Introduction to fully automatic honing machi

i 4.0

FULLY AUTOMATIC HONING MACHINE

SIRUBA
Sew Reach

NO	Introduction
1	Specification
2	Excellent Mechanical Design and Manufacturing
3	Precision and Effectiveness
4	Exquisite Appearance Design

SIRUBA
Sew Reach

(1) Specification

Advantages:

SIRUBA fully automatic honing machine was the most advanced equipment. It had the following advantages:

※ The frame was made by cast iron material (FC250 & FCD400)with excellent shock absorption to ensure stability.

※The spindle motion adopts nitrogen balance system to connect the universal joint to make spindle motion more stable.

※Adopting THK high strength guide rail and precision screw mechanism components, adopting automatic forced centralized lubrication system, the machine tool is not easy to wear and tear, durable to ensure the service life of the machine.

※ Advanced screw anti loosening design makes machine tool more stable.

※ Adopting FANUC servo control system and Japanese SANKYO high precision rotary table to meet flexible manufacturing.

※ Powerful spindle motor provides powerful power for large aperture machining. :

※ The automatic size detection system (gas electric conversion measurement) has the functions of automatic checking, calculating and correcting.

(1) Specifiaction

Machine Specification

Item	unit	Specification
Honing Diameter Range	mm	∮3～∮50
Z-axis travel	mm	100
Tool storage capacity	pcs	6
Max Spindle working distance	mm	300
Speed range of spindle	rpm	0～2000
Rapid traverse rate	m/min	35
Distance from spindle to worktable	mm	400～800
Size of revolving disk	mm	∮690
Type of revolving disk	0.75kw	Electric
Number of workplaces	step	8
Working time of single workplace	s	2
Power of spindle driver motor	kw	5.5
Speed range of spindle driver motor	rpm	300～1100
Power of elevating motor	kw	1.6
Speed range of elevating motor	rpm	0～3000
Power of cooled motor	kw	1.5
Required precision： ①dimensional accuracy±	mm	0.001
②Circularity ○	mm	0.001
③Cylindricity /○/	mm	0.002
④Roughness √	μm	Ra0.2
Machine size	mm	L3000×W2240×H2650

SIRUBA Sew Reach

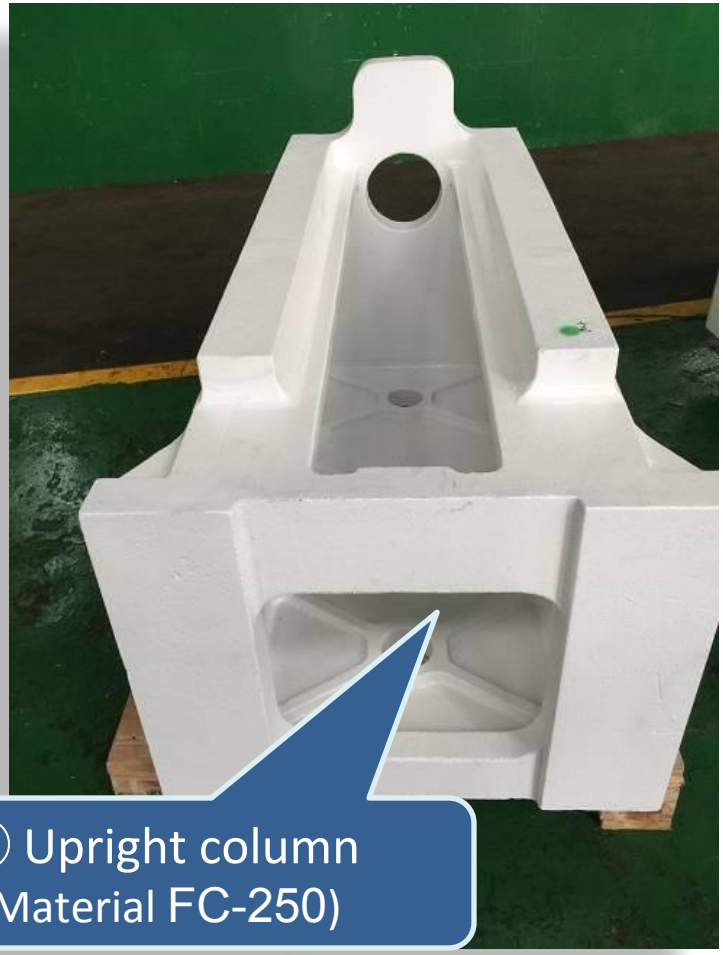
(1) Specifiaction

FANUC Specifications

Brand		FANUC
Model		ROBOT LA Mate 200iD
Controlled axes		6 axes
Reach		717mm
Motion range (Maximum speed)	J1 axis	340°/s, 5.93rad/s
	J2 axis	245°/s, 4.28rad/s
	J3 axis	420°/s, 7.33rad/s
	J4 axis	380°/s, 6.63rad/s
	J5 axis	250°/s, 4.36rad/s
	J6 axis	720°/s, 12.57rad/s
Max load capacity at wrist		7kg
Allowable load moment at wrist	J4 axis	16.6 N·m
	J5 axis	16.6 N·m
	J6 axis	9.4 N·m
Allowable load inertia at wrist	J4 axis	0.47 kg·m²
	J5 axis	0.47 kg·m²
	J6 axis	0.15 kg·m²
Mass		25kg

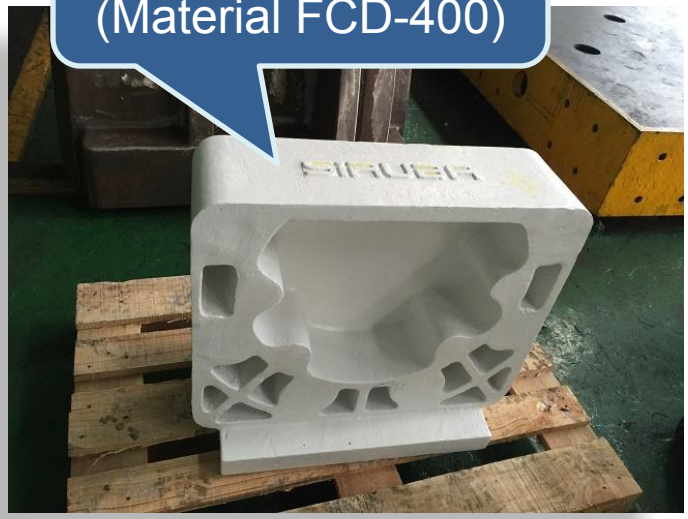
SIRUBA® Sew Reach

(2) Excellent Mechanical Design and Manufacturing



② Upright column
(Material FC-250)

③ Multi Spindle
(Material FCD-400)



① Machine tool base
(Material FC-250)

