GCS SERIES

DIGITAL

READOUT

INSTRUCTION

BOOKLET

TWO AXIS DIGITED READOUT、 THREE AXIS DIGITAL READOUT

EDM–DIGITAL READOUT

SHENZHEN HENGXINGXING PRECISION INSTRUMENTS CO.,LTD.

Dear User:

Welcome to use the Grating DataView System,the grating system is widely used in milling machine、grinding machine、lineCut、lathe, the applications can help us to advance produce efficiency、show frank intritive、operation conveniency、precision nicety、repeating stabilization,it's absolutely necessarily setting of the mould production、machine process、exactitude measuring .

   Use the Grating DataView System,you aren't be fostered,follow the instruction of the booklet ,you can use it very easily.it's fit to the newer,and can be used skilled by the older.",

Safety precautions:

Open the packing of the production, take out the Dataview table and anastomosisto the raster,then plug in to see if it's in gear.

① When you open the production,check-up the appearance is thru or not,if you find something at fault,contact to the company at once,be sure not to take down it.

② The setting used the alternating current of 110V~220V or 50Hz~60Hz、the electrical source bnc connector plugs pin is three core pin which has earthing feet.

③ The user be sure not to repair it proper motion, the table has high-handed piezoelectricit,avoid to do some damage to people.

④ The chassis is used by ABS plastic , it can't be used in the high temperature or defend burst entironment.

⑤ When you not use it ,please turn off the electrical source. It can prolong the time of the product.

⑥ If the thunder storm comes,close the electrical source.

Routine Maintenance:

① When you clear the product ,please turn off the power.

② Use the dry cloth or brush clean the defend crust or the data view table.

③ Can't cleanout the crust by toluene or ethanol.

④ The smear of the crust can be cleaned by detergent。

panle button instruction

X、Y window   axis   Assistant window   zero clear

calculate

up and down

1/2

cleared

Enter

Radius/Diameter
Advanced Users Setting

SDM coordinate

circle hole

line hole

INCH/MM   RI   slant   Arc hole   ABS/INC   Smooth Arc

Allipse Hole

X、Y window   axis   Assistant window   zero clear

calculate

up and down

1/2

cleared

Enter

Radius/Diameter
Advanced Users Setting

Allipse Hole

SDM coordinate

circle hole   line hole

INCH/MM   RI   Slant   Arc hole   ABS/INC   Ellipse hole

List

prompt Grating Dataview Table,used nigh-tech electron technique,more function,operate easily,credibility durable. it's the necessary product of machine artifactitious。

One、Function item

1、Cleared

2、Input coordinate

| X₀ | Y₀ | Z₀ |

3、INCH/MM

| ◁X | ◁Y | ◁Z |

4、ABS/INC

$\frac{IN}{MM}$

5、1/2

$\frac{ABS}{INC}$

6、RI

$\frac{1}{2}$

7、High user settings

RI

8、Calculator

≡

9、SDM

CAL

10、Circle-Hole

SDM

11、Ellipse-Hole

⊕

12、Line-Hole

⊕

13、ARC-Hole

14、Smooth

15、Slant

AUTO
R

16、EDM

17、Power cut memory

EDM

Two、nine core bnc connector jack and sense organ connect table

Feet size	1	2	3	4	5	6	7	8	9
Function	null	0v	null	null	null	signal	5V	signal	Zero signal

Clear

$$\boxed{X_\circ}$$

Function: prompt   operator and clear the coordinate at any place

eg: press $\boxed{X_\circ}$ ──────► clear x

  press $\boxed{Y_\circ}$ ──────► clear y

  press $\boxed{Z_\circ}$ ──────► clear z

0.000	⟨X
0.000	⟨Y
0.000	⟨Z

ABS absolute
$X_\circ$
$Y_\circ$
$Z_\circ$

$$\boxed{⟨\;|\;X}$$ **input Coordinate**

Function: prompt the operator and set the workpiece place to any data.

e.g: set the X to 45.8mm

Press in turn $\boxed{⟨|X}$ $\boxed{4}$ $\boxed{5}$ $\boxed{•}$ $\boxed{8}$ $\boxed{ent}$

45.800	⟨X
0.000	⟨Y
0.000	⟨Z

ABS absolute
$X_\circ$
$Y_\circ$
$Z_\circ$

(pour: when you input,the X data will glint)

$$\boxed{\dfrac{IN}{MM}}$$ **INCH/MM**

Function: prompt it can make the data switch between the mm and inch
  Now the mm is 25.400, the inch is 1.0000

Operation steps

e.g 1: now the data is in inch ,we change it to mm.

1.000	⇐ X	ABS absolute
0.000	⇐ Y	X_o
0.000	⇐ Z	Y_o
		Z_o

press $\frac{IN}{MM}$

25.400	⇐ X	ABS absolute
0.000	⇐ Y	X_o
0.000	⇐ Z	Y_o
		Z_o

e.g 2: now the data is in mm ,we change it to inch.

25.400	⇐ X	ABS absolute
0.000	⇐ Y	X_o
0.000	⇐ Z	Y_o
		Z_o

press $\frac{IN}{MM}$

1.000	⇐ X	ABS absolute
0.000	⇐ Y	X_o
0.000	⇐ Z	Y_o
		Z_o

(Attention: at ABS/INC, SDM it can be switched als

$$\frac{ABS}{INC}$$ **ABS/INC**

function : prompt the dataview table provide two coordinate,
they are ABS and INC.

1、 The operator can memory the RI to ABS,and switch to INC for
   operationg.。

2、 Clear the INC coordinate at any place, the 1/2 can not affect
the ABS coordinate。

3、 at ABS coordinate the absolut value can autosave,and the operator
   can see it at any time。

Operation steps

e.g1: Switch the ABS to INC

			ABS absolute
0.000	X		
0.000	Y		X。
0.000	Z		Y。
			Z。

press $\frac{ABS}{INC}$

			INC incremental
0.000	X		
0.000	Y		X。
0.000	Z		Y。
			Z。

Operation steps

e.g2:Switch the INC to ABS

press X。

			ABS absolute
0.000	X		
0.000	Y		X。
0.000	Z		Y。
			Z。

→

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Operation steps

make the X to another side ⟶ press $\boxed{1/2}$ ⟶ press $\boxed{\Leftleftarrows}\boxed{X}$ operate

RI ⟶ press $\boxed{\frac{ABS}{INC}}$ ⟶ move the machine tool to RI

$\boxed{1/2}$ midsplit autoly

Function: prompt at currently data press $\boxed{1/2}$ and move the machine tool to Zero.

e.g: e set the X zero to the middle of the machine tool.

1、 move the machine tool to one side ,press $\boxed{X_\circ}$

2、 move the machine tool to another side,press $\boxed{1/2}$, and press $\boxed{\Leftleftarrows}\boxed{X}$

3、 move the machine tool to "0.000"

$\boxed{RI}$ (Find RI)

Function: prompt set the size of Zero and RI
e.g: example for X

1、 Clear the X at ABS, press $\boxed{X_\circ}$

2、 press $\boxed{RI}$ ⟶ $\boxed{\Leftleftarrows}\boxed{X}$

3、 move the machine tool when it come by the RI

When power off,if you move the operation table,you can find the RI by the RI function when you open it next time

Press $\boxed{RI}$ ⟶ $\boxed{\Leftleftarrows}\boxed{X}$, move the machine table when it come by RI,the

function window view $\boxed{OK\cdots\cdots}$ and beep for "du—du".move the machine tool to "0.000" .

CAL	Calculator

At everyday process,the most tool is calculator besides workpiece.

The Calculator of the provide the function for add、minus、multiply、divide and some function ,contains Sin 、Cos、TAN.etc.

The Calculator function can move the result to the axis which you need to operate it,the operator just need move the machine tool to zero.the place is you needed.

For example: 123+76=199   6×35=210

Press 1 2 3 + 7 6 =

6 × 3 5 =

attention: 1、if you input error press ⫽CE to cancel

2、when you finished press ⇦X , the result move to X

3、at calculator press ⇦X move the data of X to calculator

SDM	300 Group

prompt the dataview table provide three

coordinates:ABS、INC、SDM (SDM0-SDM299)。300 Group user coordinate

can use to assistant zero in opeating.ABS is absolutent

coordinate.it's established at the begin,it used to be the datum

mark of processing workpiece.the SDM is defined relative to

absolutent coordinate.。

like pic, the origin of the ABS is inthe centerof the workpiece, there are

two menthod to set.

① To place clear zero

② Coordinate input
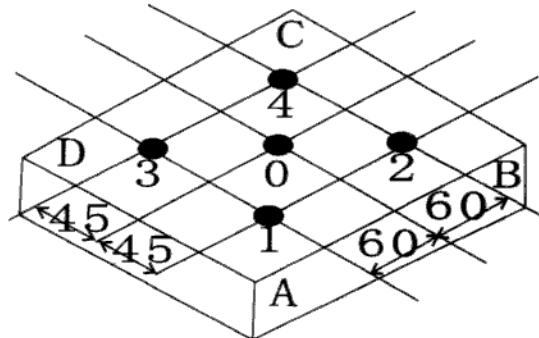
e.g 1: To place clear zero

set the workpiece zero to ABS zero.move the machine tool to SDM begin place and clear zero,when operating without reference to ABS or SDM,move the workpiece to "0.000".

Steps:
(1) Follow the methods of the midsplit autoly,set the ABS begin to the rectangle centre,AB neat to the X.

AD neat to Y, aim at 0, ABS、X、Y clear near.

Sdm0 X, Y Clear Zero

Sdm1 X, Y Clear Zero

Sdm2 X, Y Clear Zero

Sdm3 X, Y Clear Zero
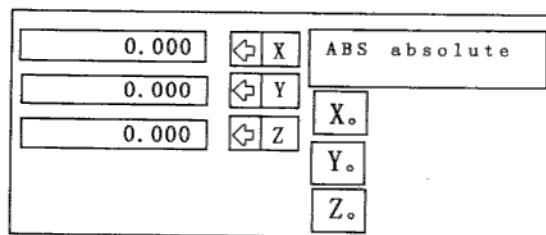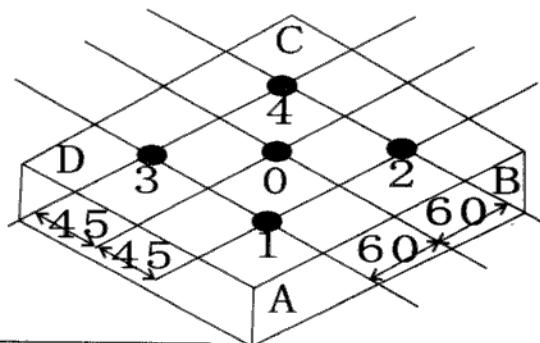
operation steps

(1) Set the first point SDM ,enter the SDM coordinate,Clear X,Clear Y,move the machine tool to the first point.like pic.

