control must be carried out exclusively via potential-free dry contacts.

MAINTENANCE

Works, specified in the "Technical maintenance" section, are to be regularly performed. If the power plant user cannot perform regular maintenance independently, it is necessary to address the official service center to register an order for such work performance.

⚠ IMPORTANT! In case of any damages that occurred due to non-performance of regular maintenance works, the manufacturer bears no responsibility for such damages.

Such damages include:

- Damages occurred as a result of using non-original spare parts;
- Corrosion damage and other results of improper equipment storage;
- Damages occur as a result of maintenance performance by inexperienced and unauthorized specialists.

Manual compliance

Technical maintenance, operation, and **Könner & Söhnen®** generator storage are to be performed according to this manual's recommendations. The manufacturer bears no responsibility for damages and losses caused by non-compliance with safety requirements and technical maintenance rules.

First of all, this applies to:

- use of lubricants, fuel, and motor oils, forbidden by the manufacturer;
- device technical alterations;
- equipment operations against its intended use;
- indirect damages caused by operating faulty equipment.

⚠ ATTENTION – DANGER! Stop the engine before performing any maintenance work. If it is necessary for the engine to run, make sure that power plant operation will not endanger the service personnel.

This is manual compliance! You can find a list of service center addresses on the website of the exclusive importer: **www.konner-sohnen.com**

Technical maintenance works

Service elements	Maintenance periods								
	Before each start	After the first 50 hours of work	Every 100 hours of operation	Every 250 hours of operation	Every 500 hours of operation	Every 1000 hours of operation	Every 2000 hours of operation	Every year	Every 2 years
Air filter			⊙	✦		○		○	
Oil filter		○		○				○	
Motor oil	⊙	○		○				○	
Fuel filter				○				○	
Fuel line and clamps on it		⊙		⊙					○
Liquid in the cooling system				⊙			○		○
Cooling system hoses and belt clamps		⊙		⊙					
Integrity of electrical connections and drives		⊙			⊙				
Battery electrolyte level				⊙					
Rechargeable battery (charge monitoring)				⊙					
Fan and pump belt		⊙		⊙	●	○			
Valve gaps						●			
Flushing the cooling system and radiator									⊙
Water separator			✦						
Fuel tank								⊙	✦
Air filter indicator	⊙								
Coolant level	⊙								

○ – replacement; ⊙ – check; ● – regulation; ✦ – cleaning.

If the generator is operated in dusty, dirty, or severe conditions, maintenance procedures such as air filter cleaning and inspection should be performed twice as often as indicated in the maintenance table.

RECOMMENDED OILS

Engine oil requirements

To ensure reliable and long-lasting operation of the Baudouin diesel engines, it is essential to use engine oil that strictly meets the following quality and viscosity specifications.

API quality class

Use engine oils designed for heavily loaded diesel engines that meet one of the following API (American Petroleum Institute) classifications:

- API CF-4
- API CH-4
- API CI-4+

SAE viscosity class

The oil viscosity should be selected strictly in accordance with the ambient temperature range in which the power plant set operates.

For most climate zones, the universally recommended and primary viscosity grade is **SAE 10W-40.**

SAE Viscosity Class	Operating temperature range
5W-30	from -30°C to +30°C
10W-30	from -25°C to +30°C
10W-40	from -25°C to +40°C (primary recommendation)

Mixing is prohibited:

It is **FORBIDDEN** to mix engine oils of different manufacturers, brands, quality classes, or viscosities. A complete flushing of the engine's lubrication system is required before changing oil types.

Motor oils with viscosities other than those specified in the table may be used only if the average ambient temperature in your region falls outside the indicated operating range.

If the oil level drops, it must be topped up to ensure proper power plant operation. The oil level should be checked according to the maintenance schedule. When changing the oil, be sure to replace the oil filter.

Engine oil replacement or adding

If the oil level decreases, add the required amount to ensure correct power plant operation. It is necessary to check the oil levels according to the technical maintenance schedule. When changing the oil, be sure to replace the oil filter.

To drain the oil

To drain the oil, perform the following steps: To facilitate oil flow, unscrew the oil filler cap located on the valve cover (Fig. 12A). Place a container for used oil under the drain opening located at the bottom of the diesel power plant housing. Unscrew the drain plug (Fig. 12B). Remove the dipstick (Fig. 12C). Open the oil drain valve located at the bottom of the engine crankcase (Fig. 12D). Allow the oil to drain for several minutes.

