



ORIGINAL OPERATING MANUAL

ESE 20YW/RS	Article No. 333 271
ESE 30YW/RS	Article No. 333 272
ESE 35YW/RS	Article No. 333 273
ESE 45YW/RS	Article No. 333 274
ESE 50YW/RS	Article No. 333 275



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General information

The illustrations in these operating instructions do not always comply completely with the actual design, in particular with regard to the colour, and are simply to be considered as the depiction 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 About the instructions



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.

2 Documentation

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

- Operating manual and maintenance instructions for the engine
- Operating manual for the alternator
- Circuit diagram for the generator
- Test protocol for the power generator
- Replacement parts for the power generator

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

3 Safety symbols



General hazard warning

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



Warning of potentially explosive materials

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



Warning of a dangerous electrical voltage

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



Warning of toxic substances

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



Warning of environmentally damaging substances

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



Warning of hot surfaces

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

4 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.

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
- Refuelling during operation
- Spraying with high-pressure cleaners or fire-extinguishing equipment
- Removal of protective equipment
- Installation on or in a vehicle, container or trailer.
- Installation in buildings.

Intended use

The generator produces electricity in place of the power grid, in order to supply electrical equipment and plant.

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 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.

Residual risks

The points analysed and evaluated before beginning the design and planning of the generator were the residual risks using a risk analysis tool according to EN ISO 12100.

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

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

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

- the special warning notices on the generator
- the general safety instructions given in these operating instructions
- the specific warnings given in these operating instructions
- the specific service instructions for the planned use.

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
- Turning parts

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
- electrical hazards

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

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
- Too large a distribution network configuration
- see also (Table 14-3: Reduced output of the generator)

Operating personnel – qualifications and obligations

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

The authorised operating personnel must:

- be of age.
- be trained in first aid and able to provide it.
- be familiar with the accident prevention regulations and generator safety instructions and be able to apply them.
- have read the chapter “General Safety **Regulations**”.
- has understand the content of the chapter “General Safety **Regulations**”.
- be able to use and implement the content of the chapter “General Safety **Regulations**” in practice.
- be trained and instructed according to the rules of conduct in the event of 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.

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	on vehicles	Radius of 5.0 m	1.0 m from the outer edge
	with a forklift		
	with a crane		
Operation	Setting up	1.0 m from the outer edge	
	Operating		
	Refuelling		
Service maintenance and	Cleaning		
	Shutting down		
	Maintenance		

Table 4-1: Danger zones and work areas on the generator

5 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 generator's danger area.

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.

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 generator components and their function and know how to use them.

Transport The generator may only be moved or lifted using transport equipment which is suitable for its weight. To do this only the transport equipment foreseen for use such as forklift pockets or crane loading rings should be used. (Figure 6-1,(4),(5))

Setting up The generator is only be set up on sufficiently even and firm ground.

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

The generator should be earthed by an electrician according to the form of network used.

Do not cover the equipment during use.

Do not obstruct or block the air supply.

Devices must not be connected during start-up.

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

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 doors closed.

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

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.

Do not use a high pressure cleaner.

Maintenance and repair work	<p>Operating personnel may only carry out the maintenance or repair work described in these operating instructions.</p> <p>All other maintenance or repair tasks may only be carried out by specially trained and authorised specialists.</p> <p>Always disconnect the starter battery before beginning maintenance and/or repair work.</p> <p>The maintenance intervals specified in these operating instructions must be observed.</p> <p>It is prohibited to service the generator during operation.</p> <p>It is prohibited to service the generator when it is still hot.</p>
Decommissioning	<p>The generator should be put out of service if it is not required for a longer period of time.</p> <p>Correct putting out of service is described in the engine operating manual and maintenance instructions.</p> <p>Wherever possible store the generator in a dry and locked room.</p>
Documentation	<p>A copy of these operating instructions must always be kept together with the generator.</p> <p>The operating instructions and the maintenance instructions for the engine are integral parts of this instruction manual.</p>
Environmental protection	<p>The packaging and transport material must be recycled according to the environmental protection regulations applicable at the place of use.</p> <p>The workplace must be protected against contamination by leaking operating fluids.</p> <p>Used or leftover fuels and lubricants must be recycled according to the environmental regulations applicable at the place of use.</p>

6 Description of the Generator



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

Views of the generator

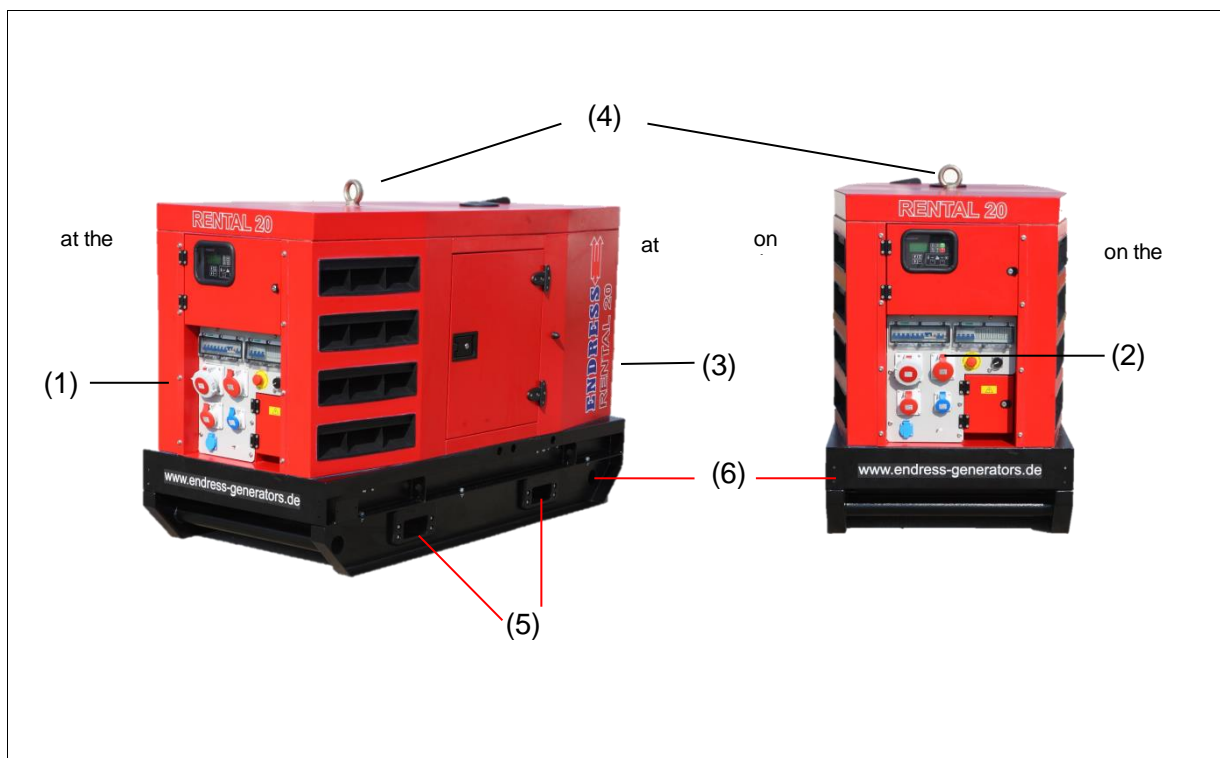


Figure 6-1: Views of the generator

- | | |
|----------------------|-------------------------------------|
| (1) Alternator side | (2) Connector panel (control panel) |
| (3) Engine side | (4) Crane loading lug |
| (5) Forklift pockets | (6) Base frame |

Components in the interior (on the right side)

