

# Operating instructions

For responsible bodies and persons using the machine

## Portable Tube Saws

### PS 4.5

### PS 6.6



Machine-no.:

.....  
.....

Translation of original  
operating instructions  
Code 790 048 762 | EN



To work safely with this machine, please read through the operating instructions in full before initial operation.  
Retain the operating instructions for future reference.



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# 1. 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.

## 1.1 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.

## 1.2 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.

### 1.3 Abbreviations

<b>Abbr.</b>	<b>Meaning</b>
PS 4.5	Portable Tube Saw for cutting tubes with an outer diameter of up to 4.5 inches
PS 6.6	Portable Tube Saw for cutting tubes with an outer diameter of up to 6.6 inches

## 2. INFORMATION AND SAFETY INSTRUCTIONS FOR THE RESPONSIBLE BODY

### 2.1 Requirements for the responsible body

**Workshop/outdoor/field application:** The responsible body is responsible for safety in the danger zone around the machine, and should allow only qualified personnel to enter the zone or operate the machine in the danger zone.

**Employee safety:** The safety regulations described in chap. 2, p. 6 must be observed and work must be carried out with safety in mind using the prescribed protective equipment.

### 2.2 Using the machine

#### 2.2.1 Proper use

- The machine is to be used solely for processing (cutting) materials, as specified in chap. 4.2.2, p. 15 with an outer tube diameter of max. 170 mm (6.69 inch) and a maximum length of 6 m (working range, see chap. 4.2.1, p. 15).
- The machine casing (vice) can be fixed directly onto the work bench using screws or by means of a mounting plate (Accessories, see chap. 1.1, p. 4). The mounting plate is also screwed to the work bench.
- The machine must only be operated using the voltage levels specified on the drive identification plate (Technical specifications, see chap. 5, p. 16).
- Only to be used as a drive for motor SBE1100 (Code 790 048 190 to 790 048 192).
- The machine may only be used on tubes and containers that are empty, unpressurized, do not have explosive atmospheres and are not contaminated.
- The drive motor may only be used in connection with the machine (Code 790 048 190 to 192).



Proper use also includes the following:

- observing all safety instructions and warning messages included in these operating instructions
- carrying out all inspection and maintenance work
- sole use in the original condition with original accessories, spare parts and materials
- processing only materials set out in the operating instructions

#### 2.2.2 Improper use

- A use other than that defined under "proper use" or a use that goes beyond this or the specified constraints shall be considered improper use due to the potential risks involved.
- The responsible body shall be solely responsible for damages that arise through improper use and the manufacturer shall assume no liability whatsoever.
- The removal of safety equipment is not permitted.
- Do not misuse the machine.
- The machine is not intended for use by private consumers.
- The technical values defined for normal operation must not be exceeded.
- Do not use the machine as a drive for applications other than those listed under proper use (chap. 2.2.1, p. 6).



### 2.2.3 Machine constraints

- Keep your working area clean. Disorder or unlit working areas can lead to accidents.
- The workplace can be in tube preparation, in plant construction or in the plant itself.
- A radial space requirement/freedom of movement of approx. 2 m around the machine is required for people.
- Work lighting: min. 300 lux.
- Operated by one person.
- Climate conditions: temperature range for machine operation: -15 °C to 40 °C (< 80% rel. humidity).
- Do not use outdoors in fog, rain or during a thunderstorm.

### 2.2.4 Shutting down the machine

Information on the EMERGENCY STOP or the shutting down function, see chap. 9.1.1, p. 30.

## 2.3 Environmental protection/disposal

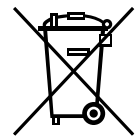
### 2.3.1 Chips and gear lubricant oil

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

### 2.3.2 Electric tools and accessories

Discarded electric tools and accessories contain large quantities of valuable raw and synthetic materials that can be recycled. Therefore:

- Electrical (electronic) devices that are marked with the symbol to the left may not be disposed of with household waste in accordance with EU regulations.
- By actively using the available return and collection systems, you actively contribute to the reuse, recycling and utilization of electrical (electronic) devices.
- Used electrical (electronic) devices contain parts that must be handled selectively according to EU regulations. Separate collection and selective treatment is the basis for environment-friendly disposal and the protection of human health.
- Appliances and products that you bought from us after August 13, 2005 will be disposed of in accordance with legal standards after they have been supplied to us at no cost.
- We may refuse to accept old appliances that pose a risk to human health or safety due to contamination produced during use.
- The end user is responsible for disposing of used appliances introduced to the market before August 13, 2005. Please contact a disposal center near you for this purpose.
- **Important for Germany:** our products may not be disposed of in municipal disposal sites as they are only used for industrial purposes.

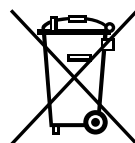


**RECYCLING**  
(as per RL 2002/96/EC)

### 2.3.3 Returning batteries

Some of our units are battery-powered.

- Accumulators and batteries that are marked with one of the symbols to the left may not be disposed of with household garbage according to EU directive 91/157/EEC.
- In batteries containing harmful substances, the chemical sign for the heavy metal contained is indicated below the garbage can: Cd = Cadmium Hg = Mercury Pb = Lead
- **Valid for Germany:** the end user is required to return defective or used batteries to the distributor or to a recycling center established for the purpose.



## 2.4 Basic safety instructions

The machine (hereinafter referred to as the PS 4.5 or PS 6.6) is a state-of-the-art machine designed for safe use. The risks involved in using the machine are described in the operating instructions below. Using this machine in a way other than that described in these instructions can lead to serious physical injury and material damage.

Therefore:

- Observe warning messages at all times.
- In addition to this operating instructions, the general warning messages for electric tools by Metabo (see red supplement), which should always be retained.
- Keep complete documentation close by the machine.
- Observe country-specific regulations, standards and guidelines.
- Always ensure that the machine is in good working order. Observe the maintenance information (chap. 10, p. 33).
- Only operate the machine if all the safety equipment such as the restart inhibitor, overload protection and chips guard are in good working order and the machine is firmly positioned.
- Report any unusual machine behavior to the person responsible immediately.
- Only use the dimensions and materials specified in these instructions. Other materials should be used only after consulting with Orbitalum Tools customer service.
- Use only original tools, spare parts, materials and accessories from Orbitalum Tools.
- Repair and maintenance work on the electrical equipment may only be carried out by a qualified electrician.
- At the end of each working cycle, before transportation, changing tools, cleaning and performing any maintenance, adjustment or repair work, switch off the machine, allow it to run to a stop and pull the mains plug.
- Do not carry the machine by the cable and do not use the machine to pull out the plug except in an emergency. Protect the cable from heat, oil and sharp edges (chips).
- During operation, keep hands away from the tools.
- Check that the tube is correctly clamped.
- Switch on the machine only when the tube has been clamped.
- In extreme operating conditions conductive dust can settle inside the machine, so to increase safety, the customer should ensure that an SPE-PRCD or FI protect switch is installed by a qualified electrician between the mains supply and the machine.
- When working with the machine, wear safety shoes in accordance with EN ISO 20345 (at least S1), safety goggles in accordance with DIN EN 166, tight-fitting safety gloves in accordance with DIN EN 388 and ear protection in accordance with DIN EN 352.

### NOTE

The recommendations concerning "Personal protective equipment" only apply to the product being described. Other requirements resulting from the ambient conditions on-site or of other products, or from combining with other products, are not taken into account. These recommendations do not in any way release the responsible body (employer) from its statutory health and safety at work obligations towards its employees.



**DANGER**

**If the mains cable is damaged, live parts may cause death if touched directly.**

Fatal electric shock.

- ⊘ Keep the mains cable of the tube saw motor **away** from the saw blade.
- ⊘ **Do not** let the cut-off tube piece drop in an uncontrolled manner.
- ⊘ **Do not** run the machine unattended.
- ▶ Secure the falling tube piece.
- ▶ During processing, always keep an eye on the position of the mains cable.
- ▶ Keep the machine clean. Always remove lubricant residues from the machine.





DANGER

**Damaged insulation!**

Fatal electric shock.

- ⊘ **Do not** screw any indicators or signs to the drive motor.
- ▶ Use stickers.



DANGER

**Metal dust can collect in the motor housing and cause loss of insulation!**

Fatal electric shock.

- ▶ Depending on the level of contamination, clean the machine at least once a day using the brush supplied.



