ESE Power Generator

ORIGINAL OPERATING MANUAL

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ESE 1006 DHG-GT ES Duplex	Art-No. 113261
ESE 1306 DHG-GT ES Duplex	Art-No. 113258
ESE 1506 DHG-GT ES Duplex	Art-No. 113259
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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.

Table of Contents

1 Directories

1.1 List of illustrations

1.2 List of tables

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

Hazard Type
Hazard Consequence

► Hazard Avoidance

⚠ DANGER!

Electrical voltage

Risk of suffering potentially deadly electrocution by touching live parts

► 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 emphasises the type of danger; see next example. A list of the safety symbols used in this operating manual can be found in Chapter Fig. 3-1 . 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

Type and Consequence of Improper Use

► Intended Use

NOTICE!

Use of wrong or outdated fuel damages or destroys the engine.

► Only use released 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. 3-1 .

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. 3-2), 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. +49 (0)7123 9737-44

Email: service@endress-stromerzeuger.de

You will find competent contact persons there, also concerning original spare parts and wear parts. (see also Chapter 14)

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.

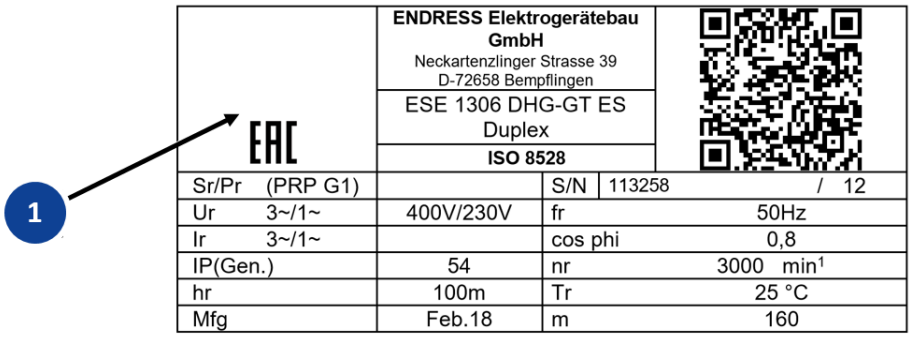


Fig. 3-1 Example of a type plate

3.2.1 A device description and intended use

Your Generators generates electrical energy for the "On-site operation" mode as part of a network backup operation, through which you can supply a mobile distribution system with electricity. This enables mobile use of commercially available electrical devices with single-phase 230V AC / 50 Hz or three-phase 400V AC / 50 Hz (depending on the equipment being used).

This operating mode means that your Generators, which has been designed for manual or automatic (remote start) operation, can be used with one or more electrical consumables. To protect against electric shock (current flow through your body), the protective separation measure with equipotential bonding according to DIN VDE 0100-551: 2017-02 is used. The protective conductor system of the attached consumer equipment takes over the function of the potential equalisa-

tion device. The power in the “On-site operation“ mode is taken through a spray water protected Schuko socket with a nominal voltage of 230V / 50 Hz 1~ or through a CEE 400V / 50 Hz 3~ socket, see Fig. 6-4

The Generators must not be connected up directly to another energy distribution network (e.g. public electricity supply) or to a power generation production system (e.g. other power generators).

Your Generators of a DUPLEX generator driven by a combustion engine attached to it. This unit is mounted in a stable tubular steel frame with vibration dampers to provide elastic and low-vibration support.

An integrated voltage regulator ensures that the stability of the generated voltage is within the nominal rotational speed range.

The Generators is only to be used outdoors and within the indicated voltage, power and nominal rpm limits (see type plate).

The Generators is not to be used in potentially explosive areas.

The Generators is not to be used in areas where there is a risk of fire.

The Generators must always be operated according to the instructions given in the technical documentation.

Any improper use or any Generators activities that are not described in these instructions is forbidden misuse that lies outside the manufacturer's legal liability limits.

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 13) allows operation for spray water, however not in the case of floods.

3.3 Labels on the generator

An important part of the operating manual is in the form of labelling and notices on your Generators. This The label must not be removed and must always be maintained in a legible condition. In a case of damage to the Labels can be ordered from our customer service team. The following figures and tables show the prescribed attachment point and a short explanation about labels.

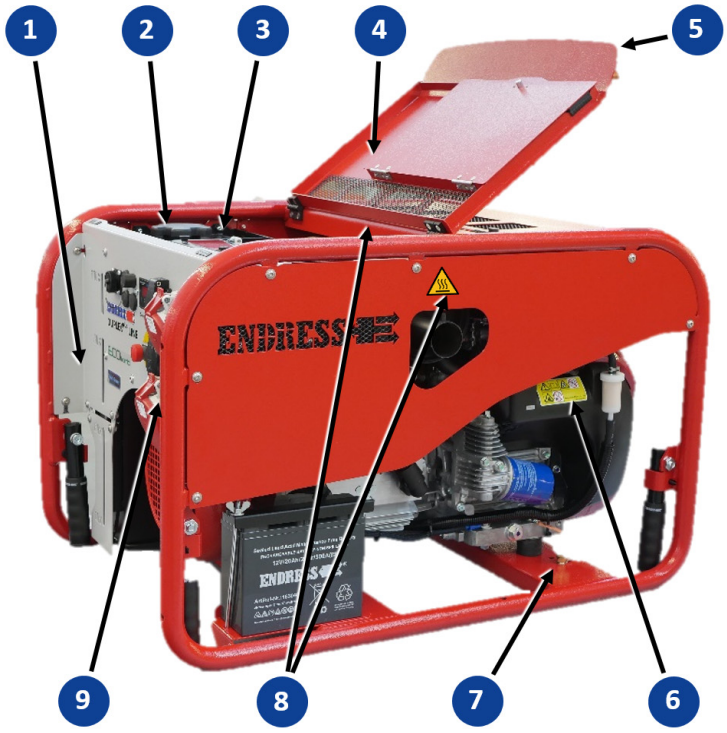


Fig. 3-2 Labels on the device

Pos.	Label	Significance
1		Mandatory signs Read the operating manual
2		Prohibition signs No naked flames

Pos.	Label	Significance
3	Normalbenzin ROZ 95 DIN EN 228 Tankinhalt ca. 20 l ACHTUNG: NICHT WÄHREND DES BETRIEBES NACHTANKEN. ZUM NACHTANKEN, MOTOR ABSTELLEN UND EINIGE MINUTEN ABKÜHLEN LASSEN. NICHT IN UNBELÜFTETEN RÄUMEN BETREIBEN.	Note Tank capacity and fuel quality
4	ENDRESS Elektrogerätebau GmbH ESE 406 HG-GT Duplex Neckartenzlinger Straße 39 D-72658 Bempflingen ISO 8528 Germany Sr/Pr (PRP G1) 4.0kVA/4.0kW S/N 113552 / 11 Ur 1~ 230V fr 50Hz Ir 1~ 17.4A cos phi 1 IP(Gen.) 54 nr 3000 min¹ hr 100m Tr 25 °C Mfg Jun.16 m 80 kg	Type plate
5	LWA 97 dB	Note Noise emissions
6		Warning Dangers incurred during engine operation
7		Potential equalisation (earthing for RCD)
8		Warning signs Hot surfaces Risk of burns
9	Stromerzeuger **Ausführung A** gemäß **DGUV-Information 203-032** A	Note DGUV information

Tab. 3-1 Meaning of the signs

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 is 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 5 and 4 . 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 injurieswhen 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. 3-2).
- ► 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. In doing so the respective, pertinent VDE provisions, EN and DIN standards, in their respectively valid versions, must be observed. You must abide by the DGUV Information 203-032 edition of May 2016 if it will be used in construction or assembly sites. It defines special protective measures and rules of conduct for the commissioning as well as a corresponding marking on the device.

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 Generators has been designed for manual or automatic operation (remote start) with one or more electrical consumers. To protect against electric shock (current flow through your body), the protective separation measure with equipotential bonding according to DIN VDE 0100-551: 2017-02 is used. The protective conductor system of the attached consumer equipment takes over the function of the potential equalisation device. The terminal (Fig. 6-2) is connected with this Potential equalization device connected. An Earthing is not necessary.

Your Generators corresponds to a Version A generator according to DGUV Information 032-203 issued in May 2016. A corresponding marking can be found on the device (see Fig. 3-2):

We strongly recommend that you also comply with the requirements of DGUV Information 203-032 for other purposes.

⚠ DANGER!

Dangerous electrical voltages will be present if several consumables are connected up without a working personal safety device.

Mortal danger from electrocution

- ► Never operate multiple consumables from the Generators without additional RCDs (residual current circuit breaker) for the second and each additional consumable.
- ► 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. (Examples in TRBS 1201, implementation instructions re §5 of BGV/GUV-V A3, BGI 594, BGI 608, Annex 2, recommendation of BGI/GUV-I 5090 “Repeated testing of mobile electrical equipment“).

