EN

ENDRESS®

Power Generators

Operating Manual

ESE 2000I

Article No. 110 005

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List of illustrations

General note:

The illustrations in these operating instructions do not always comply completely with the actual design, in particular with regard to the colour, and are to be considered a representation of basic principles.

Overview / first steps

Before operating the generator, read this manual thoroughly, especially its safety instructions.

This manual instructs you on basic work with the generator and helps you prevent hazards, repairs and defects.

Intended use

The generator is designed exclusively for private use and is not suitable for sustained commercial use.

The generator is for producing 230V alternating current at a frequency of 50 Hz and a nominal load of 1600 watts (for cos phi = 1; also see p. 34).

Included in delivery

First inspect the delivery (see Fig. 1):

1. Generator
2. Tool kit
3. Oil filling funnel
4. 12V charging cable

Is the delivery complete?

Is there visible transport damage?

If so, always contact your dealer. If there is transport damage, do not operate the device.

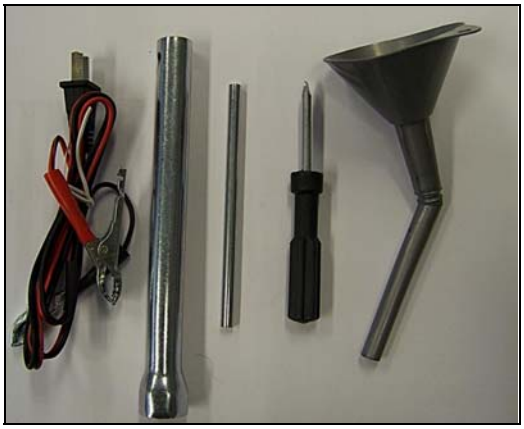


Figure 1: Included in delivery

Safety

This section describes the basic safety regulations for operating the generator.

DANGER!

High risk!
Failure to comply can cause injury or death.

CAUTION!

Moderate risk!
Failure to comply can cause property damage.

BEWARE!

Mild risk!
Instructions that must be observed when using the device.

General safety instructions

- Keep the operating manual at hand during operation.
- Always keep children and pets away from the power generator.
- Operate the device only on a level, non-skid surface. If necessary, secure the device further.
- Keep at a minimum safety distance of one metre from buildings or objects.
- It is forbidden to make technical changes.
- Repairs must be made only by a professional workshop. (Safety-related components must be replaced only with original replacement parts!)
- Do not operate the generator if it is visibly damaged.

DANGER! DANGER TO LIFE!

Shock hazard!

- Protect the device from dampness and moisture.
- Operation is only allowed when the device is dry. If the device becomes damp or wet while running, stop it immediately.
- Operation with existing power supply networks is prohibited.
- Do not grasp the electrical plug with wet hands.
- Make sure that the power supply cable does not come into contact with hot components of the generator and that the insulation is not damaged in this way.

DANGER! DANGER TO LIFE!

Asphyxiation hazard!

- Operation in closed rooms is prohibited.
- Always make sure there is adequate ventilation.

FIRE / EXPLOSION HAZARD!

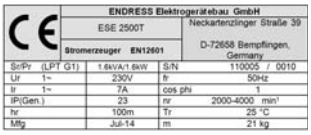
The generator becomes very hot during operation.

- It is forbidden to fuel the generator during operation or while it is still hot.
- Keep away from direct sunlight. Beware of petrol odours
- Wipe up spilled fuel completely before you restart the device.
- Allow the device to cool after use.
- Always make sure there is adequate ventilation.
- Use safety gloves.

Operating elements

Components of the electric generator

Figure 3: Labels on the generator

No.	Sign	Name	No.	Sign	Name
1		Nameplate	**4**		Caution: fire hazard
2		Read the operating manual	**5**		Caution: hot surfaces
3		Mind the noise level	**6**		Warning of dangerous electrical voltage

Components of the electric generator

Figure 4: Control panel

1	Red LED oil warning	7	Protective contact socket, 230V/~
2	230V green LED (230V outlet has voltage)	8	Choke
3	Red overload LED (230V outlet, no voltage)	9	12V circuit breaker =
4	ECOtronic On/Off	10	12V = outlet
5	On/Off switch	11	Potential equalization (only for special applications, specialist electrician required)
6	Fuel valve		

Figure 5: Components of the power generator - 2

1	Recoil starter	4	Spark plug (behind side panel)
2	Tank cap with air-release valve	5	Air filter (behind side panel)
3	Exhaust	6	Oil filling (behind side panel)

Function and mode of operation

The power generator makes use of inverter technology.