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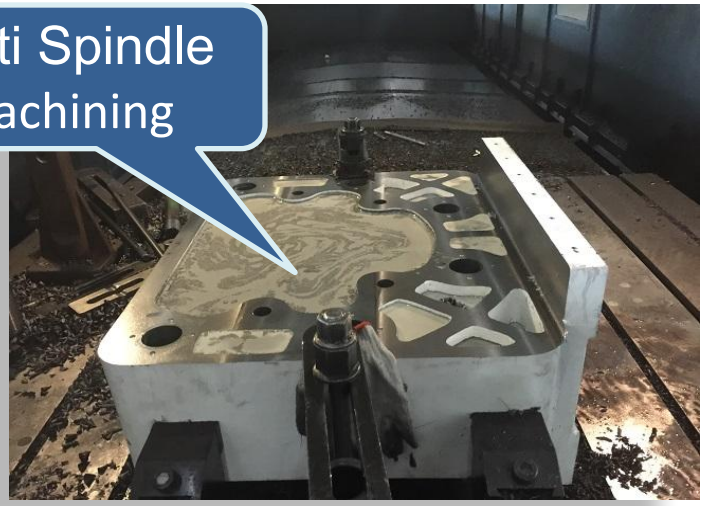
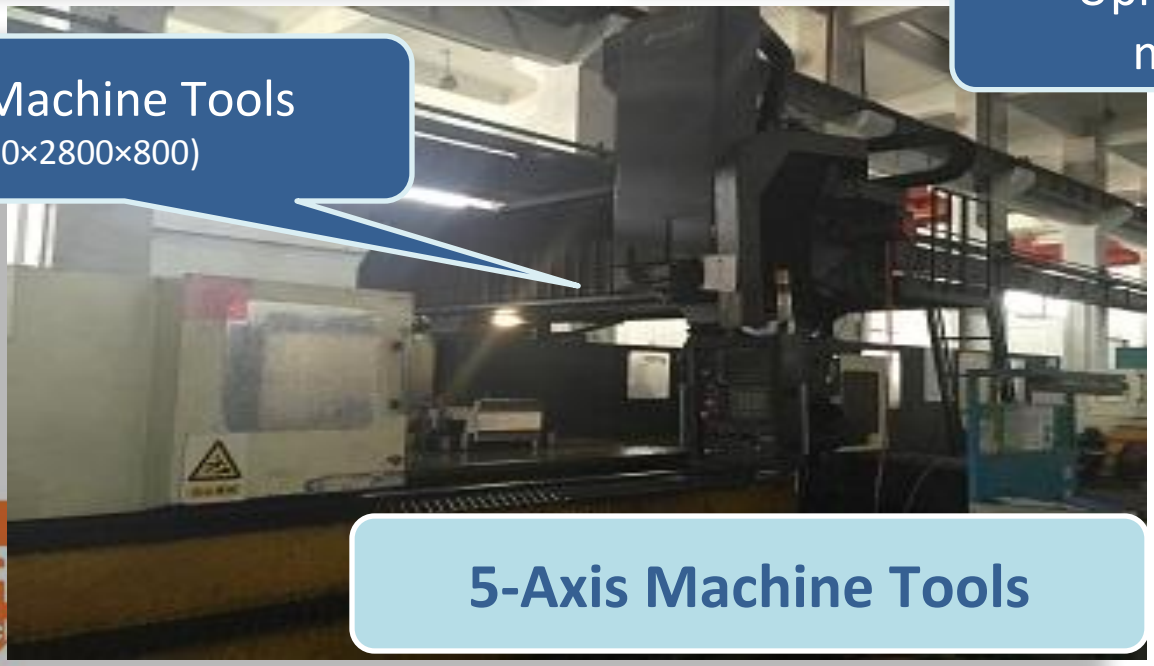
(2) Excellent Mechanical Design and Manufacturing

Multi Spindle machining



Upright column machining

5-Axis Machine Tools
(6000×2800×800)



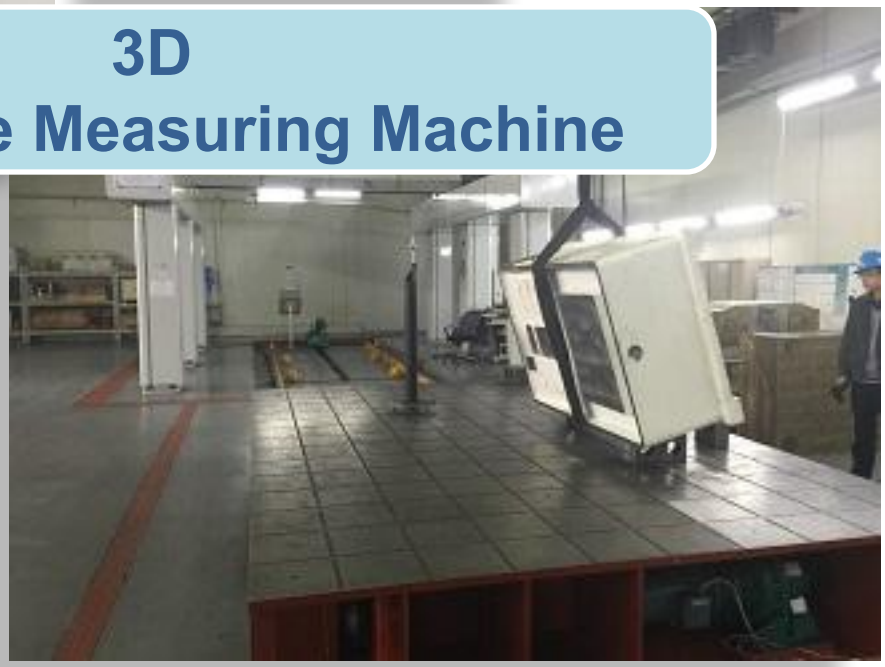
5-Axis Machine Tools

(2) Excellent Mechanical Design and Manufacturing

Italy
HEXAGON
3D CMM

3D
Coordinate Measuring Machine

Checked by
3D CMM



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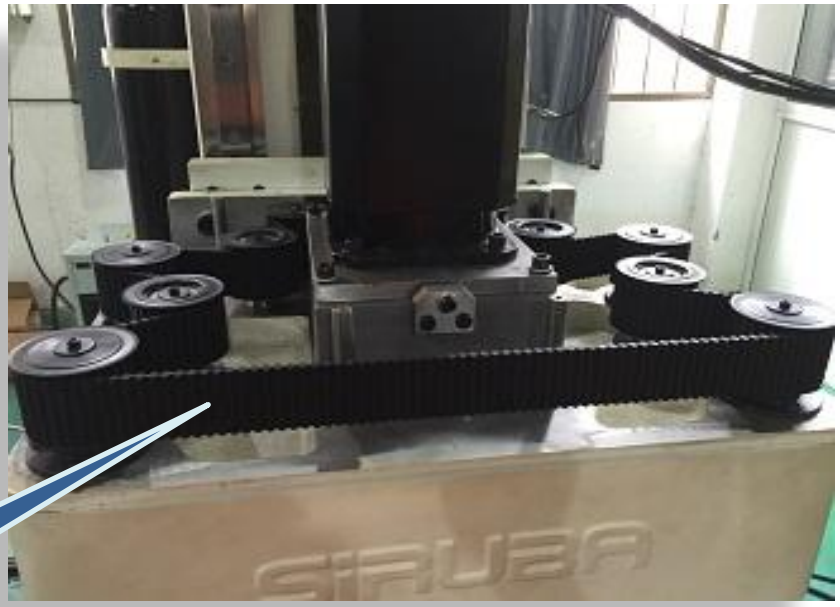
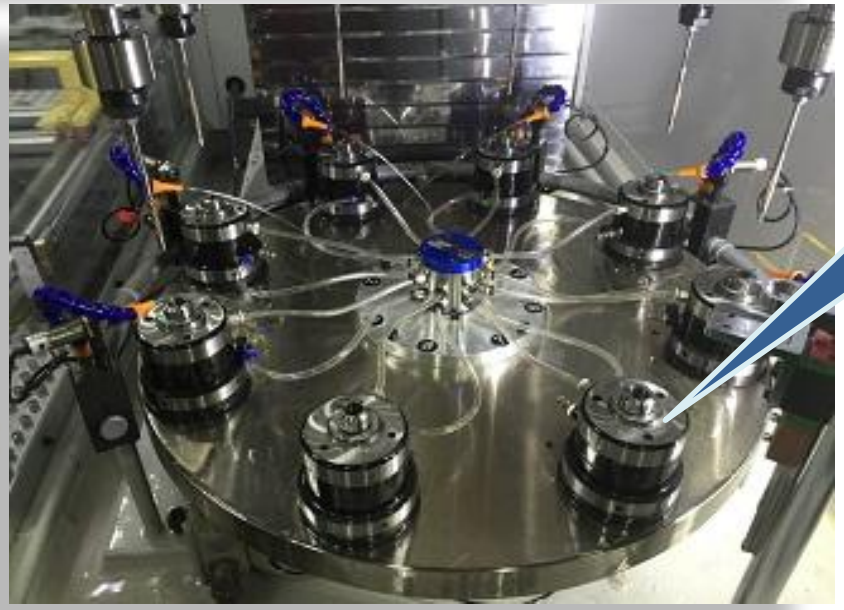
(2) Excellent Mechanical Design and Manufacturing