DANGER

**Damaged plug!**

Fatal electric shock.

- ⊘ **Do not** use adapter plugs with ground protected electrical tools.
- ▶ The machine connector plug must fit the socket.



DANGER

**Loose/baggy clothing, long hair or jewelry can get caught in rotating machine parts!**

Serious injury or death.

- ⊘ During operation, **do not** wear loose/baggy clothing, e.g. neckties.
- ▶ Tie up long hair to prevent it from being caught.



DANGER

**Safety components that are contaminated or worn are defective!**

The failure of safety components can cause physical injury.

- ⊘ **Do not** misuse the cable, e.g. such as using it to suspend or carry the machine.
- ▶ Replace defective safety components immediately and check them daily to ensure proper operation.
- ▶ Clean and perform maintenance on the machine after each use.
- ▶ Keep cables away from heat, oil, sharp edges and moving equipment parts.
- ▶ Inspect the machine daily for visible signs of damage or defects, and have them repaired by a specialist if necessary.



WARNING

**Flying parts/breaking tool!**

Diverse physical injuries and material damage.

- ⊘ **Do not** process the tube while it is loose in the vice.
- ⊘ **Never** use a damaged or deformed saw blade.
- ⊘ In the event of tool breakage with a new tool, **do not** enter the old cut because the tool can break again.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Immediately replace worn-out tools.
- ▶ Ensure that the cutting tools are correctly fitted.
- ▶ Tube dimension must be set correctly. During cutting, the saw blade must saw through the entire tube wall.
- ▶ Avoid breaking tool through low (adequate) feed force, correct dimension (see chap. 8.6, p. 27) and speed (see chap. 8.7, p. 28) settings.
- ▶ Hold on to the motor unit tightly by the handle, and guide it with low (adequate) feed force during the machining process.



WARNING

**Falling objects or tilting and bending tubes!**

Irreversible crushing.

- ▶ Wear safety shoes (in accordance with EN ISO 20345, at least S1).
- ▶ Place sufficient tube supports under the tube.



WARNING

**Danger caused by vibration and unergonomic, monotonous work!**

Discomfort, tiredness and disruptions to the locomotor system.

Limited ability to react, and cramps.

- ▶ Do relaxation exercises.
- ▶ Ensure activity is varied.
- ▶ Assume an upright and relaxed posture when working.



WARNING

**Pressing the ON-OFF switch unintentionally.**

Diverse physical injuries and material damage.

- ▶ Before changing tools, cleaning or performing any maintenance, adjustment or repair work, allow the machine to run to a stop and pull the mains plug.



WARNING

**Dangerous laser radiation!**

The retina of the eyes can be damaged and can thereby impair sight.

- ⊘ **Do not** look at the laser beam or view it using optical instruments.
- ⊘ **Do not** point the laser beam at other people.
- ⊘ **Do not** misuse the line laser and do not remove from the tube saw.

**Caution!**

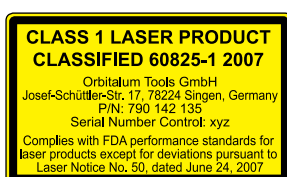
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

## 2.5 Warning symbols

Observe all of the warnings and safety instructions affixed to the machines.  
The following labels also appear on the machine:

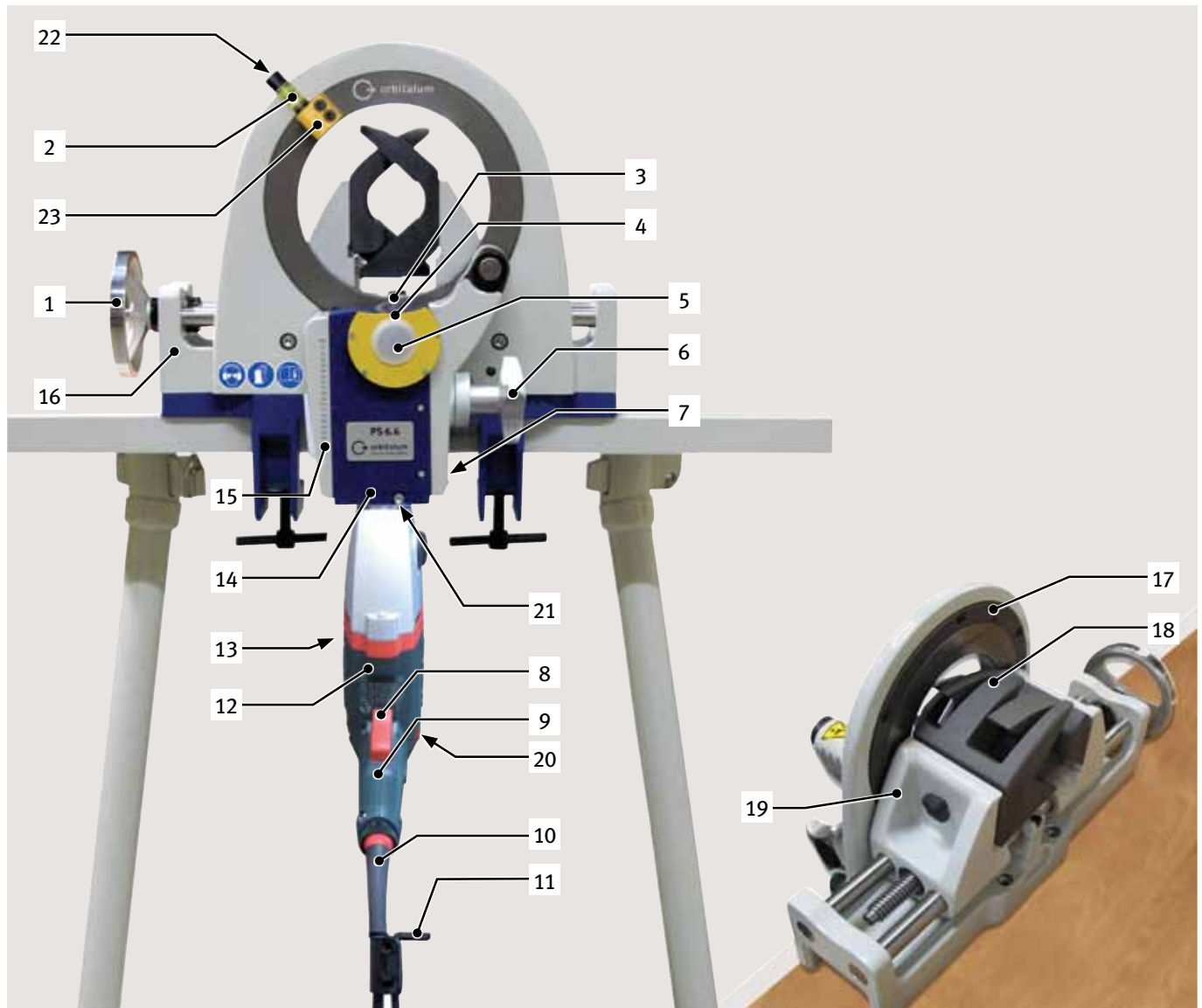
Image	Type of machine	Position on machine	Meaning	Code
	PS 4.5, PS 6.6	PS 4.5: Vice, left PS 6.6: Guiding flange, to the left of the slide	Instruction: Wear safety goggles in ac- cordance with DIN EN 166, ear protection in accordance with DIN EN 352 and tight- fitting safety gloves in ac- cordance with DIN EN 388.  Read the operating instructions.	790 086 200
	PS 4.5, PS 6.6	Chips guard, top	WARNING: Danger of being injured by sharp cutting edges.	790 046 196
	PS 4.5, PS 6.6	Directly on line laser	WARNING: Laser class I.	<u>For Laser 790 142 125:</u> 790 142 288 <u>For Laser 790 142 135:</u> 790 142 298*
	PS 4.5, PS 6.6	Holder indicut (line laser)	WARNING: Dangerous laser radiation.	790 142 289

\* Warning symbol with Code 790 142 298:



## 3. PRODUCT DESIGN

### 3.1 Portable Tube Saw PS



- |                                     |   |                   |  |
|-------------------------------------|---|-------------------|--|
| 1. Turning handle for clamping jaws | 8. ON/OFF switch  | 12. Motor         | 18. Aluminum clamping jaws               |
| 2. Line Laser                       | 9. Motor grip   | 13. Speed setting | 19. Slide jaws                           |
| 3. Saw blade position 1             | 10. Connecting cable and swivel cable with plug-in coupling       | 14. Slide         | 20. Fixing button                        |
| 4. Saw blade position 2             | 11. Allen wrench (to loosen the clamping screw (21) of the motor) | 15. Slide housing | 21. Clamping screw (to loosen the motor) |
| 5. Chips guard                      |   | 16. Vice          | 22. ON/OFF switch line laser             |
| 6. Hand wheel                       |   | 17. Swivel ring   | 23. Holder indicut (line laser)          |
| 7. Type plate                       |   |                   |  |

## 3.2 Accessories

Not included as standard.



