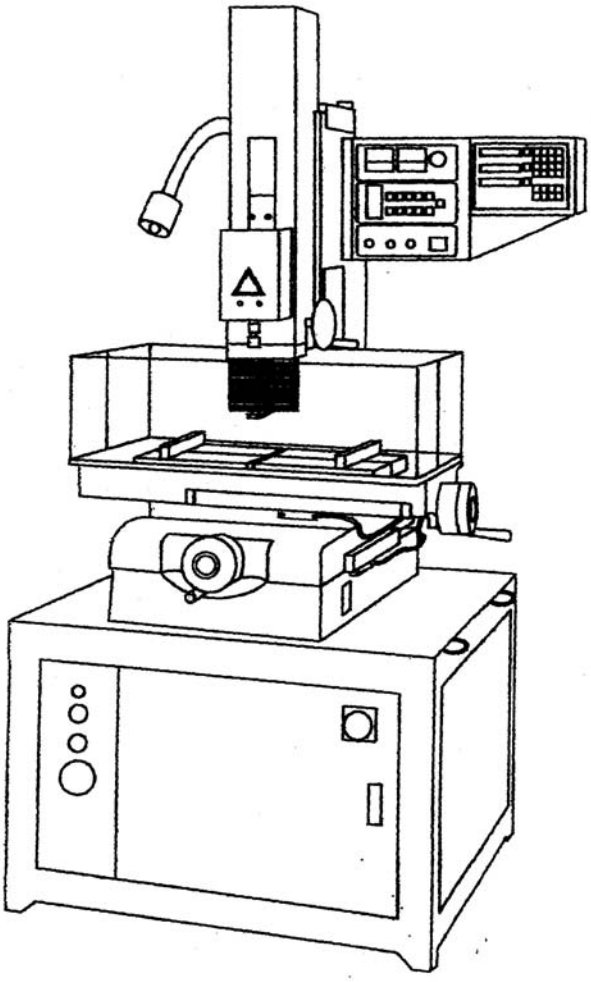
V350D

Drilling Ele Discharge Machine

Operation Manual



OPERATION CHECK

Preparation before start the machine:

Installation of electrode and guide head:

(1) Move the electrode head to the highest place by pushing the buttom of " Electrode upward " .

(2) FIlow the sequence to link the electrode guide device into the cabinet and lock it (see drawing in the next page).

(3) Insert the collet chuck from the body of chuck.

(4) Insert the electrode tube into collet and adjust the tube to protrude the chucd body around 15~20 mm and lock chuck sleeve and fix electrode tube . Double check whether or not the steel tube is situated in the centre of electrode.

(5) Water stop block insert from chuck body.

(6) Install chuck body in spindle and lock it. (see drawing in the next page)

Caution:

(1) To use correct sizes of collet chuck , water stop block and electrode guide to suit the diameter of electrode steel tube.

(2) Pay extra carefully to the diameter of tube and DO NOT drop or crash the electrode.

(3) Make sure the electrode steel tube is perfectly without burr or flat outlet.

(4) Check whether or not the tube has bending situation.

Installation of workpiece:

(1) Lift the electrode guide edvice up to the level that the workpiece can be turned over , then lock it.

(2) Clean the bottom of workpiece and work table.

(3) Fix workpiece on the work table.

(4) To cover the discharging area in the work table.

(5) Alignment the electrode and workpiece.

PRECAUTIONARY ITEMS :

(1) Precautionary items before machining.

(A) Electrode material can be copper , brasss and bronze , the diameter from ϕ 0.3 ~ 3.0 mm.

(B) Electrode copper bends easily when hitting other objects expecially using the tiny copper.

(C) Electrode tube will be blocked if it is flat or dirty .

(D) Rotate the electrode on flay surface to check deformation or not .

(E) Workpiece should be fixed.

(F) Rotate the electrode to check it is deflecting or bending . If so, it will be result in unstability , heavy electrode machines with deflecting condition seriously , the depth can not be advanced after machining to certain depth.

(G) Please refer to " dielectric switch "to check the injection.

(H) Consult the machining data to check the preset machining condition.

(2) Precautionary items while machining .

