

Operating instructions with spare parts list

Tube Squaring Machines

RPG 1.0 Cordless (right-angled drive)



Code 790 036 762

Maschine-no.:

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0 About these instructions

To allow 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 against the dangers of injury or material damage. Always read and observe these warning messages!




This is a warning symbol. It should warn you against dangers of injury.

Follow all instructions which are identified with this safety symbol in order to avoid injuries or death.

Warning symbol	Meaning
 DANGER	Direct danger! Non-observance could result in death or critical injury. ⊙ Restrictions (if applicable). ► Measures to prevent danger.
 WARNING	Possible danger! Non-observance could result in serious injury. ⊙ Restrictions (if applicable). ► Measures to prevent danger.
 ATTENTION	Dangerous situation! Non-observance could result in minor injuries.
ATTENTION	Dangerous situation! Non-observance could result in material damage.

0.2 Further symbols and displays

Symbol	Meaning
Important Note	Notes: Contain particularly important information for comprehension.
	Instruction: You must take notice of 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
RPG 1.0 Cordless	Tube Squaring Machine for tubes with an outer diameter of up to 1.0 inches, equipped with a rechargeable accumulator
RPG 1.0 Cordless right-angled drive	Tube Squaring Machine for tubes with an outer diameter of up to 1.0 inches, equipped with rechargeable accumulator and with a right-angled drive.
MFW	Multifunctional Tool

1 Notes on safety

The Tube Squaring Machine Cordless and/or with right-angled drive (in the following referred to as RPG 1.0) is a state-of-the-art machine. Using it for purposes other than those described in this manual may cause injury to the user or to others. The machine or other equipment may also be damaged.

Therefore:

- Always ensure that the machine is in good working condition, and always comply with these notes on safety.
- Keep the complete documentation close by the machine.
- Generally valid regulations for the prevention of accidents must be observed.

1.1 Proper use

- Use the RPG 1.0 exclusively for machining thin-walled tubes (see “Scope of application”, chapter 3.2, p. 10).
- The user will be the only person liable for damages caused by improper use.

1.2 Safety regulations

- Only use the dimensions and materials specified in this manual. Always consult Orbitalum Tools after-sales service personnel before using other materials.
- Read the enclosed safety notes completely and carefully before handling the rechargeable accumulator and the battery charger.
- Only use original Orbitalum Tools spare parts and auxiliaries.
- Inspect the RPG 1.0 every day for visible signs of damage or defects. Any damage or defect must be repaired immediately.
- Work on the electrical equipment may only be performed by a qualified electrician.
- Disconnect the RPG 1.0 from power supply before changing the tools, transport or carrying out maintenance and repair work and allow the machine to come to a stop.

1.3 Working with safety in mind

"Make your contribution to safety in the workplace."



- Report any unusual behavior of the machine to the person in charge immediately.
- Always work with safety in mind.
- Wear safety goggles and safety gloves when working with the RPG 1.0.
- Tie up long hair (snood-type cap); do not wear any wide clothing. Attention: jewelry and ties can get caught by rotating parts.
- Make sure that the work piece has been clamped correctly.
- Switch off the RPG 1.0 after each working cycle and allow the machine to come to a stop.
- Disconnect the RPG 1.0 from power supply before performing any cleaning, maintenance or repair work and allow the machine to come to a stop.
- Keep hands away from the tools during processing.
- Pay attention to the surroundings. Do not use any electric tools or rechargeable batteries in a damp or wet area. Make sure to have good illumination. Do not work near combustible liquids or gases.

1.4 Waste disposal / environmental protection

- Dispose of chips and used gear lubricant oil according to the regulations.

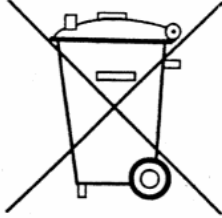
Discarded electric tools and accessories contain a large share of valuable raw and synthetic materials which can be recycled.

