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MATE AUTOMATION

Semi-Auto Spiral Wound Gasket Machine

MV-01

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
ADD: BUILDING 15-1 PUTIAN PRIVATE INDUSTRIAL ZONE WEITING SIP JIANGSU 215122
TEL: 0086-512-6285 0086 FAX: 0086-512-6285 0087

Company brief

Suzhou Industrial Park Mate Automation Technology Co., Ltd. is a metallic gasket and equipment manufacturing and selling company. We are located 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;

Guide rings grooving machine;

Inner ring beveling machine;

Bend & weld machine;

Inner ring stretch machine

Double jacket machine

Laser marking machine;

as well as computer controlled compression tester machine.

Our concept is to provide our customers with one-stop service for all metallic gasket related machinery and equipment. We have successfully sold our products and equipment to customers in the Asia India USA Europe and South America.

We sincerely hope to cooperate with all customers from abroad and home.

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MV-01 Semi-auto spiral wound gasket machine (Pic)

Note Strip protection is optional configuration, only deployed per customer's request.

Features and specification

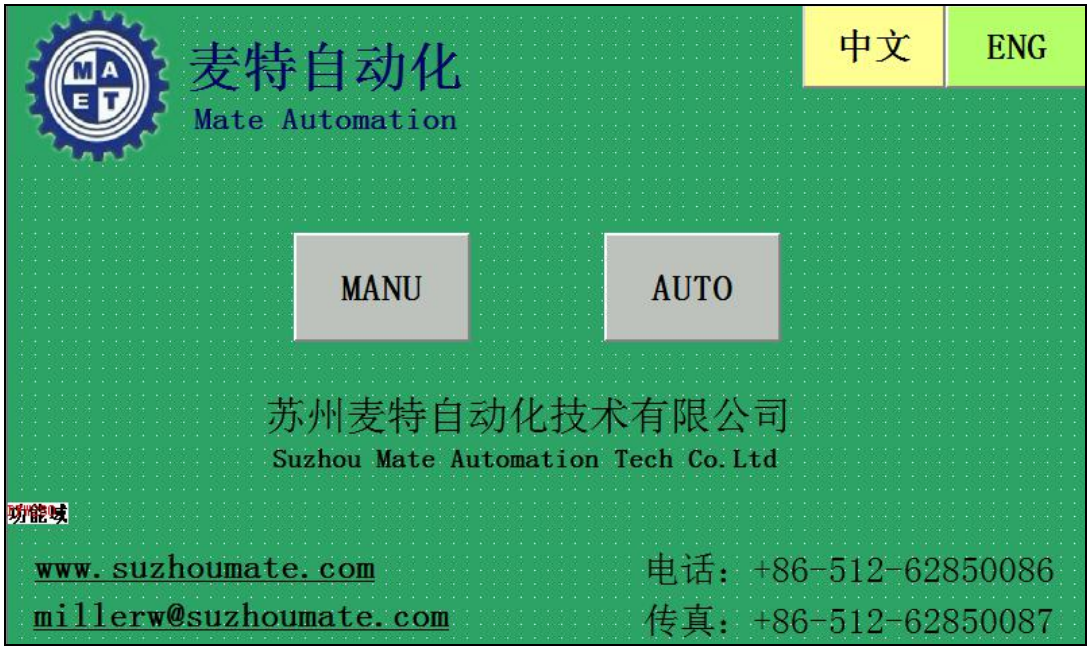
1. PLC controlled process, make 1/2" to 10" both standard and inner ring gasket.
2. With automatic welder, weld quality and even points.
3. With Strip former, so it uses flat strip, one charge load 15-20kg strip.
4. Filler material break sensor is optional choice, with this device, the machine stop automatically when the filler break or run out, and auto and manual mode switch gives operator lots of flexibility during process.
5. Easy set up machine and size change over, very suitable for small volume and lots types of gasket production.
6. Automatic steel cutter is optional, which make machine operating tools free.

