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OPERATIONAL MANUAL

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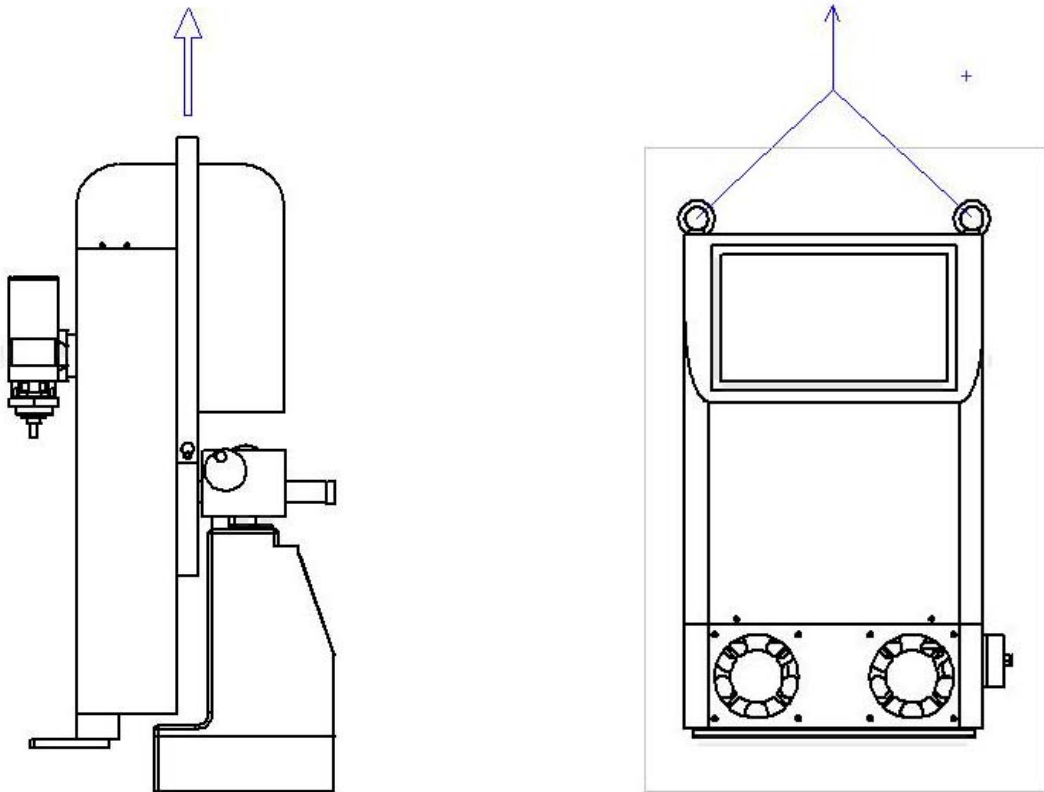
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1. MACHINE MOVING.

1.1 The machine Life up and moving:

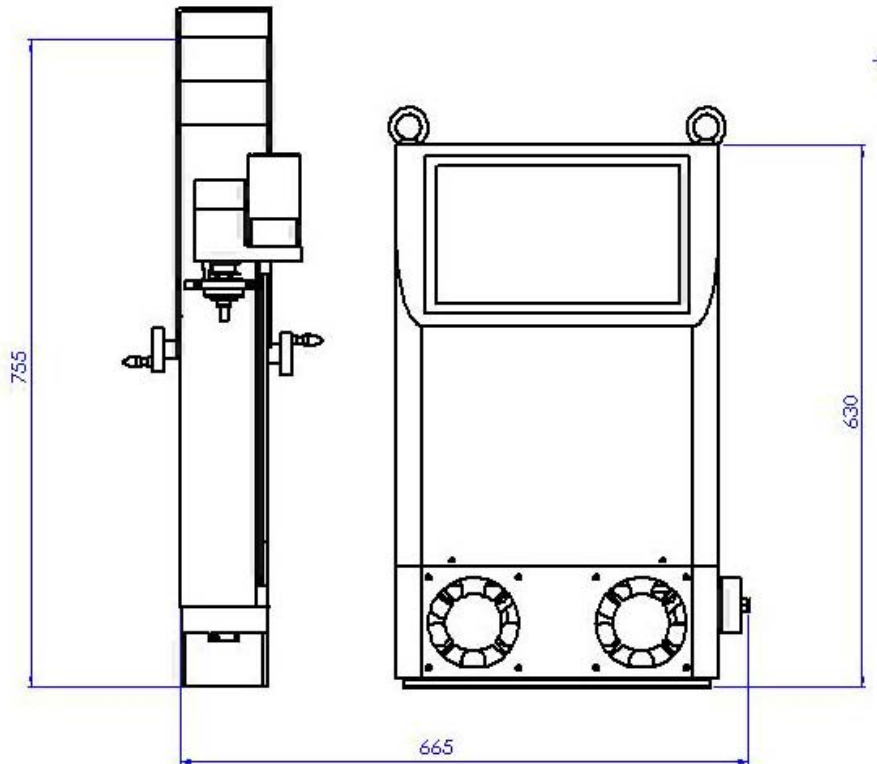
The machine life up and moving such as drawing, please pay attention the rope at 4 sides are flat or not when machine lift.

The lift rope strength can load over 100 kgs.



2. The installation space and environment requirement

2.1 Installation space environment



Attention:

- @ The machine install accord to above drawing, if the space too small, it maybe cause machine poor dissipation heat, and effect on machine normal operation.
- @ The machine should be installed on stable ground, to avoid installation on big vibration environment.
- @ Please correct machine leveling at once after machine at right position.
- @ Do not install at dirty and more dust environment. Please keep the proper distance with other machine.