Therefore:

- Electrical (electronic) devices which are marked with the symbol to the left, may not be disposed of with household waste in accordance to the EU directive 2002/96/EC.
- By actively using the offered return and collection systems, you actively contribute to the reuse, recycling and utilization of electrical (electronic) devices.
- Electrical (electronic) used devices contain parts which must be handled selectively according to the EU directive. Separate collection and selective treatment is the basis for environment-friendly disposal and the protection of human health.
- Our products that were sold to you after August 13th, 2005 are taken back and treated according to legal standards. These products have to be send free of charge.
- The return of used devices which pose a health or safety risk for human beings due to soiling during use may be refused.



(RL 2002/96/EC)



Cd

- The legally compliant disposal of electrical (electronic) devices that were placed on the market before August 13th, 2005 are in the responsibility of the end-user.
- Batteries which are marked with the symbol on the left may not be disposed of together with household waste according to the applicable EU directive 91/157/EEC.
- With batteries containing hazardous substances, the chemical symbol for the heavy metal content is indicated below the waste bin.

1.5 Further safety regulations

Observe the regulations, norms and guidelines specific to your country.

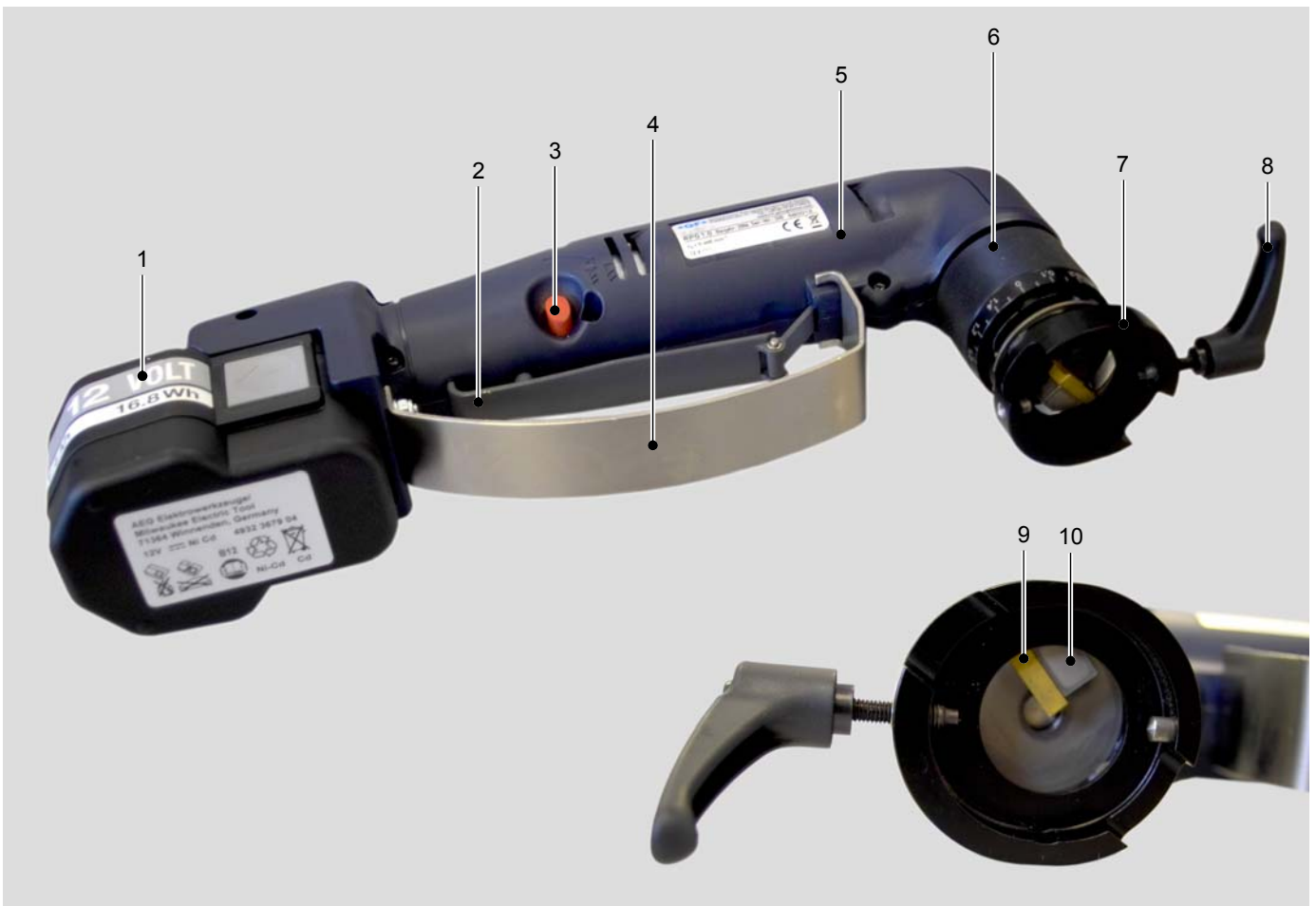
2 Design of the product

2.1 RPG 1.0 Cordless



- | | | | |
|---|--|----|----------------------------------|
| 1 | Rechargeable accumulator | 6 | Feed Unit |
| 2 | Housing with driving motor | 7 | ON/OFF switch / Speed controller |
| 3 | Switch for right-handed / left-handed rotation | 9 | Tool support |
| 4 | Feed with scale ring | 10 | Multifunctional tool (MFW) |
| 5 | Release handle for fixing the clamping shells | | |

2.2 RPG 1.0 Cordless right-angled drive



- | | | | |
|---|--|----|---|
| 1 | Rechargeable accumulator | 6 | Feed with scale ring |
| 2 | ON/OFF switch / Speed controller | 7 | Feed Unit |
| 3 | Switch for right-handed / left-handed rotation | 8 | Release handle for fixing the clamping shells |
| 4 | Hoop guard / Carrying handle | 9 | Multifunctional tool (MFW) |
| 5 | Housing with driving motor | 10 | Tool support |

2.3 Accessories

2.3.1 Multifunctional tool (MFW)



