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Operation Manual

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Contents

1	Introduction	- 3 -
2	Safety Precautions	- 4 -
2-1	Introduction	- 4 -
2-2	Danger Zones-Workplace-Free Space Around The System	- 5 -
2-3	Safety Plates	- 5 -
2-4	Safety Devices	- 6 -
2-4-1	Emergency stop buttons	- 6 -
2-5	Personal Protective Equipment	- 7 -
3	Machine Specifications	- 8 -
4	Installation	- 9 -
4-1	Unpacking and Inspection	- 9 -
4-2	Handling, Lifting, Transporting and Unloading Procedure	- 9 -
4-2-1	Preliminary operations	- 9 -
4-2-2	Lifting the machine	- 10 -
4-3	Installation	- 11 -
4-4	Connecting Electric Power	- 12 -
5	Machine Outline	- 13 -
5-1	Machine Outline and Major Components	- 14 -
5-1-1	Section view	- 14 -
5-1-2	Front view	- 15 -
5-1-3	Side view	- 16 -
5-2	Control Panel	- 17 -
5-2-1	Control panel	- 17 -
5-3	A description of the detecting device	- 18 -
6	Operation Mode	- 19 -
6-1	Replacement of Tool Head	- 19 -
6-2	Adjustment of Cutting Bits	- 19 -
6-2-1	Adjustment of tool seat and cutting bit for end facing	- 19 -
6-2-2	Adjustment of tool seat and cutting bit for end facing outside wall chamfering	- 20 -
6-2-3	Adjustment of tool seat and cutting bit for inside wall chamfering	- 21 -
6-3	Adjustment of the Feeding Speed	- 23 -
6-4	Selection of Spindle Speed	- 24 -
6-5	Operation	- 25 -



6-5-1 Manual operation	- 25 -
6-5-2 Semi-auto operation.....	- 25 -
6-6 Adjust the head Cutting feedrate	- 26 -
6-7 Adjust the Blade Entry Speed.....	- 27 -
7 Maintenance	- 28 -
8 Troubleshooting	- 29 -
9 Appendix.....	- 30 -
9-1 Machine Operates Range Pictures	- 31 -
9-2 Machine Specifications.....	- 32 -
9-3 Hydraulic Circuit Diagram and Air Circuit Diagram.....	- 33 -
9-4 Electrical Circuit Diagram.....	- 34 -
9-5 Parts Lists and Drawings.....	- 35 -

1 Introduction

Machine features

- Evenly chamfers the inside, outside and face of the tube simultaneously
- Different rotation speeds for various materials and requirements (Pulley setup)
- 2 steps chamfering process
 - First speed ----- Fast approach for time saving
 - Second speed ----- Infinitely adjustable chamfering speed for smooth finish
- Optional chamfering seats for centering (Solid bar)
- Optional chamfering seats for small tube diameters (Ø6mm ~ Ø15mm)

2 Safety Precautions

2-1 Introduction

1. Machine operators must read the manual thoroughly, and fully understand the functions of the machine and its safety requirements before usage.
2. No one other than qualified operators should operate the machine.
3. This machine design has complied with safety requirements of your company. In case of any concern, check on the detail of each requirement as needed.
4. The operator should check to ensure that the machine is connected to proper power source before usage.
5. Depress emergency stop button and shut off power source if any unusual situation occurs during usage.
6. Un-plug power source while installing, dismantling, maintaining, or adjusting the machine
7. During the process of adjusting or testing the machine, if the electric power needs to be on, the operator should pay extra attention to the action of automatic mode to ensure people safety.
8. Keep the machine and its surrounding clean and bright to ensure operation safety.
9. Maintain the machine periodically to ensure normal functions of each part of the machine.
10. Do not operate the machine beyond its specifications.
11. Do not remove or alter any safety protection part of the machine, such as saw blade protection cover, operator safety cover, emergency power switch etc.
12. The operator must wear eye protective goggle while operating the machine.

2-2 Danger Zones-Workplace-Free Space Around The System

Figure 2-1 shows the machine layout indicating the danger zones, the operator's workplace and the necessary free space around the system to ensure regular activities related to the machine.

A free space of at least one meter around the entire perimeter of the machine is required to ensure safe operation.

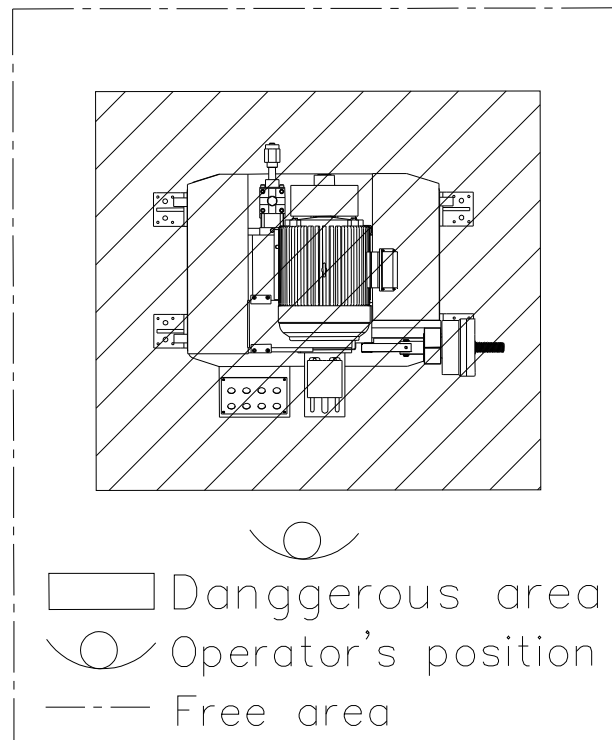


Figure 2-1 Danger zones-Workplace-Free space around the machine

2-3 Safety Plates

The customer shall replace safety plates which may become illegible due to wear in time. Never remove safety plates from the machine.

SOCO cannot be held liable for machine safety if this safety precaution is not respected.

2-4 Safety Devices

2-4-1 Emergency stop buttons

1. Red emergency stop mushroom buttons are arranged on the machine.
2. Press one of the mushroom buttons to stop the machine in an emergency. The buttons operate a safety circuit and block all movements.
3. Carry out the following procedure every 200 hours to test correct operation of the emergency stop circuit:
 - a. Start the machine.
 - b. Press an emergency stop button.
 - c. Reset the emergency stop button.

Repeat this procedure for all emergency stop buttons. You will not be able to restart the machine if the emergency circuit fails.



Emergency Stop

Figure 2-2 Danger zones-Workplace-Free space around the machine

2-5 Personal Protective Equipment

Operators and maintenance personnel carrying out various operations on the machine must use personal protection equipment, such as goggles, safety boots and gloves to reduce the possibility of danger.