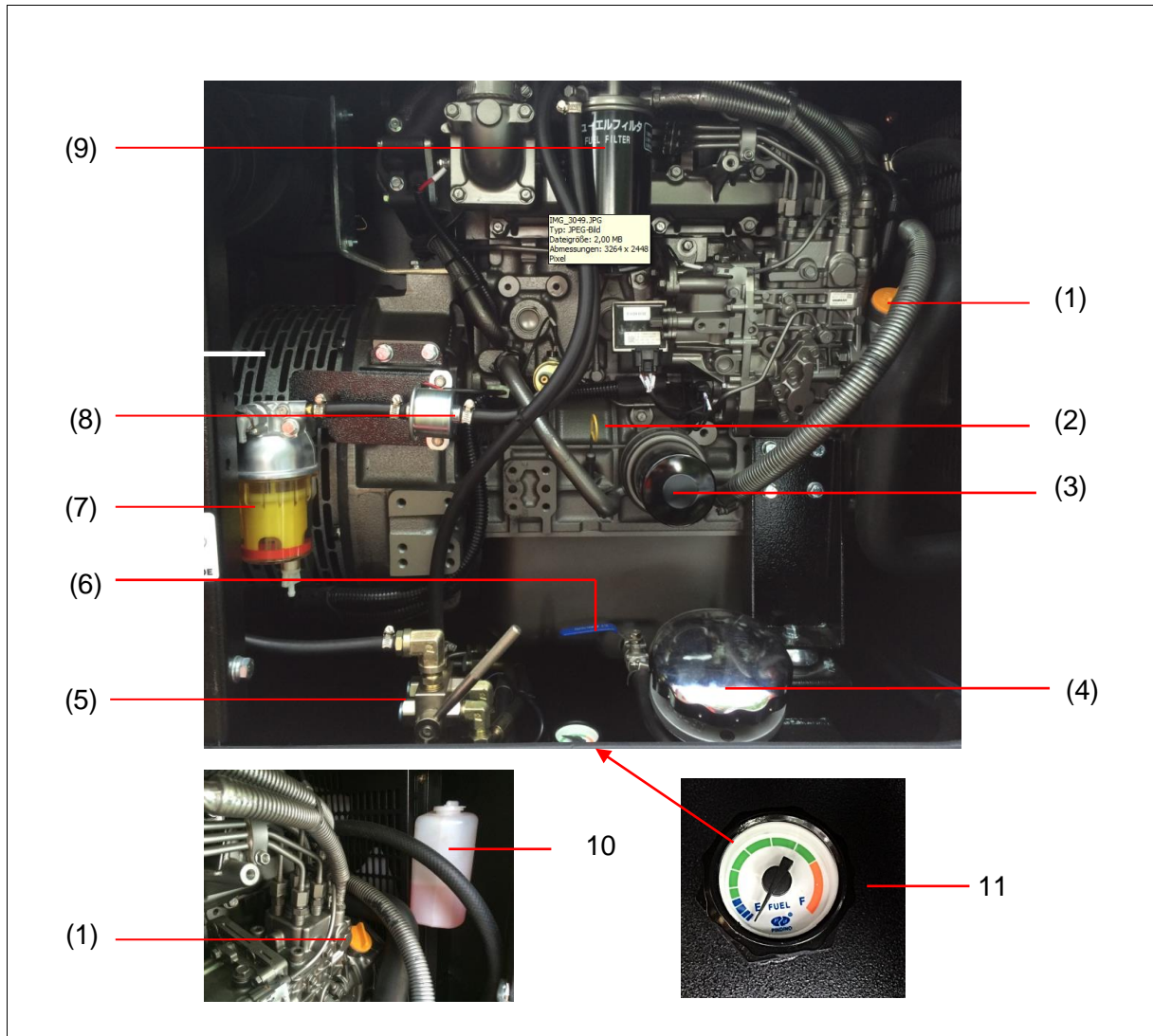


Figure 6-2: Components in the interior (on the right side)

- | | |
|----------------------------------|--|
| (1) Filling opening (engine oil) | (6) Valve lever - drain oil |
| (2) Oil dipstick | (7) Fuel pre-filter with a water separator |
| (3) Engine oil filter | (8) Fuel pump |
| (4) Tank filling opening | (9) Fuel filter |
| (5) 3-way fuel valve with tap | (10) Coolant compensation tank |
| | (11) Fuel fill level indicator |

Components in the interior (on the left side)

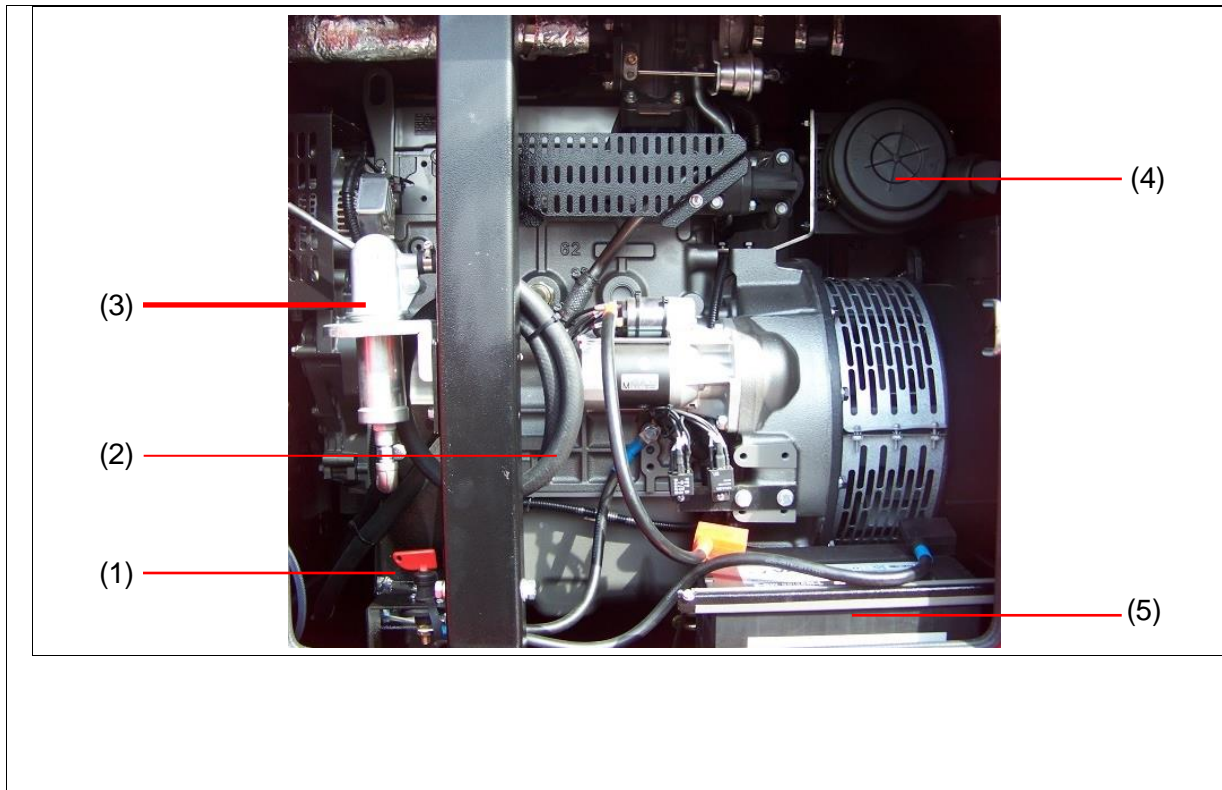


Fig. 6-3: Components in the interior (on the left side)

- | | |
|----------------------------------|----------------------|
| (1) Main battery switch | (3) Oil suction pump |
| (2) Hose to the oil drain points | (4) Air filter |
| | (5) Starter battery |

Connector panel (control panel)

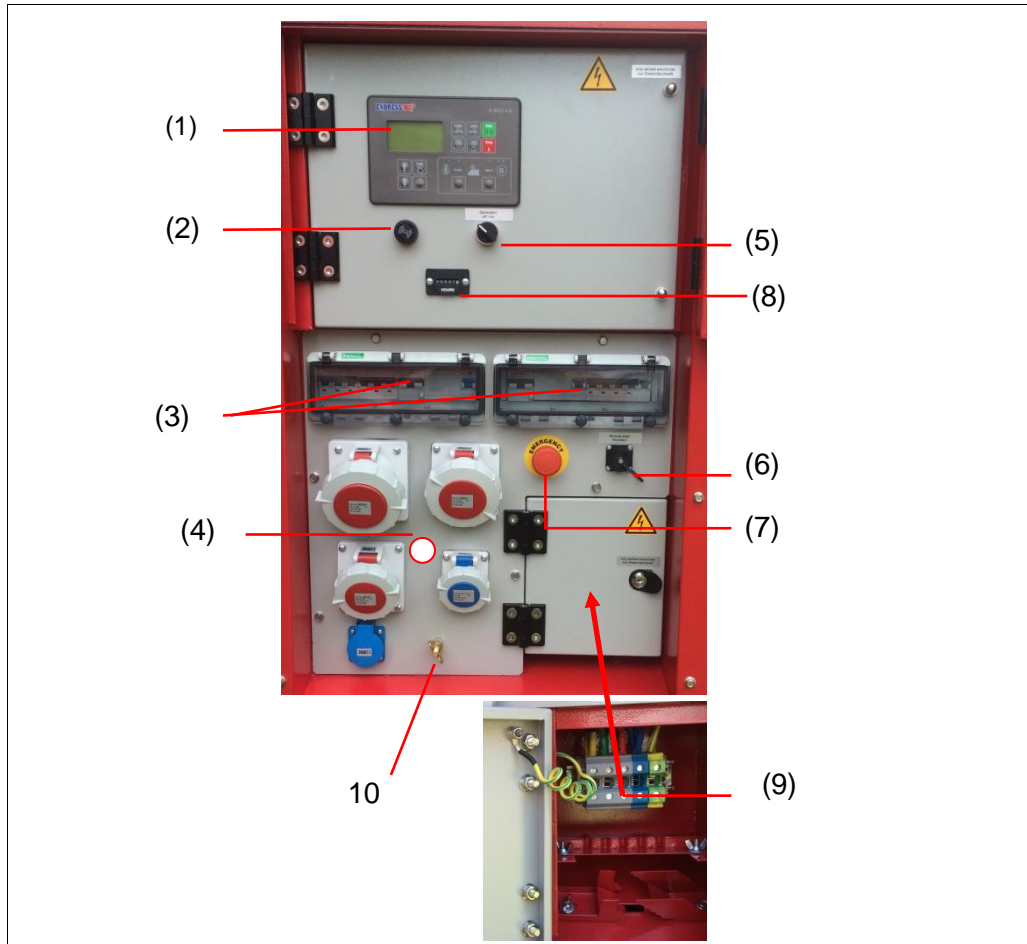


Fig. 6-4 Connector panel/control panel

- | | |
|---|--|
| (1) Control module E-MCS 6.0 | (2) Piezo buzzer (acoustic warning) |
| (3) Line and residual current circuit breaker | (4) Sub-assembly with a Schuko socket (1 piece) and CEE sockets (4 pieces) |
| (5) EMERGENCY-STOP switch | (6) Remote start socket |
| (7) EMERGENCY-STOP switch | (8) Operating hours counter |
| (9) Terminal strip for direct connection | 10 Earthing terminal |