At the beginning of machining , please turn "Servo Sensitivity" and slow down electrode feed in speed. If the electrode feed in speed is too high , the electrode bends and defects easily and results in unstable machining. After stable machining , adjust "Servo Sensitivity " to a better efficiency of electrode feed in speed.

OPERATION STEP

1) Be sure power connects to power switch well.
   Turn on Door Switch of main power.
2) Depress the power switch on the panel, the indication lamp lights then start to operate.
3) Fix the workpiece on the worktable.
4) Choose the chuck and " water repellent plastic block " fix for electrode diameter , and install the electrode properlyl.
   Meanwhile , apply the suitable guide head.
5) Adjustment between electrode and workpiece.
   (A) Fix the electrode and workpiece exactly.
   (B) Push the "asend" on the control the workpiece, the buzzer will sounds. Meantime , this switch can protect the pipe without bending.
   (C) Lift the electrode guide device to a proper height , and fix it then move the electrode head to make the electrode close to workpiece.
   (D) Move X axis and Y axis to the machining area.
   (E) Fix X axis and Y axis and lower the electrode guide device near the workpiece surface.
   (F) Lower electrode holder and install the electrode into electrode guide device , while the electrode is lowering ascertain to avoid the hit of electrode to workpiece resulting in the bending or damaging of electrode copper.
   (G) Turn on the dielectric switch to inject the dielectric water from the inner tube of electrode copper. Please consult the dielectric pressure of machining condition.

   (H) Preset "machining current", "pulse on duration" "pulse-off duration" machining capacitor then depress discharge switch.
   (I) Electrode starts to lower and machine.
   Coordinate "servo adjustment button" adjustment to stabilize machining.

Caution:

(1) Before discharging:

(A) Electrode is tube , electrode diameter between 0.3-3.0 mm.

(B) DO NOT damage electrode tube.

(C) Any damage in the gole of Electrode tube will create coolant leaking . Check it carefully.

(D) Check the electrode tube on a flat table by turning it.

(E) Fix perfectly?

(F) Turn electrode tube to check whether or not vibration of bending situation occured.

(G) Check the coolant outlet situation.

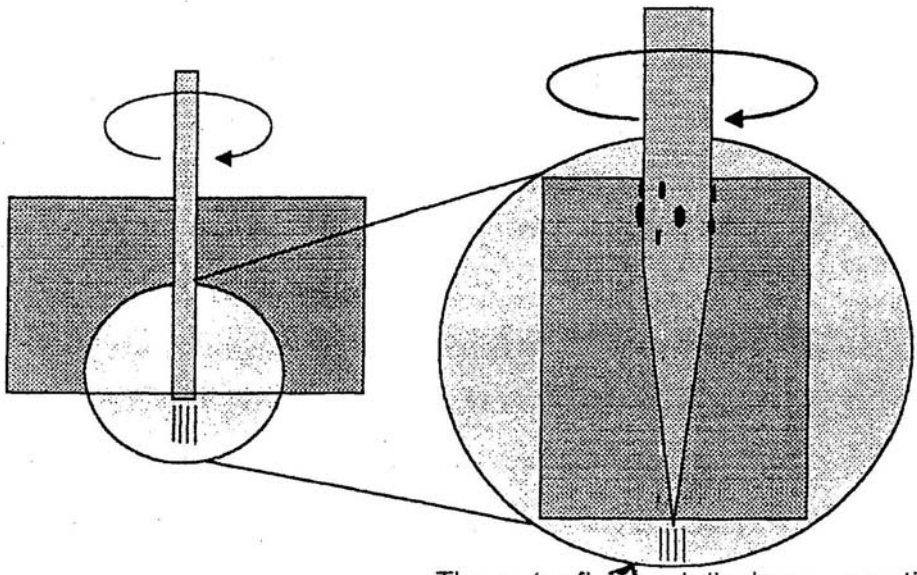
(H) Check the discharging condition setting.

(2) During discharging:

(A) Please adjust "Servo feedrate" to lower feedrate situation in the begining to make sure the electrode tube will not be bending or unstabilize occured.