The generator generates a higher frequency voltage that is then rectified and electronically turned into an AC voltage of 230V/50Hz by the inverter.

This measure makes it possible to generate an output voltage with a constant frequency and voltage regardless of the engine speed.

In ECOtronic mode, it is possible to specify a load-dependent engine speed. The RPM varies between approx. 3500-4600 min^{-1} in this case.

The ECOtronic system can be deactivated for consumers with high switch-on currents (pumps, cut-off grinders, compressors, etc.). The engine speed is then approx. 5000 min^{-1}.

Operation

Transporting the generator

Requirements

- The generator is turned off
- On/Off switch in “Stop” position, Figure 4, No. 5
- Fuel tap in “Off” position, Figure 4, No. 6
- Fuel tank lid ventilation in “Off” position, Figure 5, No. 2
- The generator has cooled down
- Connection lines are disconnected.

DANGER!

The device may cause severe injury if it falls or slides away.

- Bear in mind that the device weighs approx. 21 kg.
- Place the device on a non-skid floor and secure it further (such as with tension straps).

DANGER!

Beware of petrol odours.

- If the generator contains motor oil or petrol, it must be transported only in upright position.
- Heat can vaporize the petrol in the carburettor and become an explosive gas.
- Intense shocks (during transport) can make petrol overflow into the carburettor.
- Carefully wipe up leaking fuel.

Carrying the device

1. Grip the device by the support handle.
2. Lift the generator.
3. Carry generator to place of use.
4. Set down the generator.
5. Let go of the handle.

✓ The generator has been carried to its work site.

Notes

Refuelling

Requirements

- the device must be shut off.
- a cooled down generator
- sufficient air supply/ventilation

DANGER!

Escaping petrol can burn or explode.

- Prevent petrol from escaping.
- The generator is switched off.
- The generator has cooled down.
- Avoid open flames and sparks.

CAUTION!

Escaping petrol can contaminate soil and groundwater.

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

CAUTION!

Using the wrong fuel will destroy the engine.

- Only use **lead-free ROZ 95 premium petrol**.

Figure 6: Refuelling

Refuelling the device

1. Set the fuel cock to the “OFF” position, Figure 4, No. 6
2. Unscrew tank cover.
3. Checking the fill level
4. Use the filling aids
5. Fill in petrol, no more than to the red marking (ring)
6. Screw on fuel cap.

✓ The device has now been refuelled.

Fill the generator with motor oil

Requirements
- the device must be shut off.
- a cooled down generator

BEWARE!

The generator is always delivered without motor oil.

- If the oil level is too low, the device cannot be started.

CAUTION!

Leaking engine oil can contaminate soil and groundwater.

- Do not fill the crankcase to the maximum (check the fill level with the dipstick).
- Use a filling aid.

CAUTION!

Using the wrong motor oil will destroy the motor.

Use SAE10W-40.

Do not mix any commercial additives into the oil, and do not mix different types.

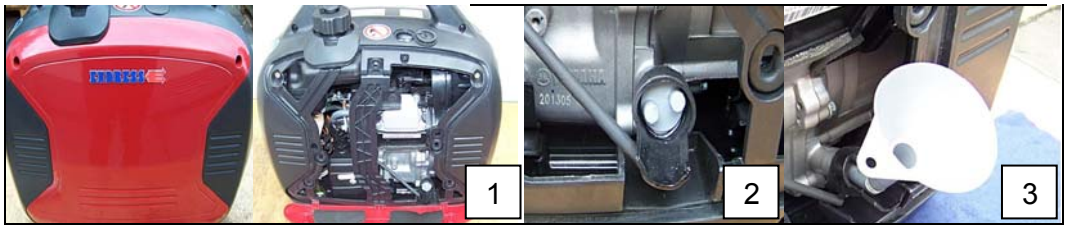
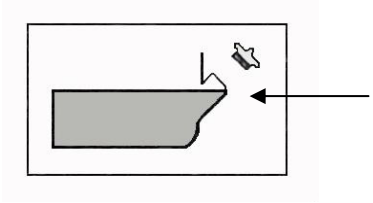


Figure 7: Refilling with oil

Fill the device with motor oil



1. Unscrew the side panel
2. Unscrew the sealing plug.
3. Insert the filling funnel into the filler opening.
4. Pour in oil (0.4l SAE10W-40) to right below the edge of the oil filling port.
5. Remove the filling funnel.
6. Repeat the filling process if the oil level is too low.
7. Screw the sealing plug in again.

