



OPERATING INSTRUCTIONS

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ESE 904 DBG ES DIN	Article No. 151013
ESE 904 DBG ES FS DIN	Article No. 151023
ESE 1104 DBG ES DIN	Article No. 151015
ESE 1104 DBG ES FS DIN	Article No. 151025
ESE 1304 DBG ES DIN	Article No. 151016
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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 Documentation and accessories

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)
- Circuit diagram for the generator
- Regulations for handling the battery

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 methods that will be used to install the generator on these surfaces of a vehicle require 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 ESE 804 / 1104 / 1304 DBG DIN generator were the residual risks identified using a risk analysis tool.

Structurally unavoidable residual risks during the entire service life of the ESE 804 / 1104 / 1304 DBG DIN generator include:

- 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 at least 18 years old.
- 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	Radius of 5.0 m	Radius of 1.0 m
	Operating		
	Refuelling		
Service and maintenance	Cleaning	Radius of 1.0 m	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:

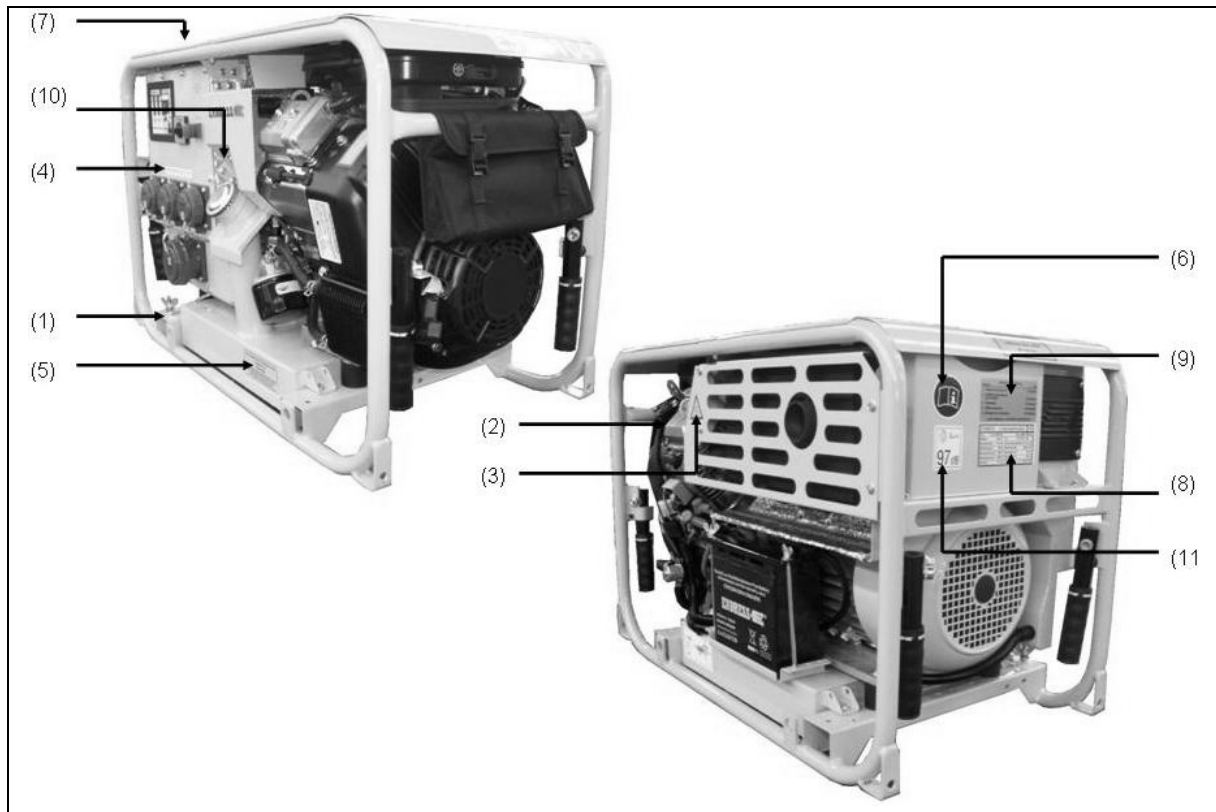



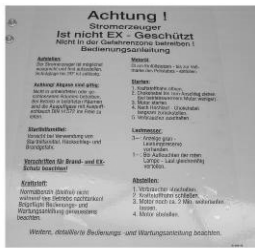


Fig. 2-1: Labels on the generator

- | | | | |
|---|---|----|--|
| 1 | Potential equalization (earthing for FI) | 6 | Reference note - "read operating instructions" |
| 2 | Motor model plate | 7 | Short operating instructions (interior)/
Reference note regarding short operating instructions (exterior) |
| 3 | Reference note - "hot surface" | 8 | Model plate |
| 4 | Reference note - "cable extension" (under the flap) | 9 | Reference note - "maintenance" |
| 5 | Reference note - "fuel note" | 10 | Reference note - "open flame" |
| | | 11 | Reference note - "noise emission" |

Label	Designation																								
	Potential equalization (earthing for FI)																								
	Reference note - "hot surface"																								
Gesamtes Leitungsverlängerungsnetz max.100m bei 2,5mm ² bei größerer Ausdehnung Bedienungsanleitung beachten!	Reference note - "cable extension"																								
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.	Reference note - "fuel note"																								
	Reference note - "read operating instructions"																								
	Short operating instructions (inner side flap)																								
<table border="1"> <thead> <tr> <th colspan="3">ENDRESS D-72658 BEMPFLINGEN CE</th> </tr> </thead> <tbody> <tr> <td>Typ</td> <td>1304 DBG ES FS</td> <td>DIN 14685/1996.04</td> </tr> <tr> <td>Baujahr</td> <td>Feb.12</td> <td>Nr. 151026 / 38 EK</td> </tr> <tr> <td>Nennleistung</td> <td>13,0 kVA</td> <td>Nennleistungsfaktor 0,8 cos φ N</td> </tr> <tr> <td>Nennfrequenz</td> <td>50 Hz</td> <td>Nenn Drehzahl 3000 min⁻¹</td> </tr> <tr> <td>Nennspannung 3~</td> <td>400 V</td> <td>Nennstrom 3~ 18,8 A</td> </tr> <tr> <td>Nennspannung 1~</td> <td>230 V</td> <td>Nennstrom 1~ 30,4 A</td> </tr> <tr> <td>Gewicht</td> <td>150 kg</td> <td>Funktörgrad N DIN 57875</td> </tr> </tbody> </table>	ENDRESS D-72658 BEMPFLINGEN CE			Typ	1304 DBG ES FS	DIN 14685/1996.04	Baujahr	Feb.12	Nr. 151026 / 38 EK	Nennleistung	13,0 kVA	Nennleistungsfaktor 0,8 cos φ N	Nennfrequenz	50 Hz	Nenn Drehzahl 3000 min ⁻¹	Nennspannung 3~	400 V	Nennstrom 3~ 18,8 A	Nennspannung 1~	230 V	Nennstrom 1~ 30,4 A	Gewicht	150 kg	Funktörgrad N DIN 57875	Generator model plate
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Label	Designation
	Reference note - "no naked flames"
	Note Noise emission

Table 2.2: Labels on the generator

2.7 General safety instructions

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

The engine'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 any open flame, light or spark-generating devices within the generator's danger zone.

Protect the alternator 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 spark plug socket 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.

Notes

3 Operating generator ESE 904 - 1304 DBG DIN



The components and functionality of the generator are described in this section.

3.1 Components of generator ESE 904 - 1304 DBG DIN

The generator components are distributed on all four sides.

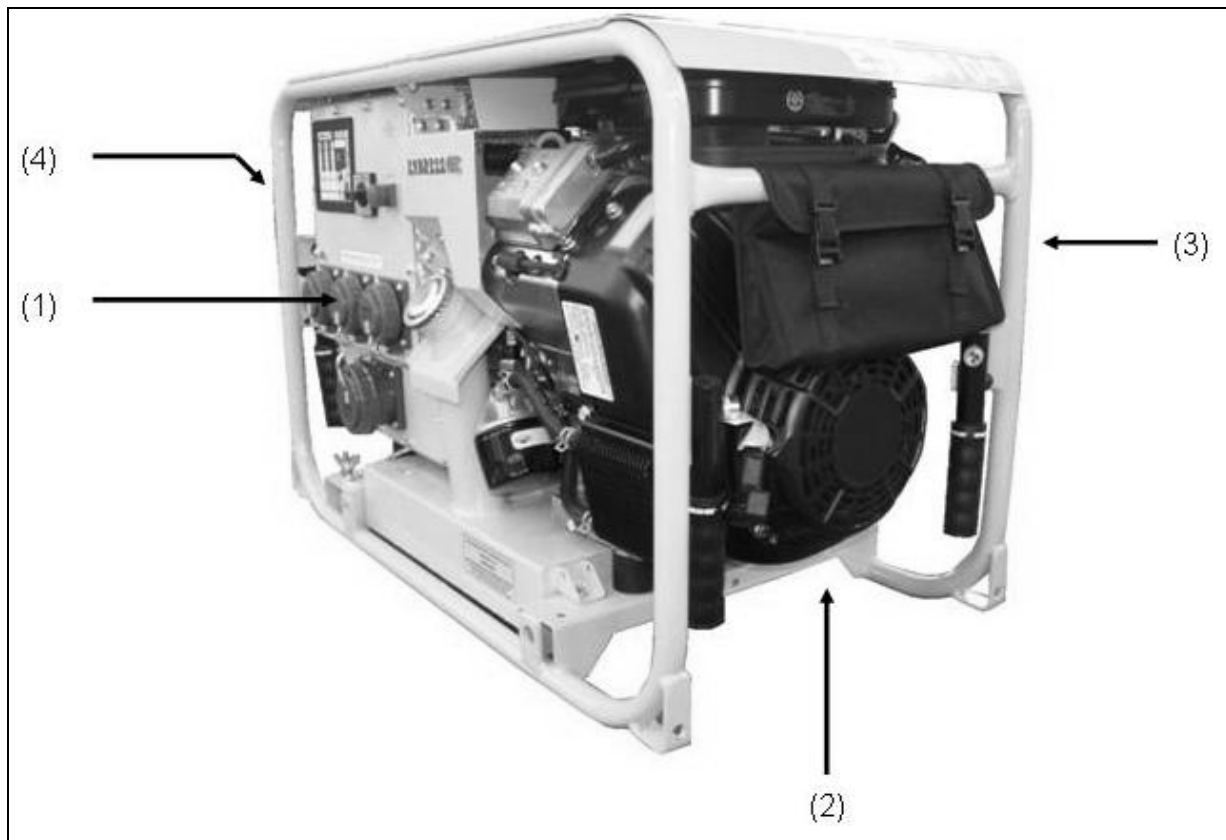


Fig. 3-1: Views of the generator

- | | | | |
|---|--------------|---|------------------|
| 1 | Control side | 3 | Exhaust gas side |
| 2 | Engine side | 4 | Alternator side |

3.1.1 Components of the operating and alternator side

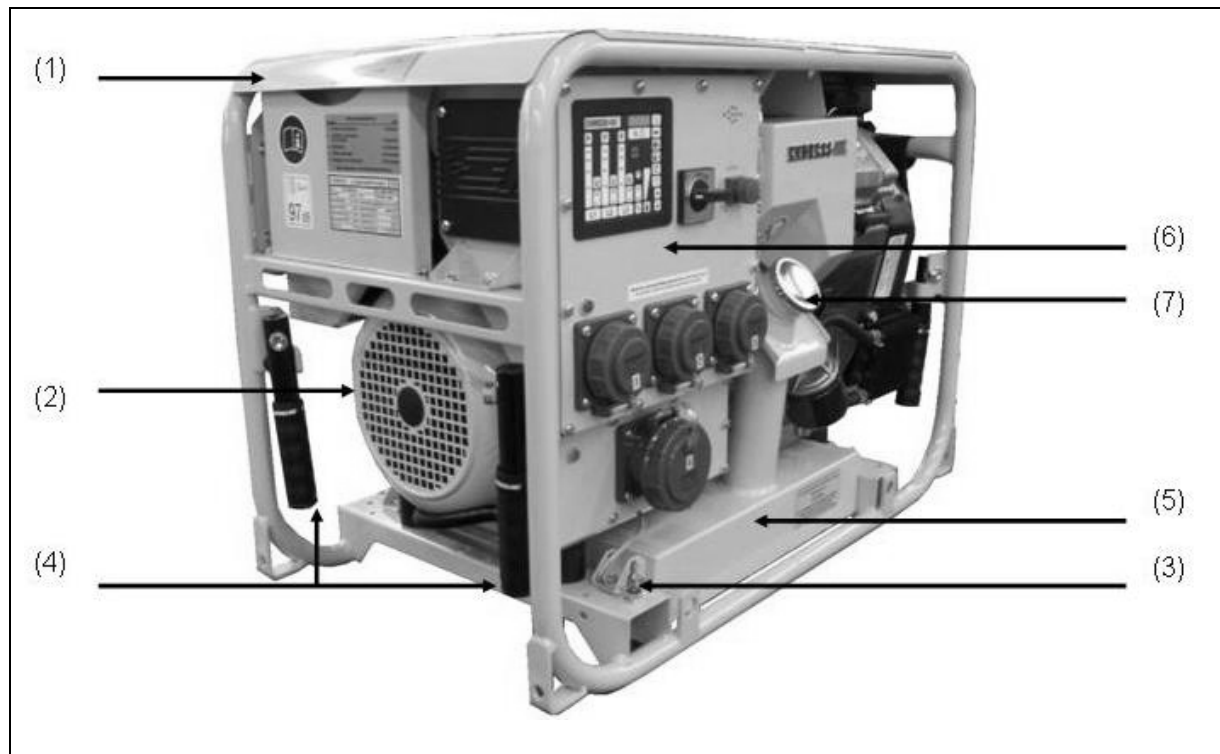


Fig. 3-2: Components of the operating and alternator side

- | | | | |
|---|---|---|------------------------|
| 1 | Generator lid | 5 | Tank |
| 2 | Generator | 6 | Electrical compartment |
| 3 | Potential equalisation screw (for an optional FI earthing connection) | 7 | Tank cover |
| 4 | Carrying handle | | |

