



OPERATING INSTRUCTIONS

ESE 608 DHG ES DI DIN SILENT

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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.

The operating manual and the maintenance instructions for the engine (see Figure 1-1-(5)) are integral components of these instructions.

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

1.1 Documentation / scope of delivery

In addition to this document, there are the following documents and standard accessories for the ESE 608 DHG ES DI DIN SILENT generator.

- Cable with test tip (see Figure 1-1-(1))
- Tools (see Figure 1-1-(2))
- Engine circuit diagram (see Figure 1-1-(3))
- Motor service centre directory (see Figure 1-1-(4))
- Engine operating instructions (see Figure 1-1-(5))
- Motor replacement parts list (see Figure 1-1-(6))
- Motor replacement seal (see Figure 1-1-(7))
- Oil drain hose (see Figure 1-1-(8))
- Test report
- Ring screw for loading
- Wiring diagram

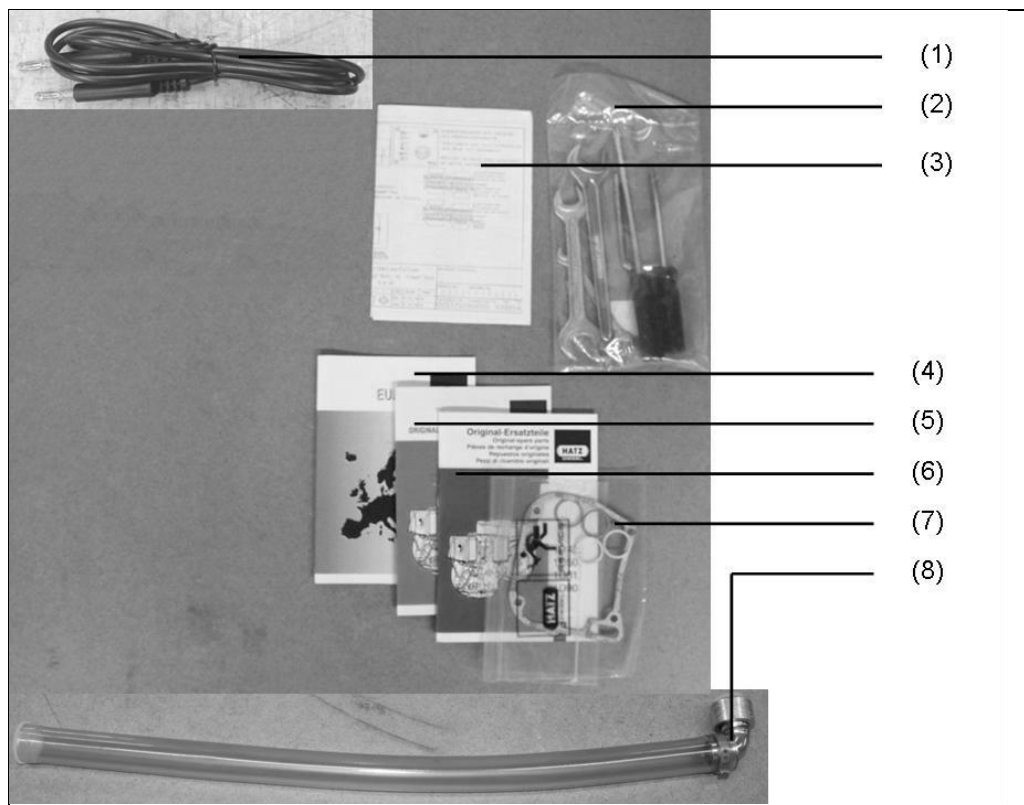


Figure 1-1: Delivery documentation / Accessories

1.2 Safety symbols

The safety warning symbol indicates that a source of danger exists.



General hazard

This warning symbol 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 a risk of an electric shock, possibly with lethal consequences.



Poisonous substances

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

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
-

2.1.1 Intended use

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

The generator is only to be used outdoors within the indicated voltage, output, and nominal rpm ranges (see name-plate).

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

The generator is not to be used in explosion-prone environments.

The generator is not to be used in fire-prone environments.

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

Every inappropriate use or all activities on the generator which are not described in these instructions are forbidden misuse outside the legally defined limits of liability of the manufacturer.

2.1.2 Foreseeable incorrect use or inappropriate handling

Foreseeable incorrect use or inappropriate handling of the generator nullifies the manufacturer's EC Declaration of Conformity and automatically thereby the operating licence.

Foreseeable incorrect use or inappropriate handling include:

- Operation in explosion-prone environments
- Operation in fire-prone environments
- Operation in confined areas
- 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
- 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

2.1.3 Residual risks

Before design and planning were begun, the residual risks of the ESE 608 DHG ES DI DIN SILENT generator were analysed and evaluated by means of a hazard analysis.

Structurally unavoidable residual risks during the entire service life of the ESE 608 DHG ES DI DIN SILENT 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 in this manual
- The special warnings in this manual

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 gases

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

- Inappropriate handling
- Transport
- Hot components

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

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 equipment in the operating area of the generator can be caused by:

- Inappropriate handling
- An overvoltage or an undervoltage

Welding generator's performance or functionality limitations

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 27°C
- Too large a distribution network configuration

2.2 Operating personnel – Qualification and obligations

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

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 a malfunction 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.

2.3 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
- protective shoes

2.4 Danger zones and work areas

The danger zones and work places (work areas) around the generator are determined by the activities to be undertaken 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	
	Operating		
	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

2.5 Signs on the generator

These signs must be fitted on the generator and be kept in a clearly legible condition:

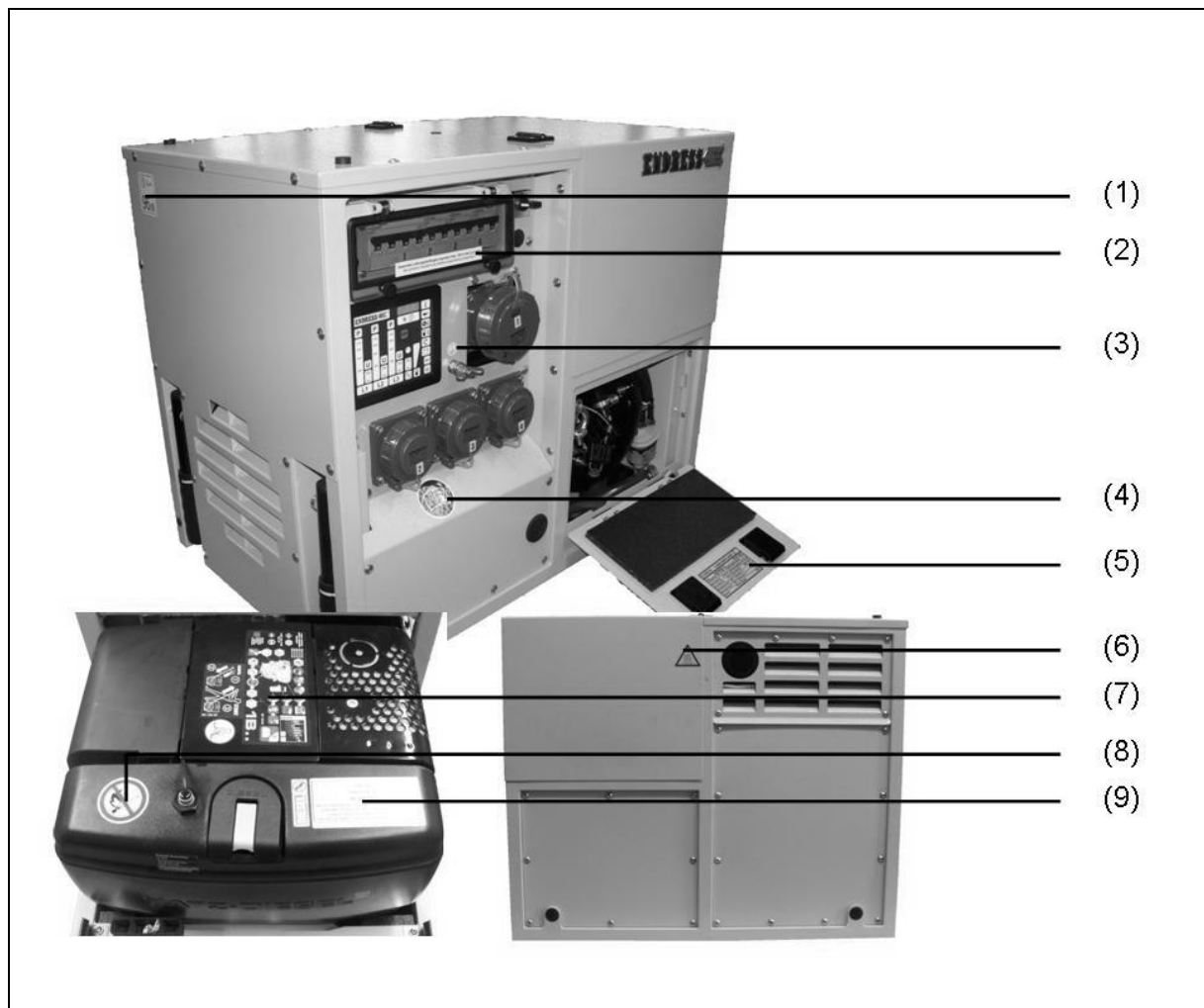


Fig. 2-1: Signs on the generator

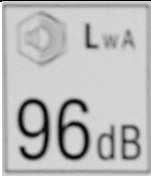
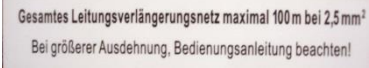







Number	Sign	Name
1		Noise emission
2		Note Line extension
3		Potential equalization (earthing for FI)
4		Reference note - read operating instructions
5		Nameplate Generator
6		Note Hot surfaces
7		Fuel note
8		Note Open flame prohibited
9		Fuel note

Table 2.2: Signs on the generator

2.6 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 signs on the generator must be in place and be in a clearly legible condition.

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

The generator is only be used outdoors and with sufficient ventilation.

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

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

Protect the generator against dirt and foreign matter during operation.

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

The authorised personnel are responsible for safeguarding the generator 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.

Authorised personnel must 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.

Consuming alcohol, drugs, medicines, or other consciousness-expanding and/or changing substances is prohibited.

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

Transport The generator is only be transported after it has cooled down.

The generator may only be transported in a vehicle after being fastened correctly.

The generator may only be lifted by the crane loops provided.

Setting up The generator is 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.

The generator must always be operated with the hood closed.

Refuelling It is prohibited to refill the generator's fuel tank during operation.

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

Use filling aids for refuelling.

To prevent overflow, do not fill the tank to the upper edge of the filler neck.

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 disconnect the starter battery 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 decommissioned if it is not required for more than 1 year (see 4.10).

Store the generator in a dry, locked room.

Documentation

A copy of these operating instructions must always be kept together with the generator.

The operating manual for the engine (see Figure 1-1-(5), are integral components of these instructions.