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	• 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	• 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 generator is fitted with insulation monitoring and/or an RCD, then the operating personnel must run protective device functional tests (see Chapter 8.2.2 and Chapter 8.2.3) every working day. The operating personnel must be trained to do this.	Operating personnel
Retest at the latest once every six months	• 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 Views

The following section provides an overview of the designation and location of the most important components of your generator. It is important to make oneself familiar with these in order to further understand the described functions and operating steps and to be able to perform these 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	Engine side	2	Exhaust gas side
3	Control side	4	Maintenance page

6.2 Operating and exhaust-side components

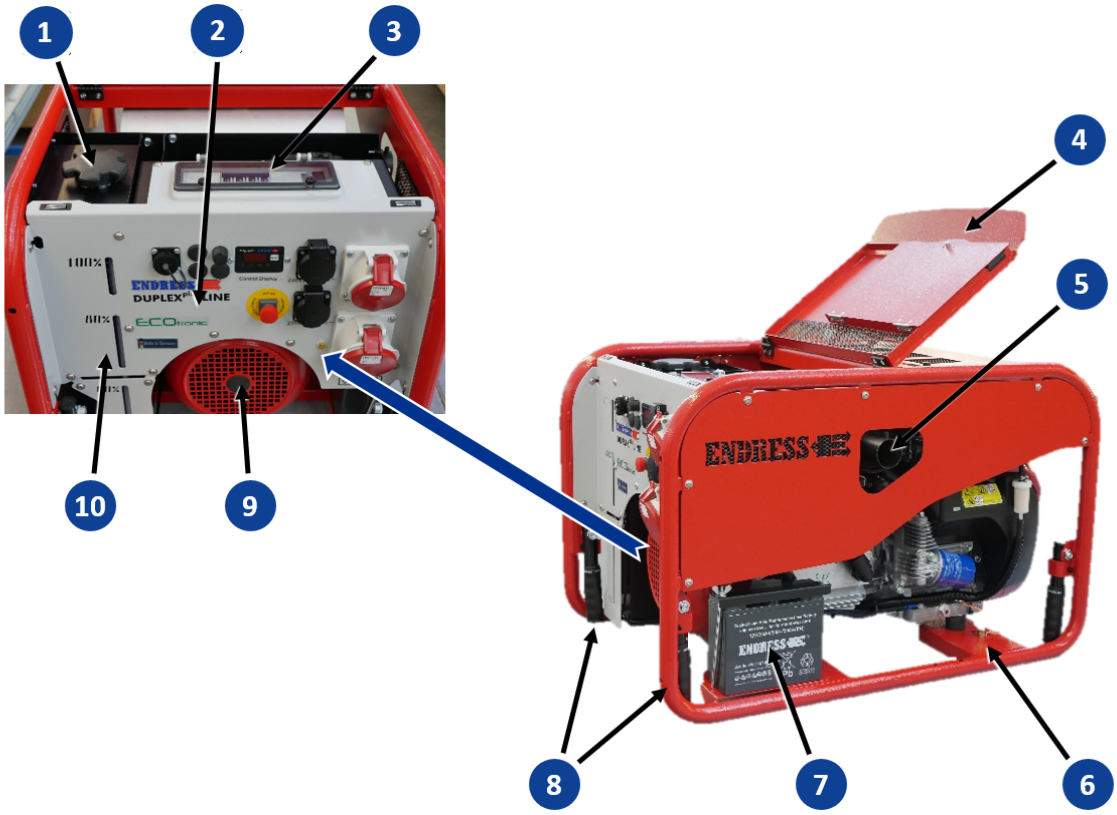


Fig. 6-2 Operating and exhaust-side components

1	Tank cover	2	Control panel
3	Fuse window	4	Protective tank cover and fuse holder with compartment for operating manual
5	Silencer and exhaust outlet	6	Connection terminal Potential equalisation / Earthing
7	Starter battery 12 V	8	Carrying handles (four)
9	Alternator	10	Display Tank capacity

6.3 Components on the engine and tank side

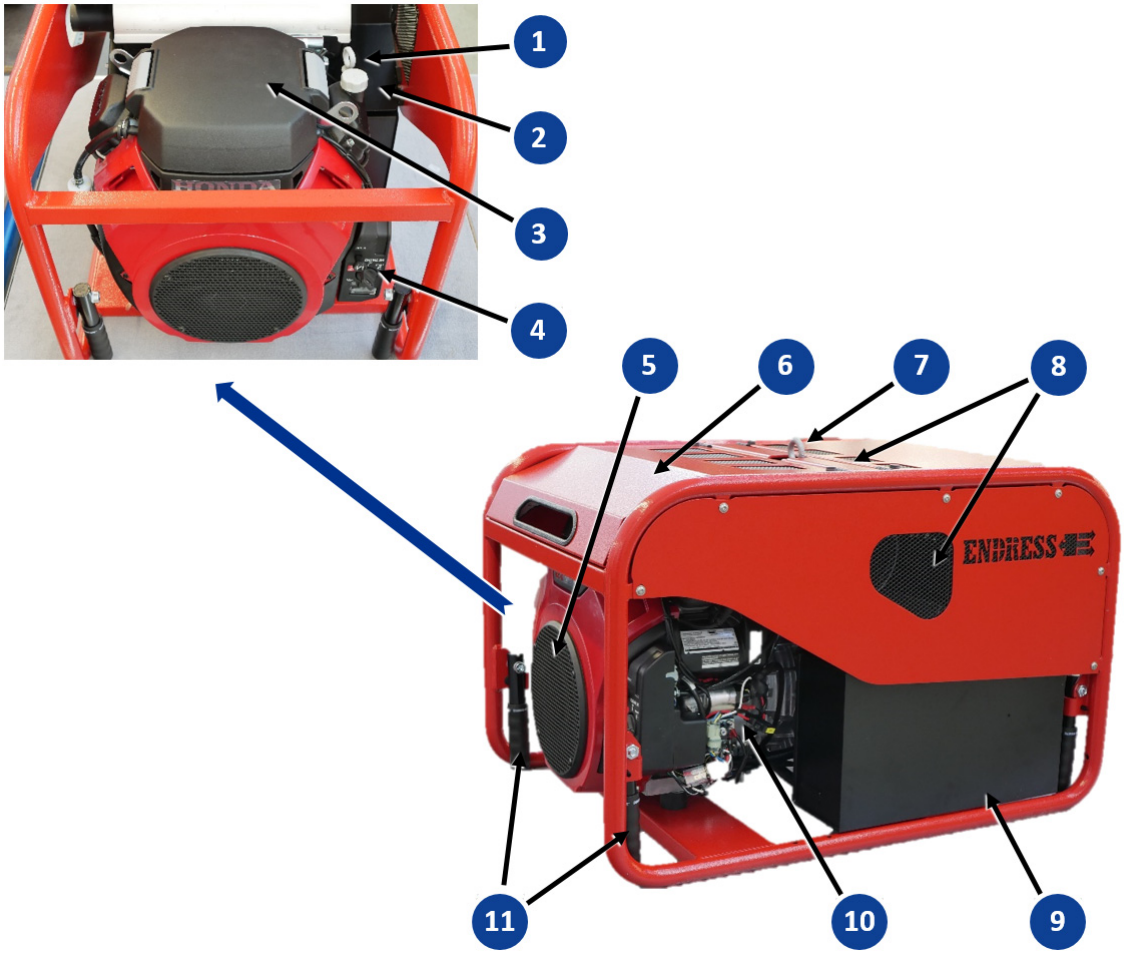


Fig. 6-3 Components on the engine and tank side

1	Oil dipstick	2	Oil filling inlet
3	Air filter housing	4	Control panel Engine starter
5	Air intake grille for engine cooling	6	Engine hood
7	Crane loading lug	8	Exhaust grille
9	Fuel tank	10	Drive motor
11	Folding carrying handle		

6.4 Control panel components full option

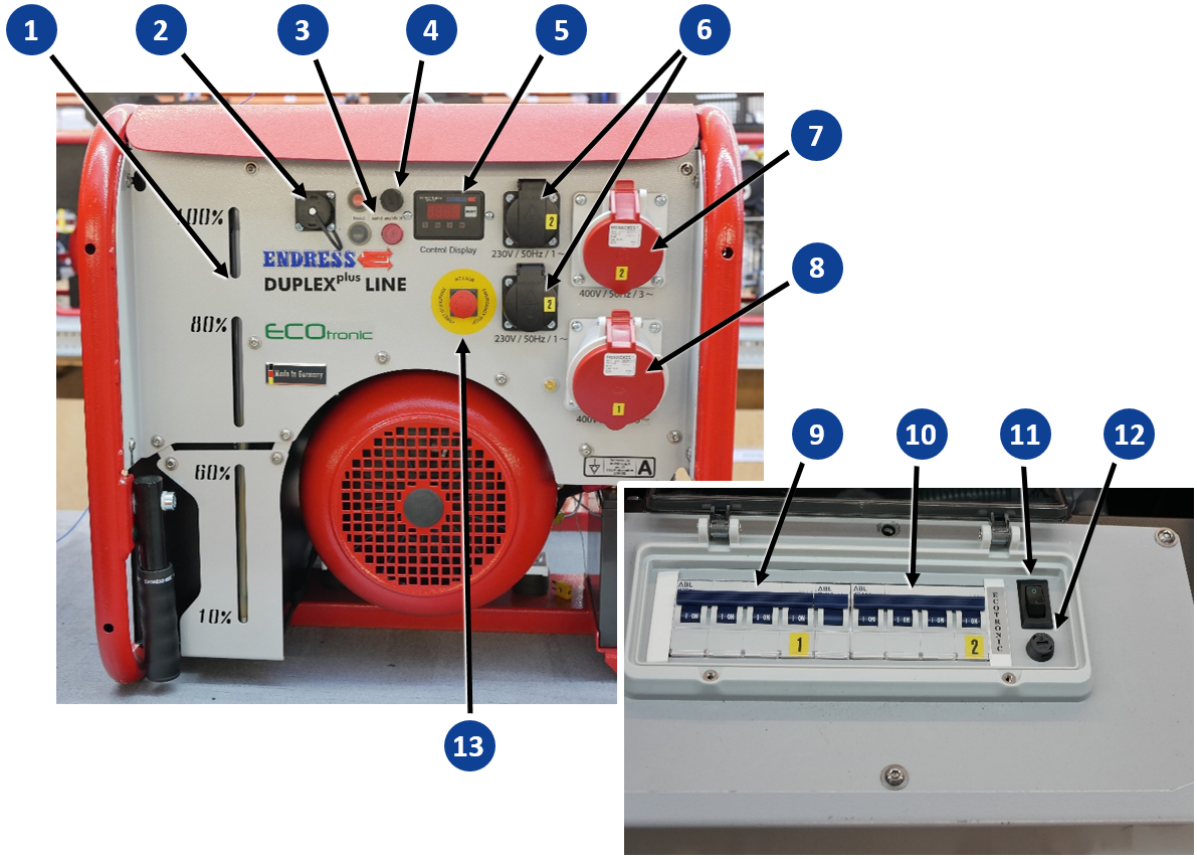


Fig. 6-4 Control panel components full option

1	Display Tank capacity	2	Remote start socket (CPC) ***
3	Insulation monitoring *	4	Remote start socket fuse ***
5	Multi-functional display	6	Schuko attachment sockets 230V / 16A / 1~
7	CEE socket for 400V / 16A / 3~	8	CEE socket for 400V / 32A / 3~
9	Circuit breaker 32A	10	Circuit breaker 16A
11	ECOtronic switch *	12	Fuse for ECOtronic *
13	EMERGENCY-STOP smash button ***		

