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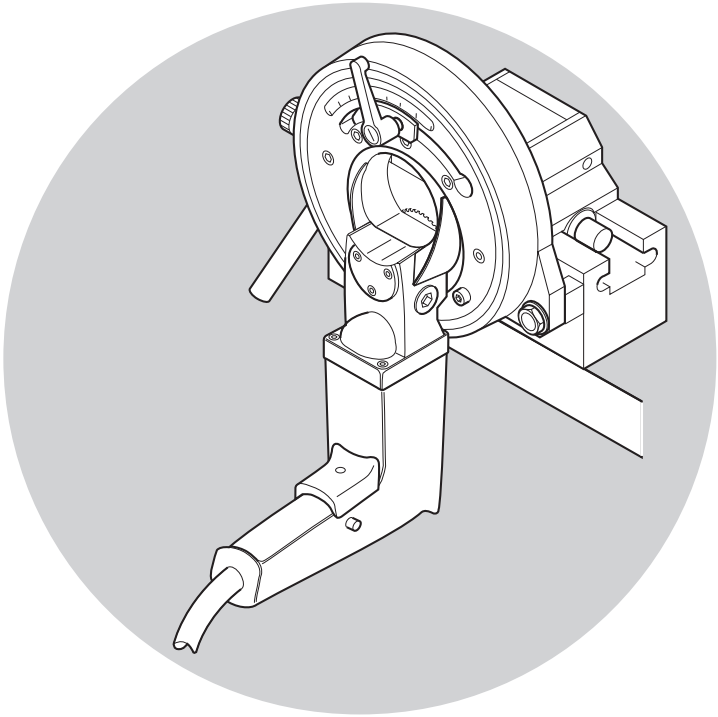
tools for piping systems

precision.
power.
simplicity.

Operating instructions

Pipe Cutting and Beveling Machine

RA 21 S



Code 790 044 762

Translation of original operating instructions

Machine-no.: _____

Table of contents

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
RA 21 S	Pipe Cutting and Beveling Machine, Type 21 S
RA 21 S INOX	Pipe Cutting and Beveling Machine, Type 21 S with special stainless steel clamping jaws

1 Notes on safety

The Pipe Cutting and Beveling Machine (in the following referred to as RA 21 S) 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 RA 21 S only for cutting and beveling of pipes.
- 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.
- Only use original Orbitalum Tools spare parts and auxiliaries.
- Only use the pipe cutter for cutting and beveling operations.
- Work on the electrical installations may only be performed by a qualified electrician.
- Disconnect from the mains before changing the tools, maintenance- and repair-works and allow the machine to run a stop.
- Do not use the RA 21 S unless all safety devices (restart inhibitor, overload protection and saw blade guard) are working properly and the fixtures are fitted securely on the base plate or pipe-supply.

1.3 Working with safety in mind

"Make your contribution to safety in the workplace."

- Report any unusual behavior on the part of the machine to the person in charge immediately.
- Always work with safety in mind.

- Wear safety goggles, safety-gloves and hearing protection during working with the RA 21 S.

- Tie up long hair (snood-type cap); do not wear any wide clothes. **Attention:** jewels and ties can be grasped by the rotating parts.
- Switch the RA 21 S off after completing each stage of work and allow the machine to run a stop.

- Disconnect from the mains before cleaning-, maintenance- and repair-work the RA 21 S and let the machine leak.
- Keep the RA 21 S dry, do not use in the rain.
- Do not use the RA 21 S in areas subject to explosion hazards.

DANGER

Danger of death by electric shock!

If the mains cable is damaged, live parts may cause death when being touched directly.

⦸ Keep the mains cable of the pipe cutter motor away from the saw blade or bevel cutter.

▶ Secure the falling pipe piece.

⦸ Do **not** let the cut-off pipe piece drop in an uncontrolled way.

⦸ Do **not** run the machine unattended.

▶ While processing the pipe, always keep an eye on the position of the mains cable.

WARNING

Danger of being injured by sharp cutting edges!

⦸ Keep hands away from the tools during cutting or beveling.

▶ Wear safety gloves.

WARNING

Danger of being injured by the rotating slide housing!

▶ Make sure that the slide housing starts from its home position.

▶ Clamp the pipe to be processed into the vice.

▶ Pull off the vice handle from the spindle before the slide housing starts rotating.