2.2 Power environment

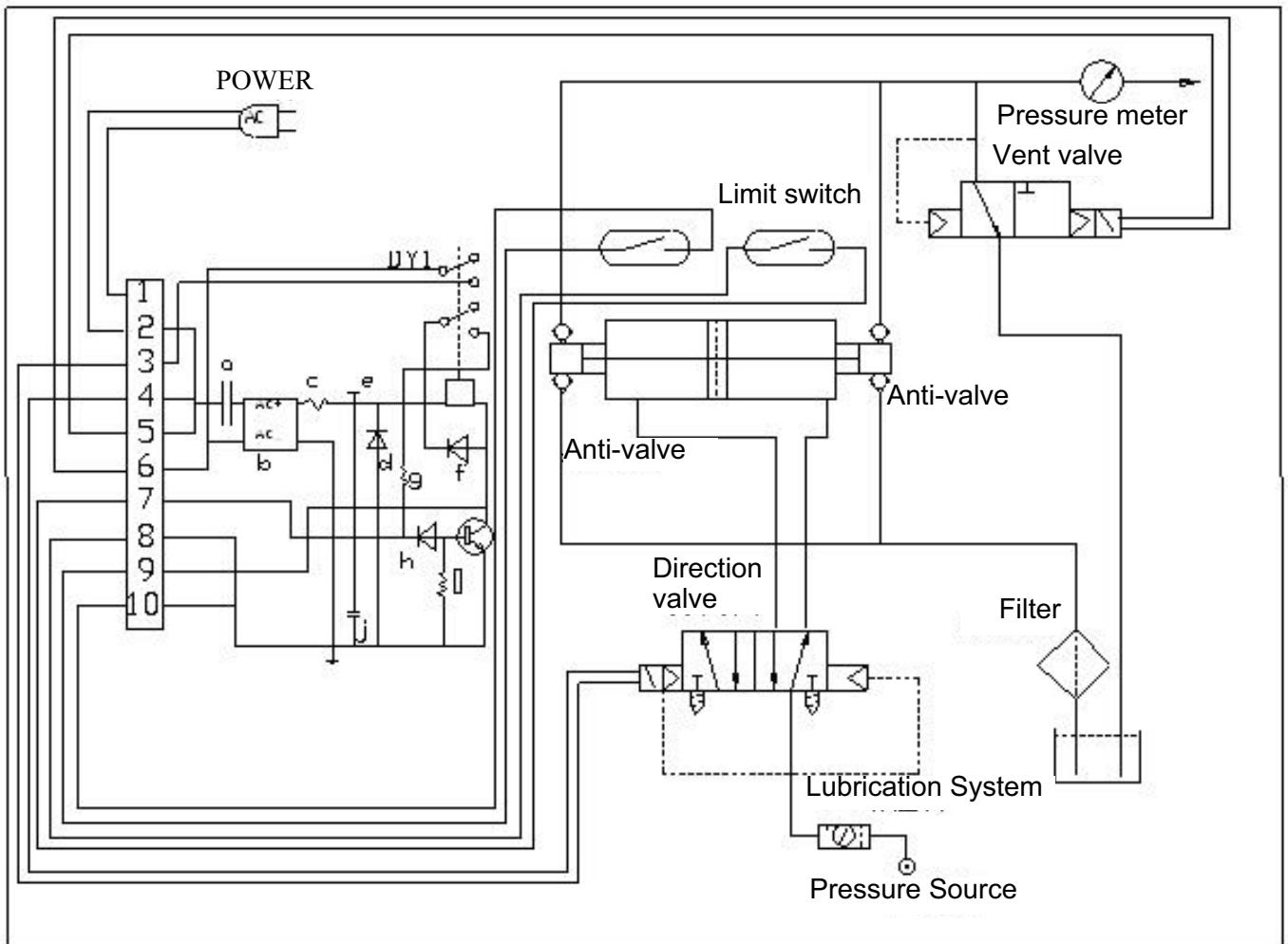
- a、 The power supply should be same as this machine.
- b、 This machine power use 220V single phase.
- c、 The line doesn't over 3M for connecting generator to breaker switches.
- d、 The power supply of compressor should not connect with machine same Breaker protecting switch.
- e、 The breaker specification is 15A.

2.3 The explanation for main power

The main power component with three colors L,N, E lines, the yellow, green Lines should connect to ground (E), another two colors without different with pole and phase, you just connect to single phase power in sequencing. Please make sure the voltage if same as your machine before connecting power.

To supply this machine should need a breaker, its specification is 15A, and this breaker can't use with another machine same time.

