



Automatic Groove & Chamfer Machine MGB-22A

Operation Manual

SUZHOU INDUSTRIAL PARK MATE AUTOMATION

TECHNOLOGY CO.,LTD

www.suzhoumate.com

Thanks for using our products. Before use, please read this menu carefully and keep it for future reference. Thanks for your understanding if there's any discrepancies between the manual and practical operation process due to technical update ceaselessly.

Suzhou Industrial Park Mate Automation Technology Co., Ltd. is a metallic gasket machinery and equipment manufacturing and selling company. We locate in Suzhou - a city well known for its Chinese classic garden, south of Jiangsu Province, China. With our technology, we offer our customers very wide variety of metallic gasket equipment, such as

Spiral wound gasket winding machine;

Kammprofile machine;

Metal jacket machine;

Guide rings grooving machine;

Inner ring beveling machine;

Bend & weld machine;

Laser marking machine;

as well as computer controlled compression tester.

Our concept is to provide our customers with one-stop purchase and service for all types of metallic gasket related products, parts, and equipment. We have successfully sold our products and equipment to customers in the Asia India Middle-east Europe North America and South America.

We welcome all customers from abroad and home.

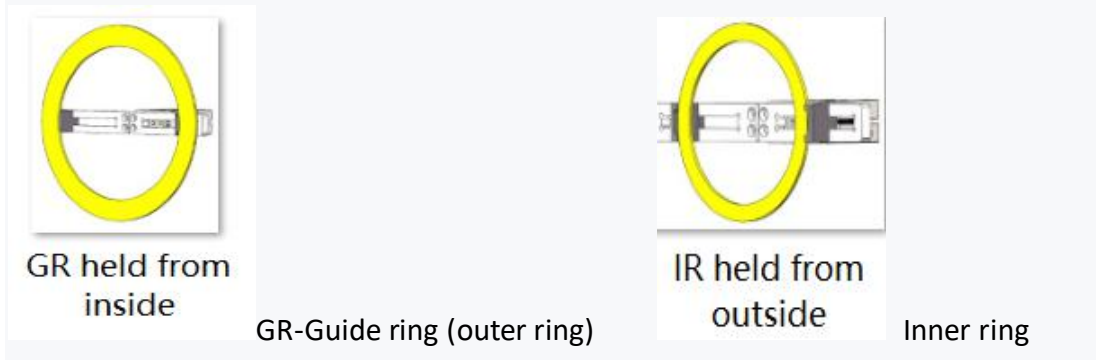
MGB-22A Automatic Groove & Chamfer Machine (Pic1)