* Version is equipment-dependent

*** only fitted in remote start version

6.5 SEA control panel components

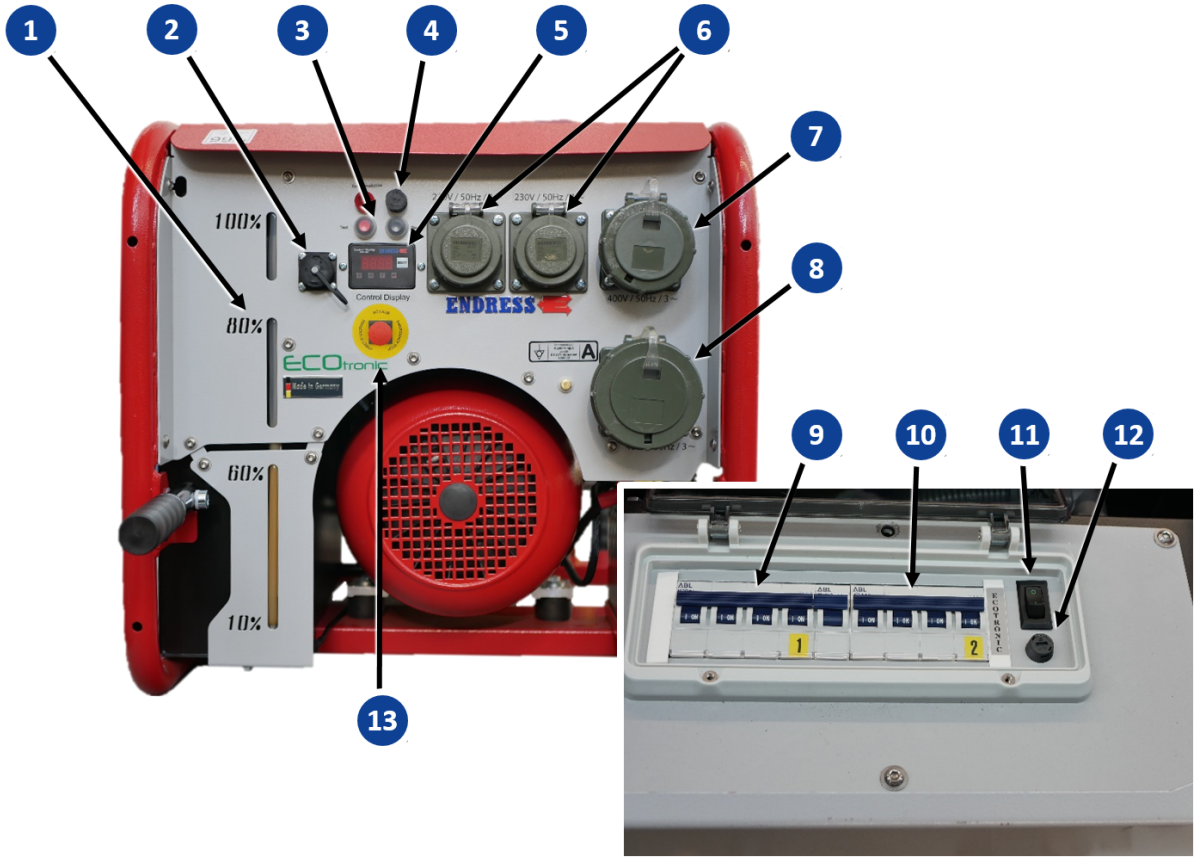


Fig. 6-5 SEA control panel components

1	Display Tank capacity	2	Remote start socket (CPC) ***
3	Insulation monitoring	4	Remote start socket fuse ***
5	Multi-functional display	6	Schuko sockets 230V / 16A / 1~ IP68
7	CEE socket for 400V / 16A / 3~ IP68	8	CEE socket for 400V / 32A / 3~ IP68
9	Circuit breaker 32A	10	Circuit breaker 16A
11	ECOtronic switch *	12	Fuse for ECOtronic *
13	EMERGENCY-STOP smash button ***		

* Version is equipment-dependent

*** only fitted in remote start version

7 Commissioning

The following chapter explains the basic procedure for initial or repeated generator start-ups in "Direct supply" mode. Perform the following described steps when you put your generator into operation for the first time or put into operation again after transport.

NOTICE!

For start-up and operation of a generator on building and assembly sites, Deutsche Gesetzliche Unfallversicherung (DGUV) in DGUV Information 203-032, the May 2016 edition, requires observance of special protective measures and behaviour regulations.

Be sure to refer to the following section for a summary of this DGUV information. It supplements the operating instructions for this special application.

We also urgently advise observance of relevant DGUV information under comparable operating conditions.

We recommend that you read DGUV Information 203-032 before starting the initial commissioning. In cases of doubt consult a qualified electrician.

Operation of the generator on construction and assembly locations according to DGUV Information 203-032(BGI867).

According to the above information, your Generators has been **classified as Version A** and has the following markings:

	Connection for the protective equipotential bonding
	Marking for design class A on the device

CAUTION!

You must always abide by the steps required to protect people from dangerous contact voltages when using your Version A Generators as shown in the 7.6 info-illustration!

- A PRCD-S cannot be used here as a **residual current protection device** because it cannot be switched on.
- The same requirements apply to generators with an insulation monitoring device (IMD).

- Only rubber-insulated flexible cables of the type H07RN-F or H07BQ-F may be used on construction and assembly locations.
- Electrical equipment must be spray water protected and meet the regulations for rough operation.

7.1 Transporting and preparing your generator

The following requirements must be fulfilled before you can transport the generator:

Requirements

✓ The installation area must have an even and load carrying substrate
✓ The generator must be turned off
✓ The generator is cooled down

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.

Manual transporting

⚠ WARNING!

Danger due to a high device weight.

Risk of crushing through sliding or a falling down machine

► Observe the empty weight from to 160 kg.
► The device must be carried by four people.
► Only lift the device using the carrying handles.
► Raise/lower device evenly.
► Walk slowly.

Carrying the generator

1. Fold out the so that they are fully out.
2. Lift the generator simultaneously and evenly from all four sides.
3. Carry the generator slowly to its place of use.
4. Lower the device evenly.
5. Fold in the carrying handles so that they are fully in

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

Loading by crane

Only use lifting devices that are suitable and approved for the weight of the device and have a safety device to prevent slipping out during loading

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.
✓ Carrying strap with sufficient load capacity is ready.

⚠ 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.

⚠ CAUTION!

The crane lifting eyelet integrated in the frame can become very hot during operation due to engine waste heat

Risk of being burnt if it is touched!

- ► Always leave the generator to cool down before transporting it.
- ► Wear protective gloves that are suitable for the purpose whenever necessary.

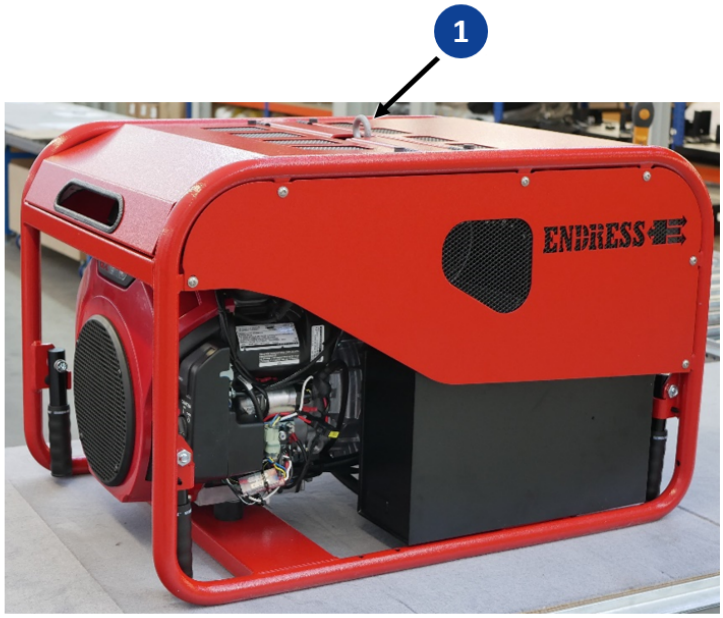


Fig. 7-1 Loading by crane

1. Fold out the crane loading eyelet (1) from the frame so that it is in the vertical position.
2. Hook the lifting device with safety catch onto the crane loading eyelet.
3. Raise the generator evenly.
4. Transport the generator to its place of use.
5. Lower the device slowly and evenly.
6. Unhook the lifting device.
7. Fold the crane loading eyelet back into its horizontal position.

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

7.2 Refuelling your generator

Proceed as follows to the generator.

Requirements:

- ✓ The 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 (Tab. 3-1).
- ► 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.

Refuelling the generator

1. Unscrew the tank cover (Fig. 6-2 1).
2. Insert nozzle into the filler neck.
3. Fill with fuel slowly and evenly.
4. Watch the fuel gauge (Fig. 6-2 -10to ensure that you do not overfill the tank.
5. Refit the tank cover.

The generator is now refuelled.

