CRUXWELD®

INDUSTRIAL EQUIPMENTS PVT. LTD.

BEVEX 63

OD Mounted Automatic Pipe Beveling Machine

Tube OD 28 – 63 mm | wall up to 12 mm | automatic feed | 1300 W | 220 V single phase



USER MANUAL

Please read this manual carefully before installing and using the machine.

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This manual describes the set-up, operation and maintenance of the Cruxweld BEVEX 63 OD mounted automatic pipe beveling machine. Read it completely before using the machine and keep it with the machine. Damage caused by operation not in line with this manual is not covered by the warranty. Cruxweld improves its products continuously; the contents of this manual may be revised without prior notice.

Signs used in this manual

Sign	Meaning
▲ **DANGER**	Immediate danger which will cause death or serious injury if it is not avoided.
▲ **WARNING**	A potential hazard which may cause death or serious injury if it is not avoided.
▲ **CAUTION**	A hazard which may cause injury or damage to the machine if it is not avoided.
Note	Useful information for correct operation.

1 Safety precautions

Cruxweld builds safe, quality products. For your safety and for reliable operation, observe the following rules before and during use of the machine.

1.1 Read the manual

Read this manual before setting up the machine and make sure you understand all set-up and operating instructions. This saves time and helps to avoid injury to the operator and damage to the machine.

1.2 Inspect the machine and accessories

Before starting, check for loose bolts or nuts, grease leaks and any other condition that may affect operation. A well-maintained machine greatly reduces the risk of injury.

1.3 Signs and labels

Read the safety labels on the machine. Keep all labels clean and readable and replace damaged labels.

1.4 Electrical safety

> **▲ DANGER**
> **Electric shock.** Always disconnect the machine from the power supply before moving it, changing tool bits or clamping blocks, or removing the motor. The supply must match the rating plate (220 V, 50 Hz, single phase) and must be earthed. Do not use a damaged cable or plug.

1.5 Moving parts

> **▲ CAUTION**
> Keep hands, arms and fingers clear of all moving parts. Keep the power cable clear of the cutting area.

1.6 Personal protection

- Eye protection is required: always wear safety goggles when the machine is working.
- Wear hearing protection while the tool is cutting.
- Chips are sharp and hot. Remove them with a brush or hook only when the machine is stopped.
- Do not wear loose clothing, jewellery or long, open hair near the machine.

2 General description

The Cruxweld BEVEX 63 is a portable, OD mounted pipe beveling machine for tubes and small-bore pipe from **28 to 63 mm outside diameter**, with walls up to **12 mm**. A clamping block matched to the tube OD grips the outside of the tube and centres the machine on it; the clamping handle locks it. The electric drive motor turns the cutter through a reduction gearbox and a spiral bevel gear, and the automatic feed takes the tool into the tube end and returns it afterwards.

The result is a cold, machined 30° weld bevel or a square (faced) tube end, ready for fit-up and the root pass – no grinding, no gas and no heat.



Fig. 2.1 BEVEX 63 beveling a tube end in the workshop

2.1 Applications

Boiler water walls, economiser, superheater and reheater tubes, heat-exchanger and condenser tubes, small-bore process pipe in refineries and petrochemical plants, pipe spool fabrication, and shipbuilding – especially where tubes are many and the space around them is tight, for example in tube panels.

2.2 Features

- Aluminium body: light weight and easy for one operator to handle.
- Compact C-type head, suitable for narrow spaces.
- Easy operation: automatic tool feed and automatic tool return.
- OD mounted: quick set-up on the outside of the tube.
- Cold machining: no sparks and no heat-affected edge on the tube.
- Accurate bevel without burrs, the same on every tube.
- Adjustable speed to suit the material and wall thickness.

3 Technical specifications

Parameter	BEVEX 63
Type	Automatic pipe beveling machine, OD mounted
Tube / pipe outside diameter	28 – 63 mm
Maximum wall thickness	12 mm
Clamping	Self-centring OD clamping block
Clamping block sizes (tube OD)	28, 32, 38, 42, 45, 51, 54, 57, 60, 63 mm
Feed	Automatic feed and automatic return
Bevel tool	HSS tool bit, 30° (3 pcs supplied)
Drive motor	1300 W, electronic speed dial and two-speed mechanical gearbox
Drive	Reduction gearbox and spiral bevel gear
Power supply	220 V, 50 Hz, single phase
Process	Cold machining, no heat input
Supplied in	Hard carry case

All values are for reference; the rating plate on the machine applies. Clamping blocks for other tube sizes can be made to order. Specifications may change without notice as a result of continuous improvement.

