



ESE Power Generator

TRANSLATION OF THE ORIGINAL OPERATING MANUAL



ESE 75-250 IW/AS

Article-No.: 339280 - 339287

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Document number / version E136679 / i01

Publication date April 2020

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Notes on printing All descriptions, technical details and illustrations refer to the version of the generator for printing.

We reserve the right to make modifications in terms of ongoing technical development. This operating manual does not include technical modifications that occurred after printing.

The colours in this operating manual do not always comply completely with the actual designs due to technical printing reasons.

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2 About this manual

We would like to explain to you the safe and correct use of your generator in the best possible way through this operating manual. To do this we have oriented ourselves to the new European standard DIN EN 82079-1 for preparing the user manuals.

It is absolutely essential for safe and appropriate use that you read through this manual very carefully and understand it before using the device for the first time.

Your observance of it creates the foundation for,

- avoiding dangers for yourself and others,
- reducing repair costs and downtimes as well as
- increasing the reliability and service life of the generator.

Not only this manual but also the laws, regulations, guidelines, and standards applicable in the country of use must be observed.

This document only describes the safe operation of the generator when used as a complete unit. The following also includes detailed technical operating instructions that are binding with regard to using the device's specific components.

This documentation and also the product described in it are subject to a continuous improvement process. In doing this we ensure that the full product is compliant with the current safety requirements and the current state-of-the-art. The respective most up to date language version of the operating manual and the original operating manual can be found on our website

www.endressparts.com

2.1 Constituent parts of the documentation

Apart from these operating instructions, the following documents are needed to ensure that you have the all of the documentation for your device:

- Operating and maintenance instructions for the engine
- Electric generator's documentation
- Starter battery handling instructions (electric start)
- EU Declaration of Conformity
- Generator's test report



NOTICE!

The complete documentation is an integral part of the device and you must adhere to it.

- ▶ All of the integral parts of the documentation must always be accessible to the operating personnel and they should be kept with the device.

2.2 Using this operating manual

In order to increase the legibility, comprehensibility and transparency of the document, certain information is highlighted or identified according a uniform system. The following particularly belong in this category:

signs warning about dangers to life and limb

Safety and warning notices are necessary at all locations where there is potential danger from the device which cannot be eliminated by design or operational measures. We restricted ourselves to the permitted minimum in order to place the required distinctive warning notices at the correct point in time without impairing the legibility and comprehensibility of the operating manual. This is according to the regulations contained in the international standard DIN ISO 3864 describes a fixed rule for all safety and warning notices, as shown in the following example.

Examples:

Signal Word

 **DANGER!**

Hazard Type

Electrical voltage

Hazard Consequence

Risk of suffering potentially deadly electrocution by touching live parts

► Hazard Avoidance

- Only use undamaged connecting lines
- Avoid all damp / wetness when connecting consumers
- Never operate the power generator with an opened control panel

The standard mentioned classifies the safety risks according to different risk potentials. To understand and avoid dangers to one's health and even life, please be sure to read the explanations given in Chapter 4.1 .

Safety symbols



These warning notices are usually used in a safety symbol which also emphasizes the type of danger; see next example. A list of the safety symbols used in this operating manual can be found in Chapter 3.3 . The safety symbols never stand alone.

Notices on avoidance of damage to the device

According to DIN ISO 3864, notices which warn against false operation and possible damage to the device or to the equipment used should be clearly distinguishable from previously named warning notices in as far there is no danger to health. An example of such a notice can be seen here:

Signal Word

NOTICE!

Type and Consequence of Improper Use

Use of wrong or outdated fuel damages or destroys the engine.

► Intended Use

- Only use released diesel fuel.
- Observe the shelf life of the fuel according to the supplier.
- Observe the Operating manual from the engine manufacturer

Symbols and formattings in the text

In order to increase the legibility, comprehensibility and transparency of the document, various information and activities are awarded uniformly repeating bullets or formattings. The following example shows presentation of a sequence of actions with established work steps:

Example:

✓ Prerequisites which must be fulfilled before starting any sequence of actions

1. Action steps according to a fixed sequence.
2. The action steps must be fully completed.
3. The sequence must be observed.

Results of the action which should be achieved after performing the sequence of action.



Additional notices for operation or for function of a unit are marked with the adjacent symbol.

**NOTICE!**

The adjacent symbol is situated anywhere where the supplier documentation must be read and observed and refers to,

- ▶ appropriate information,
- ▶ tasks or
- ▶ action steps.

References to details and components in figures are made with blue bordered position numbers in the text such as the example of CE signs on the type plate demonstrates, see Fig. 3-3 .

3 Product identification

3.1 Welcome to ENDRESS!

We are pleased that you have made the decision to purchase a ENDRESS power generator. You have purchased a high-performance product into which we have embodied decades of our experience and have integrated many functions oriented on daily use. Through careful selection of high quality components and materials in combination with the proverbial Swabian engineering performance you have in your possession a device which will operate reliably for many years, also under the hardest of operating conditions.

3.2 Your product

Customer service

In order to precisely identify your device there is a type plate attached to the Generators (see Fig. 3-3), which includes details about the device designation and "S/N" serial number. If you have any questions about device details, functions or notices concerning operation, please contact our

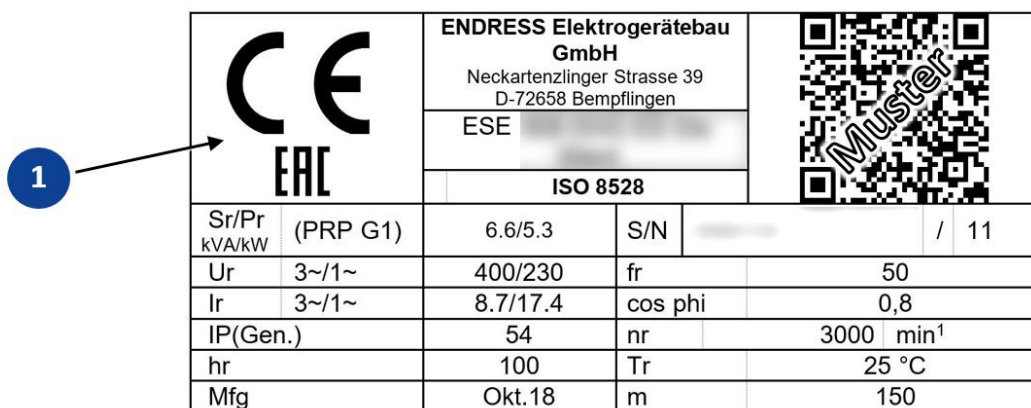
Customer service: Tel. +52 (442)192.9100

Email: energy.latam@prettl.com

You will find competent contact persons there, also concerning original spare parts and wear parts. (see also Chapter 13)

Type plate

The type plate shown below is a representation of the adhesive label placed on the device. Please be prepared, when contacting our service team, to assist us in exactly identifying your device. Refer to your generator's operating instructions for further information about finding the type plate.





| | | | | | |
|---|----------|---|---------|---|-----------------------|
|  | | ENDRESS Elektrogerätebau GmbH Neckartenzlinger Strasse 39 D-72658 Bempflingen | |  | |
| ESE | | ISO 8528 | | | |
| Sr/Pr kVA/kW | (PRP G1) | 6.6/5.3 | S/N | | / 11 |
| Ur | 3~/1~ | 400/230 | fr | | 50 |
| Ir | 3~/1~ | 8.7/17.4 | cos phi | | 0,8 |
| IP(Gen.) | | 54 | nr | | 3000 min ¹ |
| hr | | 100 | Tr | | 25 °C |
| Mfg | | Okt.18 | m | | 150 |

Fig. 3-1 Example of a type plate

3.2.1 A device description and intended use

Your power generator generates electrical energy for the "direct supply" mode as part of a mains backup operation for supplying electricity to a mobile distribution system. This enables mobile use of commercially available electrical devices with single-phase 127V AC / 60Hz or three-phase 220V AC / 60Hz (depending on the equipment being used).

Your power generator has been designed for manual or automatic operation (remote start) with one or more electrical consumers. To protect against electric shock (i.e. current flowing through your body), automatic switching off according

to DIN VDE 0100-551: 2017-02 is used as the protective separation measure. The protective conductor system from the attached consumers will take over the earthing function. The terminal strip (Fig. 6-4) is used for connecting up a suitable earth (e.g. an earthing stake). Proper is needed and it must be implemented by a qualified electrician.

Your generator consists of an AC generator that is driven by a combustion engine that is bolted onto it. This unit is mounted elastically inside a closed and sound-insulated housing and vibration dampers are used to ensure low vibrations. The current is taken from the terminal strips through measures implemented by an electrician.

The unit generates three-phase AC (three-phase current) with a nominal voltage of 220V at 60Hz. More detailed technical data can be found in Chapter 12 . An integrated voltage regulator ensures that the stability of the generated voltage is within the nominal rotational speed range. The current is drawn off through the connection terminal.

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

The power generator must never be used for direct feeding into other power distribution systems (e.g. public power supply) or be used with other power generation systems (e.g. other power generators).

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

The generator is not to be used in environments where there is a risk of fire.

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 is forbidden misuse outside the legally defined limits of liability of the manufacturer.

3.2.2 Foreseeable misuse

Apart from the description of appropriate use, the lawmaker also requires concrete references to the results of “reasonably foreseeable misuse“. In a case of incorrect use or inappropriate handling of the generator the manufacturer's EC Declaration of Conformity, and automatically thereby also the operating licence, are nullified. For products with a manufacturer's warranty the manufacturer will reject any claims made under warranty for damages which were caused by misuse and its direct as well as indirect consequences.

As not authorised Misuse is particularly the case when:

- operation of the generator takes place without valid checks for
 - electrical safety
 - checking that the prescribed servicing and maintenance work has been done
- operation of the generator takes place without the protective equipment installed by the manufacturer
- constructional or electrical modifications of the generator were undertaken
- use of the generator by inadequately instructed operating personnel

Furthermore at all costs avoid the following Misuses:

- Never refuel the generator's own tank when the engine is running. The vibrations and strong exhaust streams during operation can lead to fuel spillage. This leads to an increased risk of explosion and fire and therefore danger to operating personnel, the environment and the device.

- Never refuel the generator's own tank when it is hot. Overflowing fuel and outflowing fuel vapours can ignite on hot parts of the device.
- The generator is never to be connected up to other energy distribution systems (e.g. public power supply) or to other energy generation systems (e.g. other generators, solar plant, etc.). To start with this is usually not permitted by the energy supply company. In both cases this will inevitably lead to severe damage and possibly also severe injury.
- Never place the generator in explosion-prone environments. The individual components of the generator are not designed EX-protected.
- Never operate the generator in rooms, narrow pits or vehicles. The combustion exhaust gases contain poisonous substances including the odourless but deadly gas carbon monoxide (CO) which, when breathed in, can accumulate in cases of poor air circulation to reach deadly concentrations. Also a lack of fresh air circulation leads to overheating and possible damage to the generator right through to destruction.
- For the same reasons of risk, never divert exhaust gases for the purposes of heating rooms or vehicles.
- Never clean the generator with the aid of a high pressure cleaner or a strong jet of water.
- Never allow water to find its way inside the generator. Never pour water over the generator and never clean it using a water hose or a high pressure cleaner.
- Never operate the generator in any area where it could be flooded by high water or any other events. The Protection Class of the device (see Chapter 12) allows operation for spray water, however not in the case of floods.

3.3 included in delivery

Apart from the technical documentation mentioned in Chapter 2.1 the following articles are Scope of delivery of your generator:



Fig. 3-2 included in delivery

| Item | Name |
|------------------|------------------------|
| ① | Supplier documentation |
| ② | Tool kit |
| ③ | Coolant overflow tank |
| (no image shown) | operating manual |

3.4 Labels on the generator

An important part of the operating manual is in the form of labelling and notices on your generator. These labels must not be removed and they must always be maintained in a legible condition. New labels can be ordered from our customer service team if the originals become damaged. The following figures and tables show the stipulated attachment point and a short explanation about labels.