7.3 Starting the generator

This section describes how to start the Generators for manual use, i.e. with consumers that are connected to the Generators power sockets.

The cold start device is designed to be either a hand choke or automatic choke, depending on the selected option. Proceed as follows to start the Generators from the engine's control panel (see Chapter. 8.2.4 for starting using the remote control):

Requirements

- ✓ Electrical safety has been checked (see Chapter 5).
- ✓ The fuel tank is sufficiently full.
- ✓ 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.
- ✓ if necessary the existing exhaust hose (special accessory) is attached.
- ✓ all power consuming equipment is 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.

⚠ 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

Fig. 7-2 Engine start on control panel

Manual choke

1. Pull the choke lever 1 out to the stop.
2. Turn the engine start switch 2 to the right stop in the "START" position.
   The engine starts.
3. Release the engine start switch and it will spring back into the "ON" position.
4. Slowly press the choke lever in 1 until it is fully back in.

The engine has started.

Automatic choke

1. Turn the engine start switch 2 into the "ON" position.
   The automatic choke's servo motor starts to move.
2. Wait until the servo motor stops buzzing.
3. Turn the engine start switch 2 to the right stop in the "START" position.
   The engine starts.
4. Release the engine start switch and it will spring back into the "ON" position.

The engine has started. The choke will automatically reset back to its start position.

If the automatic choker fails, you can operate the cold start device as described under manual choke.

NOTICE!

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

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).

NOTICE!

If the warning light on the control panel lights up during the start process, 4 then the engine's oil level is too low. The automatic low-oil system prevents the motor from starting.

► First refill up to the engine oil level (see Chapter 9.4.1), before you restart the engine.

7.4 Turning off your power generator

Proceed as follows to switch off your generator:

Requirements:

✓ All of the connected consumers must be disconnected or switched off

⚠ 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.

Switching the generator off

Proceed as follows to switch off your generator:

1. Continue to run the engine without load for about two minutes.
2. Turn the engine switch (Fig. 7-2) up to the left stop in the "OFF" position. Special aspects must be taken into consideration (see Chapter 8.2.4) for a remote start.

The engine comes to a standstill and the generator is switched off.

An electric fuel cut-off valve automatically closes the fuel supply line and this secures the generator against leaking fuel.

⚠ DANGER!

Explosion hazard due to escaping fuel or fuel vapours.

A risk of suffering severe even deadly burns.

► Do not leave the engine start switch in the "ON" position after switching off the engine so that the electric shut-off valve can interrupt the fuel supply.

► Set the motor start switch, at the latest after the end of operation or **BEFORE** transporting, into the "OFF" position.

7.5 Turn off your generator in the event of an EMERGENCY

Your Generators is fitted with an EMERGENCY-STOP smash button, (this depends on the version) 1. It enables you to immediately switch the device off in an EMERGENCY.

⚠ 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 7.4 .

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.

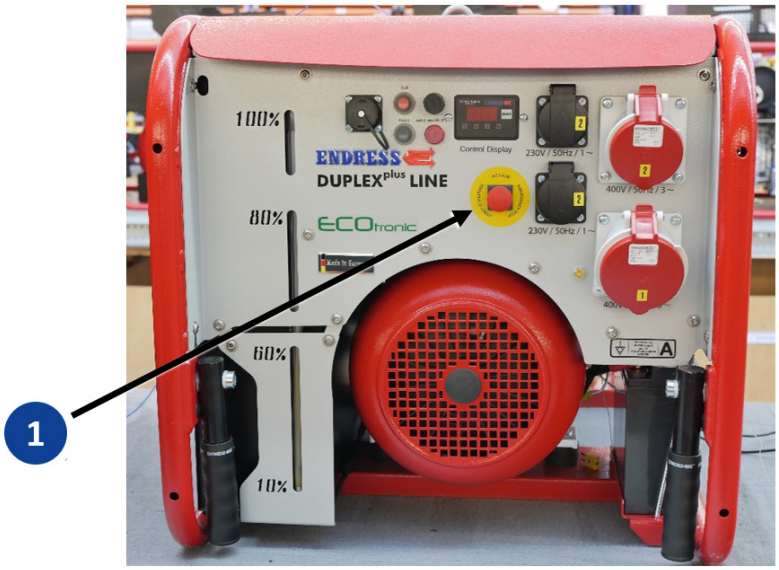


Fig. 7-3 EMERGENCY-STOP smash button

EMERGENCY-STOP

1. Push down or hit the EMERGENCY-STOP's 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 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 .

7.6 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.

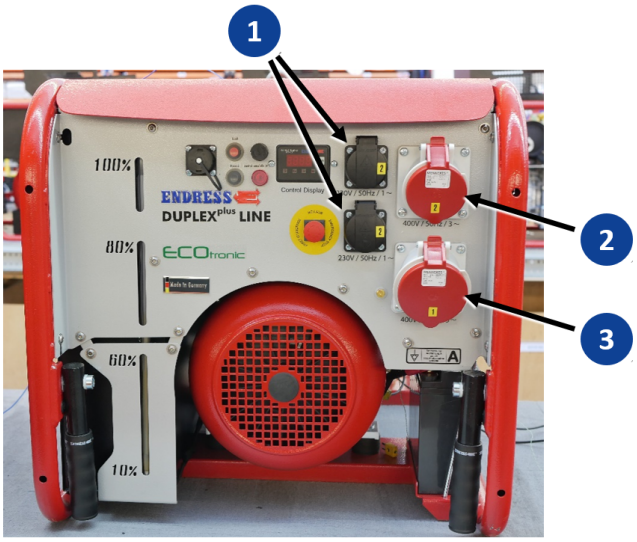


Fig. 7-4 Connecting up the consumers

You can connect up consumers with Schuko or CEE plugs to the following sockets:

1	Schuko attachment sockets 230V / 16A / 1~
2	CEE socket for 400V / 16A / 3~
3	CEE socket for 400V / 32A / 3~

Proceed as follows to connect up one consumer to your Generators:

Requirements:

- ✓ Generators It is started and brought up to operating temperature (see Chapter 7.3)
- ✓ All power consuming equipment is disconnected or switched off.

Connecting up the consumers

1. Fold up the splash guard by the relevant socket on the control panel.
2. Insert the plug on the power consuming equipment to be connected all the way into the socket.

The consumer is now to the generator and ready to use.

IMPORTANT INFORMATION
REGARDING
CONNECTING UP
THE CONSUMERS

Your generator is designed for mobile use and according to the protective measure

Protective separation with potential equalisation

designed according to DIN VDE 0100-551:2017-02 (HD 60364-5-551 + A11: 2016-05)

. This measure works without protective earthing. If a single consumer is being used, then no flow through the body ("electric shock") is possible in the event of an insulation fault. However, if more than one consumer is connected up then life-threatening body current is possible if a so-called "second fault" occurs.

⚠ DANGER!

Risk of dangerous contact voltages occurring when several consumers are used from a single generator.

Risk of electric shock with life-threatening or fatal consequences.

- ► You must comply with the following instructions for connecting up the consumables.
- ► Call in an electrician if necessary.

The above-mentioned safety standard differentiates between commissioning by a qualified electrician and commissioning by an untrained person. There are two options available for the untrained person:

1) **connection of a single piece of equipment to the generator**

   In this case it is not necessary to check the electrical safety (see Chapter “Electrical safety“ in the operating instructions) beyond the protective measures. The protective conductor of the ground contact socket assumes the function of the potential equalisation line. **This case expressly excludes use of a power distributor (multiple socket).**

2) **connection of one or more pieces of equipment to the generator**

   In this case the above-mentioned standard requires one of the following additional protective measures:

   a) protective separation with an insulation monitoring device (IMD) and automatic shut-off

   b) Protective separation using a residual current protective (RCD) and automatic switching off. An **RCD or PRCD must be used for** each socket or power circuit. We recommend that an RCD type B is used for 3-phase networks.

⚠ CAUTION!

Danger due to malfunctioning of the protective measures against hazardous shock voltages with an extended supply network!

- ► Keep the length of the connecting line as short as possible.
- ► Use as few sub-distributions as possible.
- ► Take note of the table below.

Line	max. Line length	Unit
H07RN-F (NSH öu) 1.5 mm^2	60	m
H07RN-F (NSH öu) 2.5 mm^2	100	m

8 The device in-use

8.1 Using the ECD 02 control display

The control displays allow one to display the various operating states of the generator. The display starts automatically as soon as the generator has started.

Fig. 8-1 Control Display ECD 02

1. After starting the generator the display shows the current voltage, 1 which is indicated by the illuminated "V~" symbol for volts.
2. Pressing of the button once will 2 change the display over to the current frequency, which is indicated by the illuminated "Hz" symbol for Hertz.

The display has been switched over to Frequency.

1. Pressing the button again will 2 change the display over to the operating hours, which is indicated by the illuminated "h~" symbol for hours.

The display has been switched over to Operating hours.

1. Further pressing of the button 2 causes the voltage to be displayed in Volts and the sequence begins from the beginning.

The display has been switched over to Volts.

8.2 Optional fittings

The following chapter describes the function and operation of optional equipment features that you either ordered from the factory or purchased later on as accessories. Use your order documents to check which options were fitted to your gen set.

8.2.1 ECOtronic (idle down)

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

Requirements

- ✓ Generator is ready for operation
- ✓ The generator is started (see Chapter 7.3)

Switching on ECOtronic

Switch the idle engine speed reduction as follows:

1. Move the rocker switch Fig. 6-5 -11 into the "I“ (ON) position.

Idle down is activated.

NOTICE!

Idle down is activated as soon as the engine starts and it reduces the engine speed to approx. 1,800 min^{-1}. The engine speed will be immediately increased up to the nominal speed as soon as a consumer is switched on. The engine will continue to run for 40 seconds at the nominal speed after the consumer has been switched off or disconnected, before the speed is reduced to approx. 1,800 min^{-1} again.