3.1.2 Exhaust and engine side components

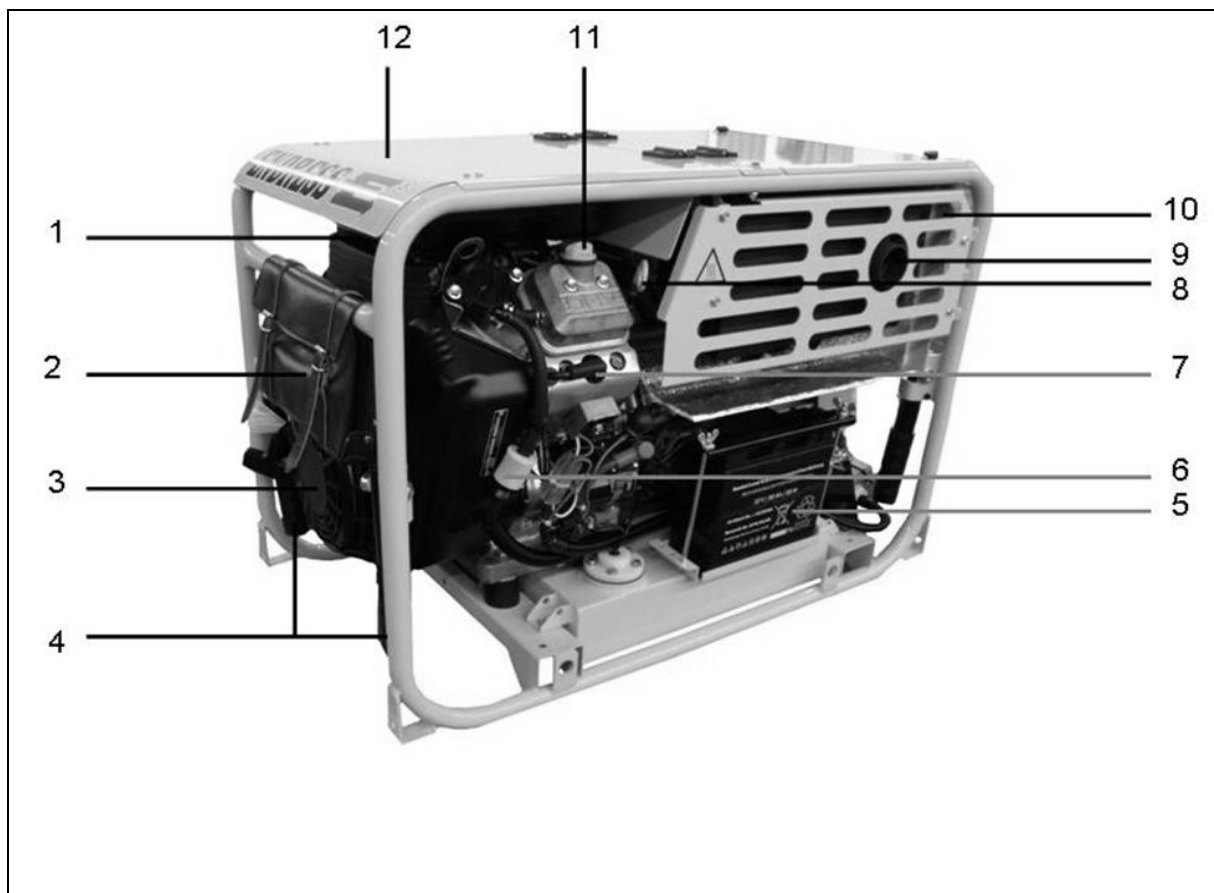


Fig. 3-3: Exhaust and engine side components

- | | | | |
|---|--------------------------|----|---------------------------|
| 1 | Air filter | 7 | Spark plug connector |
| 2 | Tool pouch | 8 | Oil dipstick |
| 3 | Briggs & Stratton engine | 9 | Exhaust |
| 4 | Carrying handle | 10 | Exhaust heat shield plate |
| 5 | Starter battery | 11 | Oil filler neck |
| 6 | Fuel filter | 12 | Motor flap |

3.1.3 Control panel components

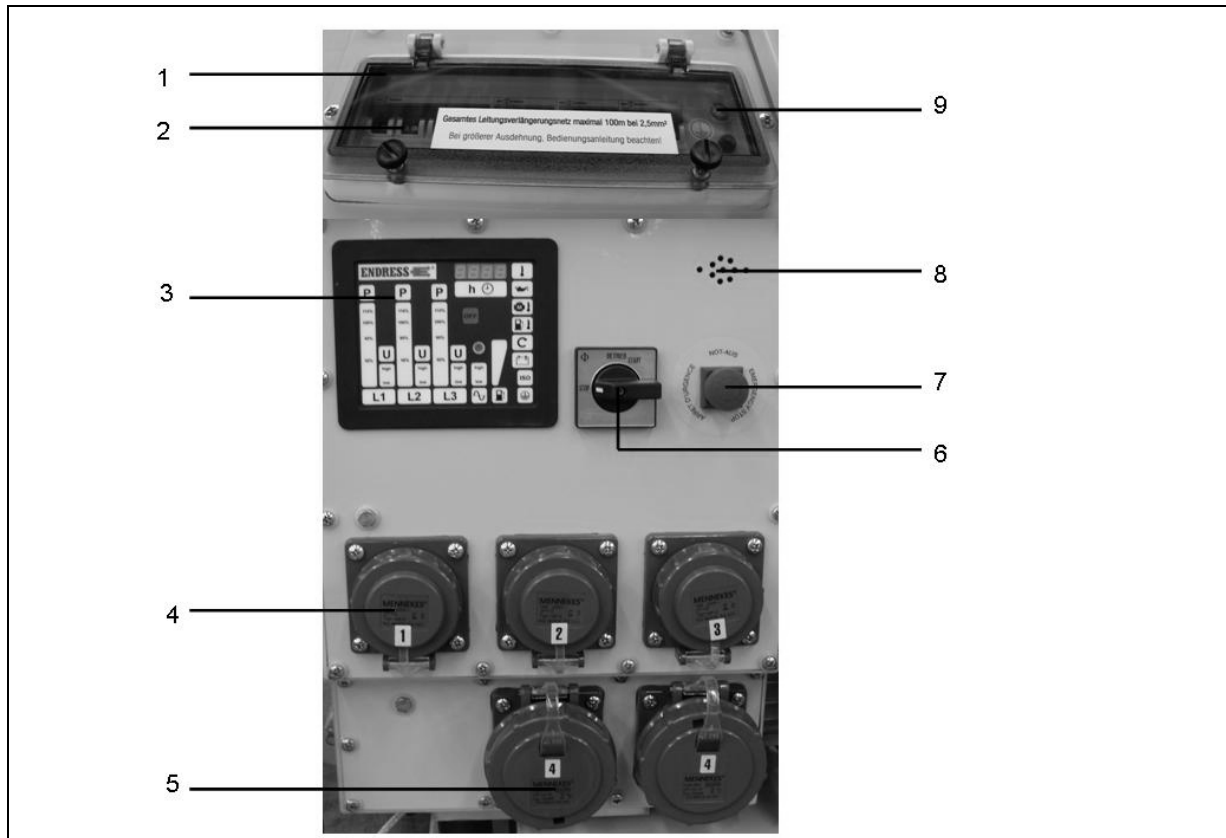


Fig. 3-4: Control panel components

- | | | | |
|---|---|---|---|
| 1 | Hinged window | 6 | START-STOP switch |
| 2 | Line circuit breaker | 7 | Emergency OFF button |
| 3 | Multi-function control display | 8 | Signal tone speaker |
| 4 | Shockproof attachment sockets ~230 V AC | 9 | Contact-socket for protective earthing conductor test |
| 5 | CEE attachment socket 3~400 V AC | | |

3.1.4 Accessory components

3.1.4.1 Standard accessories



Fig. 3-5: Components of the standard accessories

- | | | | |
|---|---|---|------------------|
| 1 | Spark plug wrench | 4 | Test probes |
| 2 | User information (operating instructions for the engine, as well as these operating instructions) | 5 | Spark plugs (2x) |
| 3 | Testing cable | | |

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3.1.4.2 Special accessories



Fig. 3-6: Components of the special accessories

- | | | | |
|---|-----------------------------|---|---|
| 1 | Fuelling device | 3 | Exhaust hose DN 50 – 1500 mm according to DIN 14572 |
| 2 | 20 litre standard container | | |

3.2 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, shockproof and 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

4 Operating generator ESE 904 - 1304 DBG DIN



The operation of the alternator is described in this section.

4.1 Transporting the generator

Proceed as follows to transport the generator.

Requirements

These requirements must be met:

- The generator must be turned off.
- The alternator must have cooled down
- The installed fuel valve is in the “OFF” position
- The fuelling device (a special accessory see 3.1.4.2) is disconnected
- Exhaust hose (a special accessory see 3.1.4.2) is not attached
- At least one person per carrying handle



WARNING!

A slipping or falling device can crush hands or feet.

- Keep the device’s weight in mind, about 125 to 155 kg (depending on the model).
- Carry the generator using at least one person per carrying handle.
- Lift the generator only by the carrying handles.
- Lift / lower the generator evenly.
- Walk slowly.

Carrying the generator

1. Unfold carrying handles.
 2. Lift generator evenly.
 3. Carry generator to place of use.
 4. Lower generator evenly.
 5. Fold carrying handles.
- ✓ The generator has been carried to its operating site.

4.2 Setting up the generator

Proceed as follows to set up the generator.

Requirements These 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.
 3. Attach the exhaust hose if necessary (a special accessory see 3.1.4.2)
- ✓ The alternator is set up and ready for use.

4.3 Refuelling the alternator

Proceed as follows to refuel the alternator.

Requirements The following requirements must be met:

- The generator must be switched off (see 4.5).
- 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" (*Fig. 5-10-(-1)*) 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.

4.4 Starting the generator

Requirements These requirements must be met:

- Electrical safety has been checked (see 6.3)

- Fuel tank has been filled (see 4.3)
- A possibly connected fuelling device (special accessory)
- sufficient oil level (fill with engine oil before initial use, see the engine operating and maintenance instructions)
- ventilation must be adequate.
- Fit push-on exhaust gas pipe (special accessory) if needed
- 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 operating site.
- Avoid explosive materials at the operating site.



WARNING!

Heat or moisture destroys the device.