(B) General setting . (low consumption)

※OPERATING NOTICE :

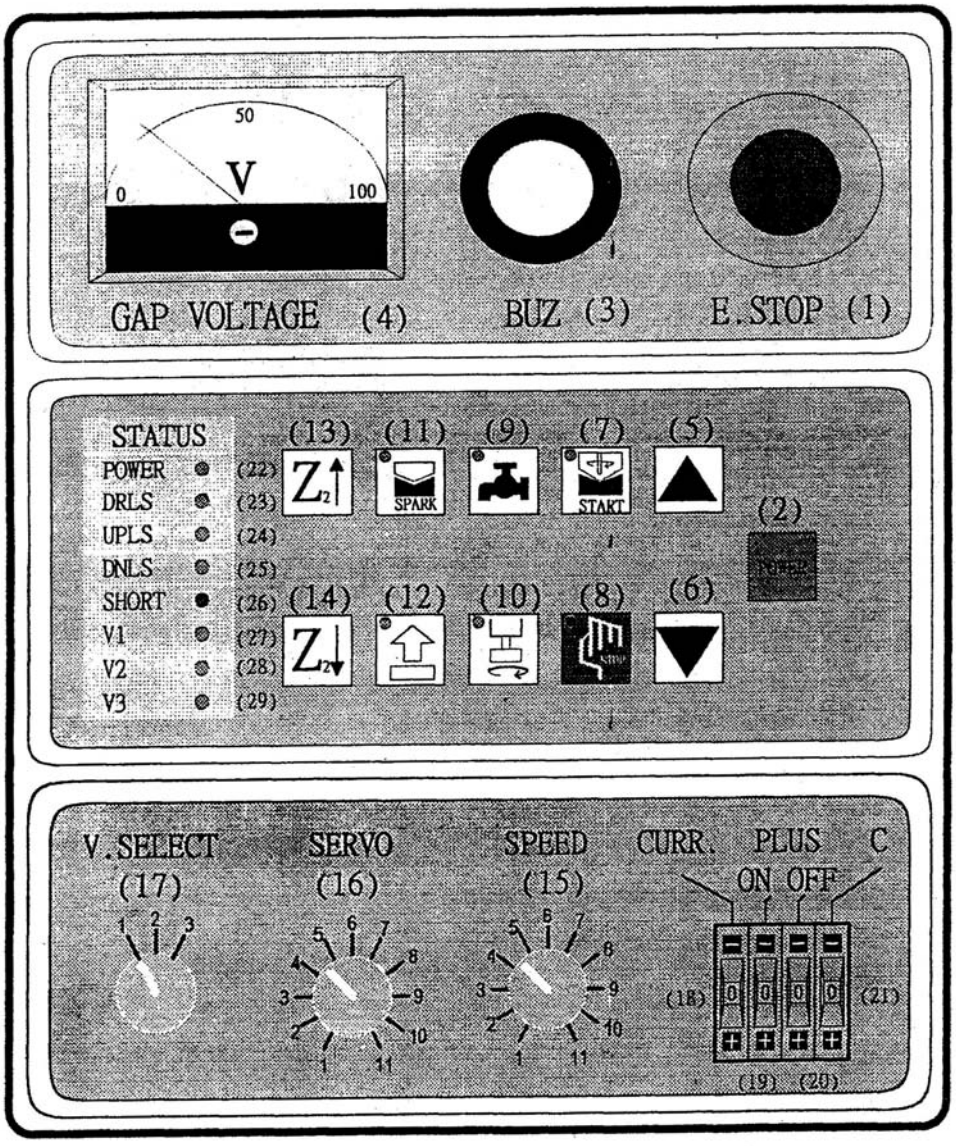


The water flow,and diacharge countine
on the pipe surface generate the carbon.

P.S When user find the pipe not easy and take time to drilling near finished holes the user can use a plastic bar to touch the drilling hole point let pipe easy pass through the hole.

Operation description of control panel :

Description of control panel



(1) Emergence stop : Push the bottom ,all power turn off.

(2) Power switch : push the power bottom,turn on power.

(3) Buzzer : Indication of voice for electrode short,UPLS arrived ,and DNLS arrived.

(4) Voltage meter : Indication of discharging voltage.

(5) Electrode upward : To upward the electrode by pushing the buttom.

(6) Electrode downward : To downward the electrode by pushing the buttom.

