



### Application:

SPH-3020Z Horizontal Profile Projector is a photoelectric measuring system of high precision and efficiency, can inspect all kinds of surface and outline of the complicated work pieces such as cam, template, tread, gear, perform willing cutter and so on. The measurement data can be printed and output. It requires in the checking department and workshop and is widely used machinery, mould, tool, meter, and light industry.

### Features:

The product structures are strong in commonality, this instrument is beautiful in its outward appearances and convenient for operations; Imported V-type straight-line slide-way is adopted for the hoisting driving of the worktable, light and comfortable in driving; The two high-and-low adjustable light intensities for transmission and indirect lightings can be adaptable for measuring requirements of different workpieces; In high quality in its optical system, the objectives are clear in imaging and accurate in multiplying factors; The fiber transmission is adopted for the indirect lighting, which is small in dimensions, high in its brightness and convenient for uses; Casting aluminum is selected for the processing of worktables, light in weight; This instrument is of super-precision, with stable and reliable performances.



Stamping parts



Screw



Gear



Milling cutter

# Product structure diagram

## SPH-3020Z Horizontal Profile Projector



### Technical Specification:

Model		SPH-3020Z			
Working table	Stage size(mm)	400*150			
	X-axis travel(mm)	200			
	Y-axis travel(mm)	100			
	Z-axis travel(mm)	80(for focus)			
	Turning range	±15°			
	Resolution	(X-axis, Y-axis) 0.5μm			
	Accuracy	(3+L/200)um			
Projector screen	Screen size (mm)	Ø 300			
	Screen rotary range	0°~360°			
	Rotary angle resolution	1 ´ or 0.01°			
Lens	Magnification	10X	20X	50X	100X
	Object view(mm)	Ø30	Ø15	Ø6	Ø3
	Working distance(mm)	103.9	95.1	65.7	35
Data processing system	DS600, multi-function data processing system				
Illumination	Transmission: 24V/150W, cooling by fans.				
	Reflection: 24V/150W,illuminated by two fibers ,cooling by fans.				
Power	110V/220V(AC)	50/60Hz	total power=400W		
Dimension	L*W*H(mm)	1215*646*1210			
Weight	Unit: (kg)	240			
Option	Mini-printer, Edge detector, M2D software and so on, please refer to Accessories for profile projector for more details.				

### High precision, stable and reliable

The horizontal projector has stable and reliable mechanical structure and high precision magnification. The contour, section and surface shape of the measured workpiece can be accurately imprinted on the projection screen. The measurement is simple and intuitive with high efficiency. Optional automatic printer, optical edge finder, etc



### The objective lens has a clear image

The objective lens has a clear image  
Professional optical processing technology to ensure clear imaging.  
The optical quality of the instrument is excellent, the image of the objective lens is clear, and the magnification is accurate



### Up and down focusing handle

Z axis handle:

Can raise and lower the focus, up and down the measuring table. The table adopts the burning process. It is much stronger than the hardness and flatness of paint to ensure long service life and not easy to damage.



The instrument is equipped with an objective lens rotating disk, which can be equipped with three objective lenses at the same time. Just rotate the turntable, When working at different magnification, no need to replace the objective lens separately, and the operation is more convenient and simple.

The focusing of the instrument is realized by the lifting and lowering of the projection cylinder, with large stroke and good stability; The workbench does not rise and fall, which enhances the stability, reaches the measuring range and has high accuracy.



## SP-CAT Measure software Instruction: (optional)

SP-CAT measuring software is developed by our company, it is suitable for the 2D measuring instruments such profile projector with RS232 interface, or connect by DRO, or by data card.