The clothing of machine operators and maintenance personnel must comply with the essential safety requirements specified in community Directives 89/656/EEC, 89/686/EEC and laws in force in the country where the machine is installed.

When the machine is in operation in an unprotected area, do not wear accessories or jewellery, including bracelets, watches, rings or necklaces to avoid mechanical risks, such as dragging, entrapment or other.

Wear safety boots and protective gloves during all working phases, such as changing the tools, filling the tubes, operating the blade seats, setting the machine, and when the machine is in operation.

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3 Machine Specifications

Please consult appendices 9-2.



4 Installation

Please read the instruction carefully before installation.

If having any question please contact your dealer for prompt service.

4-1 Unpacking and Inspection

1. Check if there is any damage on the wooden case or the plastic bag that used to pack the machine. Should any damage be found on the machine, please claim for the damage against the delivery or insurance company.
2. Check the machine and accessories against the packing list. Should any shortage, please contact your dealer.

4-2 Handling, Lifting, Transporting and Unloading Procedure

4-2-1 Preliminary operations

Follow the preliminary lifting activities listed below before handling the machine:

1. Suitably lock all parts.
2. Remove all tools from the unit, where relevant.
3. Arrange the units so that they are balanced.
4. Fasten the keys of the power enclosure, the machine control panel with suitable adhesive tape.

4-2-2 Lifting the machine

The main component lifting points are show in figures 4-1.

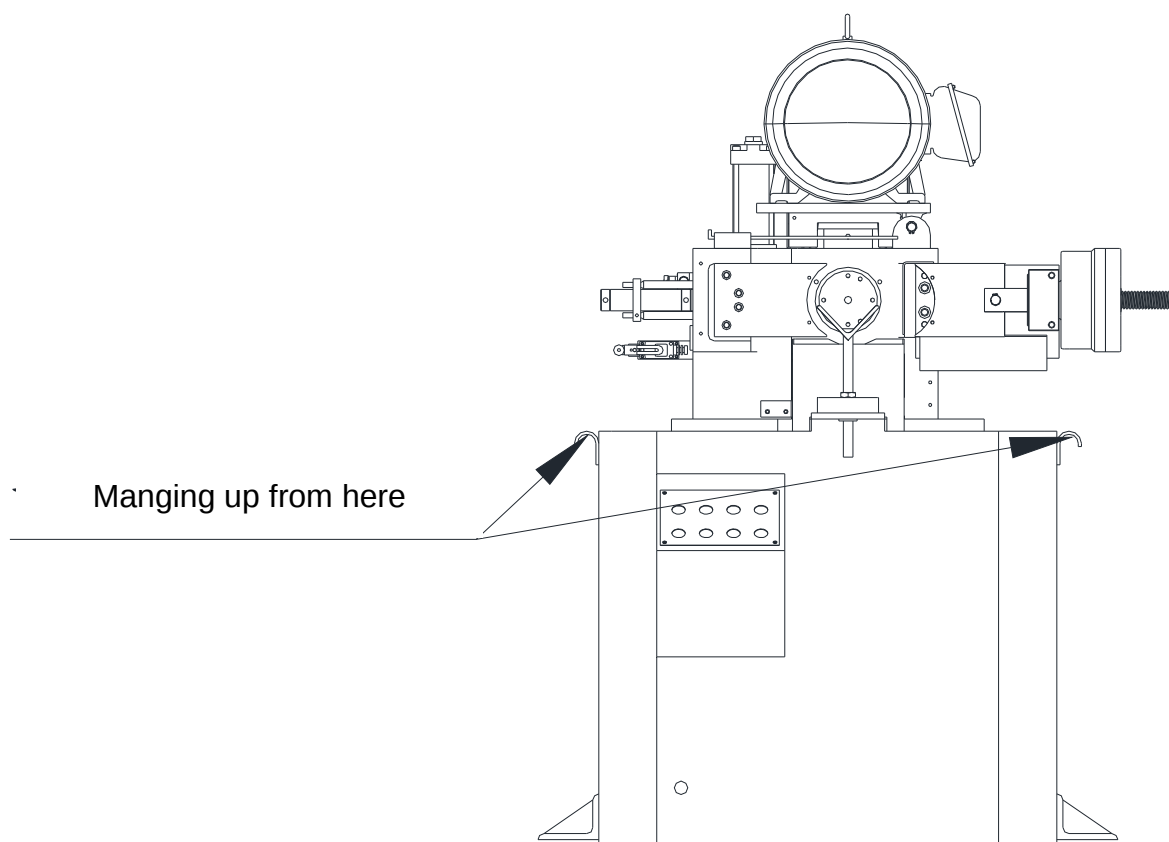


Figure 4-1 Lifting the machine

1. Drive a forklift to move the machine. The operator must be qualified to drive a forklift to move the machine.
2. Lift the machine a few centimeters and check the machine is balanced or not.
3. The weight of the machine is shown in the machine specification table (in appendix 9-2). Make sure the capacity of the forklift is enough to lift the machine.
4. When moving the machine, there should be at least two workers. One person drives the forklift and another should be responsible for the safety of surrounding people and making sure that the machine dos not collide with other objects.
5. When the machine is lifted higher than 50mm, there should be keeping a safety distance more than 2 meters around the machine.

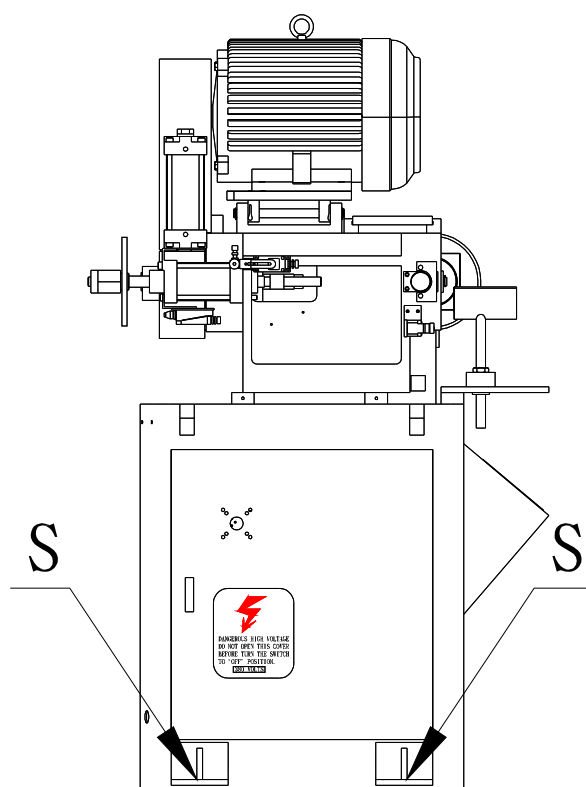
6. Be careful when moving the machine.
7. Be sure to install the machine in a horizontal base.
8. The mounted feet of the machine base and material rack need to be fixed by bolts and nuts on the shock-proof mat.

