

In 1962, Mr. A.B. Baker and Mr. A.A. Baker succeeded in setting up the first manufacturing plant in India in the field of linear dimensional metrology, in partnership with **Horstmann Gauge & Metrology Ltd., England**. In 1972, we together set up another manufacturing plant, this time in partnership with **Thomas Mercer Ltd., England**, in the same field.

We found this field interesting and challenging in terms of producing high quality products and we, over a period, developed a Passion for Precision. We focused on growing this business and today we are exporting our products to 60 countries plus, globally.

With **your support**, we wish to become one of the top global metrology players in the near future.

Baakir Baker  
Chairman & Managing Director  
**BAKER GAUGES INDIA PRIVATE LIMITED**

# Introduction

BAKER is a solutions provider for linear dimensional measuring needs of the engineering and metal working industry. We manufacture a wide range of products including precision hand-held measuring instruments (micrometers, calipers, dial gauges etc.), thread gauges and multi gauging solutions driven by air-electronic systems and computer softwares.

Today, with more than five decades of experience in the manufacture of various types of gauges, BAKER is ranked no.1 manufacturer of Gauges and Precision Measuring Instruments in India.

Both of our divisions (i.e. BMI division & HIP division) are certified to ISO 9001 - 2015 Quality Management Systems. Both divisions have independent calibration laboratory which together cover a volume of around 200 cubic meters of precisely controlled environment. Both laboratories are accredited as per ISO/IEC 17025 by NABL, India (National Accreditation Board for Testing & Calibration Laboratories).

Having a state-of-the-art infrastructure, that consists of the latest CNC and special purpose machines, a modern surface treatment plant, complete in-house heat treatment facilities and above all, our biggest asset, Experienced Personnel, has given us an edge required for producing high quality reliable products, consistently year on year.

At BAKER, we have a team, which thinks together and thinks ahead.

Consistency, Reliability and Precision is gradually taking BAKER to greater heights.







CORE TEAM: BMI DIVISION



CORE TEAM: HIP DIVISION

# BAKER

## National Presence

...a strong dealer network across the country



● **Corporate Office & Factories: (Pune)**

BMI Division: Email: bakerbmi@bakergauges.com  
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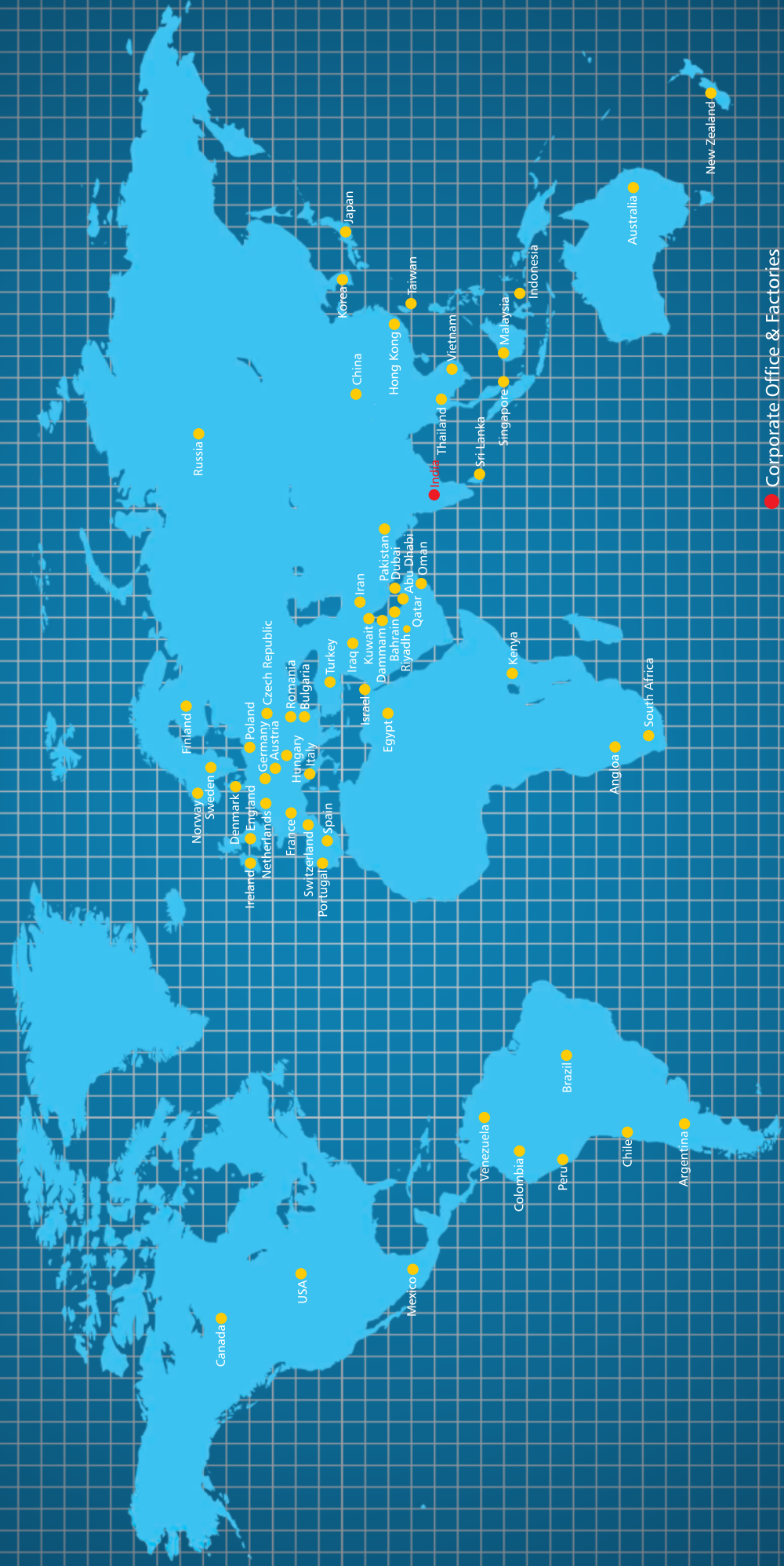
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# BAKER

## Global Presence

● Distributors



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# Index

## 1. Dial Gauges 1 - 12



- a. Mechanical Plunger type 2
- b. Digital Plunger type 7
- c. Lever type 9
- d. Back Plunger type 11
- e. Dial Gauge - Accessories 12

## 2. Dial instruments 13 - 22



- a. Dial Depth Gauge & Universal Test Set 14
- b. Dial Thickness Gauge 15
- c. Dial Bore Gauge 16
- d. Dial Snap Gauge 17
- e. Special Instruments 18
  - . Tyre Tread Depth Gauge
  - . Crankshaft Web Deflection Gauge
  - . Ball Diameter Checking Gauge
  - . Outside Diameter Checking Gauge
- f. Universal Gauge 20
- g. Harpenden Skinfold Caliper 21
  - (human body fat measurement)
- h. Dial Magnetic Stand/  
Dial Comparator Stand 22

## 3. Calipers 23 - 28



- a. Vernier Caliper 24
- b. Dial Caliper 25
- c. Digital Caliper 25

## 4. Micrometers 29 - 46



- a. Mechanical External Micrometer 31
- b. Digital External Micrometer 34
- c. Special External Micrometer 35
- d. Setting Gauge for External Micrometer 38
- e. Depth Micrometer 38
- f. Micrometer Heads 39

- g. Mechanical Internal Micrometer 40
- h. Large Mechanical Internal Micrometer 41
- i. Digital Internal Micrometer 42
- j. Microgauge Internal Micrometer 45
- k. Special Internal Micrometer 46

## 5. Contact Type Plug Gauges 47 - 52



- a. Measuring heads 49
- b. Holders 51

## 6. Height Gauges 53 - 54



- a. Digital Height Gauge 54

## 7. Plain Gauges & Masters 55 - 58



- a. Master Setting Ring 56
- b. Master Setting Disc 57
- c. Plain Plug Gauges 58

## 8. Thread Gauges 59 - 68



- a. Types of Thread Gauges 60
- b. Standard Sets - Plugs & Rings 61
- c. Miniature Gauges 61
- d. Multi Start Gauges 61
- e. Hole Location Gauges 61
- f. Customised Gauges 61
- g. Metric Gauges 62
- h. Unified Gauges 62
- i. 'G' Pipe Gauges 63
- j. Acme & Stub Acme, Trapezoidal 63
- k. Taper Gauges 64
- l. Adjustable thread ring gauges and set plugs 66
- m. Tungsten carbide thread gauge 66
- n. API (Oil) Thread Gauges 67



# Index

## 9. Spline Gauges & Master Gears 69 - 72



- a. Spline Plug Gauge 70
- b. Spline Ring Gauge 70
- c. Master Gears 70
- d. Variable Spline Indicator 71
- e. Lock Up Concentricity Ring Gauge 71
- f. Taper Master Plug 71

## 10. Air & Air-Electronic Gauges 73 - 84



- a. Universal Air Gauge Unit 75
- b. MOD - 3 Air Gauge Unit 75
- c. Air - Electronic Converter Module (AECM) 76
- d. Microprocessor based Digital Gauge 76
- e. Microprocessor based Column Gauge 77
- f. Air Plug Gauge 78
- g. Setting Rings for Air Plug Gauge 80
- h. Air Ring Gauge 81
- i. Setting Plugs for Air Ring Gauge 82
- j. Air Caliper 83
- k. Setting Discs for Air Caliper 84

## 11. Electronic Gauges 85 - 96



- a. Twin Channel Electronic Gauge 88
- b. Microprocessor based Twin Channel 89
- c. Electronic Probe 90
- d. Special Electronic Gauge 92
- e. Electronic Gauge interface 93
- f. Wireless Data Acquisition 96

## 12. Customized Gauging Solutions 97 - 122



- a. Automotive 101
  - Engine 101
  - Transmission 112
  - Shim, Spacer Selection 115
- b. Fuel, Oil & Water Pumps 117
- c. Medical (Pharmaceutical) 118
- d. High Speed Dimensional Grading and Sorting 119
- e. Other Engineering Applications 120

## 13. Coordinate Measuring Machines 123 - 132



- a. Xtreme Shop Floor CNC CMM 124
- b. Axiom too Manual or CNC CMM 125
- c. Axiom too HS High Specification CNC CMM 126
- d. Zenith 3 CNC CMM 127
- e. Azimuth CNC CMM 128
- f. Aberlink 3D Measurement Software 129
- g. Probe Options 130
- h. CMM Camera 131

## 14. Video Measuring Machines 133 - 136



- a. Video & Touch 134
- b. Video Measurement 135
- c. Multi Sensor Measurement 135
- d. AfDM Multi Sensor Software 135

## 15. Data Acquisition & SPC software 137 - 140



- a. Baker Q Soft 138

## 16. Calibration Services 141 - 144



- a. Scope - BMI Division 143
- b. Scope - HIP Division 143

## 17. After Sales 145 - 146

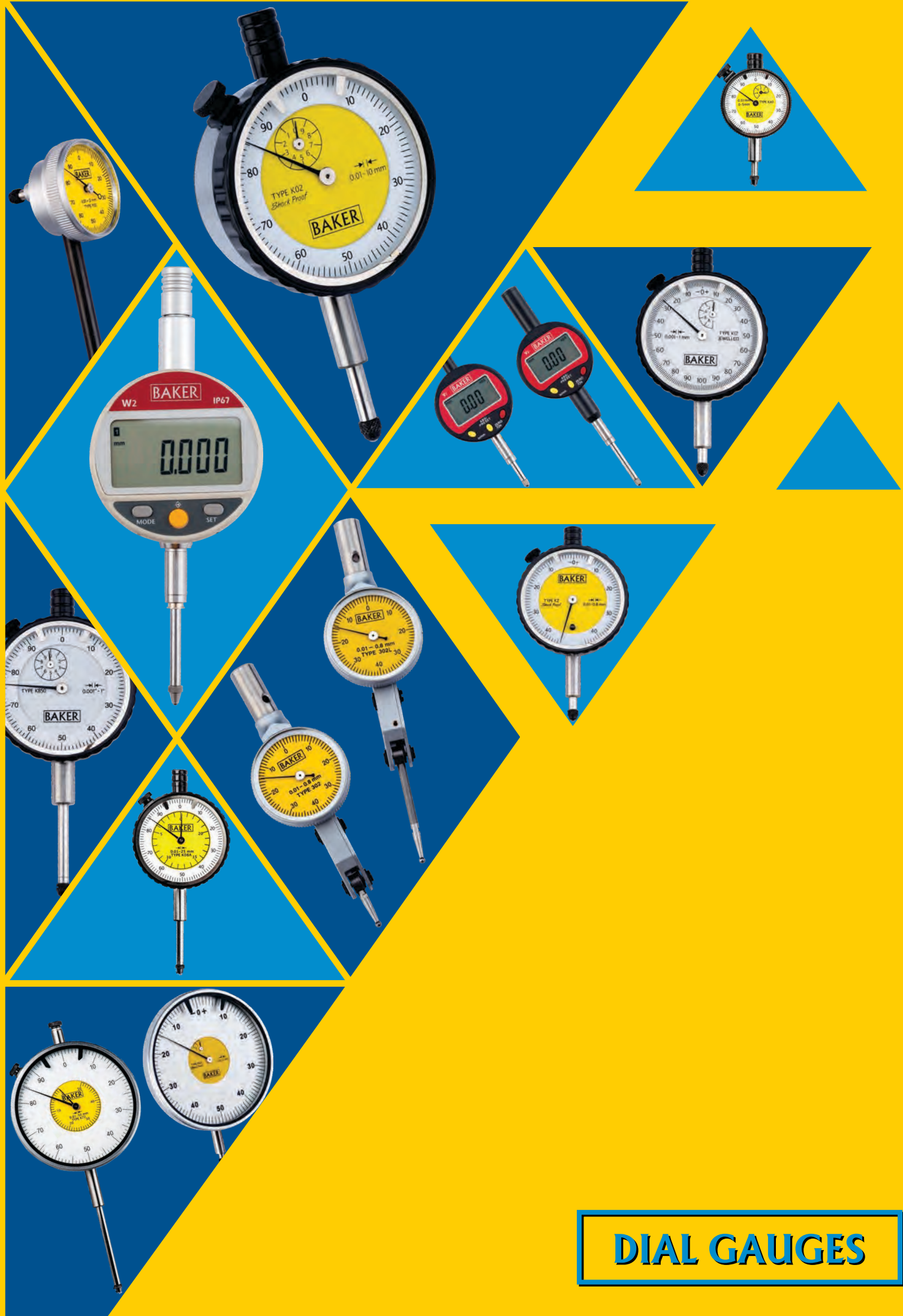


- a. Repair 146
- b. Annual Maintenance Contract 146
- c. Training 146

## 18 World Class Infrastructure 147 - 148



- a. World Class Infrastructure 147



**DIAL GAUGES**







# Mechanical Plunger type (inch)

## AGD TYPE A GROUP 2 1/4"



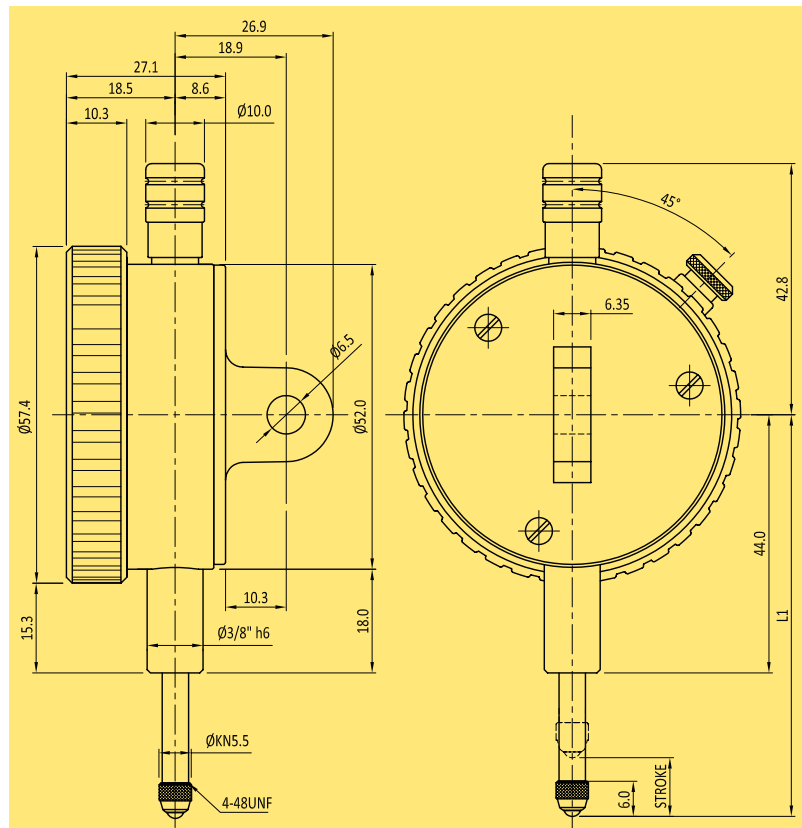
KB50

### INCH

Bezel dia.	Type	Reading	Range	Graduation	
2 1/4"	KB45	0.001 "	0.25"	0-50-0	
	KB46			0-100	
	KB51			0-50-0	
	KB52	0.5"	1"	0-100	
	KB49			0-50-0	
	KB50	0.0005"	0.25"	0-25-0	
	KB55			0-50	
	KB56		0.5"	0-25-0	0-50
	KB53				0-25-0
	KB54		1"	0-25-0	0-50
	KB57				0-50
	KB58	0.0001"	0.05"	0-50-0	
	KB59			0-100	
	KB60		0.2"	0-50-0	
	KB61			0-100	
	KB62	0.5"	0-50-0	0-100	
KB63	0-50-0				
KB64	0-100				