Machine Specification

Machine profile	1100mm(l)*950mm(w)*1450mm(h)
Drive motor	750 W
Working mode	Automatic/Manual
Work range	ASME standard 1/2"to 10"
Filler Materials Suitable	Any
Gasket Type	Standard/Inner ring Gasket
Standards	All standards
Cycle time	25-30 seconds for 4" gasket
Change over time	5-10 minutes
Mandrel or inner ring load	Manual
Process control	Programmed by PLC
Material feeding	Manual
Steel Auto cut off	Optional
Welding	Automatic
Gasket ejection	No ejection or Auto-ejector
Driving power	Variable Frequency Motor
Filler break control	Optional
Steel forming unit	Pressure adjustable
Steel spool support	Yes, one charge 15 kilo

Program set up

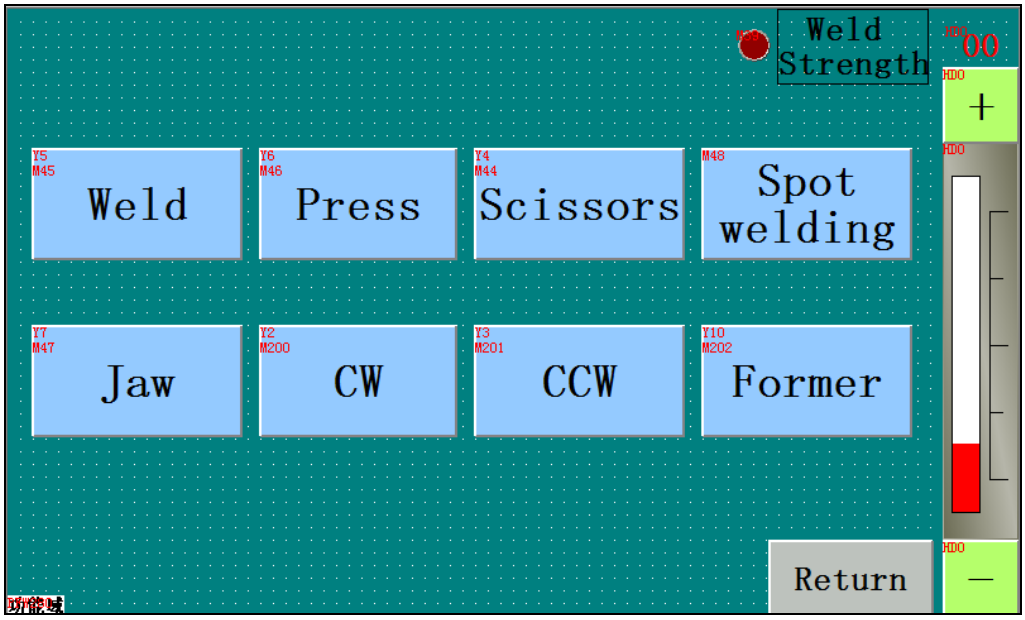
1. Connect cable to power.
2. Connect air pipe to compressed air source.
3. Turn on power, the interface will show the first page as below,



Manu---Manual mode

Auto---Automatic mode

4. Press “M”, it will come to the manual page as below,



Under manual mode, the first page show following controls,

“Weld” controls welder move forward and reverse;

“Press” controls Press roller up and down;

“Scissor” controls scissors cutting;

“Spot Welding” conduct welding;

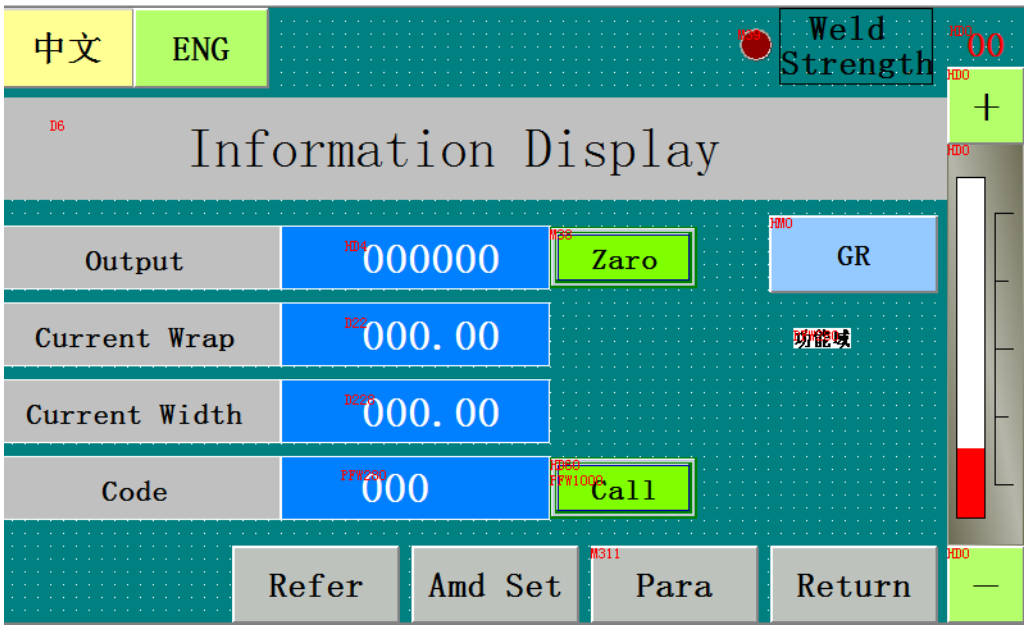
“Jaw” controls jaw expand & shrink;

