

# Operating instructions/ Spare parts list

Code 790 052 774



## Electrode Grinding Device ESG Plus

**GEORG FISCHER +GF+**



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## 0 About these instructions

To allow a quick understanding of these instructions and safe handling of the machine, all the warning messages, notes and symbols used in these instructions are presented here along with their meaning.

### 0.1 Warning messages


In these instructions, warning messages are used to warn you about the dangers of injury or material damage. Always read and observe these warning messages!

Warning symbol	Meaning
 <b>Danger</b>	Direct danger! Non-observance could result in death or critical injury.
 <b>Warning</b>	Possible danger! Non-observance could result in serious injury.
<b>Attention</b>	Dangerous situation! Non-observance could result in minor injuries or material damage.

Warning messages are always constructed according to a set pattern:

- Warning symbol
- Type and source of danger
- Possible consequences, explanation of the danger
- Restrictions (if applicable) (Display: ⊘)
- Measures to prevent danger (Display: ►)

## 0.2 Further symbols and displays

Symbol	Meaning
<b>Important Note</b>	Notes: Contain important information for comprehension.
	Instruction: You must observe this symbol.
1.	Request for action in a sequence of actions: You have to do something here.
▶	Single request for action: You have to do something here.
▷	Conditional request for action: You have to do something here, if the specified condition is met.

## 0.3 Abbreviations

Abbr.	Meaning
ESG Plus	Electrode Grinding Device

# 1 Safety notes

The Electrode Grinding Device (called ESG Plus in this document) is state of the art. Any other use than that described in these instructions can lead to injury to the user or other persons. In addition the device or other objects can be damaged.

## 1.1 Proper use

The ESG Plus is intended only to be used to process welding electrodes.

## 1.2 Safety regulations

- Only use the dimensions and materials quoted in these instructions. Other materials should only be used after consulting George Fischer's customer service department.
- Only use authentic George Fischer spare parts and materials.
- Check the ESG Plus daily for any externally visible damage or defects. Have any damage or defects repaired immediately.
- Work on the electrical equipment should only be carried out by a qualified electrician.
- Only operate the ESG Plus if the electrical protective devices function.
- Pull out the power plug before carrying out repair and maintenance work.

## 1.3 Work safely

"Play your part in ensuring safety at work."



- Report any changes in operating performance to the responsible person immediately.
- Carry out all work with an awareness of safety.
- When working with the ESG Plus, wear protective goggles, safety gloves and breathing mask.
- Turn the machine off at the end of each operating cycle.
- Before cleaning pull out the ESG Plus power plug and let the machine coast.



**Warning**

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### Danger of being injured

- ⊙ Keep hands away from the tool during processing.

Wear safety gloves.

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## **1.4 Waste disposal**

Use a suction unit or an industrial-type vacuum cleaner to collect the grinding dust.

## **1.5 Further safety regulations**

Observe country-specific regulations, norms and guidelines.

## 2 Construction of the product

### 2.1 Standard



- 1 Motor
- 2 ON/OFF switch
- 3 Identification plate
- 4 ESG Plus head
- 5 Fastening bolt head to motor

## 2.2 Accessories (optional)

### 2.2.1 Diamond grinding wheels



Exchangeable grinding wheel diamond-coated on both sides.

Version	Code
Standard	790 052 487
Rough	790 052 488

### 2.2.2 Cutting device



To cut tungsten electrodes to fixed length.

For electrode diameters 1,0; 1,6 and 2,4 mm (0.040; 0.060 and 0.095 inch).

Fixed cutting lengths: 12; 13; 15 and 17 mm selectable (0.470; 0.500; 0.600 and 0.670 inch). Other cutting lengths possible.

Code
790 052 513

### 2.2.3 Electrode holder



Without clamping collets.

Code
790 052 457

Clamping collets for electrode holder, see chapter 2.2.4, page 7.

### 2.2.4 Clamping collets

For the electrode holder.



Range [mm]	Range [inch]	Code
1,0	0.039	790 052 471
1,6	0.063	790 052 472
2,4	0.094	790 052 473
3,2	0.126	790 052 474
1,0 – 3,2	0.039 – 0.126	790 052 481

### 2.2.5 Wall/table/vice-mounting plate

Incl. 2 cylinder head screws (790 052 495).




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#### Code

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790 052 483

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### 2.2.6 Protective cover

Easy to adapt on the ESG Plus head.  
With integrated retainer for suction units.