**WARNING**

**Danger presented by using poor-quality accessories and tools not approved by Orbitalum Tools!**  
Diverse physical injuries and material damage.

► Use only original tools, spare parts, materials, and accessories from Orbitalum Tools.

### 3.2.1 Quick mounting plate with screw clamps

Easy and fast assembly.

Including 4 hexagon socket screws for mounting the PS on the quick mounting plate.



Article	Code
Quick mounting plate with screw clamps	790 048 334

### 3.2.2 Saw blades

Orbitalum Tools Performance Range.

Tube wall thickness [mm]	Tube wall thickness [inch]	Saw blade Ø [mm]	Saw blade Ø [inch]	Code
1,0 - 3,0	0.039 - 0.118	63	2.480	790 048 072
0,6 - 1,2	0.024 - 0.047	63	2.480	790 041 036



### 3.2.3 Tripod

Made of stainless steel. Easy assembly of the PS saw on the Tripod.

- Space saving
- Fast application
- Easy handling

Article	Code
Tripod for PS	790 048 335



### 3.2.4 Clamping jaws for PS 6.6

It is possible to cut tubes with a outer diameter min. 30 mm (1.181 inch) by using additional clamping jaws (accessory, Code 790 048 380). These clamping jaws are delivered as a standard with the PS 4.5. Made from coated aluminum-cast.

Article	Code
Clamping jaw set PS 4.5	790 048 380



### 3.2.5 Swivel cable

To prevent twisting of the cable. For all GF, RA and PS machines with protection class II (double insulated).

Article	Version	Cable length [m/ft]	Code
Swivel cable complete	230 V, 50/60 Hz EU	4	<b>790 142 081</b>
Swivel cable complete	120 V, 50/60 Hz US/CA	4	<b>790 142 082</b>
Swivel cable complete	230 V, 50/60 Hz CH	4	<b>790 142 083</b>
Swivel cable complete	230 V, 50/60 Hz AU	4	<b>790 142 084</b>
Swivel cable complete	120 V, 50/60 Hz GB	4	<b>790 142 087</b>
Swivel cable	230 V, 50/60 Hz EU	4	<b>790 142 076</b>
Swivel cable	120 V, 50/60 Hz US/CA	4	<b>790 142 077</b>
Swivel cable	230 V, 50/60 Hz CH	4	<b>790 142 078</b>
Swivel cable	120 V, 50/60 Hz GB	4	<b>790 142 079</b>
Swivel cable	230 V, 50/60 Hz AU	4	<b>790 142 080</b>



*Swivel cable complete*



*Swivel cable*

### 3.2.6 Warning symbols

Overview of warning symbols with order numbers, see chap. 2.5, p. 11.

## 4. FEATURES AND SCOPE OF APPLICATION

### 4.1 Features

The Portable Tube Saws PS are distinguished by the following main features:

- Increased safety due to stationary tube and rotating tool
- Self-centering clamping system with all-purpose aluminum-coated clamping jaws
- Low-maintenance gearing
- Variable-speed electric motor with restart inhibitor
- Right-angled, burr-free and deformation-free cut
- Cold machining process
- Quick cutting process
- Easy and space-saving assembly
- Quick tool change
- Saw blade position 1: Cutting of tubes
- Saw blade and clamping jaws are close to one another to absorb vibrations when sawing
- Saw blade position 2: Cutting of elbows

### 4.2 Scope of application

#### 4.2.1 Working range

Machine	Material	Saw position	Tube OD		Wall thickness	
			[mm]	[inch]	[mm]	[inch]
PS 4.5	Tube	1	6 - 120	0.236 - 4.724	< 3	< 0.118
	Elbow	2	30 - 120	1.181 - 4.724		
PS 6.6	Tube	1	50* - 170	1.969* - 6.693		
	Elbow	2	50* - 170	1.969* - 6.693		

\* It is possible to cut tubes with a outer diameter min. 30 mm (1.181 inch) by using additional clamping jaws. These clamping jaws are delivered as a standard with the PS 4.5.

#### 4.2.2 Tube materials

- Stainless steel with the following mass fractions:
  - Cr ≤ 12%; Mo < 2%; Ni < 26%
  - Cr ≤ 20%; Mo = 0%; Ni < 13%
  - Cr ≤ 28%; Mo < 8%; Ni < 30%
- High-alloy steel (stainless steel, material no. 1.40... – 1.45... in accordance with DIN 17455 and 17456)
- Unalloyed and low-alloy steel
- High-temperature steels
- Aluminum
- Copper
- CuNi-materials

Consult Orbitalum Tools before using for other applications or materials.

## 5. TECHNICAL SPECIFICATIONS

### 5.1 Portable Tube Saws PS

Type of machine		PS 4.5	PS 6.6
Dimensions (l x b x h)	[mm]	480 x 230 x 600	480 x 230 x 660
	[inch]	20.9 x 9.1 x 23.6	20.9 x 9.1 x 26
Weight	[kg]	23	26
	[lbs]	50.7	57.3
Power	[W]	1100	1100
	[hp]	1.5	1.5
Protection class	[class]	Totally insulated in accordance with class II, DIN VDE 0740	
Speed	[rpm]	30 – 165	30 – 165
Versions	[V, Hz]	110 V, 50/60 Hz	110 V, 50/60 Hz
		120 V, 50/60 Hz	120 V, 50/60 Hz
		230 V, 50/60 Hz	230 V, 50/60 Hz
Vibration level in accordance with EN 28662, part 1	[m/s <sup>2</sup> ]	< 2.5	< 2.5
Sound pressure level at workplace <sup>*)</sup>	[dB (A)]	approx. 78	approx. 78

\* The sound pressure level was measured under normal operating conditions in accordance with EN 50144-1. As the noise level in unfavorable operating conditions can also rise above 80 dB (A), it is necessary to wear ear protection in accordance with DIN EN 352.

### 5.2 Line laser

Component for the GF 4 and GF 6 (AVM/MVM) only.

Dimensions (lxb)	[mm]	68 x 15
	[inch]	2.7 x 0.59
Weight	[g]	30
	[lbs]	0.012
Power, Total Emitted	[mW]	5
	[HP]	5x10 <sup>-6</sup>
Power for Classification	[μW]	< 390
Beam range	[m]	1
	[inch]	3.937
Wave length	[Nm]	650
Operating voltage	[V DC]	2.8 to 4.5
Operating current	[mA]	20
Operating temperature	[°C]	-10 to 40
Storage temperature	[°C]	-40 to 80
Laser class		Class 1
Battery type		2 x LR44 / AG13



## 6. INITIAL OPERATION

### 6.1 Checking the parts of delivery

- Check delivery for completeness and damage caused by transport.
- Report any missing parts or damage caused by transport to your supplier immediately.

### 6.2 Included with the machine (subject to modifications)

- 1 Portable Tube Saw PS 4.5 or PS 6.6
- 1 Set of clamping jaws
- 1 Durable storage and shipping case
- 1 Saw blade (already mounted to the tube saw)
- 1 Ring spanner (SW22)
- 4 Allen screws (M8 x 80) for mounting the machine on the work bench
- 3 Allen keys (SW5, SW6, SW8)
- 1 Brush
- 1 Tube of GF TOP saw blade lubricating compound
- 1 Tool bag
- 1 Set of operating instructions and spare parts list

## 7. STORAGE AND TRANSPORT



ATTENTION

### Incorrect machine storage!

Diverse physical injuries and material damage.

- ▶ Store the machine in its original crate in a dry environment.



DANGER

### Fatal electric shock!

- ▶ Before transportation or changing the workplace, allow the machine to run to a stop and pull the mains plug.