(7) Start : Press the buttom to start discharging , coolant and swivel of electrode , single function control is also active.

(8) Stop : Press the buttom to stop discharging , coolant and swivel of electrode , single function control is also available.

(9) Coolant : Press the buttom to start the coolant , if the coolant comes out from chuck , please stop the machine and reinstall the electrode properly.

(10) Electrode swivel : Electrode swivel.

(11) Spark : Press the buttom to start discharging.

(12) Asend : Press the buttom ,and the lamp is light,when electrode is short, upward the electrode .

(13) Second axis upward : Press the buttom ,the Second axis upward .

(14) Second axis downward : Press the buttom ,the Second axis downward .

(15) Speed feedrate : To adjust spindel feed rate, turn the switch to position 1 to get slow speed, position 11 to get maximum speed , it can adjust the speed during pressing Electrode upward or Electrode downward bottom.

(16) Servo feedrate : To adjust spindel feed rate, turn the switch to position 1 to get slow speed, position 11 to get maximum speed , it can adjust the stability during discharging.

(17) V.seltection : V1 : It can be used in between ϕ 0.3~0.5 mm electrode.

V2 : It can be used in between ϕ 0.5~1.0 mm electrode.

V3 : Special material discharging.
(example : aluminum)

(18) Current selection : To control discharging speed and surface roughness of workpiece , the switch has 9 section to be choosed, when place in position 1 to get minimum current and position 9 to get maximum current.

(19) Discharging time selection : To select discharging pulse , when place in position 1 to get shortest time and position 9 to get highest time (normally place in between 2-5).

(20) Discharging interval time : To set the interval time during discharging , when place in position 1 to get shortest time and position 9 to get longest time.

(21) Pulse intensifier : Select the switch to enhance the pulse current to reach the desire of machining speed , the switch has 9 section to be choosed, when place in position 1 to get minimum enchance current and position 9 to get maximum enhance current.

(22) Power indicator : Indication of power supply.

(23) Doorlock indicator : not used.

(24) UPLS indicator : Indication of the spindle arrival up limit switch.

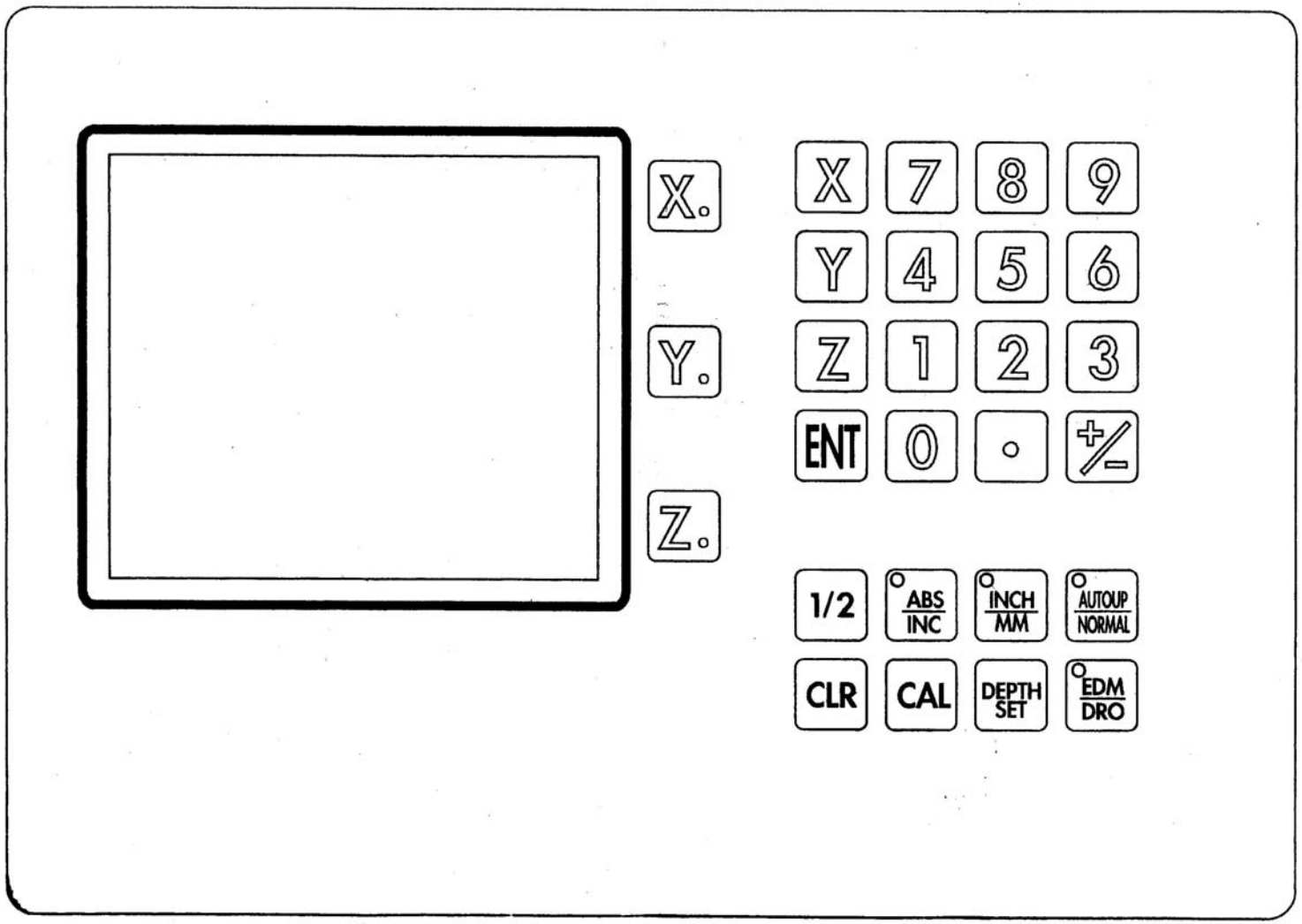
(25) DNLS indicator : Indication of the spindle arrival down limit switch.