Contained in the standard scope of delivery. Multifunctional tool with 2 cutting edges and high-performance coating Futura® Balinit. Usable for all tool holders of the RPG series.

Article	For tube OD [mm]	For tube OD [inch]	Code-no.
MFW-P-2	3.18 – 25.4	0.125 – 1	790 038 314
Torx screw	–	–	790 086 220

2.3.2 One-piece clamping shells

Extreme durable. Ensures accurate centering and quick clamping shell change without any tools. Not contained in the standard scope of delivery. Other dimensions are available upon request.



Article	For tube OD [mm]	For tube OD [inch]	Code-no.
One-piece clamping shell	3.18	0.125	790 036 201
	6.35	0.250	790 036 202
	9.53	0.375	790 036 203
	10.00	0.394	790 036 204
	12.00	0.472	790 036 205
	12.70	0.500	790 036 206
	17.20	0.677	790 036 207
	19.05	0.750	790 036 208
	21.30	0.839	790 036 209
	25.40	1.000	790 036 210
One-piece clamping shell for micro fittings	6.00	0.236	790 036 304
	6.35	0.250	790 036 301
	9.53	0.375	790 036 302
	10.00	0.394	790 036 305
	12.00	0.472	790 036 306
	12.70	0.500	790 036 303



Please check the outer diameter of the pipe before ordering the clamping shells. The various standards sometimes mean a special outline dimension (in particular for pipes in accordance with DIN2430).

2.3.3 Durable storage and shipping case



High-quality blue transportation case with insert. Very sturdy design. Already included in the standard scope of delivery of the RPG 1.0 Cordless right-angled drive.

Article	Code-no.
Durable storage and shipping case	790 036 080

3 Features and scope of application

3.1 Features

The RPG 1.0 is suitable for squaring tube ends made of metallic materials. It has the following features:

- Tube end preparation for welds conforming to standards
- Only one multifunctional tool is needed for:
 - different tube wall thicknesses (up to 2 mm/0.079 inches)
 - different tube materials (exclusively ferritic materials)
- Multifunctional tool:
 - cutting geometry adapted to application
 - multi-cutting tool
 - only one screw is needed to fix and secure the tools
 - tool coating TiN
- Machine:
 - hand-operated
- Drive with rechargeable accumulator
- Quick clamping system for tubes
- Quick change system for clamping shells
- Feed with scale ring:
 - total: 10 mm (0.393 inches)
 - per revolution: 1.5 mm (0.059 inches)
 - per pitch line: 0.05 mm (0.002 inches)
- Feed unit twistable/detachable
- Release handle adjustable

3.2 Scope of application

Working range

OD	[mm]	[inch]
min.	3.18	0.125
max.	25.40	1.000

The maximum machinable wall thickness is 2 mm/0.079 inches.