Control module E-MCS 6.0

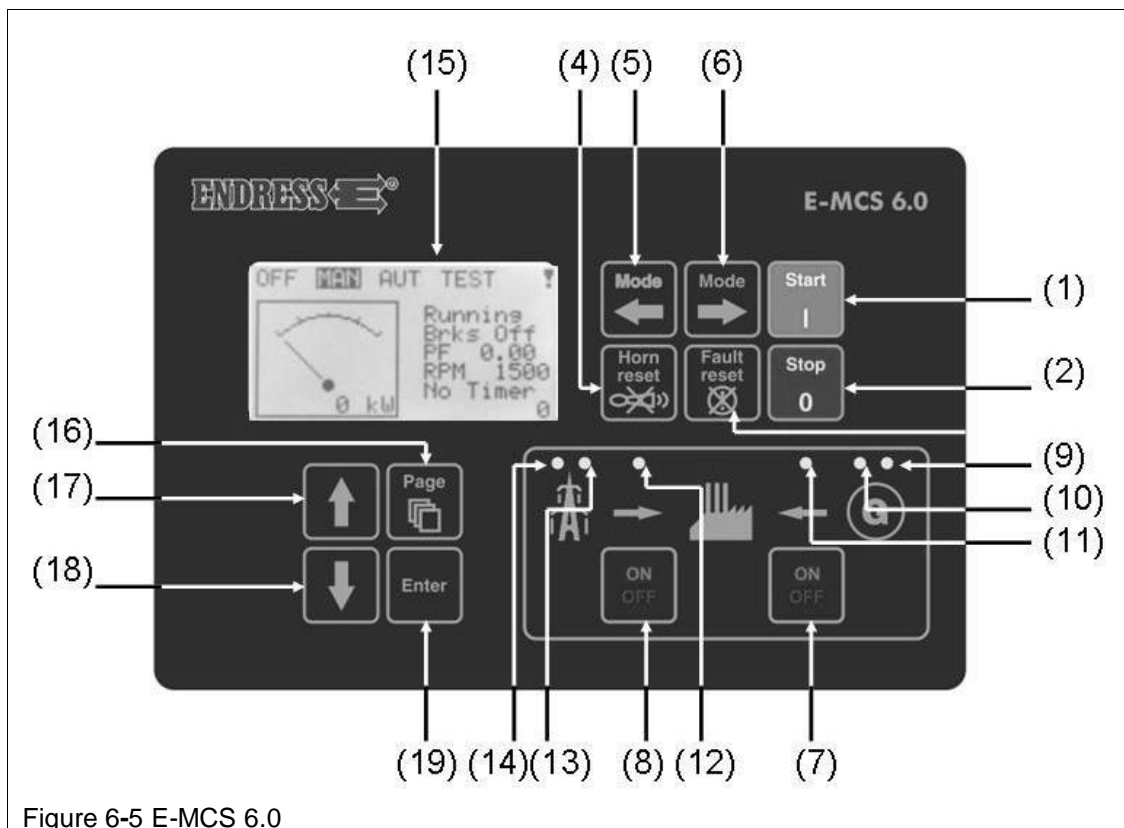





Figure 6-5 E-MCS 6.0

Control button of the E-MCS 6.0

Operation displays for the E-MCS 6.0

Item	Button	Description
1		START button. Only functional in the operating mode MAN. Press this button to initiate the starting process for the engine.
2		STOP button. Only functional in the operating mode MAN. Press this button to initiate the stopping process for the generator. Repeated pressing of the button or holding it down for longer than 2 seconds suspends the currently running phase of the stopping process (for example cooling off) and it is continued with the next phase.
3		FAULT RESET button (reset faults). Use this button to acknowledge the alarm and to deactivate the horn output. Inactive alarms are immediately faded out on the display and the status of the active alarm changes to "acknowledged", so that this is faded out immediately after removing the cause.

4		<p>HORN RESET button (reset horn). Use this button to deactivate the horn output without acknowledging the alarm.</p>
5		<p>MODE LEFT button (mode left). Use this button to alter the operating mode. This button is only functional if the main window is displayed with the indicator of the currently selected operating mode.</p> <p>NOTE: <i>This button is without function if the operating mode of the controller is forced by one of the binary outputs Remote OFF, Remote MAN, Remote ON, Remote TEST (remote controlled operating modes SWITCH OFF, MANUAL, AUTOMATIC, TEST).</i></p>
6		<p>MODE RIGHT button (mode right). Use this button to alter the operating mode. This button is only functional if the main window is displayed with the indicator of the currently selected operating mode.</p> <p>NOTE: <i>This button is without function if the operating mode of the controller is forced by one of the binary outputs Remote OFF, Remote MAN, Remote ON, Remote TEST (remote controlled operating modes SWITCH OFF, MANUAL, AUTOMATIC, TEST).</i></p>
7		<p>GCB button (generator circuit breaker). Only functional in the operating mode MAN. Use this button to switch the GCB (generator circuit breaker) off or on manually. Please note that certain conditions must apply otherwise the GCB (generator circuit breaker) switching on will be blocked.</p>
8		<p>MCB button (mains network circuit breaker). Only functional in the operating mode MAN. Press this button to switch the MCB (mains network circuit breaker) off or on manually.</p> <p>CAUTION! <i>This button separates the load from the mains power supply! Be very clear about what you want to do!</i></p>

Table 6-1 Control buttons of the E-MCS 6.0

Item	Button	Description
9		<p>Gen-set failure (error on the generator). The red LED diode begins to flash if there is a fault on the generator. After actuation of the FAULT RESET reset button it begins to light up continuously (if an alarm is still active) or goes out (if no further alarm is active).</p>
10		<p>Gen-set voltage OK (voltage of the generator OK). The green LED diode lights up if there is a voltage present from the generator and its parameters lie within the limit values.</p>
11		<p>GCB ON (generator circuit breaker switched on). The green LED diode lights up if the GCB (generator circuit breaker) is switched on. The diode is actuated with the output GCB CLOSE/OPEN (AMF 8/9) or by the signal GCB Feedback (AMF 20/25).</p>
12		<p>MCB ON (mains network circuit breaker switched on). The GREEN</p>

		LED diode lights up if the MCB (mains network circuit breaker) is switched on. The diode is actuated with the output MCB CLOSE/OPEN (AMF 8/9) or by the signal MCB Feedback (AMF 20/25).
13		Mains voltage OK. The green LED diode lights up if there is a voltage present from the mains network and its parameters lie within the limit values.
14		Mains failure. The red LED diode begins to flash if a mains failure was recognised and light up continuously after starting the generator until removal of the mains failure

Table 6-2 Operation displays for the E-MCS 6.0

Display and control buttons of the E-MCS 6.0





Item	Button	Description
15		Graphical black-white display, 128x64 points
16		PAGE button. Use this button to leaf through the displayed pages. See the chapter "Display window and page structure" under this table for more details
17		UP button. Use this button to increase the value.
18		DOWN button. Use this button to decrease the value.
19		ENTER button. Use this button to end entry of setting values or to move on the side of the history to the right.

Table 6-3 Display and control buttons of the E-MCS 6.0

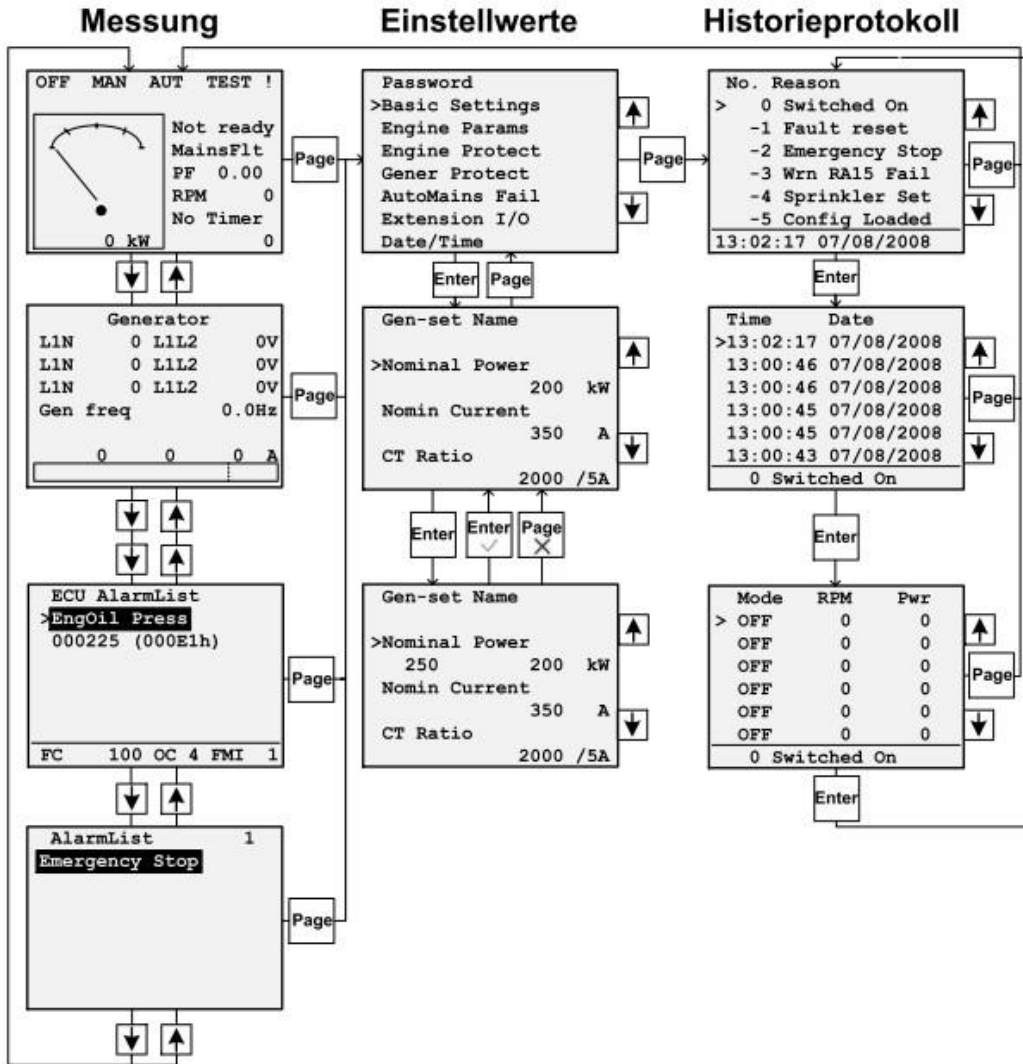
6.1.1.1 Display window and page structure



Display of information is built up with structuring in the "Pages" and "Window". Use the PAGE button to leaf through the pages.

