OPERATING INSTRUCTIONS

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General note:

The illustrations in these operating instructions do not always comply completely with the actual design, in particular with regard to the colour, and are to be considered a representation of basic principles.

We reserve the right to make modifications in terms of ongoing technical development.

These instructions do not include technical modifications that occurred after printing.

1 General information

These operating instructions must be read carefully and understood before using the generator.

These operating instructions are intended to familiarise you with the basic operation of the generator.

These operating instructions contain important information on using the generator safely and appropriately.

Complying with this information helps to:

- avoid hazards
- reduce repair costs and downtime
- increase the reliability and service life of the generator.

However, not only these operating instructions but also the laws, regulations, guidelines, and standards applicable in the country of use and at the site of operation must be observed.

These operating instructions only describe the generator operation.

A copy of these operating instructions must be available to the operating personnel at all times.

1.1 **Further documents**

In addition to these operating instructions, the following documents are relevant for the generator:

- Operating instructions and maintenance instructions for the engine (Briggs & Stratton Corporation)
- Briggs & Stratton Service Germany (Briggs & Stratton Corporation)
- Regulations for handling the battery
- Circuit diagram for the generator

The operating manual and the maintenance instructions from the engine manufacturer are integral components of these instructions and must be observed.

1.2 Safety symbols

The safety symbol illustrates a source of danger. The safety symbols in the work area of the machine/plant and the entire technical documentation correspond to the Council Directive 92/58/EEC - Minimum requirements for the provision of safety and/or health signs at work.

General hazard

This warning sign indicates activities where several causes can lead to risks.

Potentially explosive materials

This warning symbol indicates activities during which there is an explosive hazard, possibly with lethal consequences.

Dangerous electrical voltage

This warning symbol indicates activities during which there is the danger of an electric shock, possibly with lethal consequences.

Poisonous substances

This warning symbol indicates activities during which there is the danger of poisoning, possibly with lethal consequences.

Environmentally damaging substances

This warning sign indicates activities during which the environment could be endangered, possibly with catastrophic consequences.

Hot surfaces

This warning symbol indicates activities during which there is the danger of burns, possibly with lasting consequences.

Notes

2 General Safety Regulations

This section describes the basic safety regulations for operating the generator.

Whoever operates the generator or works with it must read this chapter and comply with its regulations in practice.

2.1 Important safety warning

ENDRESS generators are designed to operate electrical equipment with appropriate power output requirements. Other applications can lead to injury to the operating personnel and to damage to the generator as well as other damage to equipment.

The majority of injuries and damage to equipment can be avoided if all instructions given in this manual and all instructions attached to the generator are followed.

The generator must not be modified in any way. This can lead to an accident occurring and damage to the generator as well as devices.

WARNING!

The following actions are not permitted.

- Operation in explosion-prone environments
- Operation in fire-prone environments
- Operation in confined areas
- Operation from a vehicle platform that has not been swung out
- Operation without the necessary safety redundancies
- Operation in existing power supply networks
- Refuelling when hot
- Refuelling during operation
- Spraying with high-pressure cleaners or fire-extinguishing equipment
- Safety equipment removal
- Incorrect vehicle installation
- Non-compliance with maintenance intervals
- Failure to measure and test for early damage identification
- Failure to replace wearing parts
- Incorrectly performed maintenance or repair work
- Defectively performed maintenance or repair work
- Unintended use

2.2 **Intended use**

The generator produces electricity in place of the power grid, in order to supply a mobile distribution system.

The generator may only be used outdoors within the indicated voltage, output, and nominal rpm ranges (see model plate).

You are also permitted to use it on a vehicle extension or swivelling platform in both extended and swung out states, providing that the air circulation is uninterrupted on all sides of the alternator and that the exhaust gases are dispersed correctly. This is especially relevant as access to the side with the instrument panel and the side with the exhaust gas connection must be unrestricted.

The method that will be used to install the generator on these surfaces of a vehicle requires written approval from the distributor that supplied the generator.

The generator may not be connected to other energy distribution systems (e.g. public power supply) or to other energy generation systems (e.g. other generators).

The generator may not be used in explosion-prone environments.

The generator may not be used in fire-prone environments.

The generator must be operated according to the specifications in the technical documentation.

Any non-intended use or any activity on the generator not described in these operating instructions is considered forbidden incorrect use outside the legal limits of the manufacturer's liability.

2.2.1 Residual risks

The points analysed and evaluated before beginning the design and planning of the generator were the residual risks using a risk analysis tool according to EN 1050.

