

MEASURING TOOLS

AIR MICROMETERS

Column Model
Dial Type
Digital Model
Measuring Head
Automatically Inspects Tapped Holes

U-002
U-003
U-003-005
U-006-009
U-010

USP GROUP

AIR MICROMETER

แอร์ไมโครมิเตอร์



แอร์ไมโครมิเตอร์แบบคอลัมน์

COLUMN MODEL (FLOW TYPE) AIR MICROMETER “flowmec (PAT)”



Description

Flowmec is a precision relative measuring instrument that measures changes in airflow running through a slight clearance between workpiece and measuring head as read by the expansion of a float in taper tube. the measuring system consists of flowmec main body, measuring head and masters.

Advantages

1. Superior stability. (less than 2% active reading rang)
2. Two standard magnifications can be shares. (The body with the black float shares magnifications of 2,00 and 5,000 times.)
3. Since the upper is made of resin, it won't scratch the float.
4. The magnification setting and zero adjusting knobs and located separately, making operation easy.
5. Taper tubes are easy to remove.
6. Magnification standards of all taper tubes are the same. (in cases of changing magnification, change the float and scale board)
7. Can be fabricated to compact multiple columns by adding basic unit between feet.

How to fabricate columns

When performing multiple places measurement, flowmec can be easily fabricated to multiple columns by adding to basic units of No.3100 required and right & left feet. The above picture shows a three columns flowmec with a measuring head master for taper degree measurement.

Specification model	Number of columns	Width (mm)	Depth (mm)	Height (mm)	Weight (Kg)
No.3100	-	34	192	475	2.2
No.3101	Single columns	104			3.8
No.3102	Double columns	138			6.0
No.3103	Three columns	172			8.2
No.3104	Four columns	206			10.4
No.3105	Five columns	240			12.6
No. :	:	:	:	:	:

Indication of number of column and magnification is required when placing an order.
Ex) No.3103 (three columns) x 5000

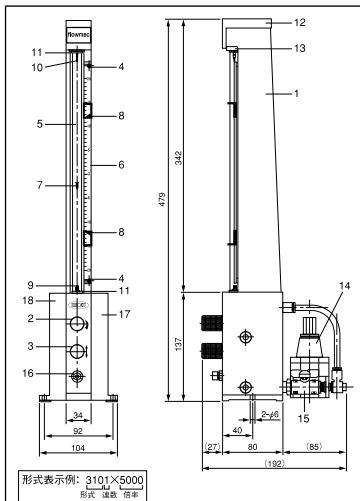
Specifications

standard magnification	times	X 10000	X 5000	X 2000	X 1000
measuring range	μm	20	40	100	200
effective measuring range	μm	15	30	70	150
scale volume	μm	0.5	1	2	5
scale width	mm	5	5	4	5
float color		blue	black	black	green*
max. measuring error	μm	less than 2% of effective measuring range			4
response time	sec.	within 1.5 (value according to conditions specified in JIS B7535)			
tolerance marker		2			
measuring head connecting screw		M10x0.75 male			
air pressure supplied	kPa	245 ~ 785			
basic unit size	mm	34(W) x 477(H) x 192(D)			
single column unit size	mm	104(W) x 479(H) x 192(D)			
basic unit weight	kg	2.2			
single column unit weight	kg	3.8			

Note: The upper damper is exclusively for the specification of the standard x 1000 magnification.

Standard Accessories

- filter unit (including a mist separator, ODØ8 touch joint or volute nipple for inlet and ODØ8 touch joint for outlet)
- touch tube, 2m length (for use in cut off value and filter unit connection)



1. Column frame
2. magnification setting knob
3. Zero adjustment knob
4. screw for secure the scale plate
5. taper (glass) tube
6. Scale board
7. float
8. limitation indicator
9. lower damper
10. upper damper
11. taper tube seal (upper and lower)
12. head cover
13. tapered tube holder
14. regulator
15. ball valve (Ø8mm with touch joint)
16. measuring head joint (M10x0.75)
17. foot (right)
18. foot (left)

Note : Please contact us if you would like to change the number of columns after purchasing this product.