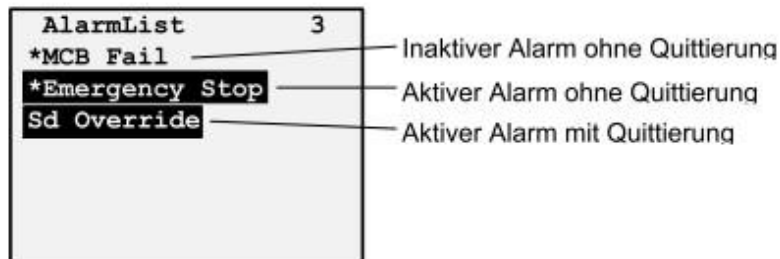
1. The Measurement page consists of windows in which the measured values such as voltages, current, oil pressure, etc, as well as calculated values such as the output of the generator, statistical data and alarm lists are displayed in the last window.
2. The Set points page contain all values to be set, arranged in groups, as well as a special group for entering passwords.

- The History log page shows the history log in the order in which the last recording is shown as the first.

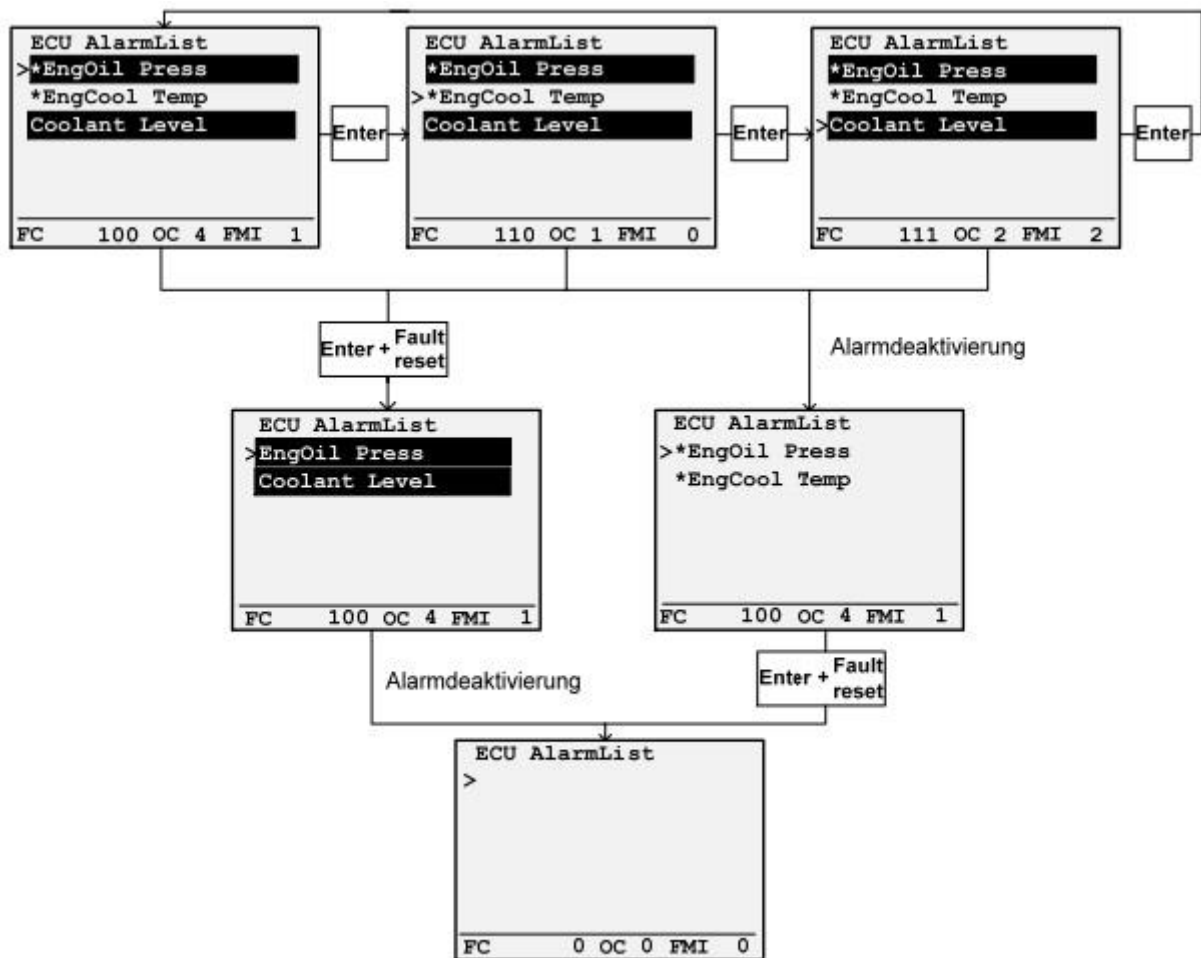


NOTE:
 The History pages and Set points are now only available if you select the interface Engineer (not User). See the following intermediate chapter information window of the controller.