Notes

3 Integral components of ESE 608 DHG ES DI DIN Silent

3.1 Operation/engine side

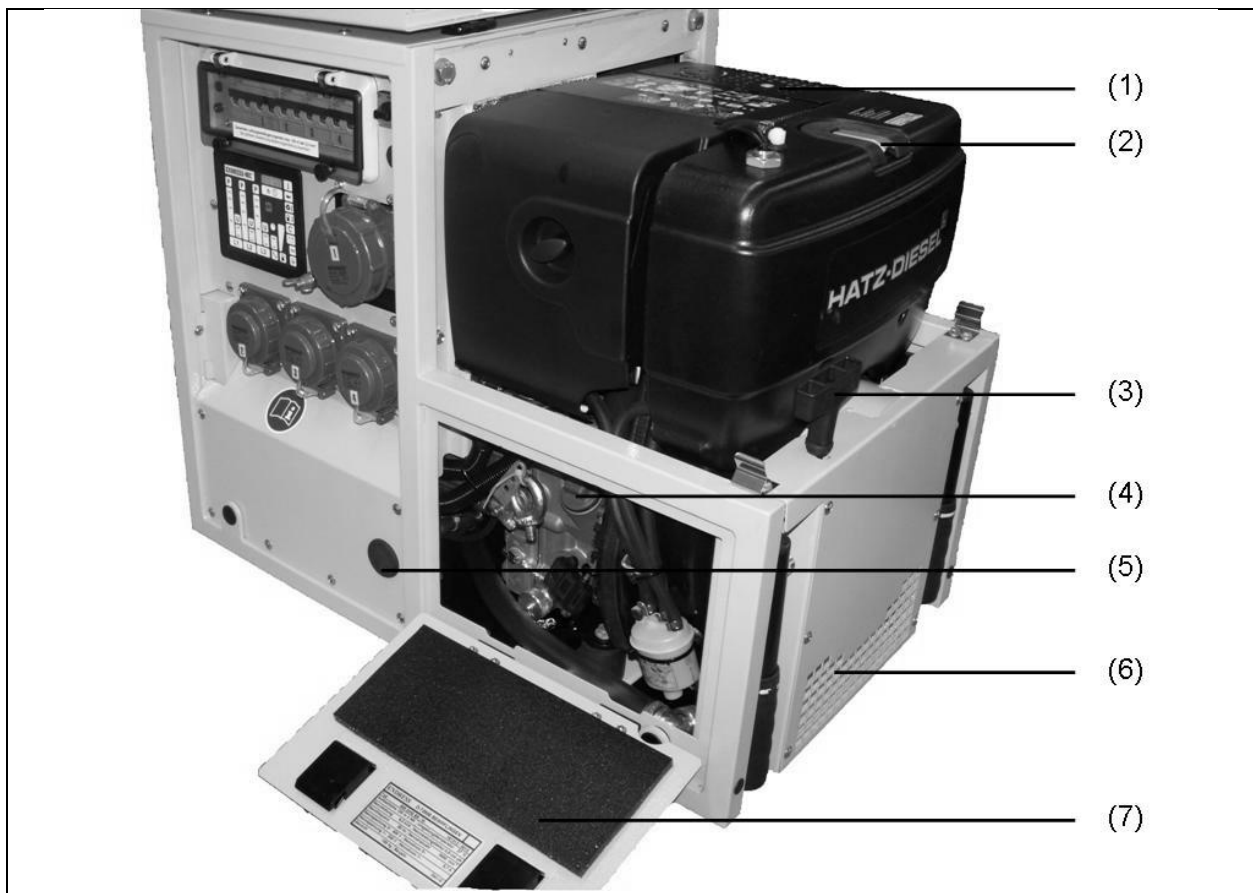


Figure 3-1: Components on the operating and engine side

- | | | | |
|---|----------------|---|---|
| 1 | Engine | 5 | Cap for external refuelling |
| 2 | Tank cover | 6 | Feed air to the engine (always keep free) |
| 3 | Recoil starter | 7 | Flap for engine below |
| 4 | Oil level | | |

3.2 Rear / generator side



Figure 3-2: Electrical compartment components

- | | | | |
|---|-----------------------|---|---|
| 1 | Flap for engine below | 3 | Feed air to the engine (always keep free) |
| 2 | Exhaust | 4 | Carrying handle |

3.3 Control panel

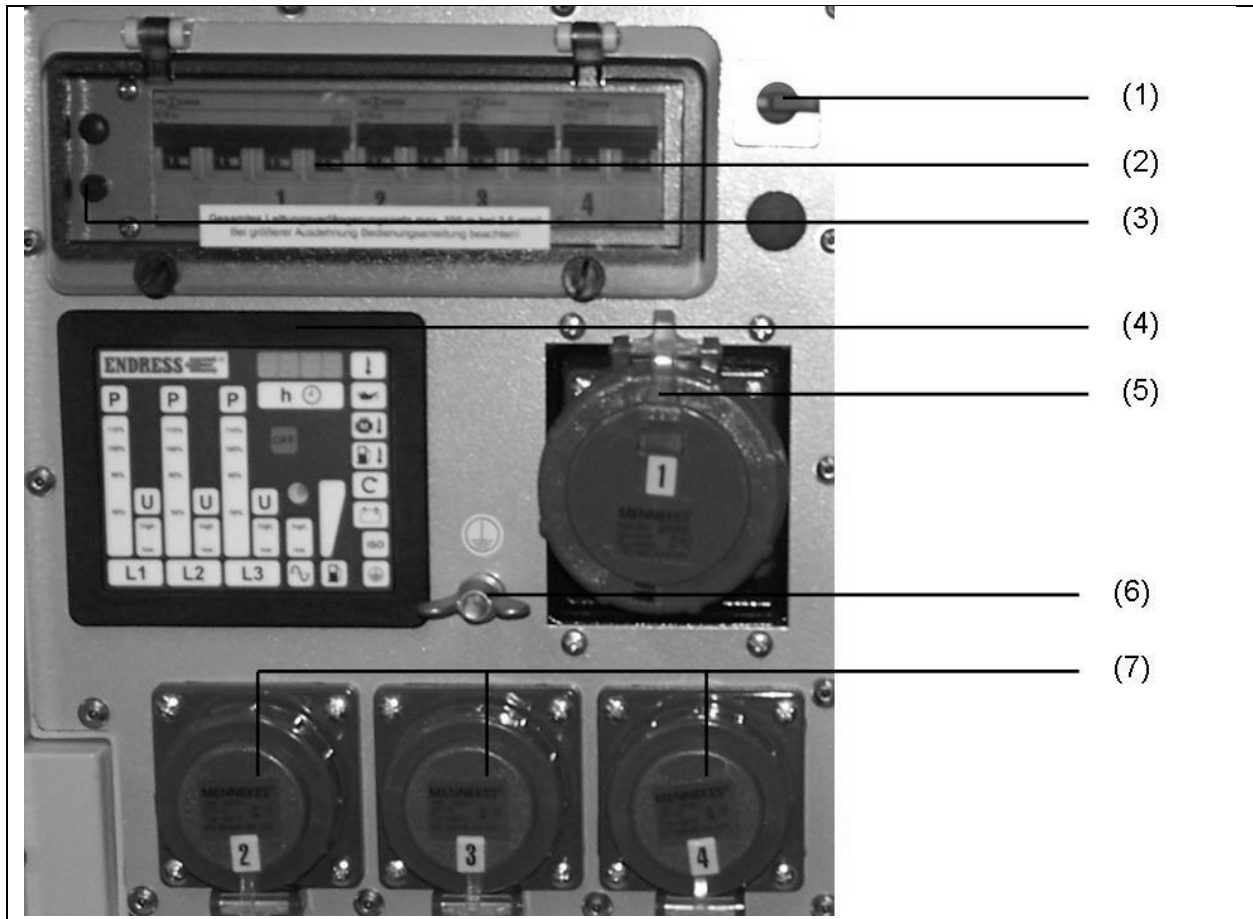


Figure 3-3: Control panel components

- | | | | |
|---|---|---|--|
| 1 | START-STOP switch | 5 | CEE socket |
| 2 | Circuit breaker (under hinged window) | 6 | Potential equalization (earthing for FI) |
| 3 | Protective earthing conductor test
(valid for devices up to year of construction
12/2015) | 7 | Schuko (shockproof) power sockets |
| 4 | Multi-functional display | | |

3.4 Function and mode of operation

Function and mode of operation

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

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

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 the ESE 608 DHG ES DI DIN SILENT



The operation of the generator is described in this section.

4.1 Transport

Proceed as follows to transport the generator.

Requirements

These requirements must be met:

- The generator must be turned off
- The generator must have cooled down.
- Fuelling device is now disconnected.
- Exhaust hose is not plugged in.



WARNING!

A slipping or falling device can crush hands or feet.