4-3 Installation

There must be enough space for machine operation where the machine was installed.

Follow the procedure to install the machine:

1. Use horizontal adjusted screws to adjust the horizontal level of the machine, as the following picture shows.
2. Please connect the power by a qualified electrical technician, according to the machine specifications and electric wiring diagrams.
3. Please provide appropriate power source and connect the power line.



S=Levelling points adjustment screws

Figure 4-2 Leveling points



4-4 Connecting Electric Power

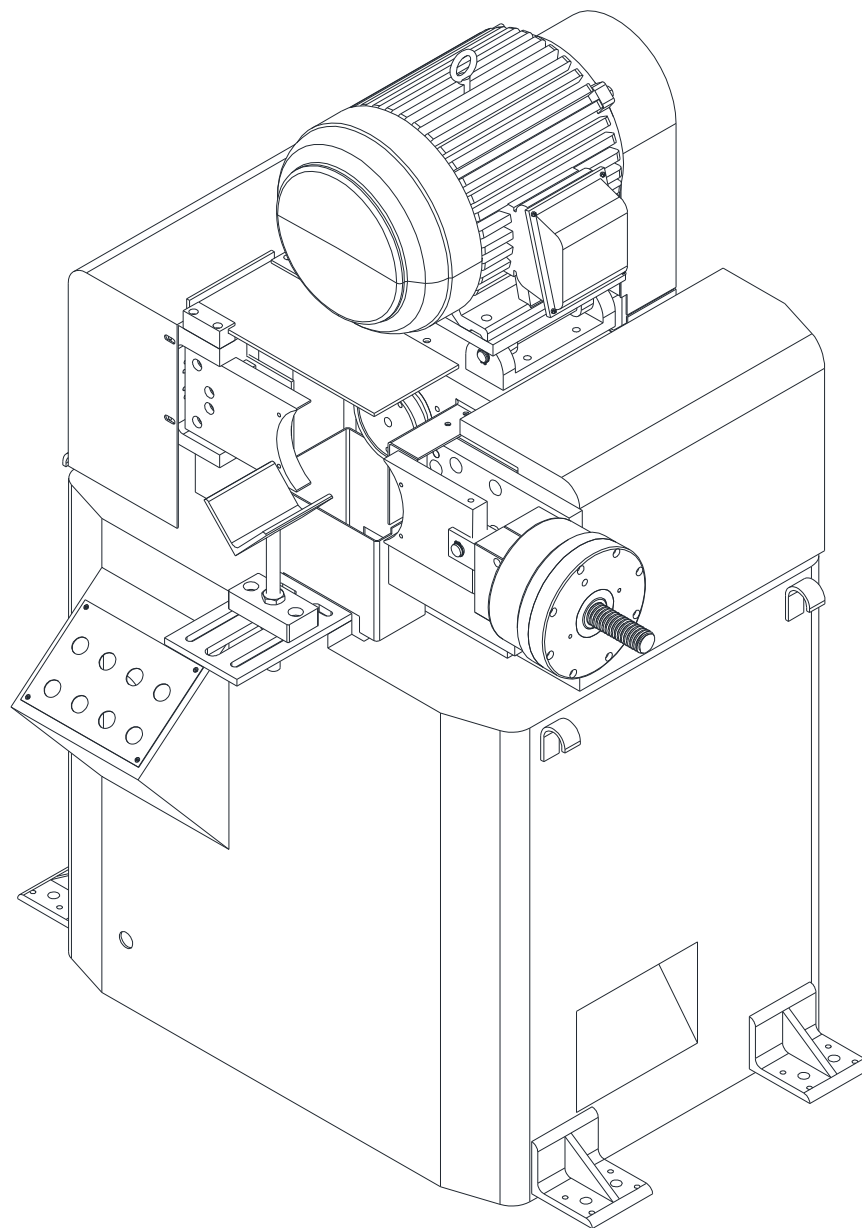
Note: Only the qualified electrician is allowed to perform this work.

Do not install saw blade on the main shaft before checking the rotational direction of the main shaft.

1. Assure the main power switch is at "OFF" position and the saw blade motor speed select switch is at "OFF" position before connecting the machine to electric power source.
2. The voltage, amperage and protection capacity of the power source shall meet the requirement of the machine and the local regulation.
 - a. Turn on the main power switch on the back of the control panel.
 - b. Turn on the saw blade motor switch on the control panel.
 - c. Check the spindle rotating direction. The spindle rotating direction should be same as the mark on the saw blade safety cover.
 - d. If the direction is not correct, turn off power; exchange two of the three power leads. Check again.

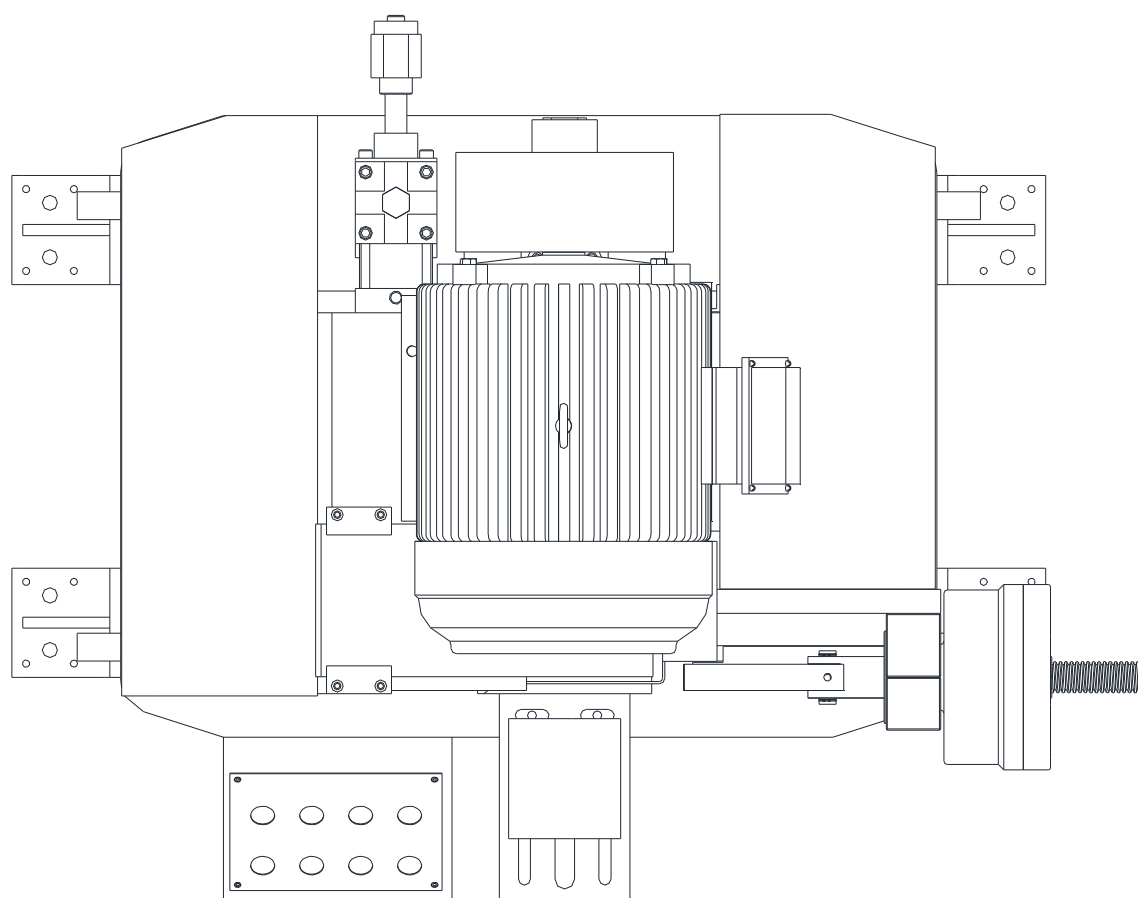
To install this machine safely and effectively, one needs to read the manual thoroughly. Contact the dealer of SOCO Machinery right away whenever questions/problems occurs.