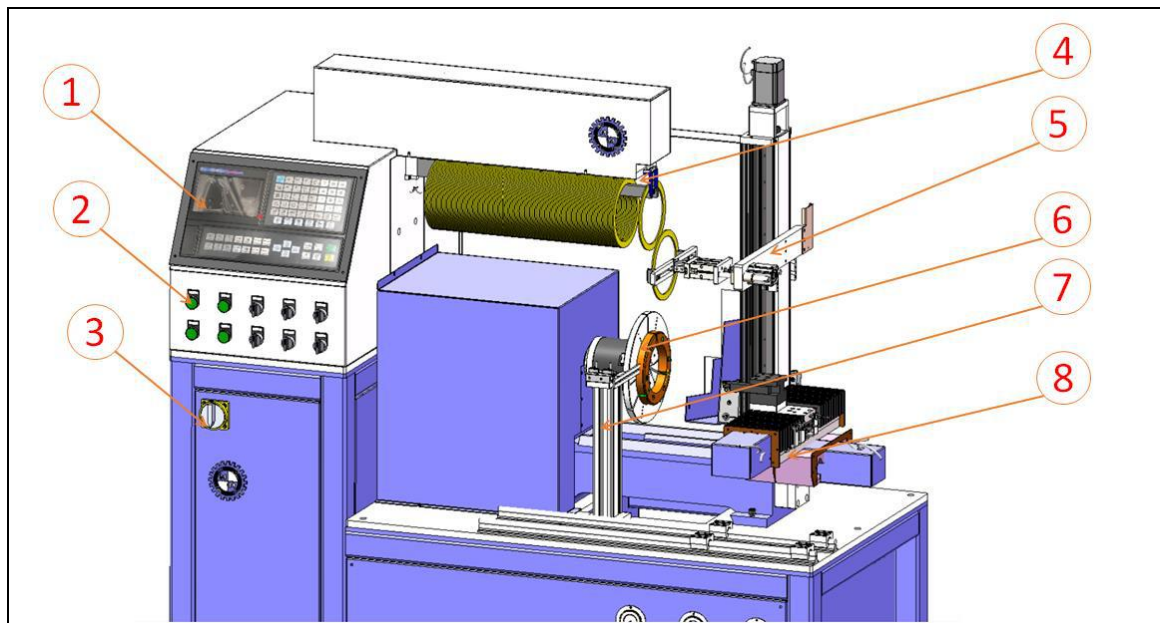
Main Features of MGB-22A Machine

1. This is multiple function machine, it can do both guide ring grooving and inner ring chamfering as well as kammprofile gasket;
2. Work mode fully automatic, user only need to load rings to the machine, one charge can load 160 rings, then pick up right program, and press “start” button, the machine can run fully automatically;
3. Use numeric control system, all program are pre-installed in machine;
4. Use standard cut insert, so as consuming parts it is very easy available at customers’ local market;

5. Need fixtures for each size of rings, grooving and chamfering fixtures are different, inner ring is held from inside, while the guide ring is clamped from outside, details please see the below pictures.

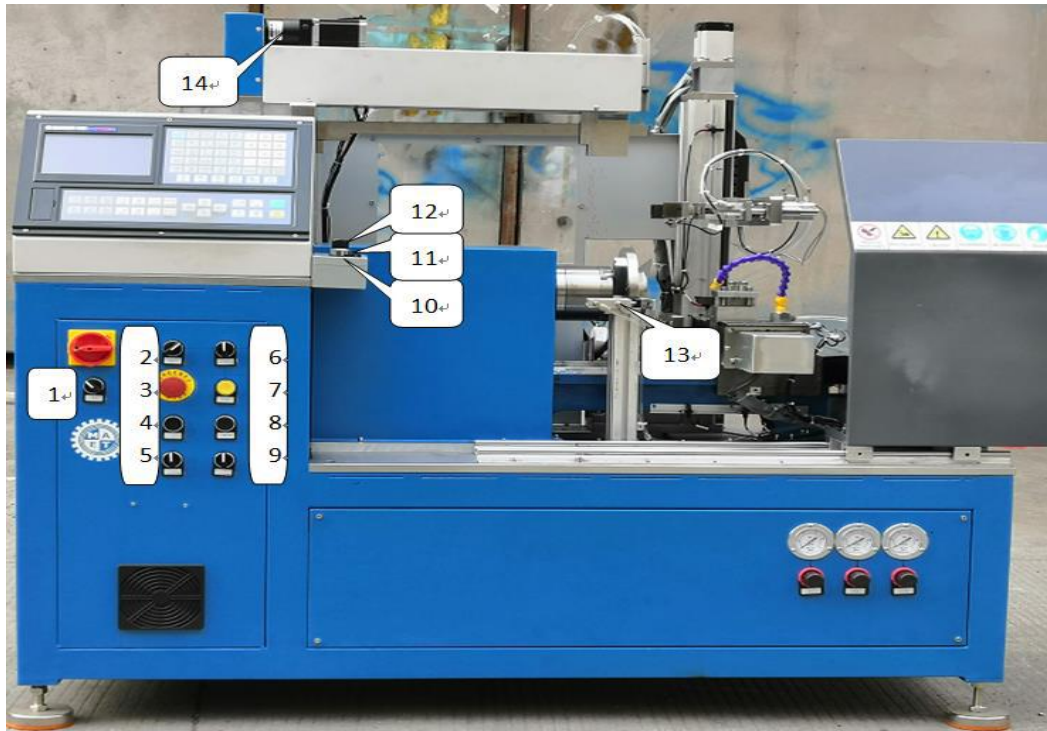


Machine main structure



- | | |
|----------------------------------|-------------------|
| 1---Numeric control system (NCS) | 5---Pick up robot |
| 2---Control panel | 6---Ring fixture |
| 3---Main power switch | 7---Ejector |
| 4---Ring feeding system | 8---Blade base |