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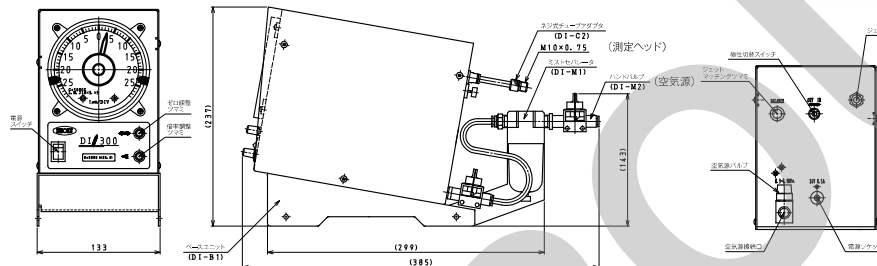
DIAL TYPE AIR MICROMETER "DI-300"

Description

Analogmeter with high visibility applied, thus workshop load reduced by easy read.
DI-300 can realize high sensible and stable measurement applying differential pressure type which has almost no influence by change of air source supplied.

Advantages

- Big scale board with analog indicator is easy to read and makes worker's tired feeling reduce.
- This instrument applies differential pressure type.
- This method give stable measurement because it has almost no influence by change of air pressure supplied accordingly.
- Differential pressure type Air micrometer has higher measuring air pressure than that of Flow type Air micrometer, thus more wide measuring clearance gives high durability of measuring head.
- Polarity inversion for internal or external measurement and zero adjustment because each nob is independent.
- Fill magnification series can meet your measuring requirement. Extra-small diam, nozzle like 0.3 nozzle is one of environment conscious products to realize energy saving.
- * As to "differential pressure type", please refer to catalog of Digital model Air micrometer "mini"



Specifications

Order No.	DI-300									
rang code	A	B	C	D	E	F	G	K	L	M
Equivalent to magnification	20000	10000	5000	2500	1250					
Nozzle type						Ø0.2	Ø0.3	Ø0.5N	Ø0.7	Ø0.8
Range of measurement (µm)	±6.25	±12.5	±25	±50	±100	±6	±7.5	±12.5	±20	±22.5
Minimum display amount (µm)	1.0	1.0	1.0	10.0	10.0	1.0	1.0	1.0	1.0	1.0
Power supply voltage	DC24V 0.5A [100 ~ 240V 50 ~ 60Hz Accessories AC Adapter]									
air pressure supplied (MPa)	0.3 ~ 0.9									
Dimension (mm)	130(W) x 225+50.2 (D) x 177(H)									
Weight (kg)	2.38									

แอร์ไมโครมิเตอร์แบบดิจิตอล

ELECTRIC & AIR MICROMETER (1CH, 2CH) & DIGITAL DISPLAY UNIT "Smp"

Overview

The Smp is a compact digital-analog display unit of touch panel type with rich function. Its measurement values are clearly legible, and you can select a presentation mode from dial indication, bar-graph indication, two-channel simultaneous indication, and more depending on your applications or personal tastes. It has diverse functions such as the three-point calibration, the continuous feeding measurement, and classification into up to 16 classes. For air micrometers, a single unit of the Smp can handle multiple magnification levels through switching of the orifice. We can also provide a unit which supports electronic micrometer's probes from various manufacturers.

Features

- Displays both the relative values with respect to the nominal value and the direct-reading absolute values.
- When two channels are used, the Smp automatically switches the indication response to the motion of each probe (measuring head).
- Supports many arithmetic values as standard (max, min, max - min, mean and median).
- Easy data output through USB connection to a PC.
- The data can be directly stored in a USB flash drive (Smp-1a, 2a for air micrometers).
- Can be used with the measuring heads from various manufacturers (Smp-1a, 2a for air micrometers).
- The graded classes are indicated in different colors to reduce workers' sorting errors.
- On completion of one cycle of the continuous feeding measurement, the indication switches to arithmetic values so that the user can confirm them.