### Specification:

- Measure the Point, Line, Circle, Arc and Ellipse feature with multi-point
- The functions of Axis-skew and coordinate-shift are very convenient
- The functions of element-combination can enhance the efficiency
- Save as \*.dxf and edit in AutoCAD
- The data can be sent to Excel
- Shift between in English and Chinese
- Record, edit and run the program

### Functions:

Element measure Can measure the Point, Line ,Circle, Arc, Angle

Can measure the rectangle with stated points

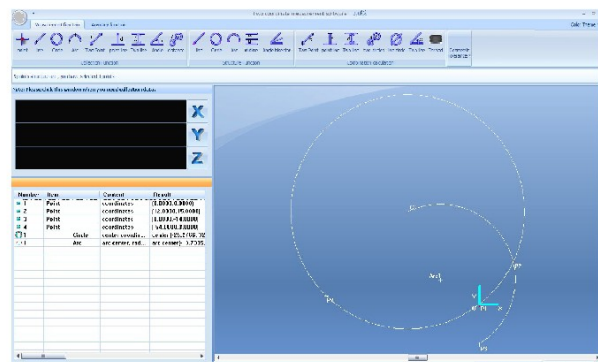
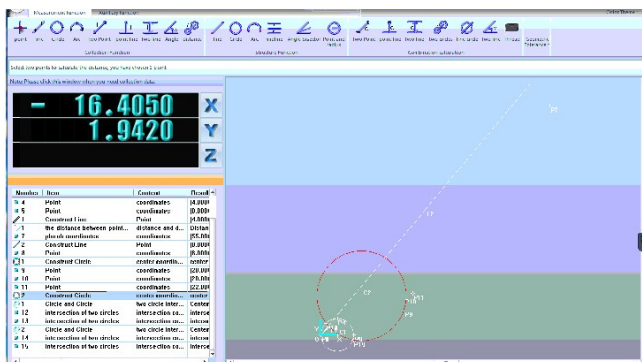
Can identify the Point, Line, Circle and the Arc automatically

Element construct Center Point, Point of intersection, Midpoint, Line, Circle, Angle

Element preset Point , Line ,Arc, Angle

Graph manage Coordinate move and cording skew ,any axis skew

Graph operation Zoom in ,Zoom out ,Move, Print, Select, Cancel select ,Delete



## Digital readout DS600 introduction: (optional)

Digital readout DS600 is a mature product designed for the 2D measurement field, it is applicable with the optical measuring instruments, such as Profile projector, video measuring system, toolmaker microscope and other vision measuring system. It is especially used with profile projector, microscope, and it can measure complicated geometry graph, measurement includes work-piece skew, establishment of coordinates system, and so on.

### Technical function:

1. Measurement of point, line, circle, angle, distance, rectangle and screw thread, preset and construction. Sampling points maximum up to 50.
2. Coordinate skew and movement, it is more convenient that the operator can skew position of work-pieces for measuring, which can reduce adjust time obviously;
3. Clearance function can delete list, adjustment, and all ;
4. Obverse or Opposite direction counting function, according to the operator's requirement;
5. Half function, rapidly determine to display 1/2 value, and confirm midpoint of section;
6. Permission function: Advanced setup can be done after right password input;
7. Call function: input record ID to use existing element;
9. Communication port of foot-switch or REINSHAW probe available;
10. Printing: print graphic elements and 3-axis displaying value;
11. RS232 output function: convey current position of linear scale to PC;
12. USB output: through USB cable convey date to PC;
13. Multi-display, separately display polar coordinates and Cartesian coordinates, and can display millimeter and inch , and can shift it easily;
14. Linear compensation and section compensation is available;
15. Z-axis can connect linear scale and rotate encoder;
16. Save 100 permanent graphic elements.