WARNING

### During transportation, the ON/OFF switch may unintentionally be activated causing the machine to start up!

Diverse physical injuries and material damage.

- ▶ Before transportation or changing the workplace, allow the machine to run to a stop and pull the mains plug.



WARNING

### Heavy weight when transporting the tube saw!

Danger of being injured through overstraining.

- ▶ Transport tube saws over long stretches with corresponding lifting aids.

### 7.1 Positioning the machine in the durable storage and shipping case

For a safe transport, the PS 4.5 of PS 6.6 should be positioned in the durable storage and shipping case as shown in the two pictures below:

1. Turn the motor 90° on its own axis in the direction of the locking handle (see chap. 9.3, p. 32).
2. The vice (with or without quick mounting plate) should lie parallel to the length side of the case in the wooden enclosure.
3. The slide housing with motor then should be rotated approx. 70° sideways, so that it fits into the case enclosure.



PS with quick mounting plate



PS without quick mounting plate

## 8. TRANSPORT AND ASSEMBLY



WARNING

### When switching the motor on, the tube saw may revolve around the tube automatically.

Diverse physical injuries and material damage.

- ⊘ In their home position, the saw blade must **not** touch the tube.
- ▶ Make sure that the slide housing is in the home position when the cutting process starts.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Pull off the hand wheel from the spindle before the slide housing starts rotating.
- ▶ Before switching the motor on, make sure that the gap between the saw blade and the tube is sufficient, and that the tube is securely clamped in the vice.
- ▶ Place sufficient tube supports under the tube.



WARNING

### Flying parts/breaking tool!

Diverse physical injuries and material damage.

- ⊘ **Do not** process the tube while it is loose in the vice.
- ⊘ **Never** use a damaged or deformed saw blade.
- ⊘ In the event of tool breakage with a new tool, **do not** enter the old cut because the tool can break again.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Immediately replace worn-out tools.
- ▶ Ensure that the cutting tools are correctly fitted.
- ▶ Tube dimension must be set correctly. During cutting, the saw blade must saw through the entire tube wall.
- ▶ Avoid breaking tool through low (adequate) feed force, correct dimension (see chap. 8.6, p. 27) and speed (see chap. 8.7, p. 28) settings.
- ▶ Hold on to the motor unit tightly by the handle, and guide it with low (adequate) feed force during the machining process.

### 8.1 Mounting the machine on the work bench

NOTE

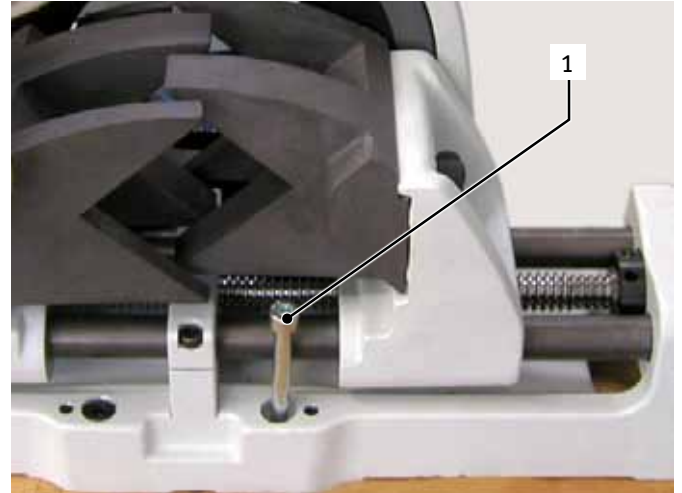
Prior to initial operation of the portable tube cutter, the electric motor must be rotated 90° anticlockwise so that the handle of the motor points toward the front (see chap. 7.1, p. 18).

Mount the machine together with the vice, either:

- without quick mounting plate on the work bench (see chap. 8.1.1, p. 20) or
- with quick mounting plate on the work bench (see chap. 8.1.2, p. 20) or
- directly on the Tripod (see chap. 8.1.3, p. 21).

### 8.1.1 Mounting the machine on the work bench without quick mounting plate

1. Use the PS as a template to punch holes in the work bench.
2. Drill 4 holes of 9 mm  $\varnothing$ .
3. Fasten the PS to the work bench using 4 included hexagon socket screws with nuts (1).



### 8.1.2 Mounting the machine on the work bench with quick mounting plate

The quick mounting plate with screw clamps is not included in the scope of supply but is obtainable as accessory (see chap. 3.2.1, p. 13).

1. Screw the quick mounting plate to the work bench by means of the 2 screw clamps.
2. Mount the PS to the quick mounting plate with 4 included Allen screws.



### 8.1.3 Mounting the machine on the Tripod

The Tripod is not included in the scope of supply but also obtainable as accessory (see chap. 3.2.3, p. 13).  
To mount the Portable Tube Saw on the Tripod:

- ▶ Mount the PS to the Tripod with 4 included Allen screws.

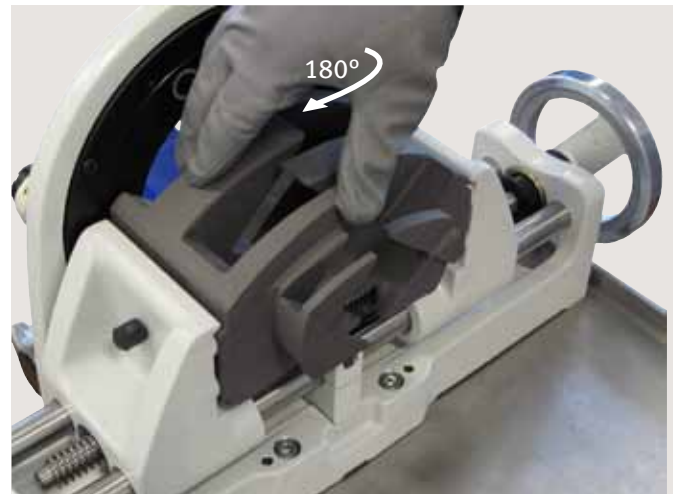


## 8.2 Mounting the clamping jaws to the vice

**NOTE** The **PS 4.5** is equipped with rotatable clamping jaws. By rotating of the clamping jaws it is possible to process small ( $< 45$  mm/1.772 inch) or large ( $> 45$  mm/1.772 inch) tube diameters (see "Scope of application", chap. 4.2, p. 15). When delivery of the PS 4.5 the clamping jaws are already mounted on the PS 4.5, so that it can be started with processing of tubes  $> 45$  mm/1.772 inch. With the standard clamping jaws of the **PS 6.6** made from coated aluminum cast it is possible to process tubes with a outer diameter of  $> 50$  mm/1.969 inch. They are included in the standard scope of supply and are on delivery already mounted on the PS 6.6. To cut tubes with a smaller outer diameter (min. 30 mm/1.181 inch), special clamping jaws are necessary (see "Accessories", chap. 3.2, p. 13).

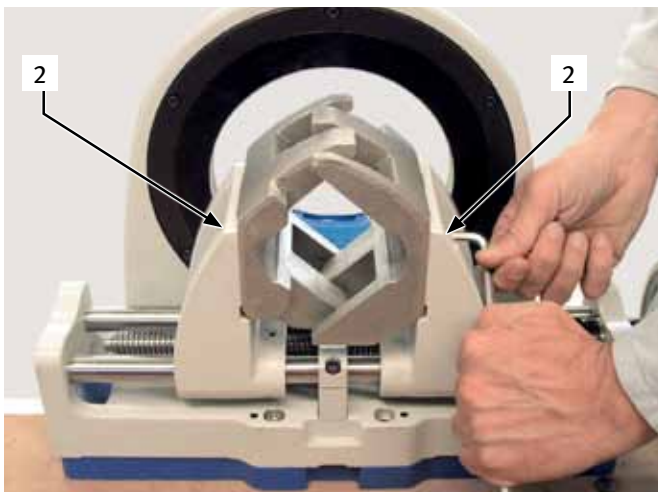
### 8.2.1 Disassembling clamping jaws from PS 4.5

1. Detach 2 wing screws (1) sideways of the vice.
2. Remove the clamping jaws and turn by 180°.
3. Fasten the clamping jaws with 2 wing screws.