Specifications

Order No.	Air micrometer		Electronic micrometer
	Smp-1a (1ch)	Smp-2a (2ch)	Smp
minimum display	µm		0.01
air pressure supplied	MPa	0.3 ~ 0.9	
main power	V	AC 85 ~ 264	
weight	kg	0.65	0.6
data output	RS232C / USB / USB Flash memory		RS232C/USB
Standard accessories	Smp display unit with stand, USB cable (1.8 m) for power supply and data transmission, and power adapter (USB plug)		
Option	Regular, foot switch, panel mounting brackets (see Note 1), various M-Bus modules (See note 2), M-Bus cable, RS232C cable (see note 3), various probe adapters, adaptets for screw type tubes, and adapters for other makes' tubes.		

Note. 1) A variety of mounting methods are available: e.g. the mounting on the operation panel or the mounting on the wall with the angle stand (M5 tapped holes).

Note. 2) The optional I/O unit allows the control of external devices via up to 32 channels.

Note. 3) The optional RS232C communication cable enables the connection to a PC or PLC.

AIR MICROMETER

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DIGITAL MODEL AIR/ELECTRONIC MICROMETER “admec”



admec A1



admec A2

Description

The admec is a compact, user-friendly, high-precision air micrometer with a wide range of operational functions. There are two basic models available: The single-channel A1 which features easy-to-use advanced functions, and the two-channel A2, which in addition to the functions of the A1, enables measurements to be made simultaneously via two channels and operational functions between channels. A1 or A2 can meet various measurement demands by users. Electronic micrometers with identical functions are also available.

A single chip microcomputer provides this product with outstanding cost performance. All models come equipped with RS-485 output, so data can be transmitted to a computer and parameters can be configured via a computer through the interface. They are also shipped with ranking assessment output, externally-controlled input and analog input for temperature correction, enabling them to handle many factory automation requirements such as automatic measurements.

Advantages

- For measuring channels, 1 or 2 channels is installed the same compact size.
- The A1 is equipped with six basic operational functions, while the A2 is equipped with thirty-five basic operational functions.
- Master settings are easily operated by pressing the operating keys. There is no need for fine adjustments via knobs.
- The number of assessment rankings can be freely set from OK1-30 via parameter settings.
- Various data for fifteen types of workpieces can be preset. The types can switched automatically or manually.
- Ideal for multi-ranking selections at the submicron level using high-precision three-point calibration. Three-point calibration corrects not only magnification, but also linearity using three master gauges (lower, medium and upper).
- Accommodates memory capture measurements and continuous capture measurements in addition to regular measurements.

Specifications

Order No.	Air micrometer				Electronic micrometer		
	A1	A1D	A2	A2D	E1	E2	E2D
Input mothad	1CH	2CH (Difference measurement)	2CH	2CH (Difference measurement)	1CH	2CH	2CH (Difference measurement)
number of measuring channels	1ch, 2ch						
operating function	comes standard with six basic operational modes for single channel specs, and thirty-five basic operational modes for two channel specs						
RS-485	comes standard						
contact output	assessment output: +NG; OK1-30(B, C, D); -NG (measurements and parameter); overall: OK or NG						
air pressure supplied	300 ~ 900kPa						
power supply voltage	100 ~ 240V±10% 50/60Hz 11VA						
environment temperature	0 ~ 40 °C						
unit size (mm)	270(W) x 260(D) x 110(H)				*(excluding protruding parts such as legs)		
weight (kg)	4.0						

magnification	20000:1Z (A)	10000:1Z (B)	5000:1Z (C)	2500:1Z (D)	SP0.3 (G)	SP0.5N (K)	electronic micrometer
item							
measuring range μm	12.5	25.0	50.0	100.0	15.0	25.0	±999.9
max. measuring error μm	0.2	0.3	0.5	1.6	0.4	1.0	-
cyclical stability μm/20 time	0.1	0.2	0.3	0.6	0.2	1.0	-
reading stability μm/20 minute	0.2	0.3	0.6	1.1	0.4	1.0	-
response time sec	1.6	1.4	1.2	1.2	2.0	1.6	-

admec model indication

- for air micrometer
model name - magnification
Ex) admec A1-C
- for electronic micrometer
model name
Ex) admec E2

