JET

DRO	3-Dxis Digital Read Out

Operating Instructions
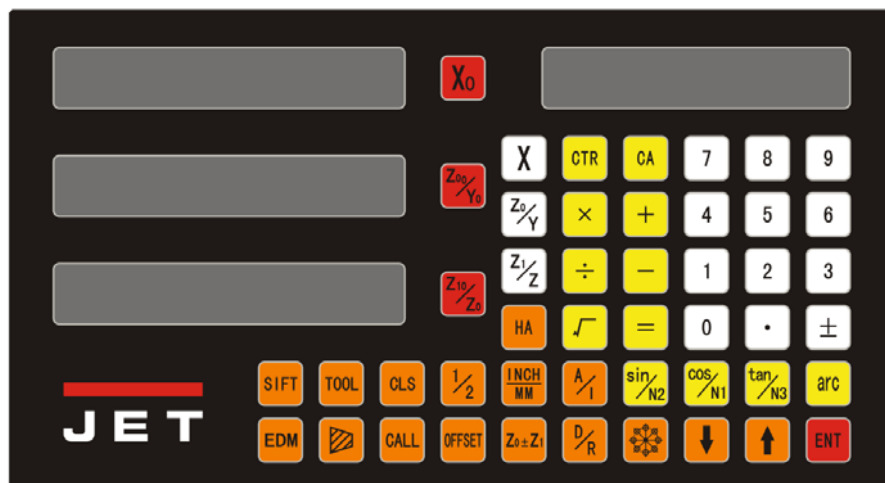
CE

CE-Conformity Declaration
CE-Konformitätserklärung
Déclaration de Conformité CE

Product / Produkt / Produit:
Digital Read Out

DRO Combi-Rite

Brand / Marke / Marque:

JET

Manufacturer / Hersteller / Fabricant:
JPW (Tool) AG, Tämperlistrasse 5, CH-8117 Fällanden
Schweiz / Suisse / Switzerland

We hereby declare that this product complies with the regulations
Wir erklären hiermit, dass dieses Produkt der folgenden Richtlinie entspricht
Par la présente, nous déclarons que ce produit correspond aux directives suivantes

2006/42/EC
Machinery Directive
Maschinenrichtlinie
Directive Machines

designed in consideration of the standards
und entsprechend folgender zusätzlicher Normen entwickelt wurde
et été développé dans le respect des normes complémentaires suivantes

EN 60204-1:2006

Responsible for the Documentation / Dokumentations-Verantwortung / Responsabilité de Documentation:

Hansjörg Meier

Head Product-Mgmt. / Leiter Produkt-Mgmt. / Resp. Gestion des Produits
JPW (Tool) AG

2017-07-01 Alain Schmid, General Manager

JPW (Tool) AG, Tämperlistrasse 5, CH-8117 Fällanden
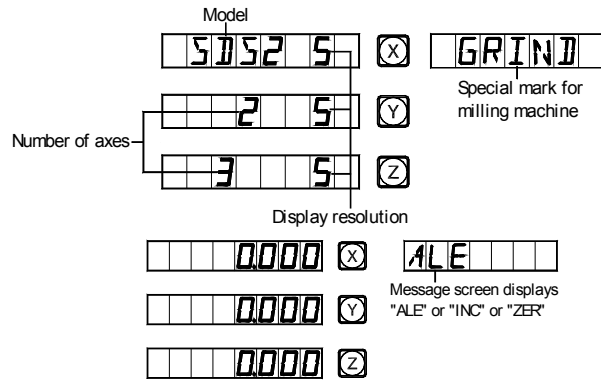Schweiz / Suisse / Switzerland

A. Basic Functions

I. Usage

1. Start, Self check

1) Selecting the power voltage,
switching the power on

2) Self check of the DRO

3) Self check finished,
enter working mode

Note: The lathe machine readout display "LATHE";

Model

```
5D52 5   (X)   GRIND
     2 5   (Y)
     3 5   (Z)
```

Special mark for milling machine

Number of axes

Display resolution

```
0.000  (X)   ALE
0.000  (Y)
0.000  (Z)
```

Message screen displays "ALE" or "INC" or "ZER"

2. Setting of System

After power on, and the digital displayer displays the digits, it is available to enter into the setting of system by keying ⟨·⟩ in 3 seconds.

1) Setting axis X resolution.
   Selecting a different resolution by keying a corresponding number
   Please refer to fig. 1 for the relations between number key and resolution.
   Key⟨⇩⟩, next step

```
5 (X)   X RESLN
```

2) Setting axis Y resolution.
   setting the Y axis and Z axis resolution is the same as setting the X axis resolution method
   Key⟨⇩⟩, next step

Fig. 1: Relations between Number key and Resolution

Number key	0	1	2	5	7	8	9
Resolution(um)	10	1	2	5	0.1	0.2	0.5

3) Setting counting direction of axis X linear encoder.
   Key⟨0⟩ and⟨1⟩ to convert the count direction.
   Key⟨⇩⟩, next step

```
0 (X)   X DIR
```

4)Set the Y axis, the Z axis, and the grating counter count in the same direction as the X axis
   Key⟨⇩⟩, next step

Note: "0" and "1" do not represent the positive and negative direction of machine tool, they are only used for converting the counting direction.