Machine introduction



- (1) Guide ring/ Inner ring process change switch
- (2) Manual/Auto mode switch
- (3) Emergency stop switch
- (4) Ring pick up position save
- (5) Axis “Y” slow move up and down
- (6) Manual control ring feeding motor move
- (7) Reset button
- (8) Up position save
- (9) Axis “Y” quick move up and down
- (10) Start button
- (11) Manual control pick up robot reach out and back
- (12) Manual control jack catch clamp and release
- (13) Ejector only need under inner ring chamfering and kammprofile

process

(14) Ring feeding motor

Machine Specification


Type	MGB-22A
Profile	1450*1300*2300
Net weight	450KG
Power Supply	2.5KW
Voltage	380V
Size scale	1/2"-6"
Groove & Chamfer	Double function
Thickness	3 mm-5mm
Flange width	5 - 20 mm
Cycle time	3-6 seconds
One charge load	150 Rings
Material suited	CS/SS
Cooling	Vortec Air Cooling
Compressed air consumption	0.8 L/ min

Machine set up


Connect to power supply and compressed air supply, power supply 3 phase 380 V Hz 50-60 Hz; Compressed air supply no less than 0.8 Mpa.



Set up blade initial position

Turn on power, the numeric control system will show below page (Pic 1),

then press  come to the manual page (Pic2), then type in

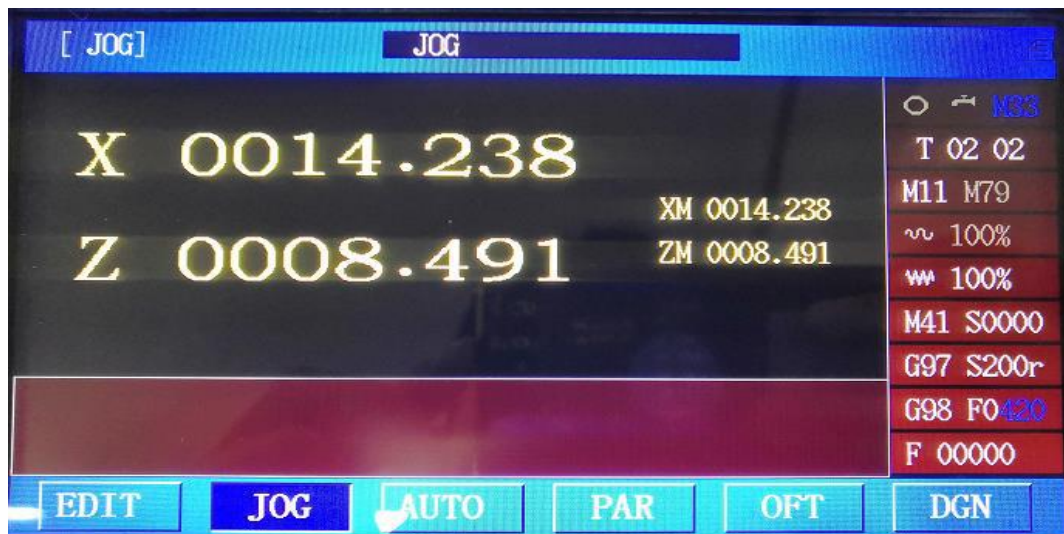
M10(Cylinder shrink) or M11(cylinder expand), then press 

clamp the part; type in M03 (manual) and press , then type in

S400 and press  define the motor turning speed, press  make motor turn around.








(Pic 1)



(Pic 2)

Set up initial position

Press , , ,  manually control cut blade move to the initial position quick, when the blade move to close enough to the part then press  reduce speed, then press the above 4 keys again to

move slowly the blade toward the part until blade touch the parts, press



come to the next page (Pic 3) record position under “X” and “Z”.