Tube materials

High-alloy steels (high-grade steel, material no. 1.40... – 1.45... in accordance with DIN 17 455 and DIN 17 456), unalloyed and low-alloy steels, aluminum, others on request.

4 Technical specifications

4.1 Rating

	RPG 1.0 Cordless	RPG 1.0 Cordless right-angled drive
Dimensions	235 x 380 x 75 mm 9.25 x 15 x 3 inch	145 x 380 x 75 mm 5.7 x 15 x 3 inch
Total weight (with accumulator; without clamping shells)	2.1 kg / 4.63 lbs	2.2 kg / 4.85 lbs
Voltage of rechargeable accumulator	12 V	12 V
Power supply of battery charger	220 – 240 V, 50/60 Hz	220 – 240 V, 50/60 Hz
Speed (max. idling speed)	0 – 400 min ⁻¹ (rpm)	0 – 350 min ⁻¹ (rpm)
Noise level at the workplace	Idle running: approx. 70 dB (A) With load: approx. 85 dB (A)	Idle running: approx. 70 dB (A) With load: approx. 85 dB (A)
Vibration level according to EN 50144	< 2.5 m/s ²	< 2.5 m/s ²

5 Commissioning

Checking the scope of delivery

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

5.1 Scope of delivery

- 1 Tube Squaring Machine RPG 1.0 Cordless / Cordless right-angled drive
- 1 Durable storage and shipping case
- 2 Rechargeable accumulators
- 1 Battery charger
- 1 Multifunctional tool
- 1 Torx T-spanner for securing the multifunctional tools (T 15)
- 1 Operating instructions with Spare parts list
- Operating instructions and safety notes for the battery charger

Subject to modifications

5.2 Transport

The RPG 1.0 is a portable machine. Special transportation aids are not required. For safe transportation, hold the machine as shown in the illustrations below.



Transport RPG 1.0 Cordless



Transport RPG 1.0 Cordless right-angled drive



DANGER

Danger of injury by unintended restart of the machine

During transport, the ON/OFF switch could be actuated inadvertently so that the machine is started.

- ▶ Remove the rechargeable accumulator before transportation or workplace change.
-

6 Operation

Note As the usage of both versions of the tube facing machine is identical, the pictures shown in this chapter solely represent the essential working steps using the RPG 1.0 cordless version.



DANGER

Danger of injury by unintended restart of the machine

- ▶ Remove the rechargeable accumulator before performing any repair, maintenance or adjustment work or tool change.

Danger of injury

Rotating tool support!

- ⊘ Do **not** reach into the tool support while machining, keep wide clothing away from the working area.
 - ▶ Operate the machine only after the tube has been clamped.
-

6.1 Preparation

Specifying dimensions

1. Specify the tube dimension to be processed.
2. Select the multifunctional tool and the clamping shells (for tool accessories, see chapter 2.3, p. 8).

6.2 Mounting the multifunctional tool (MFW) to the tool support



Danger of injury

Sharp cutting edges!

- ⊘ Do **not** touch the cutting edges when mounting the multifunctional tool.
- ▶ Wear safety gloves.

1. To detach the feed unit (1), turn the feed with scale ring (2) clockwise.



2. Screw the multifunctional tool (3) to the tool support (4) using the Torx screwdriver.



3. Mount the feed unit (1) by means of turning the feed with scale ring (2) counterclockwise.

The assembly of the multifunctional tool is now completed.

6.3 Inserting and replacing clamping shells

1. Select the appropriate set of clamping shells according to the tube dimension (see chapter 2.3.2, p. 8).
2. Turn out the release handle (5) (the end of the release handle must be flush with the inside of the housing).