“CW” turn motor clock wise;

“CCW” turn motor counter clock wise.

“Weld Strength” Adujst welding strenghthness, the longer black bar, the more strength the weld is.

5. Press “Auto”, it will show the “Automatic mode” page below,



Under Auto mode, it will show some production related information, such as current overall wraps,

current width of flange, and code shows current product code.

Code means product code，indicate a specific type of product is under building; Each code represents a set of parameter setting for a specific type of product saved in machine memory. This machine can save up to 200 sets of parameter setting.

How to use a code to save a set of parameter setting?

Para ⇨ Define a code ⇨ Setup parameters ⇨ Press "Save" to save parameters

Once you saved the para setting, next time when want to make again, you can press " code", then the screen will switch to the below chart, you can refer to it, find the right code, put it into the blue block right after "code".

Lbs / Size	AAAA	AAAA	AAAA	AAAA	AAAA	AAAA
AAAAAA	1	7	13	19	25	31
AAAAAA	2	8	14	20	26	32
AAAAAA	3	9	15	21	27	33
AAAAAA	4	10	16	22	28	34
AAAAAA	5	11	17	23	29	35
AAAAAA	6	12	18	24	30	36

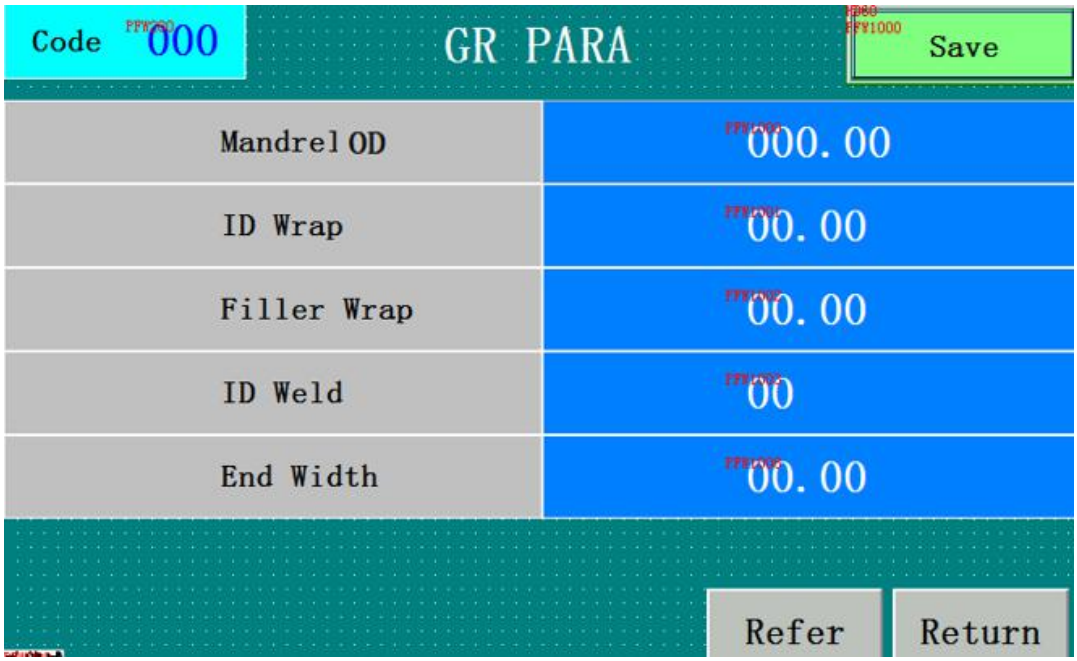
Code 000 Call 功能域 Next page Esc

GR means guide ring gasket, IR means inner ring gasket;