Residual risks which cannot be avoided by implementing design measures during the whole life cycle of the generator can be:

- Risk of death
- Risk of injury
- Environmental hazards
- Material damage to the generator
- Material damage to other property
- Limited performance or functionality

You can avoid existing residual risks by observing and following these guidelines:

- the special warning notices on the generator
- the general safety instructions given in these operating instructions
- the specific warnings given in these operating instructions
- The specific standing instructions (the relevant operational conditions) issued by fire-brigades, civil defence and other relief organisations

Risk of death Risk of death to persons at the generator can be caused by:

- Incorrect use
- Inappropriate handling
- Missing protective equipment
- Defective or damaged electrical components
- Fuel vapours
- Engine exhaust
- Too large a distribution network configuration

Risk of injury

Risk of injury to persons at the generator can be caused by:

- Inappropriate handling
- Transport
- Hot components
- Recoiling starter rope on the engine

Environmental hazards

Environmental hazards involving the generator may be caused by:

- Inappropriate handling
- Operating fluids (fuel, lubricants, engine oil, etc.)
- Exhaust gas emission
- Noise emission
- Fire hazard
- Leaking battery acid

Material damage to the generator

Material damage to the generator can occur through:

- Inappropriate handling
- Overloading
- Overheating
- Too low/high oil level of the engine
- Non-compliance with the operating and maintenance specifications
- Unsuitable operating fluids
- Unsuitable hoisting gear

Material damage to other property

Material damage to other property in the operating range of the generator can occur through:

- Inappropriate handling
- An over and/or an undervoltage
- Incorrect installation in a vehicle

Limits to performance or functionality

The generator's performance or functionality can be limited by:

- Inappropriate handling
- Inappropriate maintenance or repair work
- Unsuitable operating fluids
- An installation altitude greater than 100 metres above sea level
- An ambient temperature exceeding 25°C
- Too large a distribution network configuration

2.3 Operating personnel – qualifications and obligations

Only appropriately authorised personnel may work with or on the alternator.

The authorised operating personnel must:

- be of age.
- be trained in first aid and able to provide it.
- be familiar with the accident prevention regulations and generator safety instructions and be able to apply them.
- have read the chapter "General Safety Regulations".
- has understand the content of the chapter "General Safety Regulations".
- be able to use and implement the content of the chapter "General Safety Regulations" in practice.
- be trained and instructed according to the rules of conduct in the event of malfunctions occurring.
- have the physical and mental abilities to carry out his responsibilities, tasks, and activities on the generator.
- be trained and instructed in his responsibilities, tasks and activities on the alternator.
- have understood the technical documentation concerning his responsibilities, tasks and activities on the alternator and be able to implement these in practice.

2.4 Personal protective equipment

This personal protection equipment must be worn during all activities at the generator described in these operating instructions:

- hearing protection
- protective gloves
- hard hat
- protective shoes
- fireproof protective clothing (in areas where the danger of fire is high)

2.5 **Danger zones and work areas**

The danger zones work places (work areas) on the generator are determined by the activities to be performed within the individual life cycles:

Life cycle	Activity	Danger zone	Work area
Transport	in the vehicle	Radius of 1.0 m	none
	by the operating personnel		Radius of 1.0 m
Operation	Setting up		
	Operating	Radius of 5.0 m	
	Refuelling	Radius of 2.0 m	
Service and maintenance	Cleaning	Radius of 1.0 m	
	Shutting down		
	Maintenance		

Table 2.1: Danger zones and work areas on the generator

2.6 **Labels on the generator**

These labels must be attached to the generator and be kept in a clearly legible condition:

Label	Designation
	Reference note - read operating instructions
	Potential equalization (earthing for FI)
ENDRESS D-72658 BEMPFLINGEN CE Typ 1304 DBG ES FS DIN 14685/1996-04 Baujahr Feb-12 Nr. 151026 / 38EK Nennleistung 13,0 kVA Nennleistungsfaktor 0,8 cos φN Nennfrequenz 50 Hz Nenndrehzahl 3000 min-1 Nennspannung 3~ 400 V Nennstrom 3~ 18,8 A Nennspannung 1~ 230 V Nennstrom 1~ 30,4 A Gewicht 150 kg Funkstörgrad N DIN 57875	Model plate
Motorinstandhaltung Service / Zeit 1. Olstand kontrollieren — 8 Stunden 2. Luftfilter kontrollieren und reinigen — 25 Stunden 3. Olwechsel — 50 Stunden 4. Olfilter wechseln — 100 Stunden 5. Reinigen der Kühlrippen — 100 Stunden siehe Reparatur und Bedienungsanleitung	Maintenance interval for the engine
	Note on the hot surface
OTTO-KRAFTSTOFF, BLEIFREI 91 ROZ Tankinhalt ca. 12 l ACHTUNG: NICHT WÄHREND DES BETRIEBES NACHTANKEN. ZUM NACHTANKEN, MOTOR ABSTELLEN UND EINIGE MINUTEN ABKÜHLEN LASSEN. NICHT IN UNBELÜFTETEN RÄUMEN BETREIBEN.	Fuel note

2.7 General safety instructions

The generator's construction may not be modified in any way.

The motor's nominal rpm has been set in the factory and may not be changed.

All protective covers must be at hand and functional.

All labels on the generator must be in place and in a clearly legible condition.