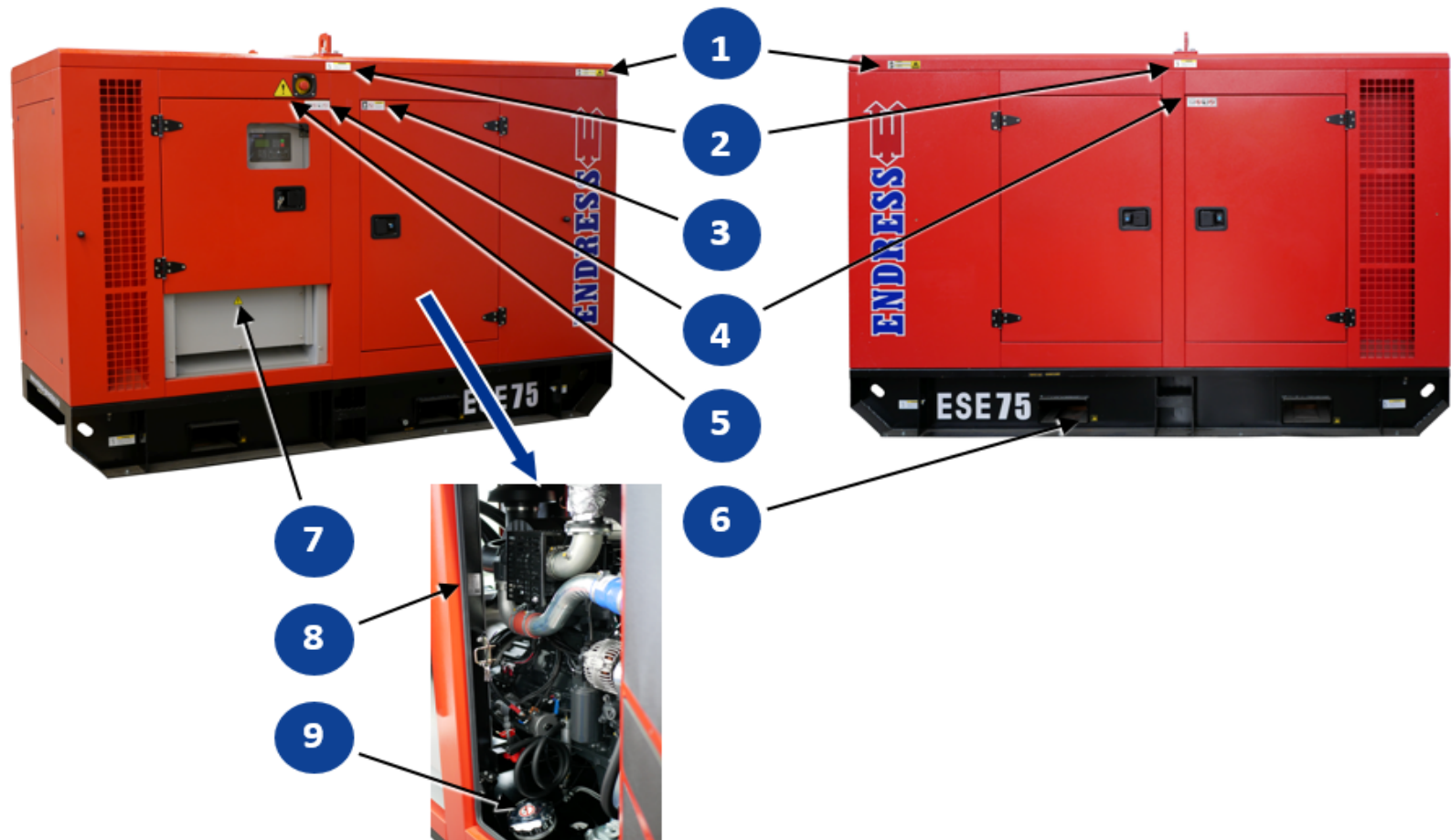





Fig. 3-3 Labels on the device

| Item | Label | Significance |
|------|-------|--|
| 1 | | <p>Warning</p> <p>Mortal danger from toxic combustion gases when the engine is running</p> <p>Risk of burns</p> <p>Hot surfaces</p> |
| 2 | | <p>Note</p> <p>Lift the unit only from here (crane loading eyes)</p> |
| 3 | | <p>Prohibition signs</p> <p>Smoking and open flames are prohibited</p> <p>Note</p> <p>Fuel quality</p> |
| 4 | | <p>Read the operating manual before starting up</p> <p>Smoking and open flames are prohibited</p> <p>Do not operate the power generator if a risk of fire exists</p> <p>You are forbidden to make any changes to the power generator</p> |
| 5 | | <p>Warning</p> <p>Warning about a general hazard</p> |
| 6 | | <p>Note</p> <p>Forklift loading pockets (forklift pockets)</p> |

| Item | Label | Significance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|--|--|------------------|--|--|------------------|--|---------|--|-----------------------------------|---------|-----|--------|------|--|--|--|-----------------|-------|-----------|------------------|----|--|--|--|-----------------|----|------|---------|-----|--|--|--|-----------|----|--|----|-----------------------|--|--|--|------------------|-----|--|------------------|--|--|--|--|-----|--------|--|-----------------|------|--|--|--|-------------------|
| 7 |  | <p>Warning signs Dangerous voltage For electricians only</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 |  <table border="1" data-bbox="564 613 1034 833"> <tr> <td colspan="2">EAC</td> <td colspan="2">ENDRESS Elektrogerätebau GmbH Neckartenzinger Strasse 39 D-72658 Bempflingen</td> <td colspan="2">ESE 75 IWAS 60Hz</td> <td colspan="2">QR Code</td> </tr> <tr> <td>Sr/Pr <small>(2020/01)</small></td> <td>88/54.4</td> <td>S/N</td> <td>339280</td> <td colspan="2">/ 10</td> <td colspan="2"></td> </tr> <tr> <td>Ur_n</td> <td>3~/1~</td> <td>220V/127V</td> <td>Fr_{nd}</td> <td colspan="2">60</td> <td colspan="2"></td> </tr> <tr> <td>In_n</td> <td>3~</td> <td>98.2</td> <td>cos phi</td> <td colspan="2">0.8</td> <td colspan="2"></td> </tr> <tr> <td>IP (Gen.)</td> <td colspan="2">23</td> <td>nr</td> <td colspan="2">1800 min¹</td> <td colspan="2"></td> </tr> <tr> <td>hr_{nd}</td> <td colspan="2">100</td> <td>Tr_{nd}</td> <td colspan="2"></td> <td colspan="2"></td> </tr> <tr> <td>Mfg</td> <td colspan="2">Mrz 20</td> <td>m_{eg}</td> <td colspan="2">1360</td> <td colspan="2"></td> </tr> </table> | EAC | | ENDRESS Elektrogerätebau GmbH Neckartenzinger Strasse 39 D-72658 Bempflingen | | ESE 75 IWAS 60Hz | | QR Code | | Sr/Pr <small>(2020/01)</small> | 88/54.4 | S/N | 339280 | / 10 | | | | Ur _n | 3~/1~ | 220V/127V | Fr _{nd} | 60 | | | | In _n | 3~ | 98.2 | cos phi | 0.8 | | | | IP (Gen.) | 23 | | nr | 1800 min ¹ | | | | hr _{nd} | 100 | | Tr _{nd} | | | | | Mfg | Mrz 20 | | m _{eg} | 1360 | | | | <p>Type plate</p> |
| EAC | | ENDRESS Elektrogerätebau GmbH Neckartenzinger Strasse 39 D-72658 Bempflingen | | ESE 75 IWAS 60Hz | | QR Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sr/Pr <small>(2020/01)</small> | 88/54.4 | S/N | 339280 | / 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ur _n | 3~/1~ | 220V/127V | Fr _{nd} | 60 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| In _n | 3~ | 98.2 | cos phi | 0.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IP (Gen.) | 23 | | nr | 1800 min ¹ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| hr _{nd} | 100 | | Tr _{nd} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mfg | Mrz 20 | | m _{eg} | 1360 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 |  | <p>Prohibition signs No naked flames</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Tab. 3-1 Labels on the device

4 For your safety

The following chapter describes basic Safety instructions for safe operation of your generator. Your device is a very high-performance electrical machine which is potentially dangerous when operated if it has not been installed, commissioned, used, serviced and repaired according to the operating manual. If necessary, the operating manual will also include different supplements that depend on the country of use, in addition to the present one.

Operation, use, servicing as well as any work with or on the generator is therefore only permitted by such persons who have read this chapter and have put its provisions into practice!

Concrete warning notices can also be found regarding basic safety instructions further on in this operating manual. These are always placed in an explanatory text immediately before the description of work steps which can be dangerous if the warning notice is not observed. Read the following sections for correct and rapid understanding of these safety and warning notices. They describe their systematic structure as well as the meaning of markings and symbols.

4.1 Safety symbols

The safety symbol indicates graphically that a source of danger exists. We use the internationally valid safety symbols from ISO 7010 for rapid and unique classification of the respective dangerous situation. In the following there is a description of the warning symbols used in this operating manual with an explanation about the respective dangerous situations.



Warning of a general hazard

This warning symbol indicates activities where several causes can lead to risks. The concrete danger must be respectively more clearly specified by further notices.



Warning of a dangerous electrical voltage

This warning symbol indicates activities where the danger of electric shock exists, possibly with lethal consequences.



Warning of potentially explosive materials

This warning symbol indicates activities where the danger of an explosion exists, possibly with lethal consequences.



Warning of toxic substances

This warning symbol indicates activities where a risk of poisoning exists, possibly with lethal consequences.

**Warning of corrosive substances**

This warning symbol indicates activities where a risk of chemical burns to the environment as well as people exists, possibly with lethal consequences.

**Warning of environmentally damaging substances**

This warning symbol indicates activities where a risk of contaminating the environment exists, 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.

**Warning of a suspended load**

This warning symbol indicates activities where the danger of falling loads exists, possibly with lethal consequences.

**Warning of automatically starting machines**

This warning symbol indicates activities where a danger of being injured by self-starting machines exists, possibly with lethal consequences.

4.2 General safety instructions

ENDRESS generators are designed to operate electrical equipment with appropriate power output requirements. Other uses can lead to severe injuries to operating personnel as well as persons nearby. There is also increased risk of damaging the generator as well as further damage to equipment.



DANGER!

Mortal danger due to an electric shock if live parts are touched.

- ▶ Never operate the device if it is in a damaged condition.
- ▶ Never operate the electrical consumers and connecting cable (power consuming equipment) in a damaged condition.
- ▶ Never feed directly into existing networks that are already connected to a power source (e.g. power supplier, solar plant, etc.).
- ▶ Never operate the device with wet hands.

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

The generator must not be modified in any way, also not temporarily. This can lead to a mortal risk to operating and deployed personnel and damage to the generator as well as the consumers being used.

Operating company and Operating personnel may only use the generator according to regulations contained in the whole technical documentation (hereinafter referred to as appropriate use).

Every instance of inappropriate use as well as 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. In return all claims for damages and claims made under warranty to ENDRESS-Elektrogerätebau GmbH which are associated with misuse are null and void.

4.3 Residual risks

As a manufacturer of EU-compliant machines, ENDRESS make great efforts to create designs which already eliminate possible risk potentials at the design stage. If this is not possible without significantly impairing the functions of a device, we implement suitable protective measures protect the user from injury.

If there are still some residual risks associated with working with the device, we clearly advise the user about these sources of danger, possible consequences as well as measures to avoid such dangers.

The residual dangers were analyzed and Residual dangers identified during the development and design of your Generators by means of a danger analysis according to DIN EN 60204, DIN EN ISO 12100 and DIN EN ISO 8528-13.

References to general sources of danger can be found in chapters 4 and 5 . From Chapter 6 one can find concrete warning notices placed before every action step which represents a residual risk.

The exact structure and contents of warning notices are defined in the ISO 3864 series of standards and follow an established identification marking required to immediately be able to estimate the degree of the respective

danger. Exactly impress upon yourself the identification marking of the four different danger levels in order to be able to reliably assess the dangers associated with the individual operating states and action steps when reading the operating manual.

 DANGER!

DANGER describes a danger which represents a high level of risk, which can lead to death or severe injuries, when not avoided.

- ▶ The individual points provide instructions and
- ▶ notices as aids to avoid the danger
- ▶ or to reduce the risk to an acceptable level.

 WARNING!

WARNING describes a danger which represents a medium level of risk, which can lead to death or severe injuries, when not avoided.

- ▶ The individual points provide instructions and
- ▶ notices as aids to avoid the danger
- ▶ or to reduce the risk to an acceptable level.

 CAUTION!

CAUTION describes a danger which represents a low level of risk, which can lead to minor or medium level injuries when not avoided.

- ▶ The individual points provide instructions and
- ▶ notices as aids to avoid the danger
- ▶ or to reduce the risk to an acceptable level.

NOTICE!

ATTENTION! describes a situation or action that might result in damage to equipment and/or malfunctions if it is not prevented.

- ▶ The individual points provide instructions and notices
- ▶ as an aid to avoid or prevent damage to equipment.

**⚠ DANGER!**

Mortal danger due to an electric shock if live parts are touched.

- ▶ Never operate the device if it is in a damaged condition.
- ▶ Never operate the electrical consumers and connecting cable (power consuming equipment) in a damaged condition.
- ▶ Never feed directly into existing networks that are already connected to a power source (e.g. power supplier, solar plant, etc.).
- ▶ Never operate the device with wet hands.

**⚠ DANGER!**

Engine exhaust gases contain poisonous and partially invisible gases such as carbon monoxide (CO) and carbon dioxide (CO₂).

Risk of death due to poisoning or asphyxiation.

- ▶ Ensure that there is good ventilation during the whole period of operation.
- ▶ Only operate the generator in the open.
- ▶ Never direct the exhaust gases into rooms or pits.

**⚠ DANGER!**

Danger of severe or mortal injuries being incurred from falling loads.

- ▶ Never stand under or close to a suspended load, also not to provide assistance.
- ▶ Ensure that there is no person in the area of swivel of the lifting device.
- ▶ Use all suitable measures to prevent the suspended load from swaying.

**⚠ DANGER!**

Leaking engine oil and fuel can burn or explode.

A risk of suffering severe even deadly burns.

- ▶ Prevent engine oil or fuel from leaking out.
- ▶ Remove leaked operating fluids immediately and appropriately.
- ▶ Never use an additional start aid.
- ▶ Smoking, naked flames and sparks are forbidden.

**⚠ DANGER!**

Hot parts can ignite flammable and explosive materials.

A risk of suffering severe even deadly burns.

- ▶ Never operate the generator in the vicinity of combustible or flammable materials.
- ▶ Never operate the generator in an environment prone to an explosion.



WARNING!

There is a risk of explosion and fire in the case of inappropriate handling and spark development when working with the battery.

Danger from spraying sulphuric acid. Danger of suffering severe even deadly burns and chemical burns. Danger of being blinded.



- ▶ Never lay electrically conductive parts on the starter battery.
- ▶ 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.
- ▶ Wear acid-resistant protective clothing.



WARNING!

Escaping corrosive acid fumes or sulphuric acid during and after the charging process. A risk of suffering severe or even deadly burns.

- ▶ Only work with acid-resistant protective equipment.
- ▶ Clean surfaces covered in acid immediately using adequate amounts of water.
- ▶ Only charge the starter battery in a well ventilated environment.



CAUTION!

Certain surfaces on the device can get very hot whilst it is running.

Risk of burns

- ▶ Never touch any engine parts (in particular the exhaust system) for a few minutes after ceasing operation.
- ▶ Always leave hot engine parts to cool down before touching them.



CAUTION!

A high device weight. Risk of crushing from improper handling during operation or transport.



- ▶ Only lift the generator with the aid of all handles provided or by using a suitable hoist.
- ▶ During transport on vehicles, ensure that there is the prescribed load securing in place.
- ▶ With it in a raised condition, never come close to or stand under the generator.