When the oil has completely drained, close the valve, tighten the drain plug, and reinsert the dipstick into its opening. It is recommended to drain the used oil while the engine is warm.

Oil filling:

1. Open the auxiliary engine oil filler opening on the top panel of the power plant.
2. Open the oil filler plug on the valve cover of the engine.

⚠ **WARNING! Make sure that the oil drain valve is closed and the dipstick is inserted into the engine.**

3. Using a funnel, add the required amount of oil into the engine.
4. Check the oil level with a dipstick.
5. It is recommended to replace the oil filter when changing the oil.

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

Power plant maintenance should only be carried out by qualified personnel. For service maintenance, please contact the point of sale, or look for an up-to-date list of service centers on the importer's official website: **www.konner-sohnen.com**

AIR FILTER TECHNICAL MAINTENANCE

Fig.13

It is necessary to check the air filter from time to time and clean any contamination. Regular air filter maintenance is necessary to maintain sufficient airflow in the air supply system. The air filter should be cleaned more often when using a power plant in dusty conditions.

⚠ **ATTENTION – DANGER! Never run the engine with the air filter removed or without the filter. Dirt and dust lead to rapid breakage of engine parts. Failure in this case will not be repaired.**

⚠ **IMPORTANT! Replace air filter every 1000 working hours. Replace twice as often in excessively dusty conditions.**

FUEL FILTER

Two types of fuel filters are used in **Könner & Söhnen®** diesel power plants. They prevent the ingress of contaminants from diesel fuel to the engine.

Coarse cleaning fuel filter

Remove the filter for cleaning every 200 operating hours or after possible contamination by hard particles. Never use water to purify the filter.

1. Remove the fuel cap.
2. Remove the fuel filter.

3. Use diesel fuel to clean the filter.
4. Put the filter back in the fuel tank.

The fuel filter in the fuel supply pipeline

This filter has to be replaced every 500 operating hours. It's located under the fuel tank on the fuel hose through which fuel enters the engine from the tank. To replace it:

Preparation:

1. Stop the engine.
2. Close the fuel shut-off valve that supplies fuel from the tank (if installed).
3. Thoroughly clean the area around the filters.

Removal:

1. Place a container to collect the drained fuel.
2. Using a wrench, remove the old filters (first the separator – if installed, then the fine fuel filter).
3. Wipe the mounting surfaces on the bracket with a clean cloth.
4. Replace the fine fuel filter.

Installation:

1. Lubricate the sealing rings of the new filters with clean diesel fuel.
2. Recommended: Fill the new filters with clean fuel (through the side openings only, not through the center).
3. Screw the new filters on by hand until the gasket contacts the surface, then tighten an additional ½–¾ turn.

⚠ **WARNING! Do not use a wrench for tightening!**

Priming (Critically Important!):

1. Open the fuel shut-off valve.
2. Locate the manual priming pump (lever or push-button type).
3. Loosen the air bleed screw (usually located on the fine fuel filter bracket or on the high-pressure fuel pump).
4. Pump the manual priming lever vigorously until fuel flows steadily from the bleed screw without air bubbles.
5. While maintaining pressure, tighten the bleed screw securely.

Inspection: Start the engine. Due to residual air in the high-pressure lines, the engine may not start immediately or may run unevenly for 10 – 30 seconds — this is normal.

Leak check: Immediately after starting, while the engine is idling, carefully inspect the filter mounting areas (around the seals) and the air bleed screw for any signs of fuel leakage.

Only after confirming that everything is dry and the engine runs smoothly can normal operation be resumed.

BATTERY MAINTENANCE

Battery Handling. Preparation for Long-Term Storage

If the generator is not used for an extended period (more than one month), the battery must be prepared for storage:

Disconnect the battery:

1. Turn off the generator and make sure all systems are de-energized.
2.First disconnect the negative (–) terminal, then the positive (+) terminal of the battery.
3. If necessary, remove the battery from the generator for separate storage.

Clean the terminals:

1. Wipe the terminals with a dry cloth and remove any oxidation if present.
2. Optionally, apply a thin layer of technical grease to the terminals to prevent corrosion.

Storage conditions:

1. Store the battery in a dry, clean, and well-ventilated area at a temperature between +5 °C and +25 °C.
2. Avoid direct sunlight and exposure to moisture.

