CRUXWELD®

INDUSTRIAL EQUIPMENTS PVT. LTD.

BEVO 240

ID Mounted Pipe Beveling Machine

Pipe ID 80 – 240 mm | wall up to 20 mm | 1800 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 installation, operation and maintenance of the Cruxweld BEVO 240 ID mounted pipe beveling machine. Read it carefully before using the machine and keep it near the machine. 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

For your safety and for safe, efficient and reliable operation of the machine, observe the following precautions.

1.1 Operator

- Only trained operators who have read this manual may use the machine.
- Do not wear loose clothing, jewellery or long, open hair near the machine. Keep warning labels clean and readable.
- Wear safety glasses at all times when working near the machine. Wear hearing protection during long cutting work.
- Gloves are not protective devices near rotating parts – do not wear gloves while the cutter head is turning. Wear gloves only to handle chips and tool bits with the machine stopped; chips are sharp and hot.

1.2 Electrical safety

- The supply must match the rating plate: **220 V, 50 Hz, single phase**.
- The supply must be earthed and protected. Do not use a damaged plug or cable, and keep the cable away from heat, sharp edges and the cutting area.
- Switch off and unplug the machine before changing tool bits or expansion blocks, adjusting the tool, measuring the bevel or cleaning.

1.3 Rotating parts

> **▲ WARNING**
> During cutting, keep at least **10 cm** between your body and the rotating cutter head. Except for starting and stopping, keep your hands away from rotating parts.

- Before switching on, check that the tool bit is 3 – 5 mm away from the pipe end so that it does not strike the pipe at start.
- Never overload the machine. When a lot of material has to be removed, cut in several passes.

1.4 Machine and pipe

- Check the machine and accessories against the packing list before use, and check that all joints are tight.
- When beveling short or small pipes, clamp the pipe firmly so that the pipe and machine cannot tip over.
- When loosening the expansion mechanism, support the machine so that it cannot fall out of the pipe.
- Do not dismantle the machine yourself. Repairs must be made by Cruxweld or by a qualified technician – take care with left-hand and right-hand threads.

2 General description

The Cruxweld BEVO 240 is a portable ID mounted pipe beveling machine for pipe with an inside diameter of 80 mm to 240 mm. It machines a weld bevel or a square (faced) end on the pipe, cold and accurately, so that the pipe is ready for welding.

The machine is fixed inside the pipe bore by an expanding mandrel. Its expansion blocks are pushed out against the inside wall, which locks the machine and centres it on the bore. The motor then turns the cutter head around the pipe end, and the tool bit is fed into the pipe end with the feed handle. Because the machine centres on the bore, the bevel and root face are concentric with the pipe and the outside of the pipe stays free.



Fig. 2.1 BEVO 240 beveling a pipe on site

2.1 Applications

Pipe end preparation in power plants, refineries and petrochemical plants, pipelines, pipe spool fabrication, pressure parts and vessels, boilers and shipbuilding – especially for long pipes, pipes on fabricated components, and pipes that cannot be moved to a lathe.

2.2 Features

- **Quick installation:** from the box to cutting in about 5 minutes; tightening the expansion nut expands all blocks together and centres the machine in the bore.
- **Simple operation:** the ratchet feed handle feeds and withdraws the tool with little effort; a tool bit is changed in seconds.
- Lightweight aluminium alloy body; compact design for places with little headroom.
- The cutter head can hold two tool bits, for example for outside and inside bevels.
- Rolling bearings and lifetime lubrication of the gear train; high-strength spindle and large expansion blocks for rigidity.
- Cold machining: no heat-affected edge and no oxide to grind off.