1.4 Waste disposal / environmental protection

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

(RL 2002/96/EC)

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

Therefore:

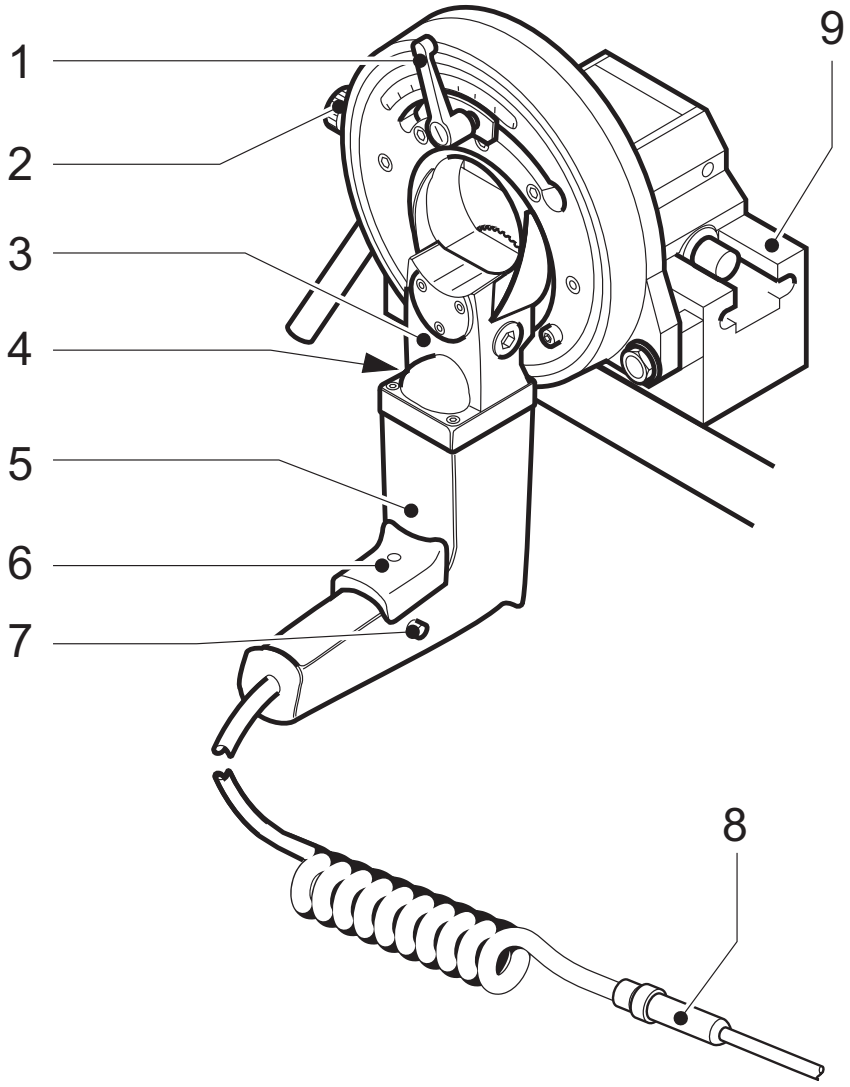
- Electrical (electronic) devices which are marked with the symbol to the left, may not be disposed of with household waste in accordance to the EU directive 2002/96/EC.
- By actively using the offered return and collection systems, you actively contribute to the reuse, recycling and utilization of electrical (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.
- 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.

1.5 Further safety regulations

Observe the regulations, standards and guidelines applicable in your country.

2 Design of the product

2.1 Standard



1 pipe diameter adjusting facility
2 locking screw
3 worm gear
4 nameplate
5 motor
6 on/off switch
7 locking knob for on/off switch
8 power cable with slipring contact
9 vise

2.2 Accessories

Not included in the standard scope of supply.

2.2.1 Saw blades and bevel cutter

These saw blades and bevel cutters are especially designed for our pipe cutters for highest requirements and longest service life.
4 different high-quality tool ranges are available for different applications:

- **Economy range**
  for low and unalloyed steel and cast iron pipes
- **Performance range**
  for high-alloy steel (stainless steel)
- **High-Performance range**
  for high-performance materials and high-alloy steel (stainless steel)
- **Premium range**
  especially made for stainless steel applications with extra long durability

Workable pipe materials	Al	Mild steel, Cu, CuNi, CuZn, CuSn	INOX, V2A, V4A, 304, 316 (L)	Ti, Duplex, Inconel
Economy	*	*		
Performance		*	*	
High-Performance		*	*	*
Premium			*	

2.2.2 Special stainless steel clamping jaws

For RA 2 and RA 21 S. In pairs. Retrofit.

Article	Code
Special stainless steel clamping jaws for RA 2 and RA 21 S	**790 041 323**

2.2.3 Saw blade lubricating compound GF TOP

Synthetic high-performance lubricant for pipe cutting and beveling. Increases the life of the saw blades. Complies with NSF H2 registration. Easy and constant lubrication of the saw blade, supplied with a special brush.