- Take the weight of about 160kg into account.
- Carry the alternator using at least one person per carrying handle.
- Lift / lower the alternator evenly.
- Walk slowly.
- Only transport the device with a crane using the ring screw provided
- Do not lift the device with forks on the under side

Carrying the generator

At least one person per carrying handle

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

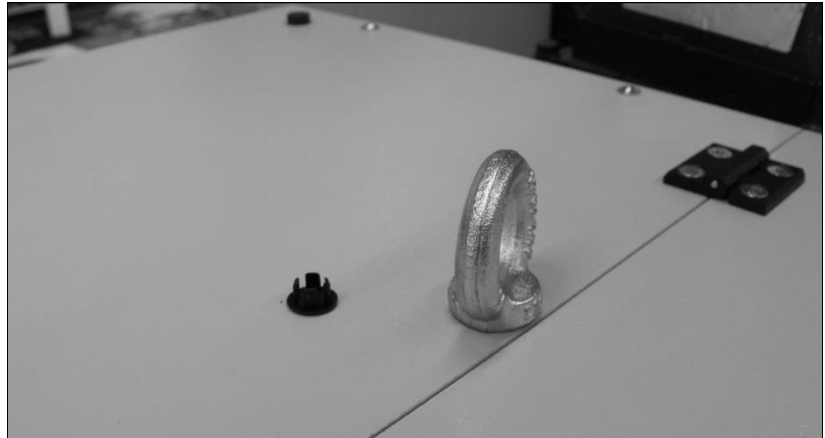


Fig. 4-1: Ring screw for loading

Transporting with a crane

1. Screw on the ring screw for loading / check for firm seating.
 2. Hook in hook for the crane onto the eye of the generator.
 3. Transport with the crane to the use location.
 4. Slowly lower the device and remove the hooks. Ensure that the support surface is even and suitable for use.
- ✓ The generator has been transported to its place of work.

4.2 fuelling

Proceed as follows to refuel the generator.

Requirements

These requirements must be met:

- The device must be shut off.
- The device must be cooled down.
- Adequate ventilation must always be available



WARNING!

Escaping motor oil or diesel fuel can burn.

- Prevent engine oil and diesel fuel from leaking.
- Generator is switched off.
- Generator has cooled down.
- Avoid open flames and sparks.



WARNING!

Leaking diesel fuel can contaminate soil and groundwater.

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



WARNING!

Using the wrong fuel will destroy the engine.

- Use only diesel fuel
(for exact specifications, see the motor manual).

Refuelling the device

Refuel the generator as follows:

1. Fold in the tank locking cap.
2. Use a filling aid.
3. Fill with diesel fuel.
4. Remove filler aid.
5. Screw the fuel cap back on.

- ✓ The device is refuelled.



Figure 4-2: External refuelling

Refuelling the device externally

A max. suction height of 1 m is allowed.

1. Remove cover plug (see Figure 4-2-(2)).
2. Place hose for external refuelling canister with quick-connect coupling LP-006 (see Figure 4-2-(1)). Put on coupling (see Figure 4-2-(1)).

✓ External refuelling is activated.

Put on the cover plug after the removing coupling to provide protection.

Note

For operating periods greater than 3 hours without refuelling, external refuelling should be used.

Comments:

The external refueling system is activated automatically after connection of the external tank.

Fuel delivery takes place in the area $\frac{1}{3}$ – $\frac{1}{2}$ of the whole volume of the tank.

Overfilling of the tank for a defect in the pump circuit is detected by a second safety circuit. This circuit operates for about $\frac{2}{3}$ of the tank volume

4.3 Commissioning

Requirements

These requirements must be met:

- Electrical safety check (see 5.3)
- there must be fuel in the tank.
- an adequate oil level (for this, see the engine's operating and maintenance manual *(see Figure 1-1-(5))*)
- Adequate ventilation must always be available
- Appliances switched off or disconnected



WARNING!

Fuel can burn.

- Prevent engine oil and diesel fuel from leaking.
- Do not use starting aids.
- Avoid open flames and sparks.



WARNING!

Exhaust gases can cause fatal asphyxiation.

- Provide for sufficient ventilation.
- Only operate the generator 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:**

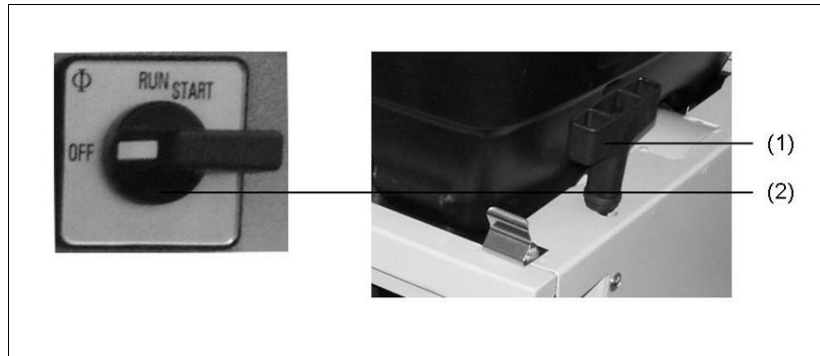


Fig. 4-3: Started by hand:

- HAND START**
1. Move START-STOP switch (Fig. 4-3-(2)) into the "RUN" position.
 2. Advance engine at the handgrip of the reversing starter (Fig. 4-3-(1)).

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

✓ The motor starts.

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

- ELECTRICAL**
1. Move START-STOP switch (Fig. 4-3-(2)) into the "Start" position.

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

✓ The motor starts.

2. Release the START-STOP switch

✓ The engine has started.

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

4.4 Connecting up to consumers

Proceed as follows to connect appliances to the generator.

Requirements These 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 to consumers

You can connect up the consumers/appliances using shock-proof- (see Figure 3-3-(7)) or CEE sockets (see Figure 3-3-(5)). Ensure that the performance of the generator is adequate.

4.5 Check the protective conductor

(valid for devices up to year of construction 12/2015)

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

Requirements The following requirements must be met:

- generator started
- connected up consumers
- 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

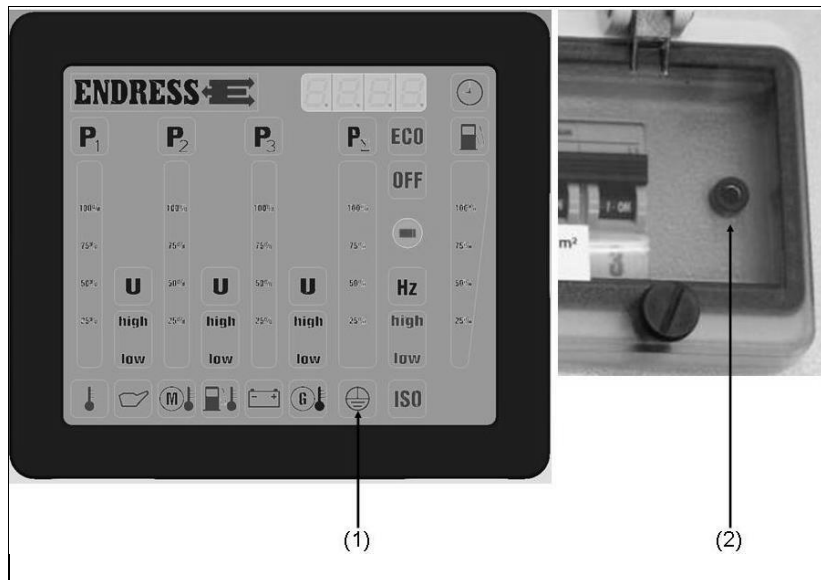


Fig. 4-4: Check the protective conductor

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

1. Insert test cable into socket (*Fehler! Verweisquelle konnte nicht gefunden werden.*-(2)).
 2. Hold a test tip on a metallic, blank location on the device.
- ✓ The test lamp (*Fehler! Verweisquelle konnte nicht gefunden werden.*-(1)) on the multifunction display shows the result:

Test lamp	Significance
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.