Timing belt drivers



6-axis and 8-stations

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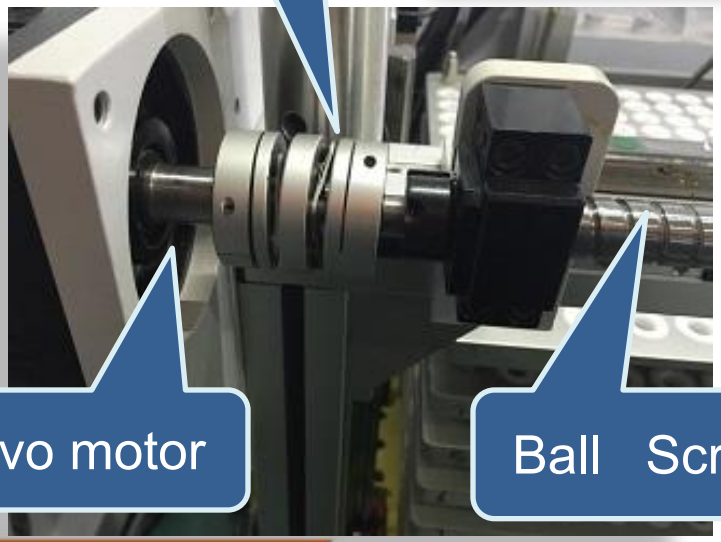
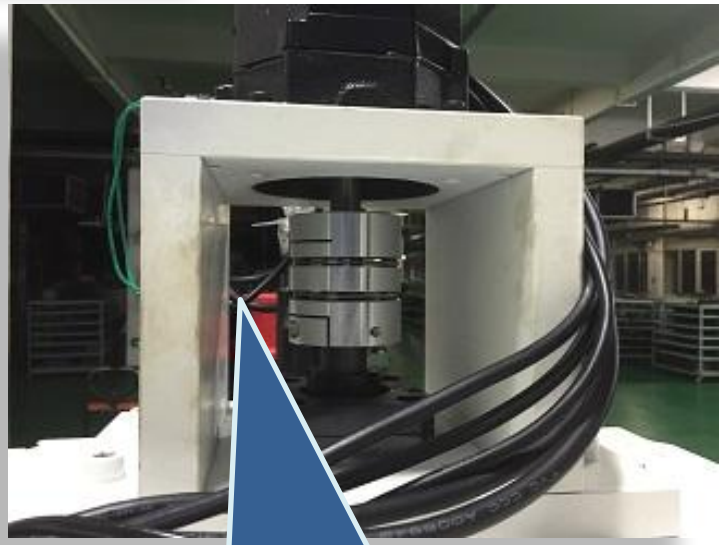
(2) Excellent Mechanical Design and Manufacturing

Double diaphragm coupling



Servo motor

Ball Screw



Double diaphragm coupling

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(2) Excellent Mechanical Design and Manufacturing

Air universal joint

Spindle motion balancing system (nitrogen type)

Balance cylinder

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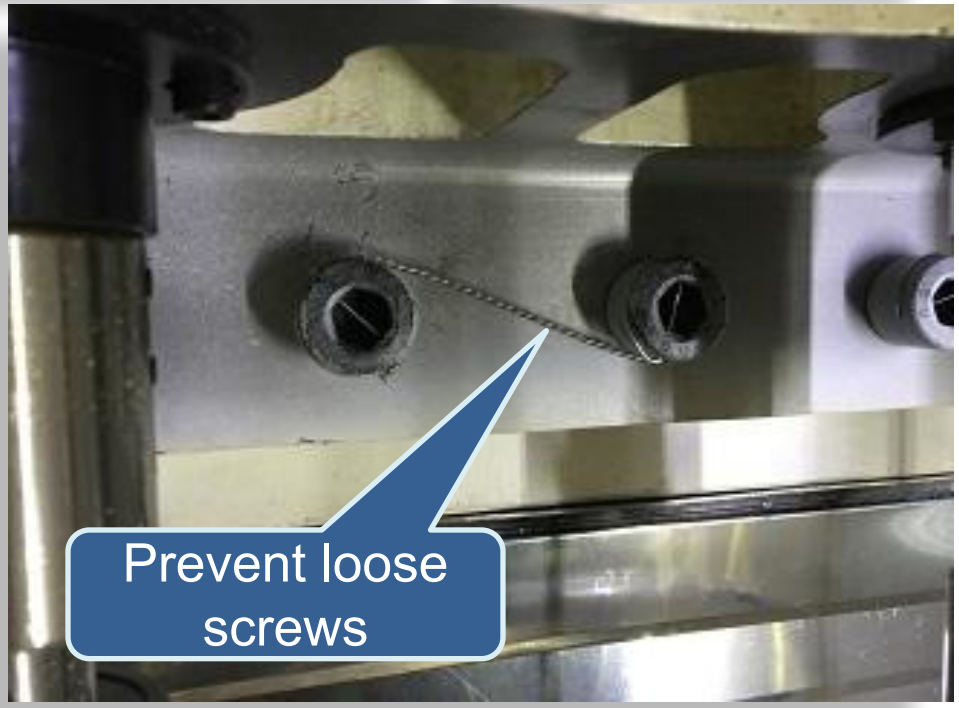
(2) Excellent Mechanical Design and Manufacturing

SUS-304不鏽鋼線 & 鉸線鉗



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(2) Excellent Mechanical Design and Manufacturing

Machine operation surface view

Industry **4.0** logo

Single -Pass Single Stroke Honing

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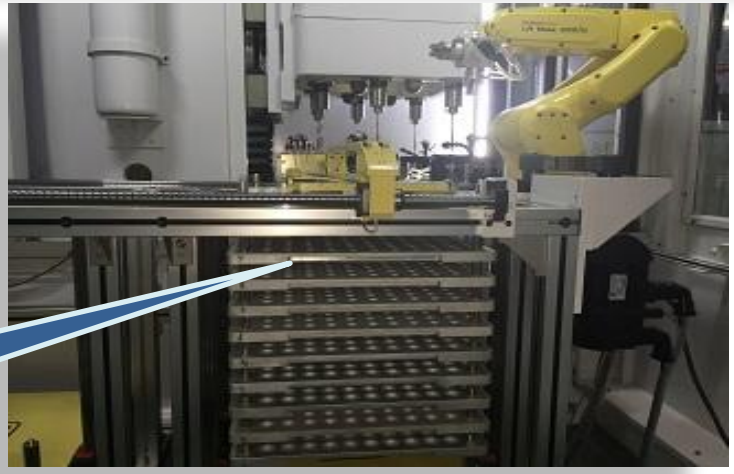
(2) Excellent Mechanical Design and Manufacturing

FANUC 6-axis robot

SMC 3 Finger Gripper Pneumatic

Automatic loading/unloading



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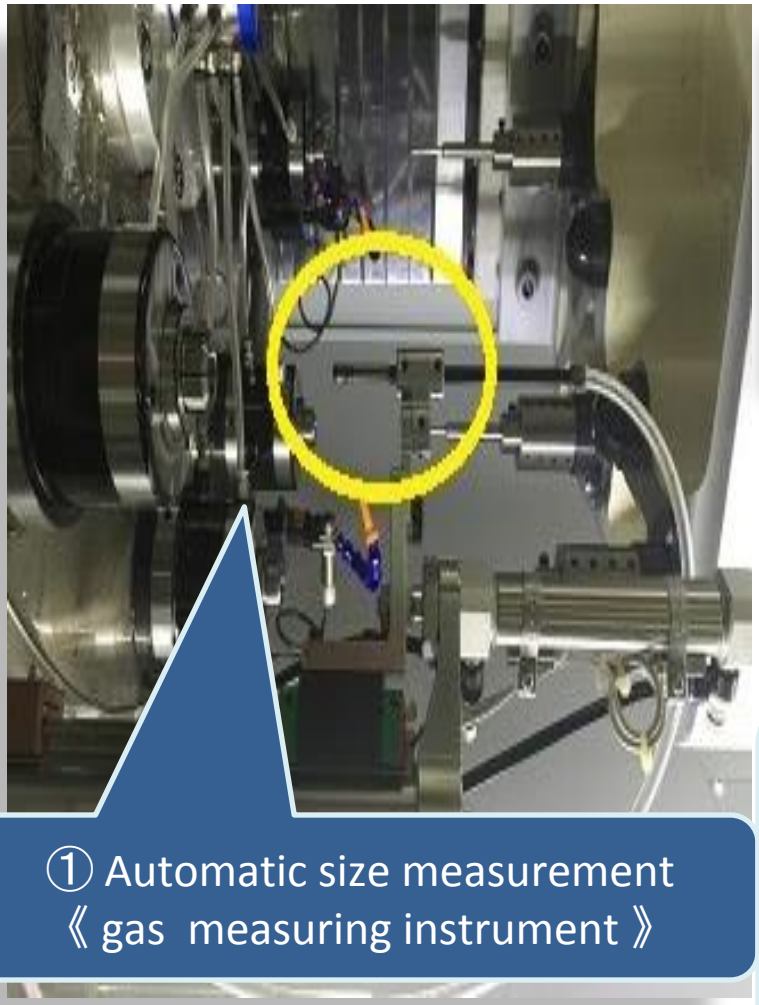
(2) Excellent Mechanical Design and Manufacturing

② Intelligent control instrument with automatic checking, calculating and correcting functions