5 Machine Outline

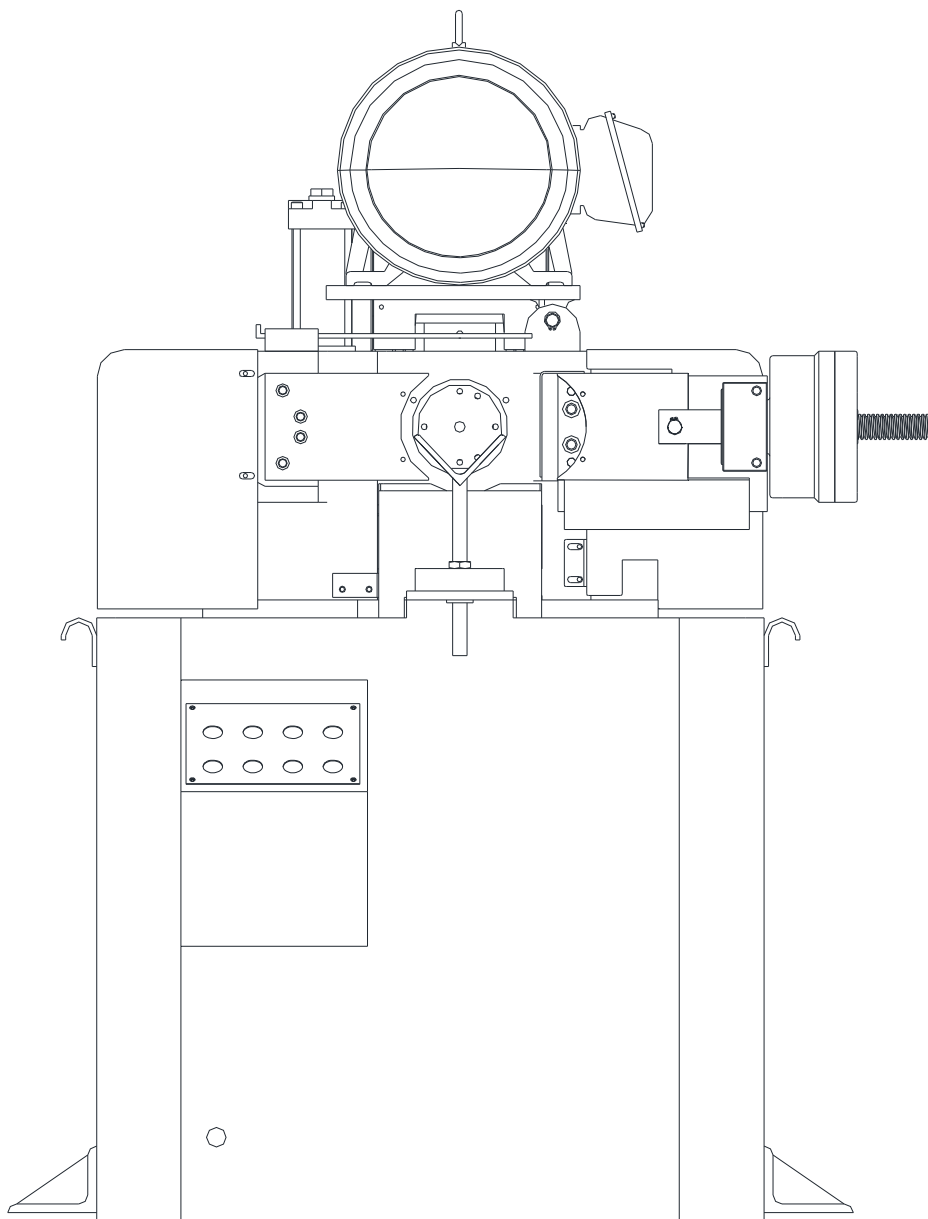


5-1 Machine Outline and Major Components

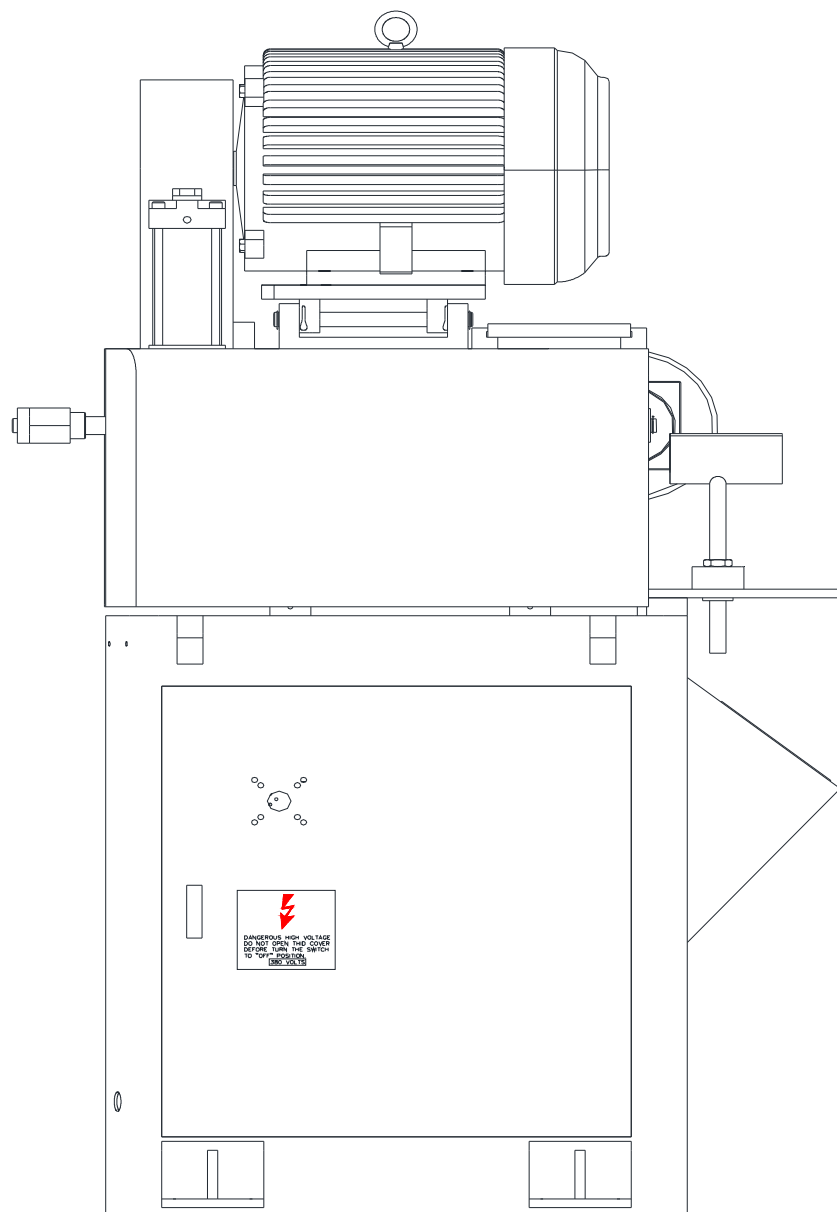
5-1-1 Section view



5-1-2 Front view

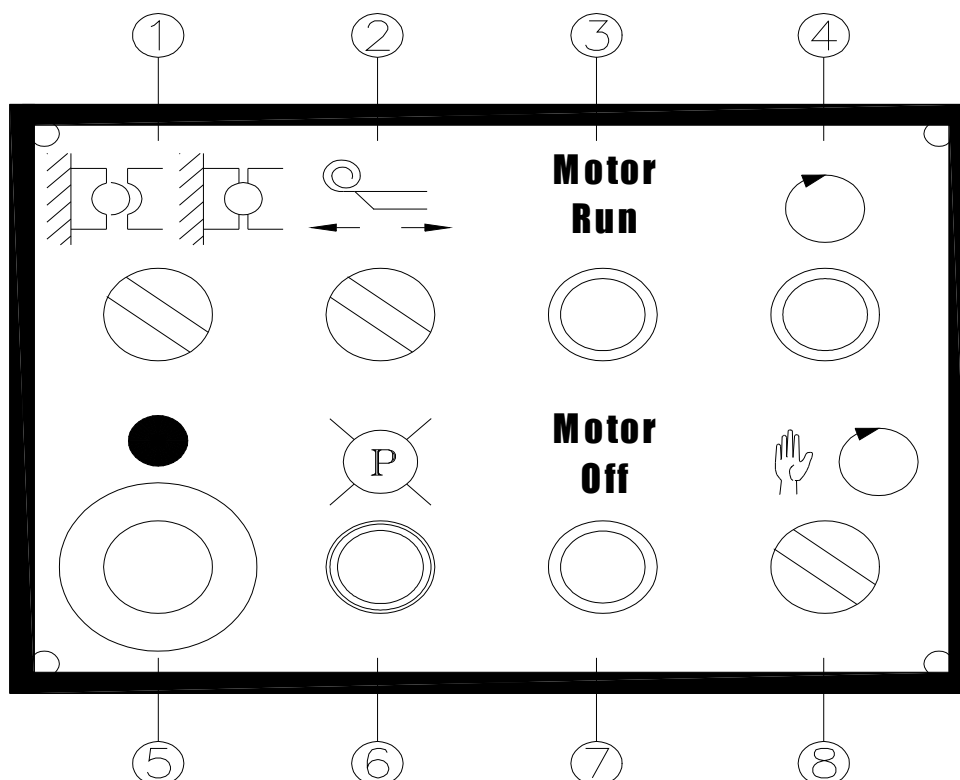


5-1-3 Side view



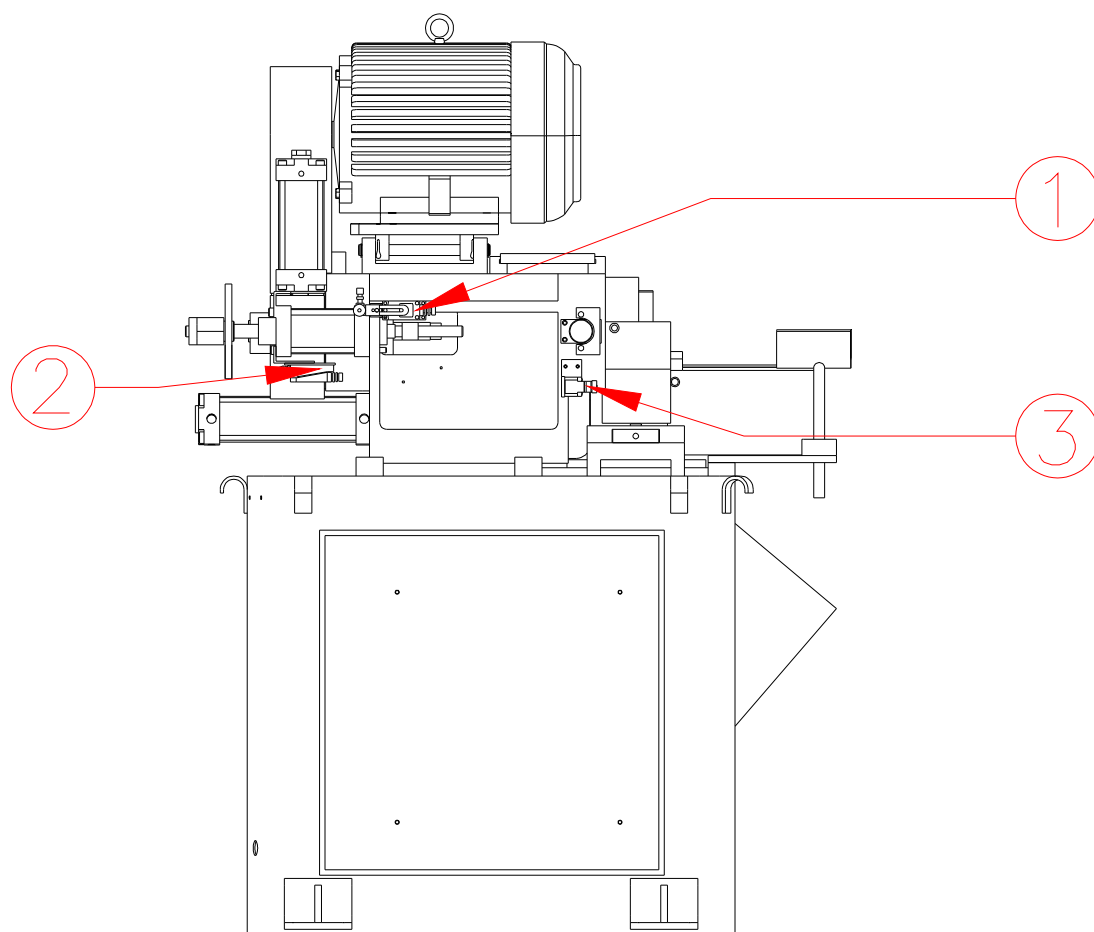
5-2 Control Panel

5-2-1 Control panel



Item	Description
1	Selection switch, clamping die close or open
2	Selection switch, cutting head feed forward or move back
3	Push button switch, motor run
4	Push button switch, semi-auto operation start
5	Push button switch, emergency stop
6	Lamp, light up when power on
7	Push button switch, motor stop
8	Selection switch, manual or semi-auto operation

5-3 A description of the detecting device



1. Front Limit of Blade Entry.
2. Rear Limit of Blade Entry.
3. Rear Limit of the Cylinder.

6 Operation Mode

6-1 Replacement of Tool Head

1. Release 3 pieces of the fixing screw.
2. Take off the tool head from the spindle.
3. Replace a new tool head on to the spindle.
4. Tighten 3 pieces of the fixing screw.

6-2 Adjustment of Cutting Bits

Generally, there are 3 sets of tool seat and cutting bit of

- (1) end facing,
 - (2) outside wall chamfering,
 - (3) inside wall chamfering,
- on a standard tool head.

For special propose, the number of set of tool seat and cutting bit may be 1 or 2 or 4, depending on the requirement of the shape to be finished.