The motor always runs in the nominal speed range if the rocker switch is in the “0” OFF position.

Turning off ECOtronic

Switch the idle down off as follows:

1. Move the rocker switch Fig. 6-5 -11 into the “0” (OFF) position.

Idle down is switched off.

NOTICE!

If the engine's speed is not reduced despite the ECOtronic being switched on and after the consumer being completly switched off, you must check the state of the fuse Fig. 6-5 12.

8.2.2 Residual current circuit breaker (RCD)

The residual current circuit breaker (RCD) serves as a protective measure against dangerous body currents in compliance with DIN VDE 0100-551. This version of the generator according to DGUV information 203-032 is classified as a Version C generator for commissioning and operation on building and installation sites and it has the following marking:

It is essential to observe the regulations and safety instructions of the DGUV information 203-032 mentioned in order to achieve body protection for all persons working in the connected distributor network.

We strongly recommend that you also comply with the requirements of DGUV Information 203-032 for other purposes.

⚠ 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 .

The operating personnel must press the test button on the residual current protection device (RCD) (Fig. 8-2 2) before every start to check the mechanical release function.

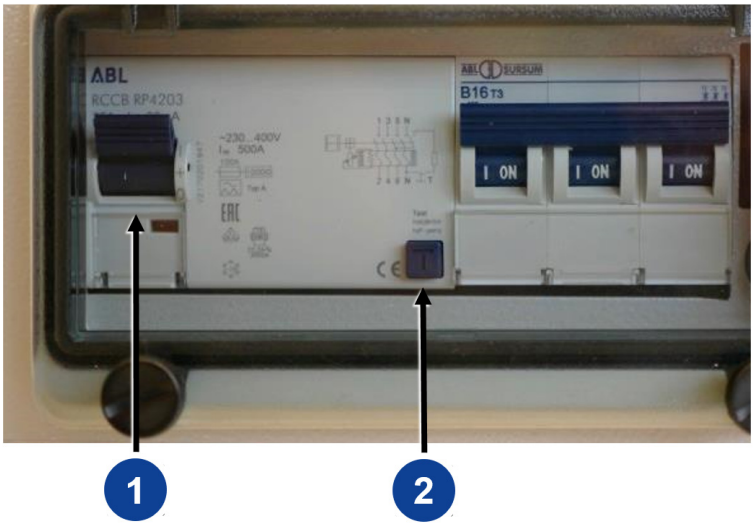


Fig. 8-2 FI circuit breaker (RCD)

Testing the RCD

✓ The generator is running

1. Move the FI circuit breaker Fig. 8-2 1 into position.
2. Press the test button Fig. 8-2 2 .

The switch position Fig. 8-2 1 indicates the result:

Symbol	Significance
Pos. I	Circuit breaker does not trip out. FI circuit breaker is defective.

Symbol	Significance
POS 0	Protection switch triggers. FI circuit breaker is working correctly.

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

1. Circuit breaker Fig. 8-2 -1 Move the circuit breaker back into POS I in order to be able to operate consumers from the generator again.

8.2.3 Insulation monitoring, with switching off

The insulation monitoring serves to provide electrical safety of the generator as well as all connected consumers and cable connections during continuous operation.

NOTICE!

The operating personnel must check the function before every start-up by pressing the insulation monitoring test button (see Chapter 5 Checking the electrical safety as well).

Proceed as follows to test the insulation monitoring function:

Requirements:

✓ The generator has started and is running

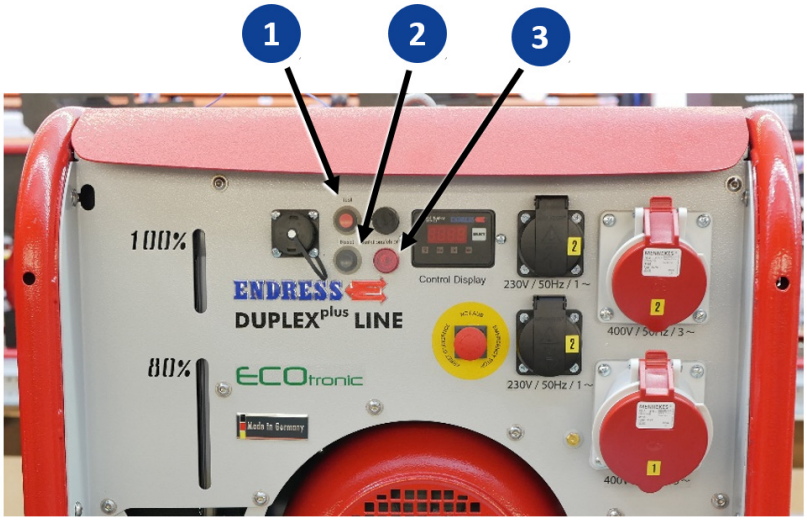


Fig. 8-3 Insulation monitoring

1. Disconnect all of the consumers from the generator's sockets.
2. You must ensure that all of the line circuit breakers (see Fig. 6-4 9 and 10) are switched on (switch in POS I).
3. Press the test knob 1..

The lamp 3 and the position of the line circuit breaker indicate the result of the test:

Lamp	Result	Significance
lights up red	Line circuit breaker jumps to POS 0	Insulation monitoring is OK
stays off	Line circuit breaker remains in POS 1	Insulation monitoring is defective
stays off	Line circuit breaker jumps to POS 0	Lamp defective

The insulation monitoring function has been successfully tested.

1. The reset button must be pressed after testing (2) and the line circuit breaker (see Fig. 6-4 (9) and (10)) must be moved into Pos. 1, so that the device can be used again.

Insulation monitoring whilst running

With the following instructions you will learn how your generator detects an insulation fault of a connected consumable during operation and how it protects you.

Requirements:

✓ The generator has started and is running.

✓ Line circuit breaker is in POS I.

1. Use a socket to connect a consumer up to the generator.

The lamp (3) and the position of the line circuit breaker indicate the result of the test:

Lamp	Result	Significance
lights up red	Line circuit breaker jumps to POS 0	Consumer has an insulation fault (≤ 23kΩ)
stays off	Line circuit breaker remains in POS 1	Consumer does not have an insulation fault
stays off	Line circuit breaker jumps to POS 0	Consumer has an insulation fault (≤ 23kΩ) and the lamp is defective

If an insulation fault exists and the unit was previously OK when tested without a device connected (see above), the insulation fault has been caused by the device.

1. Use its operating switch to switch off the consumable.
2. Disconnect the consumer from the generator's socket
3. Press the reset button (2) to reset the insulation monitoring system.
4. Move the line circuit breaker into POS I.

Your generator is ready to use again.

⚠ WARNING!

Risk of touching surfaces that are live due to faulty insulation.

Danger of electric shock if a second insulation fault occurs.

- ► The relevant consumable is not to be used any more after an insulation fault has been determined.
- ► Secure the defective consumable effectively against reuse by third parties.
- ► Replace the consumer or have it repaired by a qualified electrician.

8.2.4 Remote start device

The remote start control enables you to start and stop your generator from a remote location using a cable remote control available as an accessory.

An optional emergency power supply that is available as an accessory can also be connected up in the same way. It enables the generator to be switched on and started automatically in the event of a power failure.

NOTICE!

Important information in the maintenance and operating manual of the additional components.

- ► Always observe the further instructions and handling guidelines in the documentation attached to these components.

Requirements:

- ✓ Generator is ready for operation.
- ✓ Engine start switch Fig. 7-2 2 is in the "OFF" position.
- ✓ All consumer are switched off or disconnected from the generator.

Connecting up a remote start device

Proceed as follows to connect up a cable remote control (not included in the package).

1. Unscrew the protective cap on the CPC remote start socket Fig. 6-4 2 in the counter-clockwise direction.
2. Insert the remote control's connecting cable plug correctly in the remote start socket.
3. Turn the plug's locking ring clockwise up to the stop.
4. Route the connecting cable securely up to the operating point.

Remote start device is ready for use.

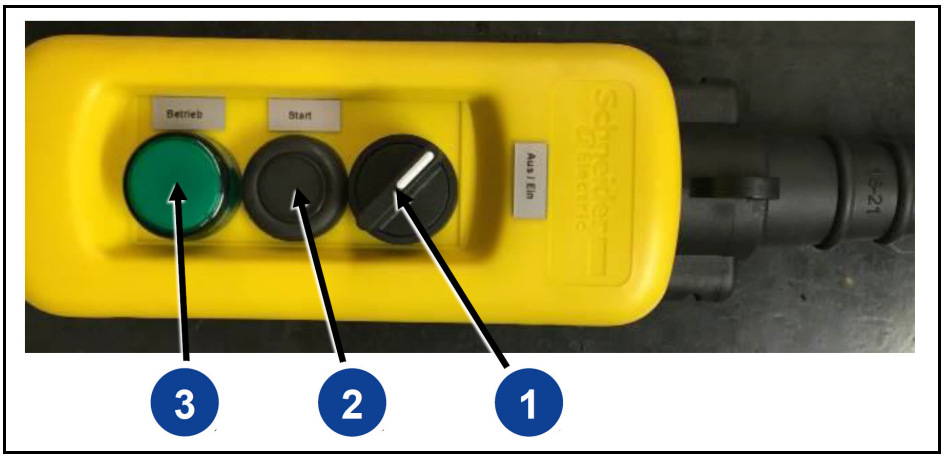


Fig. 8-4 Cable remote control

Start the engine using remote start

Proceed as follows to start the generator from the control panel on the cable remote control after connecting up as described above:

1. Turn the switch 1 into the "ON" position.
2. Press the "Start" button 2 until the engine starts up.
   The engine has started.
3. Release the "Start" button 2 .

The engine has started.

The operating control light 3 lights up.

NOTICE!

Only activate the starter briefly (max. 5-10 seconds). Never unclamp the starter battery when the engine is running.