① Automatic size measurement
《 gas measuring instrument 》

④ Defective collection area

③ Display the number of defective products

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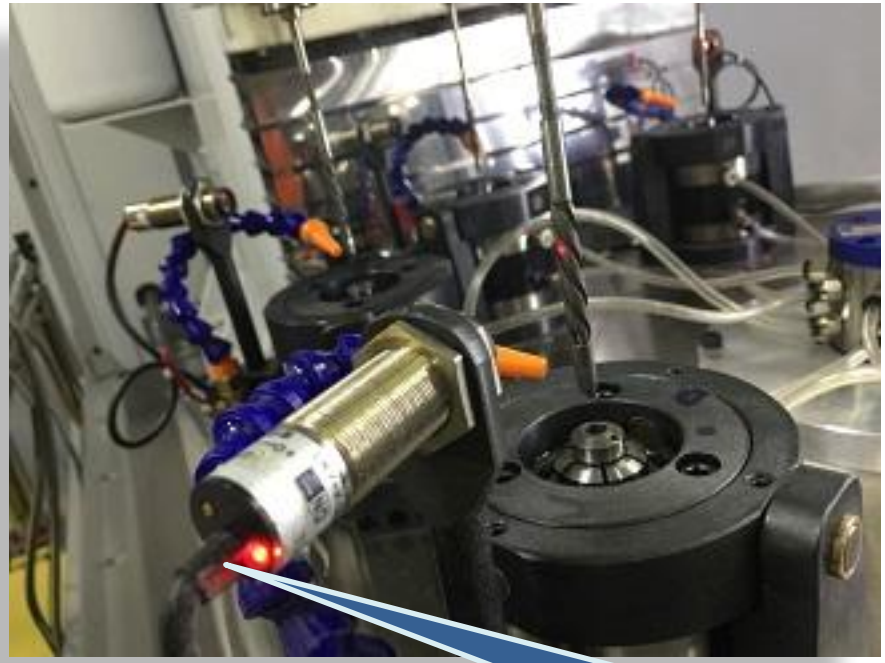
(2) Excellent Mechanical Design and Manufacturing

Infrared tool detection system(6-AXIS)



Infrared tool detection system(6-AXIS)

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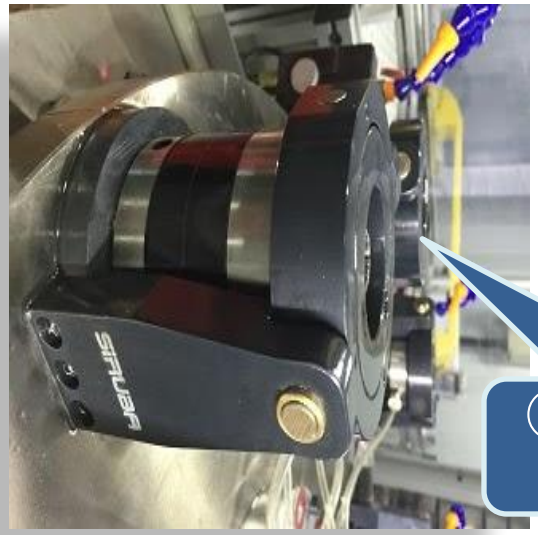
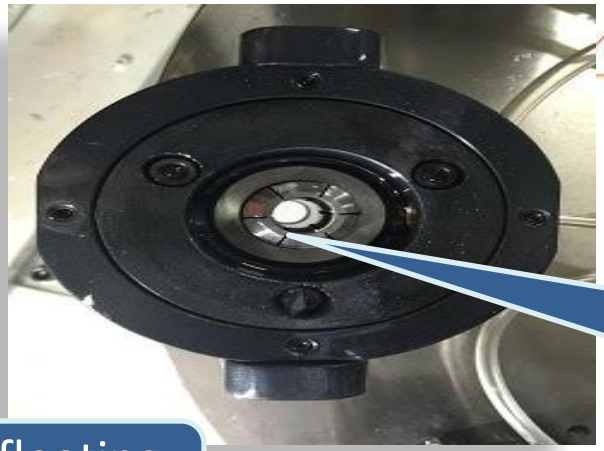
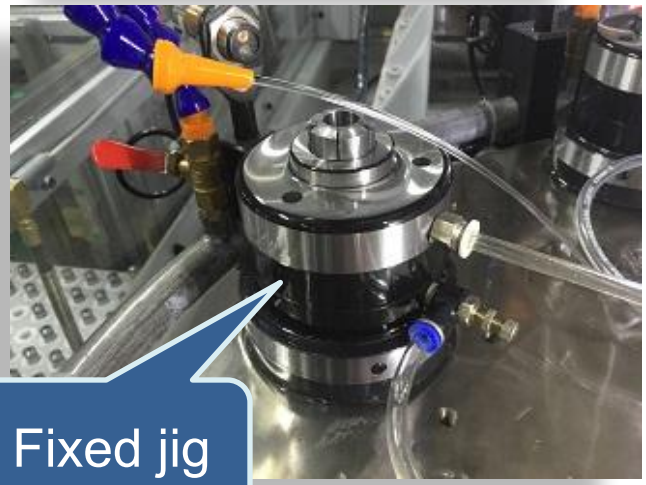
(2) Excellent Mechanical Design and Manufacturing