Article	Code
Saw blade lubricating compound GF TOP	**790 060 228**

2.2.4 Saw blade lubricating compound ROCOL

High-performance lubricant for pipe cutting and beveling. Increases the life of the saw blades.

Article	Code
Saw blade lubricating compound ROCOL ROCOL, Tube, 150 ml	**790 041 016**
Saw blade lubricating compound ROCOL ROCOL, Can, 0.5 kg	**790 041 013**
Saw blade lubricating compound ROCOL ROCOL, Can, 5.0 kg	**790 041 019**

3 Features and scope of application

3.1 Features

The Pipe Cutting and Beveling Machine RA 21 S is distinguished by the following main features:

- Increased safety due to stationary pipe and rotating tool.
- Self-centering vice.
- Low-maintenance gearing with oil-bath lubrication.
- Variable speed electric motor with restart inhibitor.
- Right-angled, burr-free, cold separating cut.
- Cold machining process.
- Quick cutting process.
- Easy and space-saving assembly.
- Fabrication of standardised welding bevels.
- Quick tool change.
- Simultaneous cutting and beveling of thin-walled metal pipes.

3.2 Scope of application

3.2.1 Application range

	[mm]	[inch]
Pipe OD	5 - 63	0.197 - 2.481
Wall thickness, depends on material	0.5 - 4.5	0.019 - 0.177
Pipe ID min. (saw blade-Ø 63 mm/2.480 inch)	min. 7	0.276
Pipe ID min. (saw blade-Ø 68 mm/2.677 inch)	min. 2	0.079
Pipe OD for bars (saw blade-Ø 63 mm/2.480 inch)	6 - 16	0.236 - 0.630

3.2.2 Pipe materials

- steel, black or galvanised
- chrome and stainless steel (up to 2.5 mm wall thickness)
- aluminum
- non-ferrous metals (e.g. copper, brass)
- plastics (PE, PP, PVDE, PVC)

Other materials on request

Note Do not use cast pipes with glass-hard surfaces (GG).

4 Technical specifications

4.1 Rating

Dimensions	300 x 450 x 300 mm
Weight (incl. vise)	34 kg
Power	550 W
Protection class	Totally insulated in accordance with Class II DIN VDE 0740
Speed	180 rpm
Versions	1-phase AC 110 – 120 V, 50/60 Hz 230 – 240 V, 50/60 Hz
Sound pressure level at the workplace	approx. 75 dB (A)
Vibration level in accordance with EN 28662, Part 1*)	< 2.5 m/s2

*) The sound pressure level was measured under normal operating conditions in accordance with EN 23741.

5 Commissioning

Checking the parts 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 Included with the machine*

- 1 Pipe Cutting and Beveling Machine RA 21 S
- 1 Durable storage and shipping case
- 1 Saw blade (Code 790 041 035)
- 1 Quick mounting plate
- 1 Tool set
- 1 Tube of saw blade lubricating compound GF TOP (Code 790 060 228)
- 1 Tube of special gear oil (Code 790 041 030)
- 1 Operating instructions and spare parts list

*) Subject to modifications

6 Transporting and assembling the pipe cutter

DANGER

Danger of death caused by electric shock!

▶ Disconnect from the power supply before transporting, mounting or dismounting and allow the machine to run a stop.

WARNING

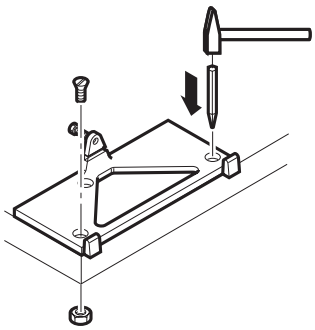
Danger of being injured during transportation!

⦸ **Never** carry and fit the pipe cutter alone.

▶ Transport and fit the pipe cutter with the aid of a crane or a similar lifting device.

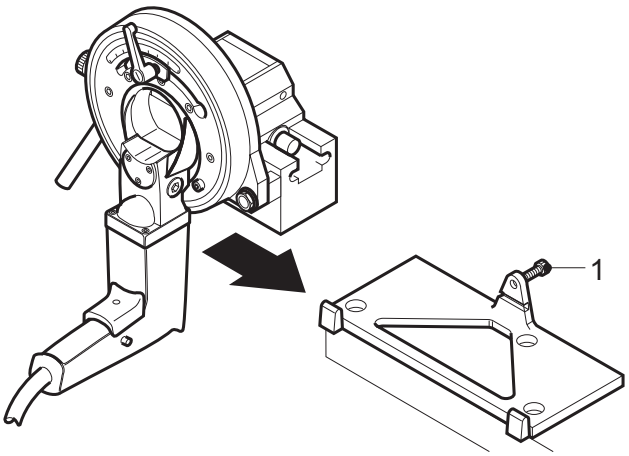
6.1 Mounting the quick mounting base plate

The pipe cutter with the vise is mounted either



- on the quick mounting base plate, or
- on the quick mounting base plate (special accessory) with clamps.