When the operator finished parameter setting, if you want to keep these settings you can give a code for this type of product, then press F8 once finish one page of parameter setting, the machine will automatic save all settings, so next time, when you need to make the same type of product, you don't need to set up parameters again, you can simply key in the code, all parameters saved will be setted up automatically.

6. Parameter setting, Press "Para", the interface will come to the pages of parameter setting, first page is as below,

Page 1



This page is used for set up GR type of gasket,

Mandrel OD---means diameter of mandrel excircle, this is key parameter which determine lots of logical calculations in the program;

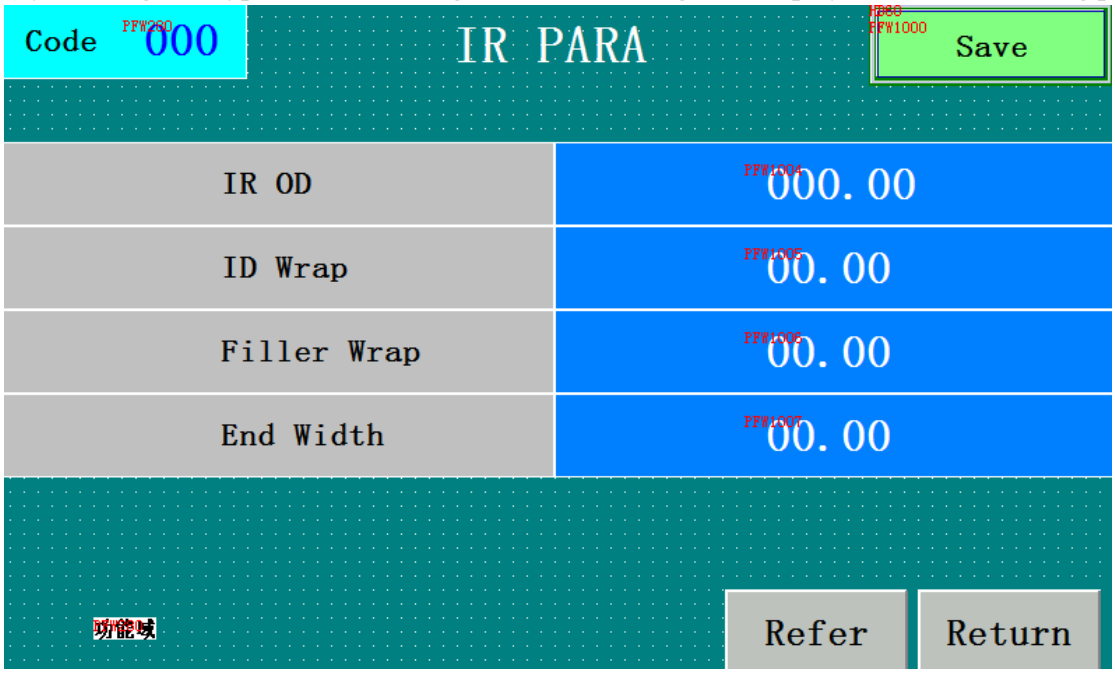
ID Wrap---means steel strip inicial wraps, normally 3-4 wraps;

ID Weld---means welding points to be allowcated on inside circle. Operator needs to calculate out and set it up how many welding points to be put;

Filler Wrap---determine how many wraps to be set.

End Width---It is to set up the ending width of whole winding. The volume must greater than width when the filler wraps winding finished, otherwise it will alert as oversize. It must be in right diameter fit into the guide ring inside circle.

If you change the type GR(Guide Ring) to IR(Inner Ring), the display will be the following page,



In this page, you need to set up,

IR OD---IR excircle diameter, this is just like mandrel OD under the GR type, this is key parameter which determine lots of logical calculations in the program.