The operational reliability and functionality must be checked before and after each use/operation.

The generator must only be used outdoors with sufficient ventilation.

Do not use open flames, lights, or spark-inducing devices in the generator’s danger area.

Protect the generator against moisture and precipitation (rain, snow) during operation.

Protect the alternator against dirt and foreign matter during operation.

The authorised personnel are responsible for the operational reliability of the alternator.

The authorised personnel are responsible for safeguarding the alternator against unauthorised operation.

The authorised personnel are obligated to observe the applicable accident prevention regulations.

The authorised personnel are obligated to obey the safety and work instructions of superiors and/or safety officers.

The authorised personnel are obligated to wear personal protective equipment.

Only authorised personnel may remain in the generator's danger zone.

Smoking is absolutely prohibited in the generator's danger zone.

Open flames and light are prohibited in the generator's danger zone.

Consumption of alcohol, drugs, medications, or other mind-altering substances is prohibited.

The authorised personnel must be familiar with the alternator components and their function and know how to use them.

Transport

The generator may only be transported after it has cooled down.

The generator may only be transported in a vehicle after being fastened in place correctly (on the transport device).

The generator may only be lifted by the carrying handles provided.

The generator must be carried by at least as many persons as there are handles provided.

Setting up

The generator may only be set up on sufficiently firm ground.

The generator may only be set up on even ground.

Generating electricity

The electrical safety must be checked before each start-up.

Do not cover the equipment during use.

Do not obstruct or block the air supply.

Do not use starting aids.

Devices must not be connected during start-up.

Only tested and authorised cables may be used for the power network.

It is prohibited to establish a connection between existing neutral conductors, potential equalisation conductors and/or equipment components (safety-separated circuit).

The entire drawn output must not exceed the maximum nominal output of the generator.

Do not operate the generator without a sound damper.

It is prohibited to operate the generator without air filters and with an opened air filter cover.

Refuelling

It is prohibited to refill the fuel tank on the generator during operation.

It is prohibited to refill the fuel tank on the generator when it is still hot.

Use filling aids for refuelling.

Cleaning

It is prohibited to clean the generator during operation.

It is prohibited to clean the generator when it is still hot.

Maintenance and repair work

Operating personnel may only carry out the maintenance or repair work described in these operating instructions.

All other maintenance or repair tasks may only be carried out by specially trained and authorised specialists.

Always remove the ignition key and the spark plug sockets before beginning maintenance and/or repair work.

The maintenance intervals specified in these operating instructions must be observed.

It is prohibited to service the generator during operation.

It is prohibited to service the generator when it is still hot.

Decommissioning

The generator should be put out of service if it is not required for more than 30 days.

Store the generator in a dry and locked room.

Use a petrol additive to prevent resinous residues in the fuel system.

Documentation

One copy of these operating instructions must always be kept in the generator's manual compartment.

The operating instructions and the maintenance instructions for the engine (Briggs & Stratton Corporation) are integral parts of this instruction manual.

Environmental protection

The packaging material must be recycled according to the environmental protection regulations applicable at the place of use.

The workplace must be protected against contamination by leaking operating fluids.

Used or leftover fuels and lubricants must be recycled according to the environmental regulations applicable at the place of use.

2.8 **Function and mode of operation**

The synchronous generator is firmly coupled to the drive motor. The assembly is installed in a stable frame and equipped with a flexible, low-vibration suspension.

Splash-proof CEE sockets with a nominal voltage of 230V and/or 400V / 50 Hz supply the power.

An integrated voltage regulator controls the voltage of the alternator in the nominal speed range of the alternator.

The generator is designed for mobile operation with one or several electrical consumers (safety-separated circuit according to VDE 100, Part 551). The protective conductor of the ground contact socket assumes the function of the potential equalisation line.

Notes

3 Operation

The generator's operation is described in this section.

3.1 Transporting the generator

Proceed as follows to transport the generator.

Requirements

The following requirements must be met:

- The alternator must be turned off
- The generator must have cooled down.
- The installed fuel valve is in the “OFF” position

WARNING!

A slipping or falling device can crush hands or feet.

- Take the weight into account — about 135 / 150 kg.
- Lift / lower the generator evenly.

Carrying the generator

1. Lift generator evenly.
2. Carry generator to place of use.
3. Lower generator evenly.

✓ The generator has been carried to its operating site.

3.2 Setting up the generator

Proceed as follows to set up the generator.

Requirements

The following requirements must be met:

- An even and firm substratum outdoors
- There are no inflammable materials at the operating site
- There are no explosive materials at the operating site

WARNING!

Leaking engine oil and petrol can contaminate the soil and groundwater.

- Prevent leaking of engine oil and petrol.

Setting up the generator

The generator is set up as follows:

1. Prepare the work site.
2. Transport the generator to the operating site.

✓ The generator is set up and ready for use.

3.3 Refuelling the alternator

Proceed as follows to refuel the alternator.