− 60.000	← X	SDM multi-group
45.000	← Y	NO.0 Total:300
0.000	← Z	X。 Y。 Z。

press X。 Y。

0.000	← X	SDM multi-group
0.000	← Y	NO.0 Total:300
0.000	← Z	X。 Y。 Z。

(2) Set the first point SDM1 ,enter the SDM1 coordinate,Clear X,Clear Y,move the machine tool to the second point.like pic.

60.000	← X	SDM multi-group
45.000	← Y	NO.1 Total:300
0.000	← Z	X。 Y。 Z。

press X。 Y。

0.000	← X	SDM multi-group
0.000	← Y	NO.1 Total:300
0.000	← Z	X。 Y。 Z。

（3）Set the first point SDM2 ,enter the SDM2 coordinate,Clear
X,Clear Y,move the machine tool to the third point.like pic.

− 60.000	← X	SDM multi-group NO.2 Total:300
− 45.000	← Y	X。
0.000	← Z	Y。
		Z。

press $\boxed{X。}$ $\boxed{Y。}$

↓

0.000	← X	SDM multi-group NO.2 Total:300
0.000	← Y	X。
0.000	← Z	Y。
		Z。

（4）Set the first point SDM3 ,enter the SDM3 coordinate,Clear
X,Clear Y,move the machine tool to the fourth point.like pic.

60.000	← X	SDM multi-group NO.3 Total:300
− 45.000	← Y	X。
0.000	← Z	Y。
		Z。

press $\boxed{X。}$ $\boxed{Y。}$

↓

0.000	← X	SDM multi-group NO.3 Total:300
0.000	← Y	X。
0.000	← Z	Y。
		Z。

（5） Process workpiece according to the coordinate

（6） Process workpice which is the same to the previous workpiece,just set the ABS zero at "0.000",the SDM Zero have set autoly,press ⬆ ⬇ and move the machine tool to zero.

2、Preset the SDM coordinate.
Use the method of preset zero,you needn't to move the machine tool,itcanset the user's zero exactness and shortcut.

e.g： use the "0" mode input,like pic when the absoluteness
coordinate is in zero,the 1（60, -45）, 2（-60, -45）, 3（60, 45）,
4（-60, 45）
Operation steps

（1） In the ABS set the RI

Press X₀ Y₀

(Press X_o Y_o)

0.000	⟵ X	ABS absolute
0.000	⟵ Y	X₀
0.000	⟵ Z	Y₀
		Z₀
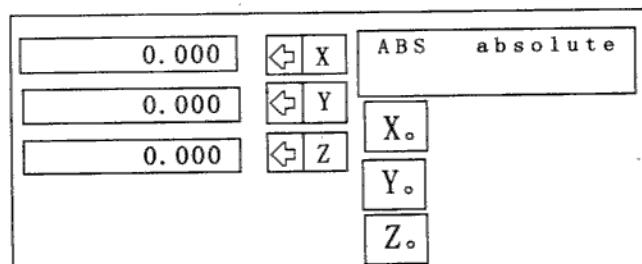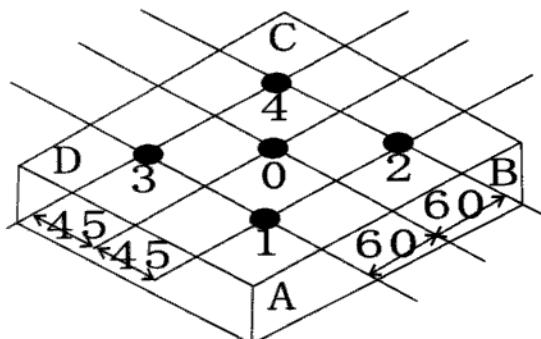
（2）Set the 1st zero,turn to the 1st zero SDM1.

press SDM ⟶ 1 ⟶ ent

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```
┌─────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   SDM multi-group  │
│  │        0.000 │  │⇦││X│   NO.1   Total:300 │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │X。│             │
│  │        0.000 │  │⇦││Y│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │Y。│             │
│  │        0.000 │  │⇦││Z│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│                             │Z。│             │
│                             └──┘              │
└─────────────────────────────────────────────┘
```

(3) Input the 1st assistant zero coordinate straight

Press [⇦][X]   [6] [0] ⟶ [ent]

press [⇦][Y] ⟶ [4] [5] [±] ⟶ [ent]

```
┌─────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   SDM multi-group  │
│  │       60.000 │  │⇦││X│   NO.1   Total:300 │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │X。│             │
│  │ −     45.000 │  │⇦││Y│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │Y。│             │
│  │        0.000 │  │⇦││Z│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│                             │Z。│             │
│                             └──┘              │
└─────────────────────────────────────────────┘
```

Set the 2nd zero,
turn to the 2nd zero SDM2.

```
┌─────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   SDM multi-group  │
│  │        0.000 │  │⇦││X│   NO.2   Total:300 │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │X。│             │
│  │        0.000 │  │⇦││Y│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│  ┌──────────────┐  ┌─┐┌─┐   │Y。│             │
│  │        0.000 │  │⇦││Z│   └──┘              │
│  └──────────────┘  └─┘└─┘   ┌──┐              │
│                             │Z。│             │
│                             └──┘              │
└─────────────────────────────────────────────┘
```

press [⇩]

Input the 2nd assistant zero coordinate straight.

press [⇦][X] ⟶ [6] [0] [±] ⟶ [ent]

press [⇦][Y] ⟶ [4] [5] [±] ⟶ [ent]

— 60.000	⟨X	SDM multi-group NO.2 Total:300
— 45.000	⟨Y	X₀
0.000	⟨Z	Y₀
		Z₀

Set the 3rd zero,
turn to the 3rd zero SDM3.

press ⬇

0.000	⟨X	SDM multi-group NO.3 Total:300
0.000	⟨Y	X₀
0.000	⟨Z	Y₀
		Z₀

Input the 3rd assistant zero coordinate straight.

press ⟨X ⟶ 6   0 ⟶ ent
press ⟨Y ⟶ 4   5 ⟶ ent

60.000	⟨X	SDM multi-group NO.3 Total:300
45.000	⟨Y	X₀
0.000	⟨Z	Y₀
		Z₀

Set the 4th zero

press ⬇

0.000	⟨X	SDM multi-group NO.4 Total:300
0.000	⟨Y	X₀
0.000	⟨Z	Y₀
		Z₀

Input the 4th assistant zero coordinate straight

press ⟨X⟩ ⟶ 6 0 ± ⟶ ent

press ⟨Y⟩ ⟶ 4 5 ⟶ ent

− 60.000	⟨X⟩	SDM multi-group
45.000	⟨Y⟩	NO.4 Total:300
0.000	⟨Z⟩	X_o
		Y_o
		Z_o
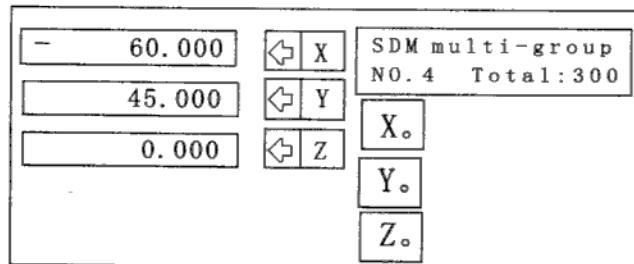
When the four assistant zero have been set,operator can press

⟨↓⟩ to the assistant zero,and move the machine tool to zero,

it's the assistant zero,quit the SDM function ,you can press

ABS INC .

Switch SDM input mode:

When the SDM mode is "0", the data input is fact data.

When the SDM mode is "1",the data input is reverse data.

Eg.1 press ☰ ⟶ ⟨↓⟩ press

0.000	⟨X⟩	SDM input Mode
0.000	⟨Y⟩	mode 0 switching?
0.000	⟨Z⟩	X_o
		Y_o
		Z_o
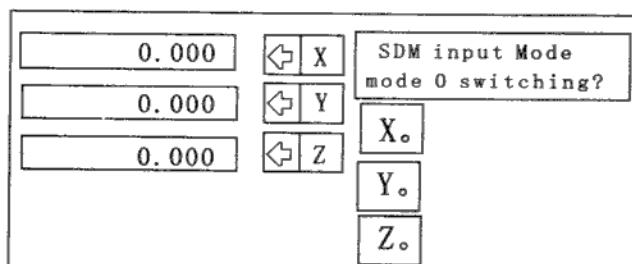
2 Press ent to selet "0"mode or"1"mode,Press ⫽CE quit.

SDM All clear away

The function is introduced: Eliminate consumer coordinate systemSDM300 Group The plain is interposed, Eliminate the queen, SDMCoordinate system has to demonstrate value and ABS coordinate system has to demonstrate value equality.

Operation step:
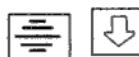
1、Press [≡] [⬇] Key Enter the fundamental parameter Press Choice arrives at "Clear SDM multiunit coordinate"

Press |ent|

0.000	⟨⤙ X	Clear SDM axis Press UP or DOWN
0.000	⟨⤙ Y	X₀
0.000	⟨⤙ Z	Y₀
		Z₀

2、When right window display ·"OVER", Press |⫽CE| for exit.

Circumference be allotted a hole

Function: The obvious form of number provides the convenient circumference halving hole function , Person requires operation to import

The circumference radius

The circumference initiation angle

The circumference termination angle

The halving hole number

Y(+)

X(+)

Angle direction

The clockwise is positive
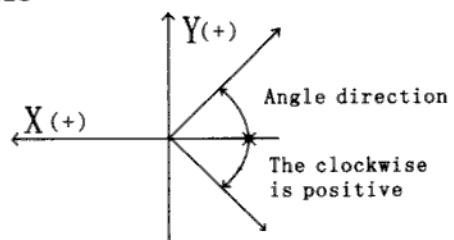
is pointed out

On the circumference the obvious form of number is calculated out just voluntarily, every divides the hole location from the middle , Every hole location is set up for zero, Person needs operation press

⬇️ or ⬆️ ,Which and then the upper

hole choosing to the circumference, the machine tool working table is swayed to zero , is the location being a hole's turn.

Operation Steps

eg. Radius: 30mm

Initiation angle: 30^0

End an angle: 318^0

Divide the hole number
from the middle: 6
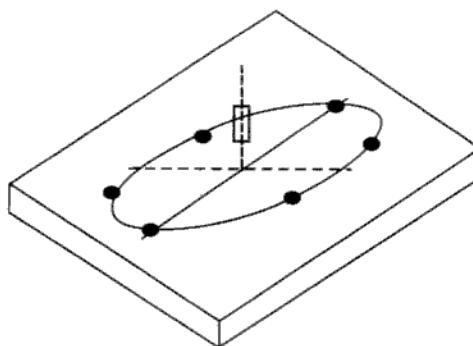
Operation Steps:

1、he central point location X=0,Y=0,press ⊕ enter the circle split.
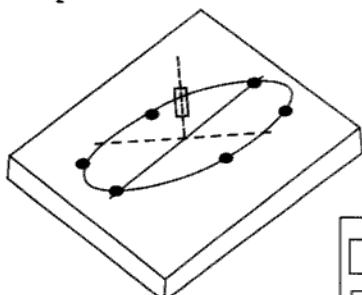
		X	Circle dispart Input Radius....
50.000		Y	X。
		Z	Y。
			Z。

2、input the radius (R: 30)
press 3 0 ent **Operation Steps**

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		⇐ X	Circle dispart Input Radius....
50.000		⇐ Y	X。
		⇐ Z	Y。
			Z。

In the first place radius interposing

		⇐ X	Circle dispart Input Radius....
30.000		⇐ Y	X。
		⇐ Z	Y。
			Z。

3、Import the initiation angle

press ┌3┐ ┌0┐ ┌ent┐

		⇐ X	Circle dispart Input Incept Angle..
45.000		⇐ Y	X。
		⇐ Z	Y。
			Z。

In the first place initiation angle interposing

		⇐ X	Circle dispart Input The End Angle
30.000		⇐ Y	X。
		⇐ Z	Y。
			Z。

4、Import the termination angle

Press ┌3┐ ┌1┐ ┌8┐ ┌ent┐

Operation Steps