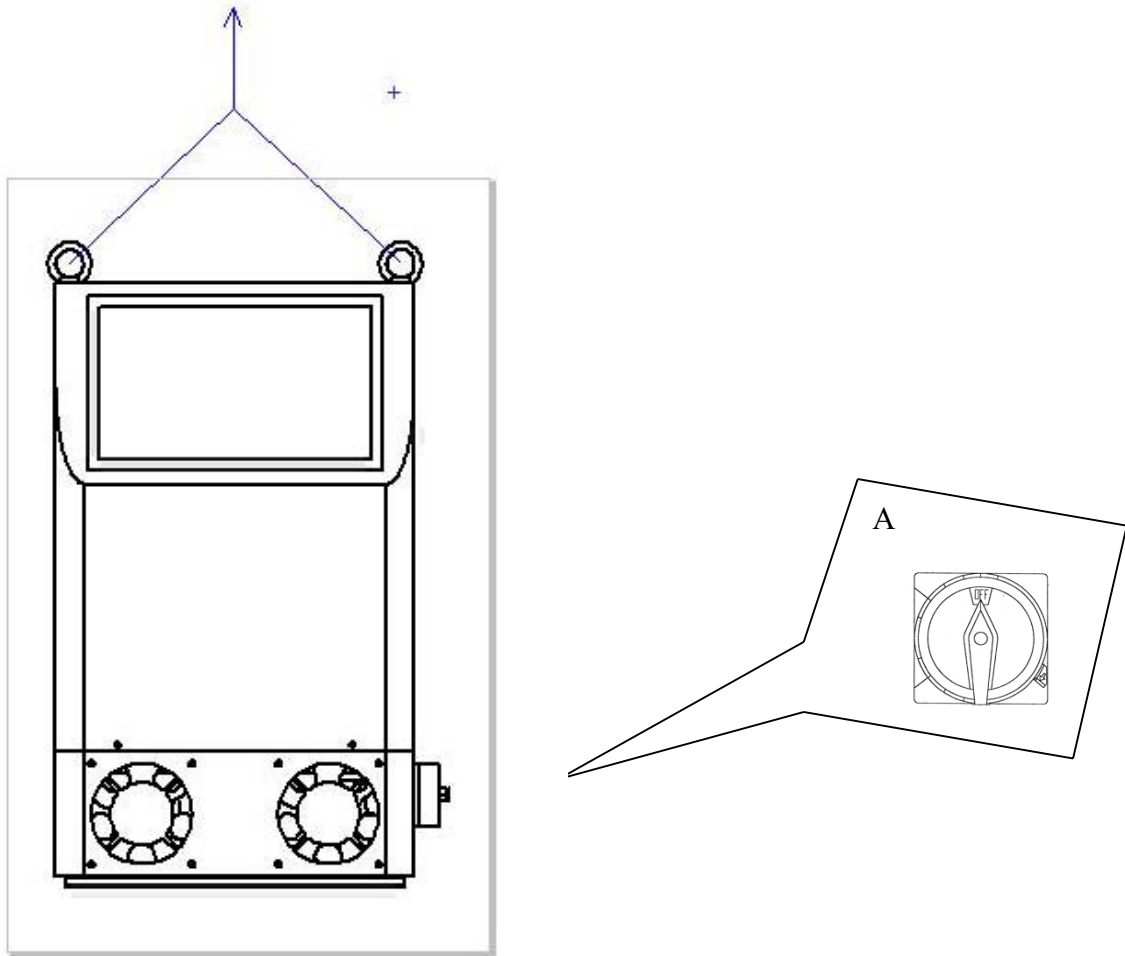
3. Pneumatic pump system



- | | |
|---------------|----------------|
| a. MC105/400V | f. RY-DPDT |
| b. BR1 RB154 | g. R3 1K |
| c. R1 10 | h. D3 5V1 |
| d. D1 ZENER | i. R2 1K |
| e. VCC | j. EC1 470/50V |

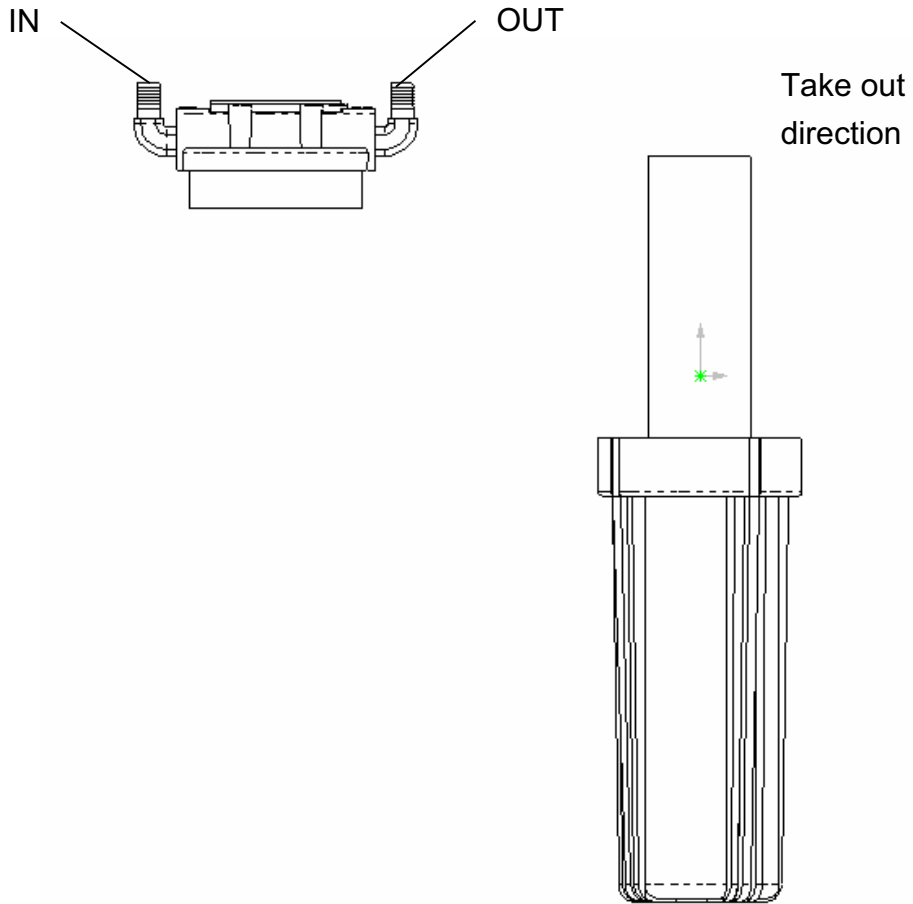
4. Explanation for other switch:

The machine other switch position as below:



A. Main power: For machine main power, if operator needs to check inside of generator, please should be turn off power at 0 Position.