Requirements

The following requirements must be met:

- The device must be shut off.
- The device must be cooled down.
- Sufficient ventilation must be available
- Appliances switched off or disconnected

WARNING!

Leaking engine oil and petrol can burn or explode!

- Prevent leaking of engine oil and petrol.
- Generator is switched off.
- Generator has cooled down.
- Avoid open flames and sparks.

WARNING!

Leaking engine oil can contaminate the soil and groundwater.

- Do not fill the tank completely.
- Use a filling aid.

WARNING!

The wrong fuel destroys the motor.

- Use only lead-free ROZ 95 premium petrol.

Refuelling the device

Refuel the generator as follows:

1. Set the fuel cock to "closed“ as necessary.
2. Unscrew tank cover.
3. Insert filler aid into the filler neck.
4. Add petrol.
5. Remove filler aid.
6. Screw on tank cap

✓ The device is refuelled.

3.4 Starting the generator

Requirements

The following requirements must be met:

- checked and tested for electrical safety
- there must be fuel in the tank.
- sufficient oil level (fill with engine oil before initial use, see the engine operating and maintenance instructions)
- ventilation must be adequate.
- a connected and operational starter battery
- appliances switched off or disconnected

WARNING!

Operating fluids can burn or explode.

- Prevent leaking of engine oil and petrol.
- Do not use starting aids.
- Avoid open flames and sparks.

WARNING!

Exhaust gases can cause fatal asphyxiation.

- Provide for sufficient ventilation.
- Use an exhaust gas pipe.
- Only operate the alternator outdoors.

WARNING!

Hot parts can ignite flammable and explosive materials.

- Avoid flammable materials at the work location.
- Avoid explosive materials at the work location.

WARNING!

Heat or moisture destroys the device.

- Avoid overheating (sufficient ventilation).
- Avoid moisture.

Starting the motor

Start the engine as follows:

Fig. 3-1: Starting the motor

ELECTRICAL START

1. Pull on the manually-operated choke *(Fig. 3-1-(2))* (completely for a cold engine / appropriately less for a warm engine) and hold firmly.
2. Turn the START-STOP switch *(Fig. 3-1-(1))* completely into the position "START“ until the engine starts and then release.

✓ The motor starts.

NOTE Only activate the starter briefly (max. 5-10 seconds). Never start or run the engine with the battery disconnected.

3. Bring the choke *(Fig. 3-1-(2))* into the basic position again.

✓ The engine has started.

NOTE The electrical devices can be connected and/or hooked up after a warming-up phase of about one minute.

WARNING!

Devices with a remote start device are fitted with an automatic choke. It is not necessary to use the manual choke.

3.5 Switching the generator off

Proceed as follows to shut down the generator.

WARNING!

Hot parts can ignite flammable and explosive materials.

- Avoid flammable materials at the operating site.
- Avoid explosive materials at the operating site.
- Allow the generator to cool down.

Switching the device off

The device is switched off as follows:

Electrical start

1. Switch off or disconnect devices.
2. Continue to run the engine for about two minutes.
3. Set the START-STOP switch *(Fig. 3-1-(1))* to position "0“

3.6 Connecting up consumers/appliances

Proceed as follows to connect appliances to the generator.

Requirements

The following requirements must be met:

- generator started
- device switched off

WARNING!

Electric shocks cause injury or death.

- Do not earth the generator.
- Do not connect protective conductor to an existing potential equalisation line.
- Do not connect the generator to an existing electrical grid.

Connecting up consumers/appliances

You can connect consumers with CEE sockets.

Fig. 3-2: Connecting up consumers/appliances

3.7 **Putting the alternator out of service**

The alternator should be put out of service if it is not required for more than 30 days. Use a cloth to cover the alternator.

NOTE Correct putting out of service is described in the motor's operating manual and maintenance instructions.

3.8 **Disposal**

Due to environmental protection considerations the generator, battery, engine oil etc. cannot simply be thrown into the refuse bin. Observe all local laws and regulations concerning correct disposal of such parts and substances. Your authorised ENDRESS generator dealer is happy to advise you.

Please observe the pertinent environmental protection regulations when disposing of the old oil. We recommend bringing the oil in a closed container to an old oil collection centre for disposal. Do not throw away used engine oil into the refuse bin or pour it onto the ground.

An inappropriately disposed of battery can damage the environment. Always comply with the local regulations when disposing of batteries. Please contact your ENDRESS maintenance dealer for a replacement.

Notes

4 Special fittings / using accessories

4.1 Remote start device

Proceed as follows to operate the generator using the remote start device.

Requirements

The following requirements must be met:

- generator is ready for operation

WARNING!

Devices with a remote start device are fitted with an automatic choke. You do not have to use the manual choke during an electrical start.