ID Wrap---same as the GR process, means steel strip inicial wraps, normally 3-4 wraps;

Filler Wrap---same as the GR process, it determines how many wraps do you need;

End Width---same as the GR process, it is to set up the ending width of whole winding, ending width determine your winding OD, winding OD should fit into the ID of the guide ring.

How to calculate filler wraps?

For example if you wanto to make ASME 4" 150 basic type of gasket,

Assume Graphite thickness 0.75mm

Steel strip thickness 0.20 mm

MV-01 Semi-auto winding machine deployed a electronic caliper under the table, which can measure the flange width of gasket being built. It zero the value when the press roller move up to the position where claimp the mandrel, during all the winding process, the caliper is constantly meansuring the flange width, and display on the screen.

With this concept in mind, you can understand how to calculate the "Filler wraps" and "Ending width"

According to the ASME, 4" 150 gasket inside diameter is 127 mm, gasket inside diameter equal to the outside of mandrel, so the mandrel OD is also 127mm.

So you have the first parameter Setting,

Mandrel OD 127 mm;

ID Wrap, according to the ASME, should be 3 wraps, this is normally same even size change.So you have the second parameter

ID Wrap 3;

Filler wrap, filler wrap is determined by the ending width. So we set up the ending width first.

4" 150 gasket outside diameter is 149.4. so ending width=(149.4-127)/2=11.2 mm.

Ending width 11.2mm, ending width is actually the gasket flange width.

Now we can calculate the filler wraps, gasket flange width (actually is the ending width)=ID steel wraps noprmally 3 *0.2mm+Filler wrap X * 0.9mm(steel strip thickness+graphite thickness)+ outside steel wraps normally 3 wraps, or more according to ASME.

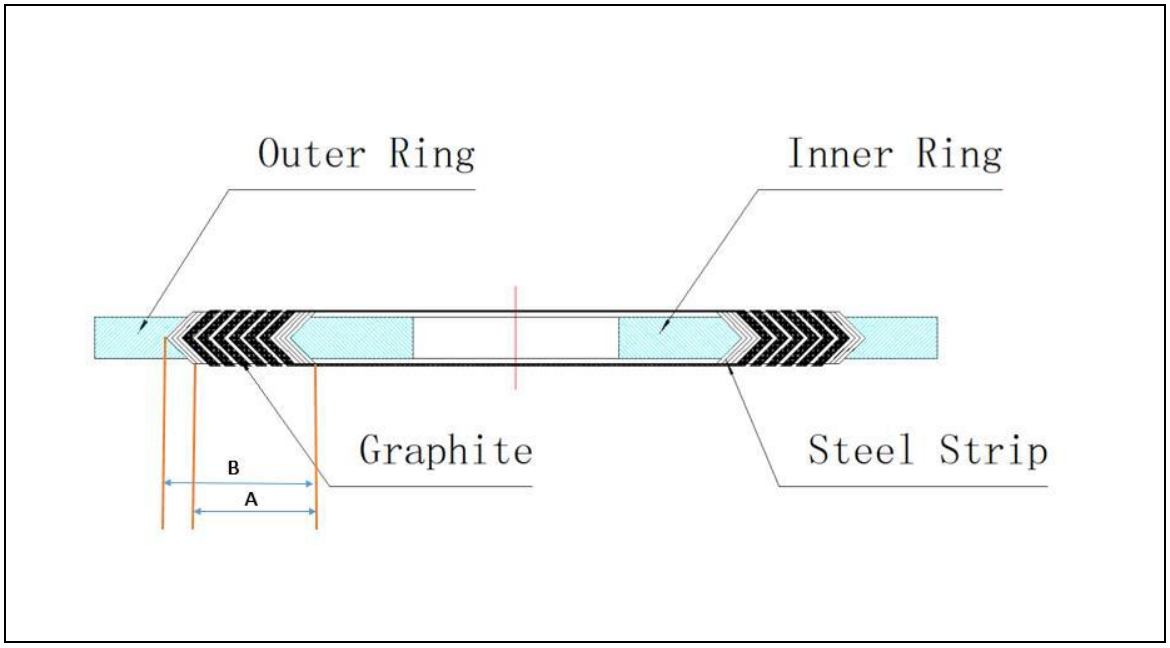
So Filler wrap X = 11.2-3*0.2(inside steel wraps)-3*0.2(outside steel wraps)=10/0.9(steel strip thickness+graphite thickness)=11.1, filler wraps must be full wraps, so take the 11 as filler wraps, one principle is, always take the integer smaller than X actual value.