5) Choose machine type
SDS6-3V readout：
   ⟨0⟩ multifunctional milling machine digital readout
   ⟨1⟩ universal milling machine digital readout
   ⟨2⟩ discharging processing digital readout
   ⟨3⟩ lathe machine digital readout

```
MIIL_MS
MIIL_M
EDM
LATHE
```

6) Choose whether integrated display Y-axis with Z-axis
   Press ⟨0⟩ or⟨1⟩ can realize the conversion
   "NONE" means no integration

```
NONE

INGREAT
```

"INGREAT" means integration and the integrated value displays in Y-axis LED.

Press ⬇, next step

Note: only 3 axis lathe machine has this function.

7) Choose Segmented compensation function and linear compensation function

Press ⓪ choose linear compensation function "LINEAR"; `LINEAR`

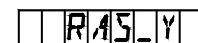Press ① choose Segmented error compensation "SEGMENT"; `SEGMENT`

Press ⬇，next step

8) Choose linear axis display and angle axis display, setting methods are：

① Press ⓪ to choose linear axis display function"RAS_X" `RAS_X`
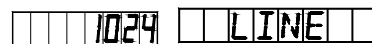
Press ⬇, next step, enter into Y axis display. `RAS_Y`
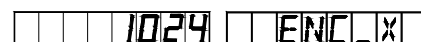
② Press ① to choose angle axis display function"ENC_X" `ENC_X`
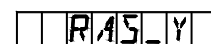
Press ᴇɴᴛ, input number of encoder lines `1024  LINE`

Press ᴇɴᴛ `1024  ENC_X`

Press ⬇ , next step, enter into Y axis display. `RAS_Y`

Select and set Y axis and Z axis display with the same method

Notes: angle display is available for minutes and seconds display as well as decimal display, press ⊕ to convert the display type under the general mode, angle display take priority if choose inch mode under angle display. The angle display values are calculated cyclically from 0-360 degree.

9) Setting the display brightness

Message screen displays"LIGHT", setting a different brightness according to a different digit key

Digit key	0	1	2	3	4	5	6	7
brightness	1 level	2 level	3 level	4 level	5 level	6 level	7 level	8 level

Key ᴇɴᴛ → ⬇ next step

10) Self test.

Key ⬇ twice, the Self-test program started `⊗ TESTOFF`

then ⊙ key to quit. Key ⬇ is also available to quit.

3. Returning the displayed Value to zero

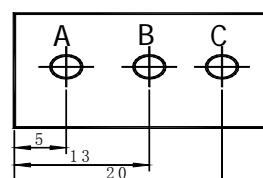1) It is possible to return to zero at any point, take the example of X axis display. `1234565 ⊗`

2) Key ⊗ → ᴄʟꜱ `0.000 ⊗`

3) Key X₀ to clear the value, and key X₀ again to return the value

4. Presetting data

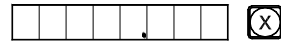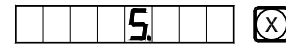1) As shown in the figure, after the processing

3

of Hole A finished, the position of the
working piece has been adjusted, Hole B is to be processed.

2) Align the Tool with Hole A.

3) Select the key for axis, key ⊠.

4) Key ⑤, Enter the value(If the entered value
   is wrong, key ⊠ and enter the correct one
   again)

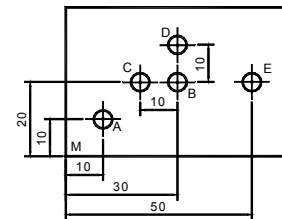5) Key ⊕, (If any mistake is found now, repeat
   steps 3~5).

6) Move the machine table to the position
   of 13, and the processing at Point B can
   start.

5. Absolute/relative/user coordinate display mode.

Key ⬆ ⬇ , the absolute/relative display mode will convert one the other.

Note: The resetting in the absolute and the relative display mode must be done separately. In absolute display mode, "ALE" is displayed on Message Screen. It is in relative display mode when "INC" is display Message Screen.