Connecting up a remote start device

Connect up the remote start device as follows (with the CON plug):

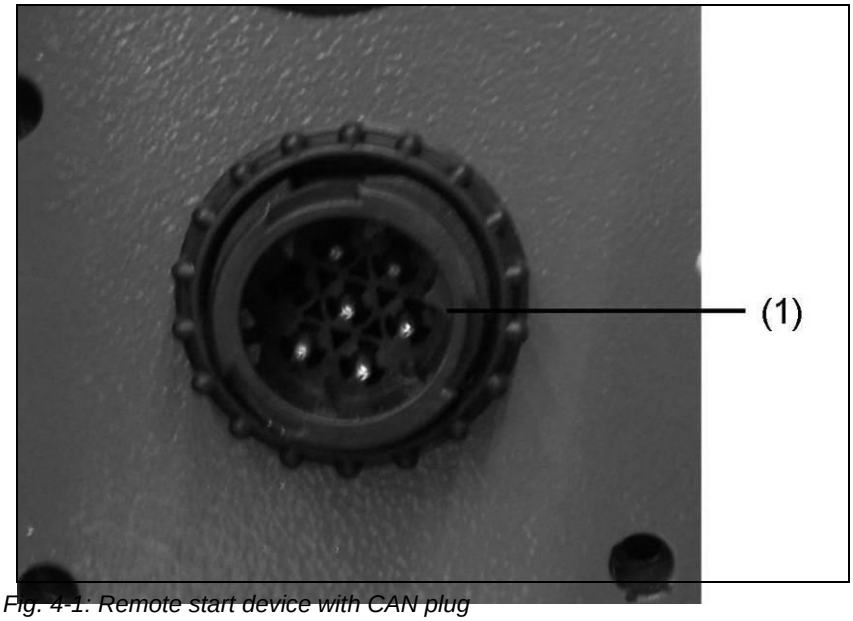

Fig. 4-1: Remote start device with CAN plug

Note

Battery charging retention might occur simultaneously when using the remote start device.

1. Insert plug for the remote start operating status / generator connecting cable into the remote start socket and lock in place by turning to the right.

✓ Remote start device is ready for use.

Disconnecting the remote start device

Disconnect the remote start device as follows:

1. Release the plug by turning to the left and then pull the remote start operating status / generator connecting cable plug out.

✓ Remote start device is disconnected.

5 Maintenance

Maintenance of the alternator is described in this section.

Only personnel from the manufacturer may carry out maintenance or repair work not described in this section.

5.1 **Maintenance plan**

The maintenance work specified in this summary must be carried out after the indicated time intervals.

Maintenance work	**Time interval in operating hours [h]**					
	after 8 h	**every 8 h / daily**	**every 25 h / annually**	**every 50 h / annually**	**every 100 h / annually**	**annually**
Checking the electrical safety	**before each start-up**					
Checking the oil		**X**				
Change the oil	**X**[3)]			**(X)**[1)]		
Change oil filter					**X**	
Cleaning the air filter			**(X)**[2)]			
Clean area around mufflers, linkages, and springs		**X**				
Exchange spark plugs						**X**
Change the fuel filter						**X**
Check fit of screws, nuts, and bolts					**X**	
Check condition and tightness of the fuel hoses and connections.					**X**	

Table 5.1: Generator maintenance plan

1) When operating under a heavy load or at high environmental temperatures at short intervals.

2) Clean more frequently when used in a dusty environment or in the presence of foreign particles in the air or for longer use in high, dry grass.

3) First time

5.2 **Maintenance work**

Only authorised personnel may carry out maintenance tasks.

Carry out all maintenance tasks specified in the maintenance plan according to the specifications in the enclosed operating and maintenance instructions for the engine. These operating and maintenance instructions of the engine manufacturer are an integral component of these operating instructions.

5.2.1 Charge battery

Important Charge the battery according to the regulations for handling from the manufacturer supplied in order to maximise the service life.

5.2.2 Replacing the starter battery

1. Unscrew the battery holder.
2. Remove the battery from the battery compartment.
3. Unscrew the battery cable. Push the protective terminal caps back for this purpose and loosen the screws. Always disconnect the cable from the NEGATIVE terminal first and then disconnect the cable from the POSITIVE terminal.

✓ Battery is disconnected.

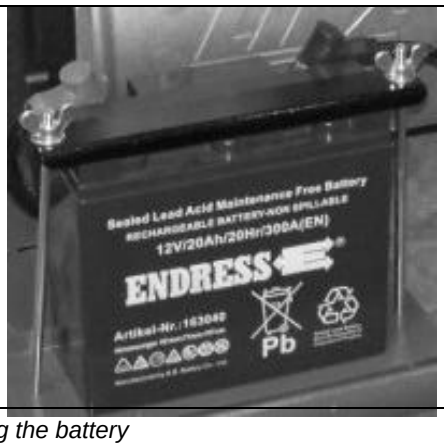

Fig. 5-1: Replacing the battery

4. Prepare a new battery.
5. The battery cables must first be screwed onto the POSITIVE terminal, then onto the NEGATIVE-terminal and then put on the terminal caps.
6. Put the battery back into the battery compartment.
7. Put the battery holder back.