✓ The device has now been filled with motor oil.

Starting the generator

Requirements The following requirements must be fulfilled:

- Disconnect the appliance, and do not start the generator under load.
- There must be fuel in the tank.
- The oil level must be adequate (otherwise the oil warning light will come on and starting will not be possible).
- Sufficient ventilation must be available
- The power generator is located outdoors and on a flat and firm surface.

DANGER!

Operating fluids can burn or explode.

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

Starting the motor

1. Set the motor switch to “ON”, Figure 4, No. 5
2. Turn the fuel cock to the “OFF” position, Figure 4, No. 6
3. Turn the vent valve of the tank lid to the “ON” position, Figure 5, No. 2
4. Set the ECOtronic switch to the “OFF” position, Figure 4, No. 4
5. Pull the choke lever out, Figure 4, No. 8
   - Pull the choke lever out completely if the engine is cold.
   - If the engine is already warm, leave the choke lever in the home position or pull it out slightly.
6. Start the engine using the rope handle (one hand on the rope handle, other hand on the carrying handle of the power generator).

✓ The engine starts.

Wait until the engine runs smoothly. Depending on the external temperature, slowly bring the choke back to home position.

✓ Now the motor will run stably.

Note Don’t just let go of the starting cord after starting — guide it by hand into its original position.

Figure 8: Wire rope hoist

Connecting / disconnecting appliances

Proceed as follows to connect up consumers to the generator.

Requirements

- Completed warm-up phase
- If possible, turn the appliance off before connecting.

Figure 9: Protective contact socket

DANGER!

Electric shocks cause injury or death.

- The alternator may neither be connected to other energy distribution systems (e.g. public power supply) nor to other energy generation systems (e.g. other alternators).

All ordinary appliances with 230 V AC current (50 Hz) and a maximum output of 1,600 W can be used.

Connecting appliances

Appliances can be connected with a safety plug (230 V AC).

1. Switch the ECOtronic switch to the “ON” position.

- For appliances with high switch-on currents (pumps, cut-off grinders, etc.), leave the switch in the “OFF” position.

2. Flip the socket cover up.
3. Insert the plug into the socket.

✓ Appliance is connected.

Disconnecting appliances

Disconnect the appliances from the generator as follows:

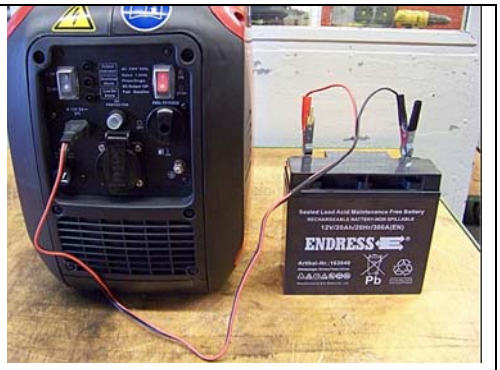
1. First, turn off the appliance, if possible.
2. Pull out the plug (never by the cord; always pull by the plug itself!).

✓ The appliance was disconnected.

Charging batteries

Requirements
- Completed warm-up phase
- Switch the ECOtronic switch to the “OFF” position.

The DC connection (Figure 4, No. 12) provides a DC voltage of 12V/8A to charge 12V batteries.



DANGER!

- Explosive hydrogen gas may escape during the charging process: Make sure that neither sparks nor an open fire may occur in the vicinity of the battery and the power generator during the charging process.
- Battery acid may harm the eyes and clothing. Avoid any contact and proceed with extreme caution.

1. Connect the red positive terminal to the positive (+) terminal of the battery.
2. Insert the 2-pin connector of the 12V charging cable into the 12V socket (Figure 4, No. 12).
3. Connect the black negative terminal to the negative terminal of the battery.

✓ Battery is charging

If a high capacity battery, a defective one or a fully discharged battery is charged, it may happen that the 12V circuit breaker trips (Figure 4, No. 10). The circuit breaker can be switched on again by actuating the pressure head.

Disconnecting battery

Disconnect the battery from the power generator as follows:

1. Disconnect the black negative terminal from the battery.
2. Remove the 2-pin connector of the 12V charging cable from the power generator.
3. Disconnect the red positive terminal from the positive terminal (+) of the battery.