When the remote start device is connected up, the generator can NO LONGER be switched off using the engine start switch Fig. 7-2 2 . Use the EMERGENCY-STOP smash button if an emergency occurs (see Chapter 7.5).

NOTICE!

If your generator is a remote start version, then it is fitted with an automatic choke for cold starting. You do not need to use the manual choke.

Switch off the engine using the remote start system

1. Switch off all of the consumers or disconnect them from the generator.
2. Let the engine run without a load for about two minutes so that it can cool down.
3. Turn the switch 1 into the "OFF" position

The generator is switched off.

The operating control light 3 has gone out.

NOTICE!

You must ensure that the generator's Fig. 7-2 engine start switch 2 remains in the "OFF" position. Otherwise the control circuit on the generator will still be energized which can cause the starter battery to discharge.

Disconnecting the remote start device

Proceed as follows to disconnect the cable remote control after the generator has been switched off:

1. Turn the plug's locking ring counter-clockwise until the lock is released.
2. Now pull out the cable remote control's plug.
3. Screw the protective cap back on the remote start socket in the clockwise direction.

The remote start device has been disconnected.

8.2.5 Using an exhaust hose

If you have purchased your generator with the optional exhaust hose, the silencer has a connection that enables you to channel the engine exhaust gases away from the generator's immediate vicinity.

⚠ 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!

The exhaust hose does not provide protection against toxic exhaust gases! The connection and version are not designed to be gas-tight.

Danger of asphyxiation or poisoning!

- ► Never use the exhaust hose to channel the exhaust gas away from rooms or pits.
- ► Only use an exhaust hose that has been approved by us.
- ► Never extend the exhaust hose.

Proceed as follows to connect up the optional exhaust gas hose to your generator:

Requirements:

- ✓ Generator is ready for operation
- ✓ The generator is switched off

Fig. 8-5 Connecting up the exhaust hose

Connecting up the exhaust hose

1. Push the mounting end of the exhaust hose onto the connection on the silencer.
2. Turn the exhaust hose clockwise until it comes up against the stop.

The exhaust hose is now connected up according to the regulations.

Proceed as follows to disconnect the exhaust hose from the generator:

Requirements:

- ✓ The generator is switched off
- ✓ The exhaust hose has cooled down sufficiently.

⚠ 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.

Disconnecting the exhaust hose

1. Turn the exhaust hose counter-clockwise until it comes up against the stop.
2. Use the handle to pull the exhaust hose away from the silencer's connection.
3. Put the exhaust hose down so that there is no risk of burns.

The exhaust hose is now connected up according to the regulations.

8.2.6 Wireless remote control

The remote start control enables you to start and stop your generator from a remote location using a radio aerial and a remote control that are available as accessories. The radio range in an industrial environment is approx. 30 m.

NOTICE!

Important information in the maintenance and operating manual of the additional components.

- ► Always observe the further instructions and handling guidelines in the documentation attached to these components.

Requirements:

- ✓ Generator is ready for operation.
- ✓ Radio aerial is connected up.
- ✓ All consumer are switched off or disconnected from the generator.

Fitting the radio aerial

Proceed as follows to connect up the radio aerial.

1. Unscrew the protective cap on the CPC remote start socket in the anticlockwise direction.
2. Insert the remote control's connecting cable plug correctly in the CPC remote start socket.
3. Turn the plug's locking ring clockwise up to the stop.
4. Align the radio aerial.

The radio aerial is now connected up and supplied with power by the generator's battery.

Use the remote control to start the engine

Proceed as follows to start the generator from the remote control after connecting up radio aerial as described above:

1. Press the “AUTO“ button on the control panel.
2. Press the start button on the remote control.
   The engine starts.

3. Release the start button.

The engine has started.

NOTICE!

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

Use the remote control to switch off the engine

1. Switch off all of the consumers or disconnect them from the generator.
2. Let the engine run without a load for about two minutes so that it can cool down.
3. Press the start button once again to stop the generator.

The generator stops.

NOTICE!

You must ensure that the generator's Fig. 6-4 engine start switch 3 remains in the "STOP" position. Otherwise the control circuit on the generator will still be energized which can cause the starter battery to discharge.

Disconnecting the radio aerial

Proceed as follows to disconnect the radio aerial after the generator has been stopped:

1. Turn the plug's locking ring counter-clockwise until the lock is released.
2. Now pull out the cable remote control's plug.
3. Screw the protective cap back on the CPC remote start socket in the clockwise direction.

The radio aerial has been disconnected.

9 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.

9.1 Maintenance plan

Maintenance work on the generator mainly concerns work 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.

You can find an overview of the time plan and scope of the required maintenance work in the following maintenance schedule.

Maintenance work		Maintenance interval according to time or operating hours [h]					
Item		**Every 8h /daily**	**First month / 20h**	**Every 6 months / 100h**	**Every year / 300h**	**Every 2 years / 500h**	**See Page**
Electrical safety	Check	X					23
Check the fitting of screws, nuts, and bolts	Check	X					
Engine oil	Check fill level	X					8(1)
	Change		X		X		8(1)
Engine oil filter	Change			Every 200 hours			9(1)
Air filter	Check	X					9(1)
	Cleaning			X(1)			9(1)
	Change					X	9(1)
	(1) More detailed information can be found in the operating instructions provided by the engine's manufacturer (2) Maintain more frequently if used in a dusty environment. (3) Maintenance work should be carried out by your service partner. (4) See the workshop manual						

Maintenance work		Maintenance interval according to time or operating hours [h]					
Item		**Every 8h /daily**	**First month / 20h**	**Every 6 months / 100h**	**Every year / 300h**	**Every 2 years / 500h**	**See Page**
Spark plug	Test, adjust				X		10(1)
	Change					X	10(1)
Spark protection	Cleaning				X		11(1)
Idle down	Test, adjust					X(3)	(4)
Valve play	Test, adjust					X(3)	(4)
Combustion chamber	Cleaning			Every 1,000 hours (3)			(4)
Fuel filter	Change				X (3)		(4)
Fuel line	Check		Every 2 years (change whenever necessary) (2)				(4)
	(1) More detailed information can be found in the operating instructions provided by the engine's manufacturer (2) Maintain more frequently if used in a dusty environment. (3) Maintenance work should be carried out by your service partner. (4) See the workshop manual						

Tab. 9-1 Generator maintenance plan

9.2 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 7.4 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".

9.3 Starter battery

9.3.1 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 9.3.2). 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 9.3.2).

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.

9.3.2 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.

⚠ 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.

The following requirements must be fulfilled before you begin changing the starter battery:

✓ The generator is turned off.

1. Pull the black pole protection cap off of the battery's negative terminal and THEN remove the black cable from the battery.
2. Undo both wingnuts Fig. 9-1 (1) so that the battery holder Fig. 9-1 (2) can be removed.
3. Pull the red terminal protection cap off the positive terminal of the battery and THEN loosen the red cable from the battery.
4. Remove the battery from the battery compartment.

The starter battery is now removed.

Fig. 9-1 Replacing the starter battery

1. Make ready a new starter battery (Observe the instructions from the battery manufacturer.
2. Place the starter battery in the battery compartment.
3. Attach the red cable to the battery's positive terminal FIRST and then pull the red protective cap over the terminal.
4. Refit the battery holder.
5. Attach the black cable to the battery's positive terminal LAST and then pull the black protective cap over the terminal.

The starter battery has been replaced. The generator can now be started.

9.4 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.

Honda recommends Engine oil for four-stroke engines which meets or exceeds the requirements for API service class SJ or higher. The second criterion is the appropriate Viscosity class which depends on the ambient conditions. HONDA recommends SAE 10W-30 or 5W-30 for general use. For start/operating temperatures between -15°C and -25°C use fully synthetic engine oil SAE 5W-30.

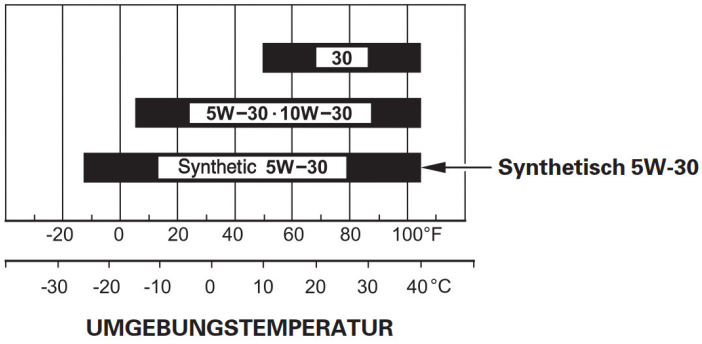


Fig. 9-2 Viscosity grade of engine oil (source: HONDA)

9.4.1 Checking the oil level

Your generator is fitted with an oil lack automatic switching off system to avoid engine damage occurring due to a low engine level. It has two functions:

1) it prevents the engine from starting for an inadequate engine oil level
2) it switches off the drive motor when the engine oil level falls below the minimum value while operating.

Check the engine oil level before every start in order to avoid delays and interruptions during operation.

Requirements

Ensure that the following prerequisites are met before you check:

✓ Ensure that the generator is mounted horizontally.

✓ Wait after previous operation for about five minutes before checking until the engine oil has gathered again in the oil sump to obtain a correct measurement.

⚠ 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.