✓ The battery has been replaced.

WARNING!

A highly explosive electrolytic gas mixture develops from gassing when charging batteries.

- Flames, sparks, an open light and smoking are prohibited.
- Avoid sparks when handling cables and electrical devices, as well as electrostatic discharge.
- Avoid short-circuits.

WARNING!

The Endress battery is maintenance-free throughout its entire service life.

- Never open the battery — this may destroy it.

5.2.3 Motor oil

WARNING!

Leaking motor oil can contaminate soil and groundwater.

- Use an oil collection container.
- Recycle used motor oil.

WARNING!

Motor oil can be hot — risk of burns.

- Allow motor to cool.

Requirements

The following requirements must be met:

- The engine should ideally be slightly warm (allow a cold engine to run for 5 min., then stop it and allow it to cool for 2 min.).

Fig. 5-2: Oil dipstick

Checking the oil

Check the oil level as follows:

1. Pull out the dipstick *(Fig. 5-2-(2))* and wipe it off with a clean cloth.
2. Reinsert the dipstick and take it out again. Drain off some of the oil if the level is above the upper mark and refill with oil if the level is under the lower mark (see below).

✓ The oil level has been checked.

Refilling with oil

Pour in oil as follows:

1. Remove oil screw plug *(Fig. 5-2-(1))*. Pull out the dipstick for easier filling (*(Fig. 5-2-(2))*.
2. Fill with oil using a filling aid.
3. Check oil level and add oil if necessary.

✓ The engine has been refilled with oil.

WARNING!

The oil escapes immediately after unscrewing the oil drainage screw.

Change the oil The procedure is as described in the operating instructions for the engine.

Change oil filter The procedure is as described in the operating instructions for the engine.

5.3 **Checking the electrical safety**

Only appropriately authorised personnel may check the electrical reliability.

The electrical reliability must be checked in accordance with the applicable VDE regulations, EN and DIN standards and especially the current version of the BGV A3 accident prevention regulations.

6 Troubleshooting

This section describes problems during operation that authorized personnel can remove.

Each occurring problem is described with its possible cause and the respective corrective measure.

The authorised personnel must immediately shut down the generator and inform the responsible and authorised service personnel if a problem cannot be solved with the aid of the following table.

Malfunction	Possible cause	Correction
No or insufficient voltage available during idling.	The motor's rpm was subsequently readjusted.	Call service staff.
Strong voltage fluctuations occur.	The engine runs irregularly.	Call service staff.
	The speed control works erratically or insufficiently.	Call service staff.
The engine does not start.	The engine is being operated incorrectly.	Follow the engine operating manual.
	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	The oil level monitor actuates.	Check oil level and refill if necessary.
	Oil pressure switch plug is loose.	Check fit of the oil pressure plug.
	Too little fuel in the tank.	Refuel.
	The fuel filter is clogged.	Replace the fuel filter.
	Bad fuel in the tank.	Call service staff.
	The ignition cable does not have any connection to the spark plug.	Attach ignition cable to the spark plug.
	The choke is not activated in a cold condition.	Actuate choke.
	The EMERGENCY-STOP button is pressed and locked in place.	Unlock the EMERGENCY-STOP button.
	The battery connecting cables are unclamped.	Clamp or screw on the battery connecting cables.
Starter battery has no output.	Battery is discharged.	Charge battery.
	Battery is defective.	Exchange battery.

Malfunction	Possible cause	Correction
	Battery terminals are oxidized.	Clean battery terminals and if necessary apply terminal grease.
Starter battery is not being charged.	Alternator / charge regulator defective.	Call service staff.
The engine does not rotate.	Engine defective.	Call service staff.
The engine smokes.	Too much oil in the engine.	Drain excess oil.
	Paper element of the air filter is dirty or oil-soaked.	Clean paper element or replace if necessary.
	Foam element of the air filter is dirty or dry.	Clean foam element and if necessary moisten.
The engine turns briefly and then shuts down.	Too little fuel in the tank.	Refuel.
	Ventilation holes on tank cover are clogged.	Clean ventilation holes.
	The oil level is too low.	Add oil.
	The fuel filter is clogged.	Replace the fuel filter.
The engine splutters.	The 20 litre standard container is empty.	Change the canister
	The refuelling device's sieve is blocked.	Clean the sieve.
	Carburettor/fuel filter/tank are covered with resin.	Call service staff.
The power output is insufficient.	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	Too much power is drawn.	Reduce power draw.
	The alternator is loaded beyond the nominal output.	Reduce power draw.
	Too much power is being taken off / the load is being taken off on one one side.	3~: reduce power take-off / 1~: Distribute the load evenly
The alternator runs jerkily.	Too little engine oil in the engine.	Refill engine oil.
The engine does not start in remote start mode.	The remote start equipment fuse is defective.	Replace the fuse.