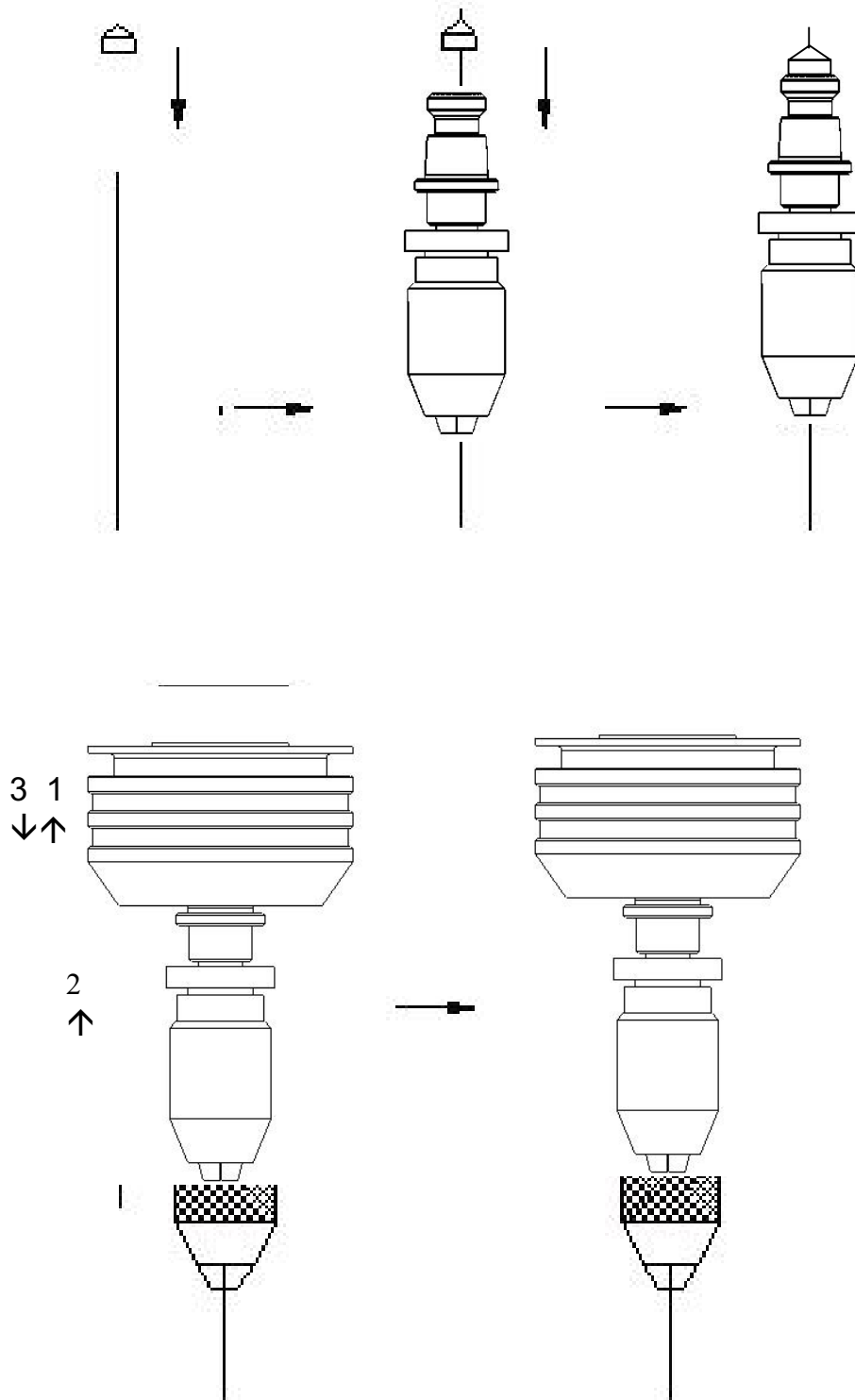
5. The replace for working liquid and filter (optional function)



6. The electrode installation explanation

Please accord to following drawing to install.

(1) Quick change electrode holder system (manual)

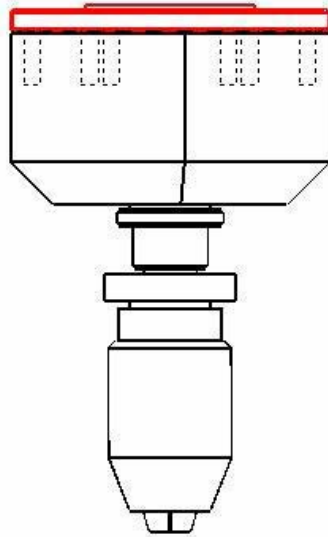


OPERATION STEP AS BELOW:

- 1. Please push up buckle ring.**
- 2. Put the electrode holder up.**
- 3. Pull down the buckle ring.**

P.S. : The manual quick change electrode holder, when you change holder, please be sure buckle ring lock to right position.

(2) Quick change electrode holder system (Pneumatic type)



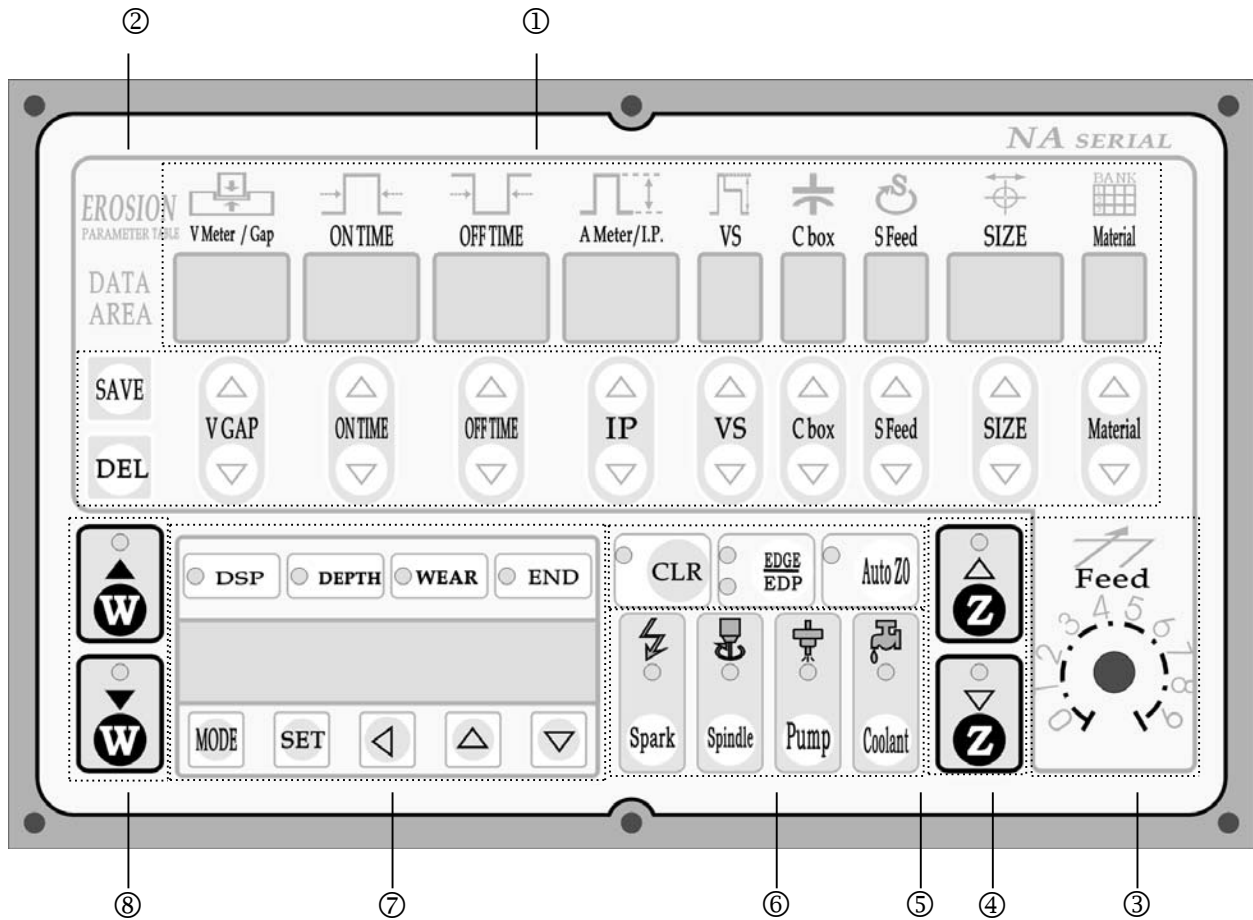
Pneumatic type change electrode holder:

1. When you change electrode holder, Please press control switch beside of column.

ATTENTION:

If customer use electrode holder (electrode chuck) (0~6.3mm) that not produce by OCEAN TECHNOLOGIES to cause Quick Change Electrode Holder System leaking or other problem. OCEAN TECHNOLOGIES doesn't assume any responsibility.