✓ The battery is now disconnected

Switching the generator off

Turning the engine off

1. Set the “ON/OFF” switch to the “STOP” position, Figure 4, No. 5
2. If the device will not be used again in the next few minutes, set the fuel cock to the “OFF” position (Figure 4, No. 6) and slide the tank lid vent valve to the “OFF” position (Figure 5, No. 2).

✓ The device is now switched off.

Cleaning the generator

Requirements The following requirements must be fulfilled:

- the device must be shut off.
- a cooled down generator

Cleaning the device The power generator should be cleaned at regular intervals. Use a slightly moistened, lint-free cloth with some dish detergent. Make sure that no liquid can get inside the generator.

Decommissioning / storing the generator

Requirements

- Dry, ventilated and dust-free room
- A cooled down generator
- The tank lid vent valve as well as the fuel cock are in the “OFF” position

Storing the device (3-8 weeks)

1. If the generator contains motor oil or petrol, it must be stored only in horizontal position.
2. It is best to cover the generator with a cloth.
3. If the generator is used very seldom, after a long period, starting problems may arise. This can be prevented by operating it weekly at idle for 15 minutes.

✓ The device is now in storage.

Decommissioning the device (more than 8 weeks)

If the device will not be used for an extended period, the motor oil and the petrol must be drained. It is best to cover the generator with a cloth.

✓ The device is now decommissioned.

Maintenance

Maintenance plan

The maintenance work specified in this summary must be carried out after the indicated time intervals.

Maintenance work		Time interval in operating hours [h]			
		before each start	every 50 hours or 3 months	every 100 hours or 6 months	every 300 hours or every year
Motor oil	check	X			
	change			X(4)	
Air filter	check		X		
	clean / replace			X(1)	
Spark plug	clean / check gap			X	
Valves	test / adjust				X(3)
Spark catcher	check/ clean			X	
Fuel filter	check/ clean				X
Check fit of screws and bolts		X(2)	X		
Check / replace the fuel lines					X(3)
Check the protective conductor connection		every 2 years(3)			

1) In dusty environments, every 10 hours
2) After first operation
3) Only by an authorized professional workshop
4) For the first time after 20 operating hours

BEWARE!

Before the generator is maintained or cleaned, it must cool off.

The power generator should generally be cleaned at regular intervals - depending on the operating environment.

Motor oil

Requirements

- The generator must be on level ground.
- The motor must not be hot, but should ideally be slightly warm.
- Place a small pan or rag under the screw plug or dipstick, in order to catch the escaping oil.
- Included tools

CAUTION!

Leaking engine oil can contaminate soil and groundwater.

- use an oil collecting tray
- recycle used engine oil.

DANGER!

Engine oil can be hot — risk of burns.

- allow engine to cool down

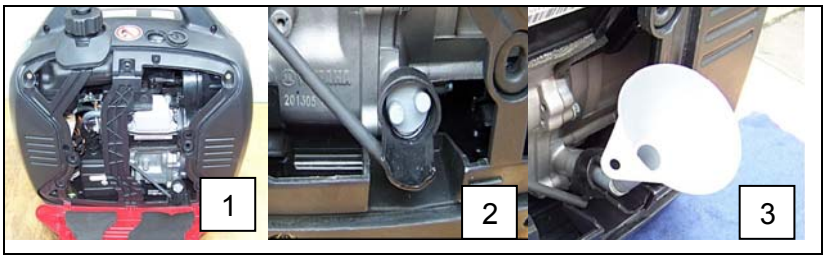
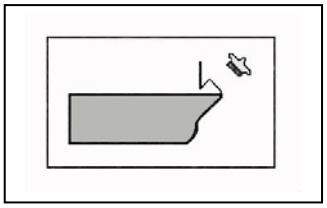


Figure 10: Checking the engine oil

Checking the oil level

Check the oil level as follows:



1. Unscrew the side panel
2. Unscrew the sealing plug.
3. The oil has to reach up to right below the edge of the filler hole.

✓ The oil level has been checked.

Adding oil

Proceed as follows to add oil (grade SAE10W-40):

1. Unscrew the sealing plug.
2. Insert the filling funnel into the filling port.
3. Add more oil so that it reaches up to right below the edge of the filler hole.
4. Screw the sealing plug in again.