```
┌─────────────────┐  ┌─┐┌─┐  ┌──────────────────┐
│                 │  │⇦││X│  │Circle dispart    │
└─────────────────┘  └─┘└─┘  │Input The End Angle│
┌─────────────────┐  ┌─┐┌─┐  ├──────────────────┤
│        8.000    │  │⇦││Y│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │X₀│             │
┌─────────────────┐  ┌─┐┌─┐  │ └──┘             │
│                 │  │⇦││Z│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │Y₀│             │
                             │ └──┘             │
                             │ ┌──┐             │
                             │ │Z₀│             │
                             │ └──┘             │
                             └──────────────────┘
```

In the first place initiation angle interposing

```
┌─────────────────┐  ┌─┐┌─┐  ┌──────────────────┐
│                 │  │⇦││X│  │Circle dispart    │
└─────────────────┘  └─┘└─┘  │Input The Most NO..│
┌─────────────────┐  ┌─┐┌─┐  ├──────────────────┤
│      318.000    │  │⇦││Y│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │X₀│             │
┌─────────────────┐  ┌─┐┌─┐  │ └──┘             │
│                 │  │⇦││Z│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │Y₀│             │
                             │ └──┘             │
                             │ ┌──┐             │
                             │ │Z₀│             │
                             │ └──┘             │
                             └──────────────────┘
```

5、Import the maximal hole number（Hole number）

press ┌─┐ ┌───┐
      │6│ │ent│
      └─┘ └───┘

```
┌─────────────────┐  ┌─┐┌─┐  ┌──────────────────┐
│                 │  │⇦││X│  │Circle dispart    │
└─────────────────┘  └─┘└─┘  │Input The Most NO..│
┌─────────────────┐  ┌─┐┌─┐  ├──────────────────┤
│       5.000     │  │⇦││Y│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │X₀│             │
┌─────────────────┐  ┌─┐┌─┐  │ └──┘             │
│                 │  │⇦││Z│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │Y₀│             │
                             │ └──┘             │
                             │ ┌──┐             │
                             │ │Z₀│             │
                             │ └──┘             │
                             └──────────────────┘
```

In the first place Maximal hole number interposing

```
┌─────────────────┐  ┌─┐┌─┐  ┌──────────────────┐
│                 │  │⇦││X│  │Circle bore       │
└─────────────────┘  └─┘└─┘  │Hole NO:        1 │
┌─────────────────┐  ┌─┐┌─┐  ├──────────────────┤
│       6.000     │  │⇦││Y│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │X₀│             │
┌─────────────────┐  ┌─┐┌─┐  │ └──┘             │
│                 │  │⇦││Z│  │ ┌──┐             │
└─────────────────┘  └─┘└─┘  │ │Y₀│             │
                             │ └──┘             │
                             │ ┌──┐             │
                             │ │Z₀│             │
                             │ └──┘             │
                             └──────────────────┘
```

Enter treating directly, If treating is finished,press ⊕ exit

attention:

1、Process the queen in entrance, Handle person press ⬇

which number holes queen to choosing , the machine tool working
table being swayed arriving at is 0.000 Be the location owing
a circumference a hole

2、 Import process middle, YAxis scintillation that can not
stay, Press ent , That the number displays a form is able to enter
next step voluntarily

3、 If operation person requires that the halfway is temporary
remove from "the circumference mark of hole " function, When
returning to regular ABS state, X , Y , coordinate show,
Press TAN Withdraw from temporarily, Press TAN return to
circumference mark of hole state。

Ellipse be allotted a hole

Function: The god of the earth who points out that the obvious form of
number provides the convenient ellipse halving hole function , handles
person requires English to import an ellipse

X , Y axis radius
Elliptic initiation angle

Elliptic termination angle

Elliptic maximal hole number

Y(+)

Angle direction

X (+)

The clockwise
is positive
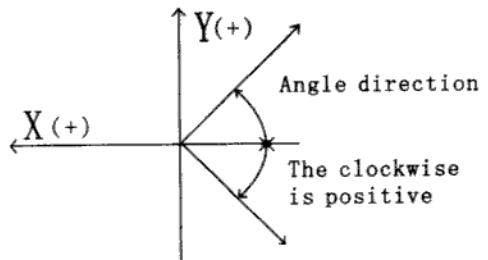
mounts every halving hole location , every hole location is set
up for zero to point out that the obvious form of number calculates
out an ellipse just voluntarily, Person needs operation

Press ⇧ or ⇩ Which and then the upper hole choosing to the ellipse,
the machine tool working table is swayed to zero , is the location
being a hole's turn.

eg: X axis radius:20mm

Y axis radius: 30mm

Initiation angle: 0°

End an angle : 360°

The NO: 6
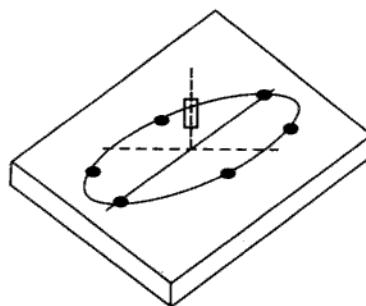
Operation Steps

Attention:

1、The central point location is X=0, Y=0

2、The halving hole hole number is that the angle divides till destination angle from starting point along the clockwise sense。

3、Think that the initiation angle is 00 , ending an angle is 3600 points , ought to be when importing the hole number (N+1)

Operation steps:

1、Fix position for zero first with workpiece centre location, then press ⊕ enter the ellipse mark of hole function

eg: X、Y axis radius: —— 20、30mm

Initiation angle:. —— 30°

End an angle: —— 360°

The No: —— 6

			Ellipse dispart
	⇐	X	Input X Radius..
10.000	⇐	Y	X∘
	⇐	Z	Y∘
			Z∘

2、Import the X axis radius（R: 20）

press [2] [0] [ent]
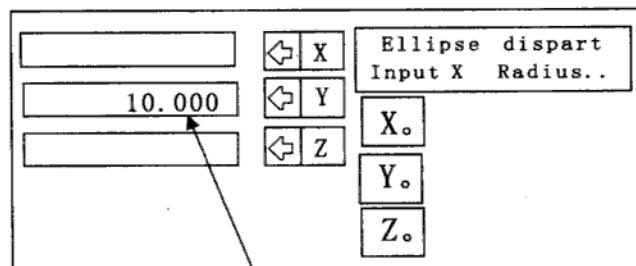
			Ellipse dispart
	⇦ X		Input X Radius..
10.000	⇦ Y		X。
	⇦ Z		Y。
			Z。

In the first place radius interposing

			Ellipse dispart
	⇦ X		Input Y Radius..
20.000	⇦ Y		X。
	⇦ Z		Y。
			Z。

by [3] [0] [ent]

			Ellipse dispart
	⇦ X		Input Incept Angle..
30.000	⇦ Y		X。
	⇦ Z		Y。
			Z。
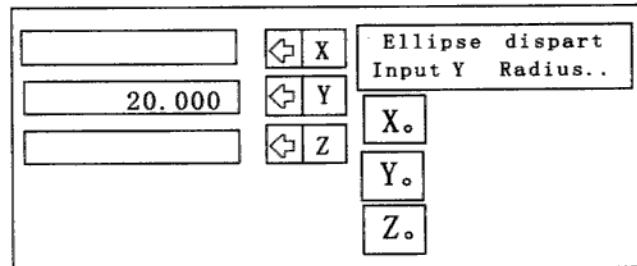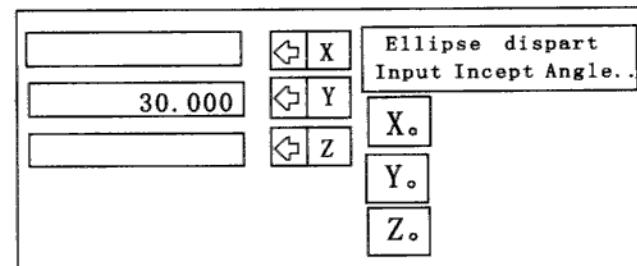
3, starting point of importation

by [0] [ent]

			Ellipse dispart
	⇦ X		Input Incept Angle..
30.000	⇦ Y		X。
	⇦ Z		Y。
			Z。

The starting point of the original settings

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```
┌─────────────────┐  ┌──┐  ┌────────────────────┐
│                 │  │◁ │X │ Ellipse  dispart   │
├─────────────────┤  ├──┤  │ Input Incept Angle..│
│         0. 000  │  │◁ │Y │ ┌──┐               │
├─────────────────┤  ├──┤  │ │X。│              │
│                 │  │◁ │Z │ ├──┤               │
└─────────────────┘  └──┘  │ │Y。│              │
                           │ ├──┤               │
                           │ │Z。│              │
                           └────────────────────┘
```

4, input termination perspective

by ┌─┐ ┌─┐ ┌─┐ ┌───┐
   │3│ │6│ │0│ │ent│
   └─┘ └─┘ └─┘ └───┘

Steps

```
┌─────────────────┐  ┌──┐  ┌────────────────────┐
│                 │  │◁ │X │ Ellipse  dispart   │
├─────────────────┤  ├──┤  │ Input The End Angle │
│        50. 000  │  │◁ │Y │ ┌──┐               │
├─────────────────┤  ├──┤  │ │X。│              │
│                 │  │◁ │Z │ ├──┤               │
└─────────────────┘  └──┘  │ │Y。│              │
                           │ ├──┤               │
                           │ │Z。│              │
                           └────────────────────┘
```

The termination point of the original settings

```
┌─────────────────┐  ┌──┐  ┌────────────────────┐
│                 │  │◁ │X │ Ellipse  dispart   │
├─────────────────┤  ├──┤  │ Input The End Angle │
│       360. 000  │  │◁ │Y │ ┌──┐               │
├─────────────────┤  ├──┤  │ │X。│              │
│                 │  │◁ │Z │ ├──┤               │
└─────────────────┘  └──┘  │ │Y。│              │
                           │ ├──┤               │
                           │ │Z。│              │
                           └────────────────────┘
```

5, the largest hole of input (number of holes)

┌─┐ ┌───┐
│6│ │ent│
└─┘ └───┘

```
┌─────────────────┐  ┌──┐  ┌────────────────────┐
│                 │  │◁ │X │ Ellipse  dispart   │
├─────────────────┤  ├──┤  │ Input The Most NO.. │
│        5. 000   │  │◁ │Y │ ┌──┐               │
├─────────────────┤  ├──┤  │ │X。│              │
│                 │  │◁ │Z │ ├──┤               │
└─────────────────┘  └──┘  │ │Y。│              │
                           │ ├──┤               │
                           │ │Z。│              │
                           └────────────────────┘
```

The original settings, the biggest hole

```
┌──────────────────────────────────────────────────┐
│  ┌─────────────┐ ┌──┬─┐  ┌──────────────────┐     │
│  │ —   17.320  │ │◁│X│  │ Ellipse bore     │     │
│  └─────────────┘ └──┴─┘  │ Hole NO:    1    │     │
│  ┌─────────────┐ ┌──┬─┐  └──────────────────┘     │
│  │ —   15.000  │ │◁│Y│     ┌────┐                  │
│  └─────────────┘ └──┴─┘    │ Xo │                  │
│  ┌─────────────┐ ┌──┬─┐    └────┘                  │
│  │             │ │◁│Z│    ┌────┐                   │
│  └─────────────┘ └──┴─┘   │ Yo │                   │
│                           └────┘                   │
│                           ┌────┐                   │
│                           │ Zo │                   │
│                           └────┘                   │
└──────────────────────────────────────────────────┘
```

Direct access to the processing, if the completion of the processing, according to exit ⊕.