3.1 Scope of supply

No.	Item
1	BEVEX 63 pipe beveling machine head with 1300 W drive motor fitted
2	Carrying handle and clamping handle (T-handle clamping screw)
3	Clamping blocks for 28 – 63 mm tubes (sizes as per quotation)
4	30° tool bits (3 pcs)
5	Allen key and fixing screws
6	Hard carry case and this user manual



Fig. 3.1 Machine with clamping blocks, tool bit and Allen key



Fig. 3.2 Hard carry case

> **Note:** The exact scope, including the clamping block sizes, is confirmed on the quotation. Spare tool bits and additional clamping blocks can be ordered from Cruxweld.

4 Machine overview

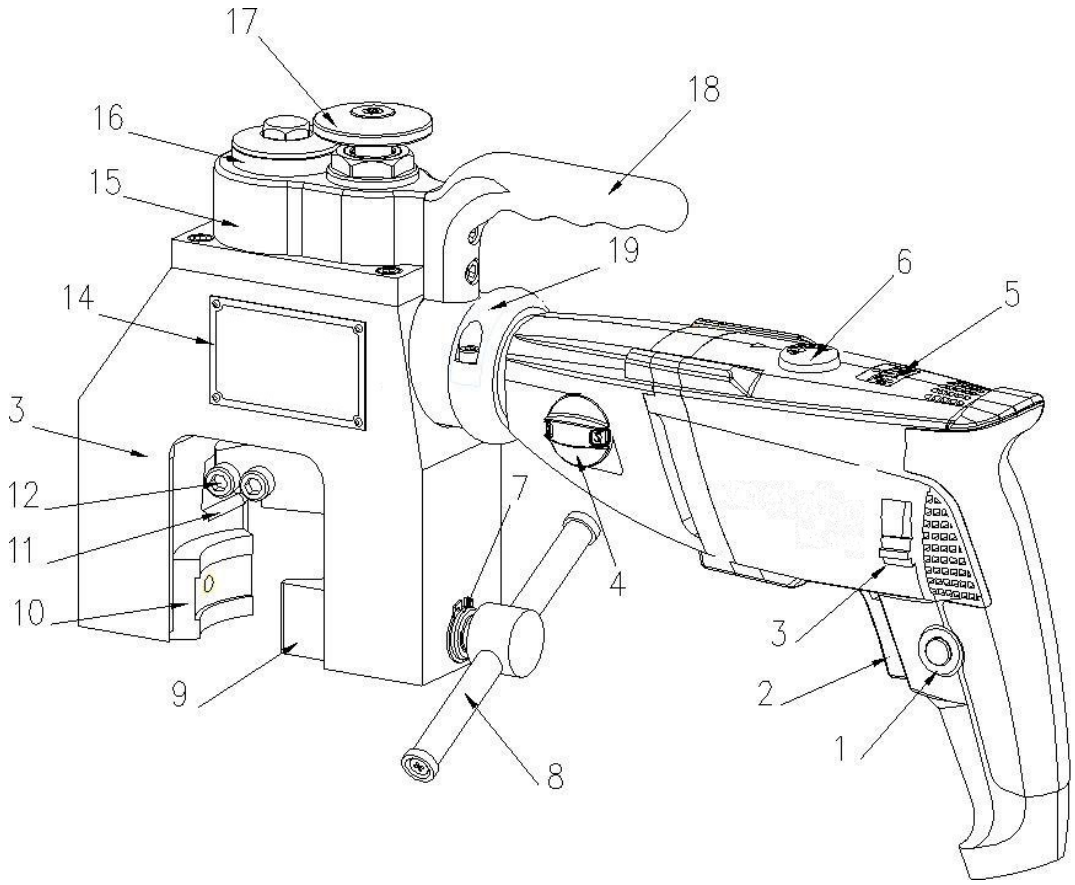


Fig. 4.1 General view of the BEVEX 63

1	Locking key (continuous run)	**11**	Bevel tool bit
2	Motor switch	**12**	Tool holder (cutter disc)
3	Direction selector (locked)	**13**	Body, aluminium
4	Gear selector (speed changer)	**14**	Rating plate
5	Signal lamp	**15**	Reduction gearbox
6	Speed dial (electronic speed control)	**16**	Cap
7	Clamping screw	**17**	Feed wheel (tool feed / return)
8	Clamping handle (T-handle)	**18**	Carrying handle
9	Clamping head	**19**	Motor coupling
10	Clamping block		

The drawing shows the arrangement of the parts; the motor housing of your machine may look slightly different.