7. PANEL OPERATION EXPLANATION:



(1) Working parameter setting display area:

a. V METER / GAP display area:

This area value is setting value for GAP voltage. It is one of working parameter. The value is between 00~99.

b. ON-Time display area:

This area display ON-Time with present value. The steps range is 5~99.

c. OFF-Time display area:

This area display OFF-Time with present value. The steps range is 5~99

d. A METER / I.P. display area:

This area value is working peak current. It is one of working parameter. The value is between 0~25 steps.

e. VS display area: working voltage display area

f. C BOX display area :

Rapid capacitor steps display area. It can display range 0~F 16 steps.

g. S-Feed speed of spindle display area.

h. SIZE display area

This area can display present diameter of electrode tube.

i. Material display area: Material data code

This area display present select material data code. It can save 0~1, 2 kinds material. Such as :

0→ steel (SKD-11)

1→ For user

P.S.: It can be magnified to 10 kinds of material. (Optional function)

(2) Working parameter setting area:

a. SAVE KEY: To save working data.

b. DEL KEY: To delete working data without save, to return beginning working data.

c. V GAP KEY : sparking gap voltage setting key.

d. ON-TIME KEY: working sparking ON TIME setting key.

e. OFF-TIME KEY: working sparking OFF TIME setting key.

f. IP KEY : sparking current setting key.

g. VS KEY : working power energy setting key.

h. C-BOX KEY: rapid capacitor setting key.

i. SPINDLE FEED KEY: working spindle speed setting key. (Optional)

j. SIZE KEY : electrode tube diameter setting key (auxiliary parameter)

k. MATERIAL KEY : material setting key.(auxiliary parameter)

(3) FEED KEY: To move Z axis or working axis speed.

This button display present moving speed of working axis, there are 0~10 steps.

(4) Z AXIS UP / DOWN MOVE KEY: Working axis up/down move key and indicate lamp.

(5) WORKING SETTING AREA:**a. AUTO Z0: Z axis auto zero : (optional)**

When this lamp is lighting, there is auto wear compensation function during working. It can change to "Lights go out" condition when no using. ("Light" was set at inside). This function is auto start after open machine. The

lamp is lighting, It's mean the machine has auto Z-axis surface return zero function during working, and working depth arrival, the Z-axis auto up function; Opposition, the machine has no auto Z-axis surface return zero function during working, and working depth arrival, the Z-axis do not auto up function, it suitable for working blind hole.

b. EDGE/EDP : Auto edge finding & point sparking change key and indicated lamp: (optional)

When EDGE indicated lamp, its mean edge finding by automatically at Auto Z0=light with Auto zero.

When EDP indicated lamp, Press SPARK, machine will do point sparking(a signal point deep around 0.3mm)

c. CLR : Z axis coordinated rapid clear key. This function can be fast clear Z axis present coordinated in using. (This function under DSP condition.)**(6) WORKING KEY:****a. COOLANT KEY AND INDICATE LAMP: coolant working liquid start / stop.**
When starting with lamp light. (Optional function)**b. PUMP KEY AND INDICATE LAMP: High pressure pump start / stop.**
When starting with lamp light.**c. SPINDLE KEY AND INDICATE LAMP: spindle start / stop.** When starting with lamp light.**d. SPARK KEY AND INDICATE LAMP : sparking start / stop.** When starting with lamp light.**(7) Z axis function setting and display area (system parameter): (optional)****a. Function display area: To display this area setting value and Z axis coordinated value.****b. Reduction key: To press this key can reduce a unit value when setting parameter.**

- c. Increasing key: To press this key can increase a unit value when setting parameter.
- d. Moving key: To press this key can move cursor position by forward / back when setting value.
- e. Set key: To edit and save display mode contents, then exit edit mode.
- f. Mode key (To display MODE setting selection): Z axis setting and system parameter setting exchange key. According with different press time appear below function parameter:
 - i) Pn: System parameter (Mechanical parameter). (Appendix A)
 - ii) END: When the lamp was light, the value at display area is Z axis working total depth. (DEPTH + WEAR). This function can't setting by manual.
 - iii) WEAR: When the lamp was light, the value at display area is Wear value of electrode tube. (The user can modify by himself).
 - iv) DEPTH: When the lamp was light, the value at display area is working Depth value of your request. (The user can modify by himself.)
 - v) DSP: When the lamp was light, the value at display area is Z axis coordinated value.

8. Working parameter steps explanation:

Figure	Explanation	Steps
V GAP	Setting working Gap range.	0 ~ 99
ON-Time	ON-Time	5 ~ 99: 95 steps
OFF-Time	OFF-Time	5 ~ 99: 95 steps
IP	Setting working current range.	0 ~ 25
VS	Power energy selection	1
C-BOX	Rapid capacitor	0 ~ F: 16 steps
Spindle Feed	Spindle Feed	0
SIZE	Electrode tube diameter	0 ~ 3.0 0.0 ~ 6.3(Optional)
Material	Material	0 ~1: 2 steps ; It can save 2 kinds material. (It can be magnified to 10 kinds of material. (for optional function)).
Feed Rate	Feed Rate	0 ~ 10: 11 steps

9. Operation steps:

- A、 Please open main power switch.
- B、 To select Material and Size
- C、 To install electrode tube and ceramic guide.
- D、 To start PUMP and adjust water pressure, to ensure the water Come out from tube.
- E、 To set correct DEPTH / WEAR (optional function: Z axis auto depth control)
- F、 To start PUMP、 SPINDLE and SPARK. That's OK.