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

Starting the motor

Start the engine as follows:



Fig. 4-1: Actuate manual choke

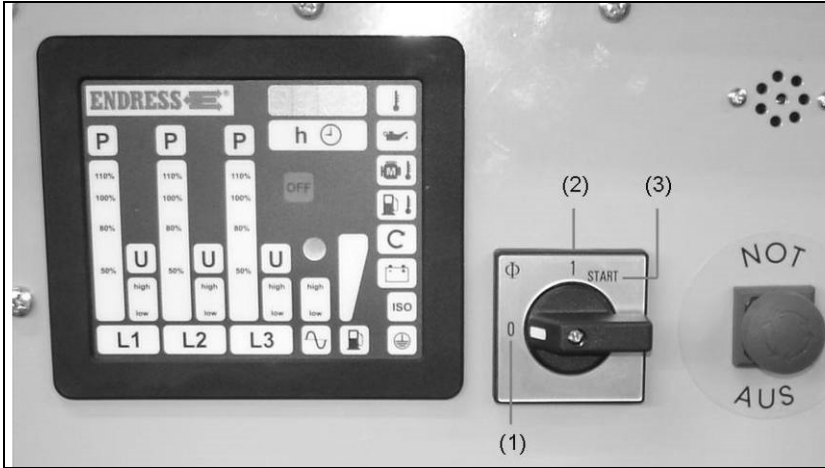


Fig. 4-2: Standard design of operating panel



Fig. 4-3: Emergency starting the pump

ELECTRICAL START

1. Pull on the manual choke (*Fig. 4-1-(1)*) in the direction of the arrow (all the way to the stop if the engine is cold, correspondingly less if it is hot).
 2. Turn the START-STOP switch to "START" position (*Fig. 4-2-(3)*) until the engine starts.
- ✓ The motor starts.

NOTE

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

3. Return the choke (*Fig. 4-1-(1)*) to home position (against the direction of the arrow).
- ✓ The engine has started.

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. You do not need to use the manual choke (on the motor).

HAND START

1. Covering hood (*Fig. 3-3-(13)*) completely open.
2. Pull on the choke (*Fig. 4-1-(1)*) (completely for a cold engine / appropriately less for a warm engine) and hold firmly.
3. For model ESE 1104 / 1304, the manual fuel pump (see *Fig. 4-3-(1)*) must be actuated 3 times.
4. Turn the START-STOP switch to position "1" (*Fig. 4-2-(2)*).
5. Advance engine at the hand grip of the reversing starter.

NOTE

Support oneself with one hand on the device grip in order to simplify advancing the engine.

- ✓ The motor starts.
6. Return the choke (*Fig. 4-1-(1)*) to home position (against the direction of the arrow).
- ✓ The engine has started.

4.5 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:

1. Switch off or disconnect devices.
 2. Continue to run the engine for about two minutes.
 3. Turn the START-STOP switch to "0" position (*Fig. 4-2-(1)*) until the engine stops.
 4. Set the fuel cock to "closed" (*Fig. 5-10-(1)*) as necessary.
 5. Allow the device to cool down
- ✓ The generator is switched off.



WARNING!

In an emergency, the generator can be stopped by pressing the emergency -OFF switch (*Fig. 4-2-(1)*) . The button is turned to the left or the right to restart the aggregate until the locking is removed again.

Note We request that you only switch off the device using the **EMERGENCY-STOP** switch in an emergency. Switch off using the **EMERGENCY-STOP** switch only interrupts the ignition so it is still possible for fuel to ignite in the silencer due to residual amounts of fuel in the carburettor.

4.6 Connecting up consumers/appliances

Proceed as follows to connect appliances to the generator.

Requirements These requirements must be met:

- generator started
- protective earthing conductor tested
- 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 devices using Schuko or CEE sockets.



Fig. 4-4: Connecting up consumers/appliances

Connecting up consumers/appliances

Proceed as follows to connect a device to the control panel:

1. Unscrew covering on the socket .
 2. Push the plug into the socket.
- ✓ The device is connected to the generator.

4.7 Check the protective conductor

Proceed as follows to check the protective conductor connection between the generator and the device.

Requirements The following requirements must be met:

- generator has been started (see 4.4)
- device is connected (see 4.6)
- 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.

Check the protective conductor

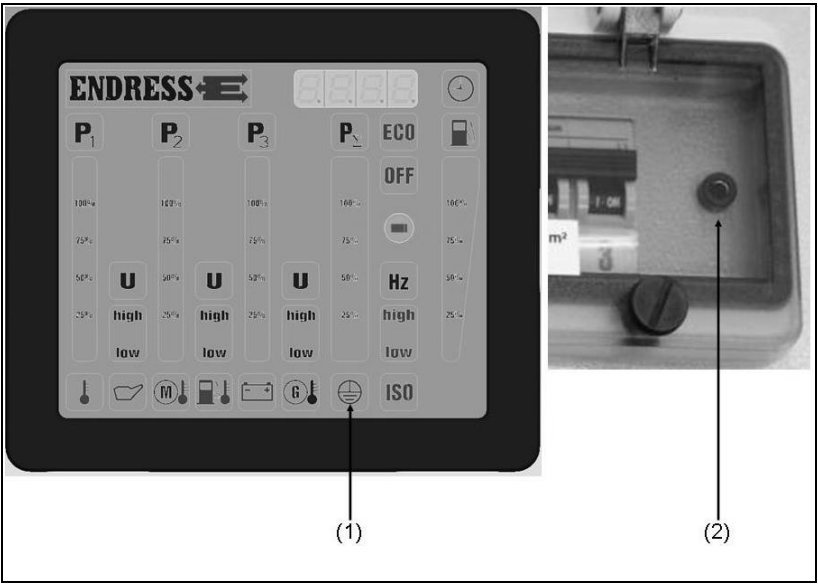


Fig. 4-5: Check the protective conductor

Proceed as follows to check the protective conductor between the device and the generator:

1. Insert test cable into socket (Fig. 4-5-(2)).
 2. Hold a test tip on a metallic, blank location on the device.
- ✓ The test lamp (Fig. 4-5-(1)) on the multifunction display shows the result:

Test lamp	Meaning
-----------	---------

Test lamp	Meaning
lights up green	protective conductor is OK
stays off	Protective conductor defective / not present

Table 4.1: Protective conductor test lamp

- ✓ The protective conductor / potential equalization for this device has been checked.

4.8 Monitoring the operating condition using the multifunctional display

Started by hand: The display will only be active once the engine has started.

Electrical start All LEDs light up for about 2 seconds to allow checking as soon as the START-STOP switch is set to the position "Operate". The normal operational lighting is then shown afterwards for about 30 seconds. If the engine is not started within this period, the E-MCS 4.0 goes into energy saving mode and the indicator goes dark. To bring the E-MCS 4.0 back into a ready-to-operate condition again, the START-STOP switch must first be turned into the position "STOP". The display intensity is dependent on the ambient brightness (sensor see Figure 4-6-(5)).

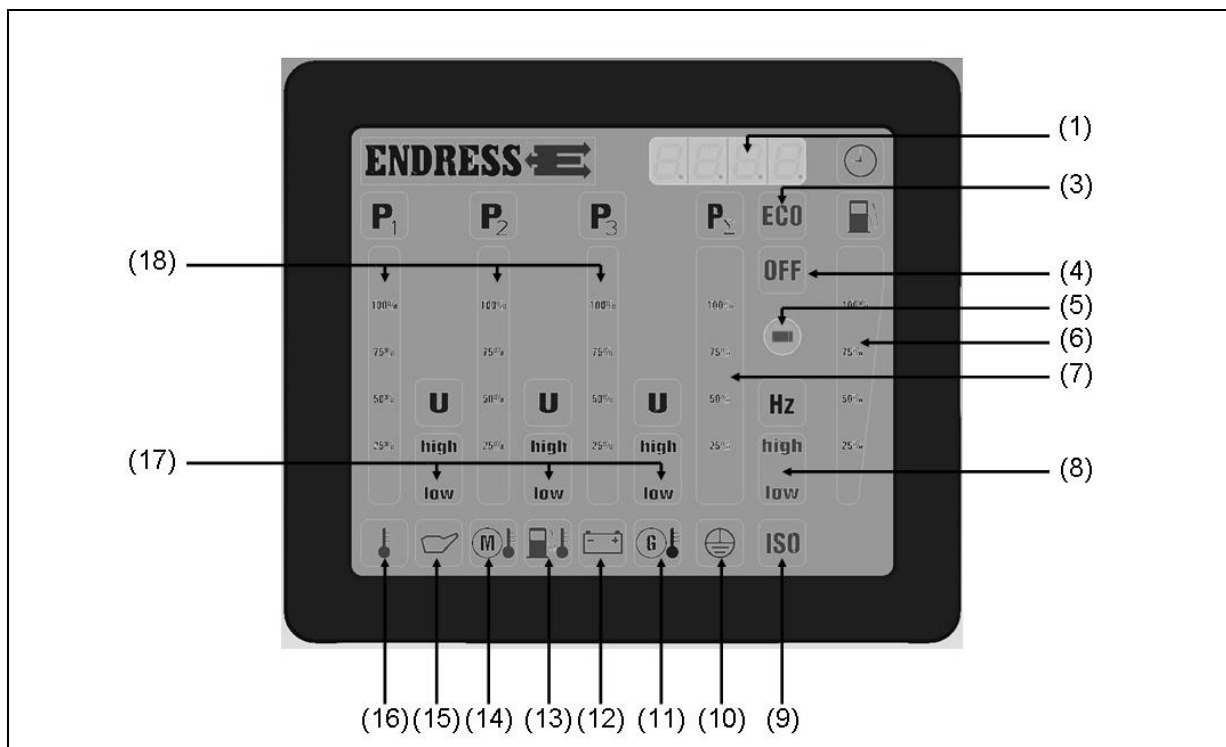


Fig. 4-6: Multi-functional display

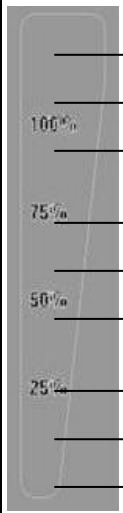
Operating hours: Displayed (see Fig. 4-6-(1)) when the generator starts or is activated for 30 seconds when the START / STOP switch is turned to the "Operate" position.

Ambient temperature: If the display is red (see Fig. 4-6-(16)) whilst the generator is running then the temperature is too high and the generator must be switched off.

(Only active if the special "Warning signal II", "Firecan" option is fitted!)

- Oil pressure:** If the display (see Fig. 4-6-(15)) lights up red whilst the generator is running then the oil pressure is too low and the generator switches automatically or the buzzer sounds, this can be acknowledged using the acknowledgement button.
(Buzzer only active for the ordered special equipment "Insulation monitoring", "Firecan")
- Engine temperature:** If the display is red (see Fig. 4-6-(14)) whilst the generator is running then the engine temperature is too high and the generator must be switched off.
(Only active if the special "Warning signal II, Firecan" option is fitted!)
- Fuel temperature:** If the display is red (see Fig. 4-6-(13)) whilst the generator is running then the fuel temperature is too high and the generator must be switched off.
(Only active if the special "Warning signal II", "Firecan" option is fitted!)
- Battery charge check:** If the display glows red (see Fig. 4-6-(12)) then the generator's recharging function is not working.
If the display flashes red then the charge voltage of the alternator is too high.
- Insulation monitoring:** If the display lights up red (see Fig. 4-6-(9)) or if the buzzer sounds then there is an insulation fault present. (see Chapter 5 Insulation monitoring).
(Only active for an ordered insulation monitoring (standard for DIN)!
- Protective earthing conductor test:** If the display glows green (see Fig. 4-6-(10)) during the protective earth lead test (see chapter 4.7 Protective earth lead test), the protective earth leads for the attached devices are OK. If the protective earth conductor function is not available, the display remains blank.

Fuel tank filling level: The display (see Fig. 4-6-(6)) gives a rough indication of the contents of tank.

Symbol	Display	Significance
	green	Fill level 100%
	green	Fill level 100%
	green	Fill level 90%
	green	Fill level 70%
	green	Fill level 60%
	green	Fill level 40%
	green, red	Fill level below 30%
	green, red flashes	Fill level below 20%
	red flashes	it must be topped up

Frequency: If the display glows green (see Fig. 4-6-(8)), the frequency is within the correct range (47.5–52.5 Hz).
 If the “high” display is red then the frequency is too high. If the “low” display is red then the frequency is too low.

L1, L2 & L3 phases: The single L1 to L3 phases (see Fig. 4-6-(18)) are displayed separately:

Voltage (U) (see Fig. 4-6-(17)):

If the field is green then the voltage is OK.
 If “high” or “low” is displayed in red then the voltage is too high or too low.

Load (P) (see Fig. 4-6-(18)):

The utilisation will be displayed in 10% steps for 3-phase loads. 10 - 80% green, 80 - 100% yellow and 100 - 110% red.

If the display is red for single phase utilisation (asymmetric load) then the load should be distributed evenly over the 3 existing phases.

Relative load indicator: Load (P_{Σ}) (see Figure 4-6-(7))

For a 1 and 3 phase load the total load on the generator is displayed in steps of 10%. 10 - 80% green, 80 - 100% yellow and 100 - 110% red.

**EMERGENCY-STOP
button:**

If the "OFF" symbol glows red (see *Fig. 4-6-(4)*) and the buzzer sounds, the EMERGENCY OFF button has been pressed. The buzzer can be acknowledged using the acknowledgement button.