Keying ⬆, ⬇ can also realize the conversion between the two display mode, and it is also possible to enter the display mode of 200 sets of user coordinates, as shown in the following circulating schematic diagram.
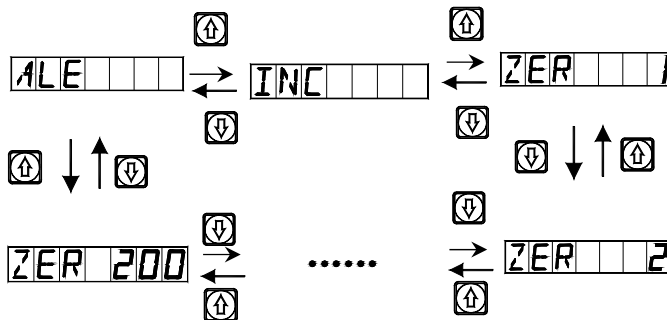
6. ⍟ key display

As shown in the figure, the enter
between two points is to be found.
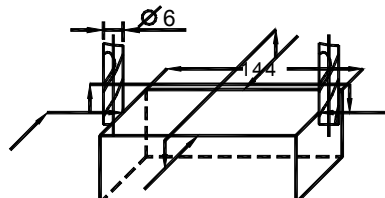
1) Let the tool touch the one edges of the
working piece and Return the X-axis displayed Value to zero, then move the tool along the direction of arrow and let it come
to touch the other edges of the working piece, then do the next step can determine the center position.

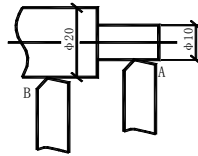2) Key axis key ⊠

3) Key ⍟

4) Move the machine tool to bring the

axis displayed value into zero, and

the center position is reached.

(in the same method can determine the center positions of Y-axis and Z-axis).

7."R/D" (Radius/Diameter) Switch Display.

X axis datum on the center line.

1)Cutting tool in place A.

2)Key [D/R]

3)Move the cutting tool to place B.

4)Key [D/R]

```
|     5.000 (X)
|    10.000 (X)
|    20.000 (X)
|    10.000 (X)
```

Notes：The machine type is only available for JET lathe digital display；Y、Z axis is not able to display so.

8. The switch of the summing axis value displaying type.

In the function of Y, Z axis summing display and separate display,

press [Z±Z] can switch the display mode.

1) If the former display mode is summing,

press[Z±Z] to switch to separate display mode.

2) press[Z±Z]，Information screen display"NONE"

3) Return to the summing display mode

press[Z±Z]，Information screen display"INGREAT"

```
|   20.000 (Y)
|   10.000 (Z)
|   10.000 (Y)
|   10.000 (Z)
|   20.000 (Y)
|   10.000 (Z)
```

Notes：The machine type is only available for JET lathe digital display；the Z axis only displays the digital value, and can't be preset value or clear.

9. "M/I" (The mm System/inch System) Conversion Display.

Key [M/I], the size displayed in the mm System/inch system will convert one to the other.
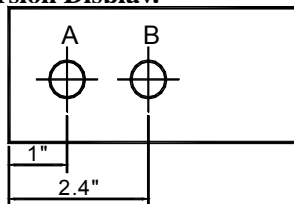
1) The original display is in the mm system, and the display in inch is desired.

2) Key [M/I] to convert inch display

3) Key [↓] or[↑] choose the bits of decimal; （4 bits or 5bits）

Key [ENT]

4) Move the working table to Hole B

5) Enter processing mode of Hole B

6) Key [M/I] can convert directly to mm System

```
|    25.400 (X)
| MORI  5
|   1.00000 (X)
|   2.40000 (X)
|    60.960 (X)
```

10. Segmented error compensation

Notes: only in Metric system can do Segmented error compensation . After Segmented error compensation, the display can be converted freely between Metric system and Imperial system.

There are two methods for Segmented error compensation of the digital display meter:

1. To carry out error compensation taking the start point as the mechanical origin. (Figure 1)

2. To carry out error compensation taking the 1st absolute zero of the raster ruler as the mechanical origin. (Figure 2)

(Figure 1)

(Figure 2)
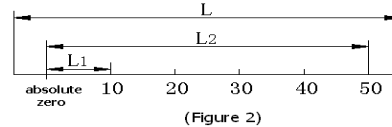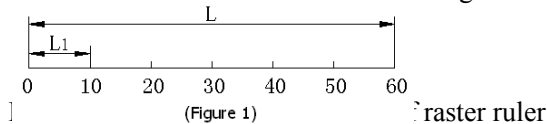
raster ruler

L1: Length of the compensation segment

L2: Effective distance of the compensation segment

1. The parameter set-up method is as follows: (the operation methods of Y-axis and Z-axis are the same as X-axis）。

1) Move the raster ruler to the smallest end of
the coordinate, and enter into "ALE" right-angle coordinate system.

`0000 ⊠ ALE`
`0000 ⊙`

2) Press ⓧ → ⚙ enter into the input function of multi-segment compensation of X axis

3) Set the segment compensation

1. FIND_ZE

`FIND_ZE`

(Find only the reference point, it needs to find the reference point after the set of segment compensation)

Press ⬇, convert

2. SET_SEG

`SET_SEG`

(segment error compensation), Press ⒺⓃⓉ , next step

Remarks: both of the two modes enter into the finding of the mechanical origin, only the segmented compensation can enter into the compensation interface after find the reference point

4）Find the mechanical origin

There are two methods for setting the compensation origin, `LEF_ZER`
after the machine origin interface is confirmed..