Note: 1, in the process, according to the operator of [⇩] choose the firstfew holes, it will shake the machine table coordinates 0.000 is the location of the elliptical holes.

2, the importation process, the Y-axis will be kept flashing at [ent] after a few tables will be automatically entered in the next step.

3, the operator need to temporarily withdraw from the middle of the "oval-hole" function, ABS returned to the normal state of X, Y, Z ride

Superscript, according to temporarily withdraw from the [TAN]

, and then return to the oval [TAN]-hole state.

[▨] Area-Hole

Angle direction

The clockwise is positive
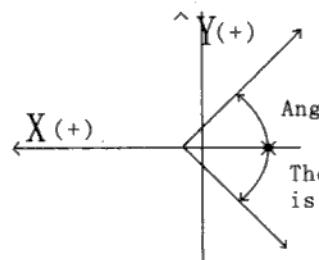
Features: Chinese Dsub-slash provide tips for YX processing center in the same plane has been online, and uniform distribution of holes, the operator simply enter the following parameters slash length (first Kongyuan into our final hole

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center distance) slash angle (referring to slash X-axis and the angle
between the direction of) a few holes in the input parameters after
a few tables will be
automatically calculated slash the location of the hole, the operator

according to ⬇️ choose holes, and then shaken to the workpiece
X-axis is 0.000, 0.000 Y axis position is the location of the hole
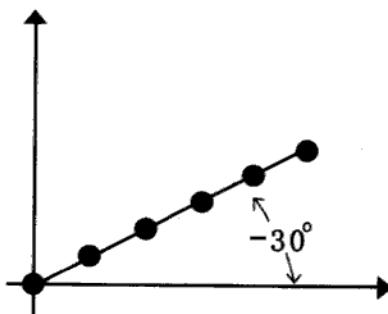
Example: For the diagram shows the workpiece, parameter setting is
as follows
Area Length: 150 mm
Area angle: -300
Hole: 6
Steps:
  1, turning tools at the first hole slash the first point, and then

click to enter a slash-📈-functional

			Line Dispart
	⬅ X		Input Line length.
60.000	⬅ Y		X₀
	⬅ Z		Y₀
			Z₀

2, the length of input Area

Main window Y-axis settings of the original slash length

Followed by `1` `5` `0` `ent`
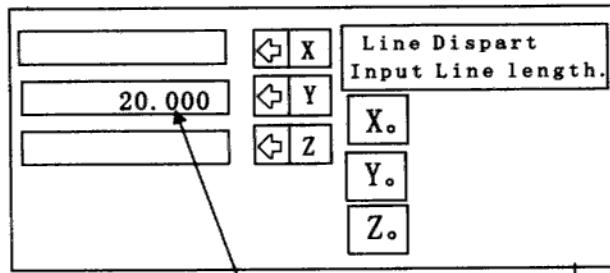
```
┌──────────────────┐  ┌──┬─┐  ┌─────────────────┐
│                  │  │◁│X│  │ Line Dispart    │
├──────────────────┤  ├──┼─┤  │ Input Line length. │
│       20.000     │  │◁│Y│  ├─────────────────┤
├──────────────────┤  ├──┼─┤  │  X₀             │
│                  │  │◁│Z│  ├─────────────────┤
└──────────────────┘  └──┴─┘  │  Y₀             │
                              ├─────────────────┤
                              │  Z₀             │
                              └─────────────────┘
```

Slash the length of the original settings
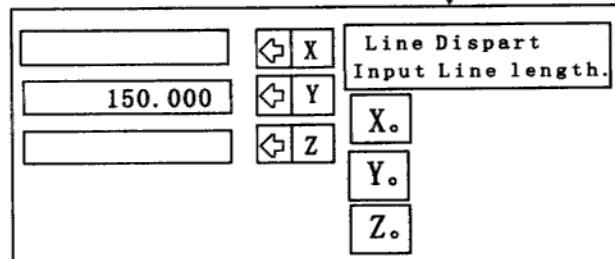
```
┌──────────────────┐  ┌──┬─┐  ┌─────────────────┐
│                  │  │◁│X│  │ Line Dispart    │
├──────────────────┤  ├──┼─┤  │ Input Line length. │
│      150.000     │  │◁│Y│  ├─────────────────┤
├──────────────────┤  ├──┼─┤  │  X₀             │
│                  │  │◁│Z│  ├─────────────────┤
└──────────────────┘  └──┴─┘  │  Y₀             │
                              ├─────────────────┤
                              │  Z₀             │
                              └─────────────────┘
```

3, enter a slash perspective

Deputy window display "Please enter a slash perspective" Y window

showed that the last set of slash followed by `3` `0` `±` `ent`

Steps
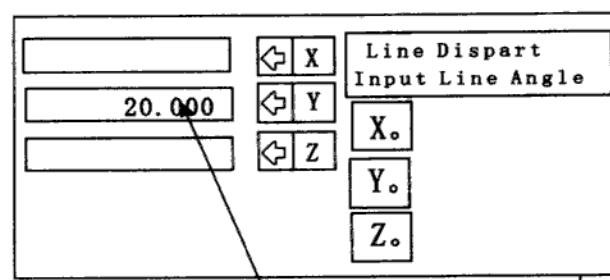
```
┌──────────────────┐  ┌──┬─┐  ┌─────────────────┐
│                  │  │◁│X│  │ Line Dispart    │
├──────────────────┤  ├──┼─┤  │ Input Line Angle │
│       20.000     │  │◁│Y│  ├─────────────────┤
├──────────────────┤  ├──┼─┤  │  X₀             │
│                  │  │◁│Z│  ├─────────────────┤
└──────────────────┘  └──┴─┘  │  Y₀             │
                              ├─────────────────┤
                              │  Z₀             │
                              └─────────────────┘
```

The original settings slash perspective

```
┌──────────────────┐  ┌──┬─┐  ┌─────────────────┐
│                  │  │◁│X│  │ Line Dispart    │
├──────────────────┤  ├──┼─┤  │ Input The Most NO. │
│        5.000     │  │◁│Y│  ├─────────────────┤
├──────────────────┤  ├──┼─┤  │  X₀             │
│                  │  │◁│Z│  ├─────────────────┤
└──────────────────┘  └──┴─┘  │  Y₀             │
                              ├─────────────────┤
                              │  Z₀             │
                              └─────────────────┘
```
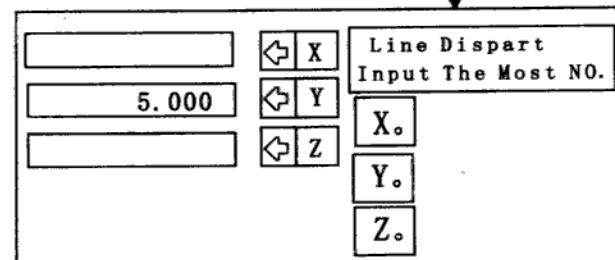
4, the importation of several slash-hole

Deputy window display "Please enter the biggest hole," Y window display set up at the last few holes, followed by [6] [ent] began processing

0.000	⟨X	Line bore
0.000	⟨Y	HOLE NO: 1
0.000	⟨Z	X_o
		Y_o
		Z_o
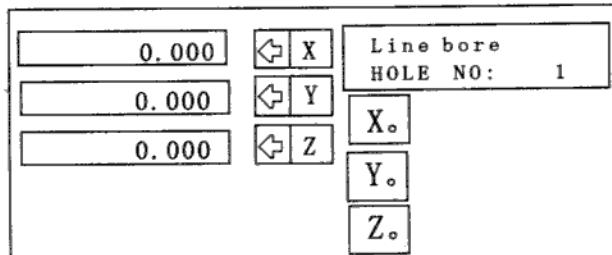
5, by [↑] or [↓] button, select the machining holes, and then shaken to the X-axis machine tool table, Y-axis display the "0.000" on the location of the points in the hole

Note: The completion of processing [⬈] to return to normal by the state showed that in the slash-hole course, the operator can temporarily leave the [TAN] by the function returned to normal X, Y, Z coordinates, and then return to the slash-[TAN]-functional.

[R⟋0] Arc processing

Features: few tips in simple arc processing system, a copper mold of single pieces, such as processing,Universal Milling Machine can easily and quickly processed by the control of the same arc cutting each controlling a smooth arc, cutting of the less smooth processing of the arc, cutting the greater the volume, processing more rough arc, The shorter processing time.
A: processing XZ and YZ plane
Arc processing XZ and YZ have eight kinds of processing methods, as shown in Fig.
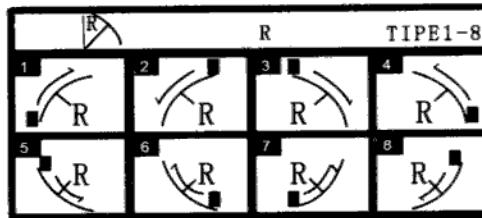
Can be used in the processing of flat-bottomed cutter or circular cutter
processing in the use of flat-bottom arc, as a knife from the diameter
of 0.000

B: XY plane processing

In the XY plane processing, it is like eight processing, and processing
of the vertical tool, and a way for each quarter

Circular arc for the processing and processing; Therefore, in
processing XY plane, it is necessary to choose knife compensation,
processing XY plane, it is flat-ended knife or knives, according to
the actual value set tools diameter.