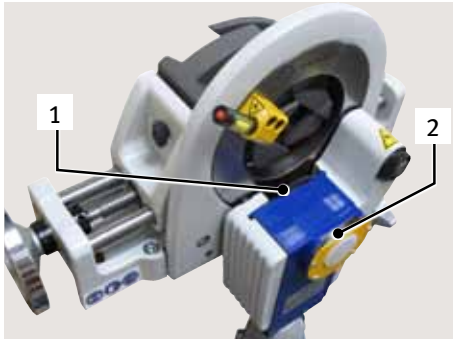
### 8.2.2 Disassembling clamping jaws from PS 6.6

1. Detach 2 screws (1) sideways of the vice by means of the allen key.
2. Remove the clamping jaws and replace with new clamping jaws if necessary.
3. Fasten the clamping jaws with 2 screws.



### 8.3 Which saw position for which application?

**NOTE** Use the Portable Tube Saw PS for cutting tubes and elbows only.  
The user will be the only person liable for damages caused by improper use



**Saw position 1:**  
Cutting tubes

**Saw position 2:**  
Cutting elbows

### 8.4 Mounting the saw blade on saw position 1



**WARNING**

**Flying, hot and sharp-edged chips, tube surfaces, cutting edges and tools!**

Danger of injury to eyes and hands.

- ⊘ **Do not** touch the running tool while the machine is in operation.
- ⊘ **Never** work without the saw chip guard mounted.
- ▶ Wear recommended protective clothing.
- ▶ Only remove chips with tight-fitting safety gloves (in accordance with DIN EN 388).
- ▶ Make sure the chips guard is working.



**WARNING**

**When switching the motor on, the tube cutter may revolve around the tube automatically.**

Diverse physical injuries and material damage.

- ⊘ In their home position, the saw blade must **not** touch the tube.
- ▶ Make sure that the slide housing is in the home position when the cutting process starts.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Before switching the motor on, make sure that the gap between the saw blade and the tube is sufficient, and that the tube is securely clamped in the vice.
- ▶ Place sufficient tube supports under the tube.



**WARNING**

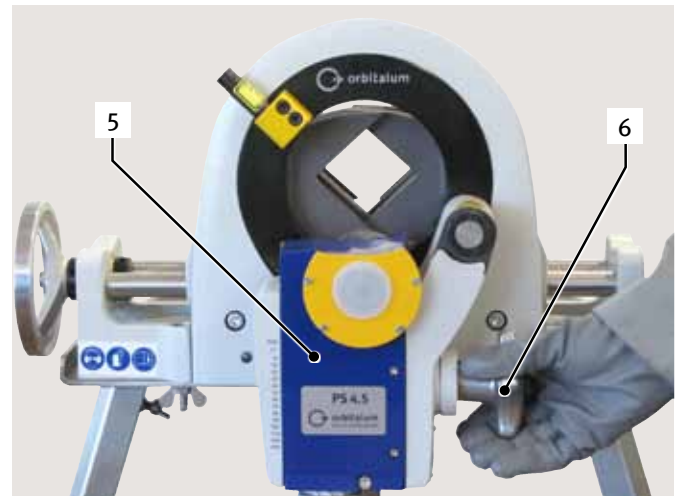
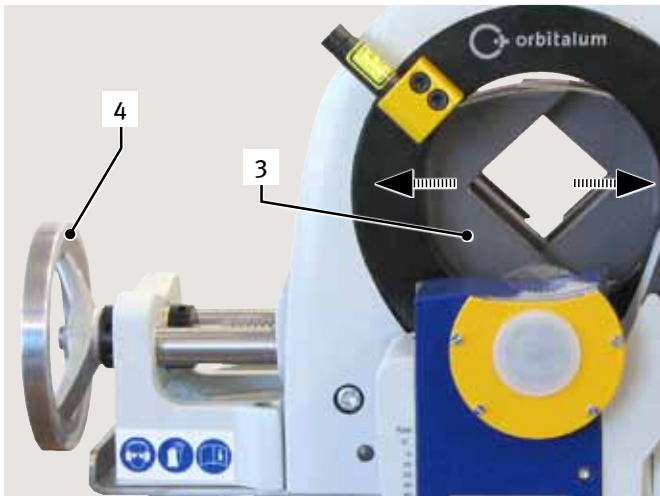
**Flying parts/breaking tool!**

Diverse physical injuries and material damage.

- ⊘ **Do not** process the tube while it is loose in the vice.
- ⊘ **Never** use a damaged or deformed saw blade.
- ⊘ In the event of tool breakage with a new tool, do **not** enter the old cut because the tool can break again.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Immediately replace worn-out tools.
- ▶ Ensure that the cutting tools are correctly fitted.
- ▶ Tube dimension must be set correctly. During cutting, the saw blade must saw through the entire tube wall.
- ▶ Avoid breaking tool through low (adequate) feed force, correct dimension (see chap. 8.6, p. 27) and speed (see chap. 8.7, p. 28) settings.
- ▶ Hold on to the motor unit tightly by the handle, and guide it with low (adequate) feed force during the machining process.

**NOTE** It is only possible to mount or replace the saw blades if no tube has been clamped into the vice before. If necessary, remove the tube before mounting the saw blade (see chap. 8.6, p. 27).

1. For a better access to the saw blade, open the clamping jaws (3) by turning the turning handle (4) counterclockwise to the limit stop.
2. Move the slide (5) upwards by turning the hand wheel (6) clockwise to the limit stop.



3. Loosen the saw blade nut (7) using the ring spanner SW 22 (left-handed thread!).
4. Remove the saw blade nut and the saw blade from the shaft.
5. Clean the saw blade shaft, the contact surface of the clamp and the surrounding using a brush.

**NOTE** The clamping plate (8) must not be removed.

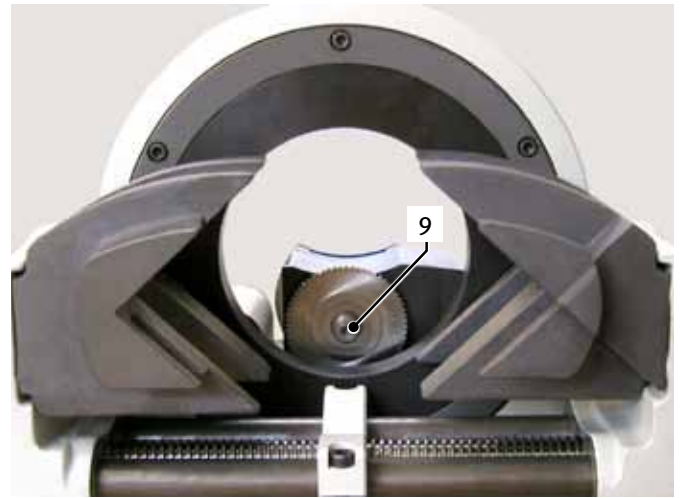
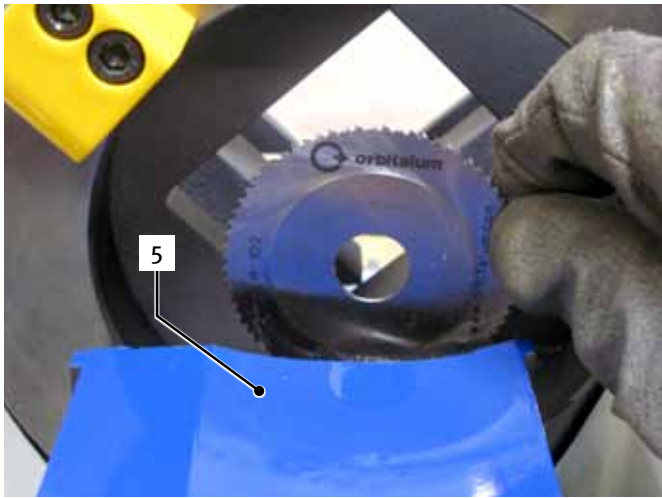


**ATTENTION** **Damage to material!**

- ▶ The saw blade must be free from chips and dirt.
- ▶ Only use Orbitalum Tools saw blades.
- ▶ Mount the saw blade on the shaft with the inscription pointing to the slide (5). The teeth are now arranged in the correct direction.



6. Mount the saw blade on the shaft (9) with the inscription pointing to the fixed clamping plate.
7. Place the saw blade nut onto the shaft again and tighten slightly using a fork ring wrench a/f 2 (anti-clockwise thread).