แอร์ไมโครมิเตอร์แบบดิจิทัล

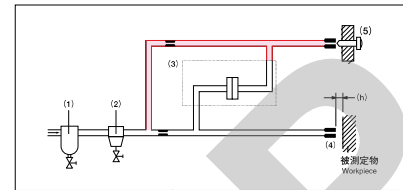
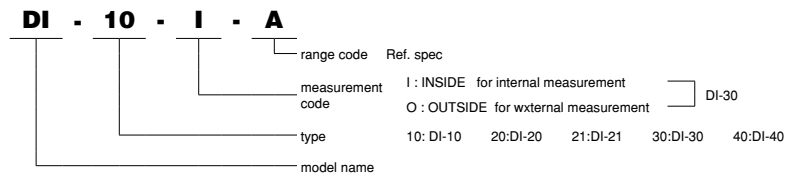
DIGITAL MODEL AIR MICROMETER “mini”

Compact type pursuing user's measurement intentions and needs, Each size of W67mm x H107mm (127mm for DI-30,40) x D135mm, has a built-in regulator and complies with multi power supplies within a range of 85 to 264V for multiple area usage. Basic model is called DI-10 and DI-30 but other models with additional functions (DI-20, 21, 40) are also available. Select each model dependent on intended usage.

Description

Previously the air pressure of flow type air circuits was limited due to the use of tapered glass tubes. Now through the use of a backpressure type circuit, higher air pressure can be realized resulting in an improvement in the endurance and reliability of the measuring workpieces. Moreover, since it is a differential pressure type comprising of a parallel bridge circuit through the addition of a zero adjustment circuit (colored red) to the back pressure type air circuit, it is less influenced by pressure fluctuations in air supply, which can result in higher sensitivity and a wider range of measurement.

• Indication of model



- (1) Air filter (mistseparator)
(2) Regulator
(3) Transducer for differential pressure type
(4) Measuring head
(5) Zero adjusted knob

Column Model

แบบคอลัมน์

Dial Type

แบบไดอัล

Digital Model

แบบดิจิทัล

Measuring Head

หัววัด

แอร์ไมโครมิเตอร์

Automatically

Inspects Tapped

Holes

เครื่องตรวจสอบ

เกลียวอัตโนมัติ

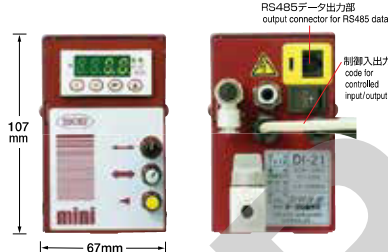
• DI-10



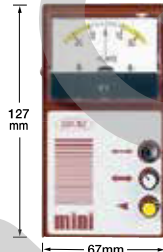
• DI-20



• DI-21



• DI-30



• DI-40



Advantages and Functions

- Adjusting knobs is applied for easy operation
- Superior admission decision function has three kinds of indications like O.K., +NG and -NG. (DI-20, 21, 40) Each measured value is indicated in three colors of green (OK), red(+NG), yellow (-NG), thus decision output reading is also superior (DI-21).
- Controlled input/output function can make max.31 units of min connect with one personal computer, (DI-21)
- Analog display can help to read MAX/MIN value and position in the tolerance easily.

Specifications

Order No.	DI-10, DI-20, DI-21, DI-30, DI-40					
range code	A	B	C	D	E	F ~ M
equivalent magnification for measuring range	20000	10000	5000	2500	1250	small diameter for nozzle
measuring range (μm)	6.25	12.5	25	50	100	
min. reading volume (μm)	0.01 (0.5)	0.1 (1)	0.1 (2)	0.1 (5)	1 (10)	
power supply voltage	AC 85 ~ 264 [V] 47 ~ 63 [Hz]					
air pressure supplied (MPa)	0.3 ~ 0.9					

* () is the scale of D-30

*Measurement for internal or external shall be set up in our factory when delivered. Any other ranges except the above table are available. Please ask us.