(Buzzer only active for the ordered special equipment "Insulation monitoring", "Firecan")

4.9 Putting the generator out of service

The generator should be put out of service if it is not required for more than 30 days. It is best to use a cloth to cover the generator.

NOTE The correct putting out of service procedure is described in the engine's operating manual and maintenance instructions (Briggs & Stratton Corporation) (*Fig. 3-5-(2)*) .

4.10 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

5 Special fittings / using accessories

5.1 FI protection switch

The FI protection switch option can only be supplied by the factory.

The FI protection switch (RCD) is a protective measure against dangerous body currents according to DIN VDE 0100-551.

Earthing requirements:

1. The assembly's earthing connection clamps must be connected to the earthing spike by at least 16mm² of earthing cable (green/yellow). The spike must be driven into the ground. BG Bau recommends an earthing resistance of $\leq 50\Omega$ (see BGI 867).
2. Alternatively, a proper earthing device conforming to VDE 0100-540 can be used (such as the main earthing line in buildings).



WARNING!

The generator must be earthed.

- In this special case the generator must be earthed! The above-mentioned safety warnings with other wording are not relevant for this special fitting.

Attention:

1. The effectiveness of this protective measure must be checked at least once a month by an electrical expert or, if suitable measuring and testing devices are available, by an electrotechnically trained person under the guidance and supervision of an electrical expert.
2. Additionally, every work day, the user must check the mechanical operation of the release by activating the test button on the residual current protection device (RCD) (see *unterhalb Fig. 5-1 -10*).

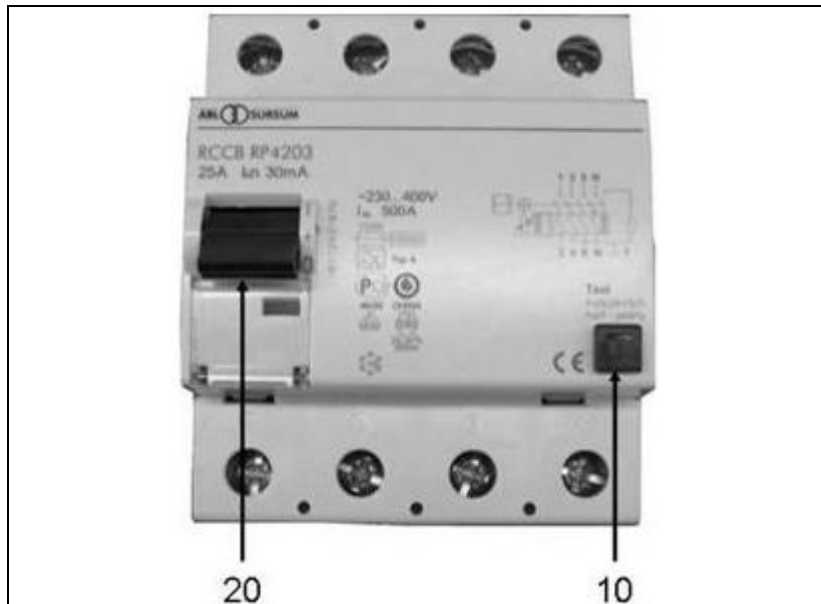


Fig. 5-1: FI protection switch

Checking the FI protection switch:

1. The generator must be started.
 2. Put the protection switch (see Fig. 5-1 -(20)) into position 1.
 3. Activate the test switch (see Fig. 5-1 (10)).
- ✓ The switch position displays the result (see Fig. 5-1 (20)):

Symbol	Meaning
Position I	Switch does not trigger. FI protection switch is defective.
Position 0	Switch triggers. FI protection switch is working properly.

Table 5.1: FI protection switch test

- ✓ The device has been tested in compliance with DIN VDE 0100-551.

5.2 Insulation monitoring with E-MCS 4.0

The insulation monitoring option can only be supplied by the factory.

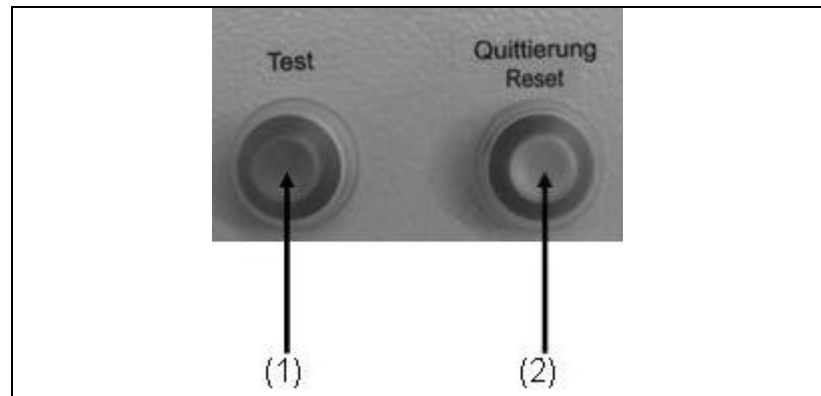


Fig. 5-2: Insulation monitoring with E-MCS 4.0

5.2.1 Insulation monitoring without switching off

(Standard for a DIN generator)

Requirements The following requirements must be met:

- Generator has been started (see 4.4)

Testing the insulation monitoring:

1. Unplug the device
 2. Press the test button (see Fig. 5-2-(1))
- ✓ The displayed symbol (see Fig. 4-6-(9)) indicates the result, the buzzer also sounds for insulation monitoring with this and it can be acknowledged over the acknowledgement button (see Fig. 5-2-(2)):

Symbol	Meaning
Yellow The buzzer sounds	Insulation monitoring is OK
stays off	Insulation monitoring is defective

Table 5.2: Insulation monitoring without switching off

- ✓ The insulation monitoring test has been run.
3. The reset button (see Fig. 5-2-(2)) must be pressed after the test has been completed so that the unit can be used again.

Insulation monitoring whilst running:

1. Plug in the consumer and switch on.
- ✓ The displayed symbol (see Fig. 4-6-(8)) indicates the result:

Symbol	Meaning
lights up red The buzzer sounds	Insulation fault ($\leq 23 \text{ k}\Omega$)
stays off	Connected unit is OK

Table 5.3: Insulation monitoring whilst running without switching off

- ✓ If an insulation fault exists and the unit was previously OK when tested without a device connected (see insulation monitoring above), the insulation fault has been caused by the device.
2. The reset button (see Fig. 5-2-(2)) must be pressed after switching off and disconnecting the device so that the unit can be operated again.

Function reset/acknowledgement button:

Action	Operation
Press once	Acknowledge the buzzer
Press twice	Reset ISO

5.2.2 Insulation monitoring with switch off

(only on request by the customer)

Requirements The following requirements must be met:

- Generator started

Testing the insulation monitoring:

1. Unplug the device
2. The circuit breaker must be in Pos. 1.
3. Press the test button (see Fig. 5-2-(1))
- ✓ The displayed symbol (see Fig. 4-6-(8)) and the position of the circuit breaker indicate the result:

Symbol	Result	Significance
lights up red	Circuit breaker jumps to Pos. 0 and the generator cuts out	Insulation monitoring is OK
stays off	Circuit breaker stays in Pos. 1 and the generator continues to run	Insulation monitoring is defective

Table 5.4: Insulation monitoring plus switching off

- ✓ The insulation monitoring test has been run.
- 4. The reset button (see Fig. 5-2-(2)) must be pressed after switching off and the circuit breaker must be turned back to Pos. 1 so that the unit can be used again.

Insulation monitoring whilst running:

1. Plug in the consumer and switch on.
- ✓ The displayed symbol (see Fig. 4-6-(8)) and the position of the circuit breaker indicate the result:

Symbol	Significance
lights up red	Insulation fault ($\leq 23 \text{ k}\Omega$)
Yellow	Insulation fault ($\leq 34.5 \text{ k}\Omega$)
stays off	Connected unit is OK

Table 5.5: Insulation monitoring whilst running without switching off

- ✓ If an insulation fault exists and the unit was previously OK when tested without a device connected (see above), the insulation fault has been caused by the device.
- 2. After the device has been switched off and unplugged, the circuit breaker must be returned to Pos. 1, and the generator must be restarted, in order for the device to be operated again.

5.3 Speed lowering in idle

Proceed as follows to operate the alternator with idling speed reduction.

Requirements The following requirements must be met:

- generator is ready for operation
- generator has been started (see 4.4)

Switching the idle down on

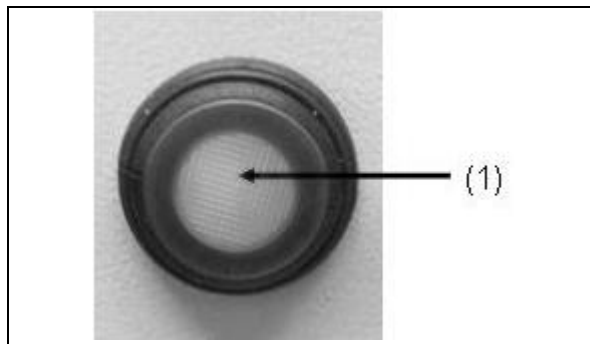


Fig. 5-3: Switching the idle down on pressure switch

Switch the idle down on as follows:

Press pressure switch (Figure 5-3-(1)) until it engages (LED lights up green).

- ✓ Idle down is activated.

ATTENTION The idling speed reduction is active for about 5 minutes after engine start and then lowers the rotational speed of the engine, in as far as no load is engaged, to about 1800 rpm. The engine speed will be increased to the nominal speed as soon as a load is switched on. The engine always runs within the nominal speed range if the rocker switch is in the "OFF" position.

Switching idle down off **Switch the idle down off as follows:**

Press the pressure switch again (LED goes out).

- ✓ Idle down is switched off.

5.4 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 Harting socket):

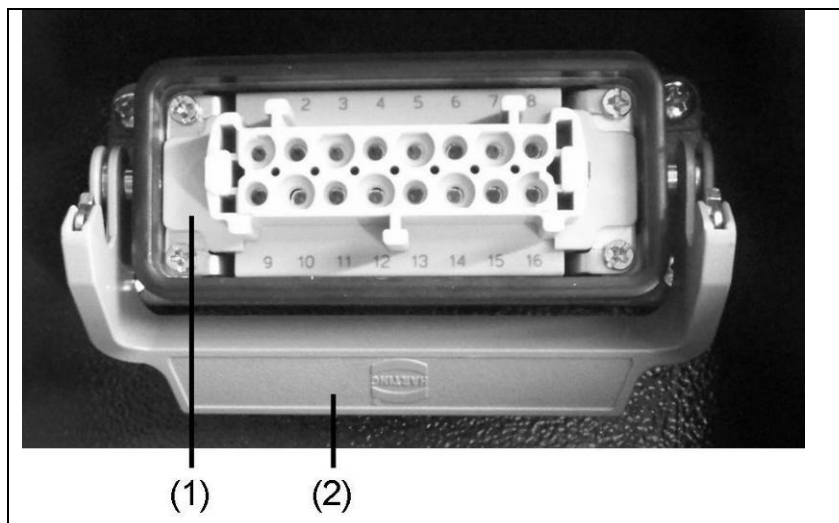


Fig. 5-4: Remote start device with Harting plug

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

1. Fold away any protective caps on the remote start socket after unlocking the clip (*Fig. 5-4(2)*).
 2. Plug the remote start operating status / generator connecting cable into the remote start socket (*Fig. 5-4(1)*) and then use the clip (*Fig. 5-4(2)*) to secure it in place.
- ✓ Remote start device is ready for use.

Disconnecting the remote start device

Disconnect the remote start device as follows:

1. Release the clip and then pull the remote start operating status / generator connecting cable plug out.
 2. Fold down any protective caps onto the remote start socket and lock in place with the clip.
- ✓ Remote start device is disconnected.

Connecting up a remote start device

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

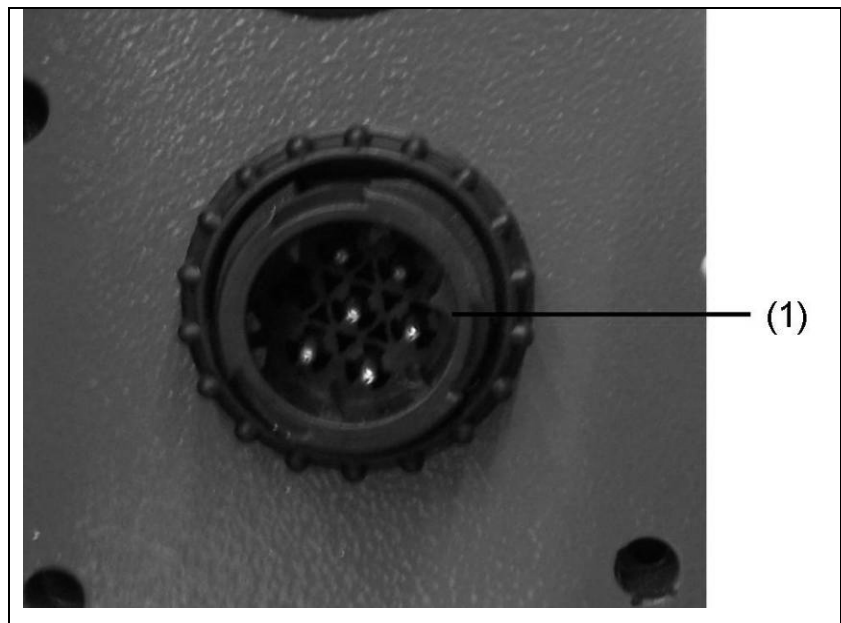


Fig. 5-5: Remote start device with CAN plug

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.