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#### Code

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790 052 496

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## 3 Characteristics and range of applications

### 3.1 Characteristics

The ESG Plus is suitable for sharpening, plane grinding and cutting welding electrodes which are used in WIG or TIG welding machines.\*)

The ESG Plus has the following characteristics:

- Electrodes and tips are sharpened to conform to recognized standards
- Replaceable grinding wheel diamond coated on both sides
- ESG Plus head for different electrode angles and electrode diameter
- Machine:
  - hand-operated
  - optionally wall/table/vice mounting plate possible
- Working instruction:
  - the electrode is inserted by hand into the corresponding opening and is ground round by a manual circular movement
- Drive:
  - A/C motor with the R.P.M. controlled electronically

\*) Consider country-specific regulations, standards and guidelines when using tungsten electrodes with thorium.

### 3.2 Range of applications

Without refitting of the equipment.

Work area	Electrode diameter						
	ESG Plus	1,0 mm (0.04")	1,6 mm (0.06")	2,0 mm (0.08")	2,4 mm (0.09")	3,2 mm (0.13")	4,0 mm (0.16")
15°		x	x	x	x	x	x
18°		x	x	x	x	x	x
22,5°		x	x	x	x	x	x
30°		x	x	x	x	x	x

**Electrode material** Tungsten electrodes alloyed with zirconium, lanthanum and cerium.

**Important** Not to be used without suction for tungsten electrodes with thorium.

## 4 Technical data

Dimensions	Ø 65 x 350 mm Ø 2.560 x 13.780 inch
Weight complete with grinding wheel	approx. 1,4 kg
Power consumption	500 W
Voltage	230 V, 50/60 Hz 120 V, 50/60 Hz
Main supply cable	3 m 118 inch
Rotary speed	30.000 U/min (r.p.m.)
Power-on time	100 %
Noise level in the workplace*)	Idle running approx. 83 dB (A)
Vibration level according to EN 28662, Part 1	2,5 m/s <sup>2</sup>
Idle running of temperature development	10 min running time + 30 °C over running temperatur

\*) Sound pressure level measurement was carried out under normal operating conditions according to EN 23741.

## 5 Commissioning

### 5.1 Scope of supply

- ▶ Check the delivery for completeness and any transportation damage.
- ▶ Report any missing parts or transportation damage to your supplier immediately.

**Scope of delivery  
(subject to alterations)**

- 1 Carrying case (metal)
- 1 Torx key
- 1 ESG Plus (Motor 230 V, 50/60 Hz **or** 120 V, 50/60 Hz)

### 5.2 Transportation

The ESG Plus is a portable, hand-operated machine. Special transportation aids are not required.



**Danger**

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#### **Danger of death by electric shock**

Cut off the power supply before transportation.

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## 6 Operation

### 6.1 Switching on the ESG Plus

1. Connect the ESG Plus (consider main voltage).
2. Press the ON/OFF switch.

The ESG Plus starts.



### 6.2 Grinding the electrodes



**Danger**

#### Hot dust

#### Danger of injury to eyes

Only work with safety goggles.

Always wear a breather mask.

- ⊗ Do not use thorium-coated tungsten electrodes without a suitable suction devices or a suitable breathing mask.

**Note** Do not exert too much pressure on the grinding wheel, since otherwise the service life of the diamond wheel is shortened. The strength of the contact pressure, but even rotation of the electrode around its own axle and a small contact pressure of the electrode to the grinding produce a high sharpening achievement.



**Note** Use a rough diamond wheel during larger sharpening achievement.

### 6.2.1 Combination of grinding angle and electrode diameter



15°



18°



22,5°



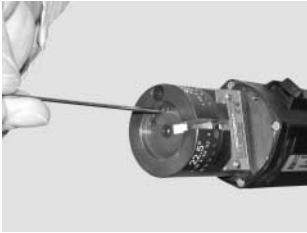
30°

### 6.2.2 Sharpening electrodes

1. Insert the electrode with the corresponding hole diameter and the desired angle until the grinding wheel is touched.
2. The electrode tip is sharpened evenly by turning the electrode slowly.

**Note** Slow and even rotating motion results in a good and exact sharpening result (longitudinal grind). If the electrode is not turned, then it is flat ground to the selected angle.

### 6.2.3 Surface-grinding the electrode tip



Precision ground point. Although able to grind flat land on tip.

- ▶ Insert the electrode (1,0 / 1,6 / 2,0 / 2,4 / 3,2 or 4,0 mm) through the openings at the front end onto the grinding wheel and square the electrode tip.