Options

mistseparator(filter)

- auto drain type to save worker's operation

baseunit

- height adjustable type for easy readings
- combined easily to multiple type

Interface

- Interface for connection with personal computer to change RS232C is available as option. DI-E2 can make max.31 units of DI-21 connect with one personal computer



AIR MICROMETER

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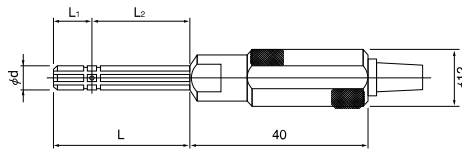
หัววัดแอร์ไมโครมิเตอร์

MEASURING HEAD FOR INTERNAL DIAM.

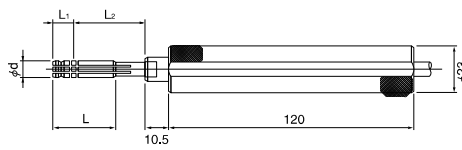
ISSOKU's measuring heads and masters for air micrometers have high accuracy and superior wear resistance, which are made by our precision machine technologies. We recommend you to use our measuring heads and masters for your efficient and effective measurement of course together with our high precision air micrometers.

This type of measuring head can be used for internal diam. of through or blind hole. By changing measuring point or position, cylindricity and circularity can be also checked.

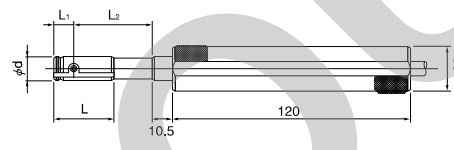
No.6002 for through hole measurement



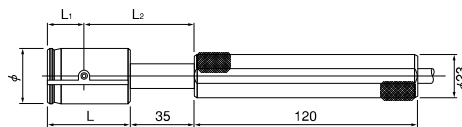
Ød	L	L1	L2
3-4	27	7	20
4-5	30	8	22



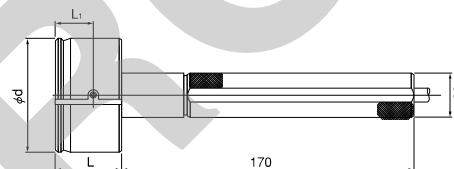
Ød	L	L1	L2
5-8	30	10	35



Ød	L	L1	L2
8-13	30	10	40

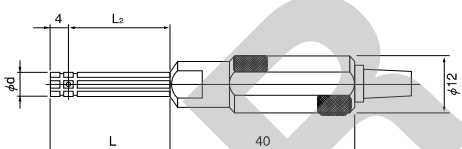


Ød	L	L1	L2
13-50	45	20	60
50-80	35	20	50

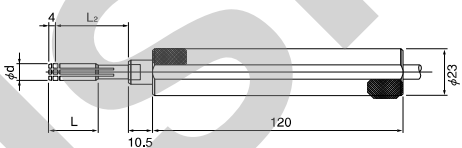


Ød	L	L1	L2
80-150	50	30	

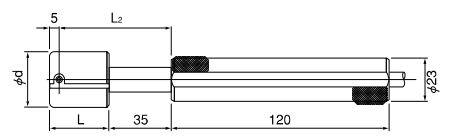
No.6012 for blind hole measurement



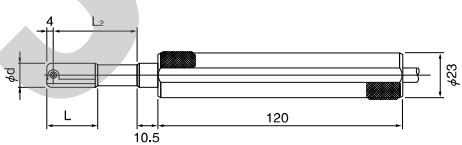
Ød	L	L1
3-4	24	20
4-5	26	22



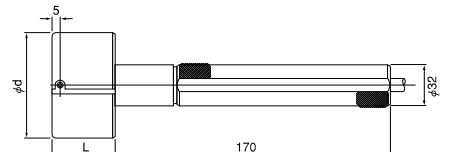
Ød	L	L1
5-8	24	35



Ød	L	L1
13-50	30	60
50-80	35	65



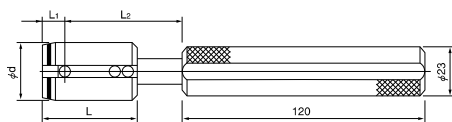
Ød	L	L1
8-13	24	40



Ød	L	L1
8-150	45	

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LEAF (PLATE SPRING) TYPE MEASURING HEAD FOR INTERNAL DIAM.