5.5 External start device

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

Requirements The following requirements must be met:

- generator has been started (see 4.4)

Connecting up an external start device

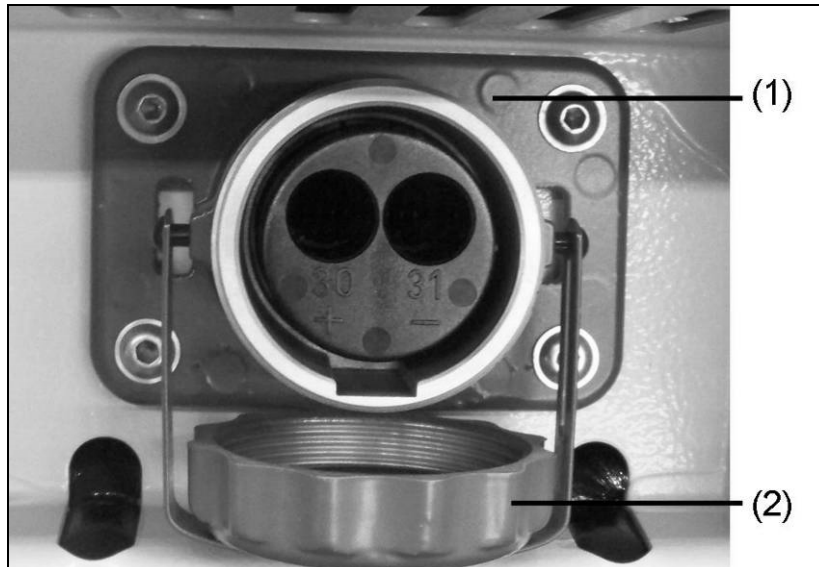


Fig. 5-6: Connecting up an external start device

Connect up the external start device as follows:

1. Unscrew cover (Fig. 5-6-(2)) on the external start socket (Fig. 5-6-(1)).
 2. Insert plug for the external energy source connecting cable (e.g. starter battery) / external start socket into the external start socket and lock in place by turning to the right.
- ✓ External start device is ready for use.
 - ✓ The engine can be started using the electrical start.

Disconnecting the external start device

Disconnect the external start device as follows:

1. Release the plug by turning to the left and then pull the external energy source / external start socket plug out.
 2. Screw protective cap for the external start socket back on again.
- ✓ External start device is disconnected.

5.6 Battery charge conservation

Proceed as follows to charge the starter battery for the generator over the battery charge conservation device.

Requirements The following requirements must be met:

- generator is ready for operation

Connecting up the battery charge conservation device

Connect up the battery charge conservation device (charge current socket A DIN 14690) as follows:

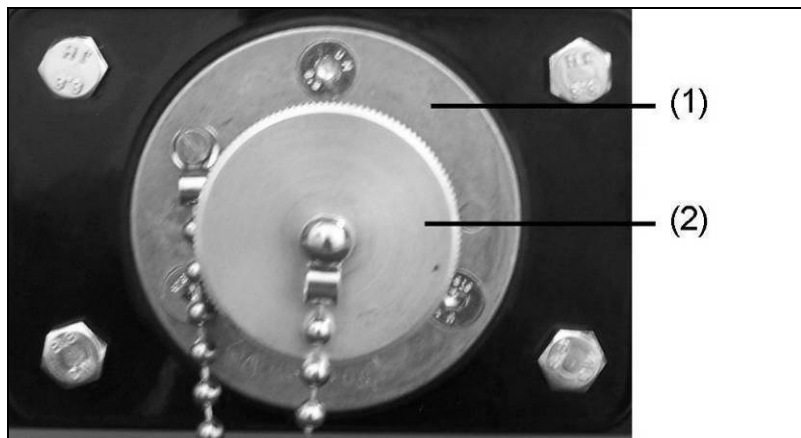


Fig. 5-7: Connecting up the battery charge conservation device

1. Unscrew cover (Fig. 5-7-(2)) for socket (Fig. 5-7-(1)) for the starter battery charge conservation device.
 2. Insert plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable and lock in place by turning to the right.
- ✓ The battery charge conservation device is ready to operate.

Disconnect the battery charge conservation device as follows:

1. Release the plug by turning to the left and then pull the plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable out.
2. Screw on protective cap (Fig. 5-7-(2)) for charge conservation device socket.

- ✓ The charge conservation device is disconnected

Connecting up the battery charge conservation device

Connect up the battery charge conservation device (charge current socket BEOS) as follows:

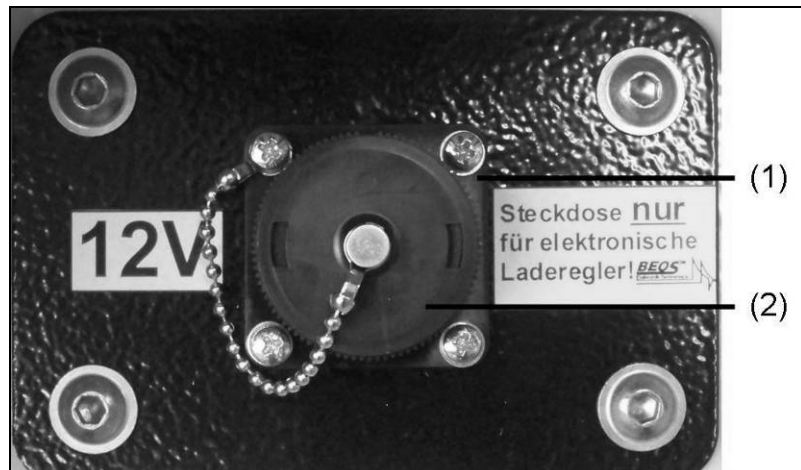


Fig. 5-8: Connecting up the battery charge conservation device

1. Unscrew cover (Fig. 5-7-(2)) for socket (Fig. 5-7-(1)) for the starter battery charge conservation device.
 2. Insert plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable and lock in place by turning to the right.
- ✓ The battery charge conservation device is ready to operate.

Disconnect the battery charge conservation device as follows:

1. Release the plug by turning to the left and then pull the plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable out.
 2. Screw on protective cap (Fig. 5-7-(2)) for charge conservation device socket.
- ✓ The charge conservation device is disconnected

Connecting up the battery charge conservation device

Connect up the battery charge conservation device (MagCode socket) as follows:

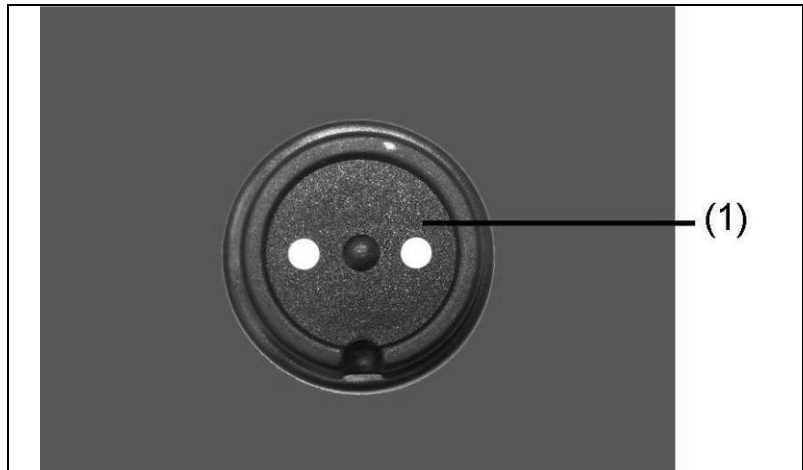


Fig. 5-9: Connecting up the battery charge conservation device

1. Put plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable in place.
- ✓ The battery charge conservation device is ready to operate.

Disconnect the battery charge conservation device as follows:

1. Pull off plug for the external energy source (e.g. a battery charging device) / charge conservation device socket connecting cable.
- ✓ The charge conservation device is disconnected

5.7 3-way fuel tap / fuelling device

Proceed as follows to use the fuelling device with the generator.

Requirements These requirements must be fulfilled:

- generator is ready for operation
- 3-way fuel tap

In the course of supplying fuel you can select between the devices own tank and the fuelling device.

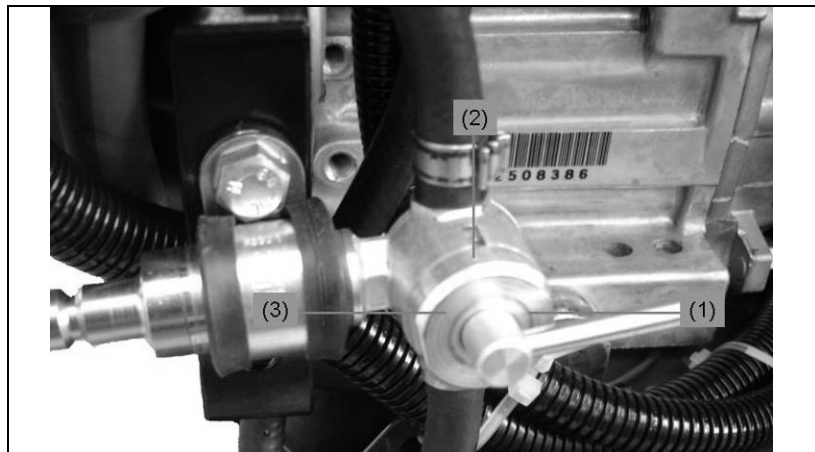


Fig. 5-10: 3-way fuel tap

Switch position	Operation
1	CLOSED
2	OWN TANK
3	EXTERNAL FUELLING

Table 5.6: Switching positions of the 3-way fuel tap

Establish a connection to the fuel supply system as follows:

1. Set the fuel tap to the desired fuelling mode.
- ✓ The fuel supply is established.



WARNING!

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

- Do not fill the canister completely.
- Allow the fuelling device to drain off.



WARNING!

The wrong fuel destroys the motor.

- Only refuel with lead-free regular grade petrol RON 91.

Connect up fuelling device



Fig. 5-11: Connect up fuelling device

Note The canister may stand at a maximum of 0.5 m below the level of fuel pump.

Connect up fuelling device:

Connect up fuelling device as follows:

1. Pull off cover plugs from quick-action coupling.
 2. Place the quick-action coupling (Fig. 5-11-(1)) on the external fuelling connection (Fig. 5-11-(2)).
 3. The quick-action coupling engages.
- ✓ The fuelling device is attached.

Disconnect fuelling device:

Disconnect fuelling device from the generator by:

1. Pulling back the knurled sleeve on the quick-action coupling (Fig. 5-11-(1)).
- ✓ The coupling is released.

2. Pull off quick-action coupling with hose from the connector.
3. Insert the cover plugs again on the quick-action coupling.
- ✓ The fuelling device is disconnected from the generator.

Connect up canister Connect the canister to the fuelling device as follows:

1. Open sealing cap on the canister.
2. Introduce hose.
3. Engage catch on the fuelling device.
- ✓ The canister is attached.

Changing the canister during operation Change an empty canister during operation as follows:

1. Place the full canister next to the empty canister.
2. Open sealing cap on the full canister.
3. Set the fuel cock to the internal tank (*Fig. 5-10-(2)*).
- ✓ The engine is supplied with fuel over its own tank.
4. Loosen the fuelling device latch on the canister.
5. Remove hose.
6. Introduce hose into the full canister.
7. Engage catch on the fuelling device.
- ✓ The canister is attached.
8. Set the fuel cock to "external fuelling" (*Fig. 5-10-(3)*).
- ✓ The empty canister is exchanged.

5.8 Exhaust hose

Proceed as follows to use the exhaust hose with the generator.

Requirements The following requirements must be met:

- Generator is ready for operation



WARNING!

Exhaust gases can cause fatal asphyxiation.