1. press ⒺⓃⓉ to choose the current position as origin, and directly enter into the set of step 5 compensation,

2. Press ⒽⒶ → ⒺⓃⓉ to choose the 1st absolute zero of the raster ruler as the mechanical origin. `ABS_ZER`
`RESET_X`

Move towards the positive direction of X axis of the machine tool and search for the 1st absolute zero of the raster ruler as the mechanical origin. After find the origin, then auto enter the next step for data input. This time the X-axis displays the raster ruler fact value, and Y-axis displays the empty compensation value(if the readout is first compensated, the Y-axis display a uncertain value).

5) Input the compensation setup of the 1st segment, At
this time, firstly move the X-axis raster ruler towards

the positive direction.

`9995 ⊠ NO i`
`9995 ⊙`

When the raster ruler is moved close to the compensation value

Press ⓨ → ① → ⓪ → ⒺⓃⓉ

6

(When press ⌨(ENT) ,Y-axis will displays the X-axis's value, and that means the compensation value has been setup. If the value input is wrong, don't move the raster ruler, and press⌨(↑), then press ⌨(↓) , this time the digit-display LED of Y-axis will be in input state, and input the right value again.）

Press⌨(↓), and enter into the next set-up point

Remarks: In this function, the display of X axis is the coordinate value, while Y axis

displays the standard value or the measurement value by laser

coordinate value

□□□□□□□□ Ⓧ

□□□□□□□□ Ⓨ

The standard value or the
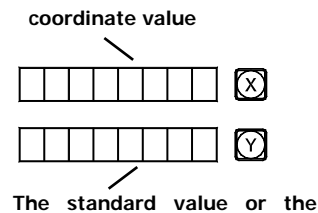
6) Input the compensation setup of the 2nd segment

Press Ⓨ → ②→ ⓪→ ⌨(ENT)

□□□□19985 Ⓧ □NO□□□2

□□□□19985 Ⓨ

Press ⌨(↓) , enter into the next set-up point

7) Input the compensation setup of the 3rd segment

Press Ⓨ → ③→ ⓪→ ⌨(ENT)

□□□30011 Ⓧ □NO□□□3

□□□30011 Ⓨ

Press⌨(↓) , and enter into the next set-up point

8) Input the compensation setup of the 4th segment

Press Ⓨ → ④→ ⓪→ ⌨(ENT)

□□□40001 Ⓧ □NO□□□4

□□□40001 Ⓨ

Press ⌨(↓) , and enter into the next set-up point

9) Input the compensation setup of the 5th segment

Press Ⓨ → ⑤→ ⓪→ ⌨(ENT)

□□□50051 Ⓧ □NO□□□5

□□□50051 Ⓨ

Press⌨(↓) , and enter into the next set-up point

10) Input the compensation setup of the 6th segment

Press Ⓨ → ⑥→ ⓪→ ⌨(ENT)

□□□60060 Ⓧ □NO□□□6

□□□60060 Ⓨ

After the setup is finished, press ⌨ key to exit.

2. The cancellation method of Segmented compensation value

The Segmented compensation value is only aimed at the digital readout, raster ruler and machine tool set up together. If the raster ruler or digital readout whose Segmented compensation value is set up in a machine tool is moved to another machine tool, the Segmented compensation value needs to be reset. When the Segmented compensation function is not needed, the Segmented compensation value is to be canceled. The cancellation method is:

Enter into the set of Segmented compensation, and press ⌨ to quit to cancel the former set compensation value when entering into the compensation value input page.

3. Methods of finding mechanical origin

If there is power off when the raster ruler is moving, or the rater ruler is moved before the power is on, after re-start, the mechanical origin needs to be found again. Because of the movement in power off or before power on, the coordinate origin of the machine tool can not match the value in the digit display meter. If the mechanical origin is not found, the misplaced relationship is brought into the later user coordinate system. As when calculating the user coordinate, the Segmented compensation value is found according to the wrong mechanical coordinate, thus there will be big error of the

displayed coordinate.

The method of finding mechanical origin is as follows:

1. Move the raster ruler to the position which is initially set up as the mechanical origin, and then enter into the select page of Segmented compensation. Choose FIND_ZE and press [ENT] to the interface for choosing compensation method, press [ENT], the interior of digit display meter handles automatically. At this time, finish finding the mechanical origin and quit the absolute coordinate system automatically.

2. Firstly move the raster ruler to the smallest value, and enter into the Segmented compensation page, choose FIND_ZE, press [ENT] to enter into the interface for choosing compensation method, press [HA] → [ENT]

Enter X axis to find the status of absolute zero. Move the raster ruler towards the positive direction. When the absolute zero is found, it is the mechanical origin. Automatically back to absolute coordinate system after above finished.

Advise: find the mechanical origin before start work after power on to assure the coordinate origin of the machine tool can match the value in the digit display meter.

11. Linear Error Compensation

The linear error compensation function is used to make the linear correction of the system error of the grating metering system.