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

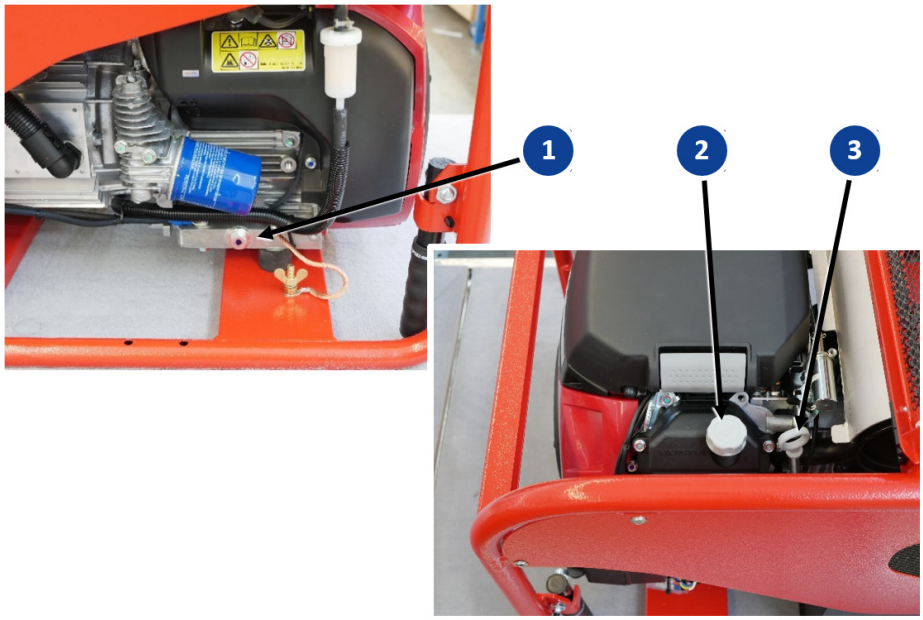


Fig. 9-3 Oil dipstick and oil drainage plug

1	Oil drain screw
2	Oil filling inlet
3	Oil dipstick

9.4.2 Changing the engine oil

The engine oil is subject to ageing and it must be changed periodically, depending on the operating conditions, in order to be able to fulfil its lubricating, cleaning and internal engine cooling tasks.

Binding information about replacement intervals (maintenance plan), the type of oil to be used and the exact procedure can be found in the accompanying operating and maintenance instructions provided by the engine manufacturer.

Requirements

Ensure that the following prerequisites are met before you change the engine oil:

- ✓ Place the generator in such a way that a suitable catching pan can be placed under the oil drain screw.
- ✓ Ensure that the generator is mounted horizontally.
- ✓ Wait after previous operation for at least five minutes before changing the oil to allow the oil to flow into the oil sump and for the engine oil to cool off.

⚠ 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.

10 Storage

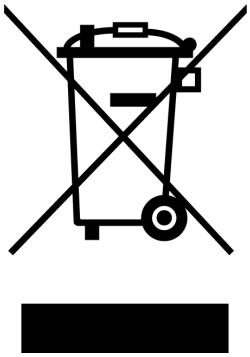
It is important to store the device at a suitable storage location as soon as your generator is no longer being used.

- 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.

11 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.

12 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
	Insufficient compression	Contact your service partner
The engine does not rotate	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 vent on the tank cover is blocked	Clean ventilation holes
The generator is running but there is no voltage at the sockets	Line circuit breaker has tripped out (Pos.0)	Eliminate the cause and switch the line circuit breaker back on (Pos.1)
	Insulation monitoring has tripped out	Eliminate the cause and switch the line circuit breaker back on (Pos.1)
	The alternator or cabling is defective	Contact your service partner
The generator is running but the output voltage is outside of tolerance	The engine speed regulator is wrongly adjusted or defective	Contact your service partner
	The electronic voltage regulator is wrongly adjusted or defective	Contact your service partner
	The load from the connected consumers is too high	Reduce the number of consumers or their load
The power output remains significantly below the nominal output	Operation under extreme climatic conditions	Adapt the usage for the climatic conditions or terminate it
	The generator has been poorly serviced	Perform maintenance work
	The generator has exceeded 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 or replace the air filter insert (always replace if oiled)
	The air filter insert (foam) is dirty	Clean the air filter insert and re-oil it
The generator is running with distinct speed and voltage fluctuations	The engine speed regulator is defective, the carburettor is wrongly adjusted or defective, ECOtronic is defective	Contact your service partner

Malfunction	possible cause	Correction
Idle down is not working	Fuse is blown	Replace the fuse
	The engine is still in the warm up phase	Wait until the engine has reached its operating temperature
	ECOtronic is defective	Contact your service partner
The generator cannot be switched off using the remote start device	The engine start switch on the generator must be in the "RUN" position	The engine start switch on the generator must always be in the "OFF" positon for a remote start

Tab. 12-1 Troubleshooting

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

Customer service: Tel. +49-(0)-7123-9737-44

Email: service@endress-generator.de

www.endressparts.com (see Chapter 14

Have the item and serial number of your device ready for identification. You will find these details on the type plate (see Fig. 3-2).

13 Technical data

The following table contains the technical data for your generator.

Name	Value				Unit
	ESE 1006 HG-GT ES Duplex	ESE 1006 DHG-GT ES Duplex	ESE 1306 DHG-GT ES Duplex	ESE 1506 DHG-GT ES Duplex	
Maximum power output [LTP] ~3 / ~1 [1)]	- /	/	/	/	[kVA]
Continuous power output [PRP] ~3 / ~1 [1)]	- /	/	/	/	[kVA]
Nominal power factor ~3 / ~1	- / 0.9	0.8 / 0.9	0.8 / 0.9	0.8 / 0.9	[cosφ]
Nominal frequency	50				[Hz]
Nominal speed	3,000				[min^{-1}]
Nominal voltage ~3 / ~1	- / 230	400 / 230	400 / 230	400 / 230	[V]
Nominal current ~3 / ~1	- /	/	/	/	[A]
Weight (ready for use)	162	151	165	165	[kg]
Tank capacity	20				[l]
Fuel consumption (at 75% load) about [2)]	4.3	4.3	5.4	5.4	[l/h]
Running time (at 75% load) about [2)]	4.7	4.7	3.7	3.7	[l/h]
Length	870				[mm]
Width	580				[mm]
Height	565				[mm]
Sound power level L_{WA} [3)]	97	97	97	99 [5)]	[db (A)]
Noise pressure level at the work-place L_{pA} [3)]	89	89	89	91	[db (A)]
Sound pressure level at a distance of 7m L_{pA} [4)]	72	72	72	74	[db (A)]
Alternator, system of protection	IP 54				

[1)] Measured under standard reference conditions

[2)] Average value; deviations might occur in specific cases, therefore they are non-binding

[3)] Measured at a distance of 1 m and a height of 1.6 m in accordance with ISO 3744 (Part 10)

[4)] Measured in accordance with ISO 3744 (Part 10), ECOtronic active

[5)] Does not conform to EU Guideline 2005/88/EC.

Tab. 13-1 Generator technical data

The information given in the table applies to the following operating conditions (standard reference conditions):

standard reference conditions

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

The usable power output can deviate from the nominal values depending on the actual operating conditions. The following table provides guide points:

Power reduction

Reference value	Power output reduction	for each additional
Setting up height above sea level	1%	100 m
Ambient temperature	4%	10°C

The following table states the valid operating conditions for operating the generator:

Ambient conditions

Name	Value	Unit
Setting up height above sea level	max. 2,000	[m]
Ambient temperature	-20 to +40	[°C]
Relative air humidity	max. 95, not condensing	[%]
Tilt angle	max. 20	[°]

14 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: +49 (0) 71239737-44

by email: service@endress-stromerzeuger.de

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“.

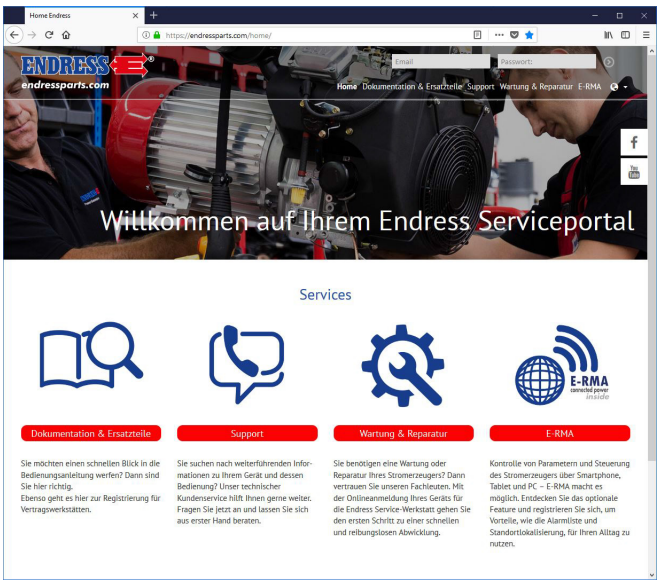
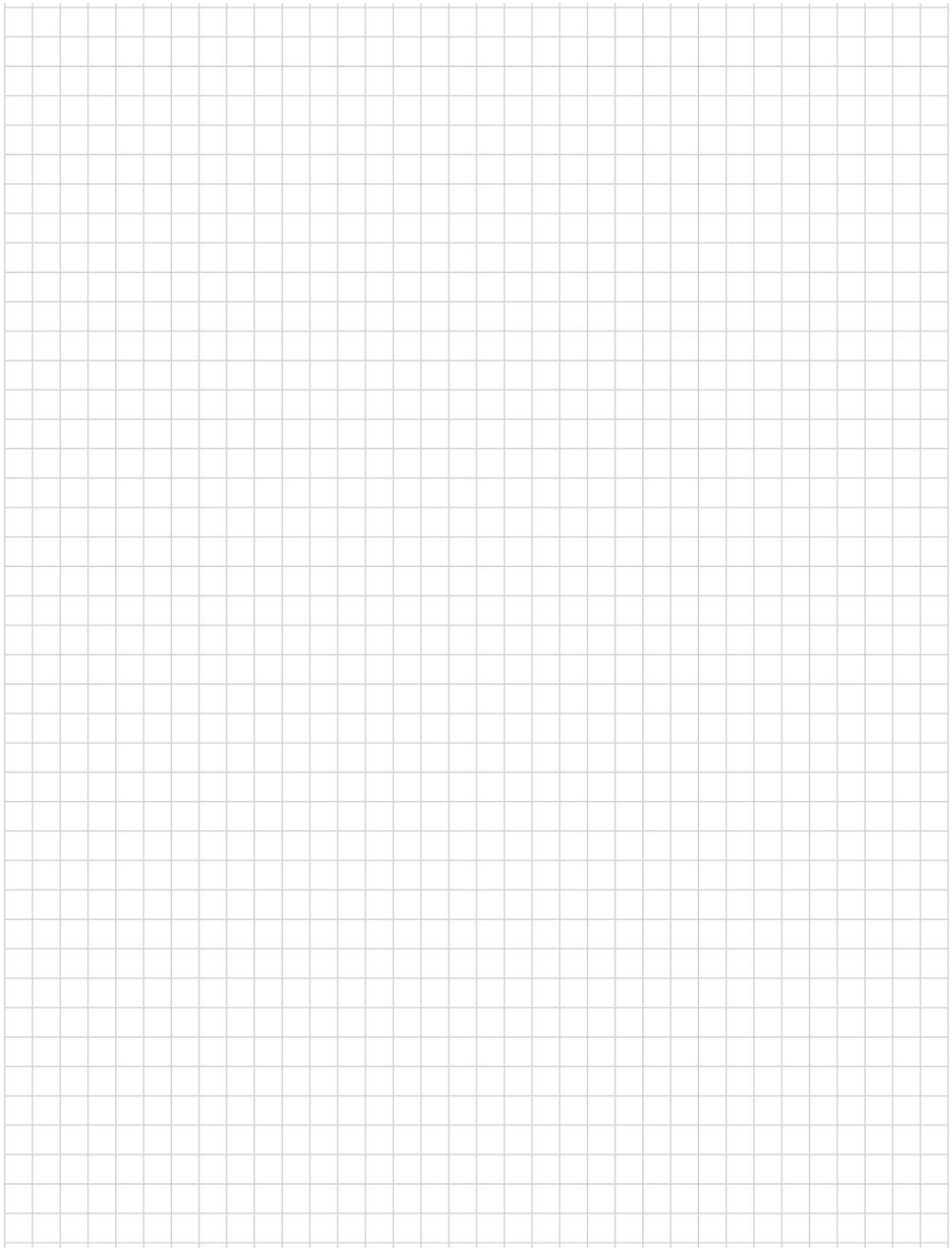