1. Mark and punch the bolt holes on the work bench. Use the quick-mounting base plate as a template.
2. Drill 13 mm Ø holes.
3. Bolt down the quick-mounting base plate.
4. Place the vise with flanged-on pipe cutter on the base plate. Tighten the hexagon nut (1).



7 Operation

WARNING

Danger of being injured by sharp cutting edges or electric shock!

⦸ Keep hands away from the saw blade/bevel cutter when inserting or changing the tool.

▶ Wear safety gloves.

▶ Disconnect the mains plug before mounting or dismounting, maintenance or adjustment and allow the machine to run a stop.

7.1 Fitting the saw blade /additional cutter

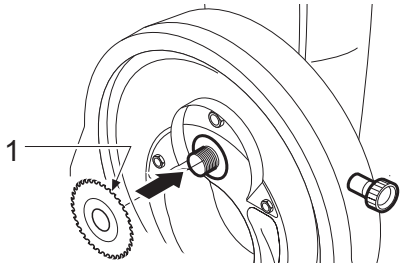
ATTENTION **Damage to material**

▶ The saw blade or bevel cutter must be free from chips and dirt.

▶ Only use Orbitalum Tools saw blades and cutters.

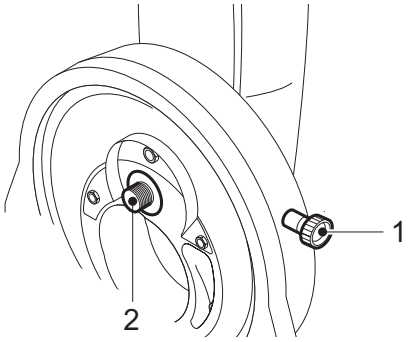
▶ When employing an additional cutter, only use the special Orbitalum Tools clamp washer, not the normal clamp washer.

▶ The inscription (1) on the saw blade must always be facing towards the pipe cutter. Consider the assembly sign at the saw blade guard.



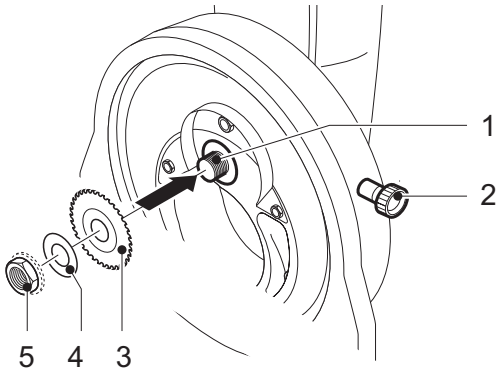
7.1.1 Preparatory work

1. Loosen the locking screw (1).
2. Turn the pipe cutter upwards 180°clockwise.
3. Tighten the locking screw (1).
4. Clean the saw blade shaft (2) and vicinity.



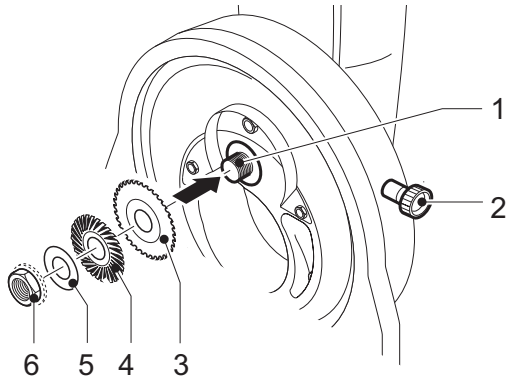
7.1.2 Fitting the saw blade or bevel cutter

1. Mount the following on the shaft (1):
   - saw blade (3) or bevel cutter
   - clamping disk (4)
2. Tighten the nut (5) by turning counter-clockwise. Left-hand thread.
3. Loosen the locking screw (2).
4. Turn the pipe cutter clockwise back down into its home position.