Arc processing parameters need to enter the following

Processing of choice

Select processing mode

Inner / outer arc processing options (XY-specific)

To be processed Radius

Tool diameter

Length of each processing

Example 1: To processing as shown arc AB 900, from point A to start
processing, the end point B, parameter settings are as follows:

Processing side: XY

R processing mode: 3

Processing of Arc

Radius: 20 mm

Tool diameter: 6 mm

Feed: 0.5 mm

Steps:

1, rocking machine worktable, turning tools at point A, X axis cleared

2, entered the arc processing
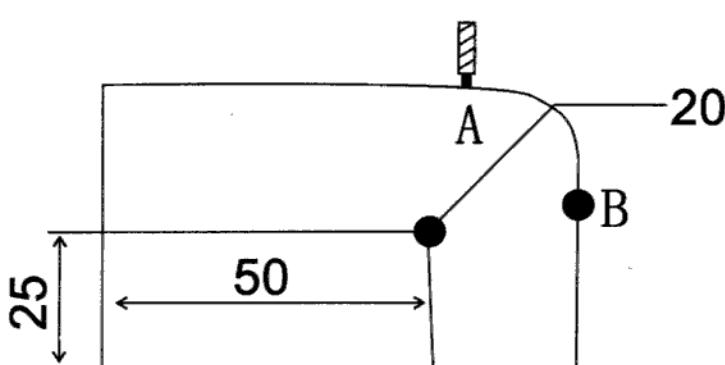
Steps

```
┌─────────────┐   ┌──┬──┐   ┌──────────────────┐
│             │   │◁ │ X│   │ Circle arc setup │
├─────────────┤   ├──┼──┤   │ Chooss Plane  XZ │
│             │   │◁ │ Y│   ├────┐             │
├─────────────┤   ├──┼──┤   │ X₀ │             │
│             │   │◁ │ Z│   ├────┤             │
└─────────────┘   └──┴──┘   │ Y₀ │             │
                            ├────┤             │
                            │ Z₀ │             │
                            └────┴─────────────┘
```

Arc entered by [R 0 ∠] processing

```
┌─────────────┐   ┌──┬──┐   ┌──────────────────┐
│             │   │◁ │ X│   │ Circle arc setup │
├─────────────┤   ├──┼──┤   │ Process Plane  XZ│
│             │   │◁ │ Y│   ├────┐             │
├─────────────┤   ├──┼──┤   │ X₀ │             │
│             │   │◁ │ Z│   ├────┤             │
└─────────────┘   └──┴──┘   │ Y₀ │             │
                            ├────┤             │
                            │ Z₀ │             │
                            └────┴─────────────┘
```

The original settings plane processing

3, the processing of choice

4, followed by [◁ X] [ent] select XY plane into the selection
   process model

```
┌─────────────┐   ┌──┬──┐   ┌──────────────────┐
│             │   │◁ │ X│   │ Circle arc setup │
├─────────────┤   ├──┼──┤   │ Choose Plane   XY│
│             │   │◁ │ Y│   ├────┐             │
├─────────────┤   ├──┼──┤   │ X₀ │             │
│             │   │◁ │ Z│   ├────┤             │
└─────────────┘   └──┴──┘   │ Y₀ │             │
                            ├────┤             │
                            │ Z₀ │             │
                            └────┴─────────────┘
```

Note: XY plane by [◁ X] options

YZ plane by [◁ Y] choice

XZ plane by [◁ Z] choice (on the two-axis X-axis choice XZ plane)

5, processing choice type

```
┌──────────────┐  ⇦ X   Circle arc setup
└──────────────┘        Process mode  1-8
┌──────────────┐  ⇦ Y   ┌───┐
│          2▏  │        │X。│
└──────────────┘  ⇦ Z   └───┘
┌──────────────┐        ┌───┐
└──────────────┘        │Y。│
                        └───┘
                        ┌───┐
                        │Z。│
                        └───┘
```

The original processing mode

6, select inner / outer arc processing

```
┌──────────────┐  ⇦ X   Circle arc setup
└──────────────┘        Process mode  1-8
┌──────────────┐  ⇦ Y
│          3   │
└──────────────┘  ⇦ Z   X。
┌──────────────┐        Y。
└──────────────┘        Z。
```

```
┌──────────────┐  ⇦ X   Circle arc setup
└──────────────┘        inner doing
┌──────────────┐  ⇦ Y
│          3   │
└──────────────┘  ⇦ Z   X。
┌──────────────┐        Y。
└──────────────┘        Z。
```

Note: The choice by │ent│ Set in the original arc processing

```
┌──────────────┐  ⇦ X   Circle arc setup
└──────────────┘        out doing
┌──────────────┐  ⇦ Y
│          3   │
└──────────────┘  ⇦ Z   X。
┌──────────────┐        Y。
└──────────────┘        Z。
```

7, the importation of Radius
Deputy window display the "Enter Radius" Y-axis settings of the

original window radius; followed by the importation of │2│ │0│

│ent│ completed radius

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐               │
│  │              │  │⇦│X│  │Circle  arc  setup│               │
│  └──────────────┘  ├─┼─┤  │Input Beside Radius│              │
│  ┌──────────────┐  │⇦│Y│  ┌──┐                │               │
│  │      50.000  │  ├─┼─┤  │X。│                │               │
│  └──────────────┘  │⇦│Z│  ├──┤                │               │
│  ┌──────────────┐  └─┴─┘  │Y。│                │               │
│  │              │         ├──┤                │               │
│  └──────────────┘         │Z。│                │               │
│                           └──┘                │               │
└───────────────────────────────────────────────┘             │
```

A radius of the original settings

```
      ┌─────────────────────────────────────────────────────┐
      │  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐       │
      │  │              │  │⇦│X│  │Circle  arc  setup│       │
      │  └──────────────┘  ├─┼─┤  │Input Beside Radius│      │
      │  ┌──────────────┐  │⇦│Y│  ┌──┐                │       │
      │  │     20.000   │  ├─┼─┤  │X。│                │       │
      │  └──────────────┘  │⇦│Z│  ├──┤                │       │
      │  ┌──────────────┐  └─┴─┘  │Y。│                │       │
      │  │              │         ├──┤                │       │
      │  └──────────────┘         │Z。│                │       │
      │                           └──┘                │       │
      └─────────────────────────────────────────────────────┘
```

8, input tool diameter

Deputy window display "Please enter diameter cutter" Y-axis settings of the original window tool diameter; followed by the importation of

[6] [ent] completed diameter cutter

```
      ┌─────────────────────────────────────────────────────┐
      │  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐       │
      │  │              │  │⇦│X│  │Circle  arc  setup│       │
      │  └──────────────┘  ├─┼─┤  │Input Sword Diameter│     │
      │  ┌──────────────┐  │⇦│Y│  ┌──┐                │       │
      │  │     20.000   │  ├─┼─┤  │X。│                │       │
      │  └──────────────┘  │⇦│Z│  ├──┤                │       │
      │  ┌──────────────┐  └─┴─┘  │Y。│                │       │
      │  │              │         ├──┤                │       │
      │  └──────────────┘         │Z。│                │       │
      │                           └──┘                │       │
      └─────────────────────────────────────────────────────┘
```

Tool diameter of the original settings

```
      ┌─────────────────────────────────────────────────────┐
      │  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐       │
      │  │              │  │⇦│X│  │Circle  arc  setup│       │
      │  └──────────────┘  ├─┼─┤  │Input Sword Diameter│     │
      │  ┌──────────────┐  │⇦│Y│  ┌──┐                │       │
      │  │      6.000   │  ├─┼─┤  │X。│                │       │
      │  └──────────────┘  │⇦│Z│  ├──┤                │       │
      │  ┌──────────────┐  └─┴─┘  │Y。│                │       │
      │  │              │         ├──┤                │       │
      │  └──────────────┘         │Z。│                │       │
      │                           └──┘                │       │
      └─────────────────────────────────────────────────────┘
```

9, each input processing length

Deputy window display "Please enter Stepping length of the" Y original

settings window each processing length; followed by [0] [•] [5]

[ent] for each input processing length, arc into the processing

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐   │
│  │              │  │⇦│X│  │Circle  arc  setup│   │
│  └──────────────┘  └─┴─┘  │Input Arc...      │   │
│  ┌──────────────┐  ┌─┬─┐  ├──────────────────┤   │
│  │      6.000   │  │⇦│Y│  │  X。             │   │
│  └──────────────┘  └─┴─┘  ├──────────────────┤   │
│  ┌──────────────┐  ┌─┬─┐  │  Y。             │   │
│  │              │  │⇦│Z│  ├──────────────────┤   │
│  └──────────────┘  └─┴─┘  │  Z。             │   │
│                           └──────────────────┘   │
└─────────────────────────────────────────────────┘
```

The original settings length

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐   │
│  │              │  │⇦│X│  │Circle  arc  setup│   │
│  └──────────────┘  └─┴─┘  │Input Arc...      │   │
│  ┌──────────────┐  ┌─┬─┐  ├──────────────────┤   │
│  │      0.500   │  │⇦│Y│  │  X。             │   │
│  └──────────────┘  └─┴─┘  ├──────────────────┤   │
│  ┌──────────────┐  ┌─┬─┐  │  Y。             │   │
│  │              │  │⇦│Z│  ├──────────────────┤   │
│  └──────────────┘  └─┴─┘  │  Z。             │   │
│                           └──────────────────┘   │
└─────────────────────────────────────────────────┘
```

10, processing arc

Deputy display window "processing No. 1" to the X Window processing,
Y window display of "0.000", the first point to complete processing,

and then start processing the second by ⬇ points, repeat the last
operation, has been processing the Deputy window display as
"processing No. 72"

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐   │
│  │      0.000   │  │⇦│X│  │Circle  Process   │   │
│  └──────────────┘  └─┴─┘  │Sequence NO:    1 │   │
│  ┌──────────────┐  ┌─┬─┐  ├──────────────────┤   │
│  │      0.000   │  │⇦│Y│  │  X。             │   │
│  └──────────────┘  └─┴─┘  ├──────────────────┤   │
│  ┌──────────────┐  ┌─┬─┐  │  Y。             │   │
│  │      0.000   │  │⇦│Z│  ├──────────────────┤   │
│  └──────────────┘  └─┴─┘  │  Z。             │   │
│                           └──────────────────┘   │
└─────────────────────────────────────────────────┘
```

```
┌─────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┬─┐  ┌──────────────────┐   │
│  │ −    23.000  │  │⇦│X│  │Circle  Process   │   │
│  └──────────────┘  └─┴─┘  │Sequence NO:   73 │   │
│  ┌──────────────┐  ┌─┬─┐  ├──────────────────┤   │
│  │ −    23.000  │  │⇦│Y│  │  X。             │   │
│  └──────────────┘  └─┴─┘  ├──────────────────┤   │
│  ┌──────────────┐  ┌─┬─┐  │  Y。             │   │
│  │      0.000   │  │⇦│Z│  ├──────────────────┤   │
│  └──────────────┘  └─┴─┘  │  Z。             │   │
│                           └──────────────────┘   │
└─────────────────────────────────────────────────┘
```

11, exit ⊡ by the end processing

Note: In the arc in the process, the operator can temporarily leave the $\boxed{\text{TAN}}$, R function returned to normal X, Y, X-axis, then return to the arc processing function $\boxed{\text{TAN}}$

$\boxed{\begin{array}{c}\text{AUTO}\\\text{R}\end{array}}$ Smooth arc processing

Smooth arc processing to enter the following parameters
Processing of choice
Select processing mode
Inner / outer smooth arc processing options (X, Y-specific)
X, Y-axis coordinates of the location of origin
Smooth radius to be processed
Tool diameter
Length of each step of processing
Starting point of view
End perspective

Example 1: machining surface: XY
Processing of Arc
X, Y-axis origin coordinates: (20, 30)
Radius: 15 mm
Tool diameter: 20 mm
Stepping in: 6 mm
Starting point of view: 00
The termination point of view: 3600
Smooth arc processing steps:

1, rocking machine table, tool aimed at the smooth processing takes place starting point arc, each axis cleared.