Here, a tool head with 3 sets of tool seat and cutting bit is used as an example to illustrate the adjustment procedure.

Adjustment these cutting bits shall be as the following sequence.

6-2-1 Adjustment of tool seat and cutting bit for end facing

1. Loosen the fixing screws for 3 sets of tool seat.
2. Take a piece of working tube against the left clamping die and slide it to tool head to check the cutting bit position. Use the tube end as the position reference for checking.
3. Adjust the positioning screw of the end facing to have the cutting bit be able to cut the tube end exactly.
4. Adjust the positioning screws of the outside wall chamfering and the inside wall chamfering to have the cutting bits move away the tube end.
5. Tighten the fixing screws for 3 sets of tool seat
6. Use manual operation to check and adjust the cutting bit.
 - a. Turn the selection switch to manual operation.
 - b. Adjust the feeding stroke to its shortest stroke.
 - c. Turn main power on.
 - d. Take a piece of working tube into clamping area and turn the clamping switch to closing position to hold the tube.

- e. Press the motor run switch.
- f. Turn the feeding switch to forward position. The tool bit will cut the tube end.
- g. Turn the feeding switch to backward position.
- h. Turn the clamping switch to opening position to release the tube.
- i. Check facing quality. If not acceptable, repeat above steps by increasing the feed stroke a little bit each time, until the result is good.