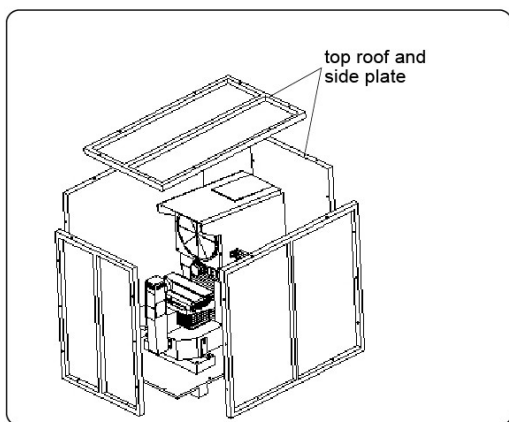


## Machine construction:

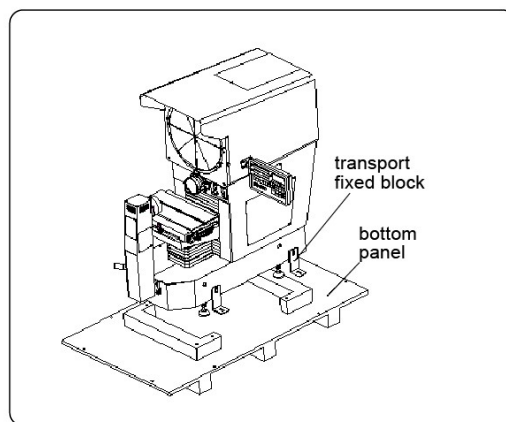
NO.	PICTURE	NAME	Remark
1		Machine body	
2		Digital readout	Fit on machine
3		Linear scale	Fit on machine
4		10X LENS	Fit on machine
5		Micro-printer	Fit on machine
6		20X LENS	Optional
7		50X LENS	Optional
8		100X LENS	Optional
9		Semi-transmitted mirror group	Optional
11		5X magnifier	Optional
12		50mm Standard scale	Optional
13		360mm glass scale	Optional
14		Press plate group	Optional
15		Rotary worktable	Optional
16		V-type fixture	Optional
17		Thimble cradle	Optional
18		Concentric circle chart	Optional
19		Foot switch	Optional
20		2D measure software	Optional



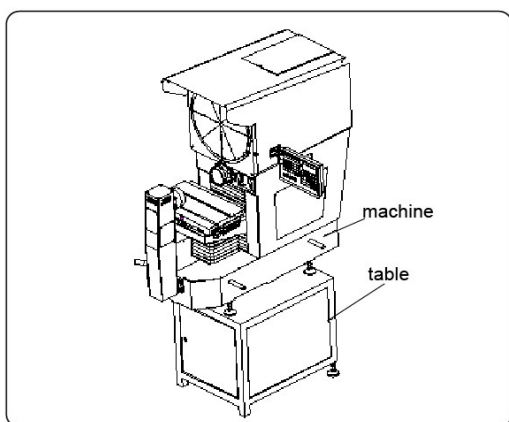
## Install instruction:



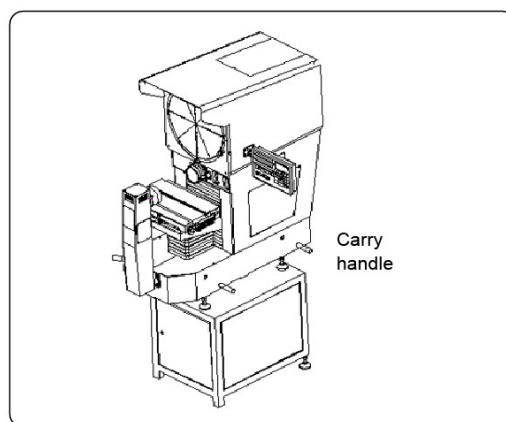
Step 1: remove the side plate and top roof of the wooden box



Step 2: remove the bottom panel and the fixed block



Step 3: place the whole machine on the table frame and adjust the level



Step 4: when the instrument is not moved, remove the handle.

## Instrument operation

### 1.0 Replace and adjust the illumination bulb

This can only work when replacing or adjusting the bulbs and checking the instrument regularly. The bulbs need to re-adjust because the original adjustment of the bulbs sometimes will change when delivering or moving. This is called re-adjust.

Caution: This can only be done after make sure that the illuminator is cold down. Otherwise it would be dangerous of hurting for the illuminator is of high temperature.

### 2.0 Re-adjusting

Take out the lens, turn on the transmission light. If the glower's image is illegibility or dose not concentrate on the screen center. Please do as:

1.1 Open the big door on the front of the instrument, move the whole set of the illumination set up and down. On the screen, the glower's image will change form illegibility to clear.

1.2 When the filament is almost clear (it needn't be too clear) and is on the center of the screen, please fix the screw (1) and put on the lens. All the re-adjust is completed.