Attention: (Working hole in/ out)

When the drilling EDM working, please be should working Quality. Example: the working hole in / out if happen extend Hole, or when machine sparking to cause tumor sharp. If machine has extend hole, it maybe

happen follow reason:

- a. The distance too far for ceramic guide and workpiece.
- b. The electrode tube was bent.
- c. The working liquid has too high conductivity.

10. TROUBLE SHOOTING

(1) Working at unstable condition:

- a. The working condition if setting proper or not?
- b. The servo speed if proper or not?
- c. The workpiece if fix or not?
- d. Working liquid (distill water) if enough or not?
- e. The distill water quality if proper or not?
- f. The electrode tube and ceramic guide if same size or not?

(2) Abnormal wear for electrode tube:

- a. The electrode tube and ceramic guide if same size or not?
- b. The electrode tube material if select mistake or not?
- c. The electrode tube if bend with no straight or not?
- d. The working condition if setting proper or not?
- e. The working liquid if enough or not?
- f. The working liquid quality if good or not?

(3) The electrode tube happen heat during working:

- a. The water pressure if enough or not?
- b. The electrode tube bottom if come out the water or not?
- c. The working condition if setting proper or not? (Over power or short (electrode tube / workpiece))

(4) The electrode tube bend during working:

- a. The ceramic guide if clear or not?
- b. The workpiece if fix or not?
- c. The working condition if setting proper or not?

(5) The Z-axis was shake during working:

- a. The electrode tube if bend, no straight, or poor install or not?
- b. The electrode tube center if something block or not? To cause poor flushing.
- c. The electrode tube and ceramic guide if same size or not?
- d. The working condition if setting proper or not?

- (6) The Z-axis without balance :
- The servo p.c. board VR (balance) in generator without adjust proper to cause offset.
- (7) The working hole serious become conical hole (the top hole Bigger than bottom hole):
- The electrode tube material if select mistake or not?
 - The working condition if setting proper or not ?
 - The working liquid conductive rate if proper or not?
- (8) The working hole bottom hole bigger than top hole:
- The electrode tube if bend without straight or not?
 - The ceramic guide or workpiece if fix or not?
- (9) The pneumatic pump no work (no water pressure):
- The cylinder air input hole was broken or without air input.
 - The cylinder limit switch was broken.
 - The cylinder piston bar without fully moving. In order to let piston bar move to proper position, it can use screw to touch limit switch.
 - The pressure valve without open. (The turn clockwise, the pressure increasing.)
- (10) The pneumatic pump running without function or no water Come.
- The anti-valve was broken?
 - The seal in cylinder was broken?
 - The water pipe was broken or not enough working liquid?
- (11) Insufficient water pressure, and the pump come/go moving fast.
- Vent pressure valve abnormal?
 - Not enough working liquid in water tank?
 - The anti-valve was broken at two sides of copper piece?

11. Maintenance, consumption and suggestion:

(1) Daily maintenance

To clear electrode holder, clamp plate for workpiece Waterproof cover. Due to this machine use water to be working liquid, it easy cause the metal rusting, therefore, it is Necessary put the oil or rustproof oil on metal.

(2) Weekly maintenance

Please check the filter every weekly, if the filter too dirty, it need To clean or replace, with change working liquid. Please check Machine lubrication system and lubrication oil of pump if enough or not?

(3) Monthly maintenance

It is necessary to adjust ceramic guide anchor with correct the Vertical.

(4) Consumption and suggestion

- a. ceramic guide
- b. electrode tube (brass / copper)
- c. filter
- d. rubber seal
- e. Immersing guide cover

©Due to the electrode tube material can be effected working quality and speed, therefore, the different workpiece material, it need to select different electrode tube. Our suggestion as below:

- a. The workpiece : steel ; The electrode tube : brass
- b. The workpiece : tungsten carbide or copper ; The electrode tube : Copper.

12. The electrode tube specification and tolerance.

All the electrode tube size, the tolerance within $\pm 1\text{mm}$.

Copper					Brass				
OD.		ID.		Length	OD.		ID.		Length
Tube	Tol.	Tube	Tol.	mm	Tube	Tol.	Tube	Tol.	mm
0.2	+0 -0.01	0.1	± 0.02	200	0.2	+0 -0.02	0.08	± 0.02	200
0.3		0.12		300	0.3		0.11		300
0.4		0.15		300	0.4		0.2		300
0.5		0.18		400	0.5		0.2		300
0.6	+0 -0.02	0.2	± 0.02	400	0.6		0.2	400	
0.7		0.2			0.7		0.2		
0.8		0.3			0.8		0.3		
0.9		0.3			0.9		0.3		
1.0		0.3			1.0		0.3		
1.1		0.3			1.1		0.4		
1.2		0.4			1.2	0.4			
1.3		0.4			1.3	0.4			
1.4		0.4			1.4	0.5			
1.5		0.5			1.5	0.5			
1.6	0.5	1.6	0.5						
1.7	0.5	1.7	0.5						
1.8	0.6	1.8	0.6						
1.9	0.6	1.9	0.6						
2.0	+0 -0.02	0.6	± 0.03	400	2.0	+0 -0.03	0.6	± 0.03	
2.1		0.7			2.1	0.7			
2.2		0.7			2.2	0.7			
2.3		0.7			2.3	0.7			
2.4		0.8			2.4	0.8			
2.5		0.8			2.5	0.8			
2.6		0.8			2.6	0.8			
2.7		0.9			2.7	0.9			
2.8		0.9			2.8	0.9			
2.9		0.9			2.9	0.9			
3.0	1.0	3.0	1.0						

13. Machining Condition

(1) Reference sample:

Unit : mm

File Name:			Material: SKD-11					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.2	25	8	17	1	7	22	2-3	0	4	120	3'30"	120
0.2	25	8	15	2	5	22	2-3	0	4	200	3'00"	120
0.3	25	15	17	1	10	22	2-3	0	A	112	1'00"	70
0.3	25	20	15	1	10	22	2-3	0	A	120	54"	70
0.3	25	20	20	1	10	22	2-3	0	A	104	1'30"	70
0.3	25	15	20	2	8	22	2-3	0	A	108	1'30"	70
0.3	25	15	20	2	8	22	2-3	0	A	180	1'00"	70
0.3	25	15	20	2	5	22	2-3	0	A	92	1'10"	70
0.3	25	18	15	2	5	22	2-3	0	A	104	54"	70
0.4	25	20	10	2	5	20	2-3	1	A	76	1'47"	100
0.4	25	20	10	2	6	20	2-3	1	A	90	1'16"	100
0.4	25	20	10	2	6	20	2-3	1	A	116	1'05"	100
0.5	25	20	20	1	15	20	2-3	0	A	100	1'18"	60
0.5	25	20	20	2	12	20	2-3	0	A	128	49"	60
0.5	25	25	20	2	12	20	2-3	0	A	156	43"	60
0.5	25	20	25	2	12	20	2-3	0	A	140	54"	60
0.5	25	20	15	2	12	20	2-3	0	A	148	41"	60
0.5	25	20	15	1	17	20	2-3	0	A	116	55"	60
0.5	25	20	20	1	17	20	2-3	0	A	96	53"	70
0.5	25	20	20	3	10	20	2-3	0	A	140	48"	50
0.5	25	20	20	3	8	20	2-3	0	A	116	51"	50
0.5	50	25	22	2	14	15	2-3	0	A	200	1'30"	50~60
0.5	50	25	20	2	14	15	2-3	0	A	190	1'26"	50~60
0.5	50	20	15	2	12	15	2-3	0	A	160	1'32"	50~60
0.5	50	20	15	1	16	15	2-3	0	A	120	1'50"	50~60
0.7	25	30	10	2	15	20	2-3	0	A	120	44"	75
0.7	25	35	10	3	12	20	2-3	0	A	136	42"	75
0.7	25	35	10	3	10	20	2-3	0	A	112	50"	75
0.7	25	35	10	3	8	20	2-3	0	A	80	1'06"	75
0.7	25	35	10	3	9	20	2-3	0	A	92	57"	75
0.7	25	35	8	2	9	20	2-3	0	A	72	1'17"	75

File Name:			Material: SKD-11					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
1.0	25	25	20	2	15	20	2-3	0	9	64	1'37"	50
1.0	25	35	15	2	19	20	2-3	0	A	84	56"	70
1.0	25	30	15	3	12	20	2-3	0	A	68	1'15"	70
1.0	25	30	10	3	14	20	2-3	0	A	80	50"	70
1.0	25	30	10	3	15	20	2-3	0	A	72	52"	70
1.0	25	30	10	3	15	20	2-3	0	A	80	52"	70
1.0	25	35	10	3	15	20	2-3	0	A	80	50"	70
1.0	25	30	20	2	25	22	2-3	0	A	100	45"	50
1.0	25	25	20	2	25	22	2-3	0	A	100	47"	50
1.0	25	35	20	2	25	22	2-3	0	A	100	44"	50
1.0	25	35	25	2	25	22	2-3	0	A	100	43"	50
1.0	50	30	20	2	25	22	2-3	0	A	130	1'36"	50
1.0	50	20	20	2	25	22	2-3	0	6	106	2'00"	60
1.0	50	35	20	2	23	22	2-3	0	6	106	1'41"	60
1.0	50	30	20	3	17	20	2-3	0	B	90	1'46"	50~70

File Name:			Material: Carbide					Tube: Copper				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.13	2	8	25	1	2	18	2-3	2	8	300	5'~ 5'30"	60
0.13	4.5	10	20	1	2	18	2-3	2	8	411	13'00"	60
0.3	4.5	10	20	2	5	22	2-3	2	6	110	1'36"	60
0.3	4.5	10	20	2	5	22	2-3	3	6	130	56"	60
0.3	4.5	5	14	2	5	22	2-3	2	6	30	5'00"	60
0.3	4.5	5	14	2	6	22	2-3	2	6	50	3'00"	60
0.3	10	10	15	2	6	22	2-3	3	7	150	3'50"	90
0.3	10	10	15	2	5	22	2-3	2	6	52	5'00"	90
0.3	10	10	15	2	5	22	2-3	2	6	51	5'67"	90
1.0	26	15	20	1	31	18	2-3	2	A	23	5'00"	40
1.0	26	13	23	1	31	18	2-3	2	A	33	9'00"	40
1.0	26	20	23	1	31	18	2-3	2	A	31	8'00"	40
1.0	26	14	23	1	31	18	2-3	2	A	12	6'30"	40
1.0	26	15	25	1	31	20	2-3	2	B	20	7'00"	50~70
1.0	88	15	25	1	31	18	2-3	2	B	20	30'00"	50~70
1.0	88	15	25	2	13	18	2-3	2	B	40	21'45"	50~70

Unit : mm

File Name:			Material: Copper					Tube: Copper				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.4	18	20	17	2	12	20	2-3	1	A	183	1'22"	100
0.4	18	20	17	2	12	20	2-3	0	A	144	1'28"	100
0.4	25	20	17	2	13	20	2-3	0	A	200	4'29"	100
0.4	25	20	17	2	13	20	2-3	0	A	200	6'39"	100
0.4	25	20	17	2	13	20	2-3	0	A	160	2'15"	100
0.4	63	20	17	2	12	20	2-3	0	A	165	7'07"	100
0.5	63	20	17	3	12	20	2-3	0	A	153	6'27"	100
0.5	63	15	14	3	12	20	2-3	1	A	148	6'40"	100
0.5	63	20	17	2	12	20	2-3	0	A	89	6'49"	100
0.5	63	20	17	2	13	20	2-3	0	A	110	6'25"	100
0.5	63	20	16	2	12	20	2-3	0	A	94	6'00"	100
0.7	18	20	18	3	15	20	2-3	0	A	105	1'23"	70
0.7	18	20	17	3	14	20	2-3	0	A	94	1'33"	70
0.7	18	20	17	3	15	20	2-3	0	A	110	1'27"	70
0.7	25	20	18	3	15	20	2-3	0	A	110	2'00"	70
0.7	25	20	17	3	14	20	2-3	0	A	100	2'20"	70
0.7	25	20	17	3	15	20	2-3	0	A	120	2'07"	70
0.7	63	20	18	3	15	20	2-3	0	A	98	4'55"	70
0.7	63	20	18	3	14	20	2-3	0	A	92	5'14"	70
0.7	63	20	17	3	14	20	2-3	0	A	89	4'31"	70
0.7	63	20	17	3	14	20	2-3	0	A	89	4'50"	70
1.0	38	20	20	2	23	20	2-3	0	B	95	3'00"	50~70
1.0	63	25	25	3	14	20	2-3	0	A	60	7'24"	50
1.0	63	25	20	3	14	20	2-3	0	A	63	6'18"	50
1.0	63	30	20	3	14	20	2-3	0	A	66	7'09"	50
1.0	63	25	20	3	15	20	2-3	0	A	68	6'38"	50
1.0	86	20	20	3	12	20	2-3	0	B	65	9'40"	50~70