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

Connecting up the exhaust hose

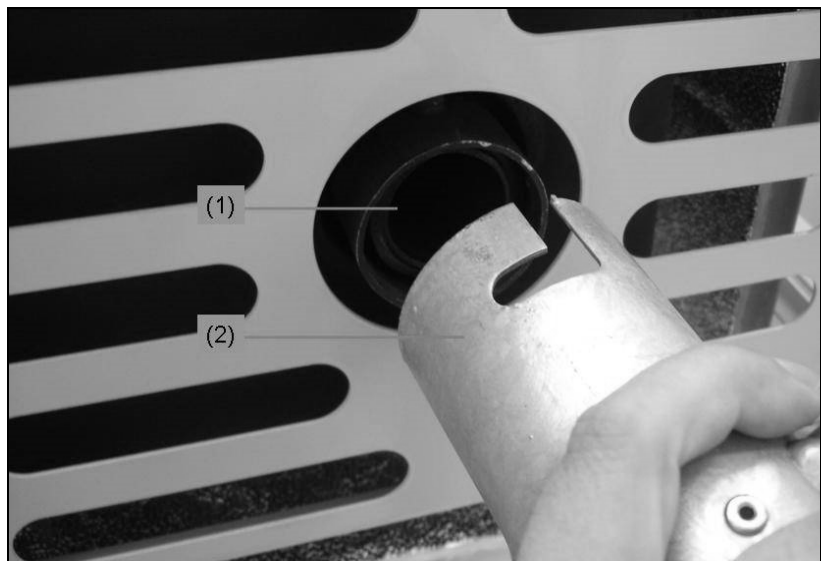


Fig. 5-12 Connecting the exhaust hose

Connect up the exhaust hose as follows:

1. Push the exhaust hose's grip with the larger opening onto the muffler's connection.
 2. Turn the exhaust hose to the right to lock it in place.
- ✓ Exhaust hose is now plugged in.

Disconnecting the exhaust hose**Disconnect the exhaust hose from the generator by:**

1. Turn the exhaust hose grip to the left.
 2. Pull the exhaust hose off the muffler's exhaust hose connection.
- ✓ Exhaust hose is now disconnected.

6 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.

6.1 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 / annual-ly	every 50 h / annual-ly	every 100 h / annual-ly	annual-ly
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 6.1: 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

6.2 Maintenance work

Only authorised personnel may carry out maintenance tasks.

Perform all work in the maintenance plan according to the information in the engine's operating and maintenance manual (*Fig. 3-5-(2)*). These operating and maintenance instructions of the engine manufacturer are an integral component of these operating instructions.

6.2.1 Charge battery

Important Charge the battery according to the handling regulations supplied by the manufacturer (see 1.1) in order to maximise service life.

6.2.2 Replacing the starter battery

1. Unscrew the battery holder (*Fig. 6-1-(1)*).
 2. Remove the battery (*Fig. 6-1-(2)*) 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. 6-1: 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 (*Fig. 6-1-(1)*) back on.
- ✓ 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.

6.2.3 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.).

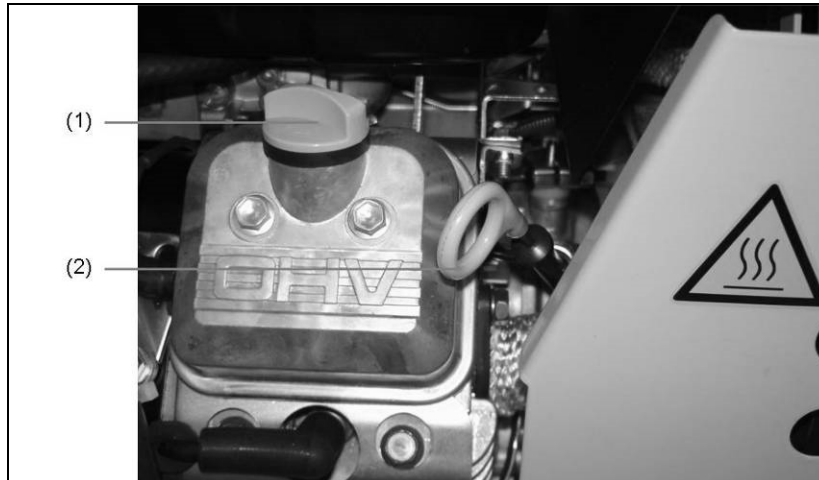


Fig. 6-2: Oil dipstick

Checking the oil **Check the oil level as follows:**

1. Pull out the dipstick (*Fig. 6-2-(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. 6-2-(1)*). Pull out the dipstick for easier filling (*Fig. 6-2-(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.

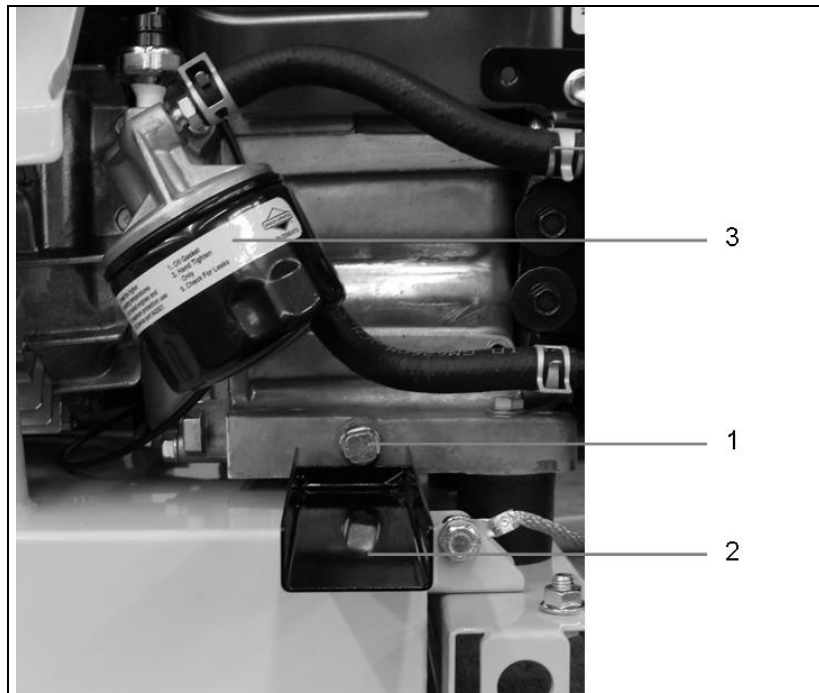


Fig. 6-3: Change the oil

Change the oil

1. Remove the oil filling screw (Fig. 6-2-(1)).
2. Prepare the oil collecting tray.
3. Mount the oil drainage trough (Fig. 6-3-(2)).
4. Set the generator at an angle of 30°.
5. Unscrew the oil drainage screw (Fig. 6-3-(1)) and allow the oil to drain completely.
 - ✓ Engine oil has been drained.
6. Screw in the oil drainage screw again.
7. Then refill with fresh oil.
 - ✓ The oil has been changed.



WARNING!

The oil escapes immediately after unscrewing the exhaust screw.

Change oil filter

When changing the oil filter (Fig. 6-3-(3)), proceed as described in the engine manual.

6.2.4 Replacing fuses

Replacing fuses (only for the special accessory external start socket, socket, charging retention and/or remote start device)

1. Open the fuse holder.
 2. Replace a fuse
 3. Close the fuse holder
- ✓ The fuse has been replaced.

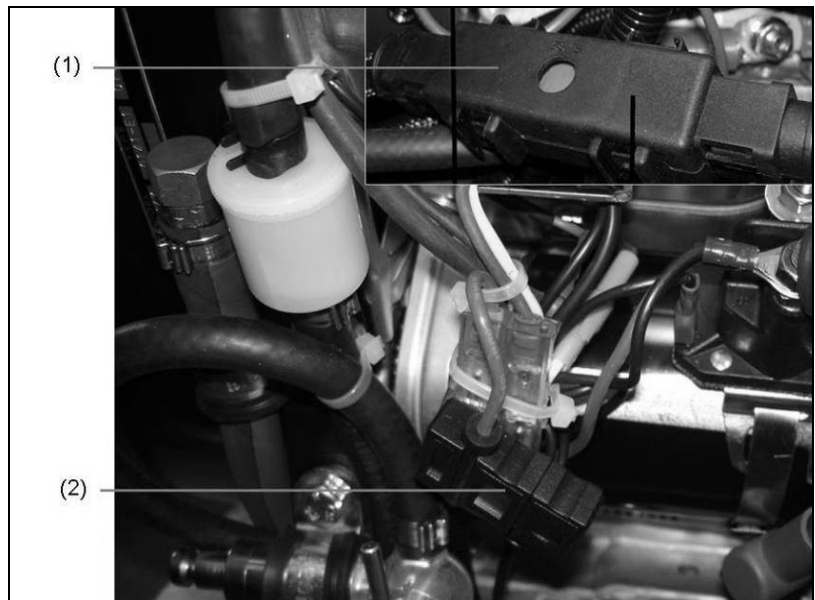


Fig. 6-4: Replacing a fuse

Fuse type	Amperes	needed for
2	20	Control system
2	15	Charging retention socket
1	150	External start (Nato) socket

Table 6.2: Location of the fuses

6.3 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.

7 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 rotational speed of the engine was adjusted afterwards.	Call service staff.
	The electronic controller has been altered.	Call service staff.
	The electronic controller is defective.	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.	

Malfunction	Possible cause	Correction
	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.
	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.	The electronic controller has been altered.	Call service staff.
	The electronic controller is defective.	Call service staff.
	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	Too much power is drawn.	Reduce power draw.
The alternator runs jerkily.	The alternator is loaded beyond the nominal output.	Reduce power draw.
The red lamp on the load meter lit up.	Too much power is being taken off / the load is being taken off on one side.	3~: reduce power take-off / 1~: Distribute the load evenly
The oil pressure is too low.	Too little engine oil in the engine.	Refill engine oil.
The protective conductor test lamp does not light up.	The test cable is not inserted properly.	Insert the test cable properly.

Malfunction	Possible cause	Correction
	The test tip is not touching a metallic blank location on the device.	Hold the test tip on a metallic blank location
	Test lamp is defective	Call service staff.
	The protective conductor is defective.	Disconnect the device from the generator.
	The protective conductor is missing.	Select the device with a protective earth.
Faults on the special equipment		
The engine does not start in remote start mode.	The remote start equipment connecting plug is not inserted properly.	Insert the remote start equipment connecting plug correctly.
	The automatic choke lifting magnet is defective.	Call service staff.
	The remote start equipment fuse is defective.	Replace the fuse.
The engine does not start in external start mode.	The external start equipment plug is not inserted properly.	Insert the external start equipment plug correctly.
	The high performance external start fuse is defective.	Replace the fuse.
The battery is not charging in charge retention mode.	The charge retention plug is not inserted properly.	Insert the charge retention plug correctly.
	The charge retention fuse is defective.	Replace the fuse.
Idle down does not work.	Rocker switch is in the OFF position.	Set the rocker switch to the ON position.
	The engine does not run for 5 minutes.	Wait for the minimum running time since an engine start.
	There is a load / electrical device switched in.	Switch off load / electrical device.
	The lifting magnet for speed lowering in idle is defective.	Call service staff.