✓ The oil has been topped off.

Draining the oil

Proceed as follows to drain the oil:

1. Set up an oil collection container to catch the draining oil.
2. Unscrew the sealing plug.
3. Tilt the power generator in the direction of the sealing plug so that the oil can escape completely.
4. Screw the dipstick and oil drain plug back in.
5. Use a rag to wipe away the remaining oil.

✓ The oil has been drained.

CAUTION!

When the generator is tilted, petrol can escape from the carburettor's overflow.

- Carefully wipe up it up.

Air filter

Requirements

- The motor must be switched off and cooled down.
- Included tools

Cleaning the air filter

Proceed as follows to check the air filter:

1. Unscrew the side panel (See Figure 11).
2. Remove the air filter housing cover after loosening the screw (See Figure 11).
3. Remove the air filter insert carefully. Meanwhile, make sure that no dirt gets into the carburettor.
4. Carefully clean the air filter box and the lid with a slightly moist, lint-free cloth.
5. Clean the air filter insert with kerosene in a suitable container.

6. Pour some motor oil (SAE10W-40) onto the filter and cleanly distribute it. Press excess oil back out.
7. Re-insert the air filter, attach the housing cover and fasten it with a screw.

✓ The air filter has been cleaned.

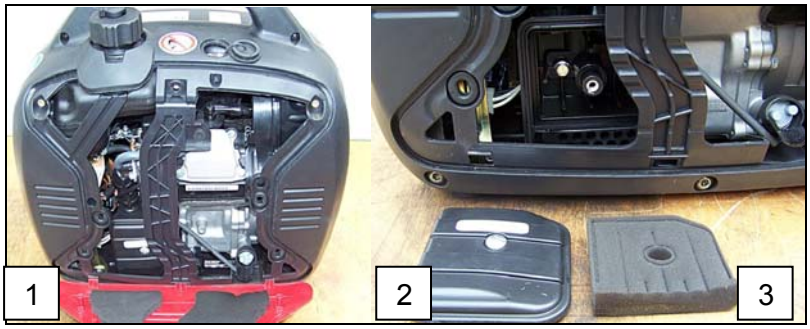


Figure 11: Air filter

Environmental protection Used or leftover fuels, lubricants and cleaning agents should be recycled according to the environmental regulations valid at the place of use.

Spark plug type Use only the following brand

- NGK BPR6HS

Requirements

- Included tool
- A cool motor

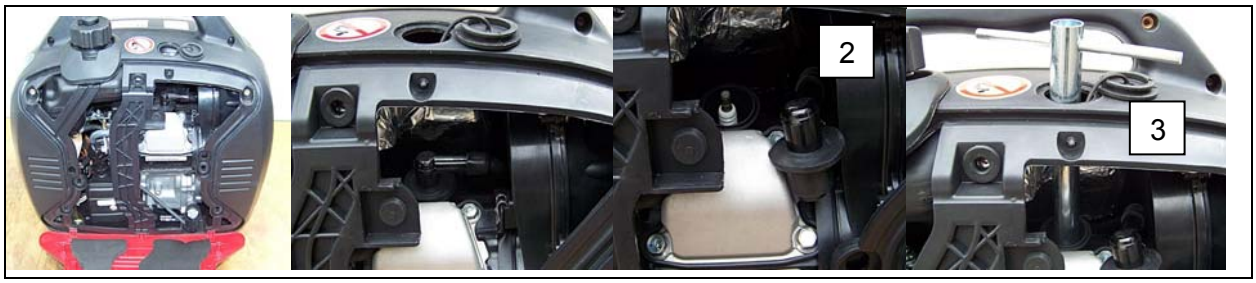


Figure 12: Spark plug

Checking the spark plug **Proceed as follows to check the spark plug:**

1. Pull the spark plug connector off the motor (see Fig. 12).
2. Apply the spark plug wrench (included).
3. Screw the spark plug out.
4. The spark plug should be light to dark brown.

CAUTION!

Check the electrode gap with a gauge. It should be 0.6 mm to 0.7 mm (see Fig. 17).

If the insulator's ceramics are damaged, the plug must be replaced.

If the plug is sooty or black, this means that the mixture is too rich (short-term operation, choke activated too long).

Clean the plug with a spark plug brush (copper wire!). A steel wire brush can destroy the plug under some circumstances.