0.000	⇦ X	ABS absolute
0.000	⇦ Y	$X_\circ$
0.000	⇦ Z	$Y_\circ$
		$Z_\circ$

2, by [AUTO R] to enter smooth arc processing functions.

0. 000	⟵ X	SmoothR setup choosed plane:XY	
0. 000	⟵ Y	X.	
0. 000	⟵ Z	Y.	
		Z.	
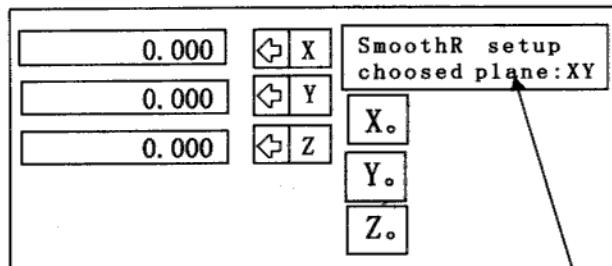
The original settings plane

3, planar processing options, press [⟵ X] or [⟵ Y] keys to choose.

4, by [⇩], and then choose from within the arc arc processing or processing.

	⟵ X	SmoothR setup out doing
	⟵ Y	X.
	⟵ Z	Y.
		Z.
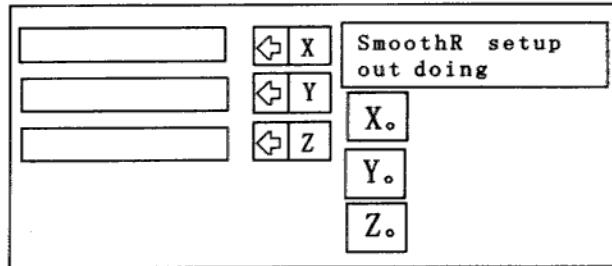
5, by [⊞] for the selection of Arc processing, according to within [⊟] arc processing. If you choose to face ZX, YZ plane, the direct input of the coordinates of the origin location of the origin of the XY coordinates position refers to the processing smooth arc relative to the center position by-0.1 [ent]

6, X axis coordinates input by [ent] ; input Y-axis coordinate value by [ent]

```
┌──────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────────────────────┐  │
│  │              │  │←││X│   │ SmoothR  setup       │  │
│  └──────────────┘  └─┘└─┘   │ Input X-axis         │  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │    20.000    │  │←││Y│   │ X₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │              │  │←││Z│   │ Y₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│                             ┌──────┐                  │
│                             │ Z₀   │                  │
│                             └──────┘                  │
└──────────────────────────────────────────────────────┘
```

```
┌──────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────────────────────┐  │
│  │              │  │←││X│   │ SmoothR  setup       │  │
│  └──────────────┘  └─┘└─┘   │ Input Y-axis         │  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │    30.000    │  │←││Y│   │ X₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │              │  │←││Z│   │ Y₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│                             ┌──────┐                  │
│                             │ Z₀   │                  │
│                             └──────┘                  │
└──────────────────────────────────────────────────────┘
```

7, the importation of smooth radius, according to $\boxed{\text{ent}}$

```
┌──────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────────────────────┐  │
│  │              │  │←││X│   │ SmoothR  setup       │  │
│  └──────────────┘  └─┘└─┘   │ Input Arc Radius     │  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │    5.000     │  │←││Y│   │ X₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │              │  │←││Z│   │ Y₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│                             ┌──────┐                  │
│                             │ Z₀   │                  │
│                             └──────┘                  │
└──────────────────────────────────────────────────────┘
```

A radius of the original settings

```
┌──────────────────────────────────────────────────────┐
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────────────────────┐  │
│  │              │  │←││X│   │ SmoothR  setup       │  │
│  └──────────────┘  └─┘└─┘   │ Input Arc Radius     │  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │    15.000    │  │←││Y│   │ X₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│  ┌──────────────┐  ┌─┐┌─┐   ┌──────┐                  │
│  │              │  │←││Z│   │ Y₀   │                  │
│  └──────────────┘  └─┘└─┘   └──────┘                  │
│                             ┌──────┐                  │
│                             │ Z₀   │                  │
│                             └──────┘                  │
└──────────────────────────────────────────────────────┘
```

8, input tool diameter by $\boxed{\text{ent}}$.

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐   ┌──┐┌──┐   ┌──────────────────┐          │
│  │              │   │⇐ ││ X│   │ SmoothR  setup   │          │
│  └──────────────┘   └──┘└──┘   │ Input Sword diam │          │
│  ┌──────────────┐   ┌──┐┌──┐   ├──────────────────┤          │
│  │     10. 000  │   │⇐ ││ Y│   │ X₀               │          │
│  └──────────────┘   └──┘└──┘   ├──────────────────┤          │
│  ┌──────────────┐   ┌──┐┌──┐   │ Y₀               │          │
│  │              │   │⇐ ││ Z│   ├──────────────────┤          │
│  └──────────────┘   └──┘└──┘   │ Z₀               │          │
│                                └──────────────────┘          │
└─────────────────────────────────────────────────────────────┘
```

Tool diameter of the original settings

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐   ┌──┐┌──┐   ┌──────────────────┐          │
│  │              │   │⇐ ││ X│   │ SmoothR  setup   │          │
│  └──────────────┘   └──┘└──┘   │ Input Sword diam │          │
│  ┌──────────────┐   ┌──┐┌──┐   ├──────────────────┤          │
│  │     20. 000  │   │⇐ ││ Y│   │ X₀               │          │
│  └──────────────┘   └──┘└──┘   ├──────────────────┤          │
│  ┌──────────────┐   ┌──┐┌──┐   │ Y₀               │          │
│  │              │   │⇐ ││ Z│   ├──────────────────┤          │
│  └──────────────┘   └──┘└──┘   │ Z₀               │          │
│                                └──────────────────┘          │
└─────────────────────────────────────────────────────────────┘
```

9, Step length of input by ⌈ent⌉

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐   ┌──┐┌──┐   ┌──────────────────┐          │
│  │              │   │⇐ ││ X│   │ SmoothR  setup   │          │
│  └──────────────┘   └──┘└──┘   │ Input arc......  │          │
│  ┌──────────────┐   ┌──┐┌──┐   ├──────────────────┤          │
│  │      4. 000  │   │⇐ ││ Y│   │ X₀               │          │
│  └──────────────┘   └──┘└──┘   ├──────────────────┤          │
│  ┌──────────────┐   ┌──┐┌──┐   │ Y₀               │          │
│  │              │   │⇐ ││ Z│   ├──────────────────┤          │
│  └──────────────┘   └──┘└──┘   │ Z₀               │          │
│                                └──────────────────┘          │
└─────────────────────────────────────────────────────────────┘
```

Step length of the original set of

```
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────┐   ┌──┐┌──┐   ┌──────────────────┐          │
│  │              │   │⇐ ││ X│   │ SmoothR  setup   │          │
│  └──────────────┘   └──┘└──┘   │ Input arc......  │          │
│  ┌──────────────┐   ┌──┐┌──┐   ├──────────────────┤          │
│  │      6. 000  │   │⇐ ││ Y│   │ X₀               │          │
│  └──────────────┘   └──┘└──┘   ├──────────────────┤          │
│  ┌──────────────┐   ┌──┐┌──┐   │ Y₀               │          │
│  │              │   │⇐ ││ Z│   ├──────────────────┤          │
│  └──────────────┘   └──┘└──┘   │ Z₀               │          │
│                                └──────────────────┘          │
└─────────────────────────────────────────────────────────────┘
```

10, starting point of importation, by ⌈ent⌉

Steps

```
┌─────────────────────┐  ┌───┐  ┌──────────────────┐
│                     │  │ ⇦ X│  │ SmoothR  setup   │
├─────────────────────┤  ├───┤  │ Input Incept Ang │
│         15.000      │  │ ⇦ Y│  │  ┌──┐            │
├─────────────────────┤  ├───┤  │  │X₀│            │
│                     │  │ ⇦ Z│  │  └──┘            │
└─────────────────────┘  └───┘  │  ┌──┐            │
                                │  │Y₀│            │
                                │  └──┘            │
                                │  ┌──┐            │
                                │  │Z₀│            │
                                │  └──┘            │
                                └──────────────────┘
```

The starting point of the original settings

```
      ┌─────────────────────┐  ┌───┐  ┌──────────────────┐
      │                     │  │ ⇦ X│  │ SmoothR  setup   │
      ├─────────────────────┤  ├───┤  │ Input Incept Ang │
      │          0.000      │  │ ⇦ Y│  │  ┌──┐            │
      ├─────────────────────┤  ├───┤  │  │X₀│            │
      │                     │  │ ⇦ Z│  │  └──┘            │
      └─────────────────────┘  └───┘  │  ┌──┐            │
                                      │  │Y₀│            │
                                      │  └──┘            │
                                      │  ┌──┐            │
                                      │  │Z₀│            │
                                      │  └──┘            │
                                      └──────────────────┘
```

11, the end point of input by $\boxed{\text{ent}}$

```
┌─────────────────────┐  ┌───┐  ┌───────────────────┐
│                     │  │ ⇦ X│  │ SmoothR  setup    │
├─────────────────────┤  ├───┤  │ Input The Eng Angle│
│        320.000      │  │ ⇦ Y│  │  ┌──┐             │
├─────────────────────┤  ├───┤  │  │X₀│             │
│                     │  │ ⇦ Z│  │  └──┘             │
└─────────────────────┘  └───┘  │  ┌──┐             │
                                │  │Y₀│             │
                                │  └──┘             │
                                │  ┌──┐             │
                                │  │Z₀│             │
                                │  └──┘             │
                                └───────────────────┘
```

The end point of the original settings