Table 7.1: Problems arising during generator operation

Notes

8 Technical specifications



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

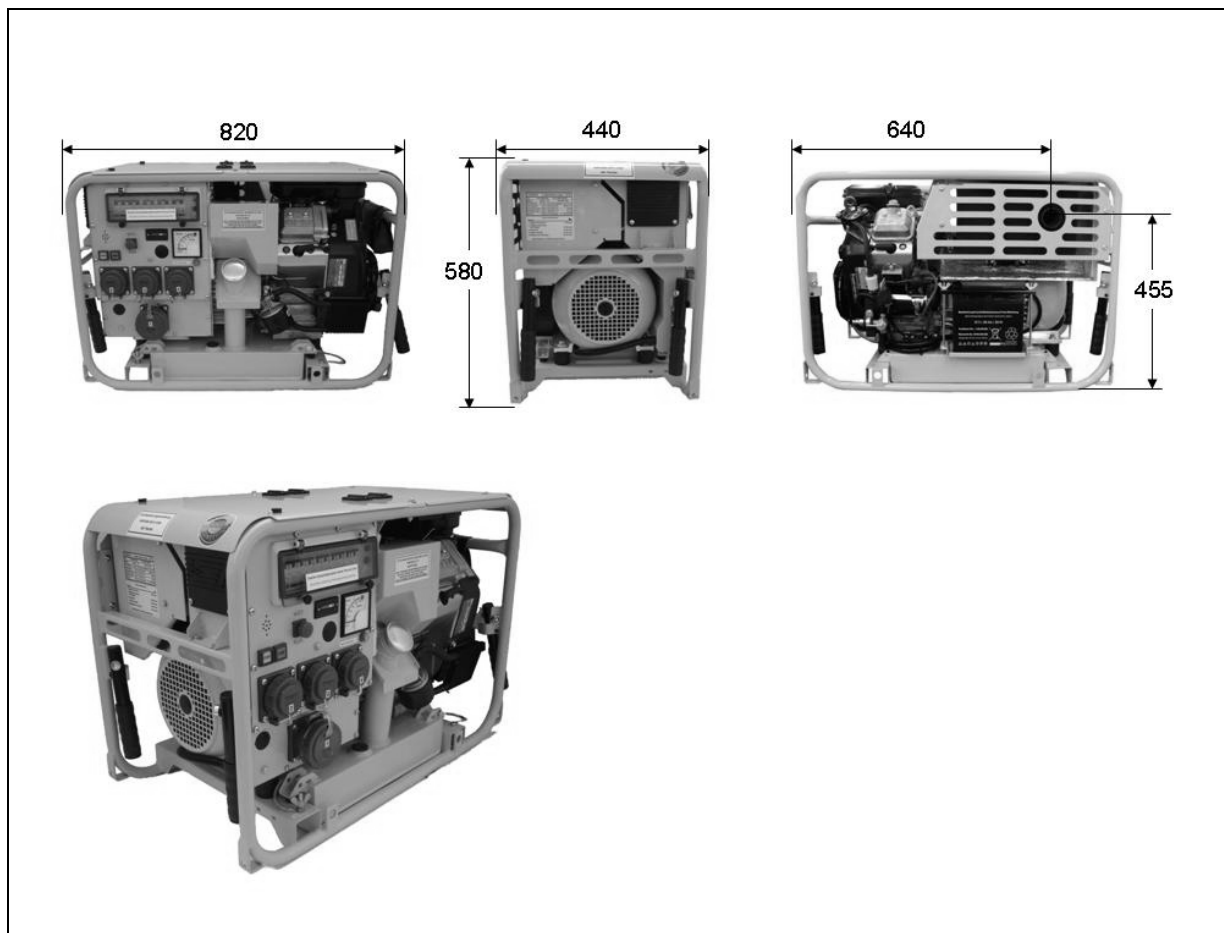


Fig. 8-1: Generator dimensions

Technical specifications

Designation	Value			Unit
	ESE 904 DBG ES DIN	ESE 1104 DBG ES DIN	ESE 1304 DBG ES DIN	
Nominal output	8	11	12.0	[kVA]
Nominal output factor 3~	0.8	0.8	0.8	[cosφ]
Nominal output factor 1~	0.9	0.9	0.9	[cosφ]
Nominal frequency	50	50	50	[Hz]
Nominal speed	3000	3000	3000	[rpm]
Nominal voltage 3~	400	400	400	[V]
Nominal voltage 1~	230	230	230	[V]
Rated current 3~	11.5	15.9	17.3	[A]
Rated current 1~	21.7	26.1	30.4	[A]
Voltage tolerance (idling – nominal output)	± 5	± 5	± 5	[%]
Weight (ready for use)	124	147	148	[kg]
Tank capacity (lead-free normal ROZ91 fuel)	12	12	12	[l]
Length	820	820	820	[mm]
Width	440	440	440	[mm]
Height	580	580	580	[mm]
Sound power level at work- place L_{pA} *	89	90	90	[db (A)]
Acoustic pressure level at 7m L_{pA} **	72	73	73	[db (A)]
Sound power level ** L_{WA}	97	98	98	[db (A)]
Protection Class	IP 54	IP 54	IP 54	

Table 8.1: Generator technical data

- Measurement procedure according to 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 8.2: Ambient conditions for the generator

Reduced output

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

Table 8.3: 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 8.4: 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

9 Replacement parts



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

The alternator is divided into these component groups:

- Frame with covers, tank and engine
- Generator and electronics
- Standard accessories
- Special accessories
- Special equipment

9.1 Frame with covers, tank and engine

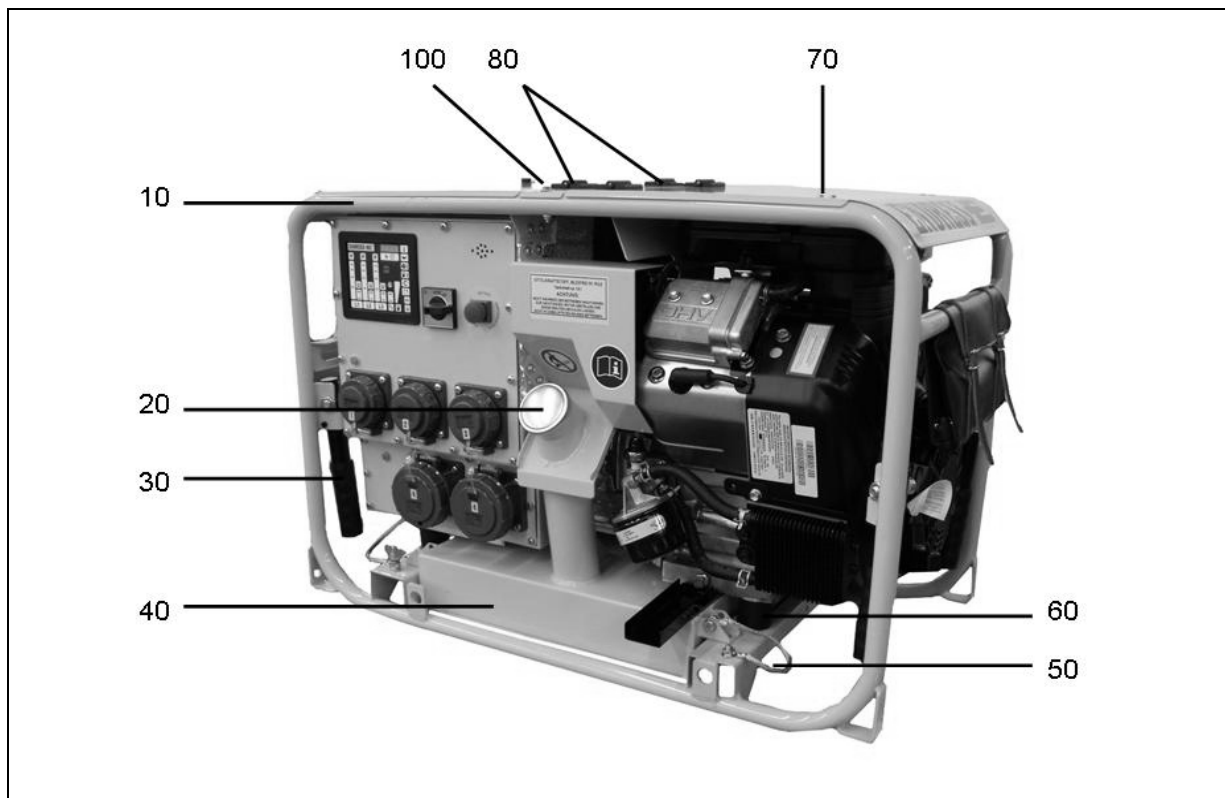


Fig. 9-1: Operating and alternator side replacement parts

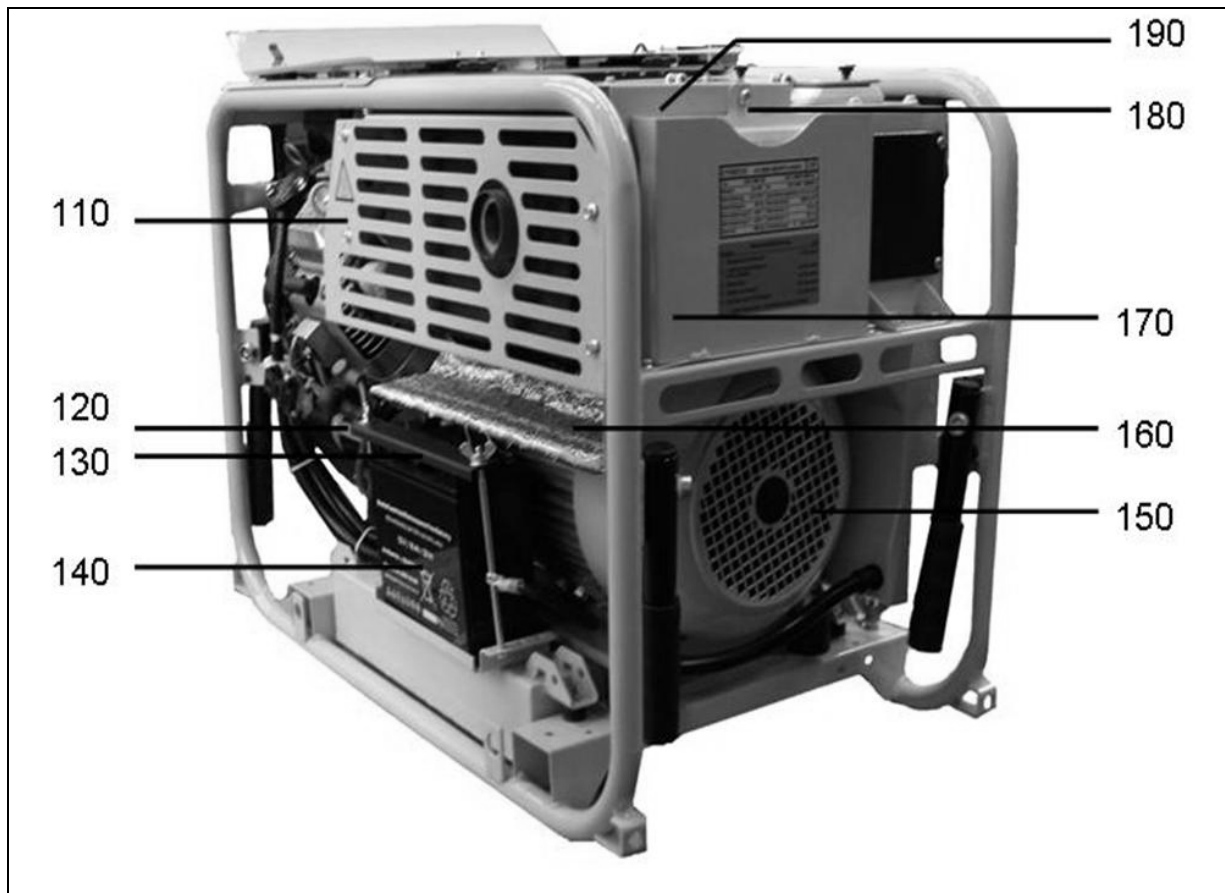


Fig. 9-2: Engine and exhaust side replacement parts

Position	Part number	Quantity	Item designation
10	E502145/10	1	Frame complete, yellow
20	E130510	1	Bayonet tank cap, size 40
30	E502064/90	4	Carrying handle, black
	E130579	4	Inset handle made of soft PVC
	E133316	4	Plastic end cap for pipe, 25x2
40	151003	1	Generator tank, yellow
50	151003	2	Earth strap, copper
60	E133301	4	Vibration dampers D40x40 M8
70	E502083/10	2	Housing, yellow
80	E100641	4	Screw on hinge
100	E502081/10	1	Hood fastener, yellow
	E502082/10	1	Housing, reinforcing metal sheet Yellow (underneath)
110	E502107/10	1	Air baffle plate 03 Sgr. yellow
	E502108/10	1	Air baffle plate 03 holder

Position	Part number	Quantity	Item designation
120	E502125/90	1	Battery clip, black
130	E132948	2	Protective cap for battery terminal
140	163040	1	Battery 12V - 18A (for electrical starting only)
150	151003	1	Generator
160	E502114/90	1	Air baffle plate
170	E502085/10	1	Manual compartment
180	E502111/10	1	Air baffle plate 01 BG yellow (yellow only)
190	E502136/10	1	Air baffle plate 04, yellow