NOTICE!

Leaking engine oil and operating fluids can contaminate the soil and groundwater.

- ▶ Ensure that the generator is transported horizontally and mounted.
- ▶ Make all efforts, at all costs, to prevent escaping of operating fluids.
- ▶ Dispose of contaminated soil immediately and according to regulations.



NOTICE!

Use of wrong or outdated fuel damages or destroys the engine.

- ▶ Only use the fuel displayed on the sign (Fig. 3-3).
- ▶ Observe the possibly enclosed documentation for the fuel release of the engine manufacturer
- ▶ Observe the shelf life of the fuel according to the supplier.
- ▶ Observe the engine operating manual.



NOTICE!

Excessive heat or moisture can destroy the device.

- ▶ Always ensure that there is a good supply of air and heat removal.
- ▶ Never operate the generator in rooms or narrow pits.
- ▶ Never clean the device with the aid of a strong jet of water or high pressure cleaner.
- ▶ Never allow water to find its way inside the generator.

4.4 Authorised operating personnel – qualifications and obligations

Your Generators is a complex machine, the operation and maintenance of which requires exact knowledge of its functions and danger potentials. Therefore any work with or on the device, of any kind, may only be performed by authorised and instructed operating personnel.

Quite apart from the authorisation which the operating company of the device must issue, only such persons may operate or service the device who fulfil the following criteria. They are designated in this operating manual as operating personnel.

The authorised operating personnel must:

- be of age.
- be trained in First Aid and be able to provide it.
- be familiar with the accident prevention regulations and safety instructions relevant to the Generators and be able to apply them.
- have read Chapter 4 , have understood the contents and are able to use and implement them in practice.
- be trained and instructed according to the rules of conduct in the case of malfunctions.
- have the physical and mental abilities to carry out their responsibilities, tasks, and activities on the Generators.
- be trained and instructed in their responsibilities, tasks and activities on the Generators.
- have understood the entire technical documentation concerning their responsibilities, tasks and activities on the Generators and be able to implement these in practice.

4.5 Danger zones and work areas

In order to be able to consider all of a machine's safety aspects and to comply with the safety and health protection requirements of the applicable standards and EU directives, we have assessed the use of your Generators in all of the phases that it will go through during its product service life (product life cycle). The following zones were defined on the Generators for this purpose: The danger zones and work places (work areas) around the generator are determined by the activities to be undertaken within the various phases in individual life cycles:

- **Working zone:** In this zone on and around the Generators (approx. 1 metre radius) the trained operating personnel (see Chapter 4.4) may operate and inspect the device in compliance with all of the safety and operating instructions given in the technical documentation. All other people (especially minors and people with disabilities) must remain outside this working zone.
- **Danger zone:** This zone must be kept free of all personnel during all phases of use and service life of the device. Any work in this zone is only to be undertaken by specially trained specialists if it is essential for the fulfilling of the task and if all of the protective equipment (PPE) needed is used. You must always comply with the following limits:

| Product's service life phase | Danger zone |
|------------------------------|---|
| Transport and installation | within a radius of 1m around or below the device |
| Operation | within the outer limits of the device |
| Service and maintenance | Within the outer limits of the device when switched on Generators |

Tab. 4-1 Danger zone on Generators

5 Checking the electrical safety

Checking of electrical safety requires different measures to be taken which may only be undertaken by respectively authorised personnel. The respective valid versions of the appropriate and relevant standards must be adhered to.

In particular you must never use defective or damaged consumers, cable connections or plug connectors, etc., (power consuming equipment). Their correct conditions must be checked at regular intervals (see Tab. 5-1)

Earthing

Your power generator has been designed for manual or automatic operation (remote start) with one or more electrical consumers. To protect against electric shock (i.e. current flowing through your body), automatic switching off according to DIN VDE 0100-551: 2017-02 is used as the protective separation measure. The protective conductor system from the attached consumers will take over the earthing function. The terminal strip (Fig. 6-4) is used for connecting up a suitable earth (e.g. an earthing stake). Proper is needed and it must be implemented by a qualified electrician.

We strongly recommend that you also comply with the legal requirements for other applications.



DANGER!

There will be no RCD personal protection during operation if the earthing of the Generators is faulty.

Mortal danger from electrocution

- ▶ The use of an RCD (FI circuit breaker) for personal protection requires proper earthing of the Generators and this must be undertaken by a qualified electrician before the initial commissioning.
- ▶ The effectiveness of this protective measure should be regularly checked by an electrician.
- ▶ Check the personal protection according to the check intervals given in Tab. 5-1 .

In addition to the details given above, the electrical safety of the generator is to be checked by a qualified electrician at regular intervals. The periods between testing must be established in such a way that the generator and all work equipment to be connected can, according to the general status of knowledge, operational experiences or on the basis of specific evidence, be safe to use in the period between the two inspections.



NOTICE!

The operator is responsible for defining and adhering to the test intervals . Above all one must ensure observance of the respectively valid national regulations.

This responsibility also extends to any additional equipment installed in conjunction with the device.

We recommend the following checks and deadlines as general guideline values:

| When | What / how | Who |
|--|--|-----------------------|
| First start-up at the operating location | <ul style="list-style-type: none"> • See Chapter 7 and also abide by the operating manual provided by the engine manufacturer • Visual inspection for externally visible defects such as transport damage. | Operating personnel |
| Start-up on a daily basis | <ul style="list-style-type: none"> • See Chapter 7.3 and also abide by the operating manual provided by the engine manufacturer • Visual inspection for externally visible defects (such as damaged insulation, connectors, cable; leaks, noise) • If the power generator is fitted with insulation monitoring and/or an RCD, then the operating personnel must run protective device function tests every working day. The operating personnel must be trained to do this. | Operating personnel |
| Retest at the latest once every six months | <ul style="list-style-type: none"> • According to BGI/GUV-I 5090 "Repeated testing of mobile electrical equipment") • Sample test report according to DGUV information 203-032 *) | Qualified electrician |
| *) Download as a text file under → www.dguv.de Webcode: d138299 | | |

Tab. 5-1 Recommended test intervals

6 Description of the device

6.1 Power generator view

The following section provides an overview of the name and location of the most important components in your Generators. It is important that you become familiar with them in order to understand the functions and operating steps explained below and to be able to implement them safely. Severe or deadly personal injuries can result and/or damage to the generator as well the attached power consuming equipment if these instructions are ignored.

In order to be in a position to clearly re-find named operating controls and components in the following descriptions and instructions, the individual views of the generator are designated throughout in a way which can be taken from the following figure.

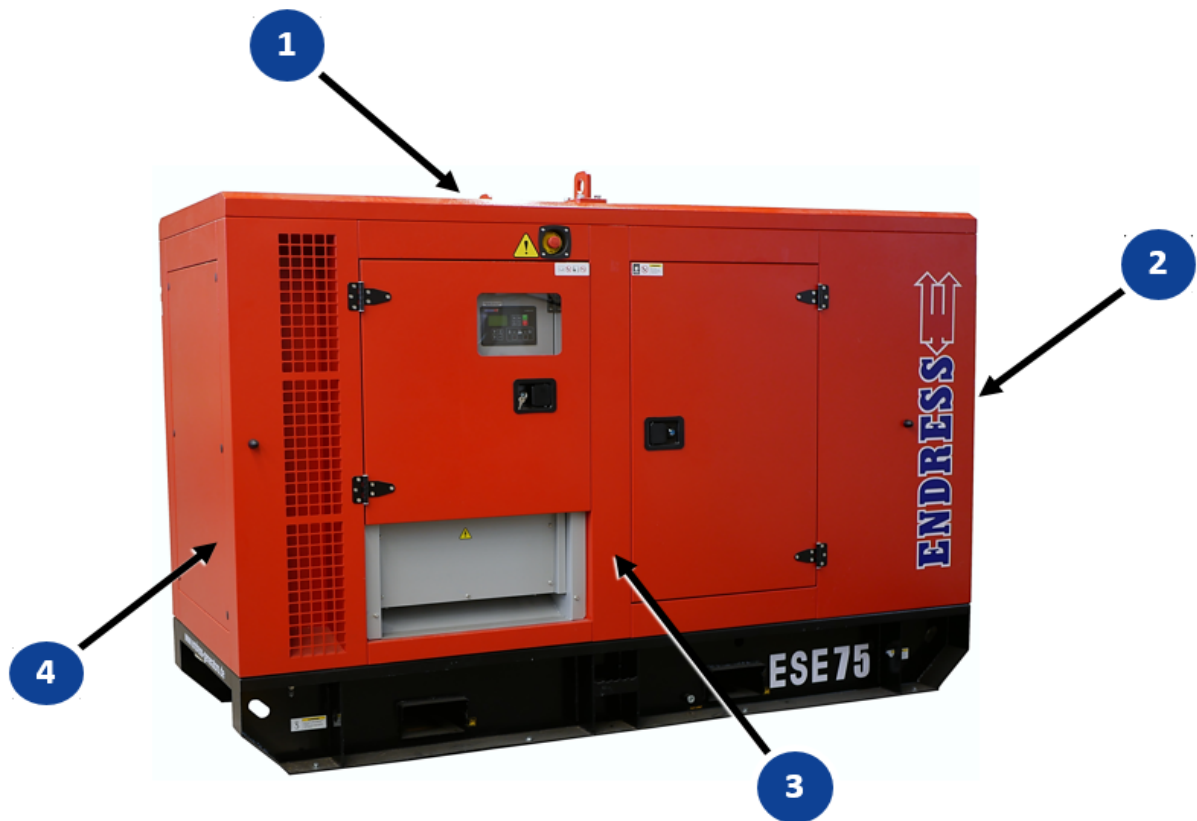


Fig. 6-1 Views of the generator

| | | | |
|----------|------------------|----------|--------------|
| 1 | Maintenance page | 2 | Exhaust side |
| 3 | Control side | 4 | Engine side |

6.2 Components on the connecting side

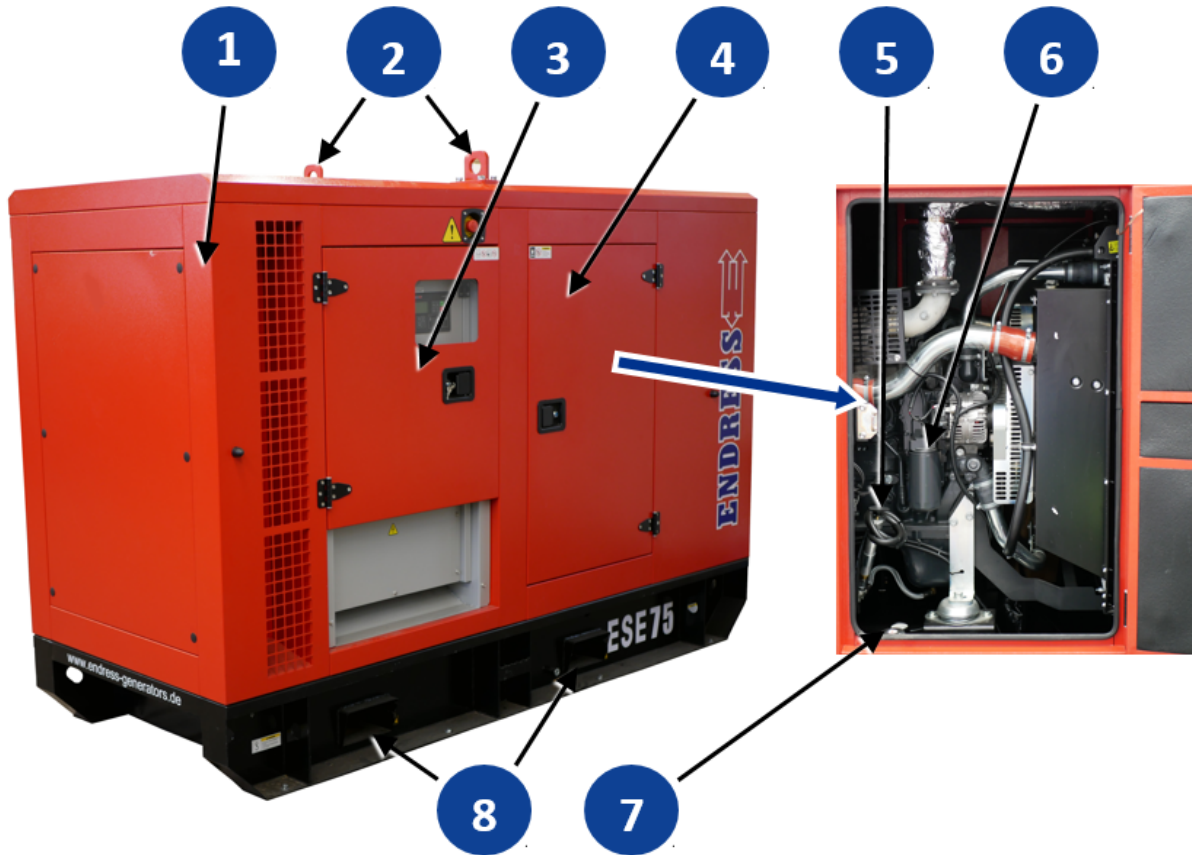


Fig. 6-2 Components on the exhaust and operating side

| | | | |
|---|------------------------------|---|-----------------------------------|
| 1 | Generator's maintenance flap | 2 | Crane loading lug |
| 3 | Control panel | 4 | Engine's maintenance access point |
| 5 | Oil drain pump | 6 | Oil filter |
| 7 | Fuel tank's filling opening | 8 | Forklift pockets |