### FEATURES

- Specification: ANSI & JIS
- Every gauge carries a calibration certificate giving actual values
- Hardened stem for trouble free clamping
- Spindle made of stainless steel
- Fitted with tungsten carbide ball anvil
- Rigid brass case for increased rigidity
- Strong and smooth metal bezel
- Supplied with tolerance pointers
- Aesthetically appealing protective top cap in black colour
- Inch Gauges conform to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available



TYPE	L1
KB51,KB52,KB45,KB46,KB53,KB54,KB55,KB56,KB63,KB64	68.5
KB59,KB60,KB61,KB62	60.7
KB49,KB50,KB57,KB58	80.9

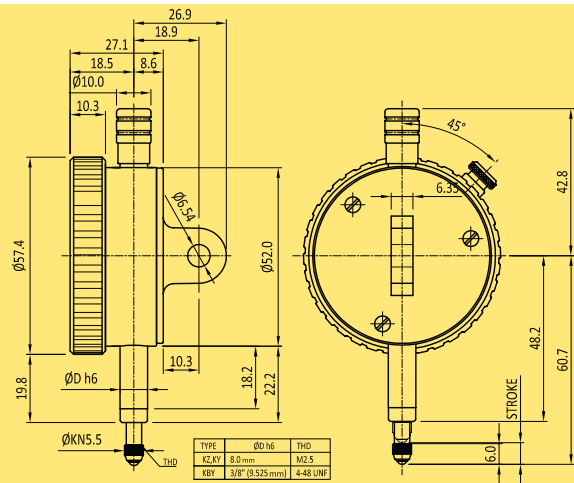
# Mechanical Plunger type



## MODEL 56 | ONE REVOLUTION



KZ



### METRIC

Bezel dia.	Type	Reading	Range	Graduation
56mm	KZ	0.01mm	0.8 mm	40-0-40

### INCH

Bezel dia.	Type	Reading	Range	Graduation
56mm	KY	0.001 "	0.08 "	40-0-40

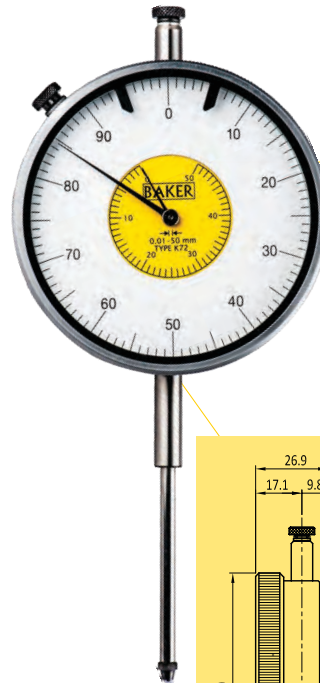
### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
2 1/4"	KBY	0.001 "	0.08 "	40-0-40

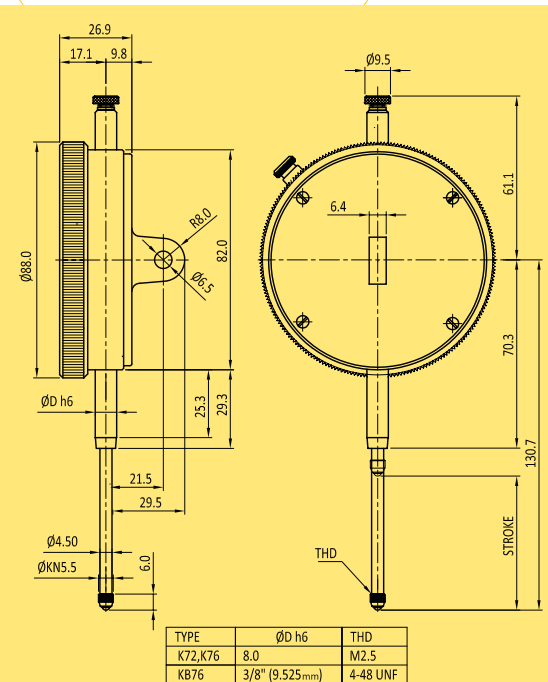
## FEATURES

- Specification: IS, DIN, ANSI & JIS
- The one revolution dial gauge eliminates reading errors due to multiple revolutions
- Shock proof mechanism to absorb shock due to sudden spindle impact
- Every gauge carries a calibration certificate giving actual values
- Hardened stem for trouble free clamping
- Spindle made of stainless steel
- Fitted with tungsten carbide ball anvil
- Rigid brass case for increased rigidity
- Strong and smooth metal bezel
- Supplied with tolerance pointers
- Aesthetically appealing protective top cap in black colour
- Special dial Gauges for OEMs also manufactured on request

## MODEL 88



K72



### METRIC

Bezel dia.	Type	Reading	Range	Graduation
88mm	K72	0.01 mm	50.0mm	0-100

### INCH

Bezel dia.	Type	Reading	Range	Graduation
88mm	K76	0.001 "	2.0 "	0-100

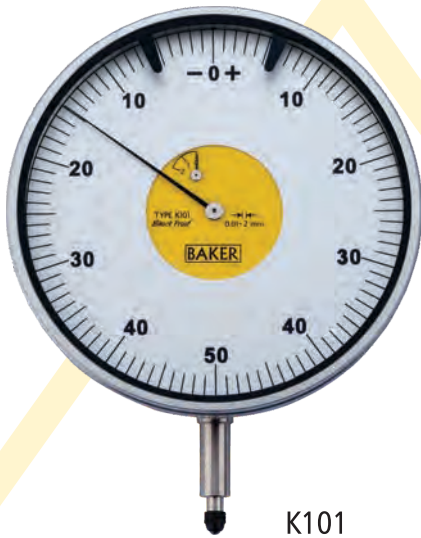
### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
3 7/16"	KB76	0.001 "	2.0 "	0-100



# Mechanical Plunger type

## MODEL 105



K101

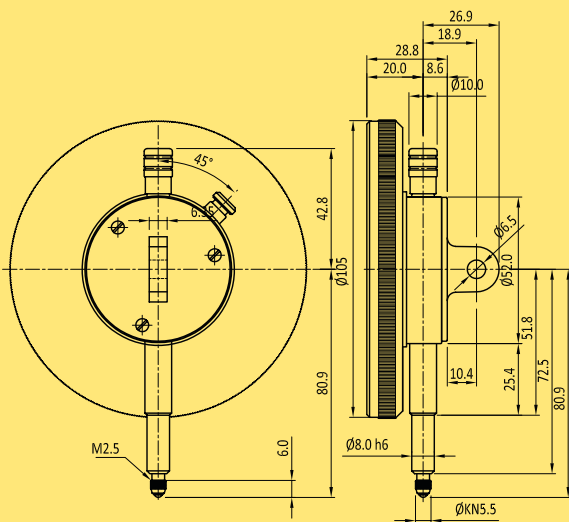
## HARDNESS TESTER DIAL GAUGE



STANDARD



SUPERFICAL

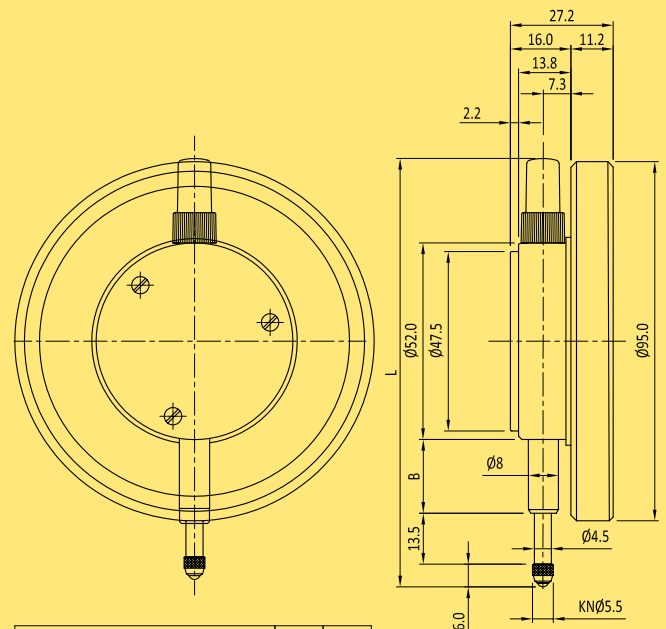


### METRIC

Bezel dia.	Type	Reading	Range	Graduation
105mm	K101	0.01mm	2.0mm	0-50-0

### FEATURES

- Larger diameter face for easy reading
- Every gauge carries a calibration certificate giving actual values
- Hardened stem for trouble free clamping
- Spindle made of stainless steel
- Fitted with tungsten carbide ball anvil
- Rigid brass case for increased rigidity
- Strong and smooth metal bezel
- Supplied with tolerance pointers
- Aesthetically appealing protective top cap in black colour
- Metric Gauges conform to company standard
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available



TYPE	L	B
STD ZERO SETTING DIAL GAUGE	113.0	19.5
SUPERFICAL ZERO SETTING DIAL GAUGE	127.0	33.0

### FEATURES

- Every gauge carries a calibration certificate giving actual values
- Auto zero setting while operating
- Used in hardness testing machine
- Supplied with dual scale

# Digital Plunger type



## WATERPROOF-IP67

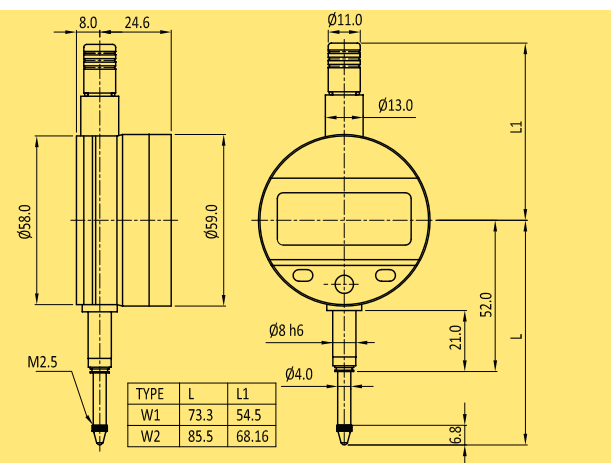


W1



W2

TYPE	W1	W2
Reading	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch
Range	0 – 12.5 mm 0 – 0.5 Inch	0 – 25 mm 0 – 1 Inch
Accuracy	0.003 mm	0.004 mm
Repeatability	± 0.002 mm 0.0001 Inch (± 2s)	± 0.002 mm 0.0001 Inch (± 2s)
Measuring Force	0.65 – 0.9 N	0.65 – 1.15 N
Weight	90 g	94 g



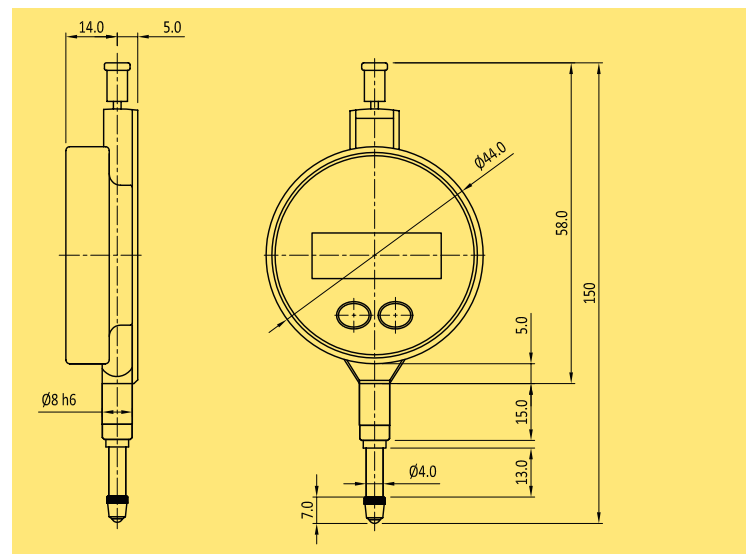
## WATERPROOF-IP65



MD001



Type	Reading	Range
MD001	0.001 mm / 0.00005 in.	0-12.5 mm (0-0.5 in.)



## FEATURES

- Rotating display (270 degrees ) with extra large digits for excellent visibility
- Accurate Inductive measuring system
- Inch / Metric capability
- Robust Construction
- New technology with configurable menus.
- Broad Choice of Menus (MIN / MAX / DELTA, TOL, Factor, PRESET, AUTO OFF etc.)
- Automatic wake-up and sleep mode
- RS232 data output
- Hardened and ground stainless steel plunger and stem
- GAUGE can be set to 0.01 mm / 0.0005 Inch, besides the standard 0.001 mm / 0.00005 Inch
- Each GAUGE carries a calibration certificate giving actual values

## FEATURES

- Accurate Inductive measuring system
- Inch / Metric capability
- RS232 output
- Hardened and ground stainless steel plunger and stem
- GAUGE can be set to 0.01 mm / 0.0005 Inch, besides the standard 0.001 mm / 0.00005 Inch
- The Electronic Module is completely sealed against dust and water / coolants / lubricating oils directed towards it from all sides (IP 65)
- Each GAUGE carries a calibration certificate giving actual values
- Measuring force 0.5-0.9 N
- Accuracy 0.005 mm / 0.0002 in
- Repeatability ± 0.002 mm / 0.0001 in (± 2s)



# Digital Plunger type

## VALUE LINE



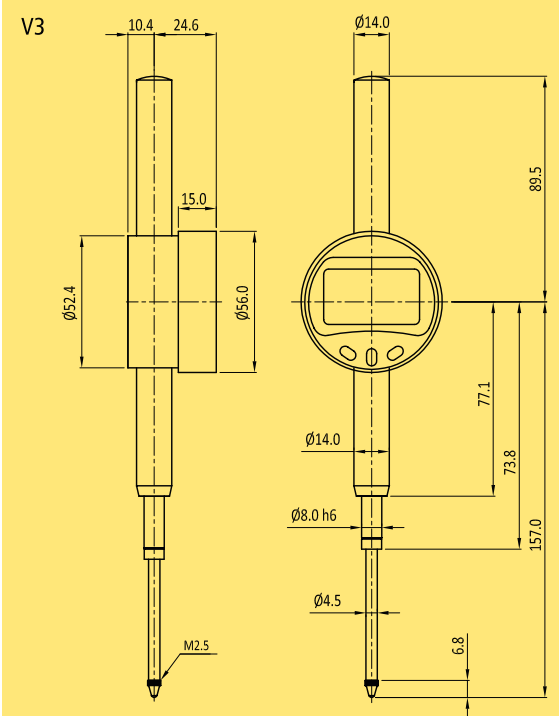
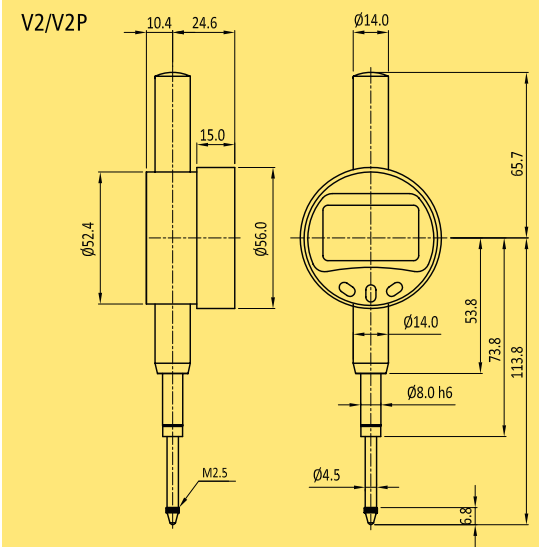
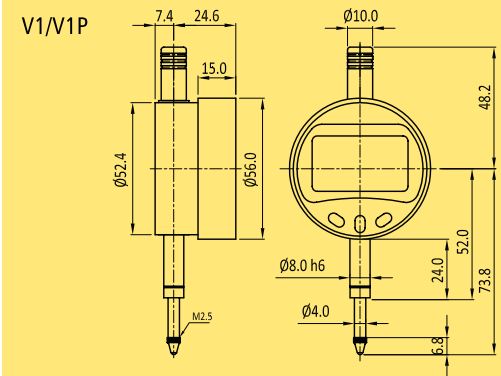
TYPE	V1	V2	V3	V1P	V2P
Reading	0.01 mm 0.0005 Inch	0.01 mm 0.0005 Inch	0.01 mm 0.0005 Inch	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch
Range	0 – 12.5 mm 0 – 0.5 Inch	0 – 25 mm 0 – 1 Inch	0 – 50mm 0 – 2 Inch	0 – 12.5 mm 0 – 0.5 Inch	0 – 25 mm 0 – 1 Inch
Accuracy	0.02 mm	0.02 mm	0.02 mm	0.006 mm	0.007 mm
Repeatability	± 0.01 mm	± 0.01 mm	± 0.01 mm	± 0.002 mm	± 0.002 mm
Measuring Force	< 1 N	< 1.5 N	< 2 N	< 1 N	< 1.5 N
Weight	110 g	120 g	160 g	110 g	120 g

## FEATURES

- Strong construction
- Large Digits for better viewing
- Display Resolution 0.01 mm & 0.0005 Inch
- Zero setting
- With Calibration certificate

### Useful functions :

- mm / Inch
- Preset Reference
- Manual / Auto power off



# Lever type



## MODEL 29/38



306



304



B303

## AGD TYPE C (1<sup>5</sup>/<sub>33</sub>"

### METRIC

Bezel dia.	Type	Reading	Range	Graduation
29mm	302	0.01mm	0.8mm	0-40-0
	304	0.002mm	0.2mm	0-10-0
	302A	0.01mm	0.8mm	0-40-0
	304A	0.002mm	0.2mm	0-10-0
38mm	306	0.01mm	0.8mm	0-40-0
	308	0.002mm	0.2mm	0-10-0
	306A	0.01mm	0.8mm	0-40-0
	308A	0.002mm	0.2mm	0-10-0