```
      ┌─────────────────────┐  ┌───┐  ┌───────────────────┐
      │                     │  │ ⇦ X│  │ SmoothR  setup    │
      ├─────────────────────┤  ├───┤  │ Input The Eng Angle│
      │        360.000      │  │ ⇦ Y│  │  ┌──┐             │
      ├─────────────────────┤  ├───┤  │  │X₀│             │
      │                     │  │ ⇦ Z│  │  └──┘             │
      └─────────────────────┘  └───┘  │  ┌──┐             │
                                      │  │Y₀│             │
                                      │  └──┘             │
                                      │  ┌──┐             │
                                      │  │Z₀│             │
                                      │  └──┘             │
                                      └───────────────────┘
```

12,such as liquid crystal display

− 45.000	⇦ X	Circle process
		Sequence NO: 1
− 30.000	⇦ Y	$X_\circ$
0.000	⇦ Z	$Y_\circ$
		$Z_\circ$

13, will show zero-axis machine tools. R which is the starting point

for processing. By ⬇ display a processing point. Machine Tool Show then moved to zero axis. Repeat operations to complete all processing is completed processing.

◺ Slant processing

Features: few tips to provide a significant slope processing automatically calculate processing function, the operator can type the following parameters
Plane processing options (XY, YZ, for the slant processing XZ plane)

Slant angle (in the XY plane and the X-axis slant that positive angle in the YZ plane with the Y-axis slant that positive angle)

	⇦ X	Bevel Setup
		Input Bevel Arc.....
30.000	⇦ Y	$X_\circ$
	⇦ Z	$Y_\circ$
		$Z_\circ$

Each processing slant length
After several significant input parameters Table hypotenuse will be automatically calculate the location of each point, the operator by

⬆ or ⬇ option processing serial number, and then turning tool processing to the two axes of the plane showed that the value of 0.000 for all locations
Example: processing as shown slant AB, parameter settings are as

```
                                            ┌──── 25 ────┐
                                                      B
    follows
    Plane Processing: XZ                ◢▨▨    45°         25
                                               A
    Slant angle: 450

    Each processing slant length: 1.2 mm
```
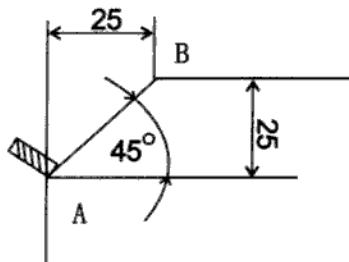
Steps

1, machine tool spindle tilt table 450, rocking machine processing
workstations at the slant-A start, the X-axis cleared, Z-axis

cleared. In the normal display by $\boxed{X_o}$ $\boxed{Z_o}$

```
┌─────────────────────┬─────┬──────────────────────┐
│           0.000     │ ⇦ X │ ABS absolute          │
├─────────────────────┼─────┤                       │
│           0.000     │ ⇦ Y │      ┌────┐            │
├─────────────────────┼─────┤      │ X_o│            │
│           0.000     │ ⇦ Z │      ├────┤            │
│                     │     │      │ Y_o│            │
│                     │     │      ├────┤            │
│                     │     │      │ Z_o│            │
└─────────────────────┴─────┴──────┴────┴───────────┘
```
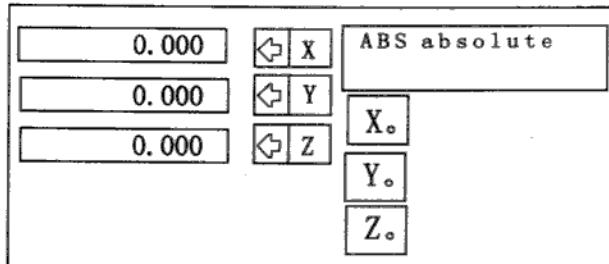
2, by $\boxed{◪}$ processing functions will be inclined to enter parameter

input, processing by the state directly to $\boxed{\text{ent}}$
   ABS absolute
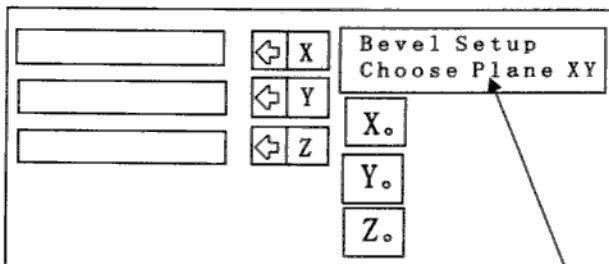
```
┌─────────────────────┬─────┬──────────────────────┐
│                     │ ⇦ X │ Bevel Setup           │
├─────────────────────┼─────┤ Choose Plane XY       │
│                     │ ⇦ Y │      ┌────┐            │
├─────────────────────┼─────┤      │ X_o│            │
│                     │ ⇦ Z │      ├────┤            │
│                     │     │      │ Y_o│            │
│                     │     │      ├────┤            │
│                     │     │      │ Z_o│            │
└─────────────────────┴─────┴──────┴────┴───────────┘
```

                     The original settings plane processing

3, the processing of choice

[←|Z] by [ent] and then choose XZ plane to enter the next step
"input bevel angle"

Note: XY plane by [←|X] choice

YZ plane by [←|Y] choice

XZ plane by [←|Z] choice

```
┌──────────────┐  [←|X]  ┌─────────────────┐
│              │         │ Bevel Setup     │
├──────────────┤  [←|Y]  │ Choose Plane zx │
│              │         │   ┌─────┐       │
├──────────────┤  [←|Z]  │   │ X。 │       │
│              │         │   ├─────┤       │
└──────────────┘         │   │ Y。 │       │
                         │   ├─────┤       │
                         │   │ Z。 │       │
                         └─────────────────┘
```

4, slope angle input
 Deputy window display "Please enter slant angle .." Y-axis settings

of the original slant angle. Press [4] [5] [ent]

```
┌──────────────┐  [←|X]  ┌─────────────────┐
│              │         │ Bevel   Setup   │
├──────────────┤  [←|Y]  │ Input Bevel Arc.....│
│    20.000    │         │   ┌─────┐       │
├──────────────┤  [←|Z]  │   │ X。 │       │
│              │         │   ├─────┤       │
└──────────────┘         │   │ Y。 │       │
                         │   ├─────┤       │
                         │   │ Z。 │       │
                         └─────────────────┘
```

The slant angle of the original settings