4.6 Monitoring the operating status using the multifunction display

All LEDs light up for about 2 seconds to allow checking as soon as the START-STOP switch is set to the position "RUN". 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 display 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 "OFF". The display intensity depends on the ambient light.

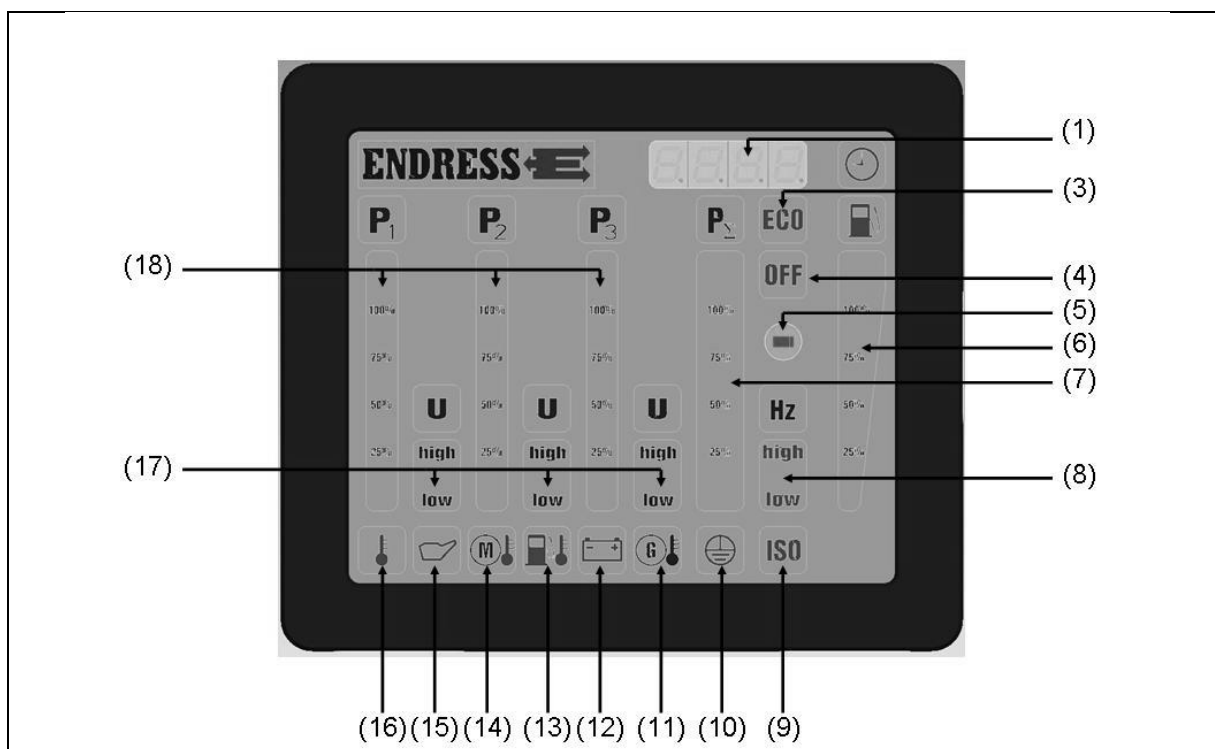


Figure 4-5: Multi-functional display

Operating hours: Displayed (see Figure 4-54(1)) when the generator has started 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 Figure 4-54-(16)) whilst the generator is running, 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 is red (see Figure 4-54-(15)) whilst the generator is running, the oil pressure is too low and the generator switches off automatically or the buzzer sounds; this can be acknowledged using the acknowledgement button.
(Buzzer only active for the ordered "Insulation monitoring", "Firecan") special fitting
- Engine temperature:** If the display is red (see Figure 4-54-(14)) whilst the generator is running, 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 Figure 4-54-(13)) whilst the generator is running, 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 is red (see Figure 4-54-(12)), the alternator's re-charging 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 Figure 4-54-(9)) or if the buzzer sounds, 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 Figure 4-54-(10)) during the protective earth lead test (see chapter 4.8 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:** There is no electrical tank sensor for this device.
- Frequency:** If the display glows green (see Figure 4-54-(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 Figure 4-54-(18)) are displayed separately:
- Voltage (U) (see Figure 4-54-(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 Figure 4-54-(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 4-4-(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 Figure 4-54-(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 "Insulation monitoring", "Firecan") special fitting

4.7 Insulation monitoring

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

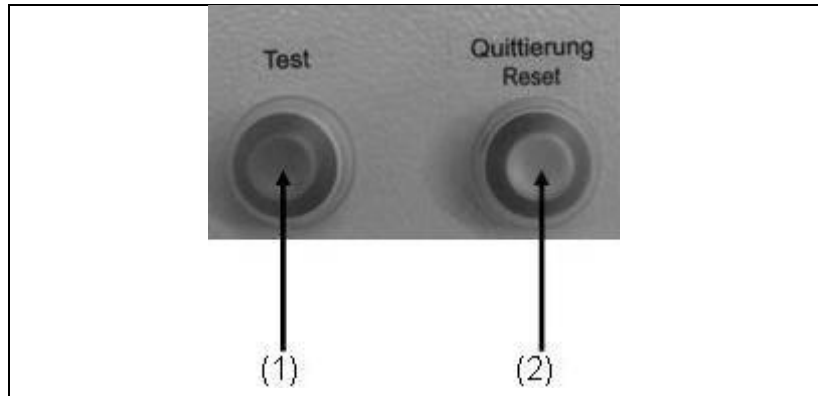


Figure 4-6: Insulation monitoring using E-MCS 4.0

4.7.1 Insulation monitoring without switching off

(Standard for a DIN generator)

Requirements The following requirements must be met:

- Generator has been started (see **Fehler! Verweisquelle konnte nicht gefunden werden.**)

Testing the insulation monitoring:

1. Unplug the device
 2. Press the test button (see Figure 4-65-(1))
- ✓ The displayed symbol (see Figure 4-54-(9)) indicates the result, the buzzer also sounds for insulation monitoring with this and it can be acknowledged over the acknowledgement button (see Figure 4-65-(2)):

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

Table 4.2: Insulation monitoring without switching off

- ✓ The insulation monitoring test has been run.

1. The reset button (see Figure 4-65-(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 device and switch on.
- ✓ The displayed symbol (see Figure 4-5-(8)) indicates the result:

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

Table 4.3: 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 Figure 4-6-(1)) must be pressed after switching off and disconnecting the consumer so that the unit can be operated again.

Function reset/acknowledgement button:

Action	Operation
Press once	Acknowledge the buzzer
Press twice	Reset ISO

4.7.2 Insulation monitoring with switch off

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 Figure 4-6-(1))
- ✓ The displayed symbol (see Figure 4-5-(9)) 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 4.4: Insulation monitoring plus switching off

- ✓ The insulation monitoring test has been run.