Fig. 4.2 BEVEX 63 – angle view



Fig. 4.3 C-type head with OD clamp and rating plate

5 Controls and accessories

5.1 Locking key (1)

Switch on the motor with the motor switch (2), then press the locking key and release the switch: the motor keeps running. Press the switch again to switch the motor off.

5.2 Direction selector (3)

The tool feed requires clockwise rotation of the cutter. The direction selector is therefore locked before dispatch, and the direction of rotation must not be changed.

5.3 Gear selector (4)



Fig. 5.1 Gear selector

Mechanical two-speed gearbox. Change the gear only when the machine is switched off and stopped.

- **Gear 1:** low speed, high torque.
- **Gear 2:** high speed, low torque.

5.4 Speed dial (6) and signal lamp (5)

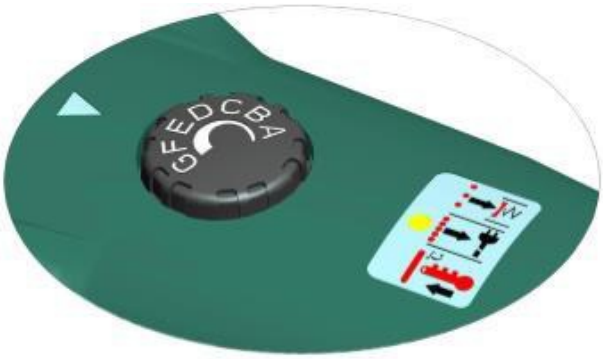


Fig. 5.2 Speed dial and signal lamp

The electronic speed dial is marked **A** to **G**, from slow to fast. It can be adjusted while the machine is running.

Work	Setting
Normal beveling	Gear 1, dial E, F or G
Thin-wall tube	Gear 2, dial A or B
Hard material or heavy wall	Gear 1, dial E or F

Watch the signal lamp of the motor during work:

Yellow signal lamp	Meaning
Flashing	Carbon brushes almost worn out – fit new carbon brushes.
Flashing rapidly	Poor contact in the power supply – check the plug, cable and socket.
Lit continuously	Motor overloaded or overheated; the overload protection has switched off the motor (see Chapter 7).

5.5 Clamping blocks (10)



Fig. 5.3 Clamping blocks 28 – 63 mm

Each clamping block is machined to one tube outside diameter; the size is marked on the block. The BEVEX 63 takes blocks for:

28, 32, 38, 42, 45, 51, 54, 57, 60 and 63 mm OD

> **▲ CAUTION**
> The clamping block must be the same size as the tube OD, otherwise the bevel will be eccentric. Never force a block onto a different size.

Clamping blocks for other sizes can be made to order. Measure the actual OD with a vernier caliper: boiler and heat-exchanger tubes are specified by outside diameter, process pipe often by nominal bore.

5.6 Bevel tool bits (11)

Each machine is supplied with three 30° tool bits. Two tube ends beveled at 30° form a 60° V-groove for the weld. Keep the tool bits sharp: a blunt tool overloads the gears and the motor.

5.7 Feed wheel (17)

- **Press the feed wheel down:** the tool feeds into the tube end automatically.
- **Pull the feed wheel up:** the tool returns automatically.

6 Installation and operation

6.1 Fitting the clamping block

Measure the outside diameter of the tube and fit the clamping block of the same size in the clamping head. The size is marked on the block.

> **▲ CAUTION**
> The clamping block must be the same size as the tube OD, otherwise the bevel will be eccentric.

6.2 Clamping the machine on the tube



Fig. 6.1 Machine clamped on the tube end

Slide the C-type head over the tube end. Turn the clamping handle clockwise until the machine is mounted firmly on the tube.

> **Note:** On thin-wall tube, tighten the clamping handle with moderate force only, so that the tube is not deformed.

6.3 Fitting the tool bit

1. Disconnect the machine from the power supply.
2. Fit the tool bit in the tool holder with the fixing screws. The cutting edge must face the clockwise direction of rotation.
3. Position the tool bit to suit the tube size, with the tool tip about **2 mm** away from the outside surface of the tube.

The machine can face the tube end square or machine the 30° bevel.