## 8.5 Mounting the saw blade on saw position 2



WARNING

### Flying, hot and sharp-edged chips, tube surfaces, cutting edges and tools!

Danger of injury to eyes and hands.

- ⊘ Do not touch the running tool while the machine is in operation.
- ⊘ Never work without the saw chip guard mounted.
- ▶ Wear recommended protective clothing.
- ▶ Only remove chips with tight-fitting safety gloves (in accordance with DIN EN 388).
- ▶ Make sure the chips guard is working.



WARNING

### When switching the motor on, the tube cutter may revolve around the tube automatically!

Diverse physical injuries and material damage.

- ▶ Make sure that the slide housing is in the home position when the cutting process starts.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Before switching the motor on, make sure that the gap between the saw blade and the tube is sufficient, and that the tube is securely clamped in the vice.
- ▶ Place sufficient tube supports under the tube.



WARNING

### Flying parts/breaking tool!

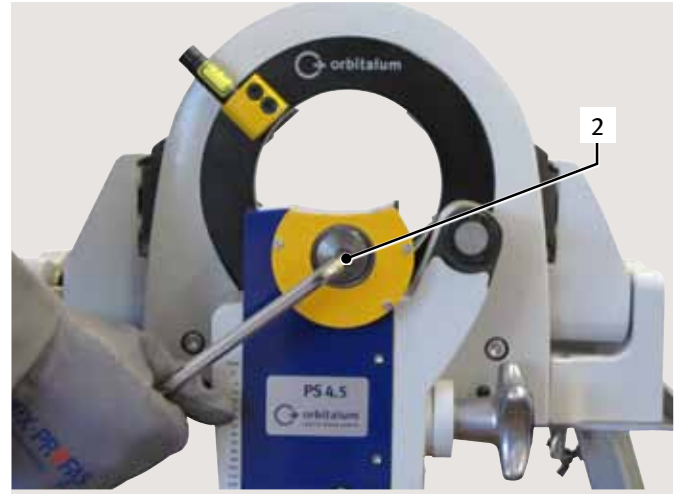
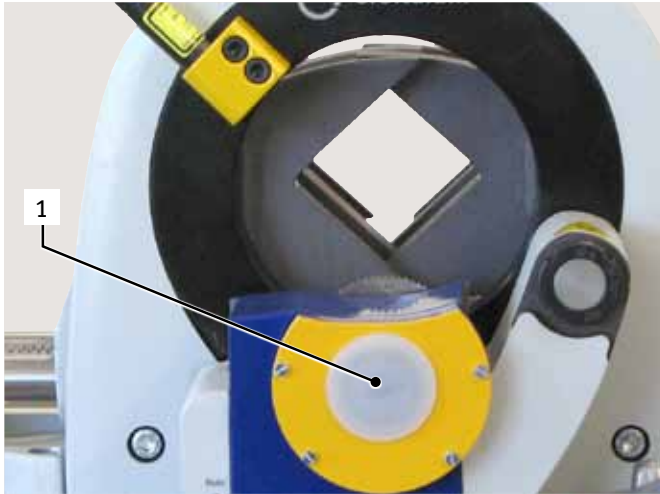
Diverse physical injuries and material damage.

- ⊘ **Do not** process the tube while it is loose in the vice.
- ⊘ **Never** use a damaged or deformed saw blade.
- ⊘ In the event of tool breakage with a new tool, do **not** enter the old cut because the tool can break again.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Immediately replace worn-out tools.
- ▶ Ensure that the cutting tools are correctly fitted.
- ▶ Tube dimension must be set correctly. During cutting, the saw blade must saw through the entire tube wall.
- ▶ Avoid breaking tool through low (adequate) feed force, correct dimension (see chap. 8.6, p. 27) and speed (see chap. 8.7, p. 28) settings.
- ▶ Hold on to the motor unit tightly by the handle, and guide it with low (adequate) feed force during the machining process.

NOTE

It is only possible to mount or replace the saw blades if no tube has been clamped into the vice before. If necessary, remove the tube before mounting the saw blade (see chap. 8.6, p. 27).

1. Remove the cover (1).
2. Loosen the clamping screw (2) by using the Allen key.
3. Remove the saw blade.
4. Clean the saw blade shaft and the surrounding by using a brush.



**ATTENTION**    **Damage to material!**

- ▶ The saw blade must be free from chips and dirt.
- ▶ Only use Orbitalum Tools saw blades.
- ▶ Mount the saw blade with the inscription pointing to the saw blade guard. The teeth are now arranged in the correct direction.

5. Mount the saw blade on the saw blade shaft.
6. Tighten the clamping screw clockwise slightly using a hexagon key wrench.



## 8.6 Clamping the tube and adjusting the tube dimension



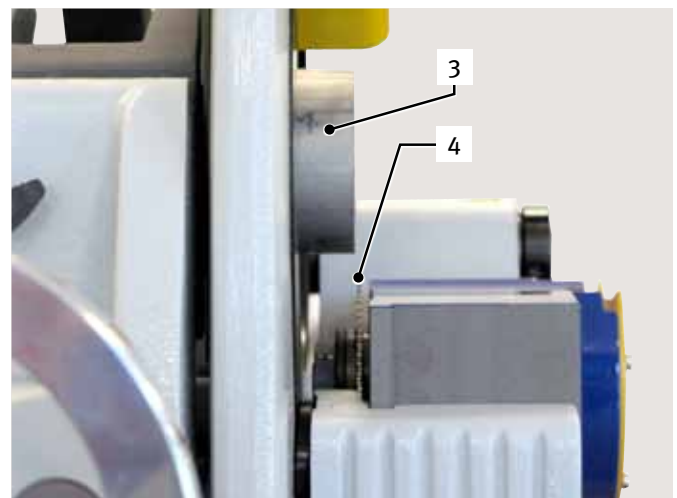
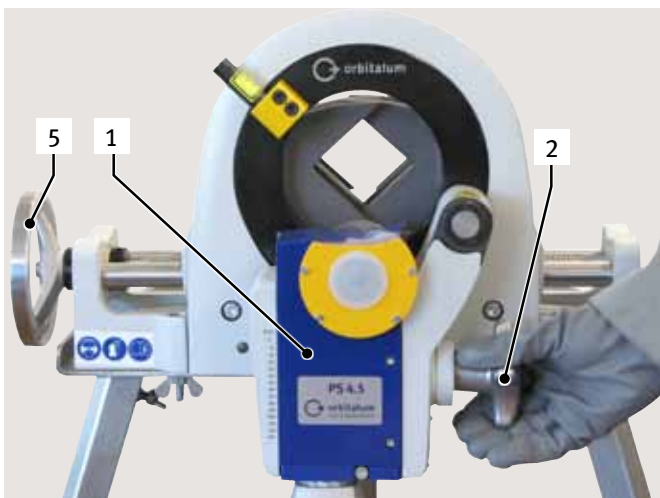
### WARNING

**When switching the motor on, the tube cutter may revolve around the tube automatically.**

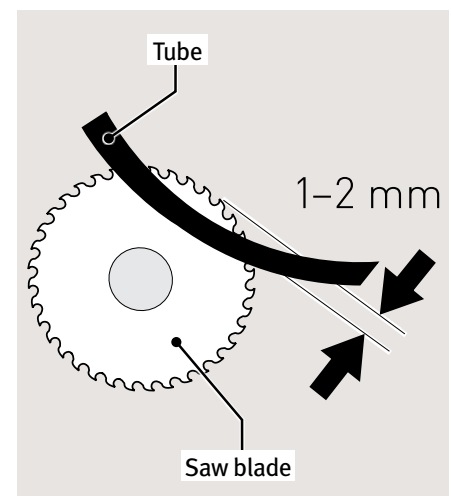
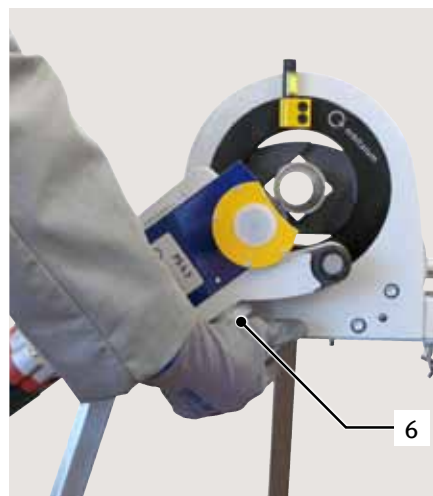
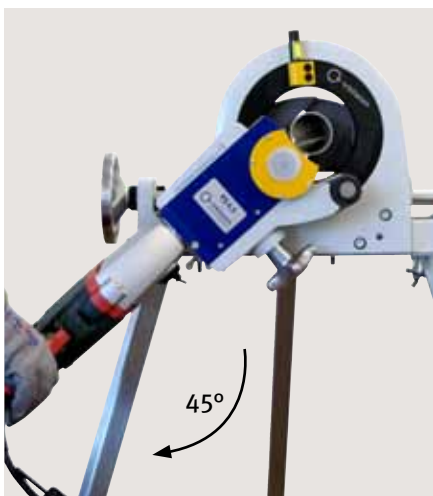
Diverse physical injuries and material damage.