Maintaining the charge:

1. Fully charge the battery before storage.
2. If the battery is stored for more than 3 months, it is recommended to recharge it every 2–3 months to full capacity.

Returning the battery to operation.

Before reinstalling the battery on the generator:

1. Check the charge level and recharge if necessary.
2. Inspect the casing and terminals for any damage or corrosion.
3. Connect the battery starting with the positive (+) terminal, then the negative (–) terminal.
4. Ensure all connections and mounts are secure.

Battery maintenance.
In **Könner & Söhnen®** models with electric start, you should periodically perform battery voltage checks. The generator battery has a voltage of 12V, if the voltage is lower 12.2V, you should perform battery charging with the help of an external charger (not included in the delivery set).

To avoid discharging the battery, it is recommended to run the power plant at least once a month for 30 minutes. If the power plant is not used for a long time, please disconnect the battery from the terminals. The battery that comes with the power plant does not require additional maintenance or filling of electrolyte.

⚠ **IMPORTANT! Please note that if you fail to start up power plants, the batteries may run out; therefore, the batteries must be fully charged before starting operation.**

STORAGE

The storage area of the power plant should be dry, well-ventilated, and out of the reach of children.

Long-term storage of the power plant:

Long-term storage can affect the engine and the power plant as a whole. This impact can be reduced by proper preparation and storage of the power plant.

Engine storage. The engine must undergo a conservation procedure, which includes cleaning the engine and replacing all liquids with fresh or preservatives. Please contact your local dealer for more information about engine storage.

Storage of AC power plant equipment. When the alternator is stored, condensation can form in the windings. To reduce condensation, store the power plant set in a dry place. Please contact your local dealer for more information about storing alternators.

Battery storage. When the battery is in storage, it should be charged every 12 weeks (8 weeks in tropical climates) to a fully charged state.

Power plants transportation (fig. 14)

⚠ **IMPORTANT! It is recommended to drain the fuel to prevent spillage during transportation.**

It is possible to lift the power station with the help of two places for hook attachment in the upper part of the power plant. Or with the help of 4 holes in the lower part of the frame located around the perimeter. Or you can use two holes in the lower part of the frame with the help of a forklift. The attachment points are marked with a sign.0

POSSIBLE FAILURES AND SOLUTIONS

⚠ **IMPORTANT! Diagnostics and troubleshooting should be performed by a specialist in diesel power plants.**

Typical failures	Possible reason	Solution
1. Engine does not start or starts with difficulty	1. The battery (AKB) is discharged or has a poor connection.	1. Check the battery voltage, charge or replace it. Clean and tighten the terminals.
	2. No fuel in the tank.	2. Refill the fuel.
	3. Air in the fuel system (e.g., after replacing filters or if the fuel has run out).	3. Prime the fuel system by removing air using the manual priming pump, as described in the manual.
	4. Clogged fuel filter (or separator).	4. Replace the fuel filters.
	5. Faulty electromagnetic fuel cutoff valve (solenoid) on the high-pressure fuel pump (HPFP).	5. Check if voltage is supplied to the valve and whether it clicks when the ignition is turned on. Replace if necessary.
	6. Faulty starter or poor connection at the starter.	6. Check the electrical connections of the starter. Contact the service center for starter diagnostics.
	7. Use of unsuitable oil (too thick) at low temperatures.	7. Replace the oil with one that meets the seasonal requirements and manufacturer specifications.
	8. Low compression in the cylinders.	8. A thorough engine diagnosis is required at the service center.