7.1.3 Fitting the saw blade and additional cutter

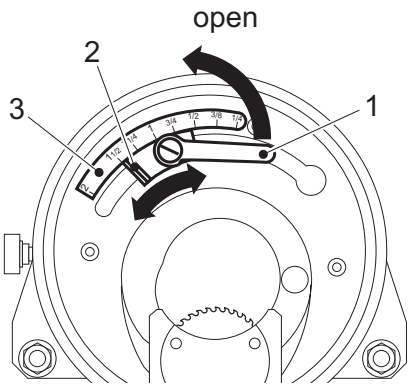
1. Mount the following on the shaft (1):
   - saw blade (3), additional cutter (4), clamping disk (5)
2. Tighten the nut (6) by turning counter-clockwise. Left-hand thread.
3. Loosen the locking screw (2).
4. Turn the pipe cutter clockwise back into its home position.



7.2 Adjusting the pipe diameter

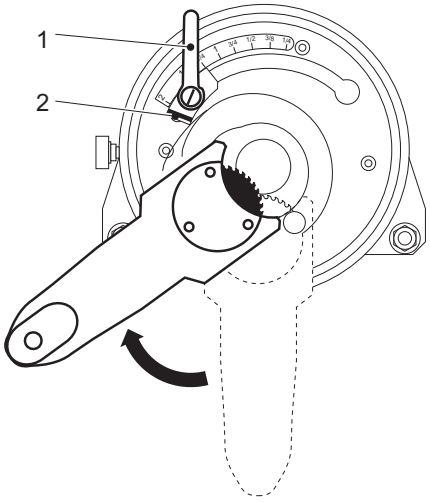
7.2.1 Threaded pipes to DIN 2440

1. Release the lever (1).
2. Select pipe diameter on the scale (3).
3. Set the red mark on the left side of the stop (2) to the corresponding number.
4. Tighten the lever (1).



7.2.2 All other types of pipe

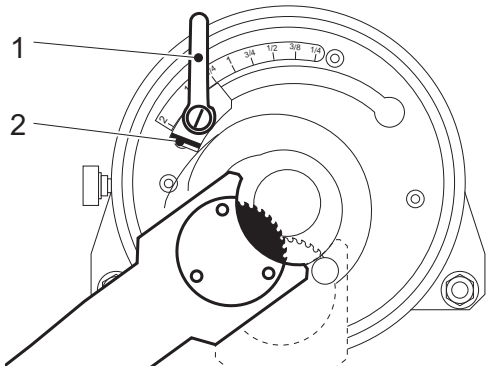
1. Insert the pipe in the vise.
2. Move the pipe almost up to the saw blade.
3. Tighten the pipe in the vise.
4. Release the lever (1) and set the stop (2) to position 2". Do not tighten.
5. Raise the motor of the pipe cutter as if to start cutting, until the points of the saw blade teeth project about 1.5 mm into the pipe.
6. Tighten the lever (1).



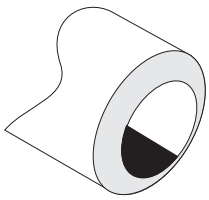
7.3 Adjusting the additional cutter

Simultaneous cutting and beveling of steel pipes up to a wall thickness of 4.5 mm is possible.

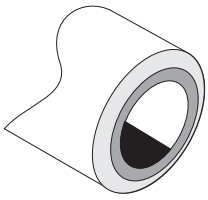
1. Insert the pipe in the vise.
2. Move the pipe almost up to the additional cutter.
3. Clamp the pipe in the vise.
4. Release the lever (1) and set the stop (2) to position 2". Do not tighten.
5. Raise the motor of the pipe cutter as if to start cutting, until the cutter covers the wall of the pipe.
6. Tighten the lever (1).



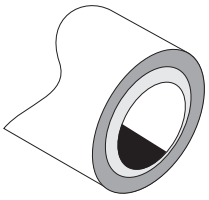
7. Do a test bevel (see chapter 7.6, p. 22) and check the result.