3 Technical specifications

Parameter	BEVO 240
Type	ID mounted pipe beveling machine, expanding mandrel
Pipe inside diameter	80 – 240 mm (3″ – 10″)
Maximum wall thickness	20 mm
Power supply	220 V, 50 Hz, single phase
Motor power	1800 W
Spindle speed	16 r/min
Maximum feed stroke	40 mm
Maximum cut depth per pass	0.2 mm
Tool feed	Manual, ratchet feed handle
Standard tool bits	0° (facing), 30° and 37.5° (outside bevel)
Operations	Outside bevel, facing, squaring the pipe end
Clamping	Expansion block sets covering 80 – 240 mm ID
Process	Cold machining, no heat input
Net weight (approx.)	35 kg
Certification	CE marked

All values are for reference; the rating plate on the machine applies. Specifications may change without notice as a result of continuous improvement.

3.1 Scope of supply

No.	Item
1	BEVO 240 pipe beveling machine with 1800 W motor
2	Expanding mandrel with expansion block sets for 80 – 240 mm ID
3	Standard tool bits: 0° facing, 30° and 37.5° bevel (1 each)
4	Operating tools in a tool box
5	User manual



Fig. 3.1 The machine is supplied in a wooden crate with the tool box

> **Note:** The exact scope is confirmed on the quotation. Spare tool bits and extra expansion blocks can be ordered from Cruxweld.