### INCH

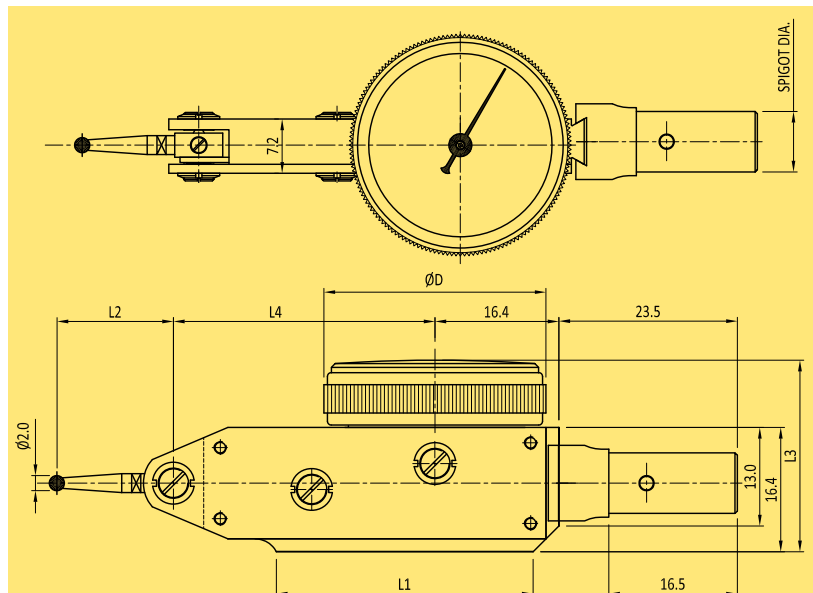
Bezel dia.	Type	Reading	Range	Graduation
29mm	301	0.0005"	0.03"	0-15-0
	303	0.0001"	0.008"	0-4-0
	301A	0.0005"	0.03"	0-15-0
	303A	0.0001"	0.008"	0-4-0
38mm	305	0.0005"	0.03"	0-15-0
	307	0.0001"	0.008"	0-4-0
	305A	0.0005"	0.03"	0-15-0
	307A	0.0001"	0.008"	0-4-0

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
1 <sup>5</sup> / <sub>33</sub> "	B301	0.0005"	0.03"	0-15-0
	B303	0.0001"	0.008"	0-4-0
	B301A	0.0005"	0.03"	0-15-0
	B303A	0.0001"	0.008"	0-4-0
1 <sup>1</sup> / <sub>2</sub> "	B305	0.0005"	0.03"	0-15-0
	B307	0.0001"	0.008"	0-4-0
	B305A	0.0005"	0.03"	0-15-0
	B307A	0.0001"	0.008"	0-4-0

## FEATURES

- Specification: IS, DIN, ANSI & JIS
- Every gauge carries a calibration certificate giving actual values
- Auto reversal mechanism
- Fitted with jewels and Swiss miniature ball bearings for smoother operation
- Rigid brass body for increased rigidity
- Robust and highly sensitive gauge suitable for workshop use
- Metric Gauges conform to IS 11498 and for the European market to DIN 2270
- Inch Gauges conform to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available
- Integral dovetail offers flexibility and rigidity for mounting of the gauge
- Metric & Inch gauges are supplied with 2 mm tungsten carbide ball stylus and 8 mm spigot assembly as standard supply
- No additional accessories are offered when suffix A is added to the type number
- Additional 1 mm carbide ball stylus, Height Gauge adaptor, spanner, universal clamp and 4 mm dovetail spigot assembly offered as additional accessories for gauges where type number is without suffix A



TYPE	dia D	L1	L2	L3	L4	SPIGOT DIA
301	34	11			34.5	1/4" & 3/8"
302	29.5	11.9	25.3			4.0 & 8.0
303	42	13			44.9	1/4" & 3/8"
304		12.9			44.9	4.0 & 8.0
305	34	11			34.5	1/4" & 3/8"
306	38	11.9	27.1			4.0 & 8.0
307	42	13			44.9	1/4" & 3/8"
308		12.9				4.0 & 8.0



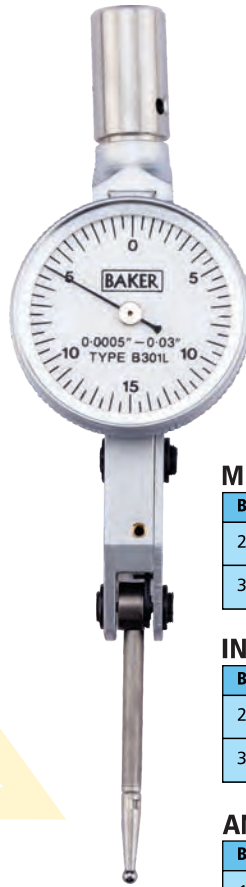
# Lever type Long Stylus

## MODEL 29/38 | LONG STYLUS

## AGD TYPE | LONG STYLUS C (1<sup>5</sup>/<sub>33</sub>" )



302L



B301L

### METRIC

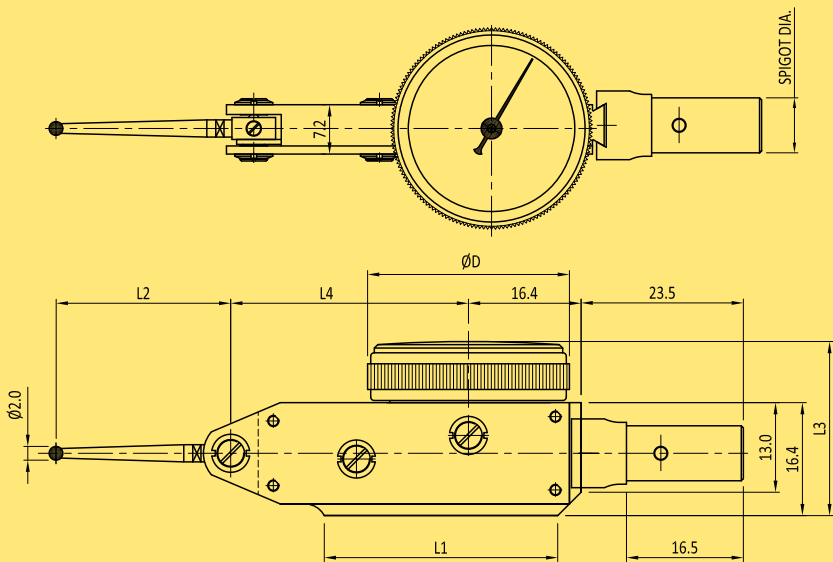
Bezel dia.	Type	Reading	Range	Graduation
29 mm	302L	0.01mm	0.8mm	0-40-0
	302AL			
38 mm	306L	0.01mm	0.8mm	0-40-0
	306AL			

### INCH

Bezel dia.	Type	Reading	Range	Graduation
29 mm	301L	0.0005"	0.03"	0-15-0
	301AL			
38 mm	305L	0.0005"	0.03"	0-15-0
	305AL			

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
1 <sup>5</sup> / <sub>33</sub> "	B301L	0.0005"	0.03"	0-15-0
	B301AL			
1 <sup>1</sup> / <sub>2</sub> "	B305L	0.0005"	0.03"	0-15-0
	B305AL			



TYPE	dia D	L1	L2	L3	L4	SPIGOT DIA
302L	29.5	34	33.6	25.3	34.5	4.0 & 8.0
306L	38			27.1		
301L	29.5	34	32.4	25.3	34.5	1/4" & 3/8"
305L	38			27.1		

### FEATURES

- Every gauge carries a calibration certificate giving actual values
- Auto reversal mechanism
- Fitted with jewels and Swiss miniature ball bearings for smoother operation
- Rigid brass body for increased rigidity
- Robust and highly sensitive gauge suitable for workshop use
- Metric Gauges conform to IS 11498 and for the European market to DIN 2270
- Inch Gauges conform to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available
- Integral dovetail offers flexibility and rigidity for mounting of the gauge
- Metric & Inch gauges are supplied with 2mm tungsten carbide ball stylus and 8 mm spigot assembly as standard supply
- No additional accessories are offered when suffix A is added to the type number

# Back Plunger type



## MODEL 38

## AGD TYPE B (1 1/2")



F02



A51

### METRIC

Bezel dia.	Type	Reading	Range	Graduation
38mm	F01	0.01mm	2 mm	0-50-0
	F02			0-100

### INCH

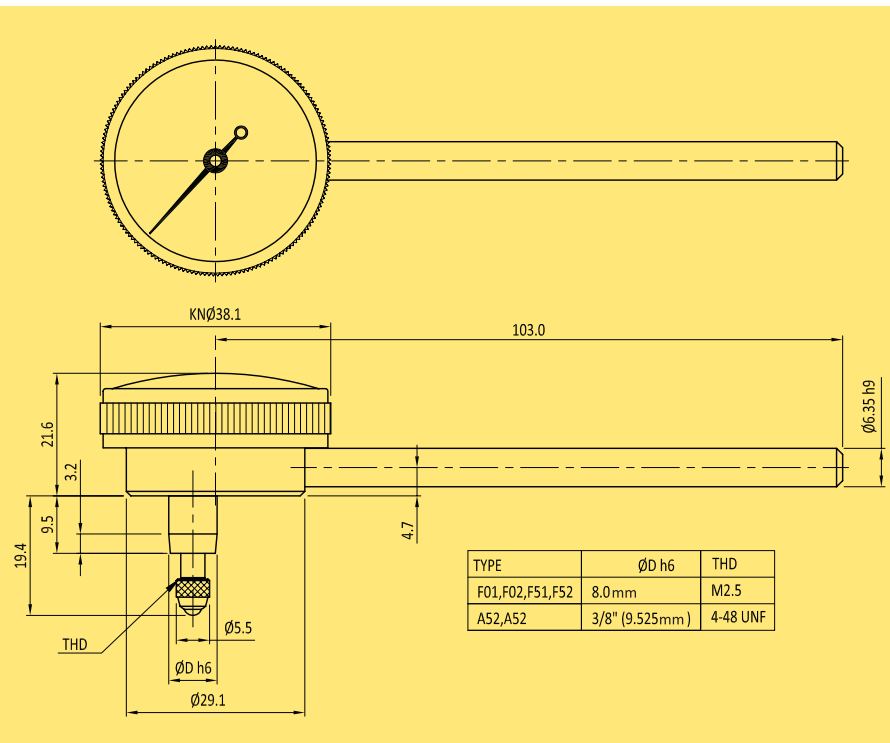
Bezel dia.	Type	Reading	Range	Graduation
38mm	F51	0.001"	0.1"	0-50-0
	F52			0-100

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
1 1/2"	A51	0.001"	0.1"	0-50-0
	A52			0-100

## FEATURES

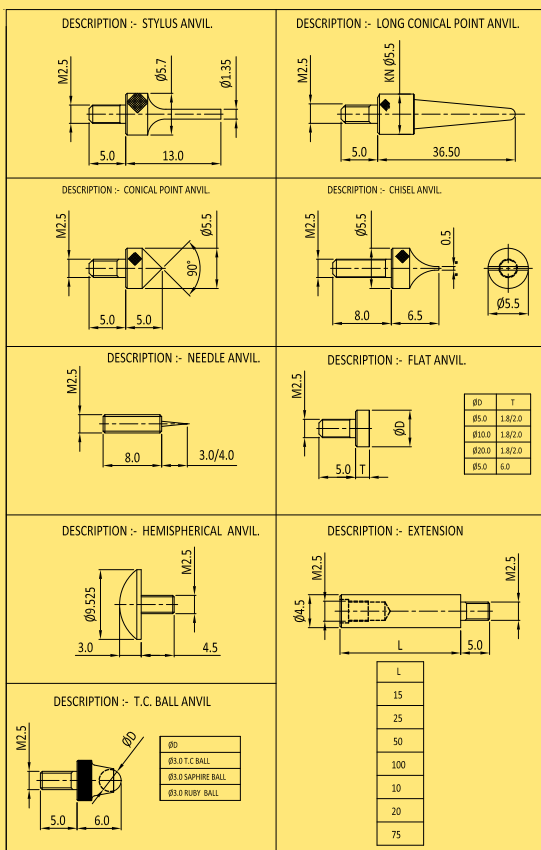
- An unique face reading dial gauge with sensing plunger at right angles to the dial
- Every gauge carries a calibration certificate giving actual values
- Spindle made of stainless steel
- Fitted with tungsten carbide ball anvil
- Rigid brass case for increased rigidity
- Strong and smooth metal bezel
- Suitable for mounting on machine tables, jigs and fixtures
- Used in small places where standard dial gauges are difficult to be accommodated
- Inch Gauges conform to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available



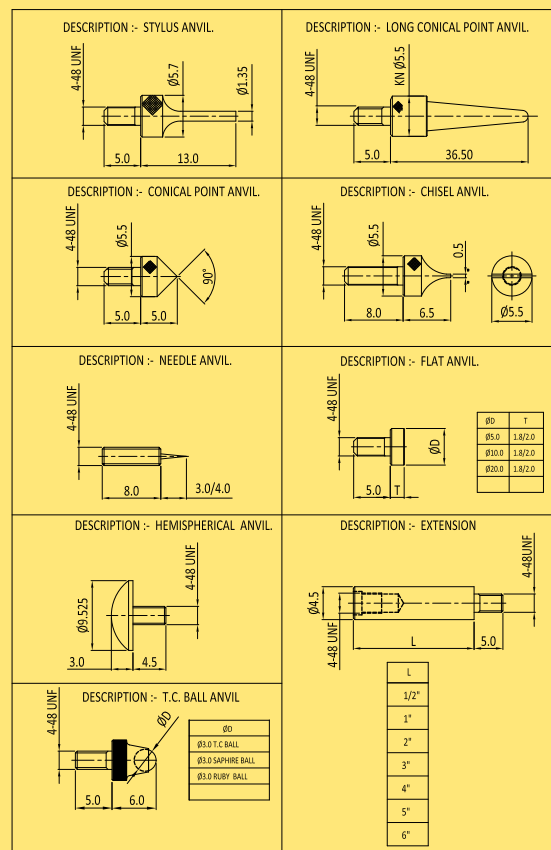


# Dial Gauge-Accessories

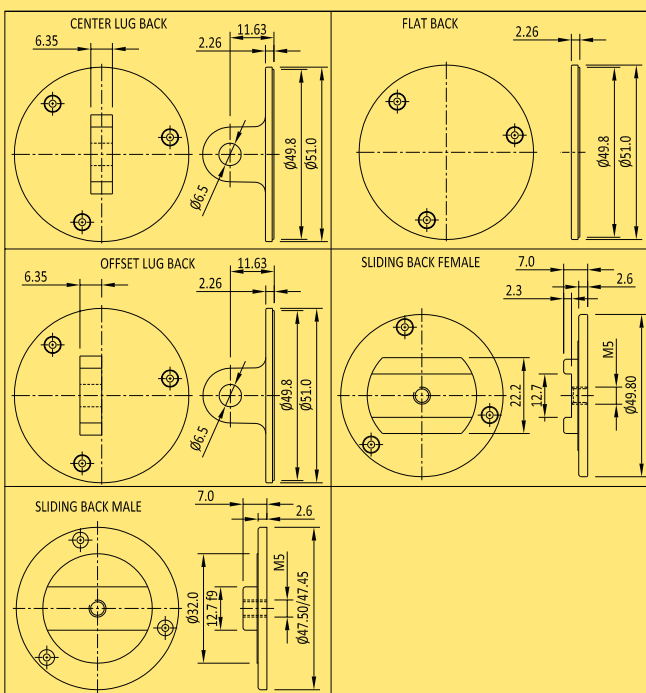
## DIAL GAUGE CONTACT POINTS



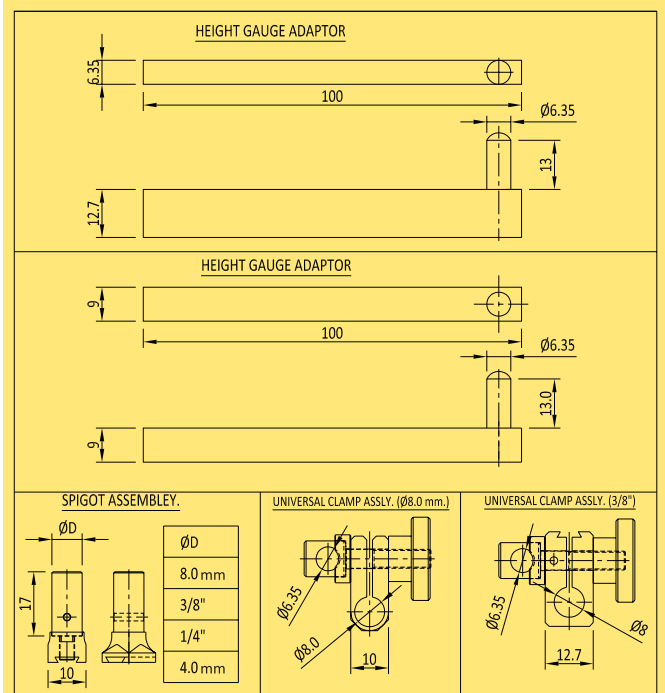
## DIAL GAUGE CONTACT POINTS (AGD)



## DIAL GAUGE BACK



## LEVER TYPE DIAL GAUGE ACCESSORIES





**DIAL INSTRUMENTS**



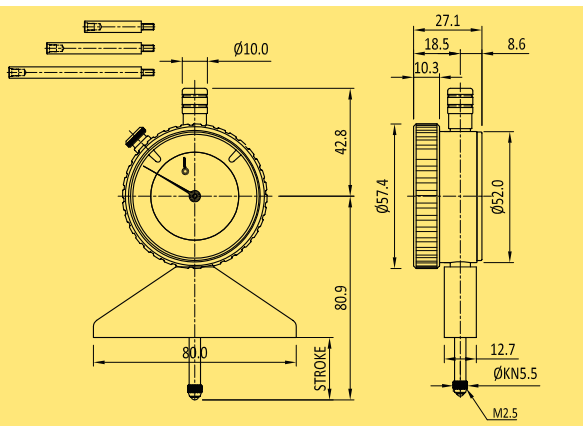
# Depth Gauge & Universal Test Set

## DIAL DEPTH GAUGE



K158/3

Also available with digital dial gauge



### METRIC

Bezel dia.	Type	Reading	Range	Graduation
56mm	K158/0	0.1mm	0-200mm	10-0
	K158/3	0.01mm	0-200mm	100-0