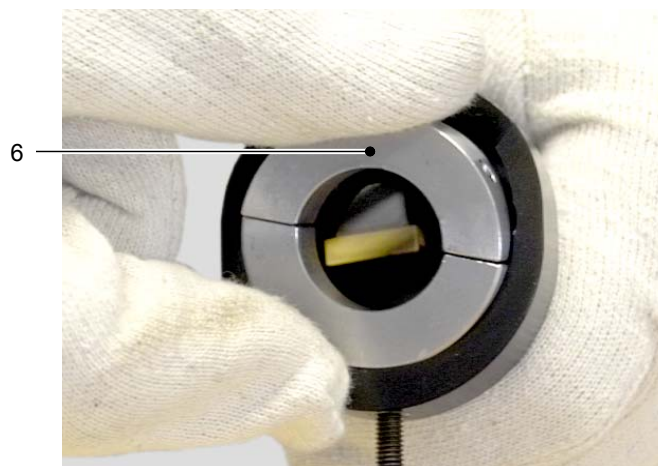


Removing clamping shells

If an already mounted set of clamping shells is to be replaced, it can now be removed by compressing it.

Inserting clamping shells

3. Compress the set of clamping shells (6) slightly and insert it into the housing.



Note The clamping shell is correctly inserted if it has engaged. If the clamping shell does not engage, readjustment is possible by slightly turning the clamping shell.

The set of clamping shells has now been inserted correctly.

6.4 Mounting the tube

ATTENTION Tool damage

The multifunctional tool could get damaged by an incorrect inserted tube.

- ▶ Before clamping the tube, make sure that there is sufficient distance between the MFW and the tube.

Fixing the machine to the tube

1. Fix the machine with sufficient distance to the tube.
2. To clamp the tube, turn the large release handle (5) clockwise to the limit stop.



The tube may now be processed.

Detaching the machine from the tube

3. To detach the machine from the tube, turn the release handle (5) counterclockwise.

6.5 Machining tubes in a cramped working area

6.5.1 Adjusting the feed unit

The feed unit with release handle is adjustable in 3 positions:

1. Detach the feed with scale ring (2) by turning clockwise.



2. Unplug the feed unit (1) and turn into the desired position:



Position 1 (Standard)

Position 2

Position 3

3. Attach the feed with scale ring (2) by turning counterclockwise.

6.5.2 Adjusting the release handle

It is possible to adjust the release handle of the RPG 1.0 in any position:

- ▶ Slightly unplug the release handle (5) and turn to the desired position.



6.6 Determining the speed

Speed range RPG 1.0 Cordless	Speed range RPG 1.0 Cordless right-angled drive
0 – 400 rpm	0 – 350 rpm

- ▶ Set the speed by means of ON/OFF switch / speed controller (7).



RPG 1.0 Cordless



RPG 1.0 Cordless right-angled drive

- Notes**
- The more the speed controller (7) is pressed, the higher is the number of revolutions.
 - The machining behavior can be influenced by altering the speed.
 - During the processing of tubes the number of revolutions may decrease or be influenced and can be readjusted with the speed controller (7).

Switching the RPG 1.0 on / Increasing the speed

- ▶ Press the speed controller down stronger.

Reducing the speed / Stopping the RPG 1.0

- ▶ Release the speed controller.

6.7 Machining the tube

**WARNING****Hot and sharp-edged chips**

Danger of injuries to eyes and hands.

- ▶ Always wear protective goggles while working.
 - ▶ Only remove chips when wearing safety gloves.
-

ATTENTION**Tool damage**

The tool could get stuck in the tube during processing.

- ▶ See “Trouble shooting”, chapter 8, p. 24).
- ▶ Move the rotating tool towards the tube end setting the automatic advance to a very low level!

If the tool gets stuck in the tube during processing and the ON/OFF switch remains pressed, the drive could get damaged (due to overheating).

- ▶ Release the ON/OFF switch immediately and remove the machine from the tube.

If the speed is reduced too quickly during processing, the tool could get stuck in the tube and come to a stop.