Figure 13: Electrode gap

Checking the ignition spark

4. Connect the spark plug connector to the spark plug itself and push it onto the valve cover. Make sure that metal is in contact with metal so that an electrically conductive connection is possible.
5. Set the motor switch to "ON", Figure 4, No. 5
6. Pull the motor's starter cord and see if a strong ignition spark is visible.

If necessary, replace the spark plug.

7. Screw the plug back in by hand, and then tighten it with the spark plug wrench.

✓ The spark plug has been inspected.

BEWARE!

Grip the dry spark plug connector at the rear, as shown. Otherwise, there is danger of electric shock.

Cleaning the spark catcher

Requirements
- Included tool
- A cool motor
- Wire brush

Figure 14: Cleaning the spark catcher

1	Rear wall	3	Wire pad
2	Clamp	4	Sieve

1. Unscrew the rear wall
2. Loosen the clamp on the exhaust silencer
3. Remove the wire pad and the sieve
4. Clean the wire pad and the sieve with a wire brush and cleaning agent
5. Fasten the sieve and the wire pad with the clamp

✓ The spark catcher has been cleaned.

Troubleshooting

Malfunction	Possible cause	Correction
Engine does not start	No fuel	Check the fuel
	Fuel cock in the “OFF” position, Figure 4, No. 6	Set the fuel cock to the open ON position
	On/Off switch in “Stop” position, Figure 4, No. 5	Set the “On/Off” switch to the “ON” position
	Spark plug dirty or loose	Check and clean the spark plug Set the electrode distance, replace if necessary
	Tank lid vent valve (Fig. 5, No. 2) in “OFF” position	Set the tank lid vent valve to the “ON” position
	“Check Oil” indicator light illuminates after startup, Figure 4, No. 1	Check, add oil
No power from the AC outlet	Red “Overload” LED illuminated, Figure 4, No. 3 The power generator was overloaded	Turn off the power generator Check the connected load of the appliances / consumers and reduce, if necessary Restart the power generator
Power generator stops during operation	No fuel	Check the fuel
	Lack of oil	Check, add oil
	Tank cover vent valve (Fig. 5, No. 2) in “OFF” position	Set the tank lid vent valve to the “ON” position
No voltage on the 12V socket, Figure 4, No. 12	Charging current too high Circuit breaker 12= has tripped, Figure 4, No. 10	Note battery charging advice on page 18 Activate circuit breaker (Figure 4, No. 10) again

If the generator still does not work, take it to an authorized service facility.

Technical specifications

Name		Unit
Type	ESE 2000 I	
Max. output	2000	[W]
Nominal output	1600	[W]
Nominal frequency	50	[Hz]
Nominal speed	3500-4600/5000	[min^{-1}]
Rated voltage	230	[V]
Rated current	8.7	[A]
Weight (empty)	21.3	[kg]
Tank capacity (lead free regular grade fuel ROZ95)	4.3	[l]
Motor oil capacity (SAE10W-40)	0.4	[l]
Dimensions LxWxH	500×288×463	[mm]
Sound power level at workplace L_{pA} *	81	[db (A)]
Acoustic pressure level at 7m L_{pA} **	69	[db (A)]
Sound level (LWA)	89	[db (A)]
Protection Class	IP23	

* measured at a distance of 1 m and a height of 1.6 m in accordance with ISO 3744 (Part 10)
** measured in accordance with ISO 3744 (Part 10)

Explanation of the model plate

CE	ENDRESS Elektrogerätebau GmbH	
	ESE 2000I	Neckartenzlinger Straße 39 D-72658 Bempflingen, Germany
	Generating set ISO 8528	

Pr (LTP)	1.6 kW	S / N	110 005 / …..
cos φr	1.0	fr	50Hz
Ur 1~	230 V	Ir	7 A
IP	23	hr	100m
Tr	25°C	Class	G1
Mfg	…..	m	21,3 kg

Nominal output in kW	Art. No. – ID* / serial number
Nominal output factor	Nominal frequency in hertz
Nominal voltage in volts	Nominal current in amperes
International protection class	Setup altitude (reference ISO3046-1)
Temperature (reference ISO3046-1)	Design class
Production year	Mass in kilograms

Declaration of Conformity

CE EG-Konformitätserklärung Declaration of Conformity	ENDRESS Power Generators	Declaration de conformité européenne Declaración de conformidad