File Name:			Material: SLD					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.4	36	10	22	2	11	20	2-3	1	6	400	12'25"	50
0.4	36	10	22	2	11	20	2-3	1	6	290	3'50"	100
0.4	36	10	18	2	11	20	2-3	1	6	258	4'08"	100
0.4	36	10	15	2	10	20	2-3	1	6	250	4'50"	100
0.4	85	20	10	2	6	20	2-3	1	A	70	5'15"	100
0.7	36	30	10	3	8	20	2-3	0	A	108	3'32"	50
0.7	36	30	20	3	8	20	2-3	0	A	120	3'54"	50
0.7	36	30	20	3	9	20	2-3	0	A	130	3'22"	50
0.7	85	30	10	3	8	20	2-3	0	A	80	4'50"	50
0.7	85	30	10	3	8	20	2-3	0	A	80	4'40"	50
1.0	36	10	15	3	15	20	2-3	0	7	130	3'28"	50
1.0	36	20	15	3	15	20	2-3	0	7	136	2'13"	50
1.0	36	25	15	3	15	20	2-3	0	7	136	1'49"	50
1.0	36	30	15	3	15	20	2-3	0	7	161	2'01"	50
1.0	36	5	14	3	31	20	2-3	0	7	116	6'15"	50
1.0	36	25	15	3	14	20	2-3	0	7	125	2'00"	50
1.0	46	30	20	3	15	20	2-3	0	B	85	1'40"	50~60
1.0	46	30	20	2	25	20	2-3	0	B	90	1'50"	50~60
1.0	85	30	10	3	15	20	2-3	0	A	80	3'00"	50
1.0	85	30	10	3	15	20	2-3	2	A	91	3'38"	50
1.0	85	30	10	3	15	20	2-3	1	6	85	3'30"	40
1.0	85	30	10	3	15	20	2-3	1	6	85	3'18"	35

Unit : mm

File Name:			Material: Steel 2083					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.4	20	20	10	2	6	20	2-3	1	8	65	1'11"	100
0.4	25	30	10	2	6	20	2-3	1	8	78	2'00"	100
0.4	25	30	10	2	7	20	2-3	0	8	100	1'16"	100

Unit : mm

File Name:			Material: Titanium alloy					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
0.5	10	20	15	3	10	20	2-3	0	A	20~30	25"	50
0.5	10	20	15	3	15	20	2-3	0	A	30~50	15"~20"	50
1.0	10	30	20	3	10	20	2-3	0	A	20~30	40"	50
1.0	10	30	20	3	15	20	2-3	0	A	30	30"	50
1.0	10	30	20	3	20	20	2-3	0	A	30	25"	50
1.0	10	30	20	3	25	20	2-3	0	A	40~50	15"	50

Unit : mm

File Name:			Material: ASP 60					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
1.0	91	30	20	3	15	20	2-3	0	B	110	5'10"	50~60
1.0	91	30	20	2	25	20	2-3	0	B	120	4'40"	50~60

Unit : mm

File Name:			Material: SKH 9					Tube: Brass				
SIZE	Thickness	ON-T	OFF-T	VS	IP	GAP	F	C	S	WEAR (%)	TIME	Kg/cm ²
1.0	70	30	20	3	15	20	2-3	0	B	140	3'11"	50~60
1.0	70	30	20	2	25	20	2-3	0	B	100	3'21"	50~60

(2) Memories data:

File Name: E0			Material: 0 (SKD-11)			Tube: Brass		
SIZE	ON-T	OFF-T	VS	IP	GAP	F	C	S
0.1	15	18	1	5	25	2-3	0	5
0.2	18	15	2	3	25	2-3	0	6
0.3	18	15	2	6	20	2-3	0	5
0.4	20	17	2	6	25	2-3	0	8
0.5	25	20	2	8	25	2-3	0	A
0.6	25	20	2	8	25	2-3	0	5
0.7	30	21	1	12	25	2-3	0	A
0.8	30	20	2	15	25	2-3	0	5
0.9	30	20	2	25	25	2-3	0	A
1.0	30	20	2	25	25	2-3	0	A
1.1	30	20	3	21	22	2-3	0	7
1.2	30	20	3	22	22	2-3	0	7
1.3	35	20	3	23	22	2-3	0	7
1.4	35	20	3	24	22	2-3	0	7
1.5	35	20	3	24	22	2-3	0	7
1.6	35	20	3	25	22	2-3	0	7
1.7	35	20	3	25	22	2-3	0	7
1.8	35	20	3	25	22	2-3	0	7
1.9	35	20	3	25	22	2-3	0	7
2.0	35	20	3	25	25	2-3	0	7
2.1	40	20	3	25	22	2-3	0	7
2.2	40	20	3	25	22	2-3	0	7
2.3	40	20	3	27	22	2-3	0	7
2.4	40	20	3	27	22	2-3	0	7
2.5	40	20	3	27	22	2-3	0	7
2.6	40	20	3	28	22	2-3	0	7
2.7	40	20	3	29	22	2-3	0	7
2.8	40	20	3	31	22	2-3	0	7
2.9	45	20	3	31	22	2-3	0	7
3.0	45	20	3	31	22	2-3	0	7

File Name:		Material:				Tube:		
SIZE	ON-T	OFF-T	VS	IP	GAP	F	C	S
0.5								
0.6								
0.7								
0.8								
0.9								
1.0								
1.1								
1.2								
1.3								
1.4								
1.5								
1.6								
1.7								
1.8								
1.9								
2.0								
2.1								
2.2								
2.3								
2.4								
2.5								
2.6								
2.7								
2.8								
2.9								
3.0								
3.1								
3.2								
3.3								
3.4								
3.5								
4.0								
5.0								
6.0								



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