4 Machine overview

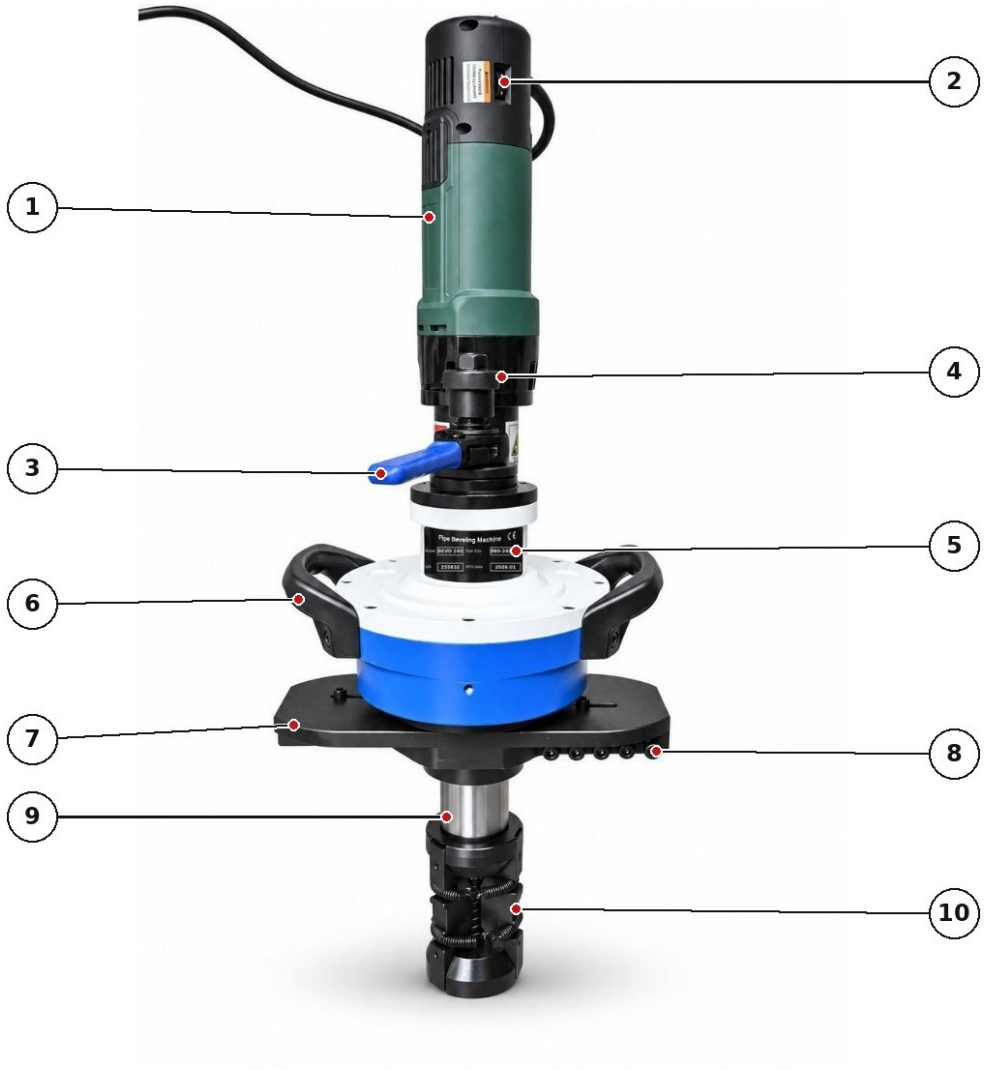


Fig. 4.1 Main parts of the BEVO 240

1	Motor (1800 W)	**6**	Carry handles (2)
2	Motor switch	**7**	Cutter head (two-arm tool holder)
3	Feed handle (ratchet)	**8**	Tool bit clamping screws
4	Expansion (tightening) nut	**9**	Spindle and pull rod
5	Gearbox with rating plate	**10**	Expansion mandrel with expansion blocks



Fig. 4.2 Expanding mandrel and cutter head

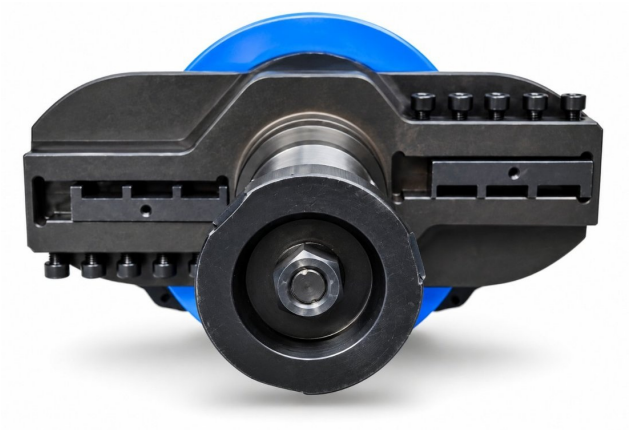


Fig. 4.3 Two-arm tool holder

5 Installation and set-up

5.1 Preparing the pipe

- Measure the inside diameter of the pipe.
- If the pipe end was cut by plasma or gas, grind off slag and burrs from the end face and from the bore before beveling.

5.2 Selecting the expansion blocks

Select the expansion blocks for the pipe inside diameter from Table 5.1 and fit them on the expansion mechanism. Tighten the fixing screws.

Pipe inside diameter (mm)	Expansion blocks to fit
80 – 100	None (base blocks only)
100 – 120	No. 1
120 – 140	No. 2
140 – 160	No. 1 + No. 2
160 – 180	No. 3
180 – 200	No. 3 + No. 1
200 – 220	No. 3 + No. 2
220 – 240	No. 1 + No. 2 + No. 3

Table 5.1 Expansion block chart (block height: No. 1 = 10 mm, No. 2 = 20 mm, No. 3 = 40 mm)

5.3 Fitting the tool bit



Fig. 5.1 Fitting a tool bit in the tool holder

1. Select a sharp tool bit for the required bevel angle (see Chapter 7).
2. Clamp it in the tool holder of the cutter head with the clamping screws. The cutting edge must face the direction of rotation (clockwise when viewed from the motor side).
3. The tool bit must not touch the spindle – this damages the machine.
4. With the feed fully withdrawn, there must be a gap between the tool bit and the pipe end.

5.4 Mounting the machine in the pipe

1. Push the expansion mandrel into the pipe bore. The expansion blocks should be about **20 mm** inside the pipe end – do not push the mandrel too deep.
2. Gently swing the machine to centre it, then tighten the expansion nut firmly so that the machine and the pipe are rigidly connected.
3. Check that the machine is mounted firmly and square to the pipe.
4. Set the cutting edge of the tool bit **3 – 5 mm** away from the pipe end, so that it does not strike the pipe when the motor starts.

> **Note:** If the pipe is standing vertically, mount and adjust the machine first and fit the tool bit afterwards, to avoid damaging the tool bit. After beveling, remove the tool bit first and then the machine.