6.4 Beveling

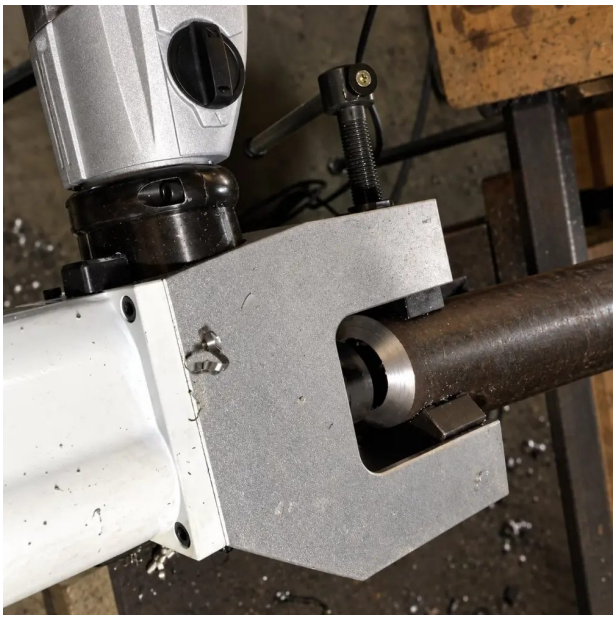


Fig. 6.2 OD clamp gripping the tube

1. Select the gear and the speed (Section 5.4).
2. Switch on the motor and press the feed wheel down: the machine starts cutting. When the tool is feeding, the cap and the feed wheel turn anticlockwise.
3. Spray coolant on the tool continuously. It helps the chips to come out smoothly and prolongs tool life.
4. Do not let chips or coolant get into the motor.
5. If the tool becomes blunt, sharpen it or replace it.

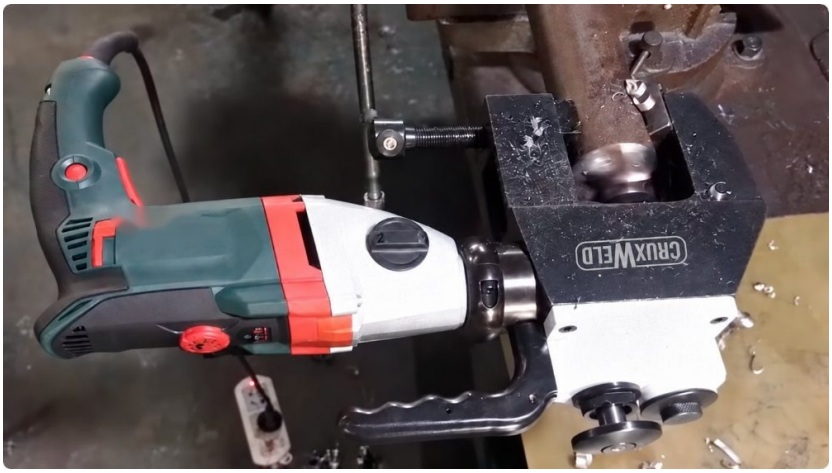


Fig. 6.3 Cutting a 30° bevel: chips, not sparks

6.5 Finishing

1. When the bevel is finished, pull the feed wheel up: the tool returns.
2. When you hear a **clicking sound**, the tool has fully returned. Switch off the motor at once, to avoid wear of the clutch.
3. Remove the chips and make sure that no chips get into the machine.
4. Turn the clamping handle anticlockwise and take the machine off the tube.
5. Clean and dry the machine and put it back in its case.

> **▲ CAUTION**
> Lift the machine only by the carrying handle. Never lift it by the power cable or by the feed wheel.

7 Important notes

1. **Coolant and chips.** While working, spray coolant continuously and clear the chips. This lets the chips come out easily and prolongs tool life. Do not let coolant or chips get into the motor.
2. **Blunt tools.** A blunt tool increases the cutting resistance and damages the shaft, the motor and the gears. Sharpen it or replace it in time.
3. **Overload stop.** If the machine stops by itself, do not try to force it on. If the motor is overheated, let it cool down. Return the tool, then start again.
4. **Stay with the machine.** The operator must stay beside the machine while it is working.
5. **No overloading.** Overloading the machine is strictly prohibited.
6. **Hard or heavy-wall tube.** Use gear 1 with dial setting E or F.
7. **Maintenance.** Grease the machine regularly. Clean and dry it after each job.
8. **Training.** The operator must read this manual completely before operation. Damage caused by wrong operation is not covered by the warranty.