- ▶ Always reduce the advance evenly.

A tube which has not been cut off square could damage the tool (MFW) if the distance between the cutting edge and the tube end is too short.

- ▶ Before switching on the RPG 1.0, make sure that there is sufficient distance between the cutting edge (MFW) and the tube end.

6.7.1 Switching the machine on

1. Connect the rechargeable accumulator (8) to the RPG 1.0.



RPG 1.0 Cordless



RPG 1.0 Cordless right-angled drive

2. Press the ON/OFF switch or speed controller (7).



RPG 1.0 Cordless



RPG 1.0 Cordless right-angled drive

The machine starts to run.

Note If the tool chatters after starting, the facing speed is too high.

- ▶ Reduce the speed (see chapter 6.6, p. 19).

6.7.2 Advancing the tool

Feed with scale ring

- Each pitch line corresponds to an advance of 0.05 mm (0.002 in); one revolution corresponds to an advance of 1.5 mm (0.059 in)
- When facing, make sure not to exceed a chip thickness of 0.05 mm (0.002 in). If this thickness is exceeded the speed can be reduced or it can cause a stop of the machine (see „Trouble shooting“, chapter 8, p. 24).

- There are 3 marks (9) on the feed unit to metering the feed:



1. Move the tool towards the tube by means of the feed with scale ring (2) until the tool contacts the tube.
2. When the cutting edge of the tool is facing along the entire circumference of the tube:
 - ▷ Go on advancing the tool with constant pressure until the desired machining result is achieved.

Switching the RPG 1.0 off

3. Release the ON/OFF switch or speed controller respectively.
The machine comes to a stop.
4. Detach the machine from the tube.

7 Maintenance



Danger of being injured when pressing the ON/OFF switch inadvertently

- ▶ Remove the rechargeable accumulator from the machine before performing any maintenance work.
-

Time / Interval	Activity
Whenever the machine is cleaned	▶ Clean the clamping shells and the housing/tool support.
Whenever the tool is changed	▶ Clean the tool support and the multifunctional tool.

8 What to do if ...?

8.1 Trouble shooting

In the following table you will find possible causes for faults and the appropriate remedies.

Fault	Possible cause	Remedy
The tool (multifunctional tool) is catching during machining.	Too much forward feed.	<ul style="list-style-type: none"> ▶ Reduce the feed. ▶ Remove the tube from the machine. ▶ Remove the chip using side-cutting pliers and file off the shoulder. ▶ Feed carefully for further machining.
	The rechargeable accumulator is almost run down.	▶ Recharge the accumulator.
	The multifunctional tool loose.	▶ Tighten the multifunctional tool.
The driving motor of the RPG 1.0 is not running.	The rechargeable accumulator is completely run down.	<ul style="list-style-type: none"> ▶ Recharge the accumulator (see the enclosed operating instructions of the battery charger). ▶ Use the stand-by accumulator.
	The rechargeable accumulator has not been connected to the RPG 1.0.	▶ Connect the rechargeable accumulator to the RPG 1.0.
The tool tends to vibrate.	The cutting speed is too high.	▶ Reduce the number of revolutions (cutting speed) (see chapter 6.6, p. 19).
High level of vibration.	Axial or radial play in the components.	▶ Check the machine for zero backlash.
	The multifunctional tool is loose.	▶ Check the multifunctional tool for tightness.
The machined tube is rough or shows too much burr.	The multifunctional tool is blunt.	▶ Replace the multifunctional tool.