### INCH

Bezel dia.	Type	Reading	Range	Graduation
56mm	K158/1	0.001"	0-8"	100-0

### DIGITAL

Bezel dia.	Type	Reading	Range
56mm	K158/D	0.001 mm/0.00005"	0-200 mm

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
2 1/4"	K158/1B	0.001"	0-10"	100-0

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Suitable for quick and easy measurements of depths.
- Base with 80 mm length: hardened and ground to a high degree of flatness
- Supplied with a set of extension rods
- Supplied with Tungsten Carbide contact point for longer life

## UNIVERSAL TEST SET



UI02

### METRIC

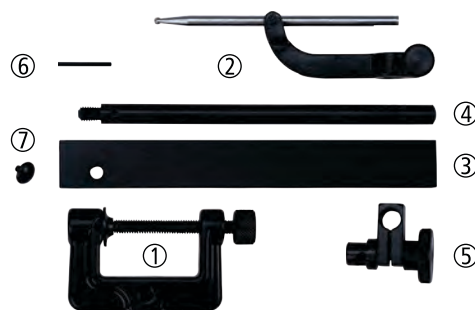
Bezel dia.	Type	Reading	Range	Graduation
38mm	UI01	0.01mm	2.0mm	0-50-0
	UI02			0-100

### INCH

Bezel dia.	Type	Reading	Range	Graduation
38mm	UI51	0.001"	0.1"	0-50-0
	UI52			0-100

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Depth
1 1/2"	U51	0.001"	0.1"	0-50-0
	U52			0-100



1. G Clamp    2. Swinging Arm Assembly    3. Tool post holder  
4. Holding Rod    5. Universal Clamp    6. Tommy Bar    7. Anvil

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Consists of back Plunger dial Gauge, 'G' clamp, universal clamp, swinging arm assembly, tool post holder, holding rod, tommy bar and anvil
- Swinging arm assembly enables the back plunger dial gauge to be used for internal work up to a depth of 40 mm similar to a lever type gauge
- 'G' Clamp, tool post holder, holding rod and universal Clamp allows multiple types of mounting possibilities
- Versatile combinations, allow gauging applications like concentricity checks, alignment of machine tools, testing parallelism and surface plate work

# Dial Thickness Gauge



## THROAT DEPTH: 30-200 mm



130



138



138



142



145



150

### METRIC

Bezel dia.	Type	Reading	Range	Graduation	Throat Depth
56 mm	K130/0	0.1 mm	10 mm	0-10	30 mm
	K130/3	0.01 mm	10 mm	0-100	30 mm
	K130/6	0.002 mm	2 mm	0-20	30 mm
	K130/7	0.002 mm	5 mm	0-20	30 mm
	K138/0	0.1 mm	25 mm	0-10	50 mm
	K138/0L	0.1 mm	25 mm	0-10	50 mm
	K138/3	0.01 mm	25 mm	0-100	50 mm
	K138/3L	0.01 mm	25 mm	0-100	50 mm
	K142/0	0.1 mm	10 mm	0-10	100 mm
	K142/3	0.01 mm	10 mm	0-100	100 mm
	K145/0	0.1 mm	10 mm	0-10	200 mm
	K145/3	0.01 mm	10 mm	0-100	200 mm
	K150/0	0.1 mm	25 mm	0-10	200 mm
	K150/3	0.01 mm	25 mm	0-100	200 mm

### INCH

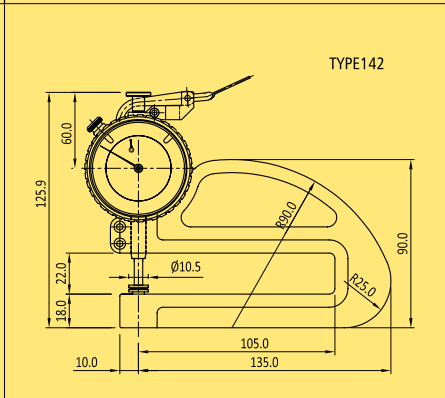
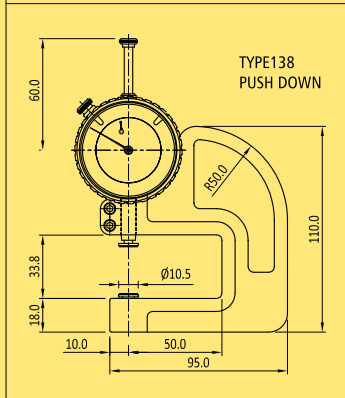
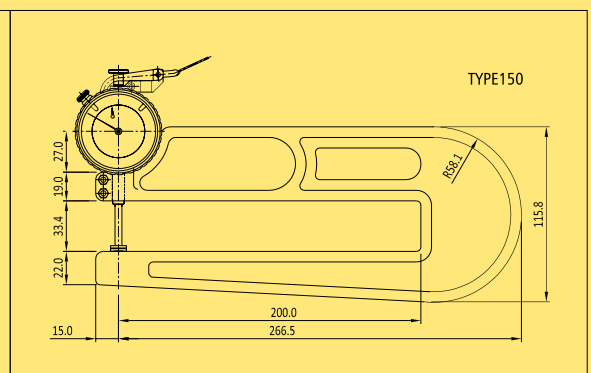
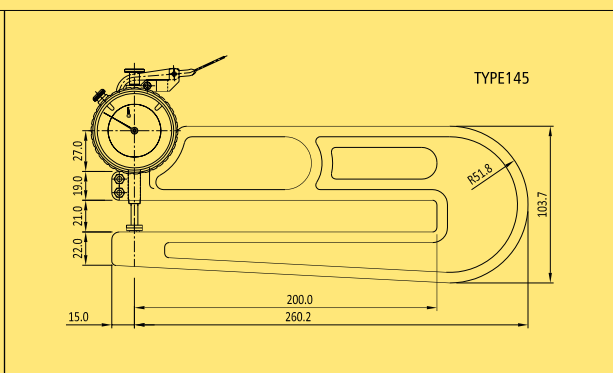
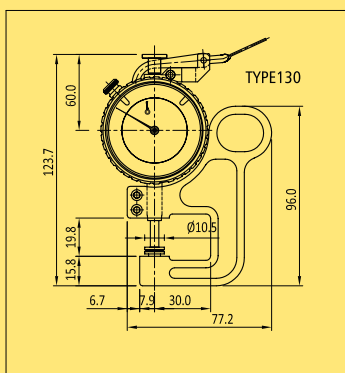
Bezel dia.	Type	Reading	Range	Graduation	Throat Depth
2 1/4"	K130/1	0.001"	0.5"	0-100	1.2"
	K130/8	0.0001"	0.05"		1.2"
	K130/9	0.0001"	0.2"		1.2"
	K138/1	0.001"	1.0"		2"
	K138/1L	0.001"	1.0"		2"
	K142/1	0.001"	0.5"		4"
	K145/1	0.001"	0.5"		8"
	K150/1	0.001"	1.0"		8"

### DIGITAL

Bezel dia.	Type	Reading	Range	Throat Depth
56 mm	K130/D	0.001mm/ 0.00005"	12.5 mm/ 0.5"	30 mm
	K138/D		25 mm/ 1"	50 mm
	K142/D		12.5 mm/ 0.5"	100 mm
	K145/D		12.5 mm/ 0.5"	200 mm
	K150/D		25 mm/ 1"	200 mm

### ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation	Throat Depth
2 1/4"	K130/1B	0.001"	0.5"	0-100	1.2"
	K130/8B	0.0001"	0.05"		1.2"
	K130/9B	0.0001"	0.2"		1.2"
	K138/1B	0.001"	1.0"		2"
	K138/1LB	0.001"	1.0"		2"
	K142/1B	0.001"	0.5"		4"
	K145/1B	0.001"	0.5"		8"
	K150/1B	0.001"	1.0"		8"



### FEATURES

- Every gauge carries a calibration certificate giving actual values
- For quick measurement of thickness of sheets, paper, leather etc
- In series K130, K138/L and K142, K145, K150 measurement pressure is independent of the user, resulting in accurate readings of thickness
- K138 'Push Down Type' thickness gauge is particularly useful where fine measurement is not required - for example plywood
- Well-balanced frames and handgrips coupled with lightweight make these gauges easy to use for measurement
- Supplied with Ø10 mm flat anvil as standard. Can also be supplied with Ø20 mm flat anvil on request



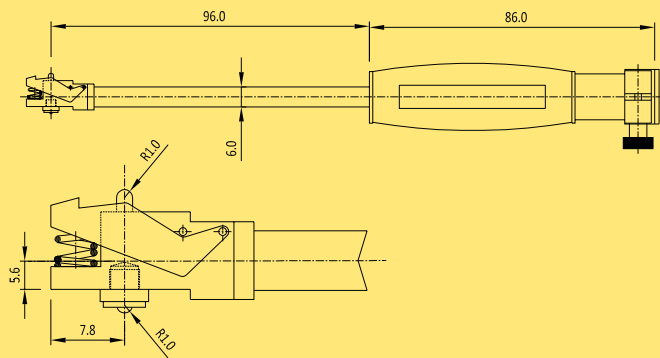


# Dial Bore Gauge

## RANGE: 10-18 mm



K639



### WITHOUT DIAL GAUGE

Type	Depth
K600	100 mm

### METRIC

Bezel dia	Type	Reading	Depth	Graduation
40 mm	K639	0.01 mm	100 mm	0-50-0

### INCH

Bezel dia	Type	Reading	Depth	Graduation
1 5/8"	K641	0.001"	4"	0-50-0

### DIGITAL

Bezel dia	Type	Reading	Depth
56 mm	K60DP	0.001 mm/0.00005"	100 mm
56 mm	K60D	0.01 mm/0.0005"	100 mm

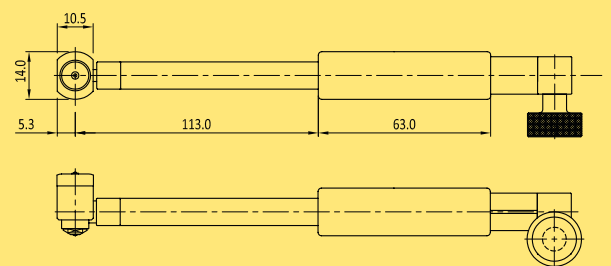
## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Measures small bores from 10 mm to 18 mm
- High wear resistance due to carbide-tipped fixed and moving anvils
- Wide bridge ensures automatic centering in the bore
- Self-centralizing feature of this bore gauge ensures that measurement can be done with minimum skill
- Supplied in a sleek wooden case containing measuring anvils and extension rods with necessary tools

## RANGE: 18-50 mm



K703



### WITHOUT DIAL GAUGE

Type	Depth
K700	175 mm

### METRIC

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K703	0.01 mm	110 mm	0-50-0
	K709	0.002 mm		0-10-0
	K717	0.001 mm		0-100-0

### INCH

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K753	0.0005"	4.5"	0-25-0
	K761	0.0001"		0-50-0

### DIGITAL

Bezel dia	Type	Reading	Depth
56 mm	K70DP	0.001 mm/0.00005"	110 mm
56 mm	K70D	0.01 mm/0.0005"	110 mm

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Highly versatile 18-50mm bore gauge covers a large range for which one needs to generally purchase 2 bore gauges having ranges Ø18-35 mm and Ø35-60 mm
- High wear resistance due to carbide-tipped fixed and moving anvils
- Wide bridge ensures automatic centering in the bore
- Self-centralizing feature of this bore gauge ensures that measurement can be done with minimum skill
- Supplied in a sleek wooden case containing measurement anvils and extension rods with necessary tools

# Dial Bore Gauge & Dial Snap Gauge

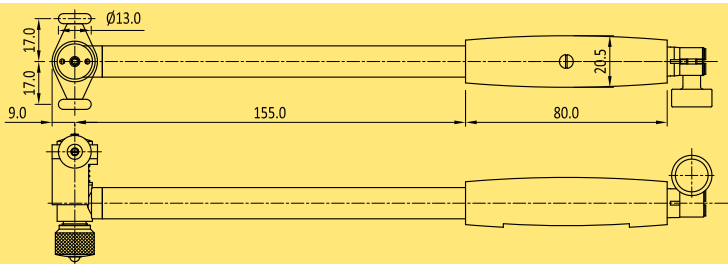


**RANGE: 50-150 mm**



K803

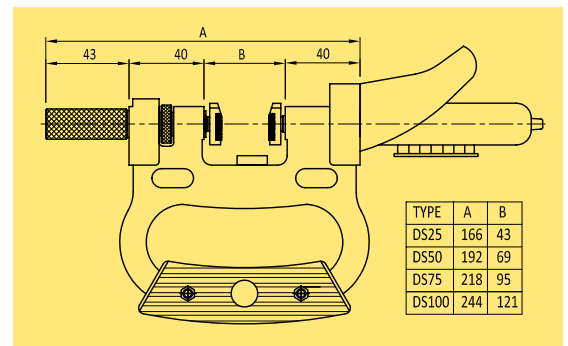
Also available with digital dial gauge



**DIAL SNAP GAUGE**



DS25



Note: Supplied without dial indicator

Type	Measuring Range (mm)
DS25	0-25
DS50	25-50
DS75	50-75
DS100	75-100

## WITHOUT DIAL GAUGE

Type	Depth
K800	150 mm

## METRIC

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K803	0.01 mm	150 mm	0.50-0
	K809	0.002 mm		0-10-0
	K817	0.001 mm		0-100-0

## INCH

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K853	0.0005"	6"	0-25-0
	K861	0.0001"		0-50-0

## DIGITAL

Bezel dia	Type	Reading	Depth
56 mm	K80DP	0.001 mm/0.00005"	150 mm
56 mm	K80D	0.01 mm/0.0005"	150 mm

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Bore gauge covering a range of 50-150 mm, is widely used by Automobile, Aircraft, Engine and Pump manufacturers
- High wear resistance due to carbide-tipped fixed and moving anvils
- Extra wide bridge ensures automatic centering in the bore
- Self-centralizing feature of this bore gauge ensures that measurement can be done with minimum skill
- Furnished in a sleek wooden case containing measurement anvils and extension rods with necessary tools

## FEATURES

- Designed for quick GO / NOT GO gauging of diameters of cylindrical parts either in process or post process
- Adjustable spindle & sensing spindle are manufactured out of graded steel
- Spindles are hardened and ground including screw threads
- Carbide ground and lapped tip of measuring faces ensures maximum wear resistance
- For quick entry, chamfer provided on front edges
- Constant measuring force, which is a result of an in-bulit spring, eliminates user error
- For easy reading, the dial indicator can be rotated and locked
- Best suited for inspection of continuous / Batch production items
- Setting is done with the help of Gauge Blocks / Cylindrical setting Masters
- Any standard Dial indicator with Ø8 h6 mm holding shank can be fitted easily
- Also used with Electronic probe & digital dial gauge

## Application

For measuring quick & accurate measurement of all kinds of Outer Diameter up to 100 mm

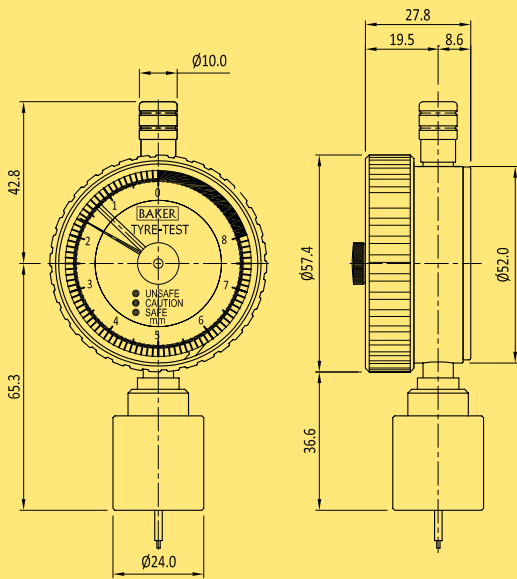


# Special Instruments

## TYRE TREAD DEPTH GAUGE



TTG01



Bezel dia	Type	Reading	Range	Graduation
56 mm	TTG01	0.1 mm	8 mm	8 - 0
	TTG02	0.004 in	0.32 in	0.32 - 0

A Gauge developed specifically to monitor compliance with safety requirements for minimum tread depth of automobile tyres. Additionally, it is useful for gauging general tyre wear in the range 0-8 mm.

### FEATURES

- Every gauge carries a calibration certificate giving actual values
- The gauge gives accurate readings to 0.1mm / 0.004Inch
- A 'telltale' maximum reading pointer is fitted to retain measurement, allowing the gauge to be applied to tyre positions where it cannot be easily read
- The dial has coloured bands for quick and easy reading

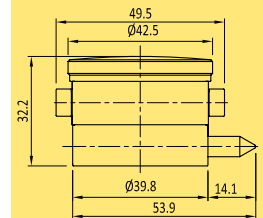
## CRANKSHAFT WEB DEFLECTION GAUGE



CS1

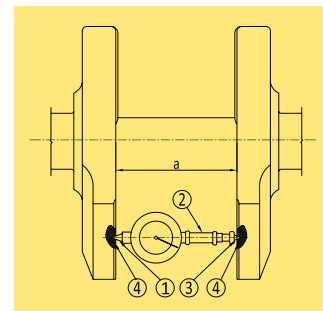
Type	Reading	Range	Graduation
CS1	0.01 mm	60-600 mm	0-50
CS2	0.0005 "	2.4-23.6 "	0-20
CS3	0.01 mm	60-600 mm	0-25-0
CS4	0.0005 "	2.4-23.6 "	0-10-0

Excessive web deflection is dangerous for the engine. The Cause may be faulty or damaged crankshaft, damaged bearing, poor bearing alignment, excessive bearing clearance or slackness, faulty flanging to transmission, flywheel or vee belt pulley etc.