Table 6.1: Problems arising during generator operation

Notes

7 Technical specifications

The technical specifications concerning use of the generator are described in this section.

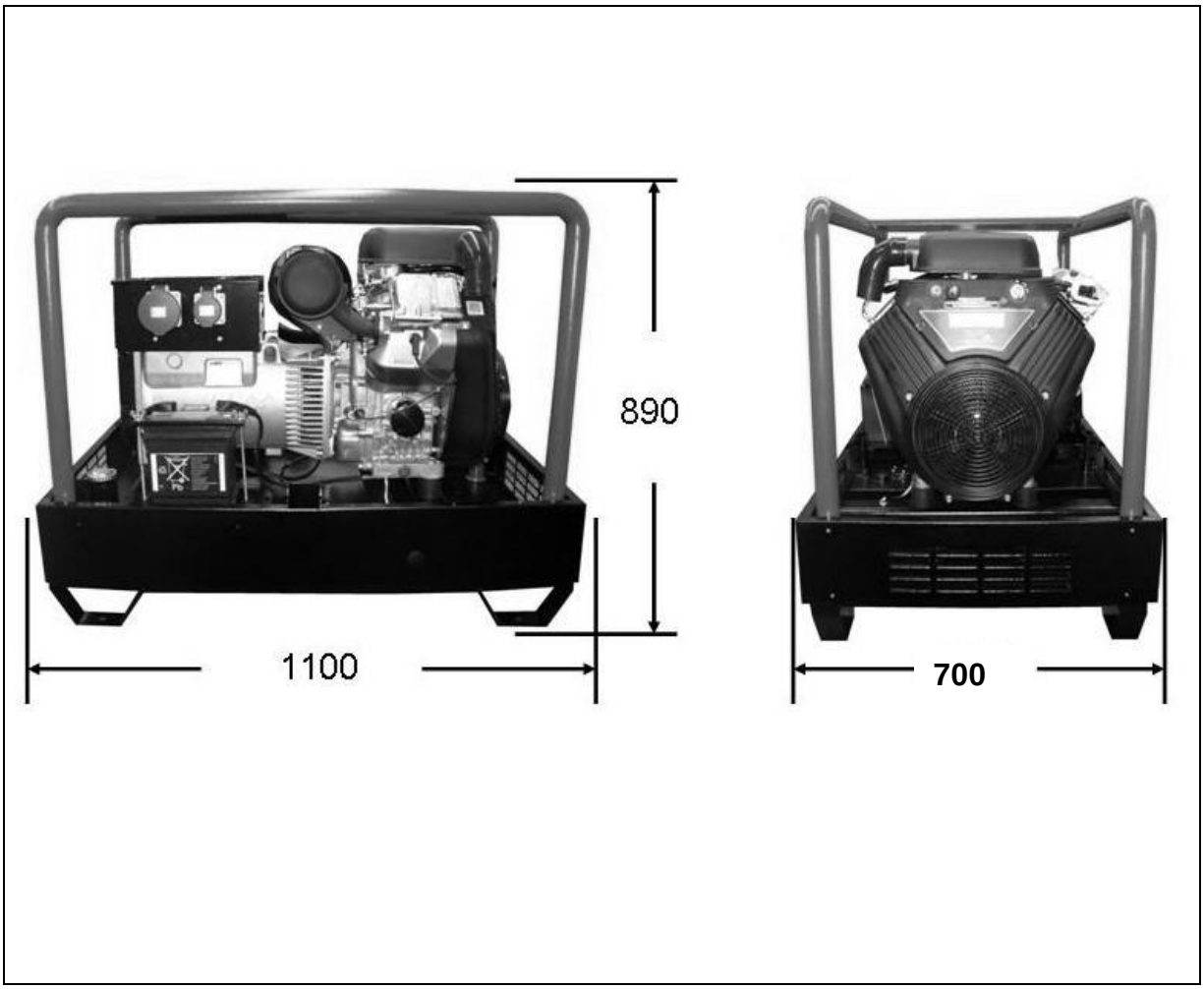

Fig. 7-1: Generator dimensions

Technical specifications

Designation	Value	Unit
Type	ESE 2006 DBS-GT ES	
Nominal output	20	[kVA]
Nominal power factor V3~	0.8	[cosφ]
Nominal power factor V1~	0.9	[cosφ]
Nominal frequency	50	[Hz]
Nominal speed	3000	[rpm]
Nominal voltage 3~	400	[V]
Nominal voltage 1~	230	[V]
Rated current 3~	29	[A]
Rated current 1~	16	[A]
Voltage tolerance (idling – nominal output)	± 5	[%]
Weight (ready for use)	230	[kg]
Tank capacity (lead-free normal ROZ91 fuel)	35	[l]
Length	1100	[mm]
Width	700	[mm]
Height	890	[mm]
Sound power level LWA*	104	[db (A)]
Sound power level LPA (7m)	79	