This is indirect type measuring head using plate spring with tungsten carbide ball point. It is applied to measurement of a width of 4mm or less or surfaces with a finish of 3.2 μmRy (R_{max}) or more. In case of blind hole measurement, more deep point nearest a bottom can be measured.

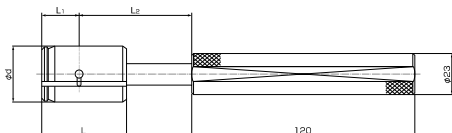
$\varnothing d$	for through hole No.8230			for blind hole No.8232		
	L	L1	L2	L	L1	L2
8 - 13	50	10	40	42	2	40
13 - 20	50	10	60	42	2	60
20 - 50	45	10	60	37	2	60
50 - 80	48	10	65	40	2	65
80 -	(note)					

d,8 is not available

(note) d>80 except above table is also available, but $\varnothing 32 \times 170\text{mm}$ handle is used in this instance.

หัววัดแอร์ไมโครมิเตอร์

BALL CONTACT TYPE MEASURING HEAD FOR INTERNAL DIAM.



Same as leaf type head, this is also indirect type measuring head using carbide ball point. It is mainly used for measurement in case that it is difficult to measure for leaf type measuring head. A further advantage of this type, two carbide balls floating in air current, which are located opposite each other, can roll over the measuring surface, thereby it prevents workpiece from the distortion or scratch.

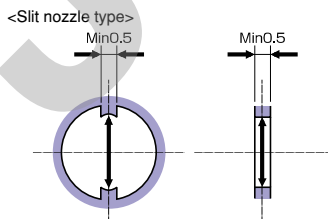
$\varnothing d$	for through hole No.8230			for blind hole No.8232		
	L	L1	L2	L	L1	L2
12 - 13	30	10	40	24	4	40
13 - 20	45	20	60	30	5	60
20 - 50	45	20	60	30	5	60
50 - 80	35	20	50	35	5	65
80 - 150 (note)	50	30		45	5	

d<12 is not available.

(note) In case of 80-150, $\varnothing 32 \times 170\text{mm}$ handle is used.

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SLIT NOZZLE TYPE MEASURING HEAD



NOTE :
Helpful tools for measuring head like stop collars shall be required if workpiece measured has special profile or it is not easy to be fixed.

Useful measurement stage can be extended by using slit nozzle type measuring head. It expands measurable range of non-contact measuring head for internal, external diam., and etc.

Min. measurable width of workpiece

In case of measuring head for back pressure type Air micrometer : 0.5mm

In case of measuring head for flow model Air micrometer : 0.5mm

<Examples of measurement>

- Measurement for workpiece with narrow space or width.
- Measurement for diam. near to bottom of blind hole.
- Measurement for width of shallow slit.
- Measurement for workpiece with helical spline.
- Measurement for small diam. or multi-places where it is not possible to measure for indirect measuring head.
- Measurement for tip circle diam. of swedge included odd number of tooth

AIR MICROMETER

แอร์ไมโครมิเตอร์



หัววัดแอร์ไมโครมิเตอร์

MEASURING HEAD FOR EXTERNAL DIAM.

Two kinds of caliper type and ring type are standardized. It is easy to do precision measurement only to put a workpiece between measuring head (caliper type) or to insert a workpiece into measuring head. (ring type)