So you have the 3rd para setting,

Filler Wrap 11;

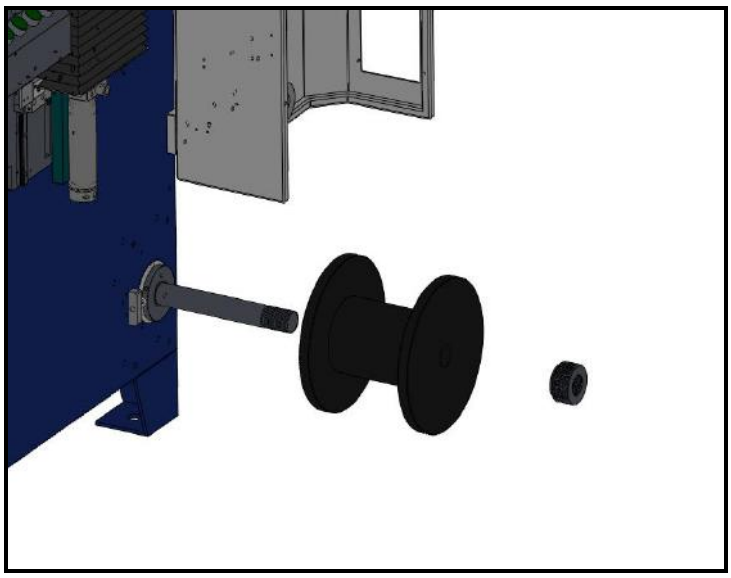
Ending width is 11.2mm.

One more important tip about the "Ending Width", it refer the dimension of the below drawing A, not B. The central piece of press roller has the V shape profile.

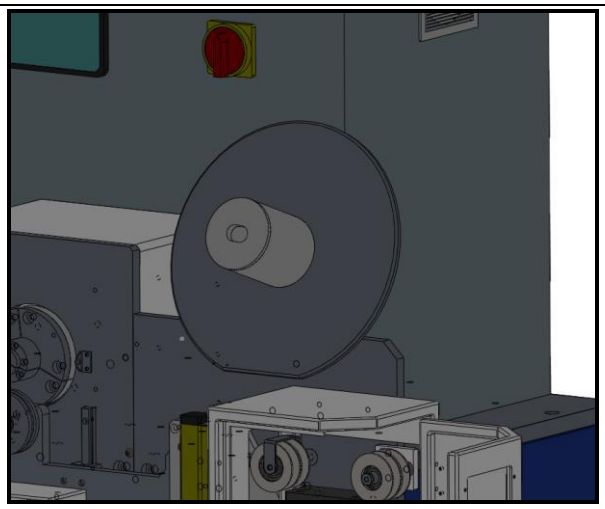


Machine set up

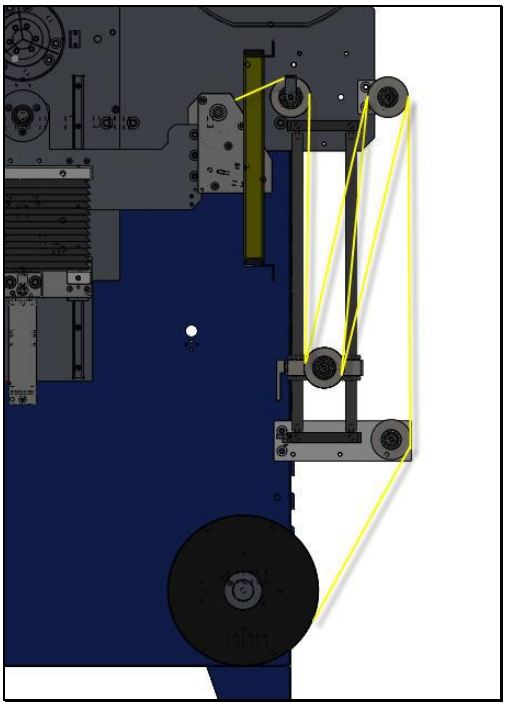
1. Load strip, see Pic 11 below, put spool on the shaft, then tight the nut to proper tightness. (Pic 8)