- j. Stop the motor and turn off power.

6-2-2 Adjustment of tool seat and cutting bit for end facing outside wall chamfering

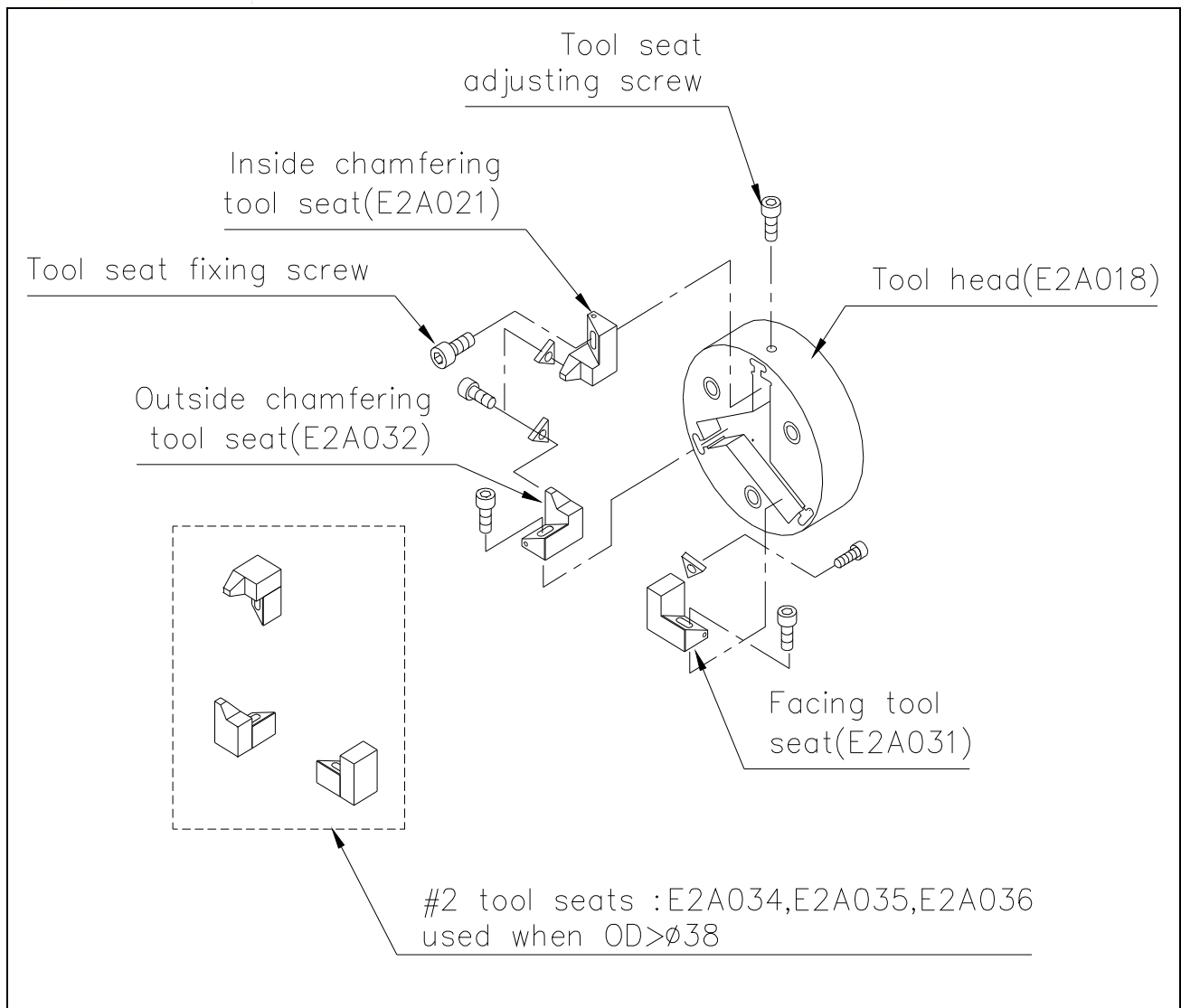
1. Loosen the fixing screw of the tool seat for outside wall chamfering.
2. Take a piece of working tube against the left clamping die and slide it to tool head to check the cutting bit position. Use the tube end as the position reference for checking.
3. Adjust the positioning screw of the outside wall chamfering to have the cutting bit be able to cut the tube end exactly.
4. Tighten the fixing screws of the tool seat for outside wall chamfering.
5. Use manual operation to check and adjust the cutting bit.
 - a. Turn the selection switch to manual operation.
 - b. Adjust the feeding stroke to its shortest stroke.
 - c. Turn main power on.
 - d. Take a piece of working tube into clamping area and turn the clamping switch to closing position to hold the tube.
 - e. Press the motor run switch.
 - f. Turn the feeding switch to forward position. The tool bit will cut the tube end.
 - g. Turn the feeding switch to backward position.
 - h. Turn the clamping switch to opening position to release the tube.
 - i. Check facing quality. If not acceptable, repeat above steps by increasing the feed stroke a little bit each time, until the result is good.
 - j. Stop the motor and turn off power.