### 6.2.4 Cutting the electrodes to length

In order for the electrode rods to be used for e.g. orbital welding, or for manual welding, they have to be cut to length.

1. Insert the electrode into the lateral slot.
2. The electrode is cut evenly by turning the electrode slowly (optional cutting device for 12, 13, 15 and 17 mm, see chapter 2.2.2, page 6).



### 6.2.5 Switching off the ESG Plus

- ▶ Press the ON/OFF button.

The ESG Plus stops.



### 6.3 Replacing grinding wheels



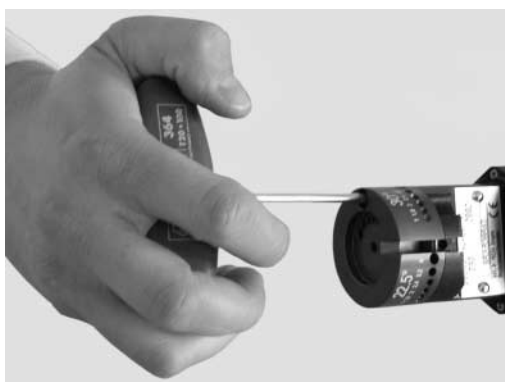
**Warning**

#### **Danger to injury to hands though unintentional activation of the ESG Plus**

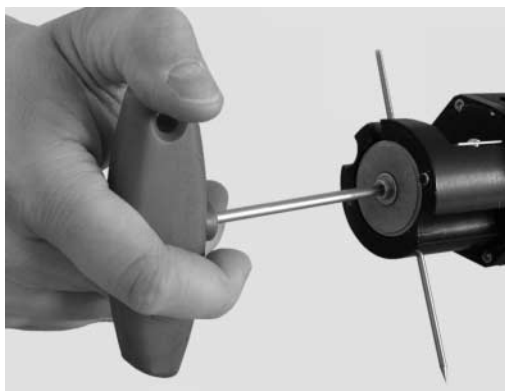
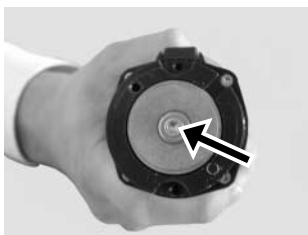
- ⊙ Do not switch on the ESG Plus while changing the grinding wheel.

Pull out the power plug.

1. Dismantle Torx screw with screwdriver.
2. Remove the ESG Plus head from the motor.



3. Slide a 2,4 mm pin through cross hole and motor shaft (rotation of the grinding wheel is prevented).
4. Loosen the screw at the ESG Plus head.
5. Loosen and remove the grinding wheel screw.
6. Turn the diamond wheel **or** insert a new wheel.
7. Insert the grinding wheel on the shaft.
  - ▷ The hole of the diamond wheel has to be inserted centrally on the motor shaft.



8. Tighten the Torx screw and assemble the ESG Plus head to the motor.

## 7 Maintenance



**Danger**

### **Danger of death by electric shock**

Before maintenance work remove the mains plug.

<b>Time</b>	<b>Activity</b>
Before starting work	<ul style="list-style-type: none"> <li>▶ The connection of the ESG Plus head to the motor has to be firm.</li> <li>▶ The device may not be moist and may not be used in a humid environment.</li> <li>▶ No unbalance in the grinding wheel may occur when the machine is switched on.</li> <li>▶ Check whether ESG Plus head and/or the Torx screw sit firm, if necessary tighten.</li> <li>▶ Check the power supply cable for damage.</li> </ul>
Weekly/daily	<ul style="list-style-type: none"> <li>▶ Remove dust from the inside of the housing, clean.</li> </ul>

## 8 What to do if...?

### 8.1 Fault elimination

Fault	Possible cause	Remedy
Motor of the ESG Plus does not run.	Power cable defective.	▶ Replace the power cable.
	Motor defective.	▶ Replace the motor.
The ESG Plus head does not stick.	ESG Plus head is not correctly fastened to the motor flange.	▶ Tighten the Torx screw.
The diamond wheel does not rotate.	No tension.	▶ Examine tension.
	Engine defectively.	▶ Replace the motor.
Unbalance of the grinding wheel when started up.	Grinding wheel mounted incorrectly.	▶ Tighten or replace the grinding wheel <b>immediately</b> .

### 8.2 Servicing/customer service

For ordering spare parts, see the separate spare parts list.

For the resolution of faults, please contact your branch office directly. You will find the addresses on the back page of these instructions.