4. The circuit breaker must be returned to Pos. 1 after the test has been completed and the generator must be re-started so that it can be used again.

Insulation monitoring whilst running:

1. Plug in the device and switch on.
 - ✓ The displayed symbol (see Figure 4-5-(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 4.5: 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.

4.8 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

Connecting up a remote start device

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

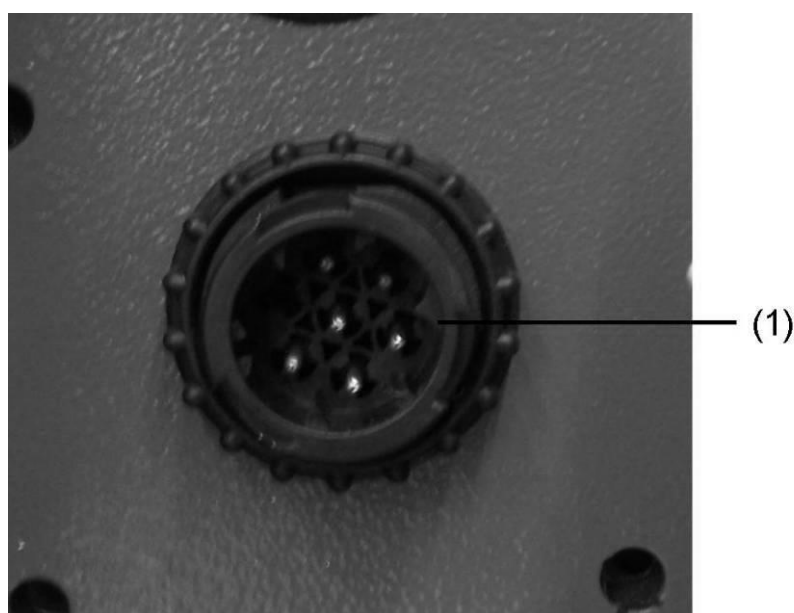


Fig. 4-6: Remote start device with CAN plug

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. Unlock the plug of the connecting cable for the remote start operating status / generator and then pull the plug out.
 2. Screw any protective cap present onto the remote start socket.
- ✓ Remote start device is disconnected.

4.9 FI circuit breaker

The FI circuit breaker option can only be supplied by the factory.

The FI circuit breaker (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!

2. 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.
3. Additionally, every work day, the user must check the mechanical operation of the release by activating the test button (see *unterhalb Figure 4-7-(10)*) on the residual current protection device (RCD).

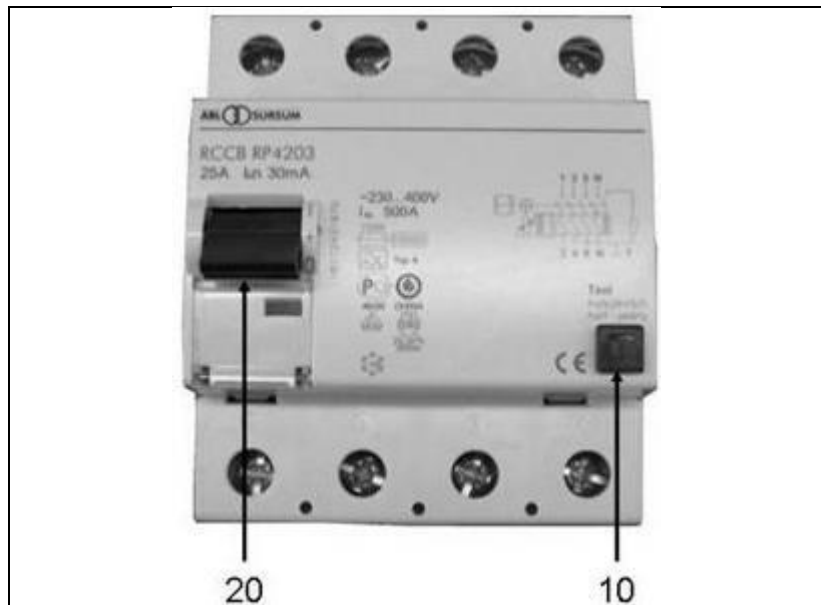


Figure 4-7: FI protection switch

Checking the FI protection switch:

1. The generator must be started.
 2. Put the protection switch (see Figure 4-7-(20)) into position 1.
 3. Activate the test switch (see Figure 4-7-(10)).
- ✓ The switch position displays the result (see Figure 4-7-(20)):

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

Table 4.6: FI protection switch test

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

4.10 Decommissioning

In a new condition the generator can be stored for up to a year. For a longer period, please contact a Hatz service facility (also see the engine operating *see Figure 1-1-(4)*).

4.11 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 Maintenance



Generator maintenance is described in this section.

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

5.1 Maintenance plan

Perform maintenance according to the information in the engine manual.

5.2 Maintenance work

Only authorised personnel are allowed to carry out maintenance tasks.

Perform all work in the maintenance plan according to the information in the engine's operating and maintenance manual (see Figure 1-1-(5)).

5.2.1 Drain the oil.

When draining, note the special features of the device.



WARNING!

Risk of scalding by hot oil

- Allow device to cool off before draining off oil.
-



Fig. 5-1: Drain the oil.

Drain the oil.

1. Lift the device using a crane
2. Remove the plate for the oil drain (see Fig. 5-1-(2))
3. Guide the drain hose (see Figure 1-1 (8)) through the opening in the frame and set the oil collection pan in place.
4. Screw off the motor's oil drain valve cap (see Fig. 5-1-(1)).
5. Screw the drain hose onto the oil drain valve. The valve opens and the engine oil flows away.

✓ The motor oil has been drained.

5.3 Checking the electrical safety

Only specifically 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. Inform yourself further in the engine operating manual.

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

Malfunction	Possible cause	Correction
No or insufficient voltage available during idling.	The rotational speed of the engine was adjusted afterwards.	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 instructions.
	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	The oil level monitor actuates.	Check oil level and refill if necessary.
	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 engine does not rotate.	Engine defective.	Call service staff.
The engine smokes.	Too much oil in the engine.	Drain excess oil.
	Air filter cartridge is soiled by dirt or oil.	Clean cartridge, or replace if necessary.
The engine turns briefly and then shuts down.	Too little fuel in the tank.	Refuel
	The oil level is too low.	Add oil.
	The fuel filter is clogged.	Replace the fuel filter.
	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	Too much power is drawn.	Reduce power draw.
The generator runs jerkily.	The generator is loaded beyond the nominal output.	Reduce power draw.

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.