8 Maintenance

> **▲ WARNING**
> Disconnect the machine from the power supply before any maintenance.

Interval	Work
After each job	Remove chips and coolant, clean and dry the machine, the clamping head and the clamping blocks, and store it in its case.
Regularly	Grease the gear train: open the motor coupling (19) and fill grease. Lightly oil the clamping screw.
Regularly	Check the tool bits; sharpen or replace blunt or chipped bits. Check that bolts and fixing screws are tight.
When the signal lamp flashes	Fit new carbon brushes in the motor.
Regularly	Check the power cable, plug and switch for damage.

- Repairs to the gearbox and the motor must be done by Cruxweld or by a qualified technician.
- Use only Cruxweld spare parts and tool bits.

9 Exploded view and parts list

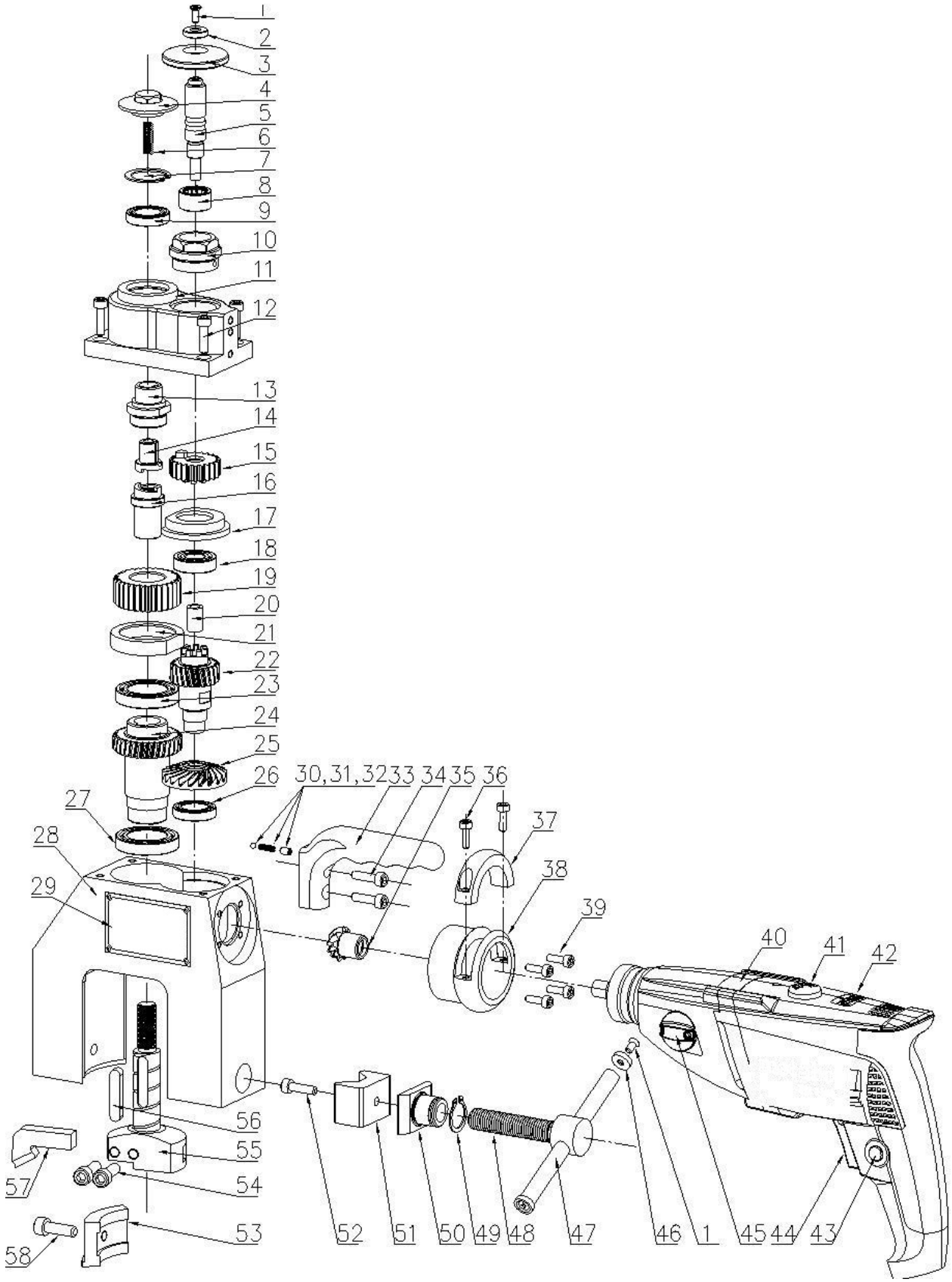


Fig. 9.1 BEVEX 63 exploded view

No.	Description	Qty	No.	Description	Qty
1	Cross screw	3	30	Steel ball	1
2	Washer	1	31	Spring	1
3	Feed wheel (tool feed / return)	1	32	Screw	1
4	Cap, bearing	1	33	Carrying handle	1
5	Clutch lever	1	34	Bolt	2
6	Spring	1	35	Bevel gear shaft	1
7	Circlip	1	36	Bolt	2
8	Bearing	1	37	Semicircle block	1
9	Deep groove ball bearing	1	38	Motor coupling	1
10	Hexagonal cap	1	39	Bolt	4
11	Cover	1	40	Drive motor	1
12	Bolt	4	41	Speed dial	1
13	Cap, backstop	1	42	Signal lamp	1
14	Backstop	1	43	Locking key, switch	1
15	Spur pinion	1	44	Motor switch	1
16	Feed bush	1	45	Gear selector	1
17	Small bush	1	46	Cap	2
18	Deep groove ball bearing	1	47	Clamping handle	1
19	Spur gear	1	48	Clamping screw	1
20	Needle bearing	2	49	Circlip	1
21	Big bush	1	50	Screw bush	1
22	Small helical gear shaft	1	51	Clamping head	1
23	Deep groove ball bearing	1	52	Bolt	1
24	Big helical gear shaft	1	53	Clamping block	1
25	Spiral bevel gear	1	54	Fixing screw, tool bit	2
26	Angular contact bearing	1	55	Tool holder (cutter disc)	1
27	Deep groove ball bearing	1	56	Flat key	1
28	Body, aluminium	1	57	Bevel tool bit	1
29	Rating plate	1	58	Bolt	1

Table 9.1 Parts list (numbers as in Fig. 9.1)

> **Note:** When ordering spare parts, state the model, the serial number from the rating plate, the part number and the description.

10 Troubleshooting

Fault	Possible cause	Remedy
Motor does not run	Cable not connected properly; overload protection not yet reset	Check the cable and plug; wait until the overload protection resets