```
┌──────────────┐  [←|X]  ┌─────────────────┐
│              │         │ Bevel   Setup   │
├──────────────┤  [←|Y]  │ Input Bevel Arc.....│
│      45      │         │   ┌─────┐       │
├──────────────┤  [←|Z]  │   │ X。 │       │
│              │         │   ├─────┤       │
└──────────────┘         │   │ Y。 │       │
                         │   ├─────┤       │
                         │   │ Z。 │       │
                         └─────────────────┘
```

 5, each input processing slant length
Deputy window display the "Z-axis stepper type of" Y-axis stepper

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set by the original volume.

Press ⬜1 ⬜• ⬜2 ⬜ent

		⬅ X	Bevel Setup
			Input Bevel .....
0. 300		⬅ Y	X_o
		⬅ Z	Y_o
			Z_o
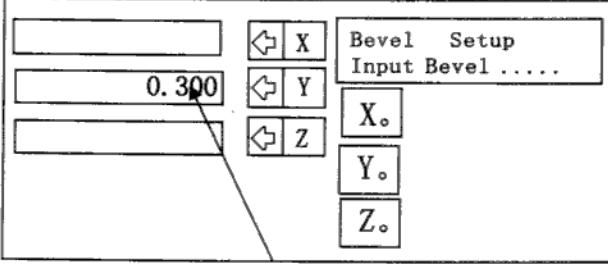
Stepping of the original settings

		⬅ X	Bevel Setup
			Input Bevel .....
1. 200		⬅ Y	X_o
		⬅ Z	Y_o
			Z_o
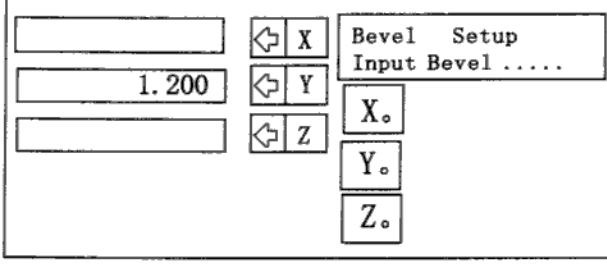
6, processing slant

Deputy display window "processing No. 1" to the X-axis lathe tool

processing, and Z-axis showed that the first point 0.000 processing

completed by ⬇ under then processing point

7, at ⬆ or ⬇ in the switch between the points

8, processing has been completed, showed that by ◪ the state to

return to normal

Use only the processing of input can be processed

Example: processing – a depth of 10 mm in parts:

1, the copper surface after the collision in the Z-axis cleared

EDM ⟶ Workpiece ⟶ $Z_\circ$

0.000	◁ X	Operating EDM	
0.000	◁ Y	$X_\circ$	
0.000	◁ Z	$Y_\circ$	
		$Z_\circ$	
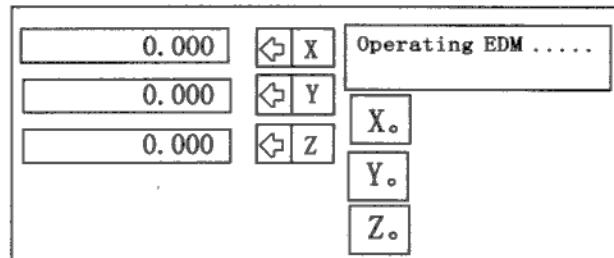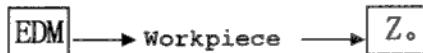
2, EDM by entering EDM functions

1.000	◁ X	Operating EDM	
0.000	◁ Y	$X_\circ$	
0.000	◁ Z	$Y_\circ$	
		$Z_\circ$	
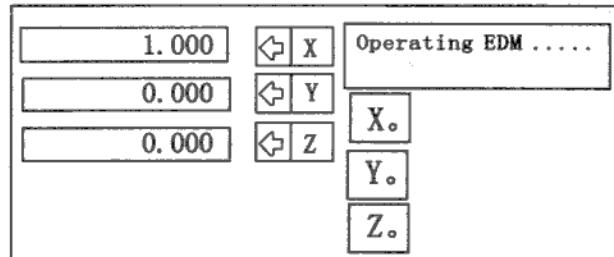
3, the depth of insertion 10

Press $\boxed{1}$ $\boxed{0}$ ⟶ ent

10.000	◁ X	Operating EDM	
0.000	◁ Y	$X_\circ$	
0.000	◁ Z	$Y_\circ$	
		$Z_\circ$	
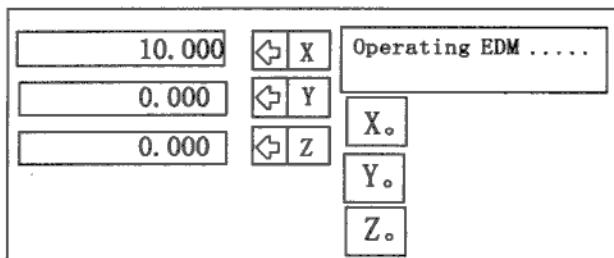
Upon completion of the above steps can be EDM. Processing place, protecting the auxiliary show at this time to withdraw from the EDM,

according to EDM can be

10.000	◁ X	EDM finished!
10.000	◁ Y	X_0
10.000	◁ Z	Y_0
		Z_0
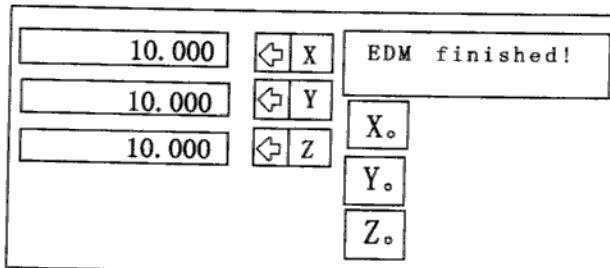
Note:

In the second step, if the X-axis no data (shown as 0.000), show support for the "EDM machining finished", can not be placed at the depth of need in the Z-axis EDM not cleared before entering, the Home a depth of the Z and then to operate.

EDM functions output wiring
to provide a significant number of EDM specific features when the copper electrode has reached the depth of user settings,

digital display table in the relay switch signal will be issued, EDM machine will stop.

Connection of single-outputicon

digital display table back a DB9 socket, the socket is the digital output output table EDM relay at the wiring.
Wiring pin and methods are as follows:

(Yellow) (red) (black)
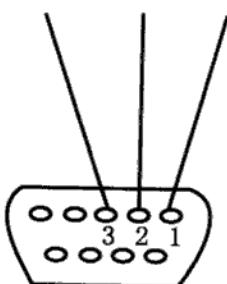
To process with the "closed" in place of "open" access: 2 and 3 feet (normally closed) to the process as "open" in place of "closure" to:
1 to 2 feet (normally open) often open to the general control.
Note: the carton configuration of an output control.

A plus or minus direction switch

Features: You can fine-tuning the direction of the axis of plus or minus

Example: by [≡] button to enter the parameter settings

By [⇩] to the "X-axis count switching positive", and then switch

the direction of [ent]

By [⇩] can choose Z-axis or Y-axis direction switch completed

By [ce] exit

Second, SDM coordinates input mode switch
After entering the basic parameters, according to the [⇧] [⇩] choice "SDM coordinates input mode switching," and then switch [ent]

When SDM model "0", input data for the actual value
When SDM model for the "1", contrary to input data for a few

Advanced users

One、Advanced users settings

1、Enter the parameters set by, [≡]   [⇩]   according to the choice of "internal Preferences"

2、And then [ent] the right of the LCD window will show "Password: "

3、input Password [3] [2] [1] [1]

Two、Resolution settings
After entering advanced users based on user configuration requirements from the production home settings, users must not lose chaos on chaos, otherwise prevented normal use. Functional disorder caused by the software must be sent back to the manufacturers to set up, otherwise no warranty.

1, in the senior user settings, the LCD window on [Setup parse / PRess UP or DOWN] [ent]
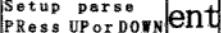
tips   enter resolution settings, and our digital form can be carried out separately for each axis resolution settings.

Steps

2, when entering resolution settings, the X, Y-axis show such as "0.00500." At this time by $\boxed{\Leftarrow}$$\boxed{X}$ the X-axis display window flashes on $\boxed{\Uparrow}$ or $\boxed{\Downarrow}$ bond cycle choose a different resolution, and then the resolution of the current $\boxed{ent}$ selected. Showing no window immediately, it means that the action has been completed.

Note: If you would like to set up three-axis resolution, select a shaft after not directly by $\boxed{ent}$, but that on-demand changes in the resolution of several key axis of the home such as $\boxed{\Leftarrow}$$\boxed{Y}$

3, linear compensation

Features: tips provide linear compensation, in accordance with the actual value of the processing and observation of the error between the value of compensation amendments.

4, restore factory settings.

Show resumed factory settings, according to $\boxed{ent}$ key Chinese Show: "Please wait initialization started......" and wait for a few seconds after the resumption of liquid crystal display "button on ENT restore settings," saying that this has been completed factory settings.

Grating linear displacement sensor

1, Overview

GXF-grating linear displacement sensor for various models of the machine tool table linear displacement measurement, the precision optical grating that it has been lost for the accuracy of the accuracy of the old machine table, transformation of practical significance, the new machine worktable supporting the use of, in terms of improving production efficiency machining accuracy or all the great advantages.

GXF sensor structure is simple, compact, stable performance, reliable, easy installation, it will certainly promote the use of technology will bring about benefits, economic and social benefits.

2, Technical Specifications

Sensor Model: GXF

Grating Ceju: 20 μ m

Resolution: 5 μ m

Accuracy: ± 3 μ m (L <200m)

± 8 μ m (200mm <L <500mm)

± 15 μ m (500mm <L <1000mm)

Repeatability: ± 5 μ m

The pace of work: not less than 25 m / min

Output waveform: two square Road

Zero Pulse: Pulse is

Operating voltage: +5 V / +12 V

The effective length: Le = 100mm ~ 1000mm (one stall per 50 mm)

Dimensions: 28mm × 58mm (Le +144) mm (including the first reading)

Weight: (0.5 × Le +0.00123) Kg

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Work Humidity: 00 ~ 400

3, the installation of digital systems

1), the preparatory work before installation

According to install a machine table position, direction, choose to install the base surface. Machine table with the two-way parallel track error should be less than 0.1 mm, then the vertical surface on the installation of 6 mm deep and M5 and M6 of the two 8 mm deep FORM, the two hole spacing and installation map shown in the table below.

2), installation requirements:

A select few in the installation location and direction, it is necessary to observe the user to display data, and user functions.

B, in order to prevent oil, water, dust, iron filings, and other deposition, sensors to flip, when the modification of the machine table, and have the best shield.

C, in accordance with the requirements of machine tool table, cable leads to swap about the need direction, it must not adjusted before installation to prevent or at the scene pack Rafah power cable.

3), installation method and adjustment

A mechanical part:

According to the installation plans and table size installation, calibration requirements to use Dial Gauge Sensor shell to guide parallel with the machine table (not more than 0.1 mm), then fastening the two ends of the sensor M5 screw fastening later check with Dial Indicator again, and another two readings M5 screw fastener head, dropping positioning blocks, and then the sensor cables plug socket connecting several significant Table, Table was opened several power switches, digital time of counting clear and bright, counting signal stability, and can work, in order to prevent damage sensor, and if the machine table to effectively than sensors measuring length, should be pre-installed Limit block.

B, electrical parts:

Grating Sensors installed, as required, to be part of the high-speed electrical plugs pin function, the sensor voltage +12 V or +5 V, if the user with the use of digital production companies in the electricity table before check the output voltage digital Table it meets the

requirements, as well as plugs on its feet with. Table closed several significant power will be significantly behind few pLugs into a socket, it should be noted at the outlet plugs will be after positioning, then plugs and sockets nut tightening then opened several significant power table, shaking table corresponding coordinates machine Guides, several significant scale should count.

4, repair and maintenance of the sensors:

1), sensors and digital form should be placed on drying and humidity to the location.

2), the sensor should be self-protective shell used to avoid affecting the dirt splash.

3), leads the cable should have fixed the machine tool bed.

4), the use of sensors in the process, not arbitrary demolition.

5), due to a processing machine vibration table, attention should be fixed installation connecting screws tight to prevent loosening and avoid lost accuracy.

6), a day before to work outside the iron filings or sensor coolant cleaning clean, not with guns blowing wind sensor sealant, dirt or so iron filings into the life and impact sensor.

5, and product warranty period of custody:

1), the product should be stored in the following conditions:
A, Environment Temperature: -600 C to-400C

B, the relative temperature: <90%

C, no corrosive gases around

2), in compliance with the custody of users, installation, the use of the provisions of circumstances, if a shipment from the factory products because of poor manufacturing or damage occurred not work, the manufacturing plant for free repair and replacement users, or users over time causes damage. Factory appropriate charge, as the case replacement parts and maintenance costs, if

The factory door repair services, the costs should be charged appropriately.

Grating itineraries and linear displacement sensor installation Size

Le:mm	L1:mm	L2:mm
100	239	221
150	289	271
200	339	321
250	389	371
300	439	421
350	489	471
400	539	521
450	589	571
500	639	621
550	689	671
600	739	721
650	789	771
700	839	821
750	889	871
800	939	921
850	989	971
900	1039	1021
950	1089	1071
1000	1139	1121

Diagram showing the installation

Pic1

L1

L2

18

18

25

51.5

34.5

46.5

1±0.5

23.5

59

79

Pic2

Straight

Vertical

Fault	Analyze the causes	Approach
Do not show	1, missed good power 2, a tributary of 110 V power supply voltage is not within the scope of ~ 220V	1, power line inspection plug and socket Interpolation is strong, whether good contact. 2, inspection of a significant form of insurance is good. 3, tests whether the input voltage 110 V ~ 220V range.
Shell Charged	1, grounding bad 2,220 V power leakage	1, machine tool bed with a few significant leader Connectivity, and power requirements of the earth The same. 2, machine Chuangjiao such as plastic mats, the ground power supply must be linked to good ground, or else they affect low-voltage power supply of sensors operating inconvenient. 3 220 V power leakage, speed electrician requested formal inspection, there are still problems such as Please contact with the manufacturers of the service. 4, please do not access FireWire 380 V Power Zone, to avoid burn a few significant power or form factors of insecurity, affecting the operator's personal safety.
Axis showed a value of twice the normal	1, optical grating resolution settings incorrect 2, a set-axis diameter display mode	1, set the correct resolution 2, the radius pattern display settings

Fault	Analyze the causes	Approach
X, Y window display confusion, numerical No laws, inaccurate	Table may be in power a few bad contact, Affected by the power disruption	1, a few tables in the power-down and then re-opened, a few significant forms can be automatically scans of their own-one. 2, if the first step is not operating the trip, please refer to the specification of-way. 3, if the next step is still unable to rule out the possibility of the service, please contact manufacturers.
Table axis of a significant number do not count	1, grating-foot table with several significant contact is good. 2, no grating signal output device. 3, check optical grating-foot body, feet first is the normal installation, whether users limit themselves demolished, rendering the first reading by ultra-foot trip Penghuai body. 4, a few tables in the axis counting problems.	Another axis grating and see whether they can change their normal count, if transplanted to normal after a device is the root counting device malfunction. Customers are requested to speed the above issues and service companies associated with the Department.

Table count several significant errors that distance and the actual distance inconsistent	1, machine tool accuracy Guide bad.	1, maintenance or transfer Machine Tool Guide is space.
	2, machine tool running too fast.	2, reducing the speed.
	3, sub-grating device installation requirements of the parallel device did not adjust well, whether on Connecting Plate ministries firmly installed.	3, reload grating feet firmly ministries to install on Connecting Plate.
	4, the grating set foot resolution inconsistent with the actual resolution.	4, set the correct resolution.
	5, linear error compensation value is not set up correctly.	5, set the correct value of the linear error compensation.
	6, grating bad feet, and missed a few.	6, repair or replacement of optical grating.