Column Model

แบบคอลัมน์

Dial Type

แบบไดอัล

Digital Model

แบบดิจิตอล

Measuring Head

หัววัด

แอร์ไมโครมิเตอร์

Automatically

Inspects Tapped

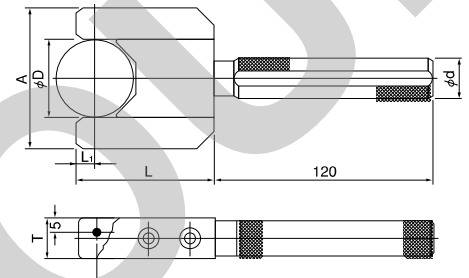
Holes

เครื่องตรวจสอบ

เกลียวอัตโนมัติ

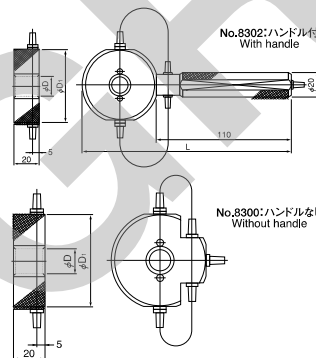
No.8310 Caliper type

ØD	A	L	L1	T	Ød
5 - 10	42	45	6	20	23
10 - 12	42	54	8	20	23
12 - 15	D+30	54	8	20	23
15 - 25	D+30	60	8	20	23
25 - 35	D+30	65	8	20	23
35 - 50	D+30	69	8	20	23
50 - 65	D+30	72	8	22	23
65 - 85	D+30	82	8	22	23
85 - 105	D+30	92	8	25	23
105 - 125	D+30	102	8	25	23



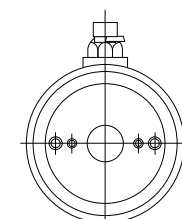
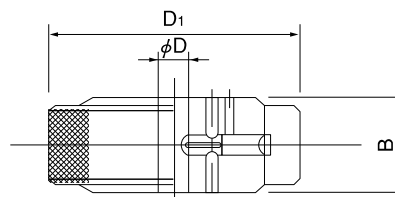
No.8300 • 8302 Ring type

ØD	D1	L
6 - 10	50	159
10 - 20	60	169
20 - 30	70	179
30 - 40	80	189
40 - 50	90	199
50 - 60	106	215

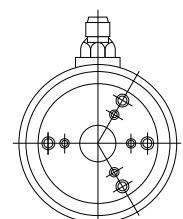


No.6300 • 6303 Ring type

ØD	D1	B
8 - 14	55	18
14 - 20	62	18
20 - 26	68	22
26 - 32	74	22
32 - 38	80	24
38 - 45	88	26
45 - 52	94	28
52 - 60	102	30
60 - 68	110	32
68 - 76	118	34
76 - 84	125	36
84 - 92	134	38
92 - 100	142	40
100 - 108	150	42
108 - 116	158	44



No.6300: 対向ノズル
Two measuring nozzles



No.6303: 3方ノズル
Three measuring nozzles

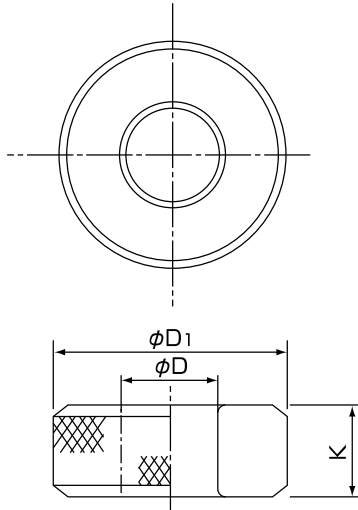
- Please ask for Ø8 and smaller.
- Measuring head treated hard-chrome plating or TiN coating and material of tungsten carbide measuring head can be manufactured also.

Note
No.6300 : two measuring nozzles
No.6303 : three measuring nozzles

มาตรฐานเกจ

MASTER GAGE

Master ring gage



ØD		ØD1	K	ØD tolerance	C	ØD		ØD1	K	ØD tolerance	C		
Above	Include					Above	Include						
	3	22	4	±1 µm	1	38	44	74	25	±1.5 µm	1		
3	4		10			44	50	84					
4	5					50	65	104					
5	8	26	12			65	80	124	30	±2 µm			
8	14		15			80	95	144					
14	20	42				95	110	164					
20	26	50				110	120	192	38	±2.5 µm			
26	30	58	20			120	130						
30	32					130	150	220					
32	38	66		±1.5 µm									