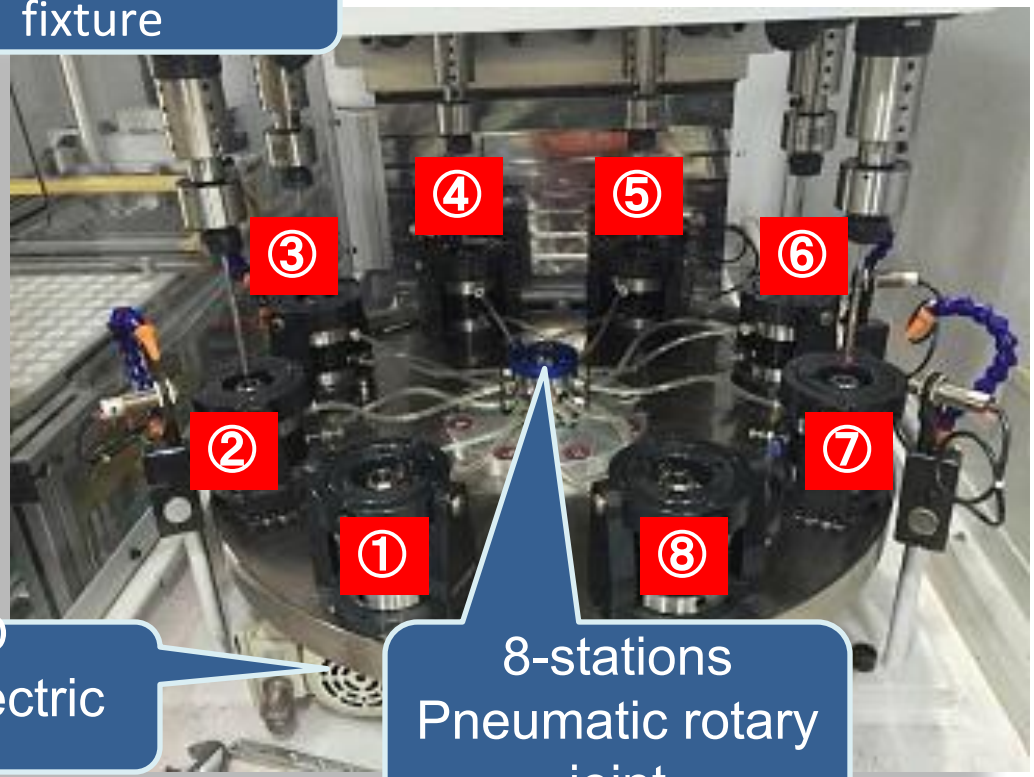
① X/Y axis floating fixture



Pneumatic flexible collet



② Fixed jig

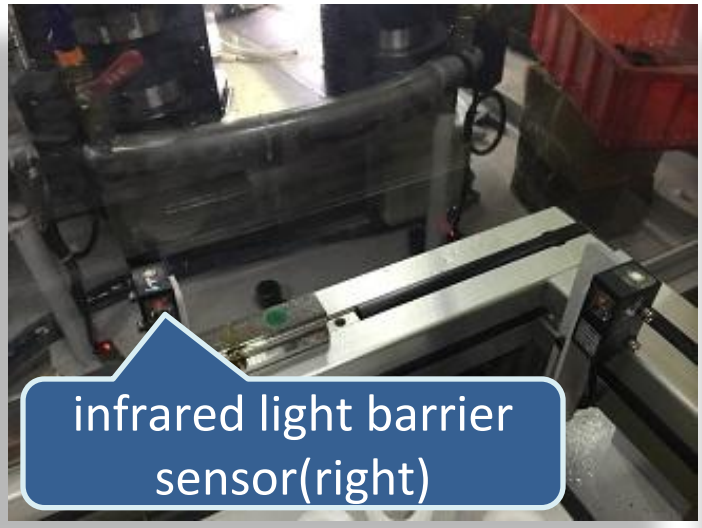


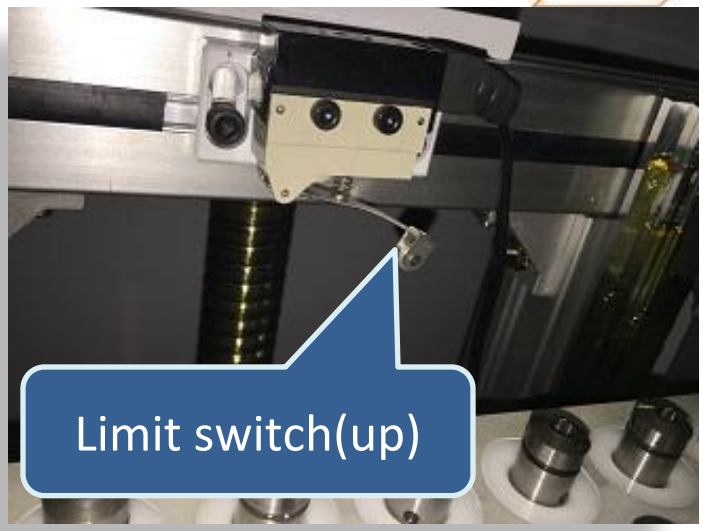
SANKYO 8-stations electric turntable

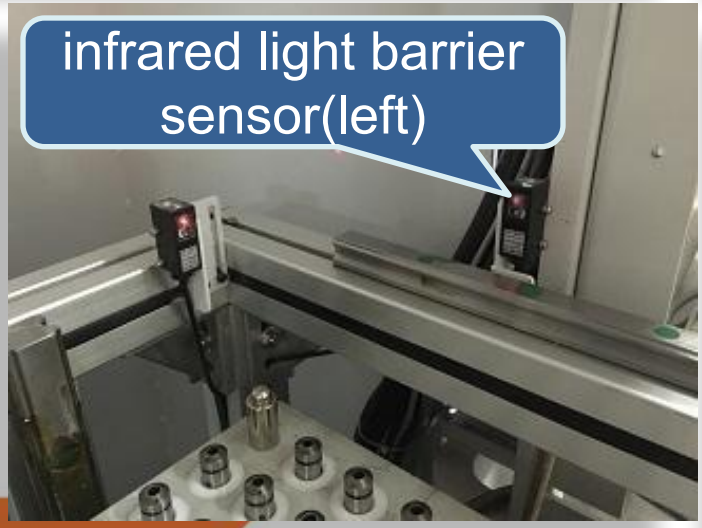
8-stations Pneumatic rotary joint

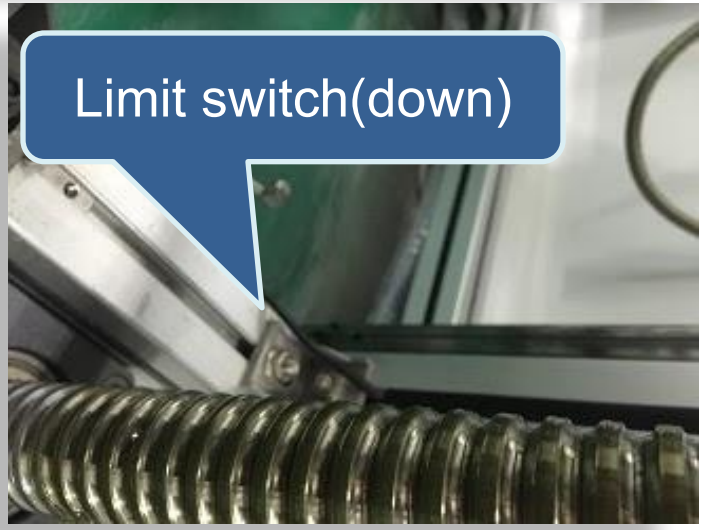
SiRUBA Sew Reach

(二)優異的機械設計&製造









SIRUBA Sew Reach

(2) Excellent Mechanical Design and Manufacturing

automatic lubrication system

Lubricating oil pipeline

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(2) Excellent Mechanical Design and Manufacturing

Filters and Filtration Systems

Design of Honing Coolant Temperature Control System ±1℃

honing oil

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(2) Excellent Mechanical Design and Manufacturing

electric closet power distribution cabinet

Air conditioning

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Sew Reach

(3) Precision and Effectiveness

QCE

- Cost
- Efficiency
- Quality

I Detection data

KF-214 (ϕ 6.5+0.009 +0.003)	NO.	①dimensional accuracy ± 0.001mm	②Circularity ○ 1μ	③Cylindricity /○/ 2μ	④Roughness √ Ra0.2
	#1	ϕ 6.506	0.22	1.22	0.053
	#2	ϕ 6.505	0.14	0.86	0.042
	#3	ϕ 6.507	0.22	1.33	0.062
	#4	ϕ 6.506	0.19	1.38	0.076
	#5	ϕ 6.506	0.17	1.11	0.041
	#6	ϕ 6.505	0.19	0.97	0.123
	#7	ϕ 6.506	0.21	1.25	0.048
	#8	ϕ 6.506	0.14	1.27	0.047
	#9	ϕ 6.505	0.25	1.73	0.035
	#10	ϕ 6.506	0.12	1.02	0.036

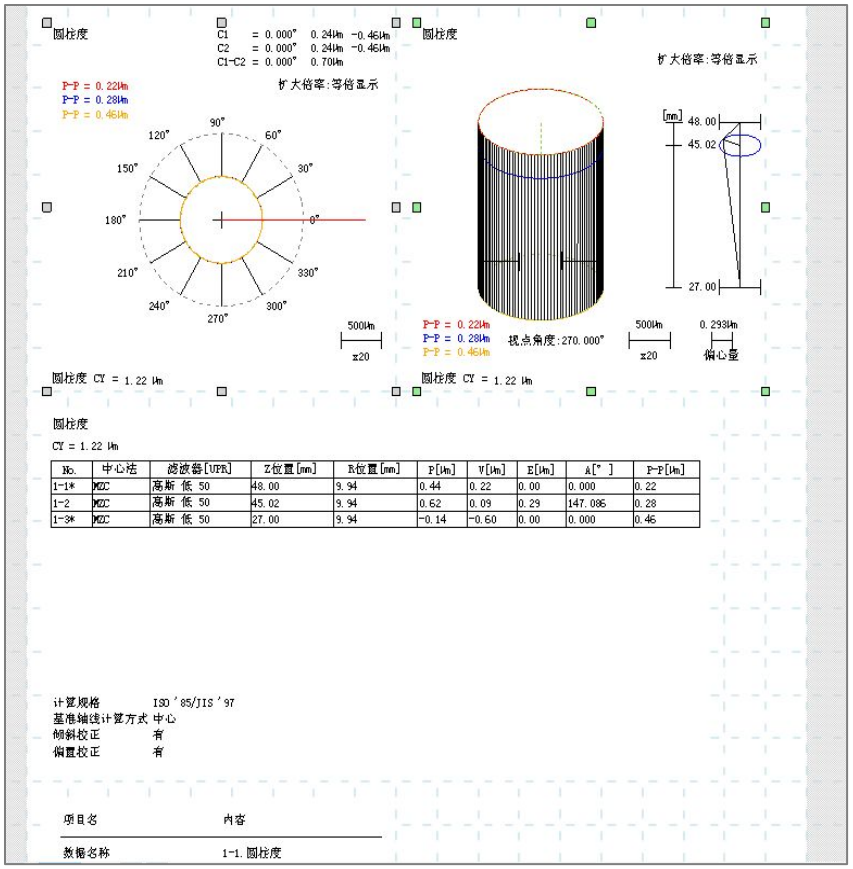
MD-41 (ϕ 15+0.003 -0.002)	NO.	①dimensional accuracy ± 0.001mm	②Circularity ○ 1μ	③Cylindricity /○/ 2μ	④Roughness √ Ra0.2
	#1	ϕ 15.001	1.9	2.93	1.962
	#2	ϕ 15.002	1.45	2.16	1.863
	#3	ϕ 15.001	1.07	2.06	1.968
	#4	ϕ 15.000	0.93	2.53	1.875
	#5	ϕ 15.003	1.88	2.92	1.628
	#6	ϕ 15.001	1.30	2.27	1.988
	#7	ϕ 15.001	1.50	2.64	1.991
	#8	ϕ 15.002	1.96	2.47	1.852
	#9	ϕ 15.000	1.72	2.33	1.793
	#10	ϕ 15.001	1.43	2.58	1.872