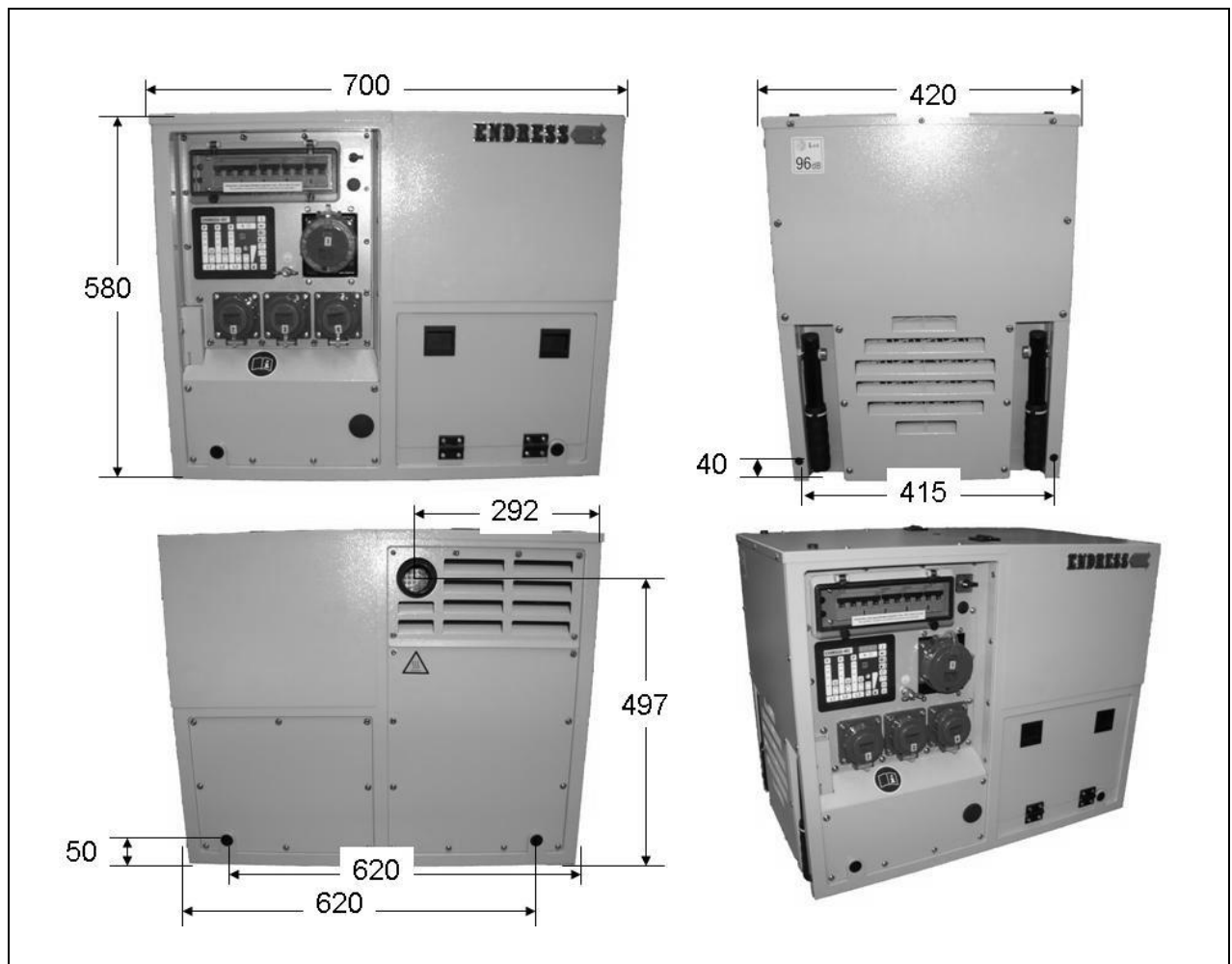


Fig. 7-1: Generator dimensions

Technical specifications

Name	Value	Unit
Type	ESE 608 DHG ES DI DIN SILENT	
Nominal output 400V / 3~	6.0	[kVA]
Nominal output 230V / 1~	4.0	[kVA]
Nominal power factor V3~	0.8	[cosφ]
Nominal power factor V1~	0.9	[cosφ]
Nominal frequency	50	[Hz]
Nominal speed	3000	[min ⁻¹]
Nominal voltage 3~	400	[V]
Nominal voltage 1~	230	[V]
Rated current 3~	17.4	[A]
Rated current 1~	8.7	[A]
Voltage tolerance (idling – nominal output)	± 5	[%]
Sound power level at workplace L _{pA} *	89	[db (A)]
Sound pressure level at a distance of 7m L _{pA} **	71	[db (A)]
Sound power level ** L _{WA}	96	[db (A)]
Protection Class	IP 54	
Weight (ready for use)	155	[kg]
Tank capacity	6	[l]
Length	700	[mm]
Width	440	[mm]
Height	580	[mm]
Protection Class	IP54	

Table 7.1: Generator technical data

Ambient conditions

Name	Value	Unit
Setting up height above sea level	< 100	[m]
Temperature	< 27	[°C]
Relative air humidity	< 60	[%]

Table 7.2: Ambient conditions for the generator

Reduced power

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

Table 7.3: Generator power reduction dependent on 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 7.4: 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.

8 Replacement parts



This section contains the replacement parts needed to run the generator.