6.3 Components on the maintenance side

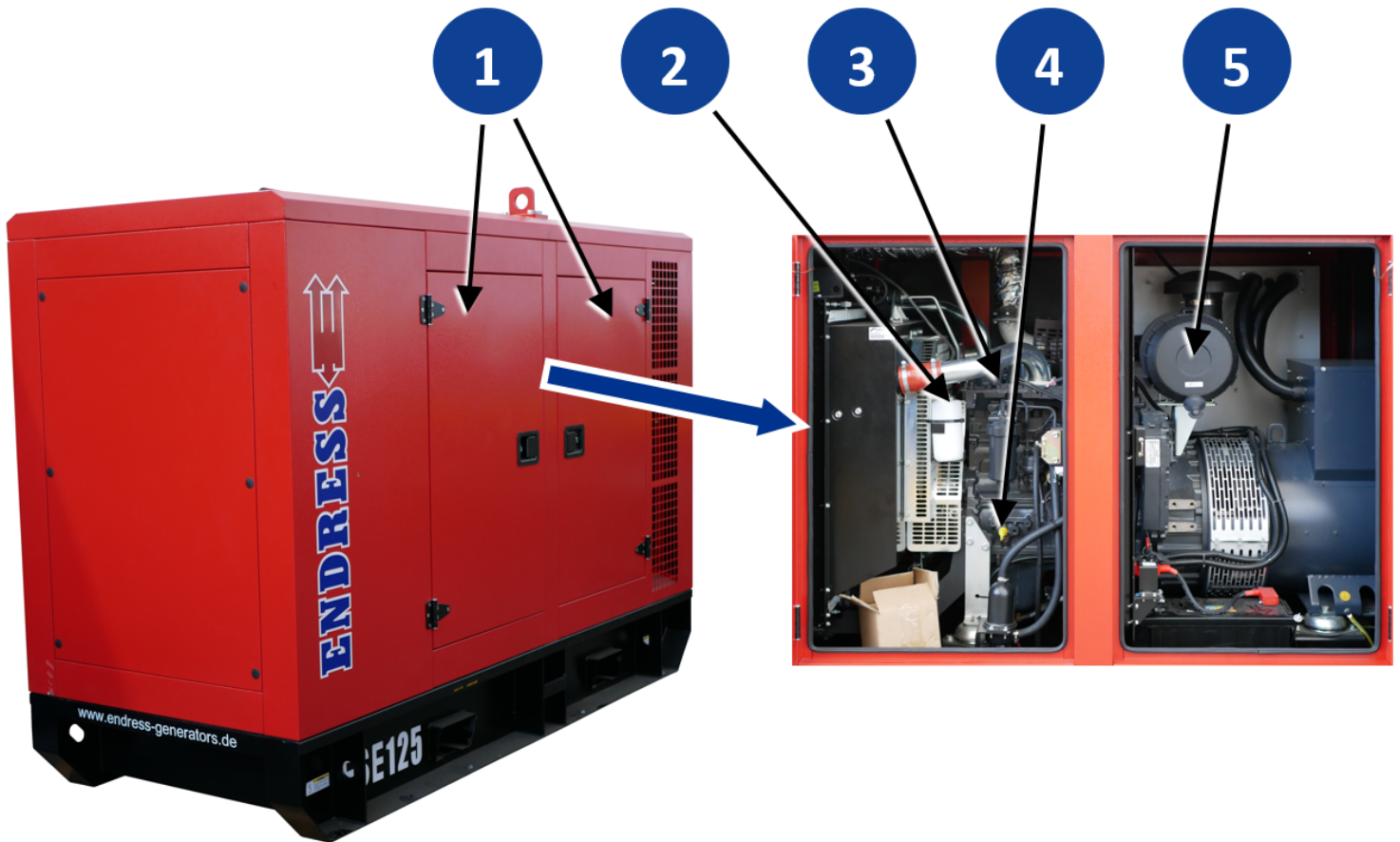


Fig. 6-3 Components on the exhaust and maintenance side

| | | | |
|---|----------------------------|---|--------------|
| 1 | Engine's maintenance doors | 2 | Fuel filter |
| 3 | Oil filling cap | 4 | Oil dipstick |
| 5 | Air filter | | |

6.4 Control panel components

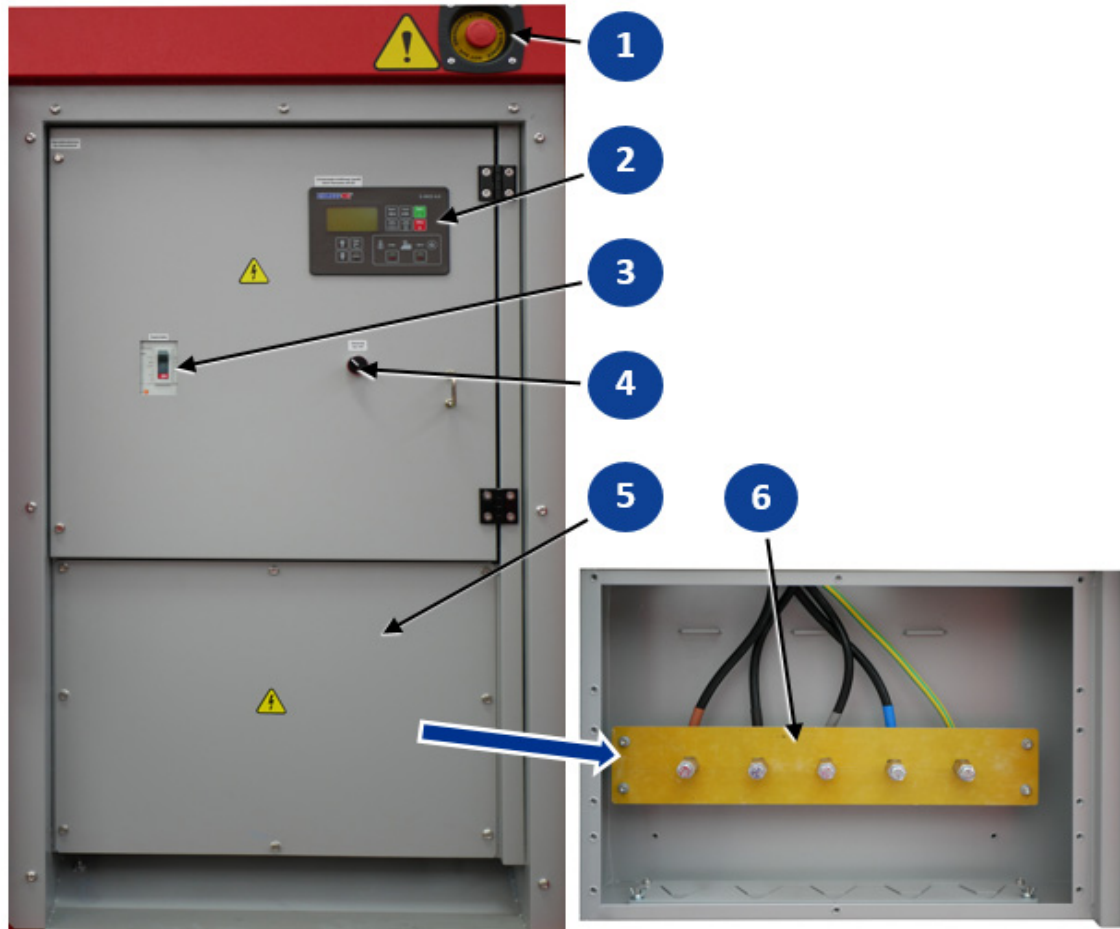


Fig. 6-4 Components on the control panel

| | | | |
|---|---|---|----------------------------------|
| 1 | EMERGENCY-STOP smash button | 2 | Control module E-MCS 6.0 |
| 3 | Main switch | 4 | Control module's ON / OFF switch |
| 5 | Terminal strip cover (only to be accessed by electricians!) | 6 | Terminal strip |

7 Commissioning

The following chapter explains the basic procedure for initial or repeated generator start-ups in "Manual" mode. Follow the working steps described below when you put your generator into operation for the first time or re-start it again after transporting it.

7.1 Transporting and preparing your generator

Choose the transporting vehicle and lifting gear so that the generator can be moved safely at all times according to its total mass (see Chapter 12). The unit's solid base frame allows it to be lifted and transported by a forklift. Alternatively, loading by crane is also possible after the crane eyes have been fitted correctly.

Ensure that all of the power generator's maintenance flaps and covers are securely closed.

Requirements:

- ✓ The ground at the installation site must be even and be capable of bearing the load.
- ✓ The generator is turned off.
- ✓ The generator has cooled down



DANGER!

Danger of severe or mortal injuries being incurred from falling loads.

- ▶ Never stand under or close to a suspended load, also not to provide assistance.
- ▶ Ensure that there is no person in the area of swivel of the lifting device.
- ▶ Use all suitable measures to prevent the suspended load from swaying.



NOTICE!

Leaking engine oil and operating fluids can contaminate the soil and groundwater.

- ▶ Ensure that the generator is transported horizontally and mounted.
- ▶ Make all efforts, at all costs, to prevent escaping of operating fluids.
- ▶ Dispose of contaminated soil immediately and according to regulations.

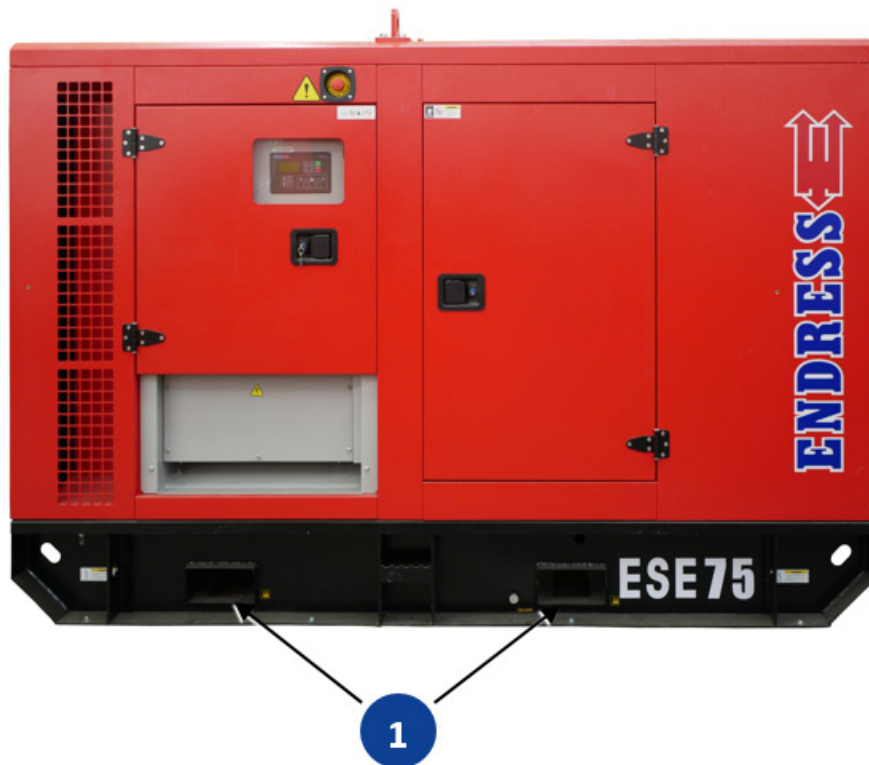


Fig. 7-1 Transporting with a forklift

Transporting with a lifting device

1. Move the lifting forks into the pockets ① in the base frame.
2. Insert the lifting forks as far as possible because of the machine's heavy weight.
3. Raise the power generator slowly and evenly.
4. Move the power generator slowly into its place of use.
5. Lower the device slowly and evenly.
6. Remove the forklift.

The generator has been transported to its place of use and positioned.

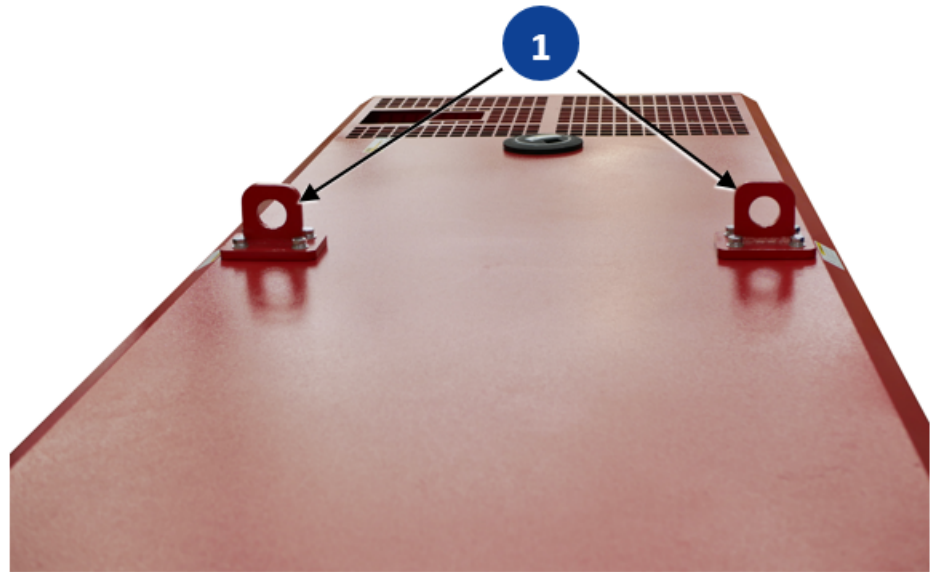


Fig. 7-2 Top

Transporting by crane

1. Connect up to the crane eyes **1** to the lifting device approved for use with the unit's heavy weight and secure it against falling off.
2. Raise the power generator slowly and evenly.
3. Move the power generator slowly into its place of use.
4. Lower the device slowly and evenly.
5. Unhook the lifting device.

The generator has been transported to its place of use and installed.

7.2 Refuelling your generator

Proceed as follows to refill the generator's own tank: the generator.

Requirements:

- ✓ The power generator is switched off
- ✓ the generator has cooled down
- ✓ there must be an adequate air supply and air removal
- ✓ all power consuming equipment must be disconnected or switched off



DANGER!

Leaking engine oil and fuel can burn or explode.

A risk of suffering severe even deadly burns.