Bevel OK



Move the stop (2) a little to the right

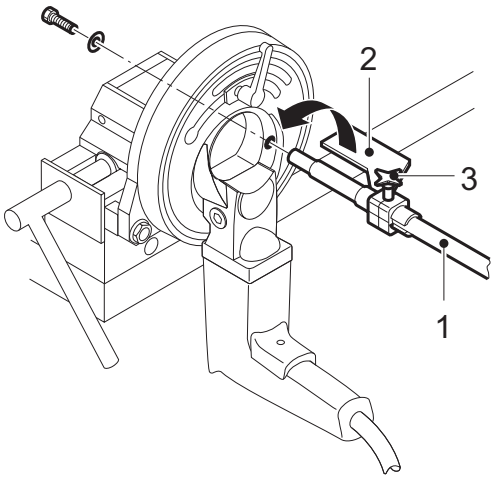


Move the stop (2) a little to the left

7.4 Using stops

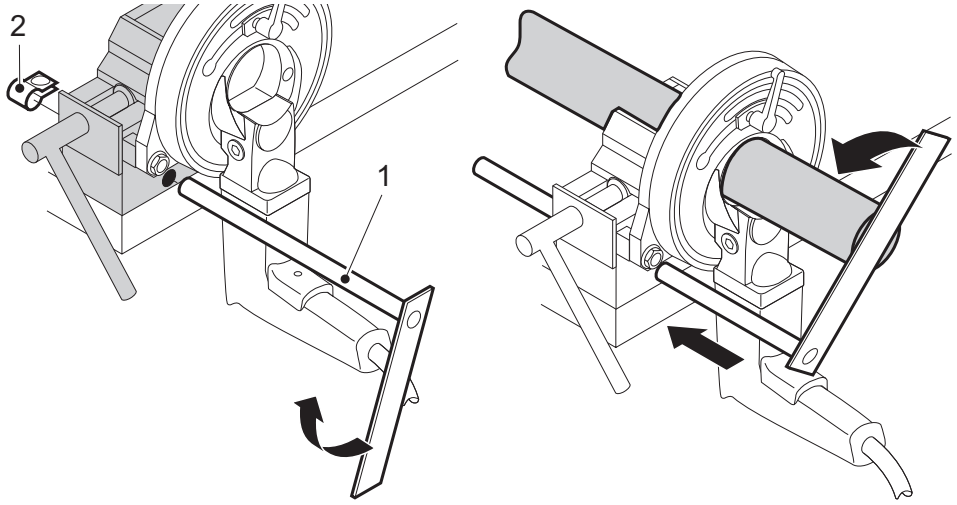
7.4.1 Length gauge up to 250 mm

1. Mount the length gauge (1).
2. Swing the stop (2) into the middle of the pipe and engage.
3. Release the cross knob (3).
4. Set to the desired length. Use the scale.
5. Tighten the cross knob.
6. Push the pipe for-wards up to the stop and clamp.
7. Swing the stop clear.
8. Cut the pipe.



7.4.2 Length gauge over 250 mm

1. Mount the length gauge (1).
2. Swing the stop in to the middle of the pipe.
3. Use a yardstick to extend the stop to the desired length.
4. Push the clamp (2) up against the housing and turn it so that it is in contact with the work bench.
5. Tighten the clamp.
6. Push the pipe up against the stop and clamp.
7. Swing the stop out and push all the way back.
8. Cut the pipe.
9. For the next cut, extend the stop and swing into place clockwise.



7.5 Cutting the pipe

WARNING

Danger of being injured by chips flying around!

⦸ **Never** work without the saw blade guard mounted.

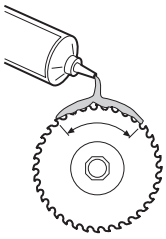
▶ Wear protective goggles.

Danger of being injured by sharp cutting edges or electric shock!

⦸ Keep hands away from the tools during cutting.

▶ Wear safety gloves.

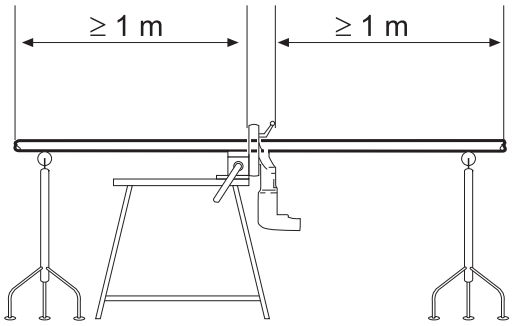
▶ Disconnect the mains plug before mounting or dismounting, maintenance or adjustment and allow the machine to run a stop.



1. Connect the pipe cutter to the mains.
2. Apply saw blade lubricant to the saw blade teeth.
   Repeat the lubrication every three cuts.

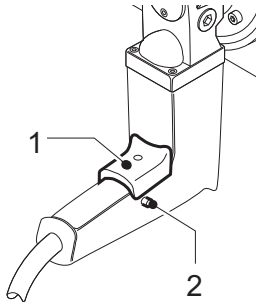
Important Use Orbitalum Tools lubricating gel only for pipes which come into contact with drinking water or foodstuffs.

3. Mark the cutting location on the pipe.
4. Insert the pipe in the vise.
5. Push the marked cutting location over the saw blade.
6. Clamp the pipe in the vise.