The screenshot shows a CNC control screen with a blue header bar containing "[OFT]". Below the header is a table with columns labeled "OFT.NO", "Z", "X", "R", "T", "S", and "Y". The table contains seven rows of data. The first row (OFT.NO 01) has the value "0000.000" highlighted in yellow in the Z column. The other rows have "0000.000" in the Z column and "0000.000" in the X, R, T, S, and Y columns. At the bottom of the screen is a row of six buttons: "EDIT", "JOG", "AUTO", "PAR", "OFT", and "DGN". The "OFT" button is highlighted in blue.

OFT.NO	Z	X	R	T	S	Y
01	0000.000	0000.000	0000.000	0	00	0000.000
02	0000.000	0000.000	0000.000	0	00	0000.000
03	0000.000	0000.000	0000.000	0	00	0000.000
04	0000.000	0000.000	0000.000	0	00	0000.000
05	0000.000	0000.000	0000.000	0	00	0000.000
06	0000.000	0000.000	0000.000	0	00	0000.000
07	0000.000	0000.000	0000.000	0	00	0000.000

(Pic 3)


Under chamfering process, repeat above steps to move the blade until its inside touch the part, then record the position under “X” and “Z” as above.


How to pick up program

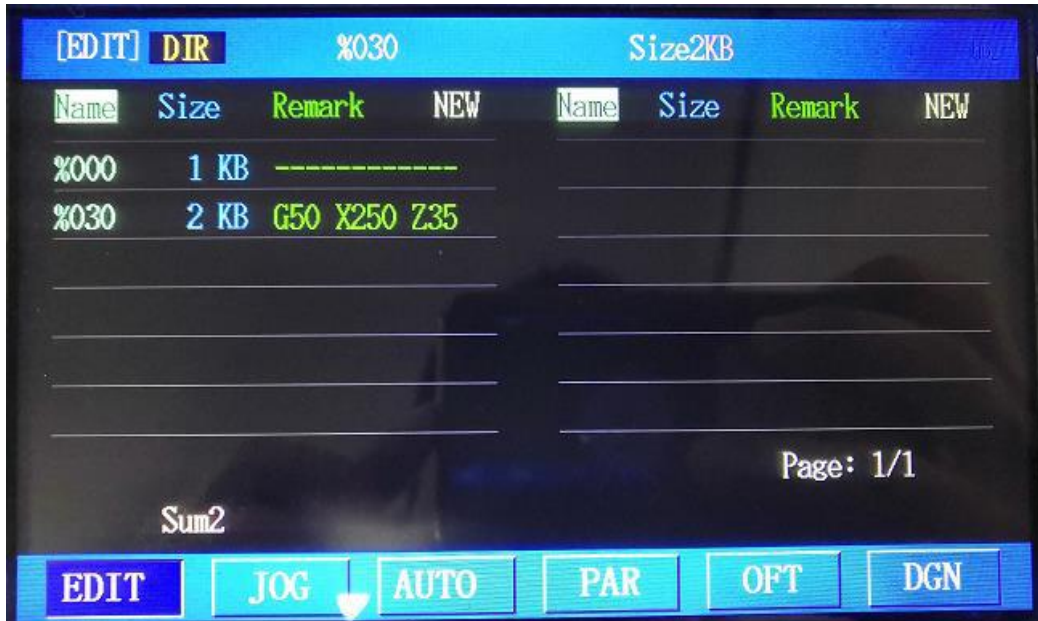