(26) Short indicator : Indication of electrode shorting.

(27) V1 indicator : Indication of V.selection pressing 1.

(28) V2 indicator : Indication of V.selection pressing 2.

(29) V3 indicator : Indication of V.selection pressing 3.


X.
Y.
Z.
X
7
8
9
Y
4
5
6
Z
1
2
3
ENT
0
.
+/-
1/2
ABS INC
INCH MM
AUTOUP NORMAL
CLR
CAL
DEPTH SET
EDM DRO

※OPERATING INSTRUCTION AND KEYS OF D.R.O.

[0] [1] ..... [9] NUMBER KEYS AND [X] [Y] [Z] [X₀] [Y₀] [Z₀]

[DEPTH SET] [CAL] [CLR] [1/2] [INCH/MM] [AUTOUP/NORMAL] [ABS/INC] [EDM/DRO]

A. Axis setting keys: [X] [Y] [Z]

Press [X] ..... [7] [8] [+/-] ..... [ENT] ..... OK ! **- 0078.000**

or

[Y] ..... [.] [5] ..... [ENT] ..... OK ! **0000.500**

or

[Z] ..... [3] [8] ..... [ENT] ..... OK ! **0038.000**

*NOTE: For using three axis.

B. Zero return on axis value: [X₀] [Y₀] [Z₀]

When the lamp of ABS/INC is off , press the key of [X₀] [Y₀] [Z₀] and zero return value is INC.

When the lamp of ABS/INC is on , press the key of [X₀] [Y₀] [Z₀] and zero return value is ABS.

C. Center position setting key : [1/2]

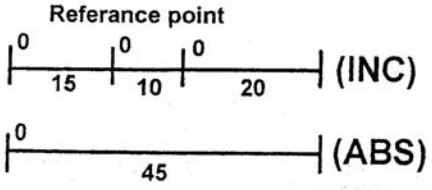
Press [X] ..... [1/2] ... OK !

Press [Y] ..... [1/2] ... OK !

D. Absolute position and incremental position display changing key : [ABS/INC]

Press [ABS/INC] .....Lamp is ON , the value display is absolute value.

Press [ABS/INC] .....Lamp is OFF , the value display is incrementale value.



E. Imperial/Metric changing key : [INCH/MM]

Press [INCH/MM] .....Lamp is ON , the value display is metrice.