Name und Anschrift der Person, die die technischen Unterlagen aufbewahrt Name and adress of the person who keeps the technical documentation Nom et adresse de la personne qui garde la documentation technique Nombre y direccion del encargado de la documentacion tecnica	David Leitze ENDRESS Elektrogerätebau GmbH Neckartenzlinger Straße 39 D - 72658 Bempflingen

KRAFTSTROMGENERATOR

Power Generator , Generateur d´alimentation, Grupo electrogeno

Handelsbezeichnung Trade name Dénomination commerciale Nombre comercial	Artikel-Nr : Order-nr. Numéro d'article número del artículo
ESE 2000I	**Art.-Nr. : 110005**

erklären in alleiniger Verantwortung, dass obigesProdukt auf das sich diese Erklärung bezieht folgenden einschlägigen Richtlinien und Normen entspricht
declare under our sole responsibility that the product to which this declaration relates is in conformity with the following relevant regulations
declarons sous notre seule responsabilité, que le produit auquel se refère cette déclaration est conforme aux normes suivantes
declara bajo responsabilidad propia, que el producto al que se refiere esta declaración, es conforme a las siguientes normas o directrice

Angewendete Richtlinien	Angewendete Normen
2006 / 42 / EG	**EN 55012**
2004 / 108 / EG	**EN 60335-1**
2002 / 88 / EG	**EN 60204-1**
2000 / 14 / EG	**EN 12601**
2005 / 88 / EG	

einschließlich nachfolgender Änderungen und Ergänzungen
and subsequent modification and integrations
et aux modifications successives at intégrations
y sucesivas modificas y integraciones

Gemessener Schalleistungspegel LWA Measured sound power level LWA Niveau de puissance sonore mesuré LWA Nivel de potencia sonora medida LWA		Garantierter Schalleistungspegel LWA Guaranteed sound power level LWA Niveau de puissance sonore garanti en LWA Nivel de potencia sonora garantizada LWA	
89dB(A)	Art.-Nr. 110005	89dB(A)	Art.-Nr. 110005

Messverfahren entsprechend ISO 3744 (Teil10)
measuring procedure according to ISO 3744 (partl10)
procédé de repérage conformément à ISO 3744 (partl10)
el procedimiento de medición conforme a ISO 3744 (parte10)

Bewertungsverfahren zur Feststellung der Übereinstimmung nach 2000/14/EC Anlage VIII. (Benachrichtigte Stelle:)
conformity assesment procedure according to 2000/14/EC procedure VIII. (notified body)
procede d´evaluation de conformite 2000/14/EC procedure VIII. (organisme avise:)
Bewertungsverfahren zur Feststellung der Übereinstimmung nach 2000/14/EC Beilage VIII. (Benachrichtigte Stelle:)

European Commission
Directorate General Environment
Unit C.1 "Air, Noise & Transport"
BU-9 06/204 - B-1049 Bruxelles
Belgium

verantwortlich
authorized by
le responsable
el responsable

Bempflingen, 01.08.2014	Hans-Wilhem Braun Technischer Leiter

E06/005-01

Notes

Warranty provisions

For commercial use, the warranty period is six months from the date of purchase.

For warranty claims or replacement parts, please contact the dealer from whom the product was purchased.

Always be sure to include the following documents with your defective device:

- Proof of purchase (receipt or invoice)
- A description of the problem

Service – Hotline

Telephone: +49(0)71 23-9737-44

E-Mail: Service@endress-stromerzeuger.de

ENDRESS Elektrogerätebau GmbH Neckartenzlinger Straße 3 9 D 72658 Bempflingen

Telephone: +49-(0)-71 23-9737-0 Fax: +49-(0)-71 23-9737-1 0
E-mail: Info@endress-stromerzeuger.de www.endress-stromerzeuger.de

Environmental protection

The packaging material must be recycled according to the environmental protection regulations applicable at the place of use.

The workplace must be protected against contamination by leaking operating fluids.

Used or leftover fuels and lubricants must be recycled according to the environmental regulations applicable at the place of use.

Electrical and electronic appliances, as well as batteries, must not be discarded with domestic waste.

At the end of their service life, the user is required by law to hand over electrical and electronic devices, as well as batteries, to suitably equipped public collection facilities or to the place of purchase.

The symbol on the product, the operating instructions or the packaging refers to this.

Removable batteries must be removed from the devices and disposed of separately.

When you recycle, recover materials or otherwise reuse old devices, you make an important contribution to protecting the environment.