Press  come to the page as (Pic 4) shown, see the left side program

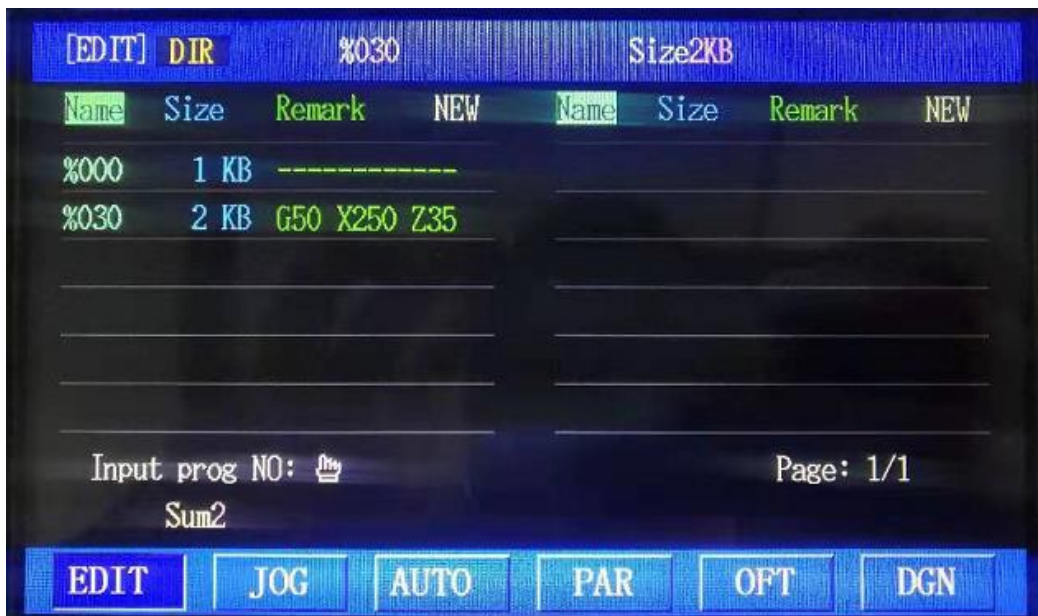
numbers such as 001,002,030 etc. Press  come to the page Pic 5,

press 001 press  finish program set up.

After program set up press  come to auto page (Pic 7) program is ready for processing.







(Pic 4)




(Pic 5)

How to modify the program,

Come to the program page shown as (Pic 6), then press  , ,

 ,  move the cursor to position where need to modify, press

 delete the value and type in revised value, modification

accomplished.

```
[EDIT] %030 Rw11 Ln7 Lines88 Size2KB
N0000 G50 X250 Z350
N0010 M8
N0030 M10
N0040 G0 X220 Z320
N0050 T11
N0070 G1 X200 Z300 F500
N0080 G2 X250 Z275 R25 F300 D0.1
N0090 G2 X200 Z250 I-50 K0
N0100 G2 U-50 W25 R25 L0.1
N0110 G2 U50 W25 I50 K0
N0120 G3 X150 Z275 R25 F500 D0.1
N0130 G3 X200 Z250 I50 K0
```

(Pic 6)



After program modification, press  come to auto page (Pic 7)

program is ready for processing.

Machine Operation

To start machine operation, user need to set up process position/ pick up position/ up position, 3 positions as well as centralize the jack catch for holding the ring.