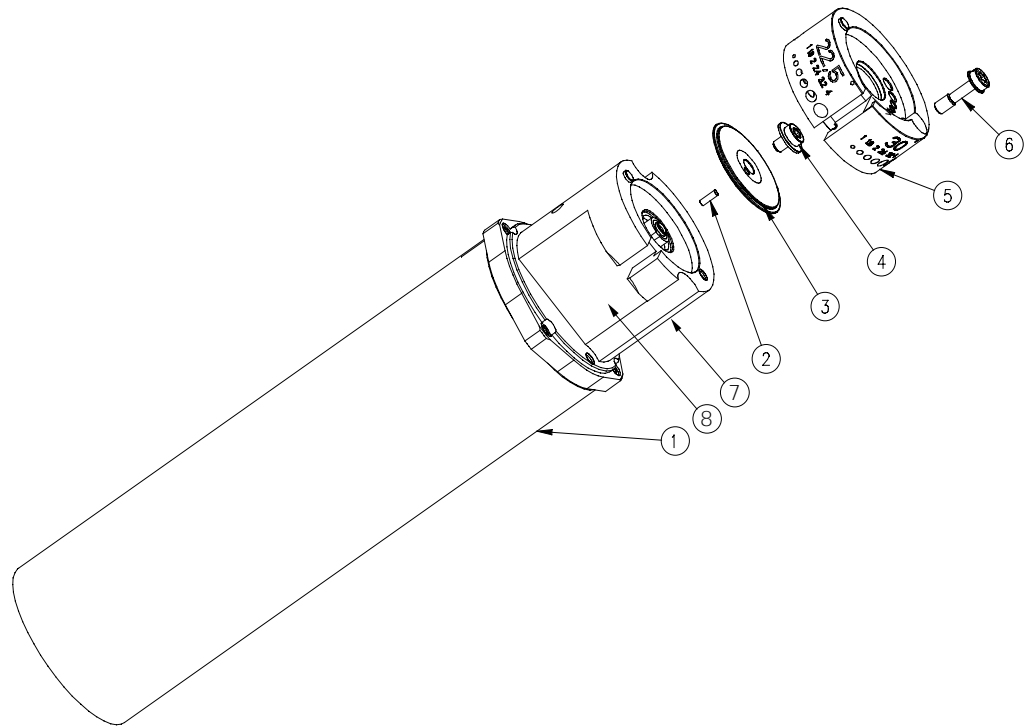
You can also contact directly our customer service address in Singen:

Georg Fischer Rohrverbindungstechnik GmbH  
 Freibühlstrasse 18/19, D-78224 Singen  
 Phone: +49 (0) 77 31 / 792-785  
 Fax: +49 (0) 77 31 / 792-592

Please give the following details:

- Machine type ESG Plus
- Machine number (see identification plate)

## 9 Spare parts list



Item No.	Part Number	Quan.	Description
1	790 052 526	1	Electric motor 230 V, 50/60 Hz
	790 052 527	1	Electric motor 120 V, 50/60 Hz
-	790 052 528	2	Carbon brushes
2	790 052 533	1	Cylinder pin Ø 2
3	790 052 487	1	Diamond grinding wheel, standard
	790 052 488	1	Diamond grinding wheel, rough
4	790 052 531	1	Cylinder head screw with disc M 4 x 6
5	790 052 530	1	Grinding head
6	790 052 532	1	Cylinder head screw M 4 x 15
7	790 052 497	1	Motor flange
8	790 008 803	1	Type plate

# **10 Appendix**

## **10.1 Declaration of conformity**



## EU declaration of conformity

According to machine guideline 98/37/EG, Appendix II A

The design of the machine

Make: Electrode grinding device with electrical drive, Type **ESG Plus**  
 Machine number: \_\_\_\_\_  
 Year of construction: \_\_\_\_\_

is developed, engineered and produced in accordance with the above EC-guideline as the sole responsibility of:

Company: Georg Fischer Rohrverbindungstechnik GmbH  
 Freibühlstrasse 18/19  
 D-78209 Singen

The following harmonized standards are applied:

- DIN EN 292-1 Safety of machines; basic concepts, general design principles;  
Part 1: Basic terminology, methodology
- DIN EN 292-2 Safety of machines; basic concepts, general design principles;  
Part 2: Technical principles and specifications
- DIN EN 294 Safety of machines; safety margins against the reaching of dangerous points  
with the upper limbs

Singen, 01.04.2002

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