Press [INCH/MM] .....Lamp is OFF , the value display is imperial.

F. Original point retrieve (after electricity cut):

*Power on after electricity cut, call original point.

[ABS/INC] Lamp is ON , press .. [DEPTH SET] ,The value calls out is the value between DRO original point to work table.(ABS mode)

*When press [DEPTH SET] Move linear scale and display value stay still untill pass through original point , and start to count.

G. Re-call key: CAL

When machining equal distance, set a value in the axis and move it toward 0.000, when it is necessary to repeat ,

only press X .... ENT OK!

or press Y ... ENT OK!

H. Three axis display and Z axis machining display changing key EDM DRO
(*.NOTE : For using three axis.)

Press EDM DRO when the lamp is ON, the display value is Z axis machining,

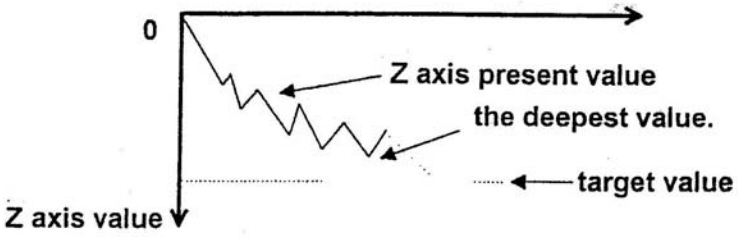
X 0010.000 the target depth value.

Y 0006.800 the deepest value.

Z 0003.200 the present value.

(Setting target value is equal to the sum of the job thickness and the pipe consumption.)

To resume three axis display screen , press EDM DRO again.



If target value is equal to the deepest value, it will output a signal to stop "discharge".

I. The target value setting :

When EDM/DRO lamp is ON, press Z ..... 3 8 ..... ENT ..... OK !

(The target value)

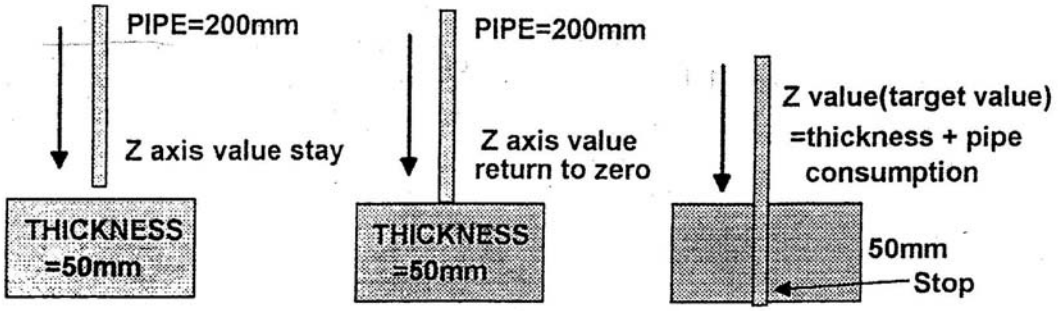
(Setting target value is equal to the sum of the job thickness and the pipe consumption.)

When TARGET VALUE is obtained or excessive, a normal open signal will be activated a 9 pin D type seat (1,2) and (3,4) at the back of display, the buzzer will be gone off.

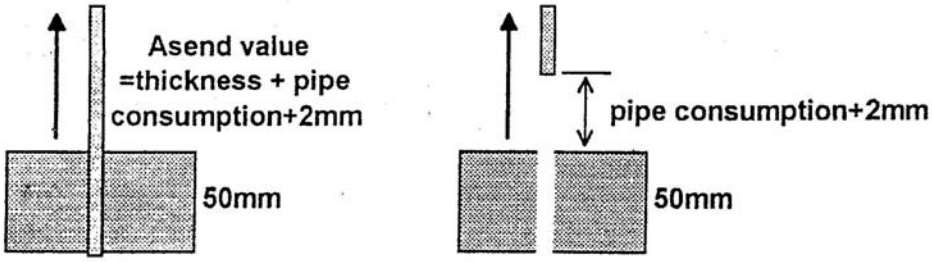
J. Auto UP setting key AUTOUP/NORMAL (PROG. KEY)

When EDM/DRO lamp is OFF, press AUTOUP/NORMAL lamp is ON,setting AUTO UP.