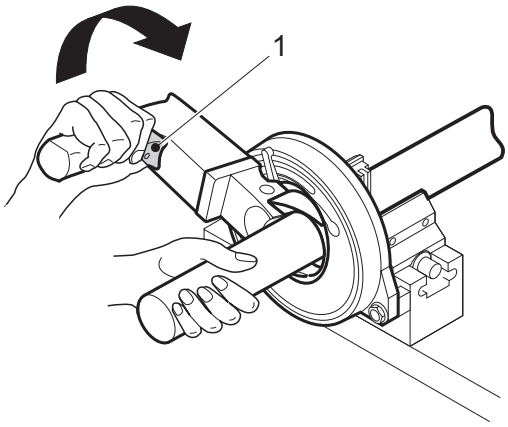


Important Use a pipe support for pipes that are over 1 m long.

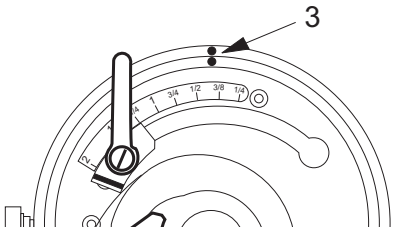
7. Switch on the saw motor. Press the on/off switch (1) and the locking button (2).



8. Carefully turn the pipe cutter clock-wise until the wall of the pipe has been pierced through.



9. Continue to turn rapidly until the pipe has been cut off and the marks (3) on the slide housing and vise housing are aligned.



10. Turn the pipe cutter back into its home position.
11. Switch off the saw motor. Press the on/off switch (1) again.

For non-stop operation

After cutting, loosen the hexagon nut on the saw blade to avoid damage caused by tension.

7.6 Cutting and beveling the pipe

WARNING

Danger of being injured by chips flying around!

⦸ **Never** work without the saw blade guard mounted.

▶ Wear protective goggles.

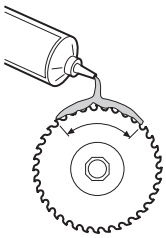
Danger of being injured by sharp cutting edges or electric shock!

⦸ Keep hands away from the tools during cutting.

▶ Wear safety gloves.

▶ Disconnect the mains plug before mounting or dismounting, maintenance or adjustment and allow the machine to run a stop.

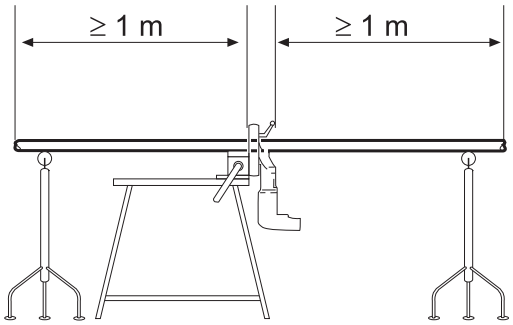
This procedure combines cutting and beveling of the pipe. When cutting and beveling simultaneously, turn the pipe cutter more slowly around the pipe that you would for cutting alone, as two tools are used at the same time.



1. Connect the pipe cutter to the mains.
2. Apply saw blade lubricant to the saw blade teeth/cutting surface. Repeat the lubrication every three cuts.

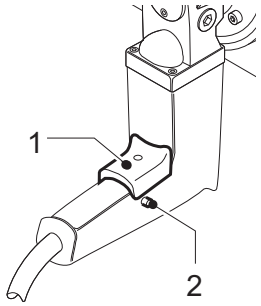
Important Use Orbitalum Tools lubricating gel only for pipes which come into contact with drinking water or foodstuffs.

3. Mark the cutting location on the pipe.
4. Insert the pipe in the vise.
5. Push the marked cutting location over the saw blade.
6. Clamp the pipe in the vise.

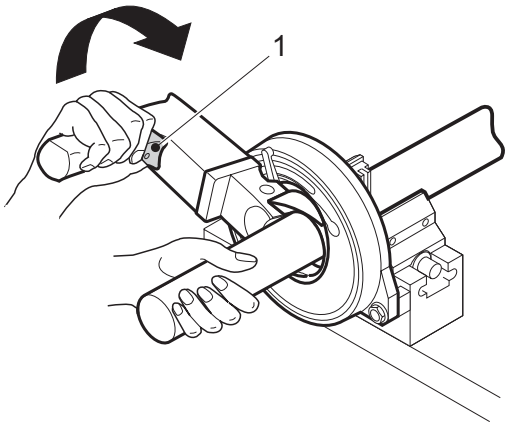


Important Use a pipe support for pipes that are over 1 m long.