Column Model

แบบคอลัมน์

Dial Type

แบบไดอัล

Digital Model

แบบดิจิตอล

Measuring Head

หัววัด

แอร์ไมโครมิเตอร์

Automatically

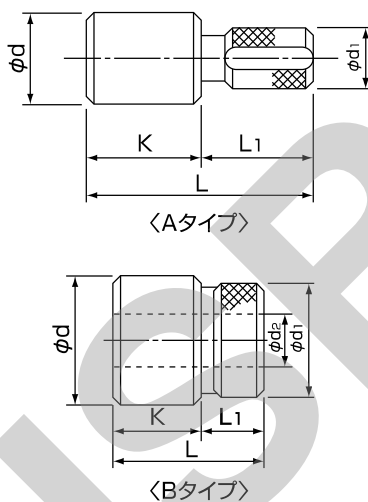
Inspects Tapped

Holes

เครื่องตรวจสอบ

เกลียวอัตโนมัติ

Master plug gage



Ød		Type	K	Ød tolerance	L	L1	d1	d2
Above	Include							
5	12	A	25	$\pm 1 \mu m$	50	25	8	-
12	15						10	
15	20						14	
20	25						19	
25	38						22	
38	50	B	30	$\pm 1.5 \mu m$	45	15	36	20
50	60						48	
60	70						58	
70	80						68	
80	90						78	
90	100						88	
100	110						98	

* Form of gage below Ø5 is another form

Special form master gage

In addition to standard master in above table, master gage for special purpose measurement can be also designed and manufactured.

AIR MICROMETER

แอร์ไมโครมิเตอร์



เครื่องตรวจสอบเกลียวอัตโนมัติ

AUTOMATICALLY INSPECTS TAPPED HOLES



SPEEDY INSPECTION

- Inspection will take only 2 second a hole. The inspection time can be greatly faster. (M1.4/Depth 3mm)
- Can be registered 50 banks and it can inspect many kinds of threads continuously.

FLOATING MECHANISM (ECCENTRICITY/INCLINATION)

Accurate judgment can be made without being affected by hole position accuracy and product inclination.

SETTING INSPECTION TORQUE BY USER'S SPECIFICATION

Measuring torque can be set same as hand work with gauge.
Inspection (screwing) torque can be set according to the product.
Reduce inside rotation friction to provide very low torque for small thread and soft material parts.
High speed and high torque for extracting thread gauge to reduce inspection time.

SPECIALIZED DESIGN WITH SENSERS. (Patent pending)

Measure depth of tread from screwed rotation makes reliable judgment.
(Good for through threaded hole also.)
Fine pitch thread inspection is also available.

RELIABLE SPECIAL THREAD PLUG GAUGE (patent pending)

ISSOKU over 73 years of thread manufacturing history provide special gauge for this machine.
Removing of incomplete thread of tip of gauge makes reliable depth inspection.
Adjustment of position and phase of thread plug gauge is not required with special gauge.
Special size and shape of thread gauge can be available.
Note) Using thread gauge not for this machine will cause malfunction.

SYSTEM CONFIGURATION

Gauge 10 types ,position and depth of gauge 50 data can be stored.
ISSOKU can provide carrying and positioning device also.

Order No.	Bee-1
Size of Thread	M1.4~M10 (or equivalent)
Pitch of Thread	Pitch 0.3~1.5 (84~17 Thread/inch) Unit change required for different pitch. Ask ISSOKU for special pitch.
Max depth of Thread	20mm
Inspection Torque	0.01Nm ~ 0.11 Nm
Rotation speed	60 ~ 2000 rpm
Z axis range	100 mm
Floating	Eccentricity Ø0.3, Inclination 5 min
Inspection Time	Around 2 sec (depends on rpm and depth)
Control Input	Operation Ready, Selection of Bank(50) Start, Emergency Stop
Control Output	In Measuring, OK , NG , err
Electric Power	100~240V
Size of Unit	498(H) x 316(D) x263(W)
Weight	About 30 kg

※Picture of front page shows model with X-Y table type.

※Specification will be changed without notice.(2016.11)