KL-208 (ϕ 10+0.005 +0.010)	NO.	①dimensional accuracy ± 0.001mm	②Circularity ○ 1μ	③Cylindricity /○/ 2μ	④Roughness √ Ra0.2
	#1	ϕ 10.005	1.5	2.5	0.243
	#2	ϕ 10.007	2.0	3.5	0.155
	#3	ϕ 10.005	1.5	3.0	0.204
	#4	ϕ 10.005	1.5	3.5	0.189
	#5	ϕ 10.008	2.5	2.0	0.165
	#6	ϕ 10.007	1.5	4.0	0.211
	#7	ϕ 10.008	2.0	3.5	0.232
	#8	ϕ 10.006	1.5	2.0	0.265
	#9	ϕ 10.006	1.5	2.0	0.144
	#10	ϕ 10.008	2.0	2.5	0.200

(三)精度及效益分析

· Cylindricity analysis diagram

Cylindricity 3D analysis diagram

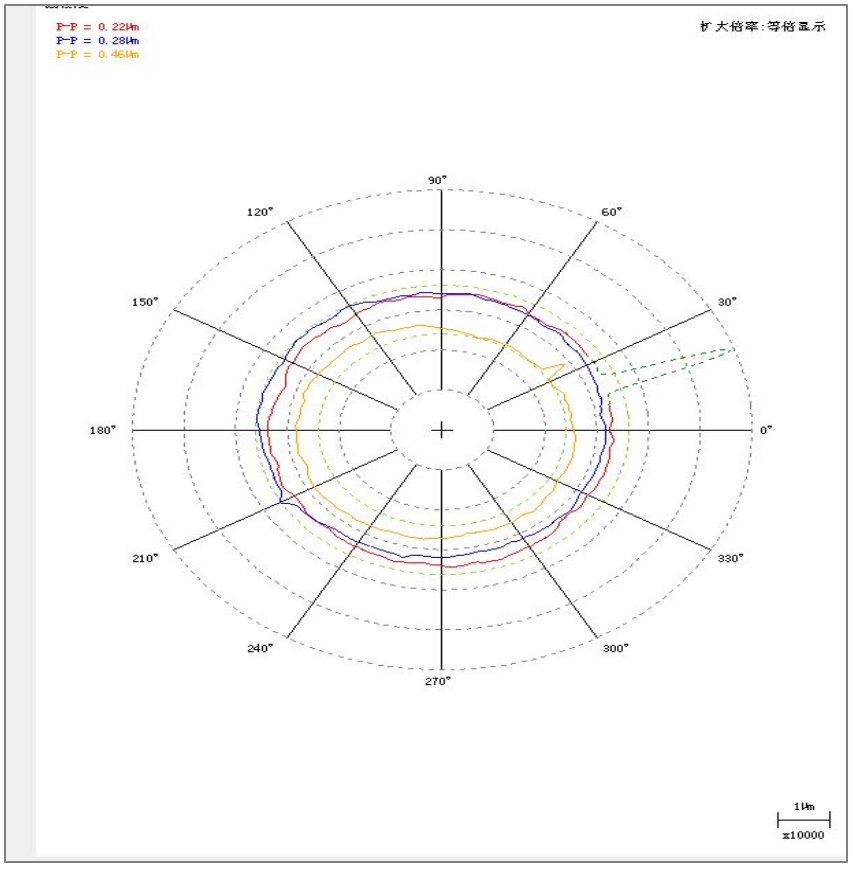


No.	中心法	滤波器[UPR]	Z位置[mm]	R位置[mm]	P[μm]	V[μm]	E[μm]	A[°]	P-P[μm]
1-1*	MZC	高斯 低 50	48.00	9.94	0.44	0.22	0.00	0.000	0.22
1-2	MZC	高斯 低 50	45.02	9.94	0.62	0.09	0.29	147.086	0.28
1-3*	MZC	高斯 低 50	27.00	9.94	-0.14	-0.60	0.00	0.000	0.46