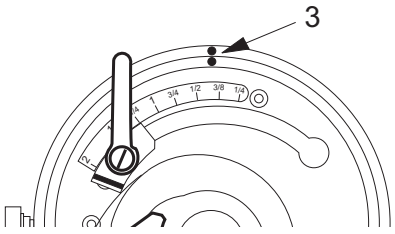
7. Switch on the saw motor. Press the on/off switch (1) and the locking button (2).



8. Carefully turn the pipe cutter clock-wise until the wall of the pipe has been pierced through.



9. Continue to turn rapidly until the pipe has been cut off and the marks (3) on the slide housing and vise housing are aligned.



10. Turn the pipe cutter back into its home position.
11. Switch off the saw motor. Press the on/off switch (1) again.

For non-stop operation

After cutting, loosen the hexagon nut on the saw blade to avoid damage caused by tension.

8 Maintenance

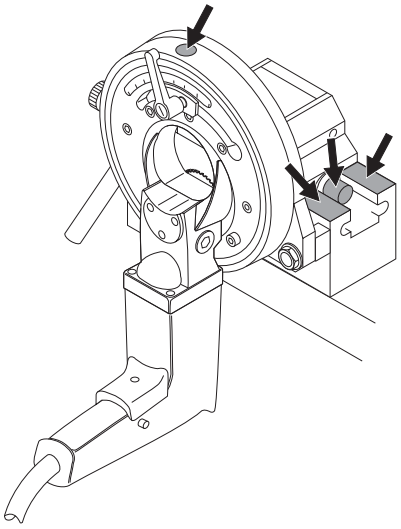
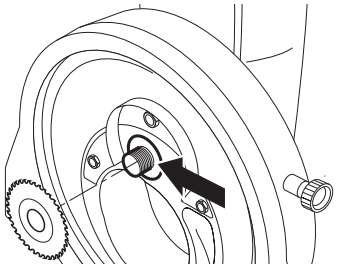
The Pipe Cutting and Beveling Machine RA 21 S is designed for a long service life and low maintenance.

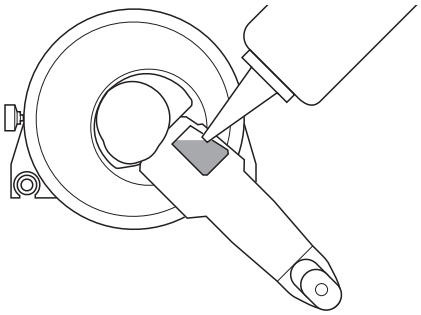
Please follow the maintenance instructions below

DANGER

Danger of death by electric shock!

▶ Pull the mains plug before carrying out any maintenance work and allow the machine to run a stop.

Interval	Activity
every week	▶ Remove the saw blade and brush off chips. ▶ Oil the four locations marked by the arrows. ▶ Check the oil level of the gear and top up ifnecessary. 
every time the cutter is cleaned, every tool change	⦸ Do **not** use compressed air to clean the area at the end of the shaft marked with an arrow as the rotary shaft seal may otherwise be damaged by chips. ▶ Use a cloth or brush to clean the end of the shaft. 

Interval	Activity
after the first 150 hours of operation (or after 3 months, which ever is sooner), then every 1000 hours of operation (or every year)	▶ Fill with gear oil up to the threaded hole. 

9 What to do if ...?

9.1 General trouble-shooting

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

Problem	Possible cause	Remedy
Pipe cutter will not turn.	Locking screw tightened.	▶ Loosen locking screw.
	Wrong pipe diameter set.	▶ Set pipe diameter correctly.
Saw blade is not cutting and is slipping.	Nut on saw blade shaft not tight enough.	▶ Tighten nut.
Saw blade is not cutting.	Saw blade wrong way round.	▶ Fit saw blade correctly. Inscription on saw blade must face the pipe cutting machine (see chapter 7.1, p. 14).
Pipe is not being cut concentrically.	Pipe cutter not flanged on. Flange surfaces are dirty.	▶ Remove pipe cutter, clean mounting parts and flange surfaces, bolt pipe cutter back on.
Pipe is not being cut.	Pipe diameter wrongly set.	▶ Adjust pipe diameter (see chapter 7.2, p. 16).
	Clamping lever not tight.	▶ Tighten clamping lever.
Motor not running.	The restart inhibitor has tripped.	▶ Turn switch to "0", then switch the pipe cutter on.

9.2 Servicing/after-sales service

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

For trouble-shooting, please contact your competent branch office directly. You will find the addresses on the back page of these operating instructions.

Please state the following details:

- Machine type: **RA 21 S**
- Machine number: *(see identification plate)*

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