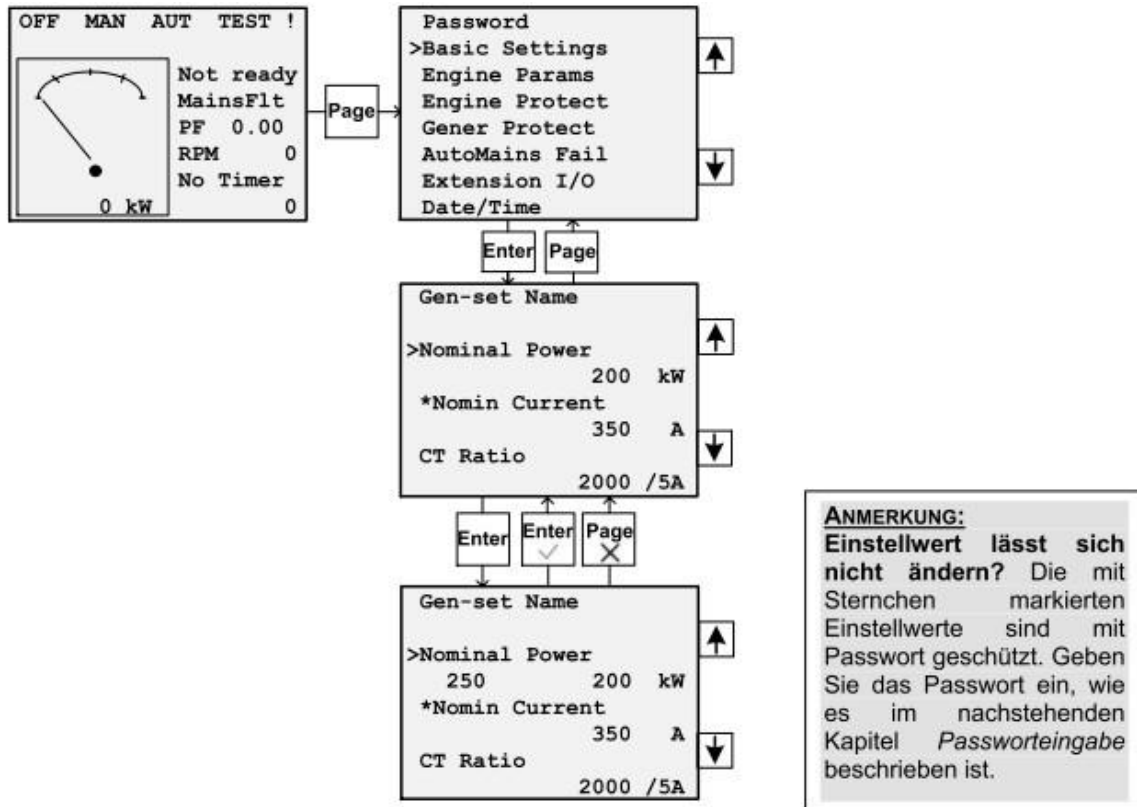
6.1.1.2 Alarms



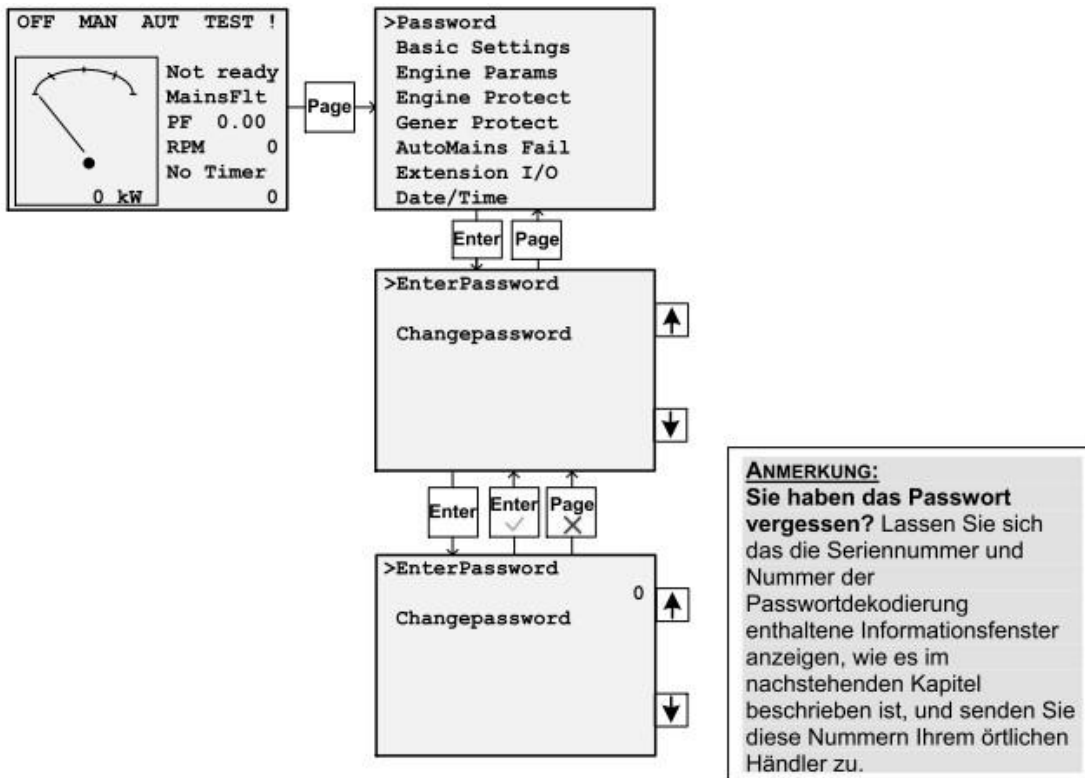
1 alarms



6.1.1.4 Changing the setting value

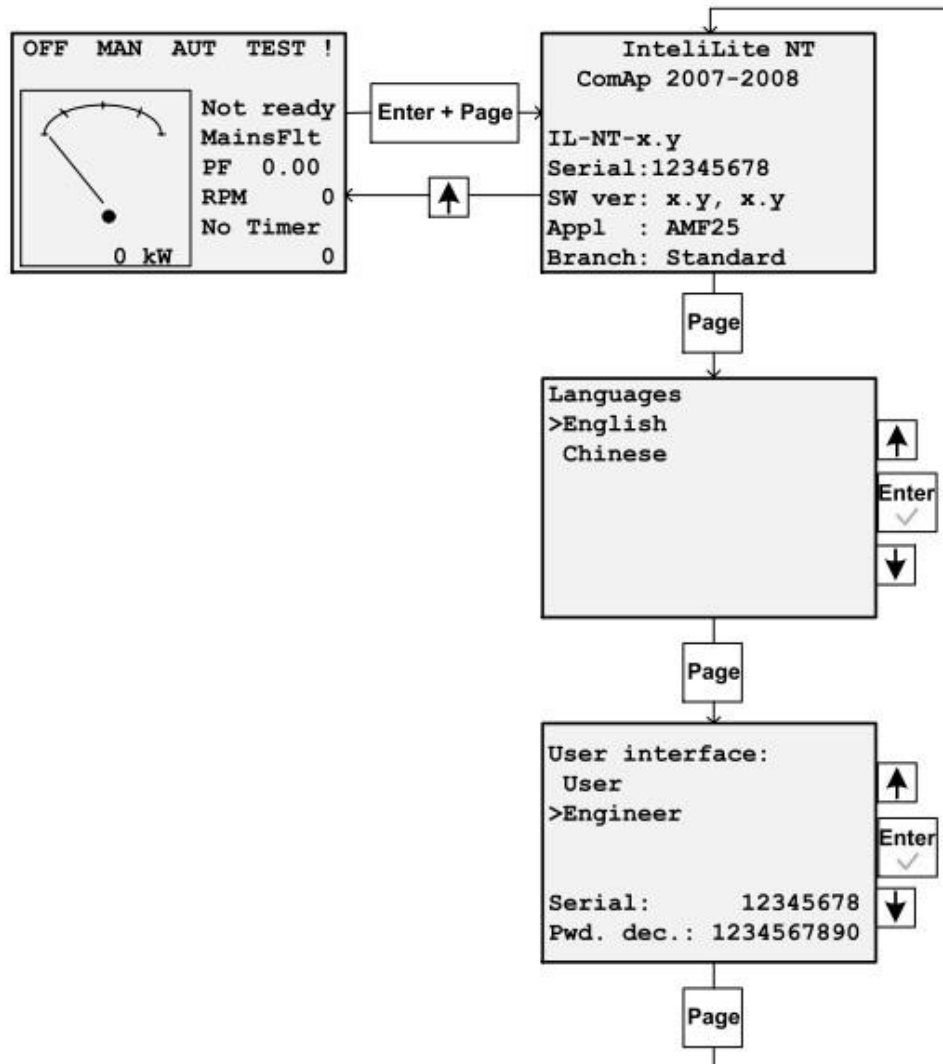


6.1.1.5 Password display

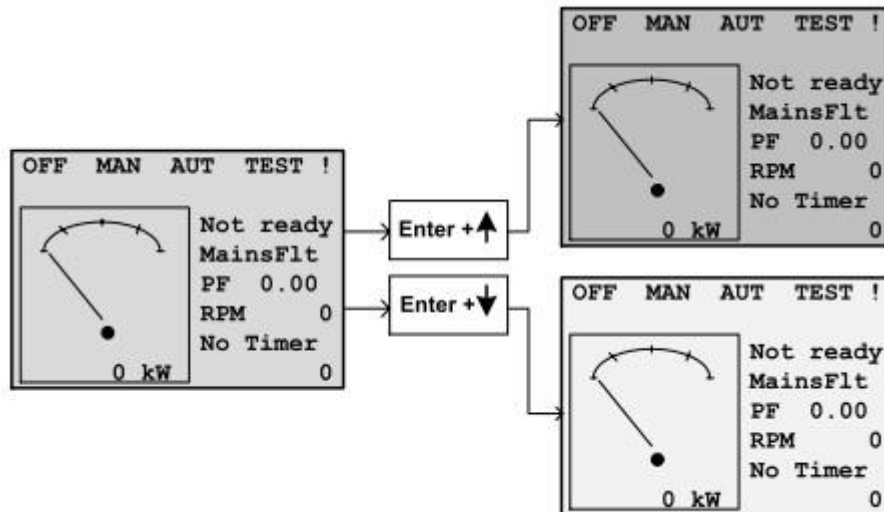


ANMERKUNG:
Sie haben das Passwort vergessen? Lassen Sie sich das die Seriennummer und Nummer der Passwortdekodierung enthaltene Informationsfenster anzeigen, wie es im nachstehenden Kapitel beschrieben ist, und senden Sie diese Nummern Ihrem örtlichen Händler zu.

6.1.1.6 Information window of the controller



6.1.1.7 Adjustment of the display contrast



7 Preparation for commissioning



Preparation for using the generator is described in this section.

Transporting the generator

Proceed as follows to transport the generator.

Requirements The following requirements must be met:

- The generator must be turned off
- The generator must have cooled down.
- The fuel valve is in the “OWN TANK” position
- Fuelling device is now disconnected.
- Power network separated and removed

Setting up the generator

Proceed as follows to set up the generator.

Requirements The following requirements must be met:

- An even and firm substratum outdoors
- There are no inflammable materials at the operating site
- There are no explosive materials at the operating site
- Place of work protected against unauthorised access

Refuelling the generator

Proceed as follows to refuel the generator.

Requirements The following requirements must be met:

- switched off device (Fig. 8-2: Switching the generator off)
- The device must be cooled down.
- adequate supply and removal of air
- Appliances switched off or disconnected



WARNING!

Leaking engine oil and diesel fuel can burn.

- Prevent leaking of engine oil and diesel.
- 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!

Using the wrong fuel will destroy the engine.

- Use only diesel fuel.

Earth the generator.

The generator should be earthed by an electrician according to the form of network used. As standard the generators are designed in the network form TN-S with a residual current circuit breaker. Design C according to DGUV information 203-032. For connection to the earth see Fig. 6-4 Connector panel/control panel



WARNING!

The effectiveness of this protective measure should be checked by an electrician.

- The earthing resistance should be a maximum of 50Ω.

8 Commissioning

Starting the generator

Requirements The following requirements must be met:

- checked and tested for electrical safety (12Checking the electrical safety)
- there must be fuel in the tank (Figure 6-2: Components in the interior (on the right side))
- An adequate oil level (for this, see the operating and maintenance manual for the engine)
- Turn the fuel cock to the position OWN TANK (Fig. 9-1: Fuel cock / fuelling device)
- adequate supply and removal of air
- a connected and operational starter battery
- device switched off



WARNING!