Correction factor $S = (L-L')/(L/1000)$ mm/m

L---the actually metered length (mm)

L'---the displayed value on digital display meter (mm)

S---the actually factor (mm/m), "+" symbol means the actual length is larger, and "-" symbol means the actual length is smaller.

Compensation range: -1.500 mm/m～+1.500 mm/m

Example: The Actual metered length of the machine tool machine table is 1000 mm, and the display value on the digital display meter is 999.98 mm.

S=(1000-999.98)/(1000/1000)=0.02 mm/m

1) Select the axis [X]

2) Key [%]

$$\boxed{0500}\ \boxed{X}\ \boxed{COPEN\_X}$$

modificatory coefficient used
last time

3) Key the new correction factor in:

[0] → [·] → [0] → [2]

$$\boxed{0020}\ \boxed{X}\ \boxed{COPEN\_X}$$

4) Key [ENT]

Note: The linear error compensation can only be carried in absolute display mode (the message screen displays ALE) and metric system；

12. Power Interruption Memory

During the processing of a working piece, there may occur power interruptions or needed temporary turnoffs, the digital display box will automatically store the working state (such as the working mode in every axis, displayed data and the linear

error compensation factor) just before every interruption event in its memory. Every time when the machine is turn on again, the digital display box will recover to its working state just before the interruption event after self checking, and the valve just before the interruption (turn off) event will recover, and the processing will continue.

13. Sleep Switch

The switch on the back panel of the digital display box may once be turned off during the processing of a working piece. It is true that the SDS Series digital box has its interruption memory, but the machine tool may have been moved after the event. In such a case, when the machine is turned on again, the working state just before the interruption event will be displayed again, but this is not the actual new situation. If the operator want to suspend the processing for his (her) rest time or any time he (she) is occupied by other thing, the sleep switch can be used to avoid the above mentioned situation.

In not ALE working state, if there a need of Sleep Switch Off, key ⬛, the digital display box will turn off the display. When restarting the processing, key ⬛, and the box will turn on all the display. No matter how the machine tool was moved after the display had been turned off, the box will "see" and "keep in mind" the end state after the machine tool have been moved. When the display has been turned on again, the displayed working state will be the actual state.

Note: When the sleep switch has been turned off, the digital display box is not really in the turnoff sate; if the power switch on the back panel of the box has been turned off, the sleep switch losses its function.

B.PCD Circle Equally Dividing Holes
(Be the same with: MIIL_MS)

Circular arc equally Dividing Function(PCD Function)

This function may be used to divide a circular arc equally, for example in the processing of drilling holes distributed uniformly
on a flange. After selecting this function, the
message window will prompt for various parameters
to be defined for the operator.

(A)

The following are parameter to be defined.

1. The position of the circle center.

The position of the circle center (CT POS) means
the position of the circle center with respect to the
center of the tool just after tool setting and clearing,
such as the position of Point O with respect to
Point A in Fig. (A).

(B)
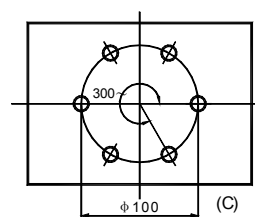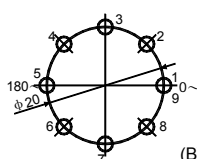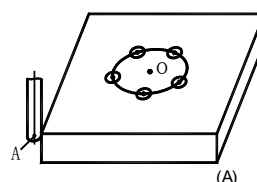
2. Diameter(DIA): The Diameter of the circle to be divided equally.

3. The number of holes(NUMBER):

The number of holes equally dividing the circle.
For the example shown in Fig. (B), 5 points from
point 1 to Point 5 must used to divide the arc from 0°

(C)

to 180° into 4 equal sections. So, 9 points must be used to divide the whole circle into 8 equal sections, and Point 9 will coincide with Point 1. As shown in the Fig., in order to drill 8 hole on the circle into 8 sections, the number of point to be entered should be 9.

4. The start angle (ST ANG): The angle of the start point of the circular arc to be divide equally.
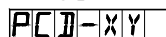
5. The end angle (ED ANG): The angle of the end point of the circular to be divided equally.

Note: For the definition of the start angle (ST ANG) and end angle (ED ANG), refer to the section "To recognize the start and end angle of a circular arc", on pages related.
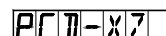
Tale the processing of the circular working-piece in Fig. (c) as example:

1) At first, find out the center position of the working piece and finish tool setting reset.
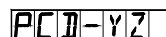
Key ✱ to enter PCD function. `PCD-XY`

2) Key ⬆ or ⬇ select processing plane. `PCD-XZ`

or

`PCD-YZ`
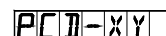
Enter the parameter

Select Plane XY. `PCD-XY`

Key ENT , next step.

（only 3V readout has this set item, 2V readout has only XY plane, so hasn't the item and can directly get into next step）

3) Enter the center position of the circular arc.

Key X → 0 → ENT
Y → 0 → ENT

`CT POS`

`0000 X` `CT POS`
`0000 Y`
`0000 Z`

Key ⬇, next step.