Table 9.1: Replacement parts for the frame with covers

9.2 Engine with exhaust and fuel system

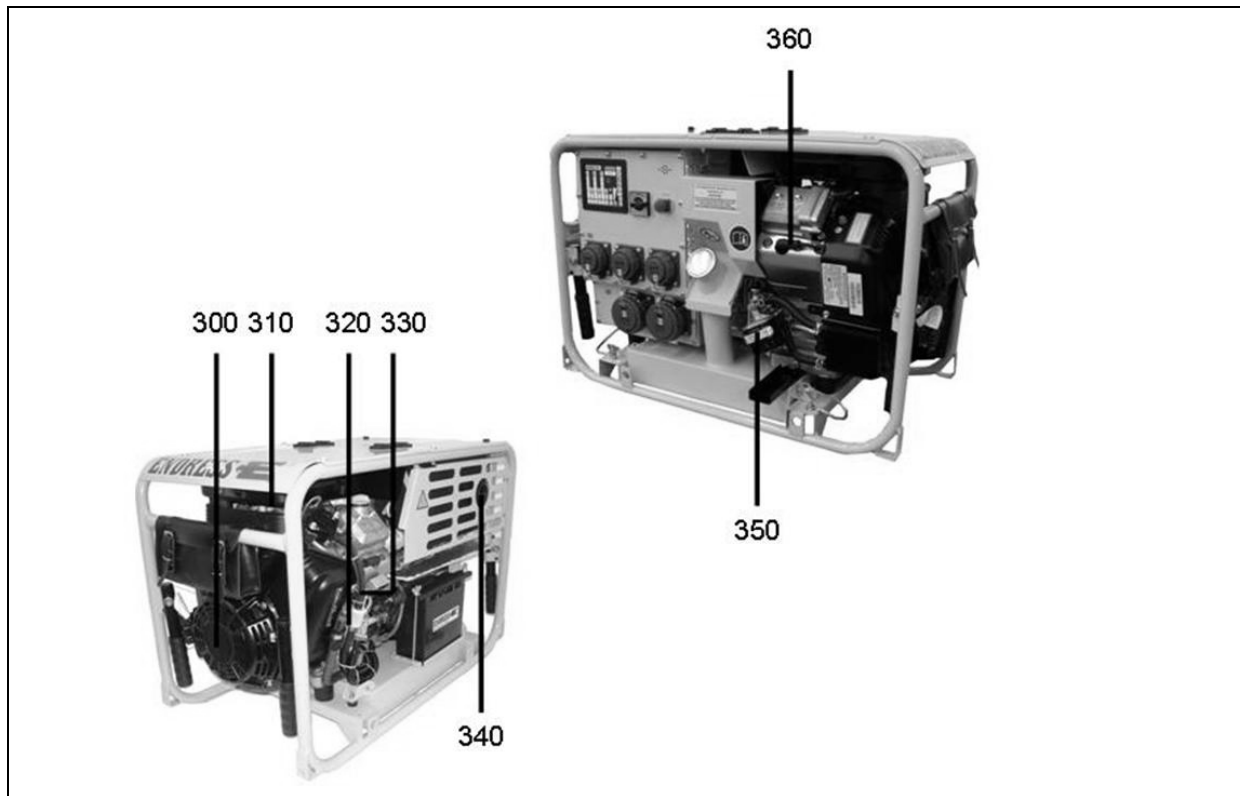


Fig. 9-3: Replacement parts for an engine with an exhaust and fuel system

Position	Part number	Quantity	Item designation
300	E133414	1	Engine Vanguard 16HP (for ESE 804 DBG DIN)
	E133415	1	Engine Vanguard 16HP (for ESE 804 DBG ES DIN)
	E131589	1	Engine Vanguard 20HP (for ESE 1104 DBG ES DIN)
	E131590	1	Engine Vanguard 22HP (for ESE 1304 DBG ES DIN)
310	692519	1	Paper filter
	692520	1	Pre-filter
320	E130804	1	Fuel filter without hose clamps
330	E100786		Fuel hose with textile
340	E502481/92	1	Muffler for generator in RAL 9005
350	492932S	1	Oil filter
360	E130472	2	Champion QC 12YC spark plugs

Table 9.2: Replacement parts for an engine with an exhaust and fuel system

9.3 Generator and electronics

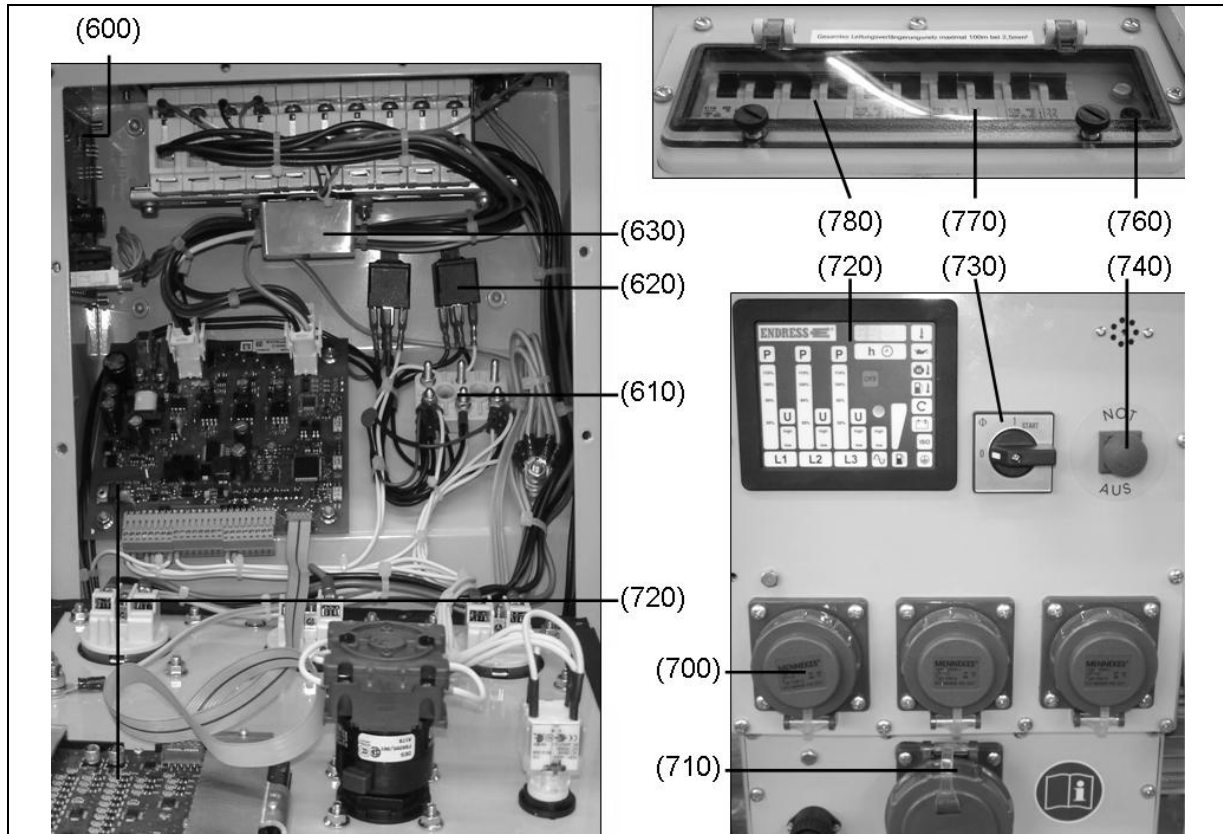


Fig. 9-4: Replacement parts Generator and electronics

Position	Part number	Quantity	Item designation
510	E131432	1	Generator fan hood, yellow*
	E131428	1	Generator fan blade*
600	E131433	1	Generator regulator for 8.5kVA / 13kVA*
610	E134151		2-conductor through clamp**
	E134152		4-conductor through clamp**
620	E130975		Mini-changer relay**
630	E131799	1	Noise filter
700	E133007	3	Schuko attachment socket TM
710	E130424	1	CEE attachment socket TM (for ESE 804/1104)*
	E130424	2	CEE attachment socket TM (for ESE 1304)*
720	162314	1	Multifunctional display with control board
730	E130996	1	START-STOP switch

Position	Part number	Quantity	Item designation
740	E132976	1	EMERGENCY-STOP button, 25 x 25 mm
	E130674	1	EMERGENCY-STOP sign
760	E130442	1	Telephone socket 16A, 4-mm
770	ESE 804 / 1104 DBG (ES) DIN		
	E130177	3	Line circuit breaker
	E100541	1	Line circuit breaker
	ESE 1304 DBG (ES) DIN		
	E134046	3	Line circuit breaker
	E134047	1	Line circuit breaker
780	E500762/90	1	Mounting rail housing 1 RAL 9005
	E500763/90	1	Mounting rail housing 2 RAL 9005
	E100091	0.21	Mounting rail TS 35/7,5
	E130422	1	Hinged window No. 40980

Table 9.3: Alternator with electrical junction box replacement parts

* When placing an order, please also enter the serial number on the model plate.

** When placing an order, please also enter the design variant.

9.4 Fuses

Only for the devices remote start, battery charge retention or external start.



Fig. 9-5: Replacement parts for fuses

Position	Part number	Quantity	Item designation
800	E132672	1	Flat fuse holder
	E132680	1	Flat fuse insert 20 A, DIN 72581 Part 3
	E132735	1	Flat fuse insert 15 A, DIN 72581 Part 3
810	E133255	1	Fuse holder for a high performance fuse
	E130915	1	150 A high performance fuse

Table 9.4: Replacement parts for fuses

9.5 Accessories and markings

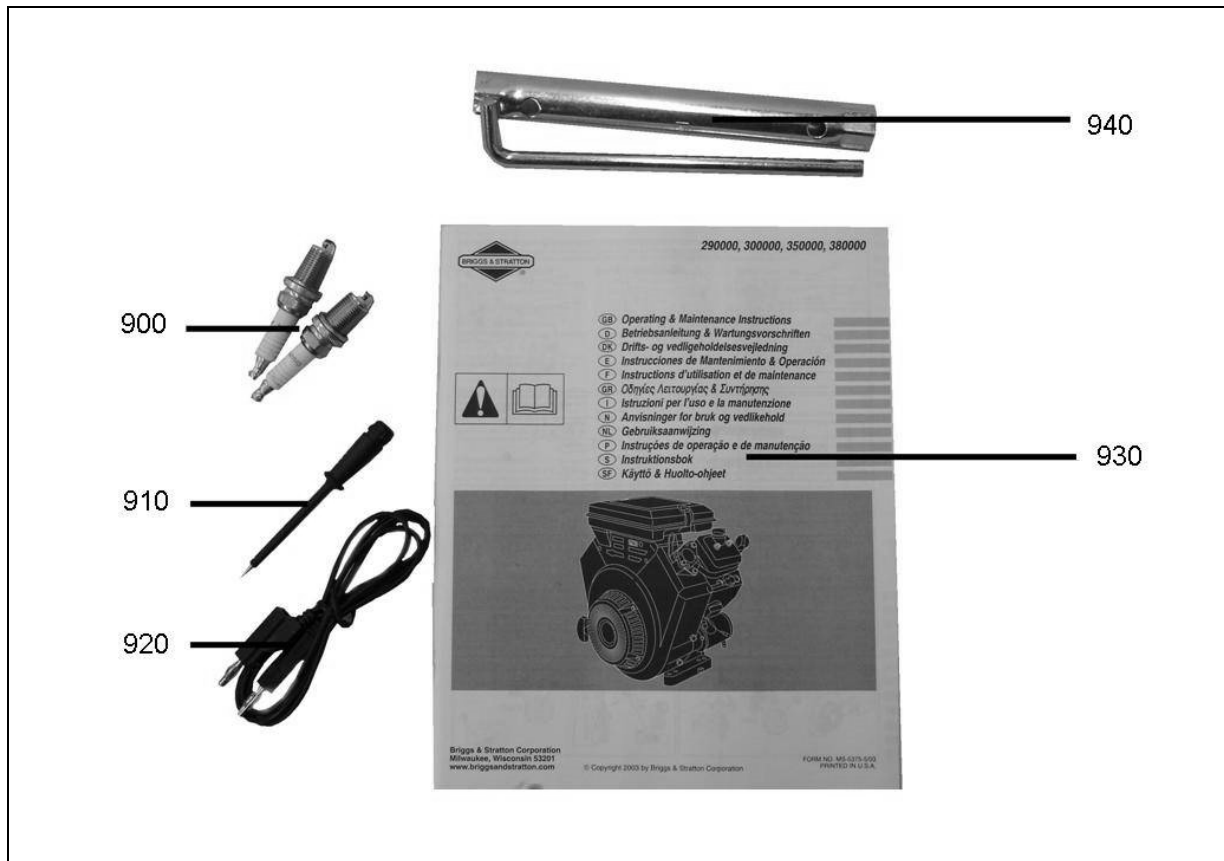


Fig. 9-6: Replacement parts for accessories

Position	Part number	Quantity	Item designation
900	E130472	2	Champion 12YC spark plugs (no other type may be used)
910	E130545	1	Test probes
920	E130446	1	100 cm measuring line
930		1	Engine operating manual B&S
940	E130534	1	Spark plug wrench
1000	E100592	1	Fuelling device (special accessory)
1010	E100593	1	20 litre canister, Nato standard (special accessory)
1020	E130473	1	DN 50 exhaust hose according to DIN 14572 (special accessory)
Figure above	E504484/90	1	Oil channel

Table 9.5: Replacement parts for accessories / special accessories



Fig. 9-7: Replacement parts for special accessories