6-2-3 Adjustment of tool seat and cutting bit for inside wall chamfering

1. Loosen the fixing screw of the tool seat for inside wall chamfering.
2. Take a piece of working tube against the left clamping die and slide it to tool head to check the cutting bit position. Use the tube end as the position reference for checking.
3. Adjust the positioning screw of the outside wall chamfering to have the cutting bit be able to cut the tube end exactly.
4. Tighten the fixing screws of the tool seat for outside wall chamfering.
5. Use manual operation to check and adjust the cutting bit.
 - a. Turn the selection switch to manual operation.
 - b. Adjust the feeding stroke to its shortest stroke.
 - c. Turn main power on.
 - d. Take a piece of working tube into clamping area and turn the clamping switch to closing position to hold the tube.
 - e. Press the motor run switch.
 - f. Turn the feeding switch to forward position. The tool bit will cut the tube end.
 - g. Turn the feeding switch to backward position.
 - h. Turn the clamping switch to opening position to release the tube.
 - i. Check facing quality. If not acceptable, repeat above steps by increasing the feed stroke a little bit each time, until the result is good.
 - j. Stop the motor and turn off power.

Warning

- (1) Tool bit fixing screws must be sure been solidly tighten to prevent any vibration happens.**
- (2) Chip protection cover must be in right position to prevent any chip flying out of machine.**

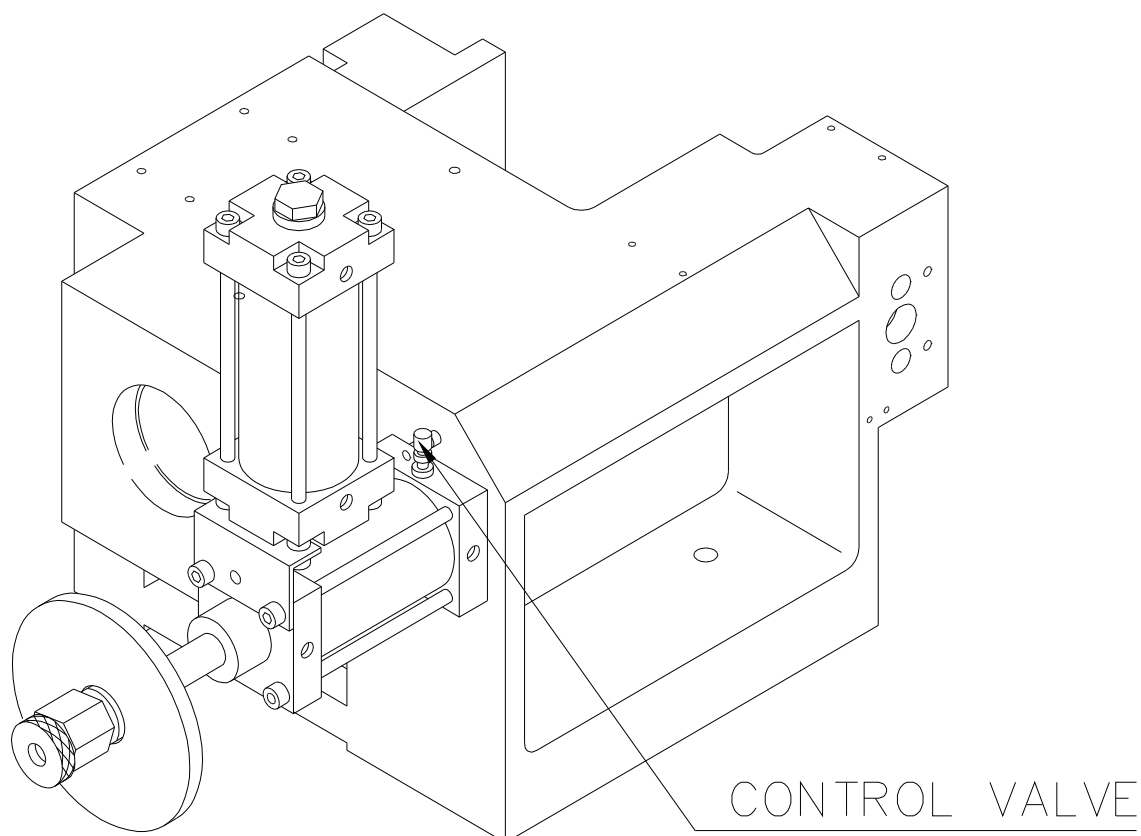


Drawing of standard tool head, E2A018

6-3 Adjustment of the Feeding Speed

The feeding speed shall be adjusted according to the material property, the diameter, thickness of wall of the workpiece. The stainless steel, the larger diameter, or thicker wall tube shall use slower feeding speed. The correct feeding speed results in smooth cutting, low noise, unburned chips, and longer cutting bit's life.

The feeding speed is adjusted through a valve on the feeding cylinder head as shown on following drawing.