Abnormal noise from the motor	Motor gear worn or damaged; motor bearing damaged	Have the parts replaced by a qualified technician
Motor overheats	Overload from too high a speed; motor fan damaged	Reduce the speed; have the fan replaced by a qualified technician
Motor burnt	Chips or coolant got into the motor; unstable supply voltage; blunt tool bit causing high load	Replace the motor rotor or stator, or the complete motor
Abnormal noise from the reduction gearbox	Gear or bearing inside damaged	Inspect and replace
Cutter turns anticlockwise	Direction selector changed	Set the correct (clockwise) direction
Tool does not feed	Clutch worn; clutch spring damaged; feed screw worn	Inspect and replace
Tool returns slowly	Clutch spring damaged	Inspect and replace
Tool does not return	Tool fed beyond its maximum travel, so the screw has released	Remove the tool bit, hold the bottom of the tool holder, pull up the feed wheel and run the motor at low speed: the tool will return
Machine shakes while working	Clamping not tight, or wrong clamping block	Tighten the clamping handle; fit the correct clamping block
Poor bevel surface	Tool bit blunt or damaged; speed too high	Sharpen or replace the tool bit; reduce the motor speed
Bevel eccentric	Wrong clamping block size	Use the clamping block of the same size as the tube OD

If a problem is not listed in the table, stop operation and contact Cruxweld service. State the model and the serial number from the rating plate.

11 Warranty

Cruxweld warrants the BEVEX 63 against defects in material and workmanship for the period stated on the quotation and invoice. During this period Cruxweld will repair or replace parts that are found to be defective due to faulty material or workmanship. After the warranty period, spare parts are charged.

The warranty does not cover tool bits, carbon brushes, clamping blocks and other wearing parts, or damage caused by:

- operation not in line with this user manual;
- repair or dismantling by unauthorised persons;
- force majeure, falls or transport;
- failure to present the warranty card and the invoice.

Model	BEVEX 63
Serial number	
Date of manufacture	
Invoice no. / date	
Customer / company	
Address	
Contact person / phone	
Inspector / stamp	

For service and spare parts please contact:

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