- ▶ Prevent engine oil or fuel from leaking out.
- ▶ Remove leaked operating fluids immediately and appropriately.
- ▶ Never use an additional start aid.
- ▶ Smoking, naked flames and sparks are forbidden.


NOTICE!
Leaking fuel can contaminate soil and groundwater.

- ▶ Take note of the residual quantity in the tank and its maximum filling capacity.
- ▶ Always bear in mind that the fuel gauge reacts only after a time delay.
- ▶ Fill the tank to a maximum of 95%.
- ▶ Always use a filling aid (e.g. funnel).


NOTICE!
Use of wrong or outdated fuel damages or destroys the engine.

- ▶ Only use the fuel displayed on the sign (Fig. 3-3).
- ▶ Observe the possibly enclosed documentation for the fuel release of the engine manufacturer
- ▶ Observe the shelf life of the fuel according to the supplier.
- ▶ Observe the engine operating manual.

NOTICE!
When selecting the fuel, please note that if you use bio-diesel, then the warranty is no longer fully guaranteed.

- ▶ Only the fuel recommended by the engine manufacturer is to be used.
- ▶ Abide by the fuel notes given in the engine manufacturer's operating instructions.

Refuelling the generator

1. Unscrew the tank cover Fig. 6-2 .
2. Insert the filler nozzle into the filling opening.
3. Fill with fuel slowly and evenly.
4. Take note of the tank's fuel level indicator Fig. 6-2 as well as the fuel level at the filling opening to ensure that you do not overfill the tank.
5. Remove the filler nozzle.
6. Refit the tank cover.

The generator is now refuelled.

7.3 Starting the generator

Starting the power generator in manual control mode (see Chapter 7.4) is described here.

Proceed as follows to start the power generator directly from the E-MCS 5.0 control module's **3** control panel.

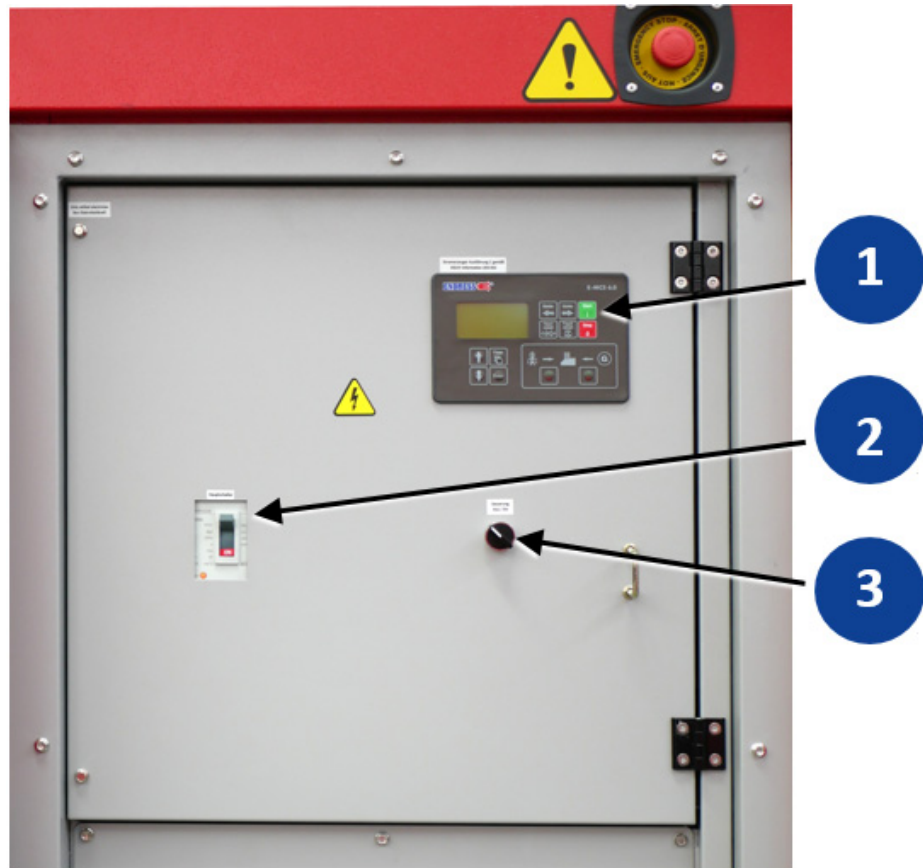


Fig. 7-3 Manually starting and stopping the power generator

Requirements:

- ✓ electrical safety has been checked (see Chapter 5).
- ✓ the fuel tank is sufficiently full.
- ✓ sufficient coolant (fill with coolant before initial use, see the engine operating and maintenance instructions for this).
- ✓ sufficient oil level (fill with engine oil before initial use, see the engine operating and maintenance instructions).
- ✓ there is an adequate air supply and air removal.
- ✓ The main battery switch must be in the “ON” position.



! DANGER!

Leaking engine oil and fuel can burn or explode.

A risk of suffering severe even deadly burns.

- ▶ Prevent engine oil or fuel from leaking out.
- ▶ Remove leaked operating fluids immediately and appropriately.
- ▶ Never use an additional start aid.
- ▶ Smoking, naked flames and sparks are forbidden.



! DANGER!

Engine exhaust gases contain poisonous and partially invisible gases such as carbon monoxide (CO) and carbon dioxide (CO₂).

Risk of death due to poisoning or asphyxiation.

- ▶ Ensure that there is good ventilation during the whole period of operation.
- ▶ Only operate the generator in the open.
- ▶ Never direct the exhaust gases into rooms or pits.

Starting the motor

1. Turn the main switch **2** into the "ON" position.
2. Turn the controller's switch **3** into the "ON" position.
The control module's display will come on and the controller will run up.
3. Wait until the start screen is displayed (see Fig. 7-7).
4. Set up "Manual" mode on the display by pressing the mode button (right arrow) once.
5. Press the "Start" button **1** once.

The engine will start up after the preheating phase.

The engine has started.

The green control LED shows you the readiness state of the Generators.

Familiarise yourself with the complete operating procedure for the E-MCS 6.0 control module before the initial commissioning of the power generator, see Chapter 7.4 .



NOTICE!

Do not apply load to the generator immediately after a cold start.

- ▶ Allow the generator engine to warm up for a few minutes before switching on a load when the generator has not been operating for more than eight hours (or for very low external temperatures).

7.4 Operating the E-MCS 6.0 control module

We will explain in detail how to operate the power generator via the control module in the following chapter, (see Fig. 6-4), and under various operating conditions. You will also learn how to display and edit various operating parameters and error messages.


The uses different control modes. The control mode that is currently being used is shown in the top line of the display, see Fig. 7-4 . Change modes by pressing the buttons on the control panel Fig. 7-5  on the control module.



Fig. 7-4 Control module's display

Control mode **AUS** - Controller off

The **"AUS"** displayed in the top line of the display indicates that the Generators can neither be started manually from the control module nor automatically due to a problem caused by the power supply company. This mode is reserved for maintenance and configuration work or if starting the Generators must be prevented under all circumstances.



NOTICE!

Automatic mains switching is deactivated in the **"AUS" control mode.**

The power generator will not start if the power supply has failed.

- ▶ Only use the **"AUS"** control mode for temporary purposes and only if starting the Generators must be prevented.
- ▶ After you have finished accessing the unit, you must ensure that the control module is back in the **"AUTO"** mode.

Control mode **HAND** - Manual

The manual is indicated by **"HAND"** being displayed in the top line of the display, see Fig. 7-4 . The power generator can be switched on and off manually and other functions can also be controlled in this mode.

**NOTICE!**

Automatic mains switching is deactivated in the “HAND” control mode.


The power generator will not start if the power supply has failed.

- ▶ Only use the manual control mode for temporary purposes or if automatic mains switching is not needed.
- ▶ After you have finished accessing the unit, you must ensure that the control module is back in the “AUTO” mode.

Control mode AUTO - Automatic

The Automatic control mode is indicated by “AUTO” being displayed in the top line of the display. The generator will start automatically in this mode as soon as the integrated mains monitoring system detects a power company fault. However, some functions such as resetting the warning tone can still be used.

Controller switched off

If the 7.3 -switch  is in the “0” position, then the controller is completely switched off. The power generator cannot be started neither automatically nor manually in this mode. However, certain optionally installed functions for ensuring operational readiness (e.g. tank heating, coolant preheating, battery charge retention) remain available.

**DANGER!**

Dangerous electrical voltage is still present even when the power generator is switched off

Mortal danger from electric shock if live parts are touched.

- ▶ Access only for electricians in areas marked with an adjacent warning sign.
- ▶ Maintenance work on the generator is only to be undertaken after an electrician has switched off the power generator and it is completely voltage-free.

7.4.1 Descriptions of the operating and display buttons

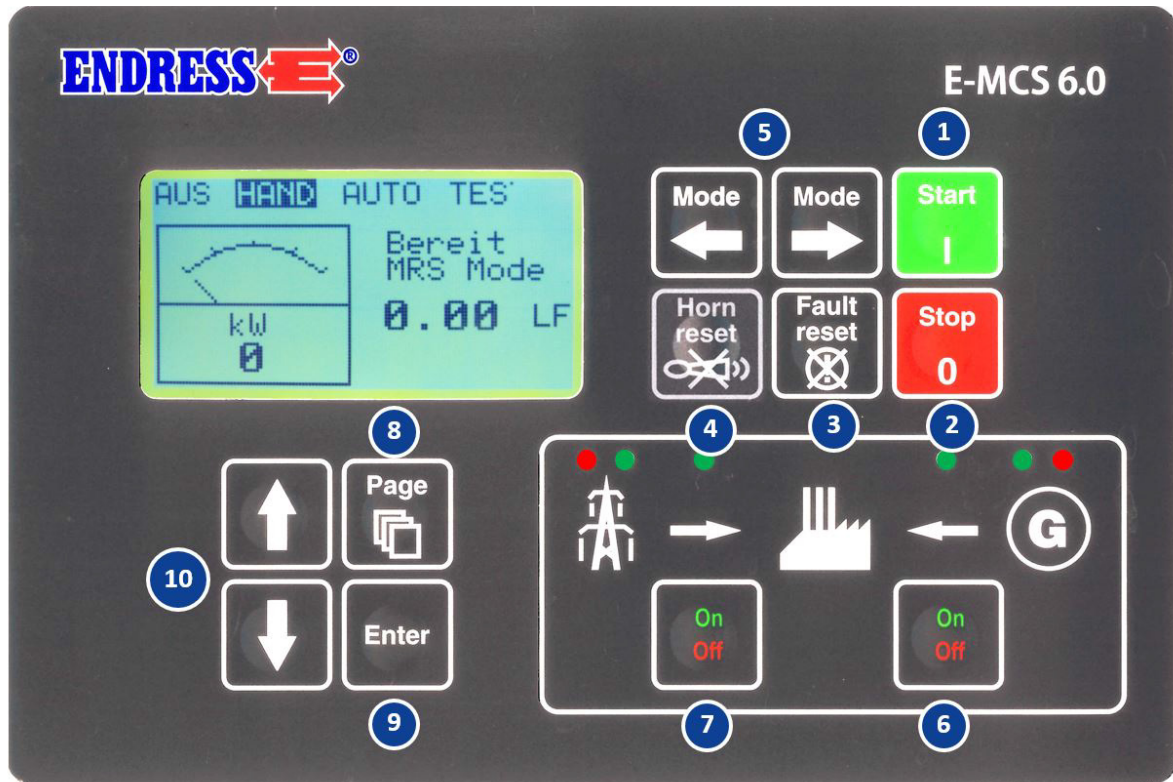




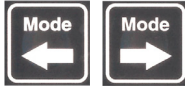


Fig. 7-5 Control module's control panel

| Item | Button | Description |
|------|---|--|
| 1 |  | START ENGINE Press this button to start the power generator if the HAND control mode has been selected, see 5 |
| 2 |  | SWITCH OFF ENGINE as well Press HAND this button once in control mode and the control module will start the power generator's cooling-down phase and it will be switched off afterwards. If this button is pressed for a 2nd time , then the control module will skip the cooling down phase and the power generator will be switched off immediately (NOT RECOMMENDED!). |
| 3 |  | RESETTING A FAULT Press the button to acknowledge an alarm message displayed on the screen and to turn off the horn. Inactive alarms are immediately faded out on the display and the status of the active alarms changes to "acknowledged" so that this will be faded out immediately after the cause is eliminated. |
| 4 |  | RESETTING THE WARNING HORN Not installed (function is run by pressing the 3 button) |
| 5 |  | SELECTING A CONTROL MODE Press this button to switch between the HAND or AUTO control modes. The buttons will only be functional if Fig. 7-7 is displayed in the main window on the controller's screen. If necessary, you should press the 9 button repeatedly until the main window is displayed. |

| Item | Button | Description |
|------|--------|--|
| 6 | | CHANGE GENERATOR MODE (only with an external changeover contactor). Press this button to go to the HAND control mode for supplying the connected distribution network from the power generator. |
| 7 | | CHANGING THE MAINS OPERATION (only with an external changeover contactor) Press this button to enter the control mode HAND for supplying the connected distribution network from the public mains supply. |
| 8 | | SELECTION MENU This function can only be enabled by service personnel. |
| 9 | | ENTER BUTTON Press this button and hold it down. Press one of the 10 buttons simultaneously to set the screen's contrast. |
| 10 | | MOVING BETWEEN THE SCREEN PAGES Press these buttons to move between the different windows displayed on the screen. |

Tab. 7-1 Control buttons on the control module

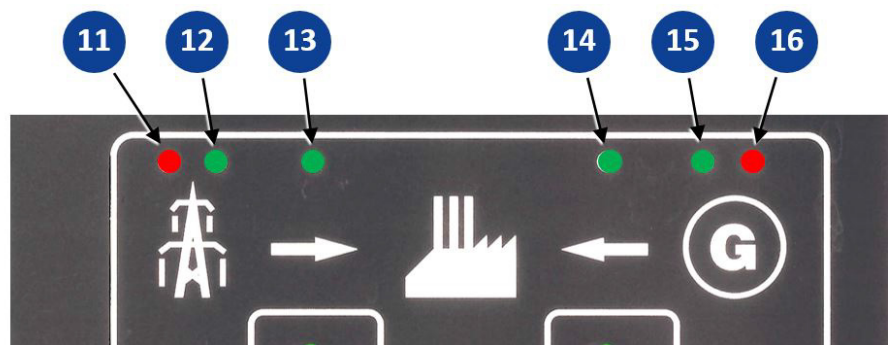


Fig. 7-6 Operating display on the control module

| Item | Description |
|------|---|
| 11 | MAINS FAULT The red LED will flash if the power supply from the mains is faulty. It will be continuously lit after the power generator has been started and remain so until the mains fault has been eliminated. |
| 12 | MAINS VOLTAGE OK The green LED diode lights up if there is a voltage present from the generator and the measured parameters lie within the limit values. |
| 13 | MAINS CHANGEOVER CONTACTOR ON This LED lights up green if the connected distribution network is being supplied from the public mains system (only with an external changeover contactor). |
| 14 | GENERATOR CHANGEOVER CONTACTOR ON This LED lights up green if the connected distribution network is being supplied from a generator (only with an external changeover contactor). |
| 15 | GENERATOR VOLTAGE OK The green LED lights up if voltage from the generator is present and the measured parameters lie within the limit values. |

| Item | Description |
|------|--|
| 16 | GENERATOR FAULT The red LED will flash if the power supply from the power generator is faulty. It will go out if the 3 button is pressed after the problem has been eliminated. The fault is still present if it remains permanently lit. |

Tab. 7-2 Operating display on the control module

7.4.2 Display window on the control module's screen

The control module screen shows you different Information about operating states, measured values, error messages and statistical data is shown in a structured form in the display windows. Press the arrow buttons Fig. 7-5 10 to move around the different display windows.