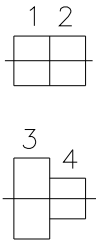


6-4 Selection of Spindle Speed

The spindle speed shall be adjusted according to the material property, the diameter, thickness of wall of the workpiece. The stainless steel, the larger diameter, or thicker wall tube shall use slower feeding speed. The correct spindle speed will result in smooth cutting, low noise, unburned chips, and longer cutting bit's life.

The spindle speed is adjusted through changing the pulley and belt combination on the spindle and motor shaft as shown on following:

MOTOR SHAFT SPEED: 5HP,6P,60Hz,1140RPM

BELT POSITION	1 AND 3	2 AND 4	 MOTOR PULLEY SPINDLE PULLEY
PCD OF MOTOR PULLEY	ø83.8	ø83.8	
PCD OF SPINDLE PULLEY	ø173.8	ø143.8	
SPINDLE SPEED(RPM)	548	662	
SUIT FOR WORKING PIECE MILD STEEL TUBE	ø2"~ø4 $\frac{1}{2}$ "	ø1 $\frac{1}{4}$ " ~ø2"	

- (1) Remove the protection cover of motor and spindle pulleys.
- (2) Loosen the belt tension adjusting bolt to remove the belt.
- (3) Place belt on the desired pulleys as above table and tighten the belt tension adjusting bolt.
- (4) Install the protection cover.

6-5 Operation

6-5-1 Manual operation

1. Manual operation is used to adjust and check the tool head, tool seats, cutting bits, feeding speed, spindle speed, etc. and test the machine running. For above operation please refer to the previous sections for details.
2. Has the Manual Semi-auto Selection Switch shifted to the manual position, functions of the clamp moving, the motor running, tool head turning, can be individually controlled by the dedicated switches.

6-5-2 Semi-auto operation

1. Semi-auto operation is used to production propose
2. If all components have been adjusted and checked in good condition as above section, the machine may run under the semi-auto operation mode.

6-6 Adjust the head Cutting feedrate

1. Different tube diameter and thickness match different blade entry speed.
In general, the blade entry speed of thin or nonferrous tubes is faster, and the blade entry speed of thick or hard material tubes is slower.
2. There are two phases of the entire blade entry stroke speed. The first phase is about 15mm, the speed is faster and unadjustable. The second phase is about 20mm, and it can be adjusted by the blade entry speed control valve (refer to Figure 6-5 4).

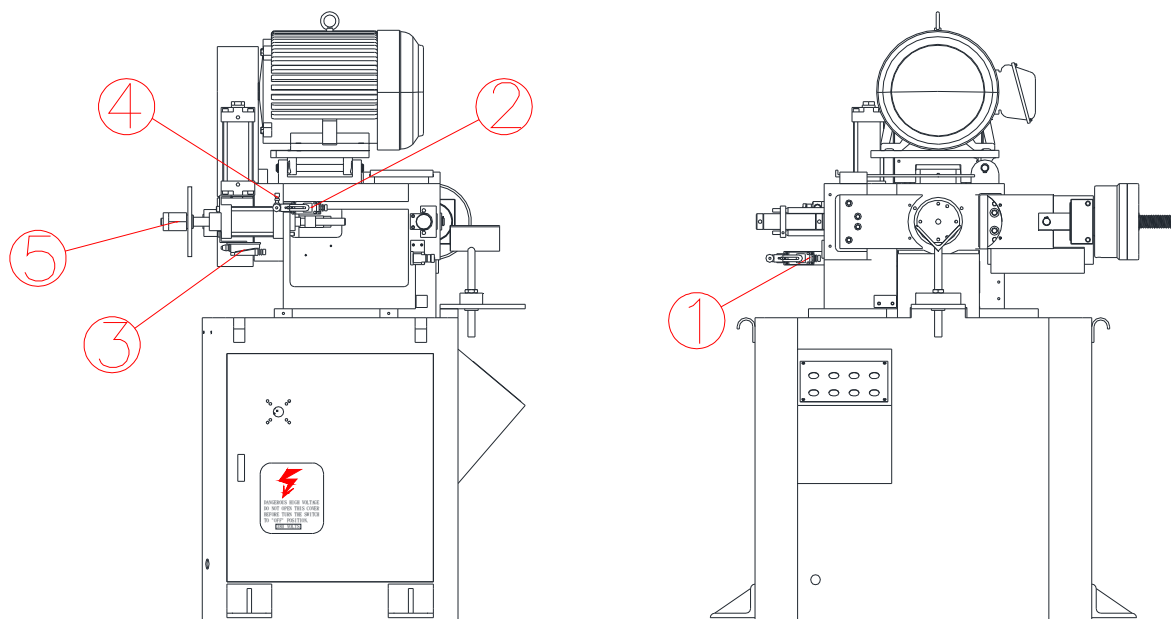


Figure 6-5

Number	Name
1	Rear Limit when Clamp Vise Opening
2	Rear Limit of Blade Entry
3	Front Limit of Blade Entry
4	Blade Entry Speed Control Valve
5	Cylinder Stroke Adjustment Ring



6-7 Adjust the Blade Entry Speed

Before delivery, we will set up the blade entry stroke, but it can be re-adjusted if necessary. If you need to cut deeper, loosen the set screw of the adjustment ring, and loosen the cylinder stroke adjustment ring (refer to Figure 6-5 5) counterclockwise. If you want to shorten the blade entry, turning the cylinder stroke adjustment ring clockwise, and tighten the set screw of the adjustment ring.

Note!

When adjusting the blade entry stroke speed, do not adjust the cylinder stroke ring too much.

7 Maintenance

- (1) Everyday before starting the machine, check main power wire and compressed air hose if they are in good connection and good condition.
- (2) Everyday after finishing working, remove all chips and dirt and wipe it clean. Apply some lube oil on moving parts.
- (3) Release condensed water trapped in the air treatment assembly from time to time.

8 Troubleshooting

1. No function of machine

Possible Cause	Action
Outside power is not good.	Check outside power.
Main power switch is off.	Set main power switch at ON position.
Emergency stop switch is in pressed position.	Turn emergency stop switch clockwise to release its stop position.

2. Machine vibrating and noising

Possible Cause	Action
Machine is not installed on flat floor.	Re-install machine on flat floor. Recommend use anchor bolts.

Note: Should any problem fail to be solved, Please don't operate the machine to avoid risk of danger. Please contact SOCO or SOCO's agent. Our personnel would be glade to provide any service.



9 Appendix



9-1 Machine Operates Range Pictures



9-2 Machine Specifications

9-3 Hydraulic Circuit Diagram and Air Circuit Diagram

9-4 Electrical Circuit Diagram



9-5 Parts Lists and Drawings