计算规格 ISO'85/JIS'97
基准轴线计算方式 中心
倾斜校正 有
偏置校正 有

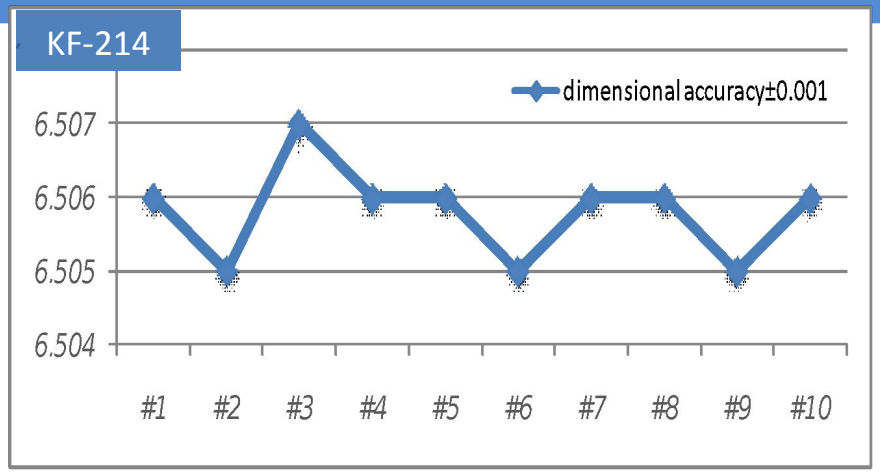
项目名	内容
数据名称	1-1.圆柱度

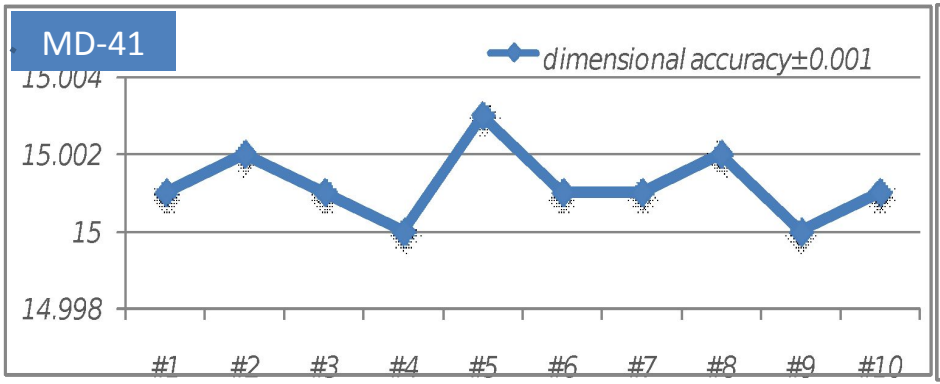
Cylindricity 2D analysis diagram

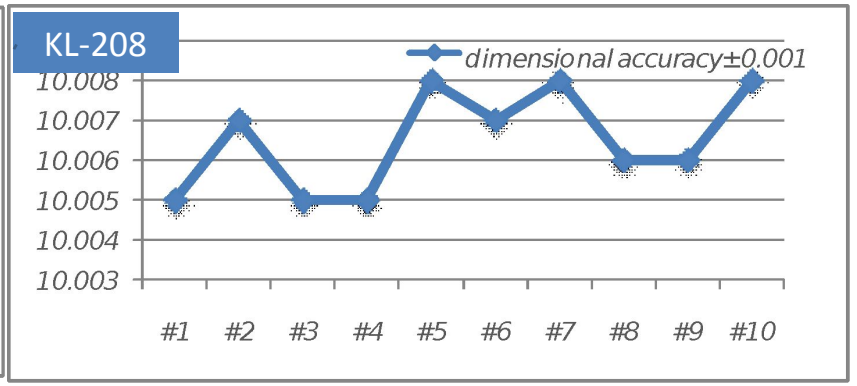


(3) Precision and Effectiveness

①《dimensional accuracy±》





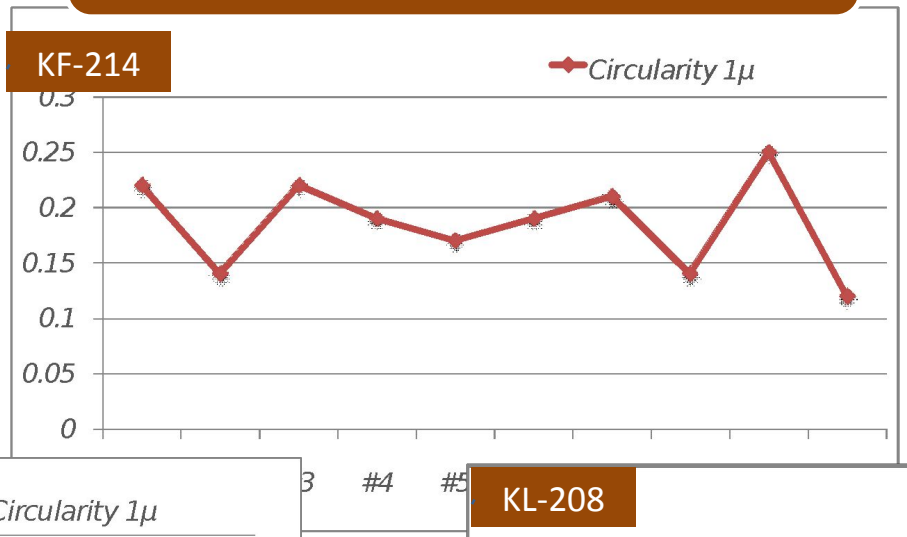


SIRUBA Sew Reach

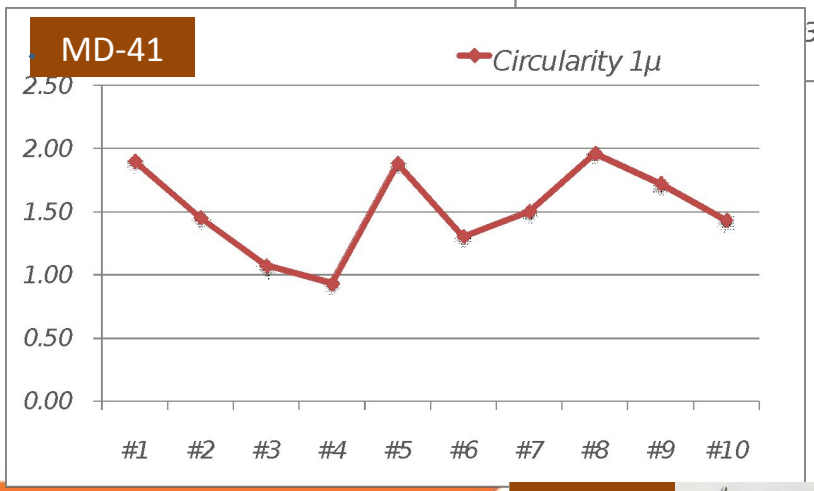
(3) Precision and Effectiveness

②《Circularity ○》

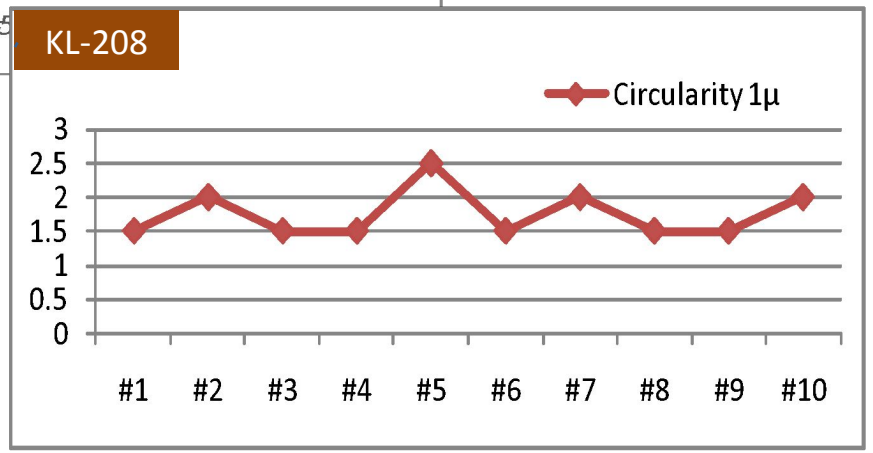
KF-214



MD-41



KL-208



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SIRUBA Sew Reach

(3) Precision and Effectiveness

③《 Cylindricity /○/》

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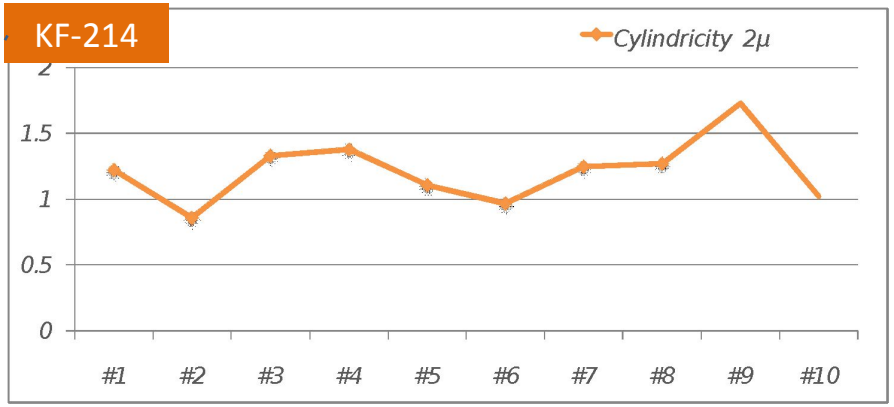

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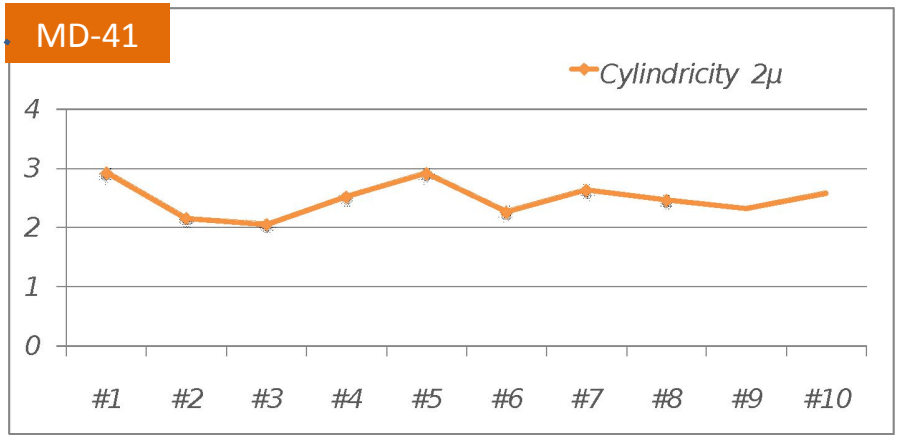

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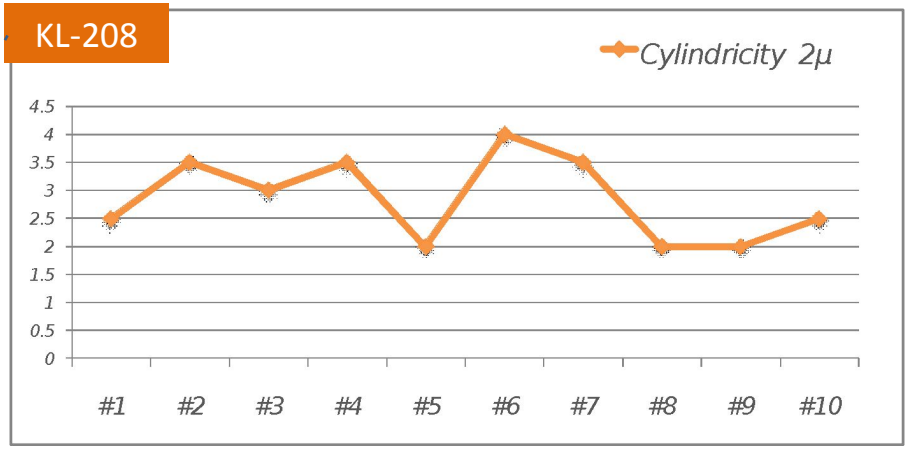