- ⊘ In their home position, the saw blade must **not** touch the tube.
- ▶ Make sure that the slide housing is in the home position when the cutting process starts.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Before switching the motor on, make sure that the gap between the saw blade and the tube is sufficient, and that the tube is securely clamped in the vice.
- ▶ Place sufficient tube supports under the tube.

1. Use the hand wheel (2) to turn the slide (1) with saw blade down to the lowest position (to the largest tube dimension).
2. Move the tube (3) towards the saw blade (4) until it is just in front of the blade; clamp the tube by means of the turning handle (5).



3. Use the motor grip to swing the motor approx. 45° upwards in clockwise direction, until the saw blade reaches the cutting position.
4. To adjust the saw blade position, turn the hand wheel (6) until the teeth of the saw blade reach approx. 1 – 2 mm into the tube (see the diagram).



5. Swing the motor back to its original position using the motor grip.
6. Move the tube forward until reaching the desired point of separation and fix it by means of the clamping jaw turning handle.

## 8.7 Selecting speed stages

Tube material	Controller setting (1)	Spindle speed (rpm)
Stainless steel (material no. 1.40... – 1.45...) with a wall thickness of 1 mm up to max. 3 mm	E – G	114 – 165
High-tech material (nickel chrome molybdenum alloy)	B – E	42 – 114



**IMPORTANT** Select low speed for large tube diameters and for thick-walled tubes.

## 9. OPERATION



DANGER

### Machine start-up due to unintentional pressing of the ON/OFF switch or the speed regulator.

Fatal electric shock!

Diverse physical injuries and material damage!

- ▶ Prior to assembly, dismantling, maintenance and adjustment work, disconnect the machine from the mains supply and allow it to run to a stop.



DANGER

### When the slide housing is rotating, excess lubricant can get into the motor unit.

Fatal electric shock!

- ▶ Remove excess lubricant from the machine after every step.



WARNING

### Flying parts/breaking tool!

Diverse physical injuries and material damage.

- ⊘ **Do not** process the tube while it is loose in the vice.
- ⊘ **Never** use a damaged or deformed saw blade.
- ⊘ In the event of tool breakage with a new tool, **do not** enter the old cut because the tool can break again.
- ▶ Clamp the tube to be cut into the vice.
- ▶ Immediately replace worn-out tools.
- ▶ Ensure that the cutting tools are correctly fitted.
- ▶ Tube dimension must be set correctly. During cutting, the saw blade must saw through the entire tube wall.
- ▶ Avoid breaking tool through low (adequate) feed force, correct dimension (see chap. 8.6, p. 27) and speed (see chap. 8.7, p. 28) settings.
- ▶ Hold on to the motor unit tightly by the handle, and guide it with low (adequate) feed force during the machining process.



WARNING

### Risk of machine and tube falling!

Irreversible crushing.

- ▶ Check the machine's position and secure it so it cannot fall.
- ▶ Support tubes using tube stands.



WARNING

### Trapped fingers between the vice/clamping shell and tube!

Irreversible crushing.

- ⊘ **Do not** insert fingers between the vice/clamping shell and tube!



ATTENTION

### Restarting the machine following blockage!

Diverse physical injuries and material damage.

- ▶ In the event of a blockage, always disconnect the machine from the power supply before clearing it.
- ▶ If necessary, remove any tensioned parts before restarting the machine.



ATTENTION

### Vapors when working with lubricants!

Damage to lungs, skin and the environment.

- ▶ Only use original lubricant recommended by Orbitalum Tools.



DANGER

### Unexpected start-up!

Serious injury or death.

- ▶ Before connecting the machine to the power supply, check the on/off switch is switched off.



DANGER

### Loose/baggy clothing, long hair or jewelry can get caught in rotating machine parts!

Serious injury or death.

- ⊘ During operation, **do not** wear loose/baggy clothing, e.g. neckties.
- ▶ Tie up long hair to prevent it from being caught.



WARNING

### Body parts can fit between the cutting tools and the tube!

Serious injury.

- ⊘ **Do not** place body parts between the cutting tools and the tube.



WARNING

**Flying, hot and sharp-edged chips, tube surfaces, cutting edges and tools!**

Danger of injury to eyes and hands.

- ⊘ **Do not** touch the running tool while the machine is in operation.
- ⊘ **Never** work without the saw chip guard mounted.
- ▶ Wear recommended protective clothing.
- ▶ Only remove chips with tight-fitting safety gloves (in accordance with DIN EN 388).
- ▶ Make sure the chips guard is working.

## 9.1 Cutting the tube (saw position 1)

### 9.1.1 Shutting down (even in an emergency)



WARNING

**Pulling the plug does not perform the EMERGENCY STOP function!**

Diverse physical injuries and material damage.

- ⊘ **Do not use** crimped cables.
- ▶ Ensure the plug is not obstructed.
- ▶ Simulate an emergency by carrying out a practice plug removal.

To be able to stop the machine (also in case of emergency), perform the corresponding steps and immediately remove from the danger area, until the machine comes to a stop:



If the fixing button (2) is not locked:

- ▶ Release ON/OFF switch (1).

If the fixing button (2) is locked:

- ▶ Actuate and release ON/OFF switch (1).

If the ON/OFF switch (1) no longer functions:

- ▶ Pull out the plug.

1. Fasten the saw blade (for saw position 1, see chap. 8.4, p. 23; for saw position 2, see chap. 8.5, p. 25).
2. Set pipe dimension and penetration depth (see chap. 8.6, p. 27).
3. Mark the point of separation on the tube.
4. Move the tube forward in the vice until reaching the desired tube length and clamp it (see chap. 8.6, p. 27).

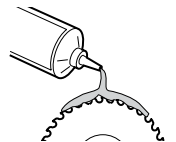
IMPORTANT

Apply saw blade lubricant to the saw blade **after each cut**.

Use only saw blade lubricant (no oils) from Orbitalum Tools (e.g. GF LUB or GF TOP).

Keep the machine clean.

Always remove residue from lubricant from the machine.



5. Connect the PS to power supply.
6. Switch the motor on by pressing the ON/OFF switch (1) and keep the switch pressed; lock it by means of the arrest button (2).



7. Select the speed stage (see chap. 8.7, p. 28).
8. Slowly turn the PS clockwise holding it at the grip until the tube wall is pierced.
9. Go on turning smoothly until the tube is cut off.
10. Turn the tube saw back counterclockwise to its original position.
11. Switch the motor off pressing the ON/OFF switch.

## 9.2 Cutting elbows (saw position 2)

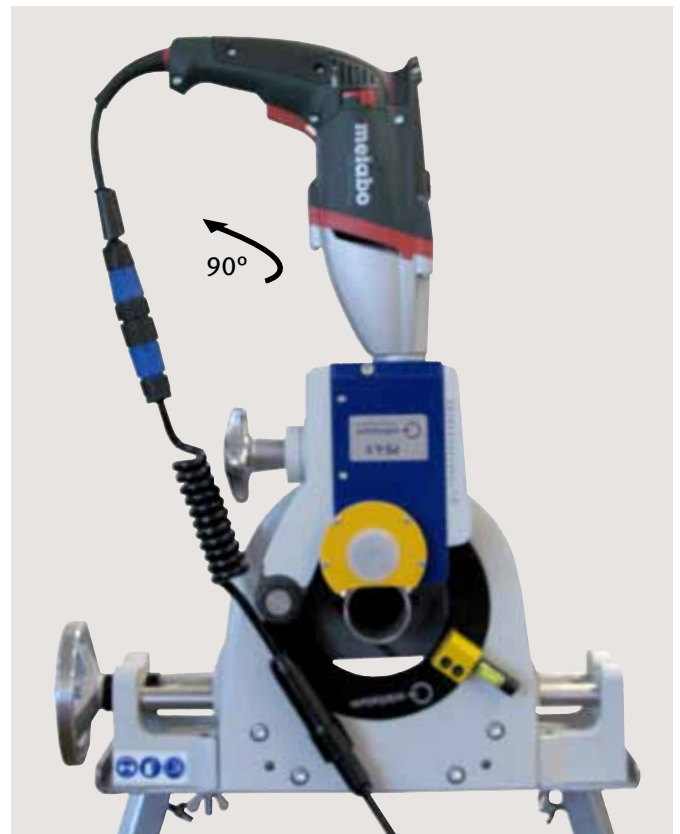
Further workflows remain the same as in chap. 9.1, p. 30.