You will find a detailed list with all event and error messages in the appendix.

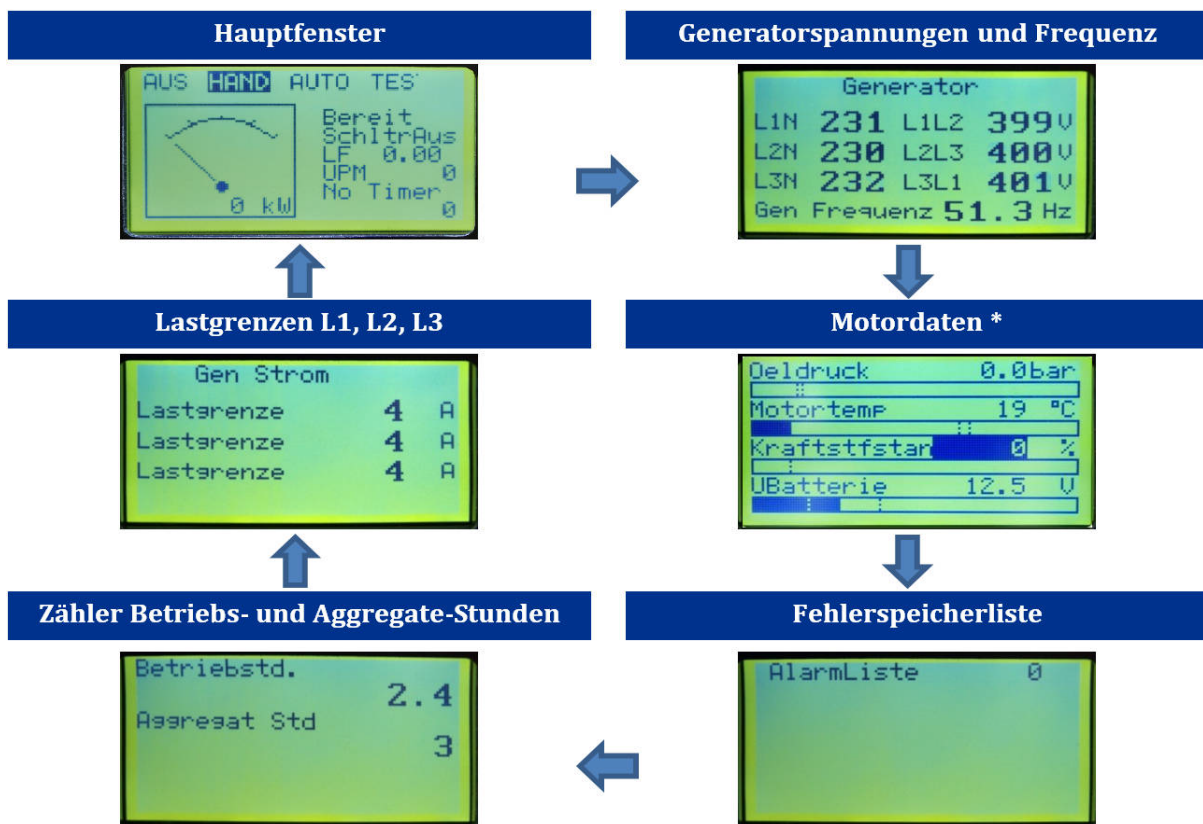
Alarm list

If an alarm is triggered, the alarm list will be displayed on the screen and you should select the entry that is preceded by an *. Proceed as follows to acknowledge the alarms:

1. If there are several entries present 10 should use the arrow keys to select the entry that you want.
2. Press the 3 button to acknowledge the alarm.

The * character will disappear.

The entry will only disappear after the error has been eliminated.



* Motoröldruck, Kühlmitteltemperatur, Kraftstoffstand, Spannung Starterbatterie

Fig. 7-7 Control module's display screen

7.5 Low load diesel engine operation

Internal combustion engines normally run most economically and environmentally friendly when they have reached their optimum operating temperature (with a coolant temperature from approx. 80°C). Prolonged operation well below the operating temperature or without a specific minimum load will have a negative effect on the service life. Incomplete combustion processes inside the engine will cause more and more deposits to form within the engine. If this operating state continues for too long or it is not compensated for by regular phases running at full load, this might result in a total engine failure and high repair costs in the worst case.



NOTICE!

Damage to the drive motor or other Generators components that was caused by low load operation that is contrary to our recommendations (see below) and/or those of the engine manufacturer will void any warranty or liability claims.



NOTICE!

Avoid, as far as possible, short-term operation or operation without a load or with a basic load that is too low. Follow these recommendations if the engine manufacturer does not provide detailed information or he provides different information:

- ▶ Run your Generators at a minimum of 30% - 40% of the rated nominal output (see nominal output in Chapter 12 Technical data).
- ▶ Avoid short-term operations where the engine does not reach its operating temperature.
- ▶ Run the engine at regular intervals **for at least one hour at maximum load** (see Chapter 8.1 Maintenance plan as well).
- ▶ Take note of the instructions provided by the engine manufacturer

7.6 Turning off your power generator

Proceed as follows to switch off your generator:

Requirements:

- ✓ Any dangers that might be caused by interrupting the power supply have been eliminated.
- ✓ Anyone who might be affected by shutting down the power supply have been informed.
- ✓ The power generator is in the manual control mode (see Chapters 7.3 and 7.4).

Switching the generator off

1. Press the Fig. 7-5 -button once **2**.
The green control LED will start to flash.
*The engine will go into the **cooling-down phase** and it will switch off automatically after a few minutes.*
The red control LED will light up.
2. Use the Fig. 7-3 -**3** switches to switch the controller "OFF"
3. Turn the main switch into the "OFF" position.
All of the displays have gone out.
The generator is switched off and secured.

7.7 Turn off your generator in the event of an EMERGENCY

Your Generators is fitted with an EMERGENCY-STOP smash button **1** . It enables you to immediately switch off the device in an EMERGENCY in order to prevent other dangerous situations from occurring.



CAUTION!

The EMERGENCY-STOP smash button is only to be used in the event of a dangerous situation arising in an emergency.

Risk of injuries if consumers are suddenly switch off.

- ▶ Always switch off the generator normally as described in Chapter 7.6 .

Requirements:

Actuating the EMERGENCY-STOP smash button must always be possible without any preconditions. Ensure that the EMERGENCY-STOP smash button is easily accessible at all times.



Fig. 7-8 EMERGENCY-STOP smash button

EMERGENCY-STOP

1. Push down or hit the EMERGENCY-STOP red smash button **1** .

The engine is stopped.

The EMERGENCY-STOP smash button's latching function is blocking the Generators against renewed operation.

The EMERGENCY-STOP smash button is locked in place in its actuated state. The generator can only be switched back on again after the danger has been eliminated if the EMERGENCY-STOP smash button is unlocked manually. How to unlock the EMERGENCY-STOP smash button:

Requirements:

- ✓ The danger or cause of the EMERGENCY-STOP process has been eliminated.
- ✓ All of the connected consumers are disconnected or switched off

Unlocking the EMERGENCY-STOP

1. Turn the red smash button on the EMERGENCY-STOP **1** slightly to the left or to the right.

This will unlock the red smash button and it will spring back up into its normal position.

The Generators is now ready for operation again and it can be restarted, see Chapter 7.3 .

7.8 Connection of power consuming equipment



 **DANGER!**

Mortal danger due to an electric shock if live parts are touched.

- ▶ Never operate the device if it is in a damaged condition.
- ▶ Never operate the electrical consumers and connecting cable (power consuming equipment) in a damaged condition.
- ▶ Never feed directly into existing networks that are already connected to a power source (e.g. power supplier, solar plant, etc.).
- ▶ Never operate the device with wet hands.



 **DANGER!**

There will be no RCD personal protection during operation if the earthing of the Generators is faulty.

Mortal danger from electrocution

- ▶ The use of an RCD (FI circuit breaker) for personal protection requires proper earthing of the Generators and this must be undertaken by a qualified electrician before the initial commissioning.
- ▶ The effectiveness of this protective measure should be regularly checked by an electrician.
- ▶ Check the personal protection according to the check intervals given in Tab. 5-1 .

Consumables are connected up through measures implemented by an electrician and they are connected to the terminal strip.

8 Maintenance

Generators maintenance is described in this section. It may only be performed by qualified specialist personnel.

Maintenance and repair which is neither described in this operating manual nor in the possibly also delivered operating and maintenance instructions may only be undertaken by authorized service personnel from the manufacturer.

8.1 Maintenance plan

Maintenance work on your generator must be performed periodically in order to secure its readiness to use and reliability over a long period. This work is only to be undertaken by trained specialist personnel. Contact your dealer or our

Service hotline +52 (442) 192.9100
energy.latam@prettl.com



NOTICE!

Please note that, in the case of a concluded warranty agreement, you will lose all rights to make claims if your generator is not serviced according to manufacturer regulations.

Maintenance work on the power generator mainly concerns working on the drive motor as well as some work on the remaining equipment.



NOTICE!

Always abide by the accompanying operating and maintenance instructions provided by the engine manufacturer when carrying out maintenance work on the drive motor.

The most important maintenance tasks are described in the following overview of the schedule and scope of the necessary maintenance work. Always abide by the maintenance schedule given in the accompanying operating and maintenance instructions provided by the engine manufacturer:

| |
|--|
| daily / after 8 hours (during operating times) |
| <ul style="list-style-type: none"> ✓ Check the engine oil level ✓ Check the coolant level ✓ Check the cleanliness of the heat exchanger ✓ Check the cleanliness of the air filter ✓ Drain off the water from the fuel pre-filter ✓ Check / refill the battery acid level and clean the terminals |
| after 300 hours |
| <ul style="list-style-type: none"> ✓ Check the tensioning and state of the v-belts |
| after 600 hours |
| <ul style="list-style-type: none"> ✓ Lubricating oil change ✓ Oil filter change ✓ Fuel filter change ✓ Fuel pre-filter change |
| after 900 hours |
| <ul style="list-style-type: none"> ✓ Change the oil vapour filter (electric motors) |
| after 1,200 hours |
| <ul style="list-style-type: none"> ✓ Change the v-belts for the auxiliary equipment ✓ Change the air filter ✓ Change the coolant |

Tab. 8-1 FPT engine maintenance schedule, source FPT engine operating and maintenance instructions

8.2 Maintenance work

Only authorised personnel are allowed to carry out maintenance tasks. Carry out all of the maintenance work listed in the maintenance plan according to the instructions given in the accompanying operating and maintenance instructions provided by the engine manufacturer. This operating manual merely describes the instructions that differ from or go beyond those instructions.



 **DANGER!**

Mortal danger from unintentional generator start up.

Danger of burns and being caught by rotating parts.

- ▶ Before accessing the generator you must switch it off and secure it so that unintentional starting of the machine is prevented under all circumstances. (see Chapter 7.2 as well).



CAUTION!

Certain surfaces on the device can get very hot whilst it is running.

Risk of burns

- ▶ Never touch any engine parts (in particular the exhaust system) for a few minutes after ceasing operation.
- ▶ Always leave hot engine parts to cool down before touching them.



NOTICE!

Also always read about the checking and maintenance work which concerns the electrical safety of the generators in the chapter “Checking the electrical safety“.

8.3 Starter battery

Your Generators has a 12V for supplying power to the starter motor and the engine control unit of the drive engine.



NOTICE!

Your Generators was fitted with a maintenance-free starter battery in the factory.

- ▶ It is imperative that you abide by the accompanying battery handling instructions.

8.3.1 Charging the battery

The battery can discharge after a longer immobilisation period or excessive power consumption in the control circuit of the generator.

Always remove the starter battery before charging (see Chapter 8.3.2). Exactly observe the handling instructions provided by the battery manufacturer. Wrong charging destroys the battery!



WARNING!

There is a risk of explosion and fire in the case of inappropriate handling and spark development when working with the battery.

Danger from spraying sulphuric acid. Danger of suffering severe even deadly burns and chemical burns. Danger of being blinded.



- ▶ Never lay electrically conductive parts on the starter battery.
- ▶ 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.
- ▶ Wear acid-resistant protective clothing.