SIRUBA Sew Reach

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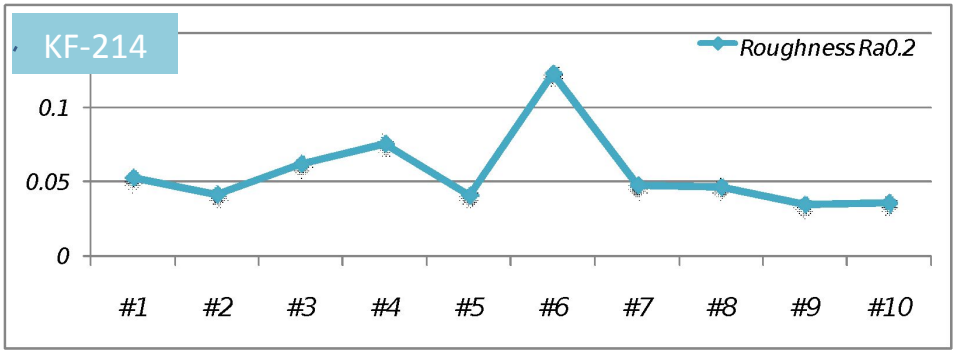
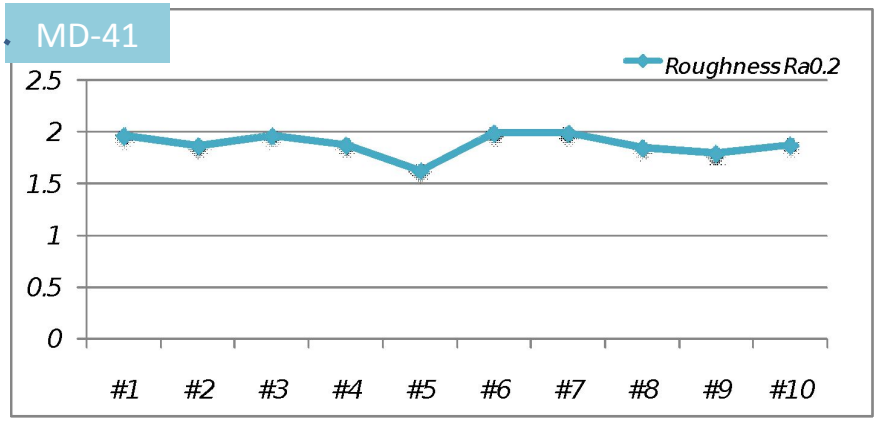
(3) Precision and Effectiveness

④《Roughness √》

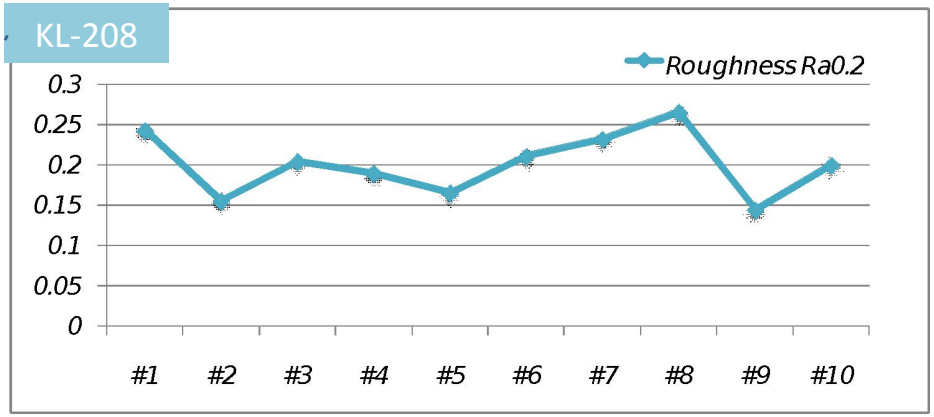
KF-214



MD-41



KL-208



SIRUBA Sew Reach

KF-214

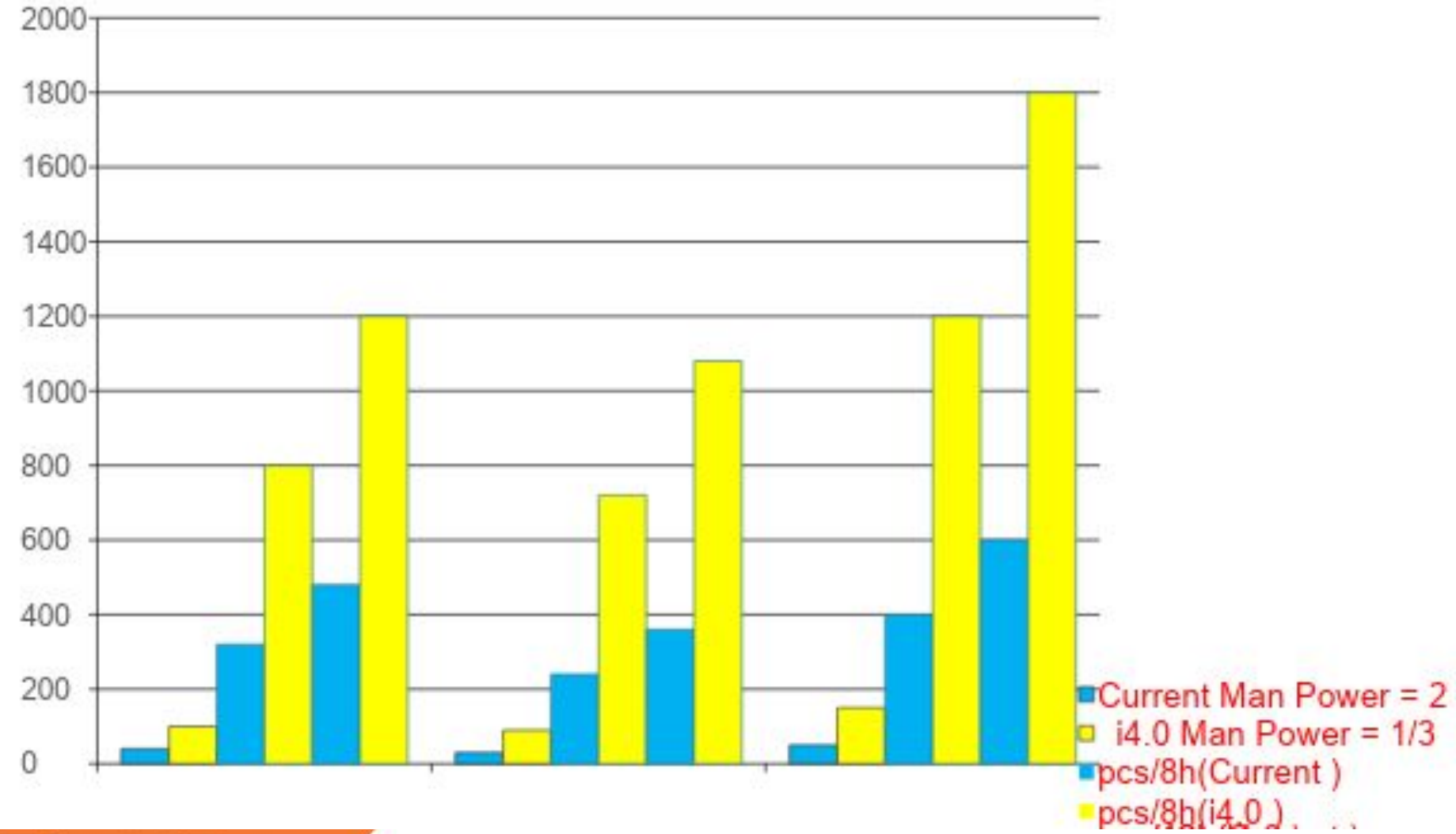
MD-41

KL-208

(3) Precision and Effectiveness

Comparison	Machining	Tool	Process				Man Power	unit	production pcs/8h	production pcs/ 11h
Vertical -honing machine	honing	Honing strip	(1) harsh honing	(2) finish honing	(3) harsh reaming	(4) finish reaming	2	2pcs	250	350
			40s/pcs	40s/pcs	14s/pcs	14s/pcs				
			Total cycle time: 108s							
i4.0 Fully automatic honing machine	Reaming and honing	Electroplating-diamond reamer	i4.0 Fully automatic honing machine				1/3	1pcs	900	1260
			30s/Cycle time							

(3) Precision and Effectiveness



SIRUBA
Sew Reach

(4) Exquisite Appearance Design

Left side of encloser

Front side of encloser

Right side of encloser

SIRUBA
Sew Reach

(4) Exquisite Appearance Design

SiRUBA®
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The intelligent factory solution is your best choice

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