8.1 Frame with engine and generator

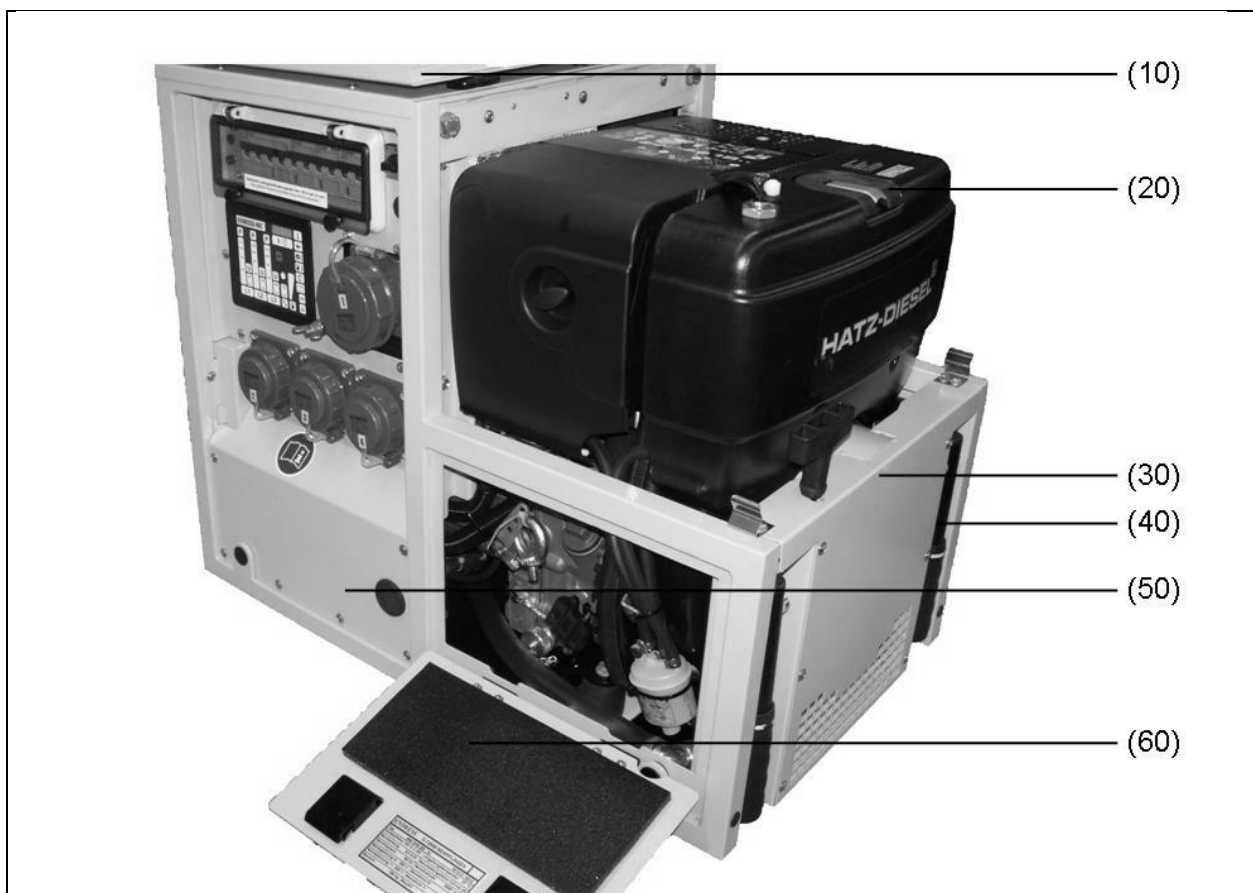


Fig. 8-1: Replacement parts for the exhaust or generator side



Fig. 8-2: Engine and exhaust side replacement parts

Item	Part number	Quantity	Article name
	E506100/99	1	Frame
10	E505716/99	1	Engine hood
20	E133683	1	1B50/10HP engine
	E130959	1	Gen syn. 7 kVA IP 54 50Hz
	E133301	4	Vibration dampers
30	E505724/99	1	Engine air duct
40	E133823	4	Inset handle made of soft PVC
	E133316	4	Lamellar plugs 27x0.8-3
	E133023	4	M12 x 45 cylindrical screw
	E133024	4	Hexagon nut M 12
	E130692	4	12.8-18-3 spacer sleeve
50	E505736/11	1	Electrical protective plate below
60	E506102/11	1	Doors
	E133090	2	Snap in snap lock
100	E505733/99	1	Sound absorber plate
	E505235/92	1	Rear muffler

Item	Part number	Quantity	Article name
110	E505709/11	1	Protective plate
120	E505732/11	1	Protective plate

8.2 Electronics

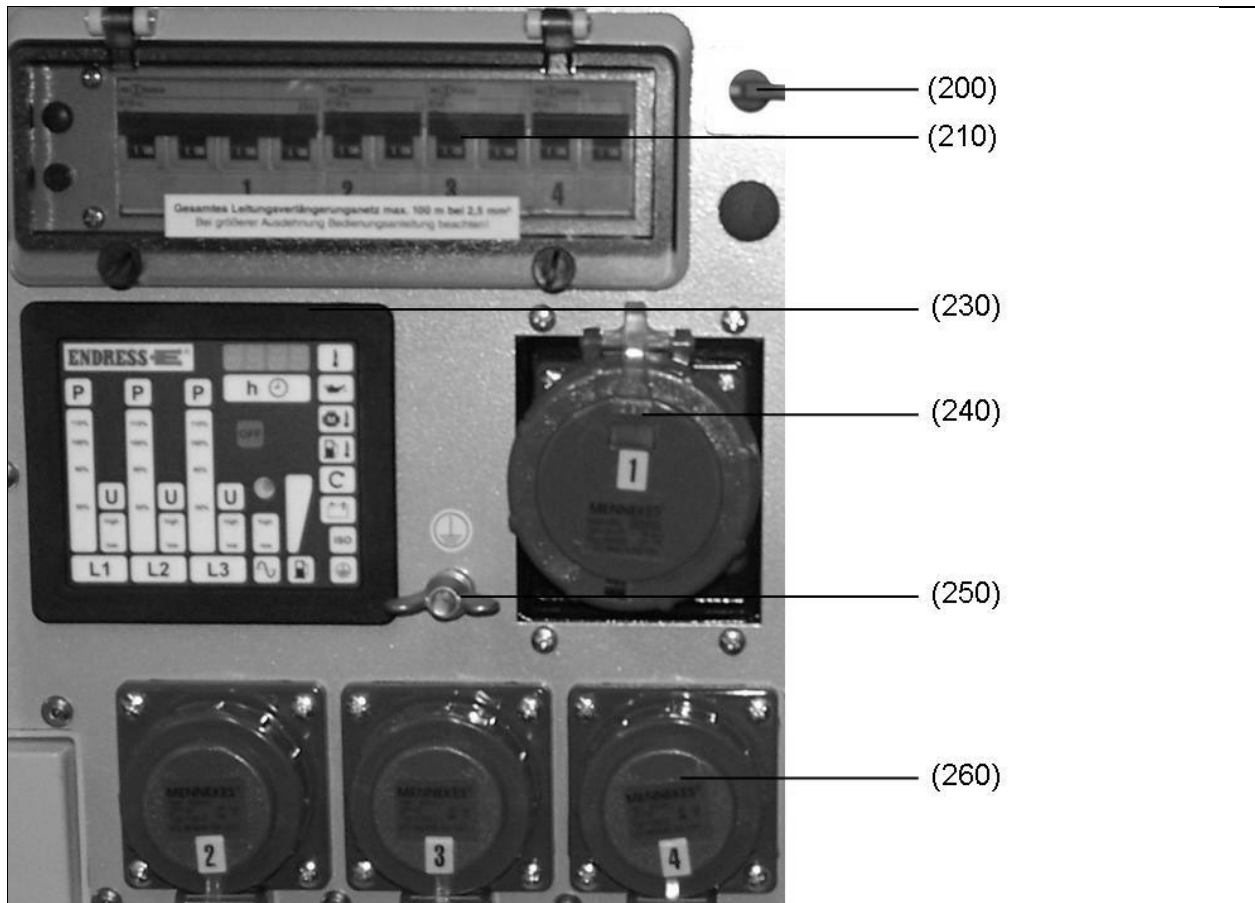


Fig. 8-3: Replacement parts for the electrical junction box

Item	Part number	Quantity	Article name
	E505229/96	1	Front panel
200	E131942	1	START-STOP switch
	E130422	1	Hinged window
230	162314	1	Multifunctional control system complete
240	E503857/96	1	Control panel V1 holder
	E130424	1	CEE panel mounting socket outlet 400V 16A 5-in.
260	E133007	3	Schuko attachment socket