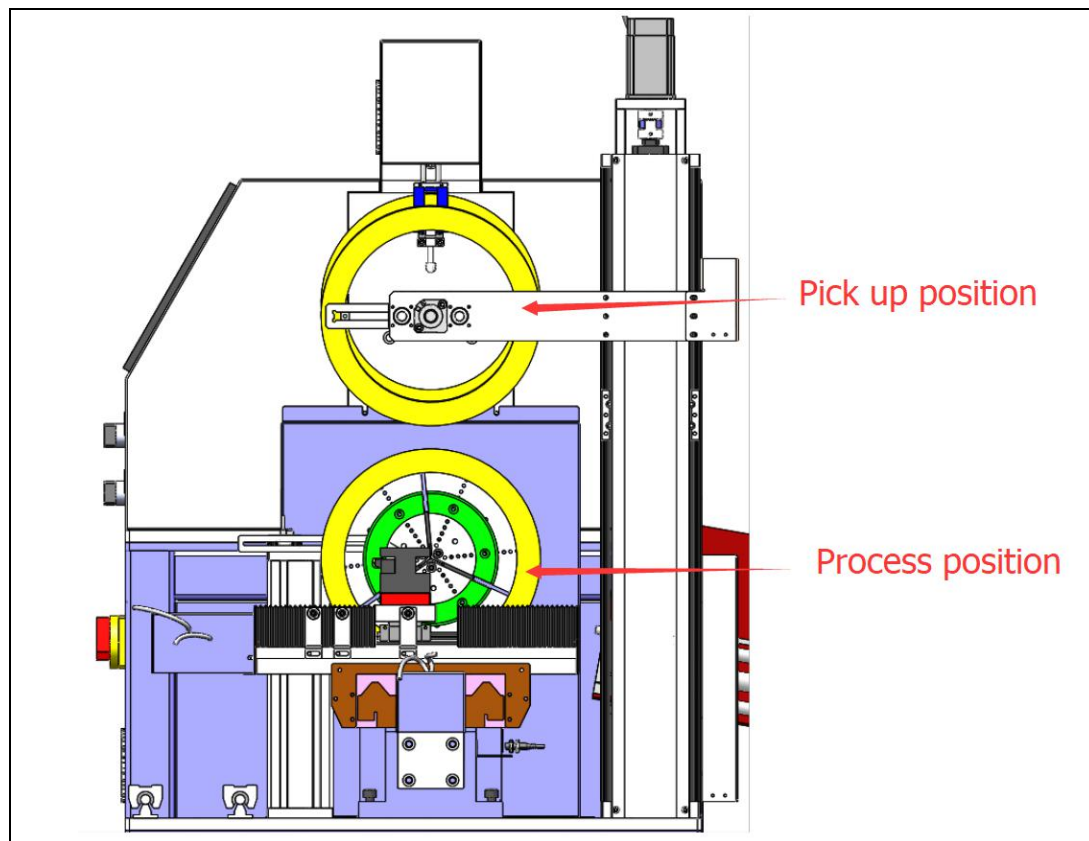
1 Process position set up

After change fixture for certain size of ring, load the ring to the fixture and hold it, (guide ring will be held from outside of ring, while inner ring will be held from inside of the ring) use (9) switch control pick up robot to the central position of jaw, process position set up. Normally process position set up as default by machine manufacturer, it need no re-set up unless user change the sensors position on pick up robot for any reasons.

2 Pick-up position set up

After centralize the jack catch, user need to set up ring pick up position, due to the ring size difference, the ring pick up position is different from size to size, so each time when you change the size, you will need to set up the pick-up position.

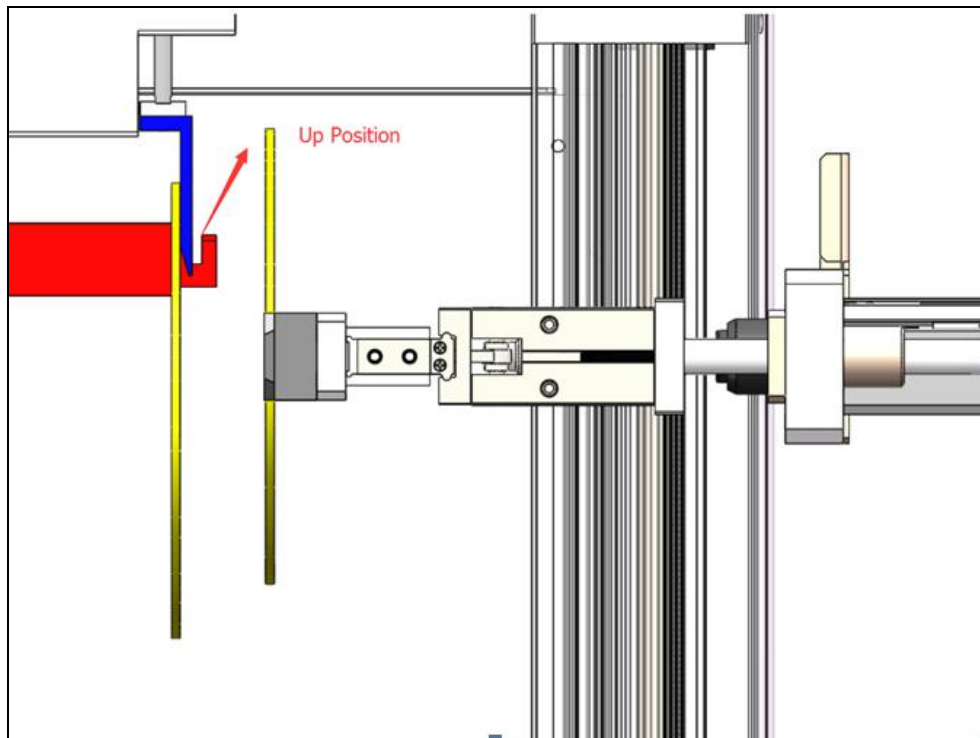
Use switch (9) to quickly move the pick-up robot to the ring waiting position, make sure the jack catch to the position of ring's center, press switch (4) save the position, pick up position set up.