4) Enter the diameter of the circular arc.

Key X → 1 → 0 → 0 → ENT

`DIA`

`10000 X` `DIA`
` Y`
` Z`

Key ⬇, next step.

5) Enter the number of points equally dividing the arc.

`NUMBER`
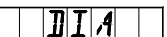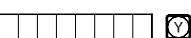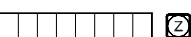
Fig. (c), we can consider it as 6 points is used to divide the arc from 0 to 300° into 5° equal section.

Key X → 6 → ENT

`6 X` `NUMBER`
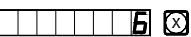` Y`
` Z`
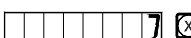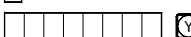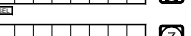
Key ⬇, next step.

It is also possible to consider as 7 points in points in used to divide the whole circle into 6 equal sections.

Key X → 7 → ENT

`7 X` `NUMBER`
` Y`
` Z`

Key ⬇, next step.

6) Enter the start angle.

Key X → 0 → ENT

`ST ANG`

`0000 X` `ST ANG`
` Y`
` Z`

Key ⬇ , next step.

7) Enter the end angle.

<div style="text-align:right">
▢ᴰ ▮ᴬᴺᴳ▮
</div>

If the arc is dividing by 6 points.
Key Ⓧ→③→⓪→⓪→🅴🅽🆃

<div style="text-align:right">
▢ 3̲0̲0̲0̲0̲0̲ Ⓧ ▢ᴰ ▮ᴬᴺᴳ▮
▢▢▢▢▢▢▢▢ Ⓨ
▢▢▢▢▢▢▢▢ Ⓩ
</div>

Key ⬇ , next step.

If the whole circle is divided by 7 point.
Key Ⓧ→③→⑥→⓪→🅴🅽🆃

<div style="text-align:right">
▢ 3̲6̲0̲0̲0̲0̲ Ⓧ ▢ᴰ ▮ᴬᴺᴳ▮
▢▢▢▢▢▢▢▢ Ⓨ
▢▢▢▢▢▢▢▢ Ⓩ
</div>

Key ⬇ , next step.

8) Enter processing
The display result for dividing the arc into 5 equal sections.

<div style="text-align:right">
▢▢ 5̲0̲0̲0̲0̲ Ⓧ ▮ᴺᴼ▮▮▮▮1
▢▢▢▢▢▢▢▢ Ⓨ
▢▢▢▢▢▢▢▢ Ⓩ
</div>

The display result for dividing the arc into 6 equal sections.

<div style="text-align:right">
▢▢▢ 0̲0̲0̲0̲ Ⓧ ▮ᴺᴼ▮▮▮▮1
▢▢▢▢▢▢▢▢ Ⓨ
▢▢▢▢▢▢▢▢ Ⓩ
</div>

9) Key ⬇ and the position of next processing point will be displayed, just move the machine tool to bring the displayed values on both axis into zero to reach the corresponding processing position.

10) You may quit PCD function at will, just key 🟦 .

C.The Function Calculator Function

The Calculation Function

Sometimes it is necessary to calculate out some values during the processing, SDS6 Series digital display boxes are provided with simple Calculation function.

The details are as following:

All the resulted value is displayed on X axis.

🅲🆃🆁 Is the Calculation function key, key it to enter the Calculation function, during using the Calculation function you may quit the function at will, just key the same key.

🔲, the key for Calculating the square root.
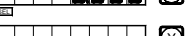
🅰🆁🅲, the key for "inverting" trigonometric functions, key it and then key a trigonometric function key for Calculating the inverse trigonometric function.

🔲
🔲 ⟩ trigonometric function key.
🔲

[CA], key for canceling last input and the result of last calculation.

[↑] → [X] [Y], data axis transferring, key them in succession to transfer the resulted value on.

[CA] → [↑], quit data axis transferring.

Example: Key [CTR] to enter calculation function.

Perform the following calculation: $10+10÷2×5＝35$

[1] → [0] → [+] → [1] → [0] → [÷] → [2] → [%] → [5] → [=] 35

Calculate: sin 45°= 0.707

[4] → [5] → [sin N2] → 0.7071

Calculate: arc sin 0.707=44.99134

[0] → [·] → [7] → [0] → [7] → [arc] → [sin N2] → 44.99134

Numerical movement of calculator:

1.By pressing the X0, Z00/Y0, and Z10/Z0 keys, you can directly transfer the calculated values from the information screen to the X axis, the Y axis, and the Z axis.

2.By pressing the X or Z0/Y or Z1/Z keys, you can directly transfer the value of the data axis to the information screen. Key [CTR] to quit the calculation function.

Notes: When the value of input or calculation exceed the display range, the information window display "CTR   E", means the result of calculation is wrong, press [CA] key can resume.

D. Tool Diameter Compensation

The Tool Diameter Compensation Function

In the processing of the four sides of the fitting shown in (1), the operator has to run for an additional feeding distance equal the diameter of the tool in every side to complete the processing of the whole length, if the tool diameter compensation function is not used. The tool diameter compensation function provided in the digital display box can make the related compensation automatically.