6 Operation

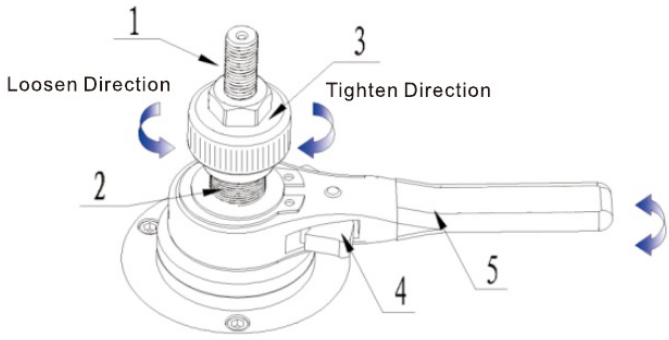


Fig. 6.1 Expansion and feed mechanism: 1 pull rod, 2 threaded sleeve, 3 expansion nut, 4 reversing pawl, 5 feed handle

6.1 Beveling a pipe end

1. Plug in the machine and switch on the motor. Check that the tool bit does not touch the pipe.
2. Turn the feed handle slowly so that the tool bit touches the **highest point** of the pipe end, and start cutting.
3. Feed slowly and evenly, especially at the start, because the pipe end is often uneven. Increase the feed only when the chip is continuous.
4. Watch the cut. If the machine vibrates or turns in the pipe, stop, re-tighten the expansion nut and reduce the feed.
5. When the bevel is complete, turn the feed handle in the reverse direction (set the reversing pawl) so that the tool bit leaves the bevel surface.
6. Switch off the motor.
7. Remove the tool bit if necessary, support the machine, loosen the expansion nut and take the machine out of the pipe.

▲ CAUTION

Feed slowly. Too fast a feed overloads the motor and the gears, makes the motor slow down sharply and can burn it out. If the speed drops sharply, switch off at once.

6.2 Good practice

- Use saponified oil or a cutting coolant on the tool bit. It lengthens tool life and improves the finish.
- For walls thicker than about 20 mm, or when a lot of material has to be removed, cut in steps: bevel the outside first, then move the tool holder and cut the inside, or fit two tool bits staggered.
- To bevel more pipes of the same size, withdraw the cutter head fully, loosen the expansion nut and move the machine to the next pipe – no new adjustment is needed.
- When loosening the expansion nut, do not turn it past its travel limit, otherwise the nut can run up against the handle and jam.
- If the feed handle is stuck and cannot be turned, the feed is at the end of its stroke: change the reversing pawl and turn the handle back.

7 Tool bits and cutting

Tool bit	Angle	Use
Facing tool	0°	Squares the pipe end and cuts the root face (land)
Outside bevel tool	30°	Common bevel; two ends make a 60° groove
Outside bevel tool	37.5°	Standard pipe weld bevel; two ends make a 75° groove

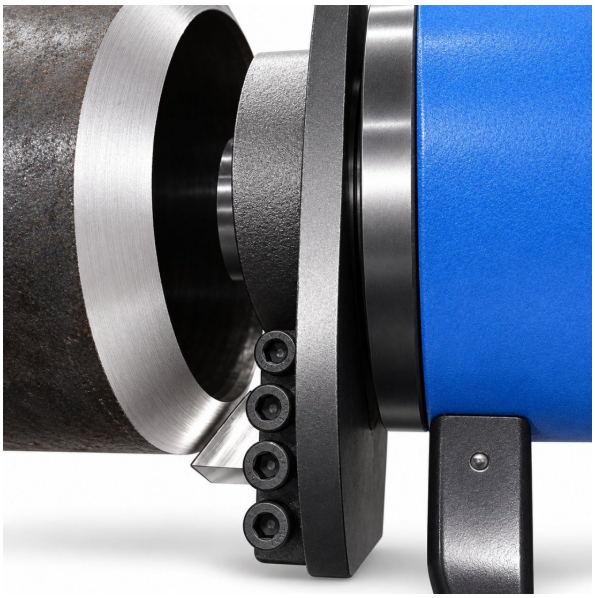


Fig. 7.1 37.5° bevel being machined



Fig. 7.2 Cold beveling produces chips, not sparks

The standard tool bits are made of high-speed steel and are suitable for carbon steel pipe. For stainless steel, alloy steel or other hard materials, and for special preparations such as J-bevels, inside bevels or counterbores, ask Cruxweld for the matching tool bits.