Operating fluids can burn.

- Prevent leaking of engine oil and diesel.
- 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!

Heat or moisture destroys the device.

- Avoid overheating (sufficient ventilation).
- Avoid moisture.
- Do not operate with the doors open

Starting the generator manually

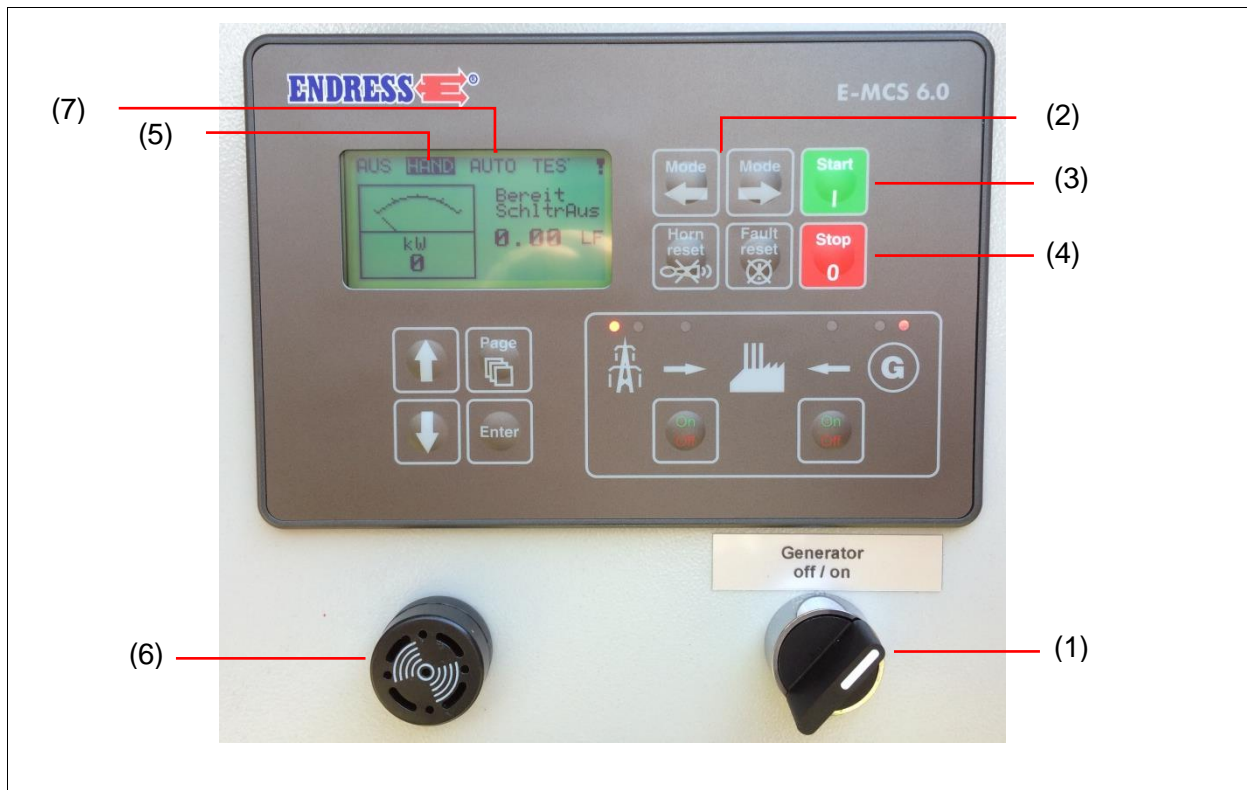


Figure 8-1: Starting the generator manually

- | | |
|---|-------------------------------------|
| (1) Selection switch Alternator off/on | (2) Mode button |
| (3) Start button | (4) Stop button |
| (5) Display of the operating mode manu | (6) Piezo buzzer (acoustic warning) |
| (7) Display of the operating mode auton | |
| cally | |

- START**
1. Move the selection switch (Figure 8-1-(1)) into position.
 2. Press the START button Figure 8-1: Starting the generator manually. The engine is started after a pre-heating phase
 - ✓ The engine starts after the preheating phase.
 - ✓ The engine has started.

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

The generator cannot be started manually in AUTO mode.

NOTE

Switching the generator off

Proceed as follows to shut down the generator.

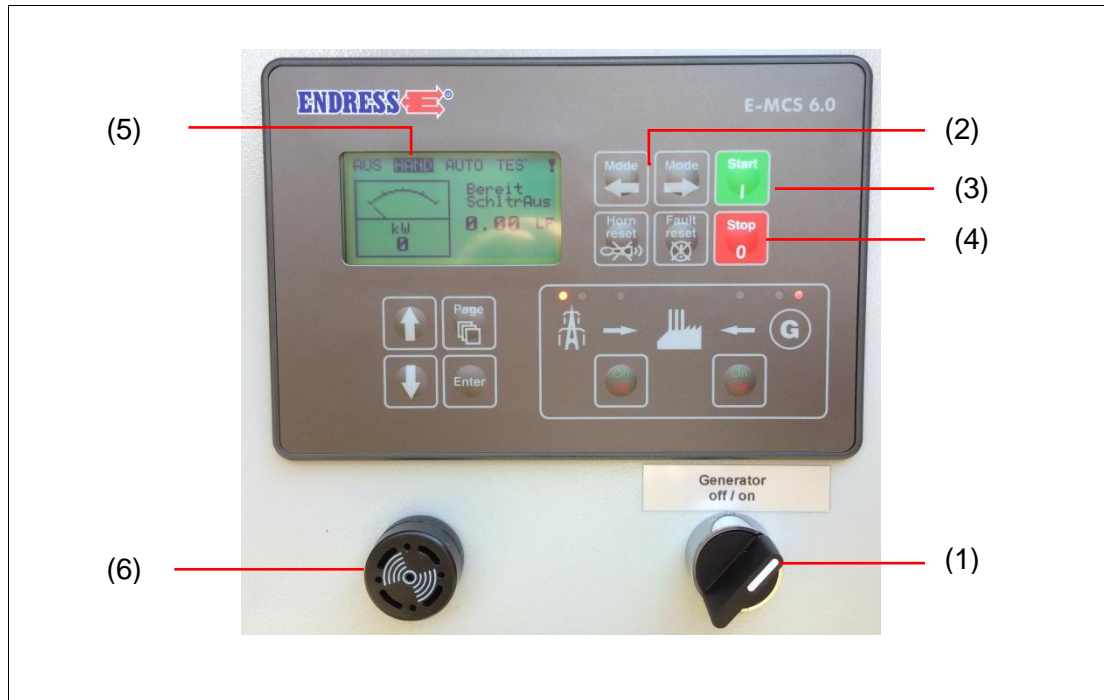


Fig. 8-2: Switching the generator off

- | | |
|--|-------------------------------------|
| (1) Selection switch Alternator off/on | (2) Mode button |
| (3) Start button | (4) Stop button |
| (5) Display of the operating mode manu | (6) Piezo buzzer (acoustic warning) |

- STOP**
1. Switch off or disconnect devices.
 2. Press the STOP button (Fig. 8-2: Switching the generator off; the red LED begins to flash. The engine stops after the cooling run-on period.
 3. Press the STOP button (Fig. 8-2: Switching the generator off) a second time; the engine stops immediately without a cooling run-on period (not recommended).
 4. Selection switch (Figure 8-2: (1)) into the Off position.



WARNING!

We request that you only switch off the device using the EMERGENCY-STOP switch in an emergency.

Connecting up to consumers



WARNING!

Electric shocks cause injury or death.

- Check the functionality of the residual current circuit breaker using the test button

8.1.1.2 You can connect consumers with Schuko or CEE sockets.



Fig. 8-3: Connect consumers over sockets

- | | |
|----------------------------|-------------------------------|
| (1) CEE socket 400V/63A/5p | (2) CEE socket 230V/16A/3p |
| (3) CEE socket 400V/32A/5p | (4) Schuko socket 230V/13A/3p |
| (5) CEE socket 400V/16A/5p | (6) Earthing connection |

NOTE Sockets of the Protection Class IP67 should be used for the CEE sockets. Sockets of the Protection Class IP54 should be used for the Schuko sockets.

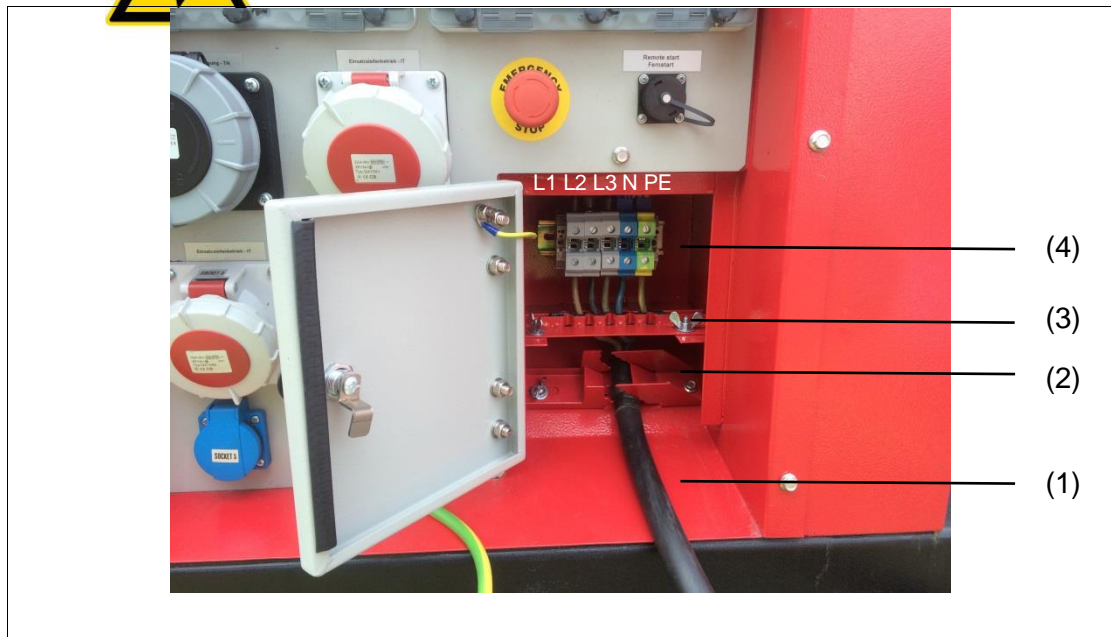
NOTE Only connection lines in the quality H07RN-F or the equivalent should be used.