### FEATURES

- Every gauge carries a calibration certificate giving actual values
- Crankshaft Gauge measures the Web deflection of a crankshaft
- The BAKER Crankshaft Gauge is developed to identify and avoid the problems mentioned above
- The Gauge covers web-to-web distance of 60-600 mm
- Supplied in a sleek wooden box
- Gauge contacts are pointed & fit into dimples in the webs. A heavy spring pressure ensures that the Gauge is restrained but is free to turn in relation to the crankshaft. An adjustable balance weight restrains the Gauge against rotation of the crankshaft, so that the dial always faces the inspector



### HOW TO USE BAKER CRANKSHAFT GAUGE ?

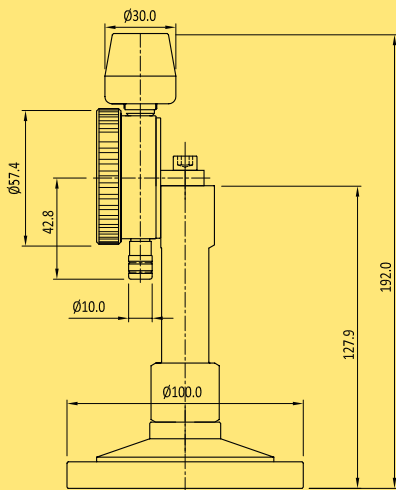
- Determine the distance (a) between two Webs. Assemble the extension (2) and fixed gauging point (3) and screw this assembly into the threaded bush of the dial gauge unit opposite to live point (1). Overall length from tip of fully extended live point (1) to tip of fixed point (3) should be about 1 to 2 mm greater than web distance (a)
- The back of the dial Gauge unit takes the balance weight to keep the dial facing upward while the Gauge is suspended between the webs during Crankshaft rotation. Use center bush for horizontal upward position and outer bush for inclined upward position. Without balance weight, the indicator adopts a face down position
- Place the Gauge between webs of Crankshaft so that gauging points are located in punch holes (4), center punched where measurement of deflection is required. First, place spring loaded live point (1) in one of the two punch holes (4), then locate fixed point (3) in other punch hole
- Set dial pointer to 20 on (metric) dial by rotating the indicator bezel. Turn Crankshaft by hand & observe pointer movement on dial
- Read deflections at various positions of the crankshaft revolution as set out in manufacturer's inspection procedure



## BALL DIAMETER

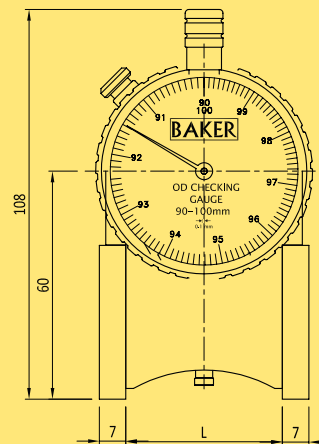


## OUTER DIAMETER



Type	Range (mm)	Reading (mm)
BD01	1-10	0.01
BD02	10-12	0.02
BD03	12-14	0.02
BD04	14-16	0.02
BD05	16-18	0.02
BD06	18-20	0.02
BD07	20-22	0.02
BD08	22-24	0.02
BD09	24-26	0.02
BD10	26-28	0.02
BD11	28-30	0.02

Type	Range (mm)	Reading (mm)
OD01	50-70	0.1
OD02	70-90	0.1
OD03	90-110	0.1
OD04	110-130	0.1
OD05	130-150	0.1
OD06	150-175	0.5
OD07	175-200	0.5
OD08	200-225	0.5
OD09	225-250	0.5
OD10	250-275	0.5
OD11	275-300	0.5



TYPE NO	RANGE	L
OD01	50-70	72
OD02	70-90	33
OD03	90-110	41
OD04	110-130	49
OD05	130-150	58
OD06	150-175	61
OD07	175-200	70
OD08	200-225	80
OD09	225-250	89
OD10	250-275	99
OD11	275-300	108

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Gauge measures ball diameter quickly
- Minimum skill required
- Inspector needs to just place the ball over the circular cup & the direct reading of ball diameter is shown
- Available in variety of sizes

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Gauge measures OD of circular parts quickly
- Inspector needs to just place the gauge over circular periphery and the direct reading of OD is shown on circular scale
- OD of stacked pipes can be easily measured at site in as is condition
- It is the simplest method of checking OD above 40 mm
- Minimum skill required
- Available in variety of sizes



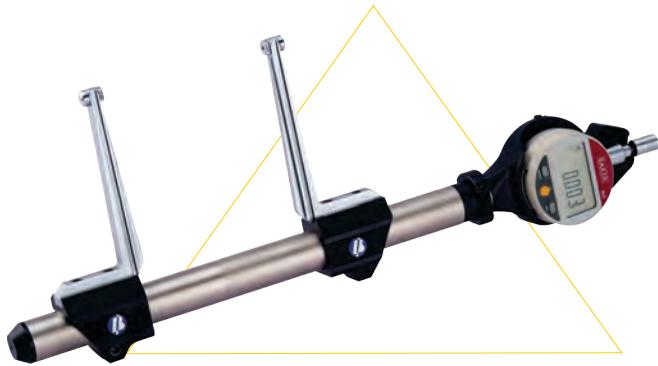
# Universal Gauge



The Bowers Universal Gauge's ingenious modular design enables it to be quickly configured to suit almost any measuring challenge, both internal and external. The Universal's clever constant measuring pressure device ensures accuracy and consistency of reading. A large variety of measuring contacts and adaptors are available for the Universal Gauge enabling countless measuring tasks to be completed with ease. Accessories for the measurement of threads, grooves, splines, gears, hole centers and many others are available as standard and special adaptations for more non-standard applications can be quoted on request.

## FEATURES

- Internal and External measurement
- Large measuring range possible 0-3000mm (0-118") with interchangeable extensions
- Constant measuring force
- Digital or Mechanical readout display
- Large range of accessories for standard measurement of threads, grooves, splines, diameters, lengths, shallow spigots and recess diameters etc.
- Special anvil designs available on request



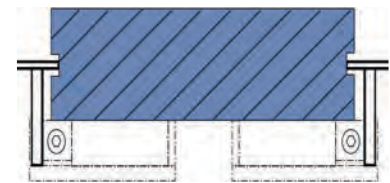
## APPLICATIONS



Flat for outside diameters/lengths



Shoulder anvils flat outside spigot diameter



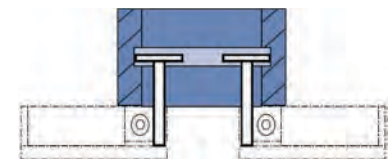
Disc anvils for measuring external groove diameter



Spherical for inside diameters



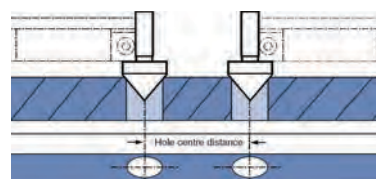
Semi-Cylindrical anvils for inside



Disc anvils for measuring internal groove diameter



Vee support for length measurement



Cone anvils for measuring hole center distance

# Harpenden Skinfold Caliper



## HUMAN BODY FAT MEASUREMENT

## FEATURES



- The Harpenden Skinfold Caliper is a precision instrument designed for use in the performance of Skinfold thickness measurements (from which estimates of body fat are derived) The use of this instrument has been well established and documented over the past 40 years
- Designed in 1958 in collaboration with D. J. M. Tanner, a prominent force in the use of Skinfold measurements in the derivation of body fat measurement
- It is the only Caliper CE marked under the Medical Devices Directive 93 / 42 / EEC for a Class 1 Device with Measuring Function and is calibrated using masters traceable to National Standards
- It is used all over the world in applications including diagnostics & research, nutrition/malnutrition, obesity, eating disorder assessment (especially in sports) and juvenile growth disorders
- It is supplied with a handbook which includes tables for body fat% versus Skinfold thickness in males & females of all ages based on the Durnin & Womersley systems
- It is also supplied with Body Assessment Software (Optional)

## TECHNICAL INFORMATION

- Dial Graduation: 0.20 mm
- Measuring Range: 0 mm to 80 mm
- Measuring Pressure: 10 gms/mm<sup>2</sup> (constant over range)
- Accuracy: 99.00%
- Repeatability: 0.20 mm.



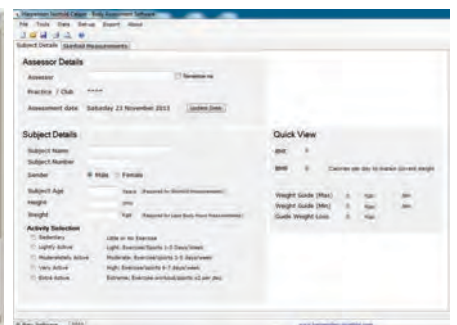
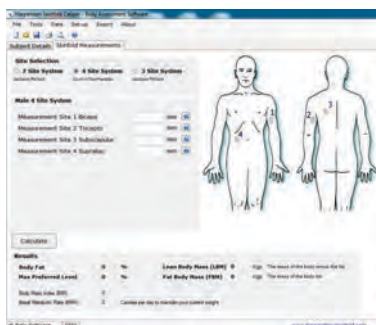
BODY ASSESSMENT SOFTWARE ON REQUEST



## HARPENDEN SKINFOLD CALIPER BODY ASSESSMENT SOFTWARE

### Assess a subjects :-

- Body fat % content
- Body fat % preferred level
- Body mass index
- Basal metabolic rate
- Lean body mass
- Fat mass
- Min/Max weight guide
- Child Bmi Growth Charts



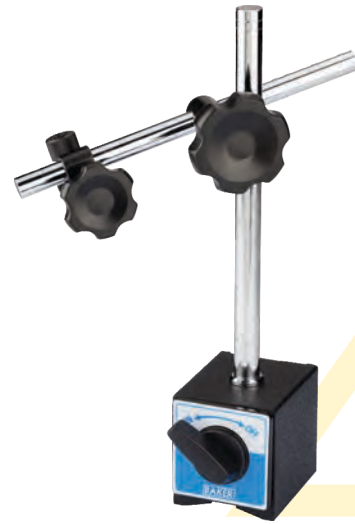


# Dial Comparator / Magnetic Stand

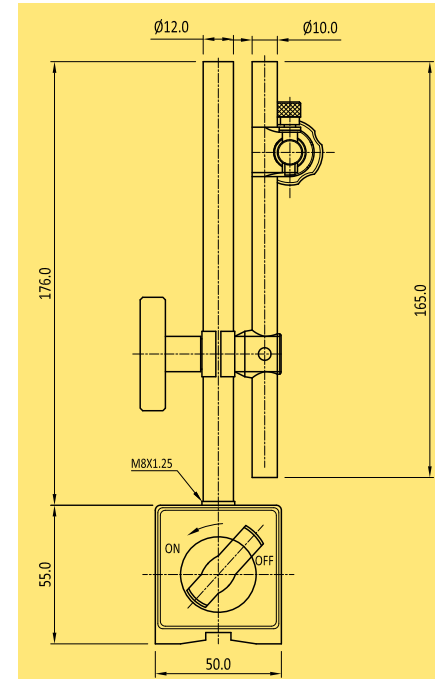
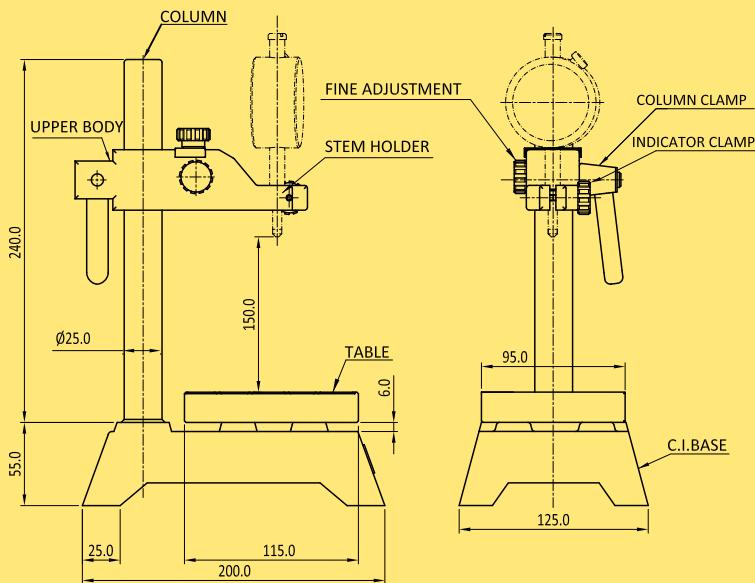
## Dial Comparator Stand



## Dial Magnetic Stand



Type : MS Magnetic Stand  
Type : MSF Magnetic Stand with fine adjustment



### SPECIFICATION

Total Height	Measuring Range	Column Diameter	Adaptor hole for dial
295mm	150mm	25mm	$\varnothing 8h7$

### SPECIFICATION

Magnetic base with on/off switch	
Clamp hole 3/8" & 5/32" and 8mm (when set a ring at the hole 3/8") & 5/32	
Magnetic force	600 N
Main stem	$\varnothing 12 \times 176$ mm
Branch stem	$\varnothing 10 \times 165$ mm
Tapped hole	M8 x 1.25 mm
Base (LxWxH)	58 mm x 50 mm x 55 mm
Weight	1.4 kg

### FEATURES

- Hardened with 0.003 mm flatness
- Rigid Cast-iron base
- Fine adjustment of 2 mm

### FEATURES

- Smooth On/Off switch
- Firm Lock of stem
- Light weight design
- Fine adjustment of 15 mm

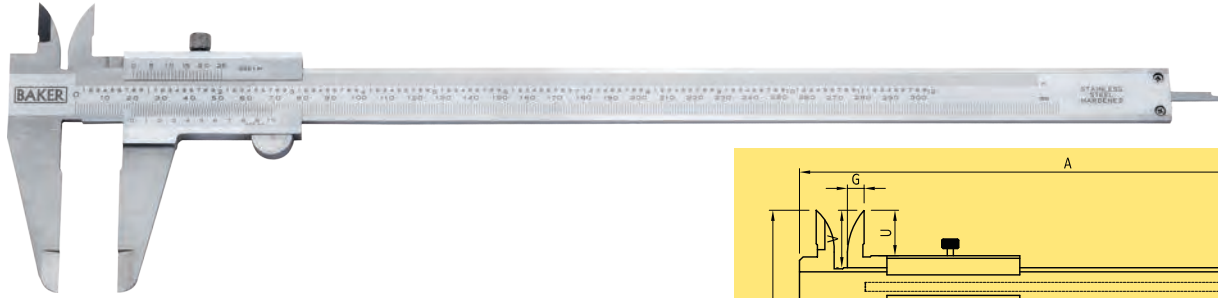




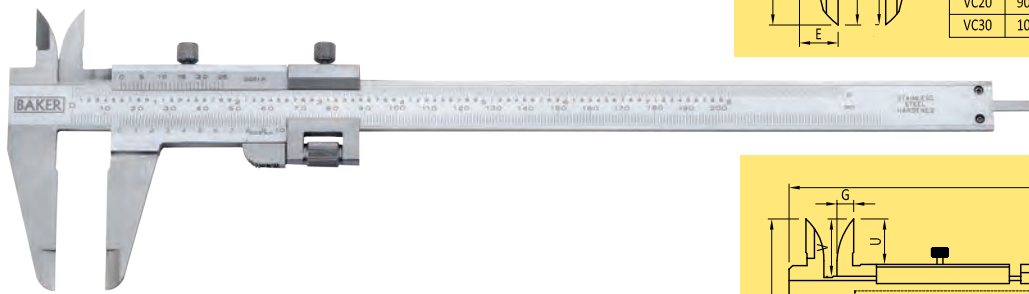


# Vernier Caliper

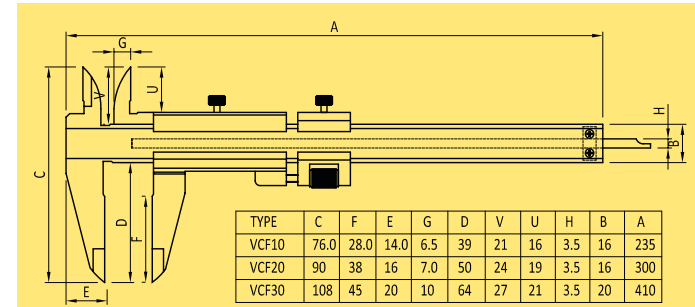
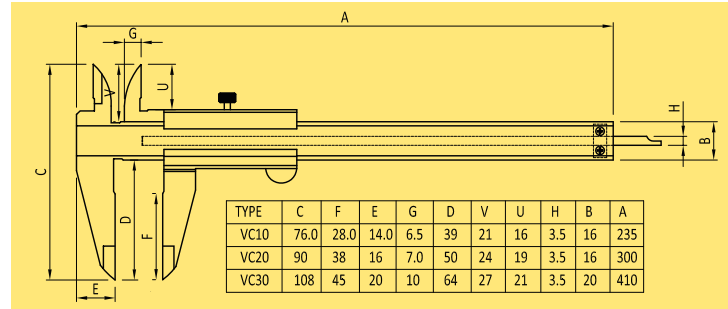
## VC SERIES