3 Up position set up

After set up pick up position, manually control pick up one ring and move it up until the ring inside circle overhead of the ring stop bead, see below (Pic 10), press switch (8) save the position, up position set up.

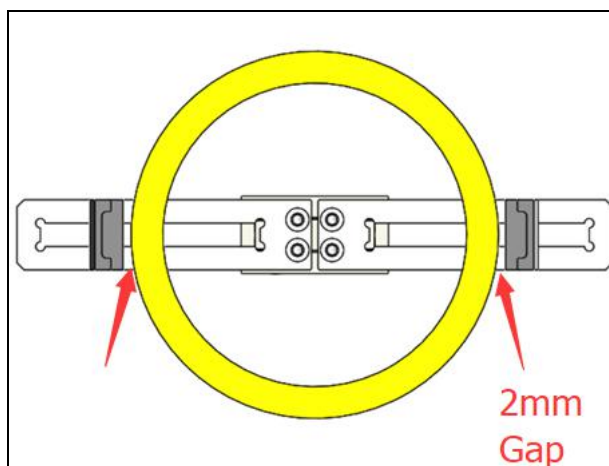
After set up all positions, switch (2) to auto mode, and press (10) “start” button, machine will process rings under automatic mode.



4 Centralize the jack catch to jaw for holding the ring

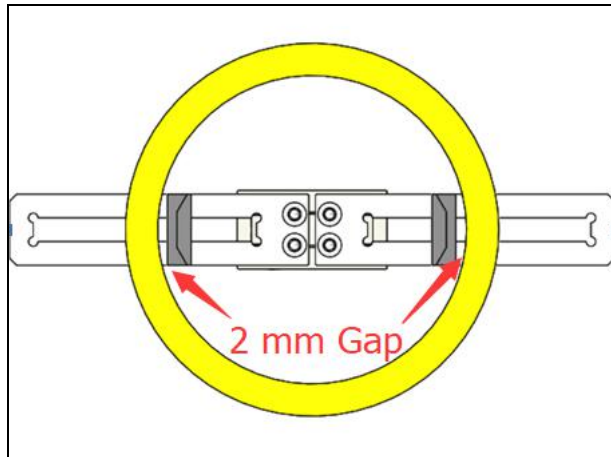
Use (11) switch to make pick up robot reach out, use switch (12) to set up jack catch at the central position of the ring.

For inner ring, make sure the cylinder on shrink position;



For guide ring, make sure the cylinder on expand position,

unscrew the 2 jack catches, after centralize it to the ring, move 2 jack catches 2mm back to each side, then tight up the screws as below pic



Type in M10 (Cylinder shrink) or M11 (Cylinder expand) press



use switch (11) move back pick up robot, jack catch centralized.

Pre-installed programs including

%000 (Chamfering)

N0000 M10 (Jaw Clamp)

N0010 M84 I21 D20 (Check signal I21, check time 20 seconds)

N0020 M11 (Jaw Expand)

N0030 G04 D1 (Time delay 1 second)

N0040 M03 S1400 (Main shaft rotate, speed 1400r/s)

N0050 G04 D0.2 (Time delay 0.2 second)

N0060 M08 (Air blow on)

N0070 G0 X96.296 Z-7.910 (Cut move to standby position, X value should be 6 mm greater than the value of initial position)

N0080 G01 X90.390 F1800 (Cut move to initial position)

N0090 G01 X89.390 F60 (Cut feed 1 mm, feed speed 60mm/min)

N0100 G0 X96.296 (Cut move back to standby position)