8.1.1.3 Connect consumers over a terminal strip



WARNING!

Electric shocks cause injury or death.



The connection to the terminal strip may only be undertaken when supervised by an electrician.

Fig. 8-4: Connect consumers over a terminal strip

- | | |
|--------------------------------------|------------------------------------|
| (1) Connection line | (2) Strain relief for outer sheath |
| (3) Fixing for the single conductors | (4) Connection terminals |

NOTE Only connection lines in the quality H07RN-F or the equivalent should be used.

9 Fuel cock / external fuelling

In the course of supplying fuel you can select between the device's own tank and the refuelling device.

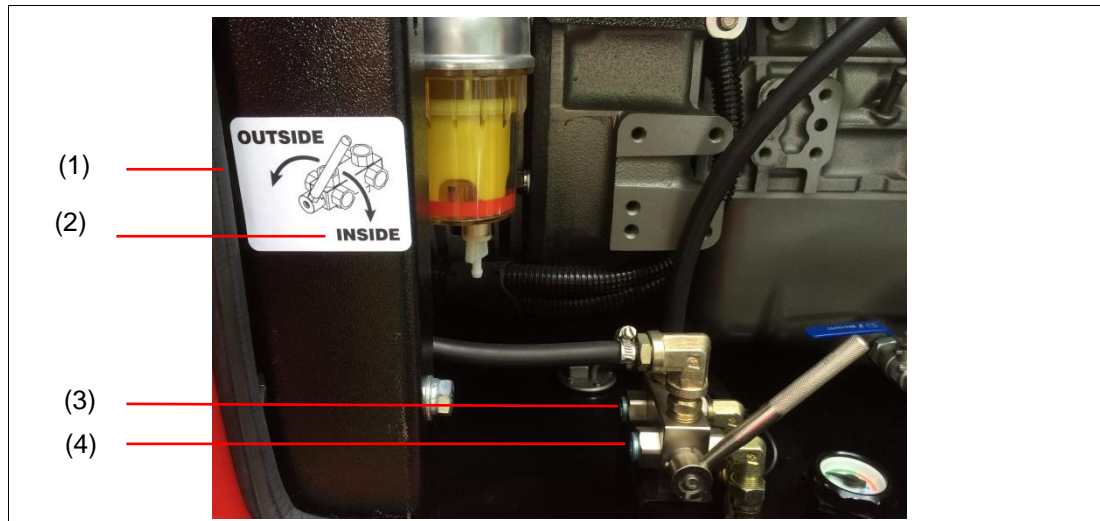


Fig. 9-1: Fuel cock / fuelling device

Switch position	Operation
1	EXTERNAL REFUELLING
2	OWN TANK

Table 9-1: Switching positions for the fuel cock / fuelling device

Establish external fuelling as follows:

1. Move the fuel cock into Position 1.



WARNING!

Using the wrong fuel will destroy the engine.

2. Connect up the return line to the connection (3)
3. Connect up the feed line to the connection (4)



WARNING!

Leaking diesel fuel can contaminate soil and groundwater.

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.

10 Extended functions

Remote start device

The generator can be switched on and off over the remote start socket (Fig. 10-1 Remote start socket). The diesel engine can be started and stopped using a potential-free external contact.

Standard function: Contact assignment 5 and 6

- Contact closed - start engine
- Contact open - stop engine

Requirements The control module E-MCS 6.0 is in "AUTO" mode.(Figure 8-1: Starting the generator manually)

Mains network failure automat.

The generator can be run as as network failure automat in combination with a remote start socket (**Fig. 10-1 Remote start socket**) and the optional accessory changeover contactors E-US 32 -90. The control module E-MCS 6.0 is in "AUTO" mode.(Figure 8-1: Starting the generator manually)

Requirements



If the generator is in Automatic mode, the generator is started automatically if there is a mains network failure. The engine stops after the cooling run-on period as soon as the mains power voltage is being applied again.



Fig. 10-1 Remote start socket

11 Maintaining the generator



Generator maintenance is described in this section.

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

Maintenance plan / maintenance work

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

Only authorised personnel are allowed to carry out maintenance tasks.

Charge battery

Important Only charge the battery with charging devices suitable for the battery type with an automatic charging characteristic.

Replacing the starter battery

1. Switch off the main battery switch (*Figure 11-1: Replacing the battery*)
2. 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.
3. Remove the battery from the battery compartment.

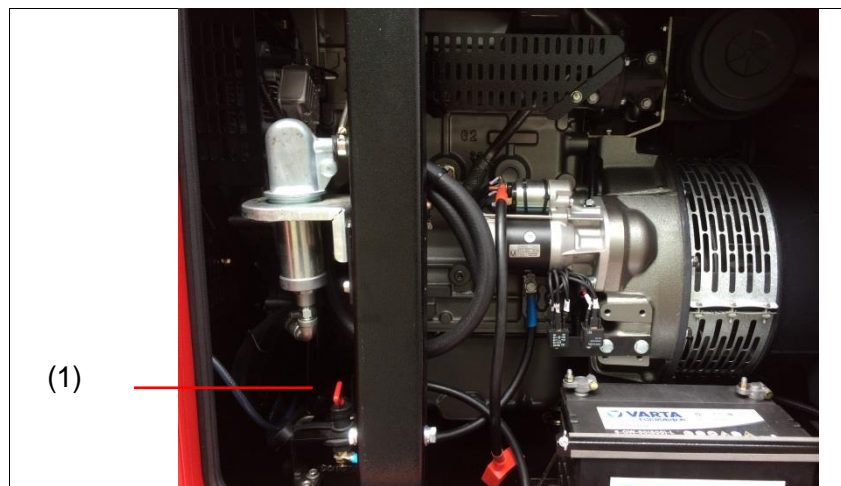


Figure 11-1: Replacing the battery

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



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.

Motor oil

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



WARNING!

Leaking engine oil can contaminate soil and groundwater.

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



WARNING!

Engine oil can be hot — risk of burns.

- Allow motor to cool

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.

12 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 accident prevention regulations.

Observe the guidelines of the DGUV information 203-032 for use of building and assembly locations. This information applies to the regularly repeated checks which must be performed.

13 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 instructions.
	Maintenance of the engine was inadequate.	Follow the engine maintenance instructions.
	The oil pressure monitoring triggers.	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 EMERGENCY-STOP button is pressed and locked in place.	EMERGENCY-STOP button unlocked.
	The battery connecting cables are unclamped.	Clamp on or screw on the battery connecting cables.
Starter battery has no power.	Battery is discharged.	Charge battery.
	Battery is defective.	Exchange battery.

Malfunction	Possible cause	Correction
	Battery terminals are oxidized.	Clean battery terminals and, if necessary, apply terminal grease.
Starter battery is not being charged.	Alternator / charge regulator defective.	Call service staff.
The engine does not rotate.	Engine defective.	Call service staff.
The engine produces white smoke.	Coolant has found its way into the combustion chamber	Call service staff
The engine produces blue smoke	Oil has found its way into the combustion chamber	Call service staff
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.
	The refuelling device's sieve is blocked.	Clean the sieve.
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 generator runs jerkily.	The generator is loaded beyond the nominal output.	Reduce power draw.
The oil pressure is too low.	Too little engine oil in the engine.	Refill engine oil.

Table 13-1: Problems arising during generator operation

14 Technical Specifications



The technical specifications are described in this section.