VC30



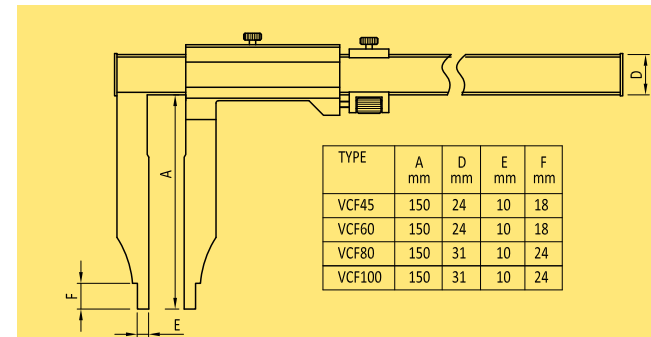
VCF20



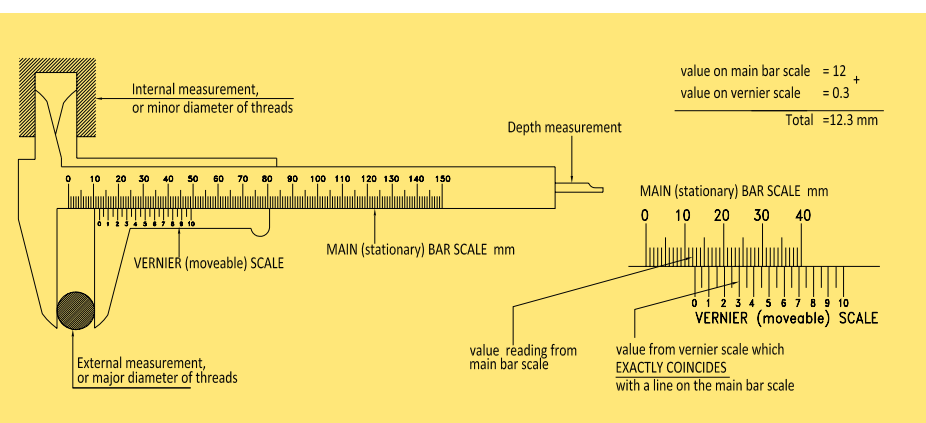
## FEATURES

- Every gauge carries a calibration certificate giving actual values
- With 0.02 mm / 0.001" Least Count
- Measures OD, ID, Step and Depth
- Accuracy as per DIN 862
- Robust, Hardened and Ground stainless steel jaws and beam
- Supplied in a sleek plastic box

Type	Reading	Range	
VC10	0.02 mm / 0.001 "	0-150 mm / 0-6 "	WITHOUT FINE ADJUSTMENT
VC20		0-200 mm / 0-8 "	
VC30		0-300 mm / 0-12 "	
VCF10	0.02 mm / 0.001 "	0-130 mm / 0-5 "	WITH FINE ADJUSTMENT
VCF20		0-180 mm / 0-7 "	
VCF30		0-280 mm / 0-11 "	
VCF45	0.02 mm / 0.001"	0-430 mm / 0-17"	WITH FINE ADJUSTMENT
VCF60	0.02 mm / 0.001"	0-580 mm / 0-23"	
VCF80	0.02 mm / 0.001"	0-780 mm / 0-31"	
VCF100	0.02 mm / 0.001"	0-980 mm / 0-39"	



## HOW TO READ A VERNIER CALIPER ?



- Read the value of the main (stationary) scale which is just to the left & above the "0" zero reading on the vernier (movable) scale
- Then add the value on the vernier (movable) scale which exactly coincides with a line on the main (stationary) scale

# Dial & Digital Caliper



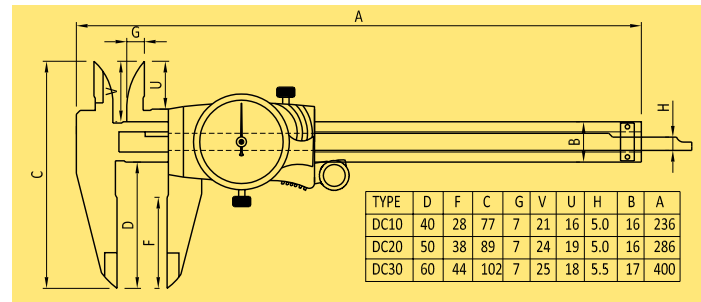
## DC SERIES



DC10

### FEATURES

- Every gauge carries a calibration certificate giving actual values
- Checks OD, ID, step and depth
- Robust, hardened and ground stainless steel jaws and beam
- With 0.02 mm Least Count
- Accuracy as per DIN 862
- Clear, easy to read graduated dial with adjustable bezel
- Shock Proof movement
- Supplied in a sleek plastic box



Type	Reading	Range
DC10	0.020 mm	0-150 mm
DC20	0.020 mm	0-200 mm
DC30	0.020 mm	0-300 mm

## IP67 WATER PROOF ZD SERIES



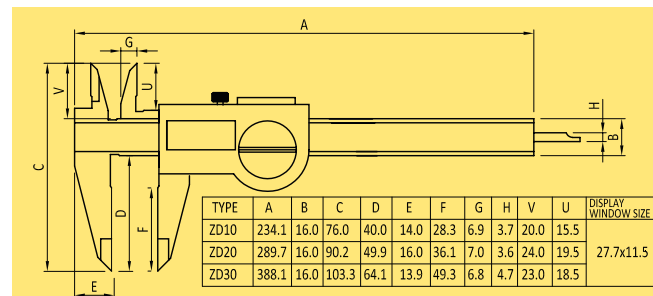
ZD10



SWISS TECHNOLOGY

### FEATURES

- Every gauge carries a calibration certificate giving actual values
- Highest degree of protection to a hand-held instrument of its type, IP67 (according to IEC 60529)
- Immunity to penetration of liquids or dust
- Reliability and Accuracy of measuring tool is assured even in the most hostile workshop environment
- High contrast Liquid Crystal Display
- Ergonomic beam design increases comfort; reduces fatigue
- Latest Smart Inductive System (S.I.S)
- Automatic stand-by mode
- Origin securely saved even in stand-by mode
- Auto switch-on by motion of slider
- New, Proximity type contactless RS232 data output allows user to store and analyze measurement data in PC or any other digital data storage apparatus
- Accuracy as per DIN 862
- Power supply 1 Lithium battery, type CR2032, 3V, 220 mAh
- Working temperature 5 to 40 °C



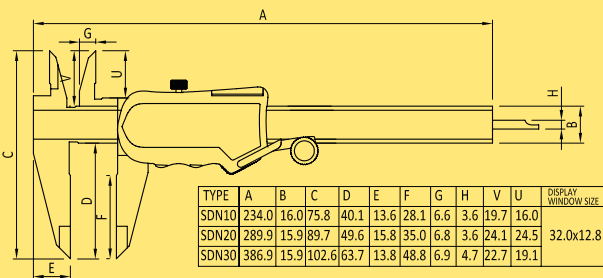
Type	Reading	Range	Weight
ZD10	0.01 mm / 0.0005"	0-150 mm / 0-6"	170 g
ZD20		0-200 mm / 0-8"	195 g
ZD30		0-300 mm / 0-12"	235 g

# Digital Caliper

## SDN SERIES



SDN10



Type	Reading	Range	Weight
SDN10		0 - 150mm / 0 - 6"	145 g
SDN20	0.01mm / 0.0005 "	0 - 200mm / 0 - 8"	170 g
SDN30		0 - 300mm / 0 - 12"	210 g

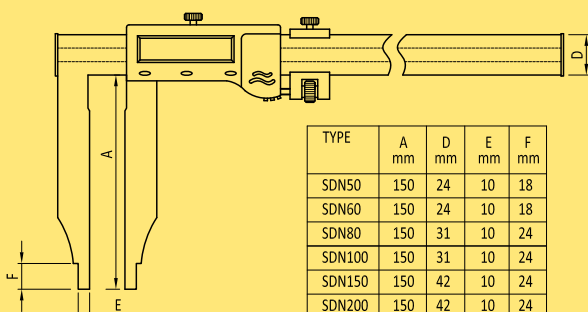
## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Robust, Hardened and Ground stainless steel jaws and beam
- Accuracy as per DIN 862
- Attractive shape and elegant design complimented by uncompromising performance
- 9.6 mm tall, high contrast Liquid Crystal Display significantly augments visibility and minimizes user fatigue
- All three ranges of calipers are fitted with thumb-roller to improve quality of measurement
- Latest Smart Inductive System (S.I.S)
- Easy and quick operation (user friendly)
- Battery changeover is fast, easy and reliable
- All three varieties of digital calipers are capable of External, Internal, Step and Depth measurement
- Display refresh rate greater than 7 / sec
- Power supply 1 Lithium battery, type CR2032, 3V, 220 mAh
- Working temperature 5 to 40 °C
- Max. slider speed 1.5 m/s

## LARGE SDN SERIES



SDN80



## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Degree of protection IP66 (according to IEC 60529)
- High contrast Liquid Crystal Display
- Ergonomic beam design increases comfort; reduces fatigue
- Fine adjustment with the lock provided for ease of setting
- Auto switch-OFF
- Accuracy as per DIN 862
- Easy and quick operation (user friendly)
- Battery changeover is fast, easy and reliable
- Power supply 1 Lithium battery, type CR2032, 3V, 220 mAh
- Working temperature 5 to 40 °C

Type	Reading	Range
SDN50		0 - 500 mm / 0 - 20"
SDN60		0 - 600 mm / 0 - 24"
SDN80	0.01 mm/0.0005"	0 - 800 mm / 0 - 32"
SDN100		0 - 1000 mm / 0 - 40"

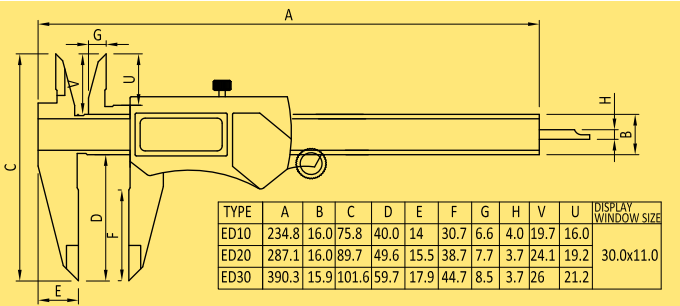
# Digital Caliper



## ED SERIES



ED 10

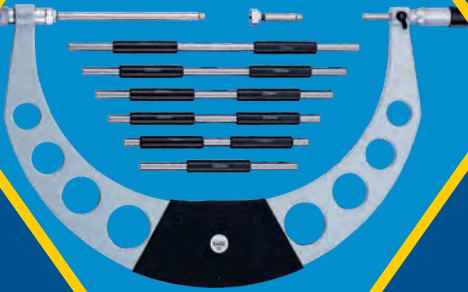


Type	Reading	Range	Weight
ED10	0.01mm / 0.0005"	0 - 150mm / 0 - 6"	165 g
ED20		0 - 200mm / 0 - 8"	187 g
ED30		0 - 300mm / 0 - 12"	273 g

## FEATURES

- Large Liquid Crystal Display for good visibility.
- Digital Calipers ED 10, ED 20 & ED 30 have measuring ranges : 0-150 mm / 0- 6", 0-200 mm / 0- 8", 0-300 mm / 0-12" respectively.
- Inch/ mm measurement.
- Least Count : 0.01mm /0.0005".
- Robust, hardened and ground stainless steel jaws and beam
- All three calipers are capable of External, Internal, Step and Depth measurement.
- Easy operation
- All three calipers are fitted with thumb-roller to improve quality of measurement.
- Easy operation
- Powered by 1 Lithium cell, type CR2032, 3 Vdc, 220 mAh.
- Battery replacement is fast and reliable.
- Manual and Auto power off facility.
- Working temperature 5°C to 40°C
- Accuracy as per DIN 862
- Every caliper carries a calibration certificate giving actual values





**MICROMETERS**

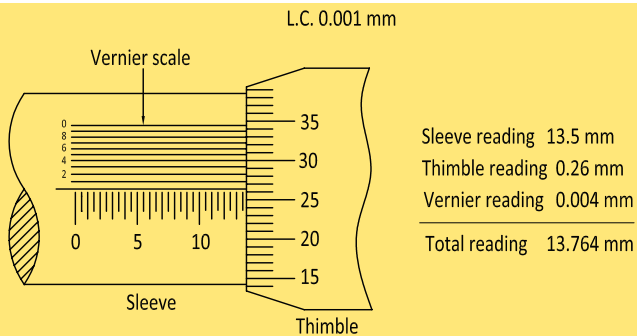
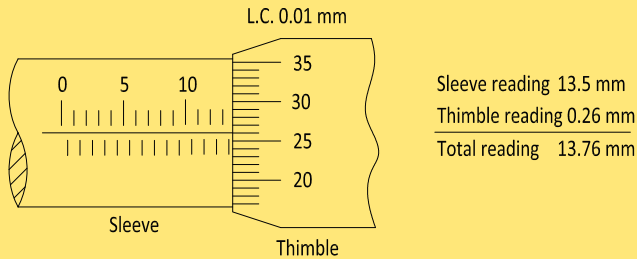


# Micrometers

## HOW TO READ A MICROMETER ?

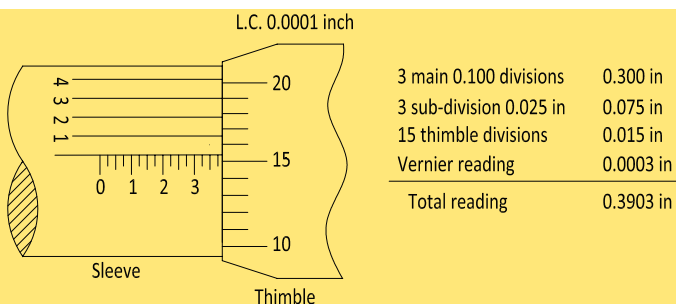
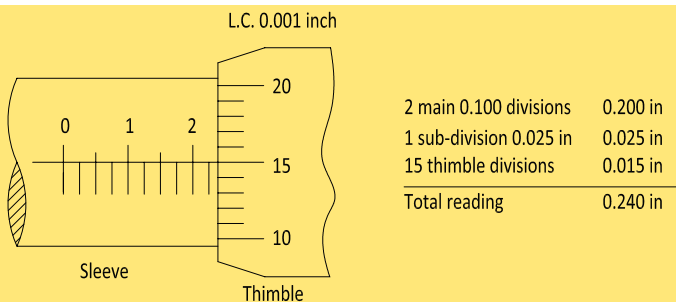
### Metric Micrometer

One full turn of the thimble moves the spindle axially by 0.5 mm. On the sleeve, the 1 mm divisions are above the datum line and the 0.5 mm divisions are below the datum line. The thimble has fifty divisions; each division of the thimble scale equals 0.01 mm (0.5 mm divided by 50).



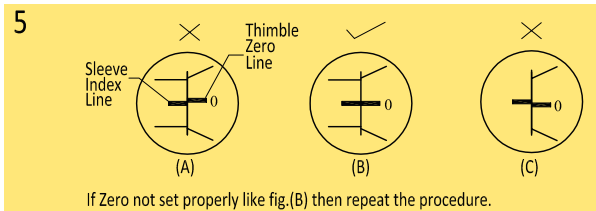
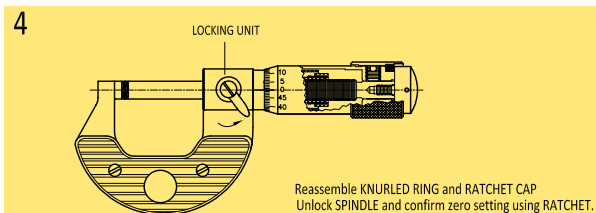
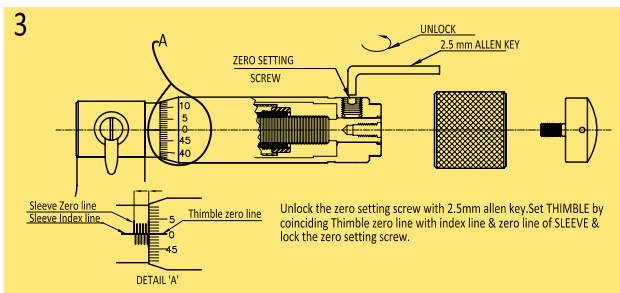
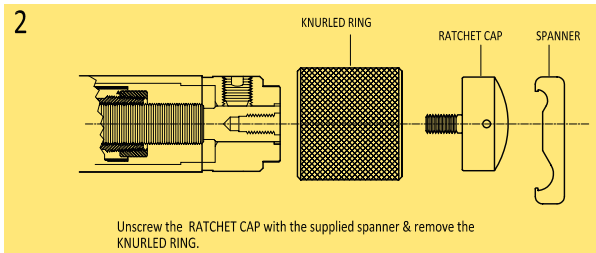
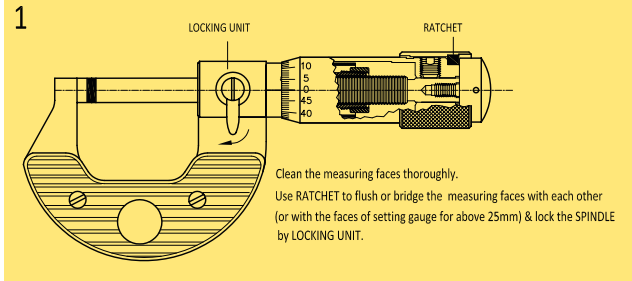
### Inch Micrometer

The main scale is divided into tenths of an inch (0.100 in) and each main division is subdivided into 4 equal parts, each division representing 0.025 in (0.1 divided by 4). One complete turn of the thimble, moves the spindle axially twenty five thousandths of an inch. The thimble has twenty five graduations, each graduation representing one thousandth of an inch.