2. Engine stops during operation	1. Out of fuel.	1. Refill the fuel and make sure to prime the fuel system.
	2. Severely clogged fuel filter or fuel pickup screen in the tank.	2. Replace the filters. Clean the fuel pickup.
	3. Engine overheating (protection activated).	3. See point 3.
	4. Low oil pressure (protection activated).	4. See point 4.
	5. Air intake into the fuel line.	5. Check the tightness of all connections from the tank to the high-pressure fuel pump (HPFP).
3. Engine overheats	1. Low coolant level (antifreeze).	1. Allow the engine to cool down! Check the level, top up the fluid. Find and eliminate the cause of the leak.
	2. Clogged radiator (externally – dust, fluff; internally – scale).	2. Clean the radiator externally (using compressed air). Flush the cooling system if necessary.
	3. Faulty thermostat (stuck in the closed position).	3. Check and replace the thermostat.
	4. Faulty fan or loose/broken fan/pump drive belt.	4. Inspect, tighten, or replace the belt. Check the fan operation.
	5. Faulty water pump (pump).	5. Contact the service center for pump diagnostics.
	6. Diesel power plant overload.	6. Reduce the load to the nominal value.
4. Low oil pressure (warning light/ signals on)	1. Low oil level in the crankcase.	1. Immediately stop the engine! Check the oil level with the dipstick, top it up to the recommended level.
	2. Clogged oil filter.	2. Replace the oil filter and oil.
	3. Incorrect type of oil (too low viscosity, poor quality).	3. Replace the oil with the manufacturer-recommended type.
	4. Faulty oil pressure sensor.	4. Check the sensor (e.g., by replacing it with a known good one).
	5. Wear of the oil pump or bearings.	5. Immediately stop the engine! Urgent diagnostics are required at the service center.
5. Engine smokes (Black smoke)	1. Power plant overload.	1. Reduce the load.
	2. Clogged air filter (lack of air).	2. Check and replace the air filter.
	3. Faulty fuel injectors (leaking fuel).	3. Contact the service center for diagnostics and repair/ replacement of injectors.
	4. Poor quality fuel.	4. Drain the fuel and refill with high-quality fuel.
	5. Incorrect fuel injection timing.	5. Fuel injection pump (FIP) adjustment is required at the service center.
	6. Blocked exhaust system.	6. Check the exhaust pipe for obstructions.
6. Engine smokes (Blue/ Gray smoke)	1. Oil entering the combustion chamber.	1. Diagnostics required at the service center (possible wear of piston rings or oil scraper seals).
	2. Faulty turbocharger (if applicable) – leaking oil.	2. Contact the service center for turbo diagnostics.
	3. Too high oil level in the crankcase.	3. Check the level, drain the excess oil.

7. Engine smokes (White smoke)	1. Coolant entering the combustion chamber (blown head gasket or crack).	1. Immediately stop the engine! Check the coolant level and ensure oil presence in it. Contact the service center.
	2. Cold start (especially in humid weather).	2. This is a normal occurrence (condensation evaporation). The smoke should disappear after the engine warms up.
	3. Faulty injectors or fuel injection pump (very lean injection).	3. Contact the service center for fuel system diagnostics.
8. Unstable operation (fluctuating RPM)	1. Air in the fuel system.	1. Prime the fuel system.
	2. Clogged fuel filters.	2. Replace the filters.
	3. Uneven operation of injectors.	3. Contact the service center for injector diagnostics.
	4. Faulty RPM regulator (on the fuel injection pump).	4. Contact the service center for diagnostics and adjustment.
9. Power plant does not produce voltage (engine running)	1. The automatic circuit breaker (protection circuit) on the generator has tripped.	1. Check the circuit breaker. Before turning it back on, identify the cause of the trip (overload, short circuit in the load).
	2. Fault in the AVR (Automatic Voltage Regulator) module.	2. Contact the service center.
	3. Damage to the alternator windings.	3. Contact the service center.

RECYCLING INFORMATION

WEEE Directive Compliance (2012/19/EU)

The diesel power plant is delivered with minimal packaging (polyethylene film and label), which should be disposed of through appropriate recycling channels where available.

At the end of its service life, the power plant must be handed over to authorized recycling or disposal facilities. Metal parts can be recycled, while electronic components, batteries, lubricants and fuel residues must be treated as hazardous waste in accordance with local regulations. Do not dispose of the generator set with household waste.

Battery safety

- Used batteries must be disposed of in accordance with local environmental regulations.
- Do not dispose of batteries in fire or with household waste.
- Improper handling of batteries may cause leakage, fire, or explosion.
- Always replace batteries with the same type and specification recommended by the manufacturer.
- Avoid short-circuiting battery terminals.

WARRANTY SERVICE TERMS

Manufacturer warranty is 2 years or 1000 hours (whichever comes first). The warranty period starts from the date of purchase. Within the warranty period, if the product fails because of defects in the production process, it will be exchanged on the same product or repaired.

The customer must provide buyer`s check during request for repair or exchange. Otherwise, the warranty service will not be provided.

Provide clean product to the service center. Parts, that must be replaced, are the property of the service center.

The warranty period is 2 years for private use and 1 year for commercial use.

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