## 9.3 Cutting tubes or elbows in a cramped workplace

### 9.3.1 Altering the swivel radius

1. Loosen the screw (1) using an Allen key (SW 5).
2. The motor may now be turned by 90°.
3. Tighten the screw (1).

The working procedure is the same as described in chap. 9.1, p. 30.





## 10. SERVICING, MAINTENANCE, TROUBLESHOOTING

**NOTE** Some of the work mentioned depends a great deal on the use and on the ambient conditions. The cycles specified are minimum specifications. In individual cases, differing maintenance cycles are possible. To ensure the safety of the machine, perform maintenance annually using an authorized service center with VDE testing. If the machine does not function as previously described, the machine must also be sent into an authorized service center.



**DANGER**

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

Non-observance could result in death or serious injury.

- ▶ Before the maintenance work is carried out, allow the machine to run to a stop and pull the mains plug.



**DANGER**

### **Risk of electric shock due to poor electrics!**

Fatal electric shock.

- ▶ Before the maintenance work is carried out, allow the machine to run to a stop and pull the mains plug.
- ▶ Repair and maintenance work on the electrical equipment may only be carried out by a qualified electrician.

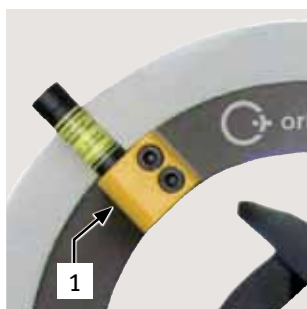
### 10.1 Maintenance

Time/Interval	Activity
Before starting work	<ul style="list-style-type: none"> <li>▶ Remove any chips and dirt from the saw blades.</li> <li>▶ Remove any chips and dirt from the guiding blade and the threaded spindle of the vice.</li> </ul>
Daily	<ul style="list-style-type: none"> <li>▶ Remove the saw blade and use the brush to brush off any chips.</li> </ul>
Every time the tube saw is cleaned.	<ul style="list-style-type: none"> <li>▶ Clean the shafts using a cloth or brush.</li> <li>▶ Use a brush to remove any chips from between the slide and the slide housing. To do so, move the slide to the upper and lower position.</li> </ul>

#### 10.1.1 Laser

- ▶ No maintenance for the laser required.
- ▶ For the Laser is no service allowed.
- ▶ The laser has to be returned to the factory for any service or repair.
- ▶ It is not allowed to open, modify or to remove protective covers or housings except for battery change.

#### 10.1.2 Mounting instruction for laser/Change of batteries



1. Loosen the threaded pin M4x4 (1) (Code 445 001 003) by using allen key SW2 to remove the laser from the cover plate.
2. Exchange the batteries.
3. After putting the laser in the holder the laser has to be adjusted and the threaded pin M4x4 (Code 445 001 003) has to be tightened with allen key SW2.

## 10.2 What to do if ...? – General trouble shooting

Problem	Possible cause	Remedy
The motor of the PS is not running. (The electronic signal indicator of the motor lights up).	<u>Quickly flashing light:</u> <b>Restart inhibitor.</b> For safety reasons, the machine will not restart automatically after a power failure in case it was switched on before the voltage loss.	▶ Switch the PS off and on again.
	<u>Slowly flashing light:</u> <b>The carbon brushes are worn out.</b> The carbon brushes are worn out almost completely. If the carbon brushes are worn out completely, the machine will switch off automatically.	▶ Have the carbon brushes replaced by the after-sales service personnel.
	<u>Permanent light:</u> <b>Overload.</b> If the machine is overloaded during a longer period of time, its power input will be reduced to prevent the motor from further heating.	▶ Disconnect the machine from power supply and let it cool down for some minutes.
The tube saw is not turning.	The tube dimension has not been set correctly.	▶ Set the correct tube dimension (see chap. 8.6, p. 27).
The saw blade is not cutting, but is slipping through.	The hexagon nut on the saw blade shaft has not been tightened.	▶ Tighten hexagon nut slightly.
The saw blade is not cutting.	The saw blade was mounted the wrong way round.	▶ Mount the saw blade correctly (see chap. 8.4, p. 23 or chap. 8.5, p. 25).
	The saw blade is worn out.	▶ Replace the saw blade.
The tube is not cut properly.	The tube dimension has not been set correctly.	▶ Set the correct tube dimension (see chap. 8.6, p. 27).
Poor machining quality on the cut surfaces.	The tool is blunt.	▶ Use new original Orbitalum Tools tool.
	Inadequate tool lubrication.	▶ Lubricate the saw blade.
	Wrong speed setting.	▶ Set the speed according to the table (see chap. 8.7, p. 28).

## 10.3 Servicing/customer service

For ordering spare parts, refer to the separate spare parts list.  
For troubleshooting, please contact the branch responsible directly.

Please indicate the following details:

- Type of machine: Portable Tube Saw **PS 4.5** or **PS 6.6**
- Machine-no.: (see type plate)

# 11. EU DECLARATION OF CONFORMITY



EG-Konformitätserklärung  
 Declaration of conformity  
 Dichiarazione di conformità  
 Déclaration de conformité  
 Declaración de conformidad

Orbitalum Tools GmbH  
 Josef-Schüttler-Straße 17  
 78224 Singen, Deutschland  
 Tel.: +49 (0) 77 31 792-0  
 Fax: +49 (0) 77 31 792-524

According to machine guideline 2006/42/EG (MaschR), Appendix II A.

Die Bauart der Maschine:  
 The following product:  
 Il seguente prodotto:  
 Le produit suivant:  
 El producto siguiente:

**PS 4.5 Portable Rohrsäge**  
**PS 6.6 Portable Rohrsäge**

Seriennummer:  
 Series number:  
 Numero di serie:  
 Nombre de série:  
 Número de serie:

Baujahr / Year / Anno / Année / Año:

ist entwickelt, konstruiert und gefertigt in Übereinstimmung mit folgenden EG-Richtlinien:  
 was designed, constructed and manufactured in accordance with the following EC guidelines:  
 è stata progettato costruito e commercializzato in osservanza delle seguenti Direttive:  
 a été dessiné, produit et commercialisé selon les Directives suivantes:  
 ha sido proyectado construido y comercializado bajo observación de las siguientes Directivas:

**Maschinen-Richtlinie (2006/42/EG)**  
**EMV-Richtlinie (2004/108/EG)**  
**Niederspannungsrichtlinie (2006/95/EG)**  
**2000/14/EG**

Folgende harmonisierte Normen sind angewandt:  
 The following harmonized norms have been applied:  
 Le seguenti norme armonizzate ove applicabili:  
 Les normes suivantes harmonisées où applicables:  
 Las siguientes normas armonizadas han sido aplicadas:

**DIN EN ISO 13849-1 (2008)**  
**DIN EN ISO 13849-2 (2008)**  
**DIN EN ISO 12100-1 (2010)**  
**DIN EN ISO 12100-2 (2010)**  
**DIN EN ISO 14121-1 (2007)**  
**DIN EN 1037 (2008)**  
**DIN EN 60745 (2010)**  
**DIN EN 61029-1 (2010)**  
**DIN EN 60204-1 (2009)**

Authorised to compile the technical file is Mr. Gerd Riegraf, Orbitalum Tools GmbH, D-78224 Singen.

Markus Tamm  
 Managing Director

Hasan Caglar  
 Manager Division Process

Singen, 22.01.2010

**We value  
your opinion!**

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