7.1 When to sharpen the tool bit

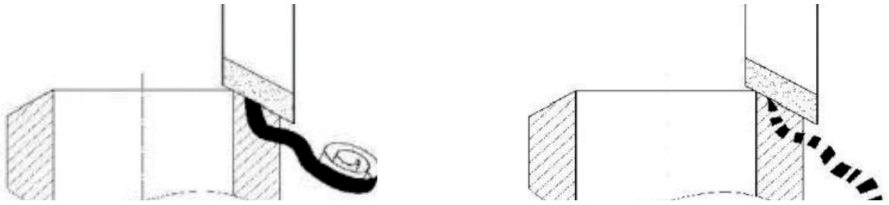


Fig. 7.3 Chip shape shows the condition of the tool bit

A sharp tool bit produces a long, continuous chip. When the chip breaks into small pieces, the tool bit is dull. A dull tool bit increases the cutting force and can damage the spindle, the motor and the gears – sharpen or replace it at once. Damage caused by cutting with a dull tool bit is not covered by the warranty.

8 Maintenance

> **▲ WARNING**
> Unplug the machine before any maintenance.

Interval	Work
After each use	Remove chips and dirt from the machine, clean the expansion mechanism and the tool holder, and protect bare steel parts against rust before packing.
Regularly	Clean and lubricate the pull rod, expansion nut, feed screw sleeve and expansion (inclined) blocks; keep chips off them. Use good-quality grease only – never used engine oil.
Regularly	Check the motor carbon brushes. They were set in the factory and adjust themselves as they wear – do not adjust them. Replace them in time when they are worn, otherwise the motor can burn out.
Regularly	Check the cable, plug and switch for damage. Check tool bits and sharpen or replace dull ones.

- Store the machine in its crate in a dry place.
- Repairs inside the gearbox and motor must be done by Cruxweld or a qualified technician.

9 Troubleshooting

Fault	Possible cause	Remedy
Motor does not run	No supply or poor contact; carbon brushes worn; motor winding burnt	Check the supply, plug and switch; replace the carbon brushes; have the motor repaired
Abnormal noise	Broken gear or damaged bearing in the drive	Stop the machine; have the faulty part repaired
Machine overheats	Poor lubrication; damaged drive parts; feed too fast	Lubricate; repair faulty parts; reduce the feed
Uneven or eccentric bevel	Pipe bore deformed; machine not seated square; expansion not tight	Re-mount the machine and expand it firmly
Strong vibration	Dull tool bit; damaged drive part; cut too deep	Replace or sharpen the tool bit; repair; reduce the feed
Machine turns in the pipe	Expansion force too low; cut too deep	Re-tighten the expansion nut; reduce the feed
Tool bit gets hot and wears fast	Material too hard; wrong or dull tool bit; no coolant	Use the right tool bit; sharpen it; use coolant
Feed handle cannot be turned	Feed at the end of its stroke	Change the reversing pawl and turn the handle back

If the fault cannot be cleared, contact Cruxweld service and state the model and serial number from the rating plate.

10 Warranty

Cruxweld warrants the BEVO 240 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.

The warranty does not cover tool bits, carbon brushes and other wearing parts, or damage caused by use not in line with this manual, cutting with dull tool bits or too fast a feed, incorrect supply voltage, dismantling or repair by unauthorised persons, falls, transport or other external causes.

Model	BEVO 240
Serial number	
Invoice no. / date	
Customer	
Dealer stamp	

For service and spare parts please contact:

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