- ✓ The starter battery is removed.
- ✓ For charging the starter battery is located at a well ventilated location.

1. Attach the starter battery according to the regulations from the battery and charger manufacturers.
2. Set a suitable charge current for the charger if necessary.
3. Switch off the charger of expiry of the charging time.
4. Disconnect the starter battery from the charger.
5. Allow the starter battery to rest for about thirty minutes.
6. Install the starter battery again in the generator (see Chapter 8.3.2).

The starter battery is charged.

If the generator cannot be started after fully charging the battery, there is a defect in the starter power circuit of the generator. Contact your service partner.



NOTICE!

The starter battery from the factory is maintenance-free throughout its entire service life.

- ▶ Never try to open the battery - risk of destruction.

8.3.2 Replacing the battery



WARNING!

There is a risk of explosion and fire in the case of inappropriate handling and spark development when working with the battery.

Danger from spraying sulphuric acid. Danger of suffering severe even deadly burns and chemical burns. Danger of being blinded.



- ▶ Never lay electrically conductive parts on the starter battery.
- ▶ 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.
- ▶ Wear acid-resistant protective clothing.

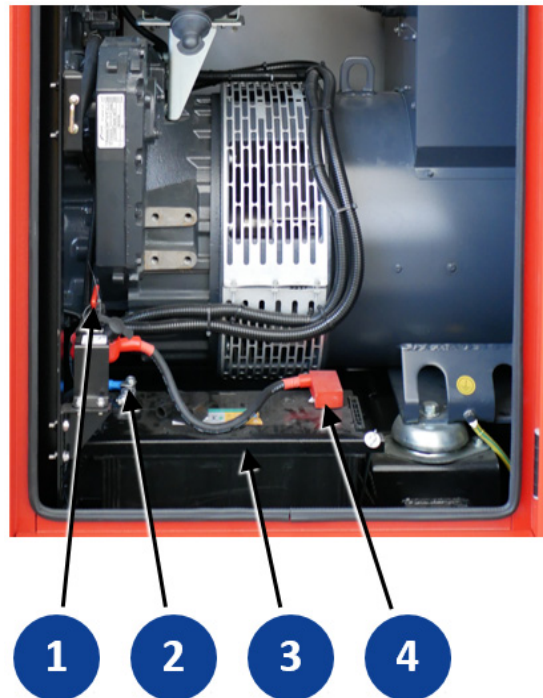


Fig. 8-1 Starter battery

requirements:



Proceed as follows to change the starter battery:

- ✓ Power generator is switched off (switch 7.3 - 1 is in the “OFF” position)
- ✓ Battery disconnecting switch 1 is in the “OFF” position.
- ✓ You are wearing personal protective equipment

1. Pull off pole protection cap (if fitted) from the battery’s negative pole and the negative cable Fig. 8-1 -must always be the FIRST 2 cable to be disconnected from the battery.
2. Pull off pole protection cap (if fitted) from the battery’s positive pole and the positive cable Fig. 8-1 -must always be the LAST 4 cable to be disconnected from the battery.
3. Undo the two fixing nuts and then remove the retaining bracket Fig. 8-1 3 from the battery.
4. Remove the battery from the power generator.
The starter battery is now removed.
5. Prepare a new starter battery (abide by the battery manufacturer’s instructions).
6. Place the starter battery in the battery compartment.
7. Use the retaining bracket Fig. 8-1 to secure the starter battery in place 3.
8. FIRST attach the plus cable Fig. 8-1 4 to the positive pole of the battery and then pull the red pole protection cap over the pole if necessary.
9. Fasten the negative cable Fig. 8-1 LAST 2 to the minus pole of the battery and then pull the pole protection cap over the pole if necessary.
10. Turn the battery disconnecter switch 1 into the ON position (image 6)
The starter battery has been replaced. The generator can now be started.

8.4 Engine oil

The drive motor for your generator, like every internal combustion engine, requires the required engine oil for cooling and inner cooling. It is also very important to use the correct engine oil, both for refilling and when changing the oil, and to adhere the stipulated maintenance intervals. Refer to the accompanying operating and maintenance instructions provided by the engine manufacturer for all necessary information.

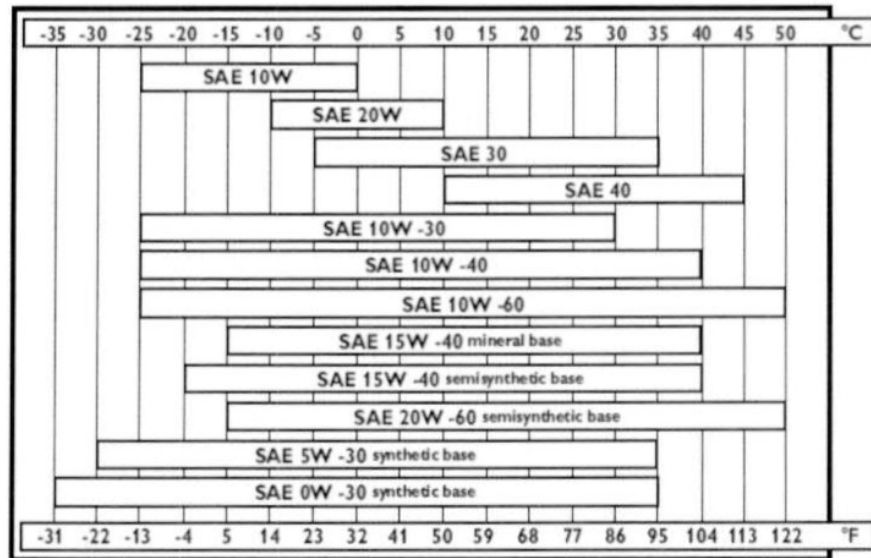


Fig. 8-2 Viscosity grade engine oil

8.4.1 Checking the oil level

Your generator is fitted with a low oil automatic switching off system to prevent the engine from being damaged due to a low oil level. It has two functions:

- 1) It prevents the engine from starting with an insufficient engine oil level
- 2) It switches off the drive motor whenever the engine oil level drops below the minimum value during operation.

The engine oil level must be checked regularly despite the fitted protective devices described here (see maintenance schedule 8.1).

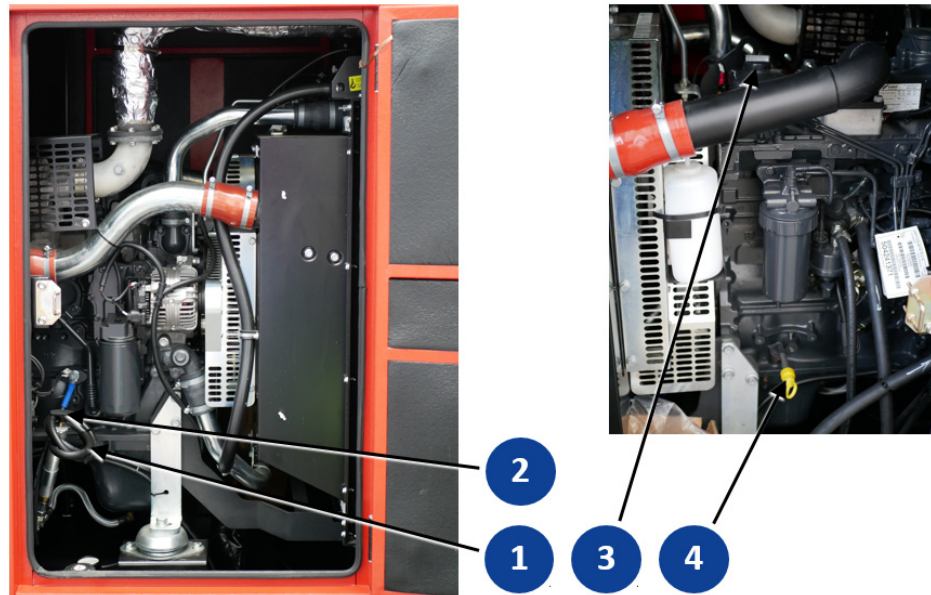


Fig. 8-3 Oil level checking and oil changing

| | |
|----------|-------------------------------------|
| 1 | Oil drainage screw |
| 2 | Pump lever and old oil suction pump |
| 3 | Oil filling inlet |
| 4 | Oil dipstick |



CAUTION!

The engine and operating equipment on the generator can get very hot while running.

Risk of burns

- ▶ Never touch any engine parts (in particular the exhaust system) for a few minutes after ceasing operation.
- ▶ Allow the engine to cool off for at least five minutes before changing or checking the engine oil.



NOTICE!

Follow the instructions given in the accompanying operating and maintenance instructions provided by the engine manufacturer to ensure that the precise procedure is used.

8.4.2 Changing the engine oil

Your generator's drive motor needs the engine oil and the oil filter to be changed at regular intervals. The first oil change is due after 50 hours and then every 600 hours under normal operating conditions (see Chapter 8.1). The maintenance intervals must be shortened accordingly if used in difficult operating conditions (e.g. dusty environment, extreme ambient conditions, etc.). All of the necessary information and the handling steps are described in detail in the maintenance and operating instructions supplied by the engine manufacturer.

In contrast to the operating and maintenance instructions for the engine Generators you also have a special oil suction device (see Fig. 8-3). All of the engine components that are important when changing the engine oil and the oil filter can be accessed via the maintenance flaps on the tank and battery side.



NOTICE!

Leaking engine oil contaminates the soil and groundwater.

- ▶ Use a suitable oil catching receptacle.
- ▶ Old oil is a special waste and may only be disposed of over suitably qualified collection points.



CAUTION!

The engine and operating equipment on the generator can get very hot while running.

Risk of burns

- ▶ Never touch any engine parts (in particular the exhaust system) for a few minutes after ceasing operation.
- ▶ Allow the engine to cool off for at least five minutes before changing or checking the engine oil.

Draining the engine oil

Proceed as follows to pump out the old oil after implementing the preceding handling steps in accordance with the engine manufacturer's maintenance instructions:

Requirements:

- ✓ The power generator is switched off
 - ✓ When it is still hot: Wait until the engine oil has cooled down to approx. 30°C – 50°C.
 - ✓ When it is cold: Run the engine until it has heated up accordingly.
1. Unwind the oil drainage hose ① and guide its end into a suitable oil collecting tank (take note of the oil filling quantity).
 2. Open the oil filling opening for better venting ③.
 3. Open the shut-off valve.
 4. Operate the pump lever on the old oil suction pump ②.
The old oil will pass through the drainage hose and run into the collecting tray.
 5. Clean and stow away the oil drainage hose ① again when no more old oil comes out.
 6. Close the shut-off valve.

The engine's old oil has now been pumped out.

**NOTICE!**

The other procedures for changing the engine oil correspond with the details given in the engine's operating and maintenance instructions. Take note of the other maintenance and disposal of operating equipment instructions that can be found there.

9 Storage

It is important to store the device at a suitable storage location as soon as your generator is no longer being used.

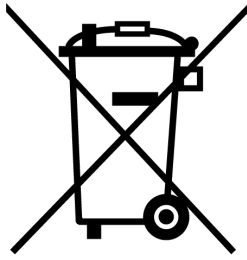
- The storage location must be roofed and must not be subjected to standing water, aggressive vapours or soiling as well as major accumulation of dust.
- Protect your device with a cover made out of breathable material.
- Ensure that the storage temperature and air humidity lie within the specified limits (see Technical data).



NOTICE!

Due to the limited shelf life of the different operating fluids, it is important for decommissioning for more than one month that additional measures for storage are taken. While doing this observe the instructions given in the attached operating and maintenance instructions from the engine manufacturer.

10 Disposal



Your device, which is an electrical or electronic device, is subject to European Directive 2012/19/EU (“WEEE directive”) which is implemented in Germany in national law through the decree regulating the use of dangerous substances in electrical and electronic equipment (ElektroStoffV). This regulates disposal and use of recycling waste electrical equipment. The adjacent icon with a crossed-out wastebasket on your device states that it must not be disposed of in the household waste at the end of its service life.

As a private end-user (a so-called b2c customer) there are free collecting points (recycling centre) near you for electrical equipment as well as possible also other collection points available for reuse of devices. The addresses can be obtained from your city or communal authority. In as far as the old electrical and electronic equipment contains personal data, you are responsible yourself for its deletion before giving it back.

Pure b2b devices (devices which, for appropriate use, or exclusively are only used the commercial area) must not be disposed of over public collecting points in Germany and further EU countries. Speak to your authorised ENDRESS generator dealer about handing back your recycling waste electrical equipment. The dealer is also your point of contact for any differing regulations on the respective country of deployment. There are also possible agreements in the purchase contract to observe.

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. Never put used engine oil in the domestic waste. Storage or introduction of old oil into nature is associated with very high fines.

An inappropriately disposed of battery can greatly damage the environment. Give back your old battery directly free of charge to your dealer when purchasing a new one.

Always observe the valid local regulations and laws concerning correct disposal of all old parts and operating materials. Please contact your ENDRESS service partner for a replacement.

11 Troubleshooting

The following table is an aid for you to use in a case where faults arise during use. Based on experience a number of malfunctions can already be removed by operating personnel or the possible causes limited. In all other cases contact your service partner as described in the table. The same applies for faults which are not listed in the table.

If a fault cannot be removed using the remedies described, shut down your generator and secure it against further use. Contact your service partner and give him an explanation, not only of the symptoms but also the possible causes which you can already exclude based upon the table. In this way you are supporting the diagnostic process so that the fault can often already be identified over the telephone or through written exchange with our specialists.



NOTICE!

The following table does not make any claims to completeness and does not mention any faults which can be caused by operating error.