Table 7.1: Generator technical data

** measured at a distance of 1 m and a height of 1.6 m in accordance with ISO 3744 (Part 10)*

*** measured in accordance with ISO 3744 (Part 10)*

Ambient conditions

Designation	Value	Unit
Setting up height above sea level	< 100	[m]
Temperature	< 25	[°C]
Relative air humidity	< 30	[%]

Table 7.1: Ambient conditions for the generator

Reduced output

Output reduction	for each additional	Unit
1 %	100	[m]
4 %	10	[°C]

Table 7.2: Generator performance reduction dependent on the ambient conditions

Distribution network

Line	max. line length	Unit
HO 7 RN-F (NSH öu) 1,5 mm^2	60	[m]
HO 7 RN-F (NSH öu) 2,5 mm^2	100	[m]

Table 7.3: Maximum line length of the distribution network as a function of the cable cross-section

The general limitation of 100 m for the overall length was selected in the interest of safe handling during practical use. Larger dimensioning of the distribution network is only to be undertaken by a qualified electrician or trained personnel.

Notes

8 Replacement parts

The replacement parts needed to run the generator are described in this section.

8.1 Frame / alternator / engine

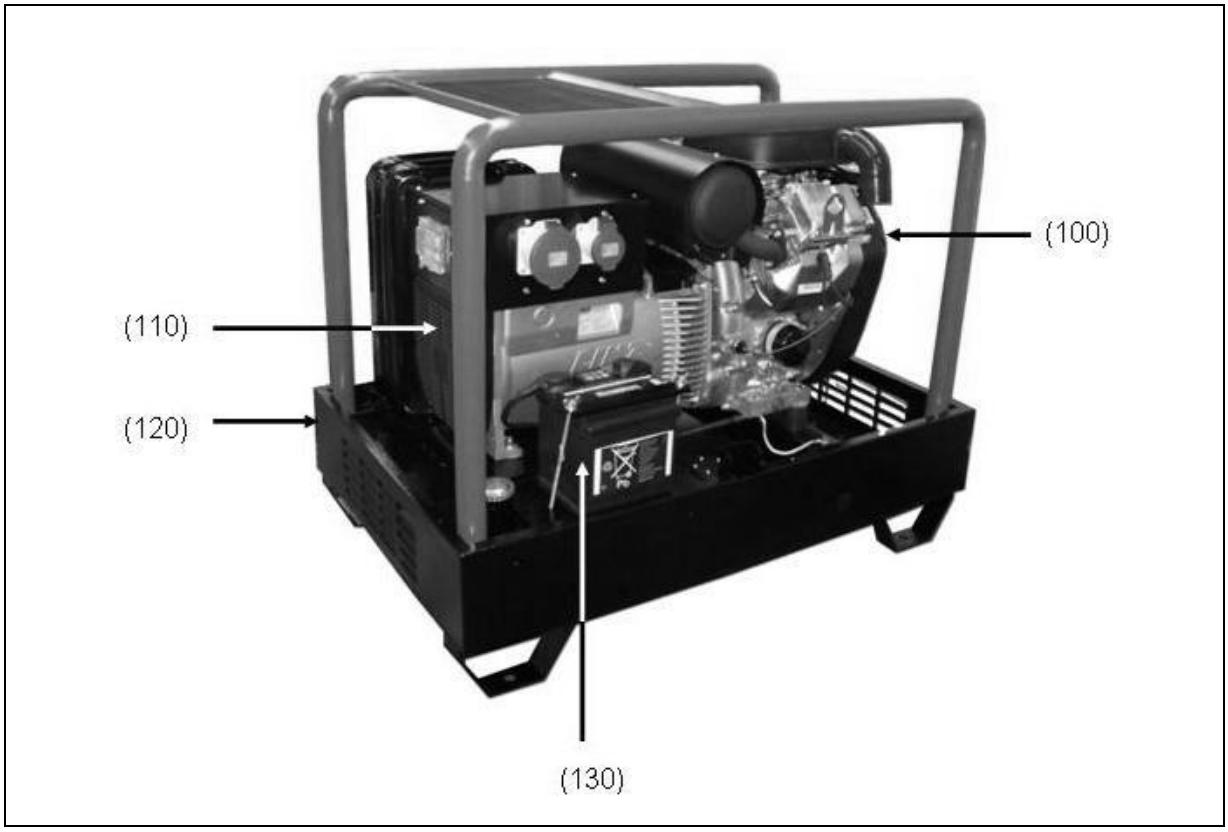

Fig. 8-1: Frame / alternator / engine

Item	Part number	Quantity	Item designation
100	E134952 E134951	1 1	MoVan.35HP/ES Cooler clean Silencer B+S
110	E134958	1	Alternator E1S13M D/2 22KVA
120	E505502/91	1	Floor assembly Sgr. The line
130	E134327	1	12V/ 40Ah battery

Table 8.1: Replacement parts for the frame with covers