Fig. 14-1 Spare parts over endressparts.com

NOTES



15 Written guarantee

GARANTIEERKLÄRUNG

DUPLEX^{PLUS} STROMERZEUGER

Für die Stromerzeuger Produktserie DUPLEX^{plus} gibt der Hersteller ENDRESS Elektrogerätebau GmbH, 72658 Bempflingen eine Garantie auf die Funktionsfähigkeit des Stromerzeugers unabhängig und über die gesetzlichen Gewährleistungsbedingungen hinaus.

I. BEGINN UND DAUER DER GARANTIE

a. Die Garantie beginnt mit dem Datum des Kaufbelegs.
b. Die Garantie läuft 36 Monate ab Beginn unter der Voraussetzung, dass der Garantienehmer die vom Hersteller vorgeschriebenen Inspektionen und Wartungsarbeiten sowie die Verschleißreparaturen gemäß Absatz 2 dieser Garantiebedingungen durch den Garantiegeber oder einer autorisierten Servicewerkstatt ausführen lässt.
c. Für die Durchführung von Garantieleistungen ist es erforderlich, dass zusammen mit dem Stromerzeuger folgende Unterlagen eingeschickt werden: Kopie des Kaufbelegs, Wartungsbuch (siehe Betriebsanleitung)

II. INSPEKTION, WARTUNG, VERSCHLEIßREPARATUREN, BETRIEBSSTUNDEN

a. Durch Nutzung des Stromerzeugers anfallende Verschleißreparaturen sind unverzüglich beim Garantiegeber oder einer autorisierten Servicewerkstatt ausführen zu lassen.

b. Weiterhin sind alle Wartungsintervalle für den Stromerzeuger und dessen Antriebsmotor einzuhalten. Die Wartungsintervalle finden Sie in der Betriebsanleitung. Die Wartungen sind im Wartungsbuch ordnungsgemäß zu dokumentieren.

c. Diese Garantie bezieht sich auf einen Zeitraum von 36 Monaten oder 3.000 Betriebsstunden. Mit Erreichen der 3.000 Betriebsstunden erlischt diese Garantie, auch vor Ablauf der 36 Monate ab Kaufdatum.

III. LEISTUNGSUMFANG DER GARANTIE

Im Garantiefall werden nach Wahl von ENDRESS die fehlerhaften Teile ersetzt oder repariert. Für ersetzte oder reparierte Teile wird nur innerhalb der für den Stromerzeuger insgesamt geltenden, ursprünglichen Laufzeit Garantie gewährt. Eine Verlängerung der Garantiezeit findet durch den Garantiefall nicht statt.

Erfüllungsort der Garantie ist in jedem Fall Bempflingen, bzw. eine der autorisierten Servicewerkstätten. Die Garantieleistung umfasst die Material- und Arbeitskosten. Darüber hinausgehende Kosten, wie Reise- und Übernachtungskosten, Kosten für Visa, Lieferkosten für Ersatzteile, Zollgebühren und Ähnliches sind vom Garantienehmer zu tragen. Die Garantieleistung ist in jedem Fall auf den Zeitwert des Stromerzeugers bei Eintritt des Garantiefalles begrenzt.

Von der Garantie ausgenommen sind:

a. Teile, die nicht ursprünglicher Bestandteil der Lieferung von ENDRESS sind bzw. nachträglich ohne Zulassung von ENDRESS eingefügt wurden

b. Teile, die infolge eines von außen einwirkenden Mangels oder Umstands ihre Funktionsfähigkeit verlieren (dazu zählen u.a. unsachgemäße Handhabung, höhere Gewalt, und weiteres)
c. Fehler durch eine unsachgemäße Reparatur, die der Garantiegeber nicht ausgeführt hat, durch unsachgemäße Behandlung des Stromerzeugers oder dessen Komponenten, insbesondere durch Nichtbeachtung der Betriebsanleitung
d. Verschleißteile, Betriebs- und Hilfsstoffe wie z. B. Kraftstoffe, Chemikalien, Filtereinsätze, Zündkerzen, Anlasser, Einspritzpumpen und –düsen, Öle, Fette und sonstige Schmiermittel sowie Kleinmaterialien (Schrauben, Klemmen und dgl., Aufzählung nicht abschließend)
e. Folgeschäden aus garantiebedingten Schäden, die nicht unverzüglich behoben worden sind (u.a. Mietausfall oder -aufwand, etc)
f. Kosten für Inspektionen und Wartungsarbeiten und für Verschleißreparaturen

IV. ERLÖSCHEN DER GARANTIE

Die Garantie erlischt, wenn:

a. die Verschleißreparaturen sowie Inspektionen und Wartungsarbeiten nicht gemäß Absatz 2 dieser Garantiebestimmungen beim Garantiegeber oder einer autorisierten Servicewerkstatt ausgeführt worden sind.
b. der Stromerzeuger unsachgemäß und nicht für den vorgesehenen Zweck eingesetzt wurde
c. die im Absatz 2 genannten Betriebsstunden vor Ablauf der 36 Monate überschritten wurden

ENDRESS WARTUNGSANLEITUNG

Modell _____

Baujahr _____

Seriennummer _____

Kaufdatum _____

Durchgeführte Wartungsarbeiten Im ersten Jahr oder 1.000 Betriebstunden	
> Motor reinigen, Schrauben und Muttern überprüfen	
> Verbrennungsrückstände vom Zylinderkopf entfernen	
> Vergaser reinigen und einstellen	
> Ventilspiel überprüfen und einstellen	
> Luftfiltereinsatz reinigen gegeben falls ersetzen	
> Zündkerze reinigen gegeben falls ersetzen	
> Ölfilter wechseln (2-Zylinder Motoren)	
> Motoröl wechseln	
> Batterie prüfen (Modelle mit E-Start)	

Durchgeführt am: **Stempel Servicepartner:**

Modell _____

Baujahr _____

Seriennummer _____

Kaufdatum _____

Durchgeführte Wartungsarbeiten Im zweiten Jahr oder 2.000 Betriebstunden	
> Motor reinigen, Schrauben und Muttern überprüfen	
> Verbrennungsrückstände vom Zylinderkopf entfernen	
> Vergaser reinigen und einstellen	
> Ventilspiel überprüfen und einstellen	
> Luftfiltereinsatz reinigen gegeben falls ersetzen	
> Zündkerze reinigen gegeben falls ersetzen	
> Ölfilter wechseln (2-Zylinder Motoren)	
> Motoröl wechseln	
> Batterie prüfen (Modelle mit E-Start)	

Durchgeführt am: **Stempel Servicepartner:**

Bitte Beachten!
Die 36 Monate Garantie auf Ihren DUPLEX^{plus} Stromerzeuger (siehe Garantieerklärung) können wir Ihnen nur gewähren, sofern 1 x jährlich oder alle 1.000 Betriebsstunden eine Inspektion bei einem autorisierten ENDRESS - Servicepartner entsprechend der Wartungsanleitung erfolgte. Dies ist vom autorisierten ENDRESS – Servicepartner mit Stempel und Unterschrift zu bestätigen. Sollte eine solche Wartung nicht erfolgen, verkürzt sich der Garantiezeitraum von 36 Monaten auf die gesetzliche vorgeschriebene Gewährleistung.
Die Kosten der Inspektion und Wartung sind vom Eigentümer des ENDRESS – DUPLEX^{plus} Stromerzeuger zu tragen.

Bitte nicht vergessen!
Den Wartungsplan für die regelmäßigen Wartungen finden Sie in der Motorenanleitung.

ENDRESS Servicepartner finden Sie unter
www.endress-stromerzeuger.de

Keyword index

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