8.2 Servicing/customer service

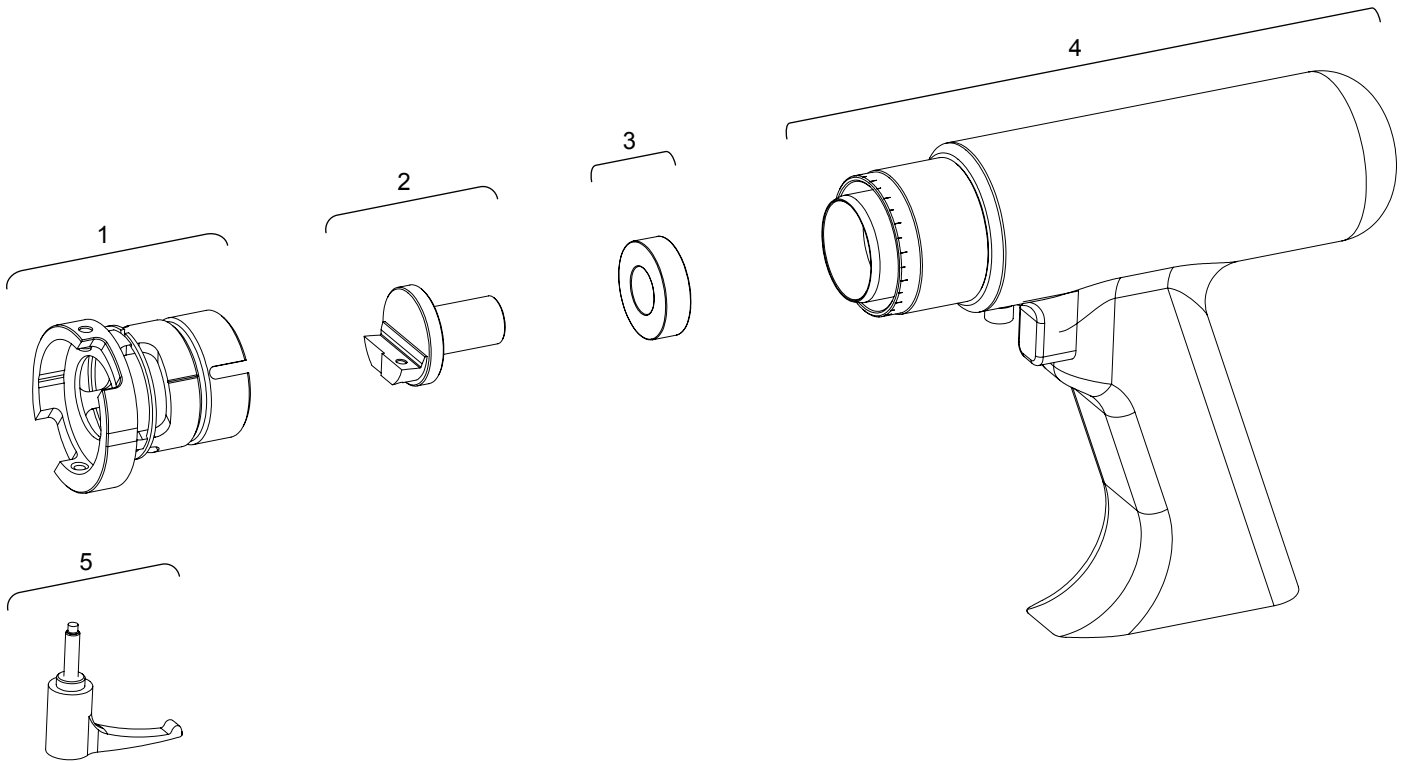
For ordering spare parts, see the spare parts list from chapter 9, p. 25. For problem solving, please contact your competent branch office directly.

Please give the following details:

- Machine type: **RPG 1.0 Cordless / RPG 1.0 Cordless right-angled drive**
- Machine number: (see the identification plate)