Note: The tool diameter can be made only in the direction of X- or Y- direction.

Operation Procedure:

1. Key [OFFSET] to enter the tool compensation function.
2. Select a processing way among the 8 presetting ways (prompt: WHICH).

3. Enter the diameter of the tool. (DIA)
4. Enter processing state.

Refer to the operation procedure in a particular example:
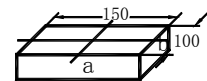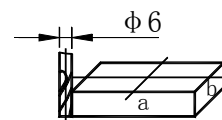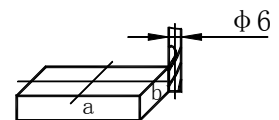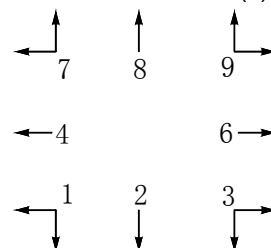
The processing of Plane a and of the fitting shown in Fig. (1).

1) Key ![OFFSET] to enter the tool compensation function.

	⊗	WHICH
	Ⓨ	
9 ⊗	WHICH
Ⓨ	

2) Select a processing mode to preset.

Start the processing at the position shown in Fig. (2)

Key ⊗ → 9 → ENT

Start the processing at the position shown in Fig. (3)

| 1 ⊗ | WHICH |
| Ⓨ | |

Key ⊗ → 1 → ENT

3) Enter the diameter of the tool

Key ⊗ → 6 → ENT

Key ⬇

| 6.000 ⊗ | DIA |
| Ⓨ | |

4) Enter processing state

① Start the processing at the position shown in Fig. (2)

9 ⊗	WHICH
Ⓨ	
– 6.000 ⊗	COMPENS
– 6.000 Ⓨ	

Move the machine tool to bring the X-axis displayed value into 150.000, and then move to bring the Y-axis displayed value into 100.000, so, the processing of two peripheral sides finishes.

② Start the processing at the position shown in Fig. (3)

| 6.000 ⊗ | COMPENS |
| 6.000 Ⓨ | |

Move the machine tool to bring the X-axis displayed value into -150.000 and then move to bring the Y-axis displayed value into -100.000, so, the processing of two peripheral sides finishes.

5) You may key ![OFFSET] to quit the tool compensation at will.
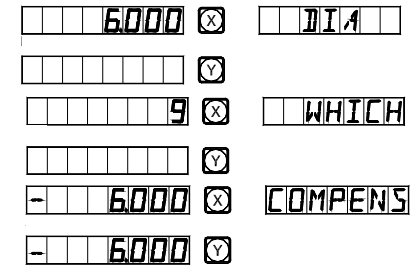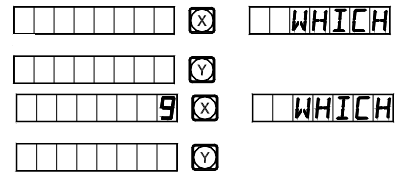
E. 200 Tool Storeroom

200 Tool Storeroom:

It will need to use different tools when turning different work pieces or different surface of work pieces, so it is necessary to uninstall and adjust the tools, SDS6 digital readout has the function of 200 tools storeroom, which makes the operation simple.

Notice: The function of 200 tools storeroom can't be used but the lathe has the frame of adjusting tool. Please don't use this function if you haven't the frame of adjusting tool.

1. Set a base tool. In the state of "ALE", to clear the display value of the X axis or the Y axis when moving the base tool to touch the frame of adjusting tool.

2. Ensure the other tool position relative to the base tool position, which is also the zero point of "ALE" coordinate system, as the figure (a) shows, the relative position of the second tool is: X-axis 25-30=-5, Y-axis 20-10=10.
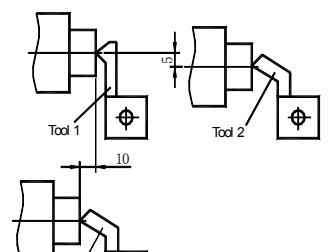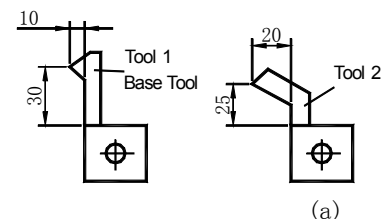
3. Number the tool, and store the relative position to the base tool into the digital readout.

4. In process, the operator can input the numbers of using tool, the digital readout will display
the relative position dimension of using tool to the zero point of "ALE" coordinate system,
moving the lathe platform to make the display of X axis and Y axis become zero.

5. The tool storeroom can store datum of 200 tools.

6. If the function of 200 tools storeroom is opened, you can lock this function after you continue to touch the key `[±]` 10 times.

If the function of 200 tools is locked, you can unlock this function after you continue touch the key `[±]` 10 times. In the state of "ALE".