PRESS "START"KEY



※ The discharged stability adjust "servo feedrate".



※ The upward speed adjust "speed feedrate".
DO'NT TOO FAST,if pipe under 1.0 .

K. Machine tolerance compensation:

Example 1 : A machine use a 100 mm block scale to align and the display show 99,950 which mean the machine tolerance is 50u, the compensation way is.

Press [CLR] . [CAL] ... [X] or [Y] to select compensate axis.

Press again [0] [.] [0] [5] ..... [+/-] ..... [ENT] ..... **OK!**

Example 2 : A machine use a 100 mm block scale to align and the display show100.110 which mean the machine tolerance is 110u, the compensation way is.

Press [CLR] . [CAL] ... [X] or [Y] to select compensate axis.

Press again [0] [.] [1] [1] ..... [ENT] ..... **OK!**

L. Rechargeable NI-CD battery is used in the DRO system,the power story in the battery might be reduced due to transportation,plesase recharge it before using the machine.

NOTE: Please zero return the compensation value before using the machine at the first time, prevent high tolerancecause workpiece damages.

The way of zero return is as follow :

Press [CLR] . [CAL] ... [X] or [Y] to select zero return axis.

Press again [0] ..... [ENT] ..... **OK!**

DATA SHEET

ELECTRODE DIA.: Φ 1.0 MM MATERIAL: BS PRESSURE: 50-60Kg/cm²

WORKPIECE MATERIAL: SKD-11

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
60mm	2	7	4	2	6	5-7	20	20-40	70-90
60mm	2	6	5	2	2	5-7	20	20-40	70-90
60mm	3	5	4	2	4	5-7	35	40-50	80-100
60mm	3	6	4	2	6	5-7	35	40-50	80-110
60mm									
100mm									

★"Cutting speed" From begining of discharging until complete the workpicec. Cutting speed is relative to electrode pipe quality and water.

☆"Servo stage" must be adjusted if the electode is unsteady and note the gap voltage should be setted on 18-25v(v1andv2)/30-40v(v3) by adjusting "servo"

ELECTRODE DIA.: Φ 1.0 MM MATERIAL: BS PRESSURE: 50-60Kg/cm²

WORKPIECE MATERIAL: HSS

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
10mm									
20mm									
40mm									
50mm									
110mm	2	7	5	2	6	4-8	22	20-30	100-140
110mm	2	8	5	2	6	4-8	25	20-30	100-150

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WORKPIECE MATERIAL: SKD-11

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
60mm	2	7	4	2	6	5-7	20	20-40	70-90
60mm	2	6	5	2	2	5-7	20	20-40	70-90
60mm	3	5	4	2	4	5-7	35	40-50	80-100
60mm	3	6	4	2	6	5-7	35	40-50	80-110
60mm									
100mm									

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WORKPIECE MATERIAL: HSS

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
10mm									
20mm									
40mm									
50mm									
110mm	2	7	5	2	6	4-8	22	20-30	100-140
110mm	2	8	5	2	6	4-8	25	20-30	100-150

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WORKPIECE MATERIAL: SKD-11

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
50mm	1	7	4	2	2	8	20	25-30	60-90
50mm	2	8	6	2	6	8	20	25-40	90-120
50mm	2	7	9	4	2	8	20	25-40	80-100
50mm	2	7	5	4	2	8	20	25-40	70-90
50mm	2	7	5	3	6	4-8	20	20-30	70-90
50mm	2	6	5	3	3	4-8	20	20-30	70-90

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WORKPIECE MATERIAL: SKD-11

THICKNESS	V	CURR	ON	OFF	C	SERVO	GAP (V)	Cutting (mm/min)	Wear rate (%)
50mm	1	7	4	2	2	4-8	20	25-30	90-120
50mm	1	7	5	3	2	4-8	20	25-40	90-120
50mm	1	5	4	2	2	4-8	20	25-40	80-100
50mm	1	4	4	1	2	4-8	20	25-40	70-90
60mm	1	7	5	4	2	4-8	20	20-30	70-90
60mm	1	5	3	1	1	4-8	20	20-30	70-90

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