## ZERO SETTING PROCEDURE

Where Zero setting on sleeve is not provided



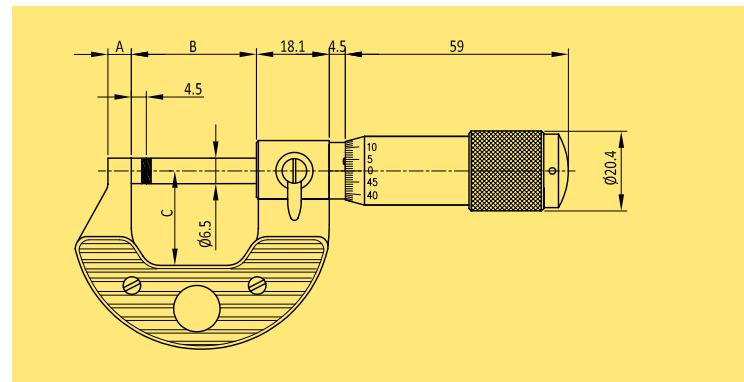
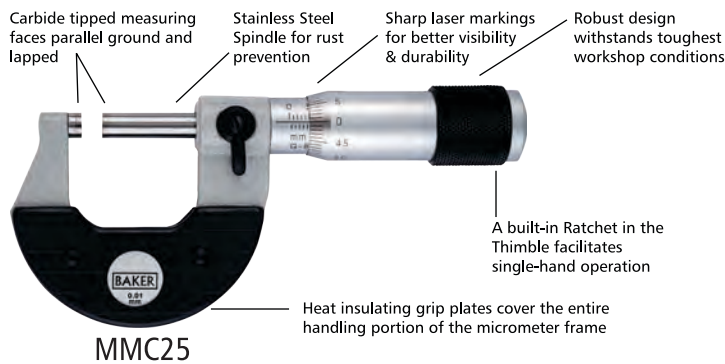
“This Zero setting cannot be tampered with easily”

For video on zero setting procedure of mechanical external micrometer, please visit:  
[http://www.youtube.com/watch?v=ollmle36\\_a0](http://www.youtube.com/watch?v=ollmle36_a0)

# Mechanical External Micrometer



**RANGE: 0-200 mm/0-8"**



6MMC150



SET OF 6 MICROMETERS (0-150 mm/ 0-6")

4MMC100



SET OF 4 MICROMETERS (0-100 mm/ 0-4")

Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0-25	0.01	MMC25	7.1	32.5	25.5	0-1"	0.001"	INC1
	0.001	MMC25-1					0.0001"	INC1-1
25-50	0.01	MMC50	7.1	57.5	30.5	1-2"	0.001"	INC2
	0.001	MMC50-1					0.0001"	INC2-1
50-75	0.01	MMC75	8	83	45	2-3"	0.001"	INC3
	0.001	MMC75-1					0.0001"	INC3-1
75-100	0.01	MMC100	8	108	58	3-4"	0.001"	INC4
	0.001	MMC100-1					0.0001"	INC4-1
100-125	0.01	MMC125	8	133	67.5	4-5"	0.001"	INC5
	0.001	MMC125-1					0.0001"	INC5-1
125-150	0.01	MMC150	8	158	82	5-6"	0.001"	INC6
	0.001	MMC150-1					0.0001"	INC6-1
150-175	0.01	MMC175	8	183	93	6-7"	0.001"	INC7
175-200	0.01	MMC200	8	208	108	7-8"	0.001"	INC8
<b>Set of Micrometers</b>								
0-100 (Set of 4)	0.01	4MMC100		-		0-4" (Set of 4)	0.001"	4INC4
	0.001	4MMC100-1					0.0001"	4INC4-1
0-150 (Set of 6)	0.01	6MMC150		-		0-6" (Set of 6)	0.001"	6INC6
	0.001	6MMC150-1					0.0001"	6INC6-1

## FEATURES

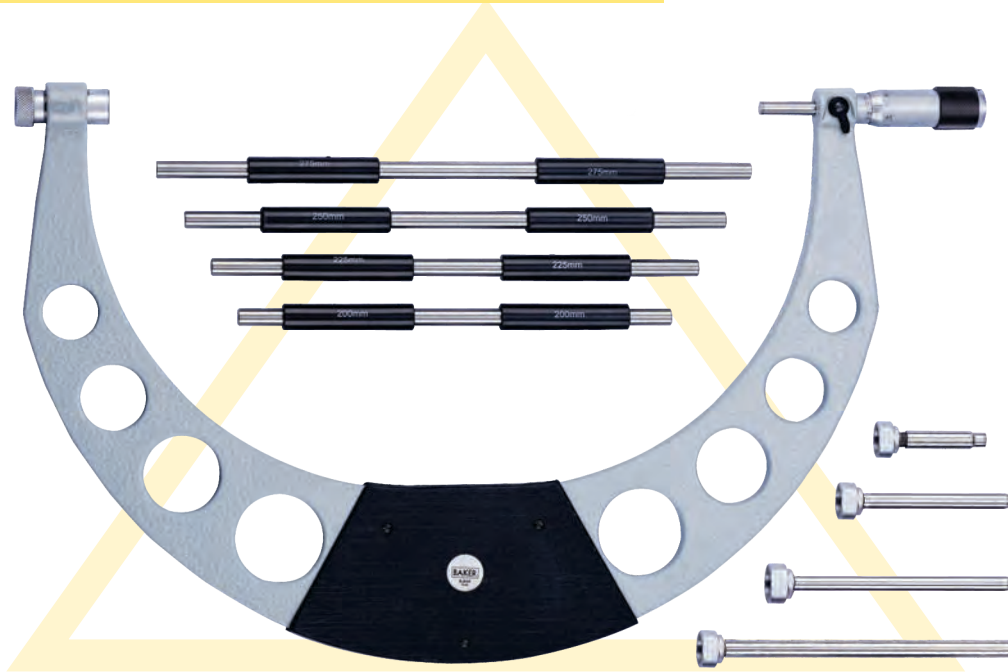
- Specifications : IS, DIN, ANSI & JIS
- Spindle made from stainless steel for rust prevention
- Measuring faces: carbide tipped, precision ground & micro lapped
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions





# Mechanical External Micrometer

## Micrometer with interchangeable Anvils

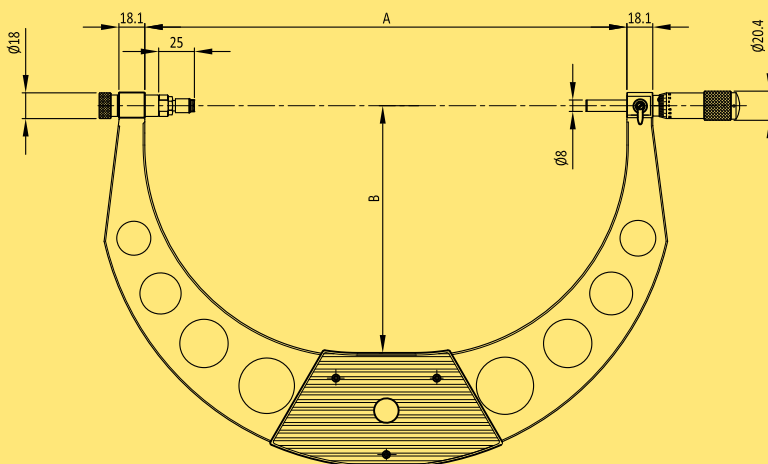


MMI200-300

Measuring Range mm	Reading mm	Type	A mm	B mm	Measuring Range inch	Reading inch	Type	Number Of Setting Standards	Number Of Interchangeable Anvils	Weight grams
0-100	0.01	MMI0-100	133	70	0-4"	0.001"	INI0-4	3	4	600
	0.001	MMI0-100-1				0.0001"	INI0-4-1	3	4	
0-150	0.01	MMI0-150	183	95	0-6"	0.001"	INI0-6	5	6	850
	0.001	MMI0-150-1				0.0001"	INI0-6-1	5	6	
150-300	0.01	MMI150-300	337	175	6-12"	0.001"	INI6-12	6	6	1700
	0.001	MMI150-300-1				0.0001"	INI6-12-1	6	6	
200-300	0.01	MMI200-300	337	175	8-12"	0.001"	INI8-12	4	4	1700
	0.001	MMI200-300-1				0.0001"	INI8-12-1	4	4	
*300-400	0.01	MMI300-400	437	225	12-16"	0.001"	INI12-16	4	4	2500
*400-500	0.01	MMI400-500	537	275	16-20"	0.001"	INI16-20	4	4	3000

**NOTE:-**

- \*External Micrometer above Range 300mm & 12inch, Supplied without Handle shell (Insulating Grip)
- Setting Standards - up to 300mm & 12inch - Both Ends Flat Face.  
Above 300mm & 12inch - Both Ends Spherical



### FEATURES

- Interchangeable anvils
- Spindle made from stainless steel for rust prevention (Ø8.0 mm, pitch 0.5mm and Stroke 25mm)
- Measuring faces : carbide tipped, precision ground & micro lapped
- An inbuilt ratchet in the thimble
- Sharp laser marking for better visibility & durability

# Mechanical External Micrometer



## Micrometer with Add on Extension Anvil



MME700-800

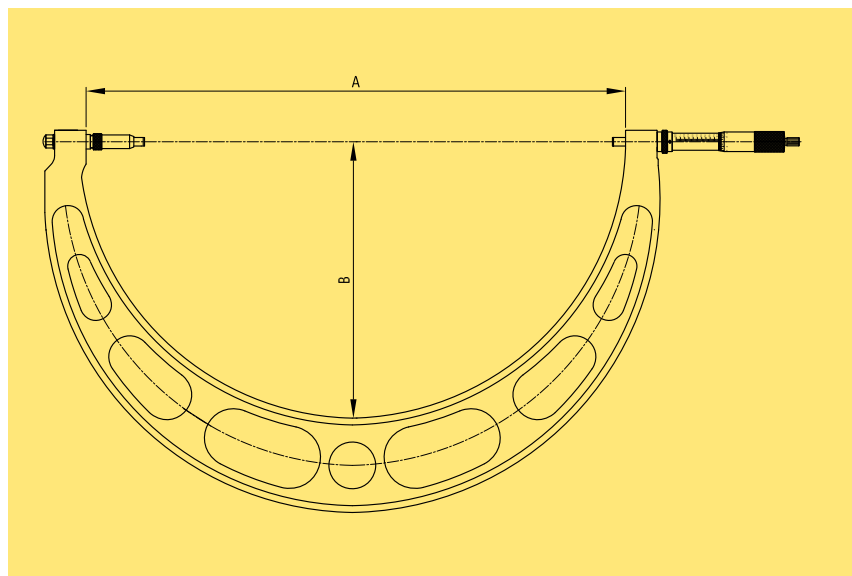
Measuring Range mm	Reading mm	Type	A mm	B mm	Measuring Range inch	Reading inch	Type	Number Of Setting Standards	Number Of Interchangeable Anvil	Weight grams
500-600	0.01	MME500-600	644	325	20-24"	0.001"	INE20-24	1	1	3700
600-700	0.01	MME600-700	745	375	24-28"	0.001"	INE24-28	1	1	4300
700-800	0.01	MME700-800	846	425	28-32"	0.001"	INE28-32	1	1	4600
800-900	0.01	MME800-900	948	475	32-36"	0.001"	INE32-36	1	1	5600
900-1000	0.01	MME900-1000	1050	525	36-40"	0.001"	INE36-40	1	1	6800

**NOTE:-**

- Setting Standards - Both End Spherical

### FEATURES

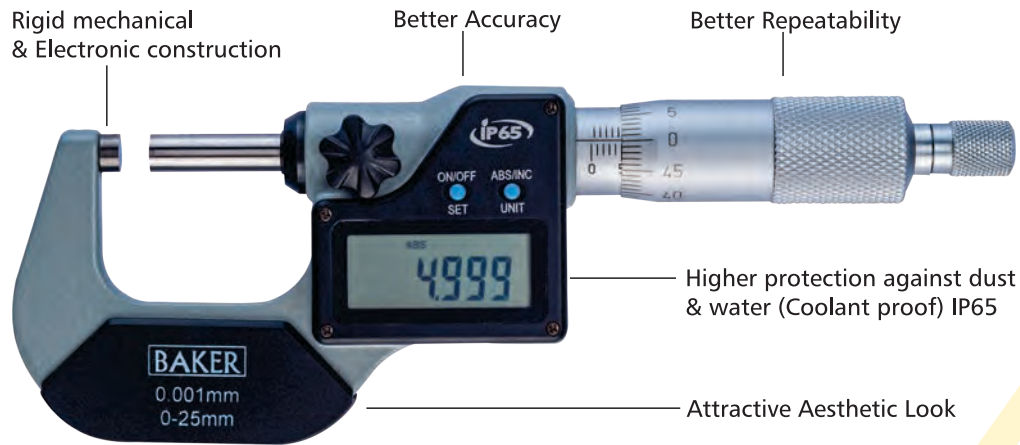
- Sturdy & Light weight Aluminum frame design
- Measuring faces: carbide tipped, precision ground & micro lapped
- Spindle made from stainless steel for rust prevention (Ø10mm, Pitch 1mm and Stroke 50mm)
- Sharp laser marking for better visibility & durability





# Digital External Micrometer

**RANGE 0-100 mm/0-4"**

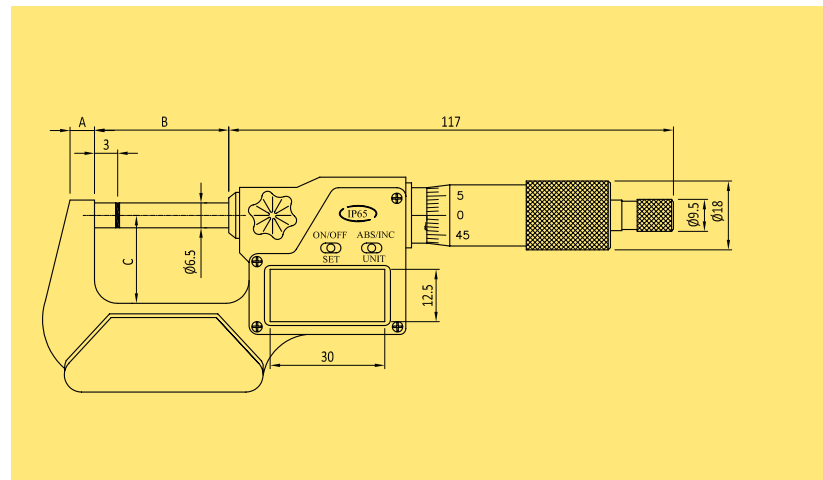


DMM25



4DMM100

SET OF 4 DIGITAL MICROMETERS (0-100 mm/0-4")



## FEATURES

- Protection level IP65 against dust & water (coolant proof)
- Stainless steel spindle to avoid rust
- Carbide measuring faces
- mm / inch conversion
- Auto power off
- SR44/LR44 battery
- Ball attachment free of cost
- Absolute & incremental measuring mode
- Easy operations with 2 buttons
- Each micrometer is supplied with calibration certificate stating actual values
- Supplied in attractive sturdy box
- Real value for money

MEASURING RANGE	READING	TYPE	A mm	B mm	C mm
0-25mm/0-1"	0.001 mm / 0.00005"	DMM25	6.5	31	25
25-50mm/1-2"		DMM50	8.5	56	32
50-75mm/2-3"		DMM75	8.5	81.5	44.5
75-100mm/3-4"		DMM100	8.5	106	57
<b>Set of Micrometers</b>					
0-100mm/0-4" (Set of 4)	0.001 mm / 0.00005"	4DMM100			

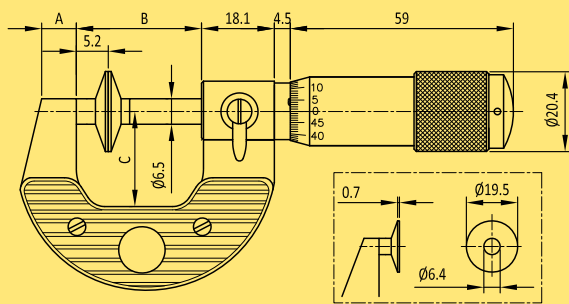
# Special External Micrometer



## DISC: ROTATING



MMC25-D

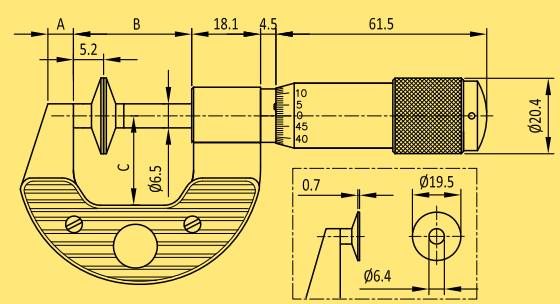


Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	MMC25-D	10	36	29	0 -1"	0.001"	INC1-D
25-50		MMC50-D	7.1	61.5	31	1-2"		INC2-D
50-75		MMC75-D	8	87	45.5	2-3"		INC3-D
75-100		MMC100-D	5.9	110	57.5	3-4"		INC4-D

## DISC: NON-ROTATING



MMC25-ND



Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	MMC25-ND	10	36	29	0 -1"	0.001"	INC1-ND
25 - 50		MMC50-ND	7.1	61.5	31	1 - 2"		INC2-ND
50 -75		MMC75-ND	8	87	45.5	2 - 3"		INC3-ND
75 -100		MMC100-ND	5.9	110	57.5	3 - 4"		INC4-ND

## FEATURES

- Spindle made from stainless steel for rust prevention
- Measuring faces: hardened steel
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

### Application

For measuring root tangent length of spur & helical gears, recess distances etc.

## FEATURES

- Non-rotating spindle (only axial moment of spindle)
- Spindle made from stainless steel for rust prevention
- Measuring faces: hardened steel
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

### Application

For measuring thickness of paper, felt, rubber, fabric etc.