Table 14-1: Generator technical data

Standard terms of subscription Name	Value					Unit
	20 YW	30 YW	35 YW	45 YW	50 YW	
Type ESE ...	20 YW	30 YW	35 YW	45 YW	50 YW	
Nominal output 400V / 3~ (PRP)	17.9	30.5	30.5	42	44	[kVA]
Nominal output factor	0.8					[cosφ]
Nominal frequency	50					[Hz]
Nominal speed	1500					[min ⁻¹]
Nominal voltage 3~	400					[V]
Nominal voltage 1~	230					[V]
Rated current 3~	25.8	44	44	60.6	63.5	[A]
Sound power level L _{WA}	92	93	93	91	90	[dB(A)]
Sound power level at a distance L _{PA} (7m)	67	68	68	66	65	[dB(A)]
Insulation	Class H					
Engine output	16.9	31.2	32.9	38.3	40.2	[kW]
Tank capacity	200					[l]
Consumption / running time at 100% load of about	3.8 / 53	6.67 / 30		8.33 / 24		[l / h]
Consumption / running time at 75% load of about	3.25 / 62	4.76 / 42		7.14 / 28		[l / h]
Weight (dry weight)	862	960	990	1020	1058	[kg]
Weight incl. base frame, coolant, oil	949	1054	1074	1129	1146	[kg]

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

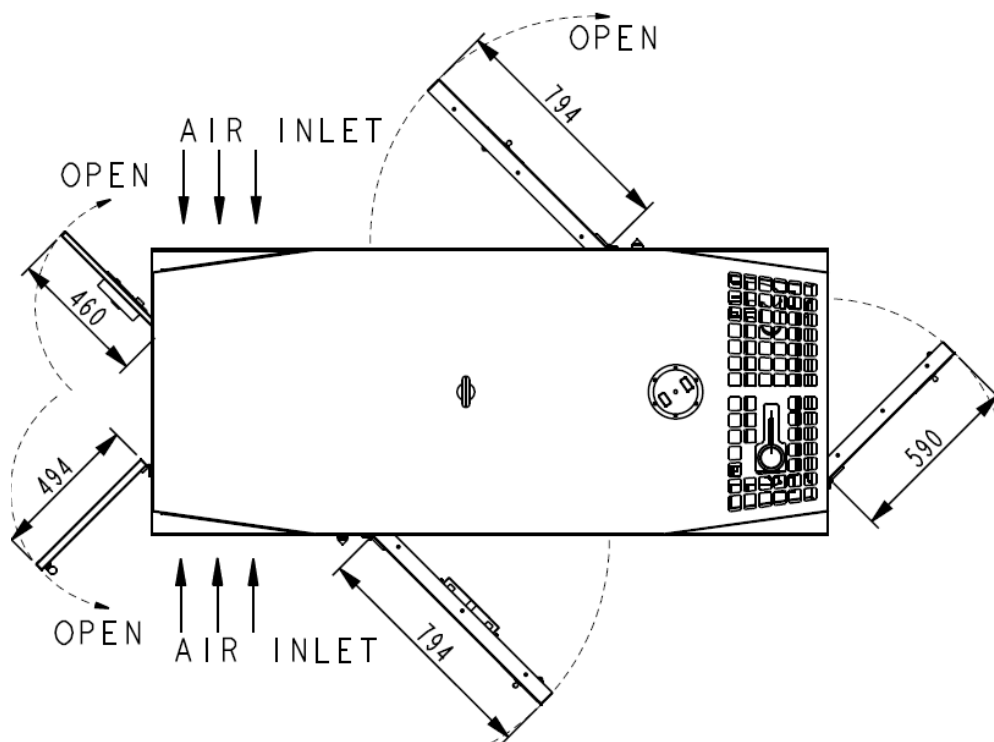
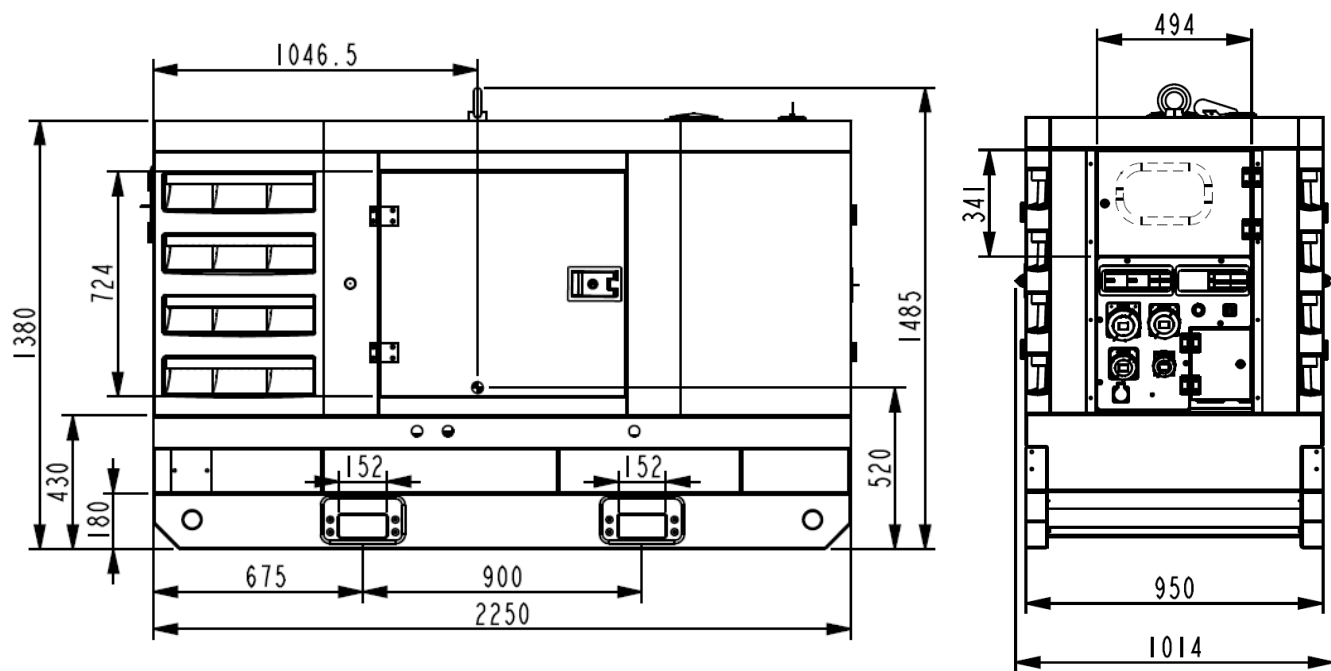
Table 14-2: Ambient conditions for the nominal output

Reduced power

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

Table 14-3: Reduced output of the generator

15 Dimensions



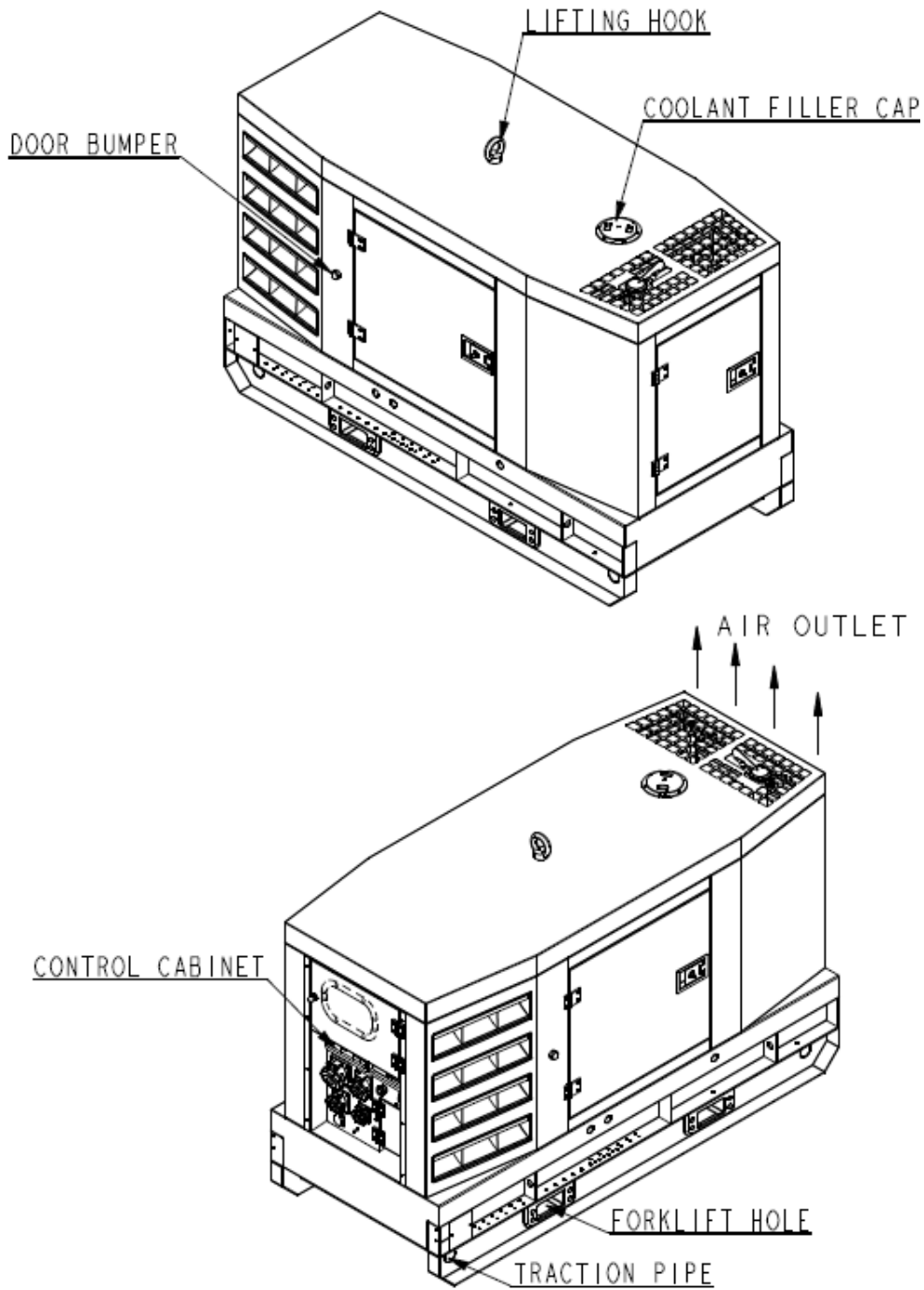


Fig. 15-1 Dimensions 20YW-50YW