`[  ][T][L][_][C][L][O][S]` Means close tool storeroom；
`[  ][T][L][_][O][P][E][N]` Means open tool storeroom。

Notes: the Y-axis value mentioned above is the integrated value of Y-axis with Z-axis, namely the Z/Z0-axis in the former lathe machine readout.

The operation of inputting the datum of tools and calling tool:

1) Please input the datum of tools, in the
"ALE" coordinate system, clear the
display value when moving the base
tool to touch the frame of adjusting tool,
set the first tool to the base tool.

`[    ][0][0][0][0] [X] [A][L][E][  ][  ]`
`[    ][0][0][0][0] [Y]`
`[    ][0][0][0][0] [Z]`

2) Enter the inputting state.
Key `[TOOL]`

`[T][O][O][L][  ][  ][1]`

3) Input the datum of tool.
Key `[X]`→`[0]`→`[ENT]`

`[    ][0][0][0][0] [X] [T][O][O][L][  ][  ][1]`
`[    ][0][0][0][0] [Y]`

`[Y]`→`[0]`→`[ENT]`

Key `[⇩]`

`[  ][S][D][M][  ][  ][N][O]`

4) Input the numbers of tool
Key `[2]`→`[ENT]`

Key `[⇩]`

5) Input the datum of tool.
Key `[X]`→`[±]`→`[5]`→`[ENT]`

`[-][  ][  ][5][0][0][0] [X] [T][O][O][L][  ][  ][2]`
`[    ][1][0][0][0][0] [Y]`

`[Y]`→`[1]`→`[0]`→`[ENT]`

6) Key `[⇩]` continue to input the datum of next tool.
Key `[TOOL]` quit the inputting state.
You can operate the tool storeroom as below after you input the datum of tools, first install the second tool.

1) Enter the using state.
Key `[CALL]`

`[    ][    ][    ][1] [X] [  ][C][H][O][O][S][E][  ]`

2) Ensure the base tool.

`[    ][    ][    ][1] [X] [  ][B][A][S][E][  ][  ]`
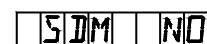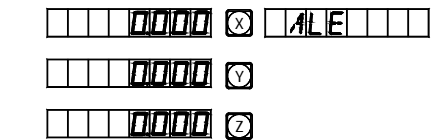
Key ⟮⇧⟯

Default the first tool as the base tool, you
can also set the other tool as the base tool, just
Key ⟮X⟯ ⟶ digit key ⟶ ⟮ENT⟯
Key ⟮⇩⟯ can call other tools.

3) Call the second tool.

Key ⟮X⟯ ⟶ ⟮2⟯ ⟶ ⟮ENT⟯

4) Exit

Key ⟮CALL⟯

Move the working table to make the display value of X axis and Y axis become zero. The second tool has finished tool

setting and reached the reference position, the operator can input and call 200 tools likewise.

Notice: You can clear the display value to zero in "ALE" coordinate system only when using the base tool, and clear

the display value to zero in "INC" coordinate system when using other tools.

F. The Function Of Measure For Taper

The Function of measure for taper:

The taper of work piece can be measured
when turning the taper work piece.

Operation:

As figure shows, the nod of lever meter
is touched the position A of work piece surface.
Pressing it to make the lever meter point to zero.

1) Then entering the function of measure
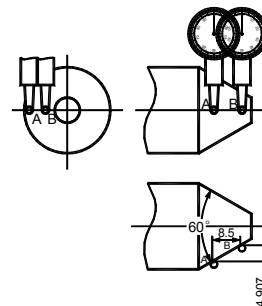for taper.

Key ⟮⊘⟯

2) Move the lever meter to position B of
work piece surface, press it to make the
lever meter point to zero.

3) Compute.

Key ⟮ENT⟯

4) Quit

The display value of X axis is taper.
The display value of Y axis is angle.

Key 🔁

Additional sheet:

Ⅰ. **What the user must know:**

1. The digital display box must be handle carefully.

2. The box must be grounded properly.

3. Power voltage selection: AC 100V~240V

 50 Hz~60 Hz

4. Power consumption: 25VA

5. Working temperature: 0℃~45℃

6. Storage temperature: -30℃~70℃

7. Relative humidity: <90%(20±5℃)

8. Weight: ≈3.2 kg

9. There must have no obviously corrosive gases around the box.

10. Number of coordinates: 2 coordinates, 3 coordinates.

11. Display: 7 digit with plus and minus symbol display (2 axes or 3 axes), the message window displays by means of 8 star character display device.

12. Frequency multiplication: 4X

13. Allowable input signal: TTL square wave.

14. Allowable input signal frequency: ≤5M Hz

15. Length resolution: 1μm.

16. Operation keyboard: Sealed diaphragm touch keys.

17. The input interface definition of Length Measuring Linear Raster Ruler:(9_pin socket)

Pin	1	2	3	4	5	6	7	8	9
Signal	Null	0V	Null	Null	Null	A	+5V	B	Z