The digital measuring projector is a kind of precision measuring instrument integrating light, electricity and machinery, which needs good maintenance to keep the instrument in good service condition, so that the original accuracy of the instrument can be maintained and the service life of the instrument can be extended.

1. The instrument shall be placed in a clean and dry room with a room temperature of 25 °C and a humidity of less than 60%, so as to avoid stains on the surface of optical parts, metal parts rust, dust and sundries fall into the moving guide rail, affecting the performance of the instrument.
2. After the usage of the instrument, the working surface shall be wiped clean at any time, and the dust cover shall be covered after cleaning.
3. The transmission mechanism and moving guide rail of the instrument shall be regularly lubricated to make the machine move smoothly and maintain a good use condition.
4. If the glass and paint surface of the workbench are dirty, it can be wiped with neutral detergent and clean water. Never wipe the paint surface with organic solvent, otherwise, the paint surface will lose luster.
5. When the professional software or data processor display of the instrument leaves the factory, the error between the workbench and the grating ruler had accurately compensated, So do not change it by yourself, otherwise, wrong measurement results will be generated.
6. Generally, all electrical connectors of the instrument should not be unplugged. If they are unplugged, they must be correctly inserted and the screws must be tightened according to the marks. Incorrect connection may affect the function of the instrument or damage the system.

The following are the precautions for turn on the machine!

1. Confirm whether the power connection is normal
2. Turn on the power switch
3. Turn on the bottom lamp switch contour and adjust the brightness to the appropriate measurement state
4. Adjust the focusing to the clearest state of the workpiece
5. If the surface measurement is needed, turn on the surface lamp switch surface and adjust its brightness to the appropriate measurement state, so that the instrument can be used normally

Matters needing attention during power off!

1. Turn off surface lamp and bottom lamp respectively
2. Turn off the power
3. Remove the workpieces from the worktable and ensure that the worktable surface is clean and free from stains



### 3.0 Method of replacing the bulb

- 3.1 Open the big door on the front of the instrument.
- 3.2 Unscrew the screw (1) and take out the whole illumination set.
- 3.3 Take out the halogen bulb (7).
- 3.4 Put on the new bulb (Please use the soft cloth to touch the bulb).
- 3.5 Test by eyes from the top to see whether the glower's image by the concave reflective mirror (8) and itself is overlap, if not please do as:
- 3.6 Draw the lamp holder (4) side to side. Make the glower and its image overlap at the right-and-left way. Then screw the screw (5).
- 3.7 Unscrew the screw (2) and (below). Make the adjusting shelf (3) to be the vertical way of the paper, and then move it parallel or obliquely. Until the glower filament and its image overlap at the vertical way on the paper. Then screw the screws (2) and (below).

### 4.0 Work table operation

1. After turn on the main power. On the multi-functional data processing system DS600 counter, appears the value of coordinate of X axis and Y axis. The value changes when moving of the worktable.
2. The positive and the negative value of the X, Y coordinate can be set through the DS600 which the users can previously set it up. If you want to measure one work piece in the first quadrant, please do as following:
3. The movement of X and Y coordinates: except hand wheel moving, X and Y coordinate can also be moved speedily by the hand haulm. While the hand wheel is used for focusing and lifting the work table.
4. Please move the handle wheel when using the X and Y coordinates to measure. And please be sure to move it smoothly and softly.
5. When you use the X and Y coordinates to measure. Usually you should move the worktable side to side for several times after you have the focusing. That would be more convenient to measure because the work table is running into measuring format from the stillness format.
6. Please return the X and Y worktable to the symmetrical position after measuring.

### 5.0 RS232 connector operation

RS232 connector showed as DS600 counter manual book. Communicating between the instrument and computer. It can process the data automatically and draw out the outline of parts through the special software. The report of measurement result and drawings can be printed out through the printer.

### 7.0 Edge detector operation (optional accessories)

Edge detector can be used for opt-electronic aim sample automatically. It can get rid off the incorrectness that caused by personal eyes and also can upgrade the measuring efficiency. Details please see the instruction of edge detector.