- In order to avoid operating errors, please exactly follow the instructions in the existing and delivered documentation.

| Malfunction | possible cause | Correction |
|--------------------------------------|---|--|
| The engine turns but does not start. | Fuel level too low | Top up with fuel |
| | The fuel filter is clogged. | Replace the fuel filter. |
| | The fuel is unusable due to overaged | Carburettor cleaning, clean the fuel tank and replace the fuel |
| | Spark plug connector detached | Firmly put the spark plug connector in place again |
| | The spark plug is very dirty or defective | Clean the spark plug and adjust or replace it |
| | Engine oil level too low (oil lack automatic switch-off) | Bring the engine oil level up to the maximum |
| The engine does not rotate | Insufficient compression | Contact your service partner |
| | The starter battery is discharged or defective (only for electrical starting) | Clean a corroded battery pole Check the starter battery and charge it or replace it |
| | Starter defective | Replace the starter |
| | Engine mechanically blocked (also for starting by hand) | Contact your service partner |

| Malfunction | possible cause | Correction |
|---|--|---|
| The engine starts but stops again shortly afterwards | Fuel level too low | Top up with fuel |
| | The fuel filter is clogged. | Replace the fuel filter. |
| | Engine oil level too low (oil lack automatic switch-off) | Bring the engine oil level up to the maximum |
| | Spark plug connector detached | Firmly put the spark plug connector in place again |
| | Tank ventilation (tank cover) blocked | Clean ventilation holes |
| The generator is running but there is no (output) voltage at the socket | Overload protection triggered (operating status display lights up red) | Connect up a piece of power consuming equipment with a low output |
| | The alternator or cabling is defective | Contact your service partner |
| | The engine speed regulator is wrongly adjusted or defective | Contact your service partner |
| The generator is running but the output voltage is outside of tolerance | The electronic voltage regulator is wrongly adjusted or defective | Contact your service partner |
| | The load of the attached power consuming equipment is too high | Connect up a piece of power consuming equipment with a low output |
| The power output remains significantly below the nominal output | Operation under extreme climatic conditions | Adapt to the climatic conditions or stop the generator |
| | The generator has been poorly serviced | Perform maintenance work |
| | The generator has reached its wear limit | Contact your service partner |
| The engine smokes | The engine oil level is too high | Draining off excess engine oil |
| | The air filter insert (paper) is dirty or contaminated with oil | Clean the air filter insert or replace it |
| | The air filter insert (foam) is dirty | Clean the air filter insert and re-oil it |
| The generator is running at a high speed and with strong voltage fluctuations | The engine is still in the warm up phase | Wait until the engine has reached its operating temperature |
| | The carburettor is wrongly adjusted or defective | Contact your service partner |
| | The engine speed regulator is defective | Contact your service partner |

Tab. 11-1 Troubleshooting

Please contact our customer service for further fault diagnosis as well as procurement of original spare parts and wear parts at

Service hotline +52 (442) 192.9100
energy.latam@prettl.com or
www.endressparts.com (see Chapter 13)

12 Technical data

The following table contains the technical data for your generator.

| Name | Value | | | Unit |
|---|--------------|---------------|---------------|----------------------|
| | ESE 67 IW/AS | ESE 125 IW/AS | ESE 220 IW/AS | |
| Max. output [LTP] | 75/60 | 125/100 | 226/180.8 | [kVA/kW] |
| Continuous output [PRP] | 68/54.4 | 114/91.2 | 205/164 | [kVA/kW] |
| Nominal output factor ~3 | 0.8 | | | [cosφ] |
| Nominal frequency | 60 | | | [Hz] |
| Nominal speed | 1,800 | | | [min ⁻¹] |
| Nominal voltage ~3 / 1~ | 220 / 127 | | | [V] |
| Nominal current [PRP] ~3 | 98.2 | 164.5 | 295.9 | [A] |
| Empty weight (approx.) | 1,360 | 1,580 | 2,050 | [kg] |
| Tank capacity | 170 | | 290 | [l] |
| Fuel consumption (at 75% load) ¹⁾ | 9.6 | 18.3 | 34.8 | [l/h] |
| Running time (at 75% load) about ¹⁾ | | | | [h] |
| Length | 2,650 | | 3,190 | [mm] |
| Width | 1,080 | | 1,125 | [mm] |
| Height | 1,786 | | 1,905 | [mm] |
| Sound power level L_{WA} ³⁾ | | | | [db (A)] |
| Noise pressure level in the workplace L_{pA} ²⁾ | | | | [db (A)] |
| Noise pressure level at a distance of 7m L_{pA} ³⁾ | | | | [db (A)] |
| Switch cabinet protection class | IP 23 | | | IP |
| ¹⁾ Average value; deviations might occur in specific cases, therefore they are non-binding | | | | |
| ²⁾ Measured at a distance of 1 m and a height of 1.6 m in accordance with ISO 3744 (Part 10) | | | | |
| ³⁾ Measured in accordance with ISO 3744 (Part 10) | | | | |

Tab. 12-1 Power generator technical data

13 Replacement parts

Maintenance and replacement parts can be obtained quickly and easily from your responsible ENDRESS service partner or ENDRESS dealer. You can alternatively obtain support from our central customer service

by telephone: +52 (442) 192.9100

by email: latam@prettl.com

Have the item and serial number of your device ready for identification.

As a registered user you can obtain rapid and uncomplicated access to a range of services over our home page to obtain suitable original spare parts for maintenance and repair work. Using your internet browser please go to

<https://endressparts.com>

and click on the area “Documentation and replacement parts“.

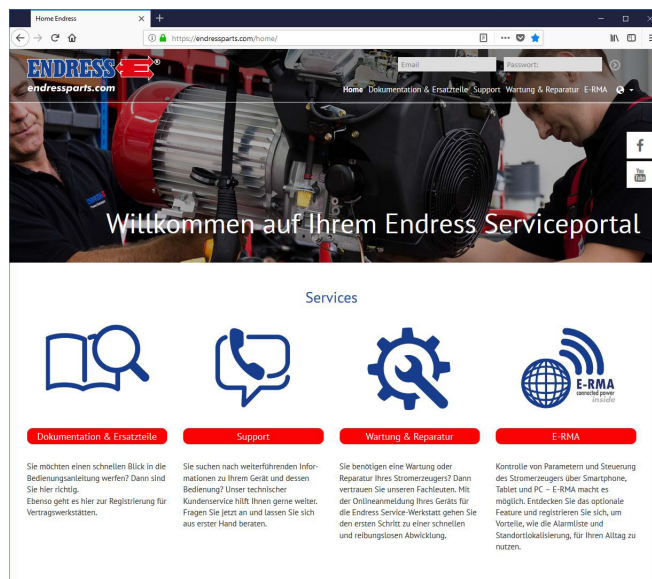
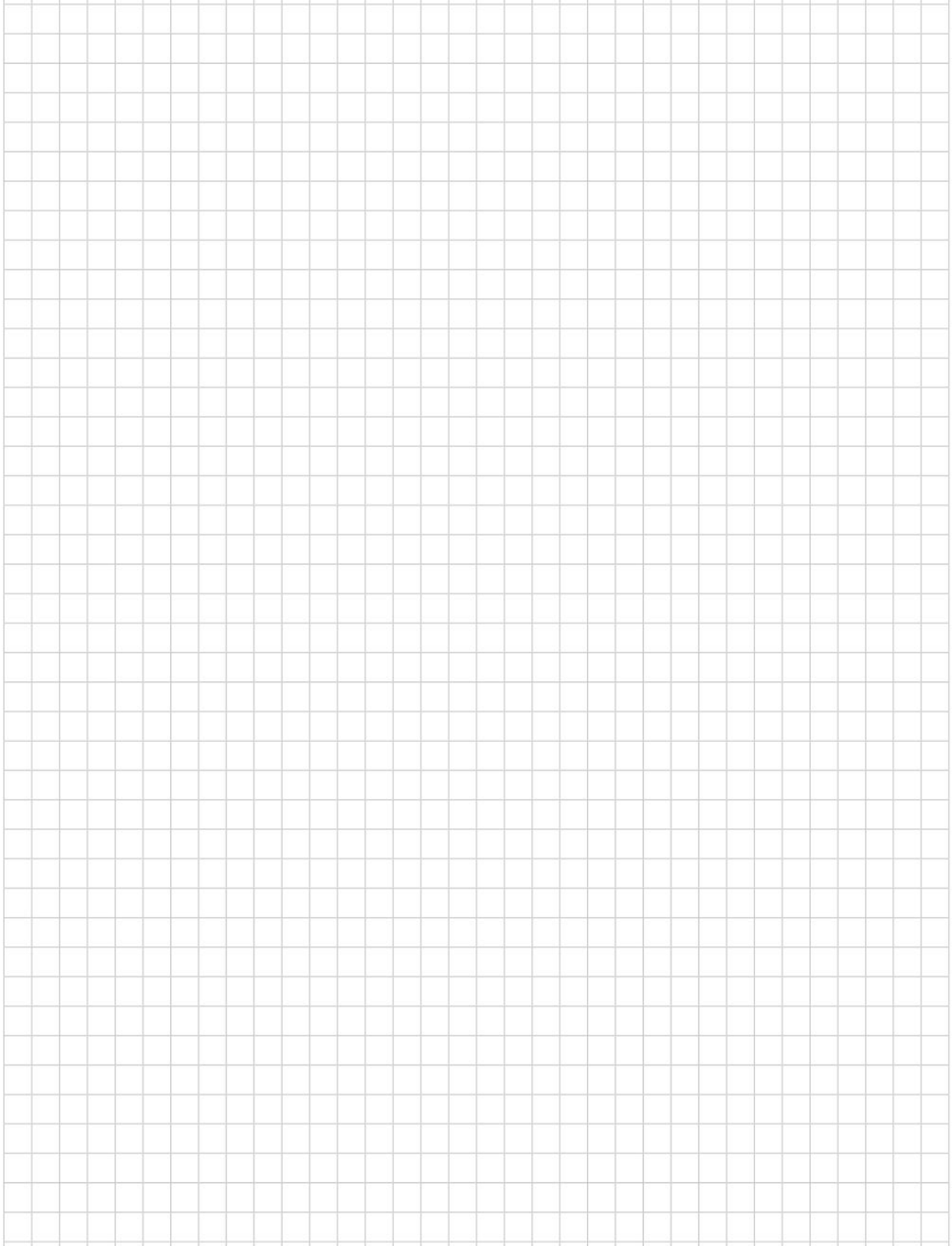
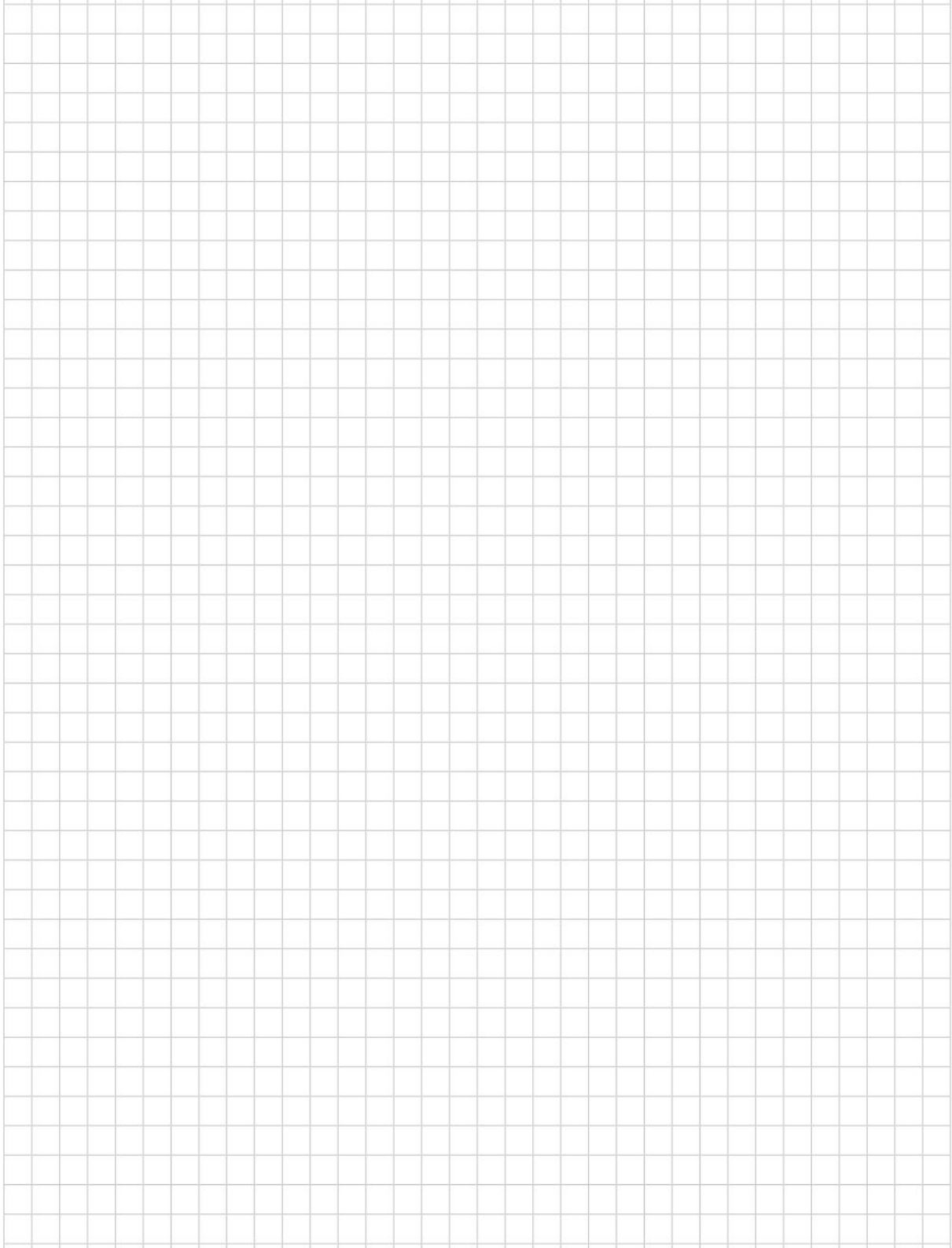


Fig. 13-1 Spare parts over endressparts.com

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