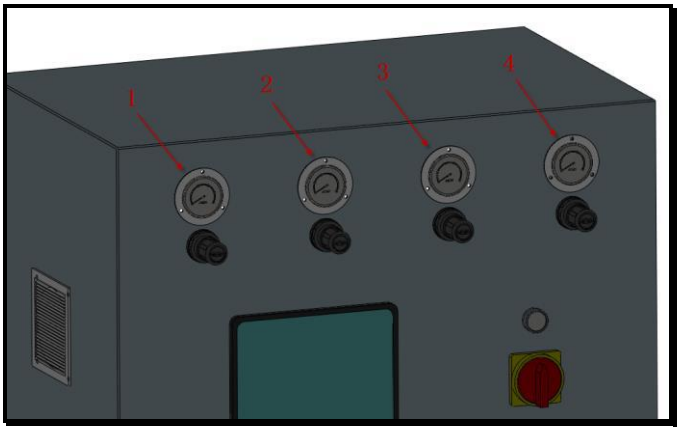
2. Load pancake of filler material. The machine is designed to load more than 6 layers of filler material once. That will significantly save material changing over time. After loading material, put the cover on top of it. (Pic 8)



3. Lead strip through 3 dancing wheels as indicated, then go through form rollers, it will be ready for production. (Pic 9)



4. Before start making process, set air pressure properly. (Pic10)

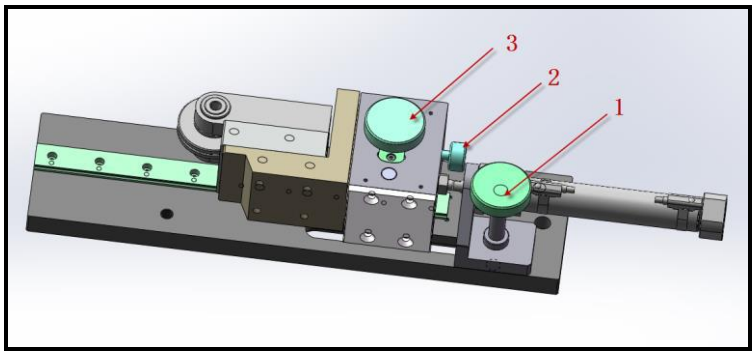


Regulators	Recommended setting
1 Welder	0.2 MPa
2 Press roller	0.25-0.3 MPa
3 Form roller	0.3-0.35 MPa
4 Jaw expand	0.6 MPa

5. Operation button indicate. (Pic 10)

1 Start
2 Reverse/Forward
3 Stop/pause
4 M weld manual welding
5 Emergency

6. Welder can adjust altitude/reach out position.(Pic 11)



1 Adjust initial position
2 Altitude lock
3 Adjust altitude

Adjust initial position of welder according to different sizes
Altitude lock after adjust the altitude of welder tips to proper height, tight it to keep the set altitude
Adjust Altitude is to set up the altitude of the welder tips to make sure tow welder tips evenly touch the shoulder of formed strip.

Welder Control details

This machine set up two sets of welding parameters， in most cases, user don’t need to use 02, 02 is for wending.the some special alloy or welding different material such as Iron to stainless.