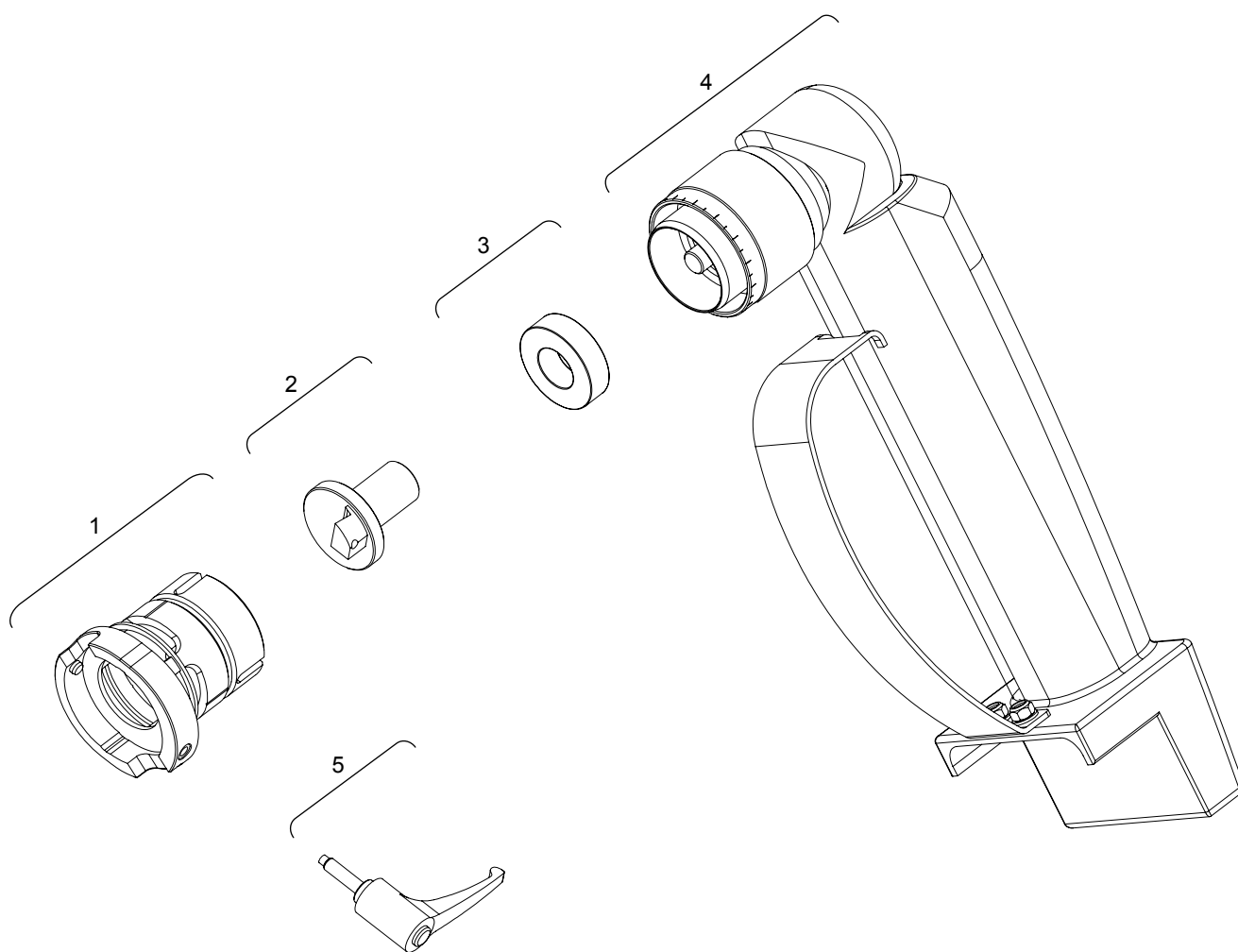
9 Spare parts list

9.1 RPG 1.0 Cordless



Item No.	Code	Description
1	790 036 170	Feed unit complete
2	790 036 132	Tool support Cordless
not shown	790 038 314	Multifunctional tool MFW-P-2
	790 038 315	Multifunctional tool MFW-P-2 (10 pieces)
	790 086 220	Torx screw to multifunctional tool
3	610 810 017	Grooved ball bearing
4	790 036 160	Driving unit complete
5	790 036 180	Release handle complete

9.2 RPG 1.0 Cordless right-angled drive



Item No.	Code	Description
1	790 036 170	Feed unit complete
2	790 036 134	Tool support Cordless right-angled drive
not shown	790 038 314	Multifunctional tool MFW-P-2
	790 038 315	Multifunctional tool MFW-P-2 (10 pieces)
	790 086 220	Torx screw to multifunctional tool
3	610 810 017	Grooved ball bearing
4	790 036 160	Driving unit complete
5	790 036 180	Release handle complete

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