N0110 G04 D0.05 (Time delay 0.05 second)

N0120 G0 Z-13.452 (Z axis move to initial position)

N0130 G0 X90.252 (X axis move to initial position)

N0140 G01 X89.252 F60 (Cut feed 1 mm, feed speed 60mm/min)

N0150 G0 X96.260 (Cut move back to standby position)

N0160 G04 D0.05 (Time delay 0.05 second)

N0170 M09 (Air blow off)

N0180 G0 Z59.504 X103 (Z and X move back to home position)

N0190 M05 (Main shaft stop)

N0200 M78 (Ring collector move out)
N0210 G04 D1 (Time delay 1 second)
N0220 M10 (Jaw clamp)
N0230 G04 D0.2 (Time delay 0.2 second)
N0240 M21 (Ejector push out)
N0250 G04 D0.2 (Time delay 0.2 second)
N0260 M22 (Ejector move back)
N0270 M79 (Ring collector travel back)
N0280 G04 D0.2 (Time delay 0.2 second)
M290 M20 (Program repeat)

%001 (Grooving)

N0000 M11 (Jaw Expand)
N0010 M84 I21 D20 (Check signal I21, check time 20 seconds)
N0020 M10 (Jaw Clamp)
N0030 G04 D1 (Time delay 1 second)
N0040 M03 S1400 (Main shaft rotate, speed 1400r/s)
N0050 G0 X82.252 Z-10.910 (Cut move to standby position, X value should be 6 mm smaller than the value of initial position)
N0060 M08 (Air blow on)
N0070 G04 D0.5 (Time delay 0.5 second)
N0080 G01 X88.252 F1800 (Cut move to initial position)
N0090 G01 X89.252 F60 (Cut feed 1 mm, feeding speed 60mm/min)
N0100 G0 X82.252 (Cut move back to standby position)
N0110 M09 (Air blow off)
N0120 G0 Z59.504 X103 (Z and X move back to home position)
N0130 G04 D0.2 (Time delay 0.2 second)
N0140 M05 (Main shaft stop)
N0150 M78 (Ring collector move out)
N0160 G04 D1 (Time delay 1 second)
N0170 M11 (Jaw expand)
N0180 G04 D0.2 (Time delay 0.2 second)
N0190 M79 (Ring collector travel back)
N0200 G04 D0.2 (Time delay 0.2 second)
M210 M20 (Program repeat)

%002 (Kammprofile)

N0000 M10 (Jaw clamp)
N0010 M84 I21 D20 (Check signal I21, check time 20 seconds)
N0020 M11 (Jaw expand)
N0030 G04 D1 (Time delay 1 second)
N0040 M03 S1400 (Main shaft rotate, speed 1400r/s)
N0050 G0 X92.252 Z-11.910 (Cut move to standby position, X value should be 1mm greater than the value of initial position; Z value should be 0.6 mm greater than the value of initial position)

N0060 M08 (Air blow on)

N0070 G0 X91.252 (Cut move to initial position)

N0080 G74 X81.252 Z-10.910 I0.05 K0.05 E1 F1000 (Surface circular processing, X value =initial position +flange width; Z value = initial position +depth of groove; I value is cut feed speed 0.05 mm/ minute; K value define Z axis return speed 0.05mm/minute; E value define X axis travel 1 mm each time if the interval of groove is 1 mm; F cut feed speed)

N0100 G0 Z59 (Z axis move back to home position)

N0110 M09 (Air blow)

N0120 G0 X103 (X axis move back to home position)

N0130 G04 D0.2 (Time delay 0.2 second)

N0190 M05 (Main shaft stop)

N0200 M78 (Ring collector move out)

N0210 G04 D1 (Time delay 1 second)

N0220 M10 (Jaw clamp)

N0230 G04 D0.2 (Time delay 0.2 second)

N0240 M21 (Ejector push out)

N0250 G04 D0.2 (Time delay 0.2 second)

N0260 M22 (Ejector travel back)

N0270 M79 (Ring collector travel back)

N0280 G04 D0.2 (Time delay 0.2 second)

M290 M20 (Program repeat)