01 parameter setting,

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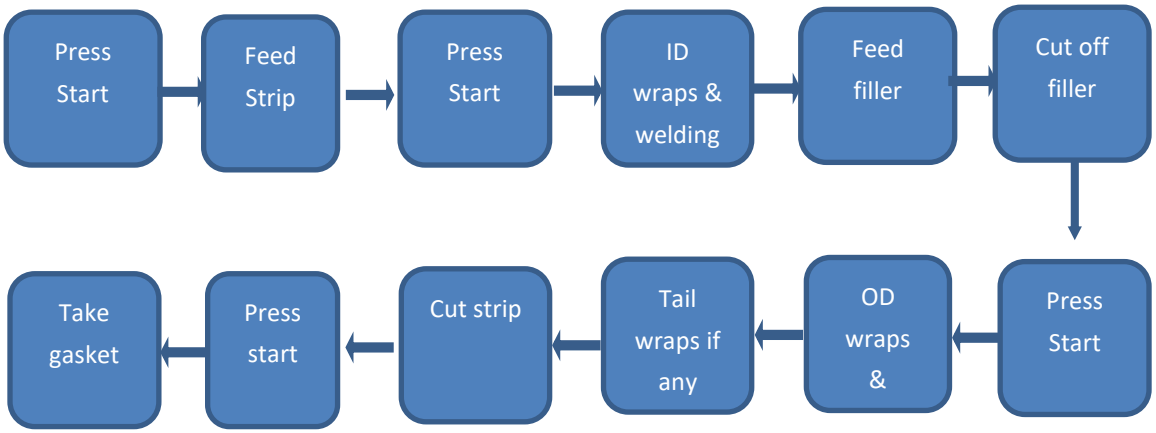
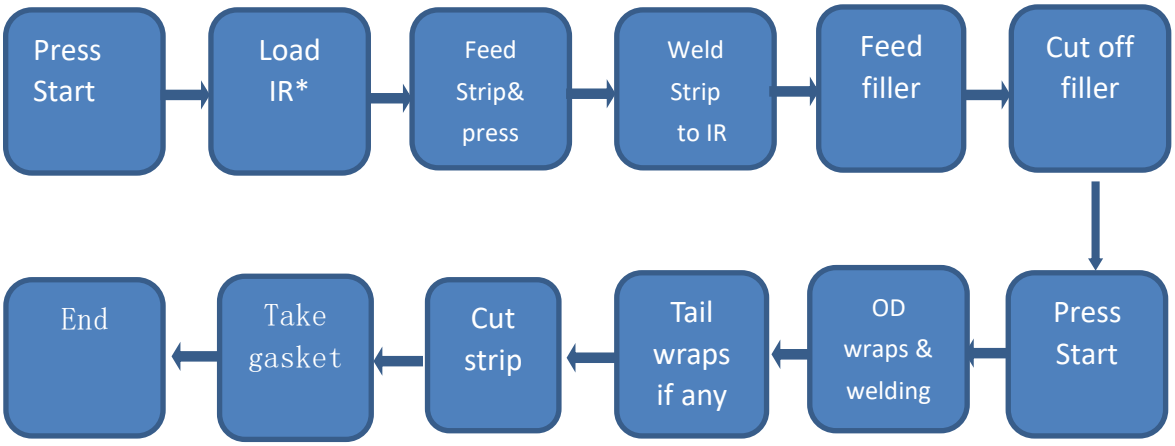
JL-08A Welding controller	
PARA	**Value**
SQUEEZE	001
	000
SLOPE1	001
	000
WELD1	01
	001
WELD1 CURRENT	01
	50-80
COOL	01
	001
WELD2	01
	000
WELD2 CURRENT	01
	50-80
SLOPE2	01
	000
HIOLD	01
	000
OFF	01
	000

7. In each step, screen will give the indication, such as "mandrel position", "feed strip", "feed filler", "stop filler", "cut off strip" etc. Operator just need to do according to the indication, then push button, then go to next step.

Standard gasket process flow,



IR gasket process flow



*Note, to prevent from improper operate, we use the “Rev” button to load inner ring, so after press “start”, use the Rev button to load inner ring.

Trouble Shooting Maintenance Tips

Welding spark	1.Welder tips not move;
	2.Welder tip position not right;
No welding	1.Welder intensity is not strong enough;
	2.Welder tips burned， need to be replaced or re-lathed on OD.
	3.Solid relay broken, check if it power on
Welder not move	Sensor broken or no pressure
Welder move too fast	Throttle valve open too big, adjust back to the proper speed
Press roller not move	Sensor broken or no pressure
Press roller move too fast	Throttle valve open too big, adjust back to the proper speed
Jaw needs to grease in daily basis.	
Welder tips need to lathe on the OD on regular basis, weekly is recommended.	
Empty oil-water separator on weekly.	

Safe Instruction

1. Operator must ware glass to protect from welding spark, or strip.
2. When feed strip, especially filler material, make sure keep finger safe distance away from the press roller.
3. Operator must ware glove, don't pull strip with hand in any cases.
4. Don't open electronic box when electrician is absence.

END