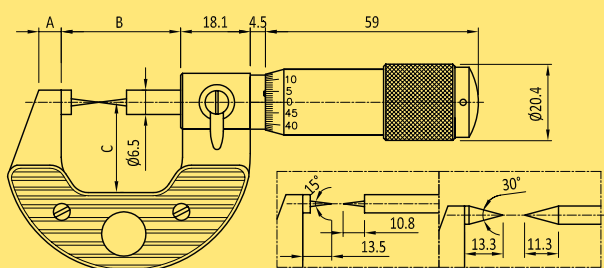


# Special External Micrometer

## POINT



MMC25-P2

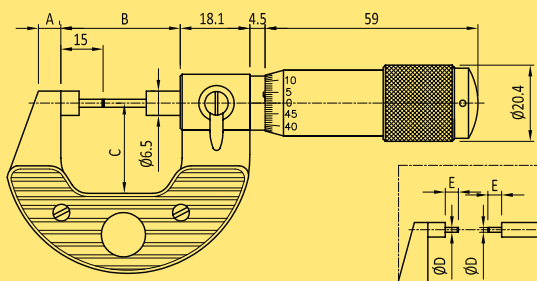


Measuring Range mm	Reading mm	Point Angle	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	15°	MMC25-P1	7.1	57.5	30.5	0 -1"	0.001"	INC1-P1
		30°	MMC25-P2						INC1-P2
25-50	0.01	15°	MMC50-P1	8	83	45	1-2"	0.001"	INC2-P1
		30°	MMC50-P2						INC2-P2
50-75	0.01	15°	MMC75-P1	8	108	58	2-3"	0.001"	INC3-P1
		30°	MMC75-P2						INC3-P2
75-100	0.01	15°	MMC100-P1	8	133	67.5	3-4"	0.001"	INC4-P1
		30°	MMC100-P2						INC4-P2

## SPLINE



MMC25-S3



Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	D mm	E mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	MMC25-S2	7.1	57.5	30.5	2	5	0 -1"	0.001"	INC1-S2
		MMC25-S3				3	8			INC1-S3
25-50	0.01	MMC50-S3	8	83	45	3	8	1-2"	0.001"	INC2-S3
50-75		MMC75-S3	8	108	58	3	8	2-3"		INC3-S3
75-100	0.01	MMC100-S3	8	133	67.5	3	8	3-4"	0.001"	INC4-S3

## FEATURES

- Spindle made from stainless steel for rust prevention
- Measuring Faces – 15° & 30° hardened steel points having radius 0.3 mm approximately
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

- Spindle made from stainless steel for rust prevention
- Measuring faces: carbide tipped available in two types Ø2 x 5 mm & Ø3 x 8 mm
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

### Application

For measuring web thickness of drills, small grooves, keyways.

### Application

For measuring recesses, grooves, Splines, Slots, Keyways & small parts in precision work.

# Special External Micrometer



## TUBE



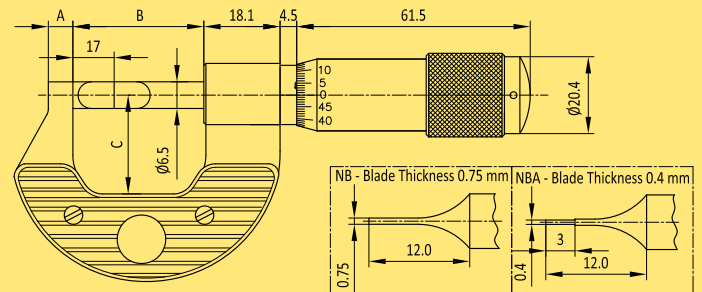
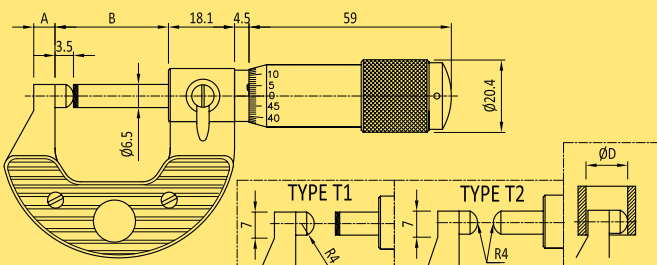
MMC25-T1

MMC25-T2

## BLADE



MMC25-NB



Measuring Range mm	Reading mm	Type	A mm	B mm	Min. Ø D mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	MMC25-T1	5.5	32.5	9.5	0 -1"	0.001"	INC1-T1
		MMC25-T2						INC1-T2
25-50	0.01	MMC50-T1	6	57.5	10	1-2"	0.001"	INC2-T1
		MMC50-T2						INC2-T2
50-75	0.01	MMC75-T1	8	83	12	2-3"	0.001"	INC3-T1
		MMC75-T2						INC3-T2
75-100	0.01	MMC100-T1	8	108	12	3-4"	0.001"	INC4-T1
		MMC100-T2						INC4-T2

Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0 -25	0.01	MMC25-NB	7.1	57.5	30.5	0-1"	0.001"	INC1-NB
		MMC25-NBA						INC1-NBA
25-50	0.01	MMC50-NB	8	83	45	1-2"	0.001"	INC2-NB
		MMC50-NBA						INC2-NBA
50-75	0.01	MMC75-NB	8	108	58	2-3"	0.001"	INC3-NB
		MMC75-NBA						INC3-NBA
75-100	0.01	MMC100-NB	8	133	67.5	3-4"	0.001"	INC4-NB
		MMC100-NBA						INC4-NBA

NOTE-  
NB-Blade Thickness 0.75 mm  
NBA-Blade Thickness 0.40 mm

## FEATURES

- Spindle made from stainless steel for rust prevention
- Measuring faces: hardened steel available in two types:  
T1 - one end spherical  
T2 - both ends spherical
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

### Application

For measuring curved surfaces & wall thickness of tubes, rings, bearings etc.

## FEATURES

- Spindle made from stainless steel for rust prevention
- Measuring faces: hardened steel
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability
- Heat insulating grip plates cover the entire handling portion of the micrometer frame
- Robust design withstands toughest workshop conditions

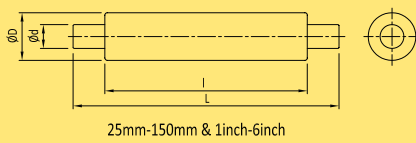
### Application

For measuring small grooves on shaft dia., keyways and other hard to reach geometries / profiles.

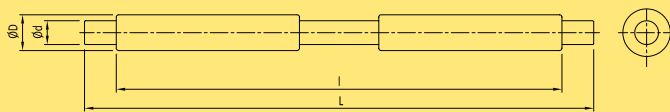


# Setting Gauge, Depth Micrometer

## FOR EXTERNAL MICROMETER



25mm-150mm & 1inch-6inch



175mm - 275mm & 7inches - 11inches

### METRIC

Length (L) mm	Tolerance $\mu\text{m}$	l mm	Diameter ( $\varnothing d$ ) mm	Diameter ( $\varnothing D$ ) mm
25	$\pm 1.5$	20	7	11
50	$\pm 2.0$	40	7	11
75	$\pm 2.5$	40	7	11
100	$\pm 3.0$	60	8	12
125	$\pm 3.5$	60	8	12
150	$\pm 4.0$	60	8	12
175	$\pm 4.5$	135	8	12
200	$\pm 5.0$	160	8	12
225	$\pm 5.5$	160	8	12
250	$\pm 6.0$	180	8	12
275	$\pm 6.5$	195	8	12

### INCH

Length (L) inch	Tolerance inch	l inch	Diameter ( $\varnothing d$ ) inch	Diameter ( $\varnothing D$ ) inch
1"	$\pm 0.00005$ "	0.79"	0.27"	0.43"
2"	$\pm 0.0001$ "	1.65"	0.27"	0.43"
3"	$\pm 0.0001$ "	1.65"	0.27"	0.43"
4"	$\pm 0.0001$ "	2.45"	0.31"	0.47"
5"	$\pm 0.00015$ "	2.45"	0.31"	0.47"
6"	$\pm 0.00015$ "	2.45"	0.31"	0.47"
7"	$\pm 0.00015$ "	5.31"	0.31"	0.47"
8"	$\pm 0.00015$ "	6.31"	0.31"	0.47"
9"	$\pm 0.0002$ "	6.31"	0.31"	0.47"
10"	$\pm 0.0002$ "	7.15"	0.31"	0.47"
11"	$\pm 0.0002$ "	7.67"	0.31"	0.47"

## FEATURES

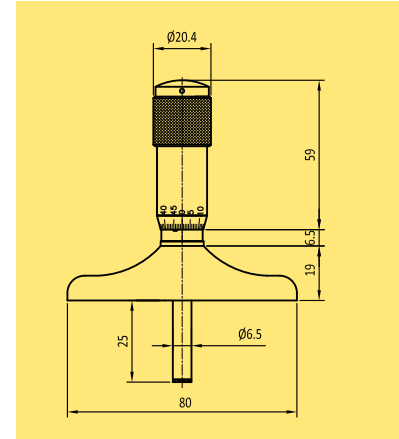
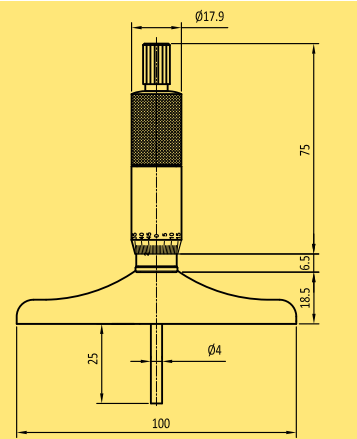
- Hardened, ground & lapped measuring faces
- Flat type measuring faces
- Measuring faces flatness  $0.3 \mu\text{m}$

## DEPTH



MMC100-DM

MMC25-DM



Measuring Range mm	Reading mm	Type	Measuring Range inch	Reading inch	Type
0-25	0.01	MMC25-DM	0-1"	0.001"	INC1-DM
	0.001	MMC25-1DM		0.0001"	INC1-1DM
0-100	0.01	MMC100-DM	0-4"	0.001"	INC4-DM
0-150	0.01	MMC150-DM	0-6"	0.001"	INC6-DM

## FEATURES

- Base –hardened ,ground & lapped
- Spindle made from Stainless Steel for rust prevention
- Measuring Faces –Hardened steel
- 0-100 mm & 0-150 mm available with interchangeable rods.
- Sharp laser marking for better visibility & durability
- Robust design withstands toughest workshop conditions

### Application

For Measuring depth of steps, shoulders etc.

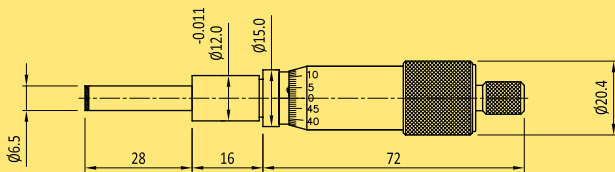
# Micrometer Heads



## MICROMETER HEAD



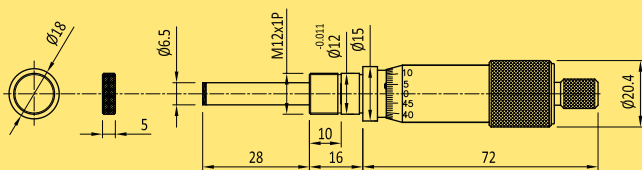
MM25-HP  
Plain holding Ø12.0 mm



Measuring Range mm	Reading mm	Type	Measuring Range inch	Reading inch	Type
0 -25	0.01	MM25-HP	0-1"	0.001"	IN1-HP
	0.001	MM25-1HP		0.0001"	IN1-1HP



MM25-HT  
Threaded holding M12x1P



Measuring Range mm	Reading mm	Type	Measuring Range inch	Reading inch	Type
0 -25	0.01	MM25-HT	0-1"	0.001"	IN1-HT
	0.001	MM25-1HT		0.0001"	IN1-1HT

## FEATURES

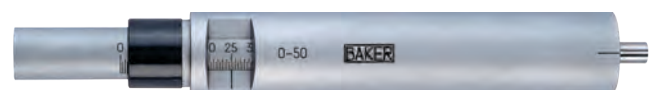
- Spindle made from stainless steel for rust prevention
- Measuring face: carbide tipped, precision ground & micro lapped
- An in-built ratchet in the thimble
- Sharp laser marking for better visibility & durability

## SPECIAL MICROMETER HEAD

- We also manufacture Micrometer Heads as per customer requirements with rotating / non-rotating spindles.



Micrometer Heads With Rotating Spindle



Micrometer heads with Non-rotating spindle





# Mechanical Internal Micrometer



## XTA SERIES

Bowers' XT Analogue Internal Micrometers are an economical solution to accurate shop-floor bore measurement. The extended mechanical travel of these advanced Two or Three point gauges ensures that exchanging measuring anvils is now unnecessary. Their wide application range, 2 - 300mm, rugged construction and easy read scale, ensure both accuracy and ease of use. XT Analogue Internal Micrometers are supplied with UKAS certification. Bowers has launched the XTA Micro to cover the measuring range 2-20mm. The XTA Micro incorporates a more compact mechanical controller and Vernier scale for improved resolution.

### TECHNICAL SPECIFICATIONS: Individual Instruments supplied with Setting Ring

Code No (mm)	Range (mm)	Code No (inch)	Range (inch)	Accuracy		Depth		Setting Ring	
				(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
MXTA1M	2-2.5	MXTA1i	0.080-0.100"	0.004	0.00015"	9	0.35"	2.50	0.1000"
MXTA2M	2.5-3	MXTA2i	0.100-0.120"	0.004	0.00015"	9	0.35"	2.50	0.1000"
MXTA3M	3-4	MXTA3i	0.120-0.160"	0.004	0.00015"	12	0.47"	4.00	0.1600"
MXTA4M	4-5	MXTA4i	0.160-0.200"	0.004	0.00015"	18	0.70"	4.00	0.1600"
MXTA5M	5-6	MXTA5i	0.200-0.250"	0.004	0.00015"	18	0.70"	5.00	0.2000"
MXTA6M	6-8	MXTA6i	1/4-5/16"	0.004	0.00015"	58	2.28"	8.00	0.3125"
MXTA8M	8-10	MXTA8i	5/16-3/8"	0.004	0.00015"	58	2.28"	8.00	0.3125"
MXTA10M	10-12.5	MXTA10i	3/8-1/2"	0.004	0.00015"	58	2.28"	12.50	0.500"
MXTA12M	12.5-16	MXTA12i	1/2-5/8"	0.004	0.00015"	62	2.44"	12.50	0.500"
MXTA16M	16-20	MXTA16i	5/8-3/4"	0.004	0.00015"	62	2.44"	20.00	0.750"
XTA20M	20-25	XTA20i	3/4-1"	0.004	0.00015"	66	2.62"	20.00	0.750"
XTA25M	25-35	XTA25i	1-1 3/8"	0.004	0.00015"	66	2.62"	35.00	1.375"
XTA35M	35-50	XTA35i	1 3/8-2"	0.004	0.00015"	80	3.15"	35.00	1.375"
XTA50M	50-65	XTA50i	2-2 5/8"	0.005	0.00020"	80	3.15"	65.00	2.625"
XTA65M	65-80	XTA65i	2 5/8-3 1/4"	0.005	0.00020"	80	3.15"	65.00	2.625"
XTA80M	80-100	XTA80i	3 1/4-4"	0.005	0.00020"	100	3.94"	80.00	3.250"
XTA100M	100-125	XTA100i	4-5"	0.006	0.00025"	115	4.53"	125.00	5.000"
XTA125M	125-150	XTA125i	5-6"	0.006	0.00025"	115	4.53"	125.00	5.000"
XTA150M	150-175	XTA150i	6-7"	0.007	0.00030"	115	4.53"	175.00	7.000"
XTA175M	175-200	XTA175i	7-8"	0.007	0.00030"	115	4.53"	175.00	7.000"
XTA200M	200-225	XTA200i	8-9"	0.008	0.00030"	118	4.65"	225.00	9.000"
XTA225M	225-250	XTA225i	9-10"	0.008	0.00030"	118	4.65"	225.00	9.000"
XTA250M	250-275	XTA250i	10-11"	0.009	0.00035"	118	4.65"	275.00	11.000"
XTA275M	275-300	XTA275i	11-12"	0.009	0.00035"	118	4.65"	275.00	11.000"

## FEATURES

- Range 2 - 300 mm (0.080" -12")
- 2 - 6mm 2 point/ 6 - 300mm 3 point measurement
- Graduation XTA Micro 2-6mm: 0.001mm, 6-20mm: 0.002mm
- Graduation XTA 20-300mm: 0.005mm
- Tungsten carbide measuring faces on all 3-point heads from 12.5mm
- Blind bore measurement from 2mm-6mm and above 12.5 mm (0.500")
- Extensions available above 6mm for deep hole measurement
- Ratchet stop to ensure consistent measurement
- Setting rings included with individual instruments and sets
- UKAS certificate supplied as standard with all XT mechanical micrometers
- Serial number on all gauges
- Internal Micrometers manufactured according to DIN 863, part 4
- After Sales Service



### SETS: Supplied with analogue internal micrometers and setting rings

Range (mm)	Code No	Range (inch)	Code No
2-3mm	SMXTA1M	0.080-0.120"	SMXTA1i
3-6mm	SMXTA2M	0.120-0.25"	SMXTA2i
6-10mm	SMXTA3M	1/4-3/8"	SMXTA3i
10-20mm	SMXTA4M	3/8-3/4"	SMXTA4i
20-50mm	SXTA5M	3/4-2"	SXTA5i
50-100mm	SXTA6M	2-4"	SXTA6i
100-150mm	SXTA7M	4-6"	SXTA7i
150-200mm	SXTA8M	6-8"	SXTA8i

### EXTENSIONS:

Code No.	Length		To Fit Heads	
	mm	inch	mm	inch
EGX 0200	63	2.5"	6-10	1/4-3/8"
EGX 0400	76	3.0"	10-12.5	3/8-1/2"
EGX 0500	100	4.0"	12.5-20	1/2-3/4"
EGX 0001	150	6.0"	20-50	3/4-2"
EGX 0004	150	6.0"	50-300	2-12"

# Large Mechanical Internal Micrometer



BAKER



## RANGE: 400-1150 mm

Microtest AG is for more than 50 years specializing in measurement of internal diameters. Microtest products are in use all over the world and guarantee the highest precision over long periods of time.

The MICROTEST system is the only one that can measure internal diameters from 400 mm to 1150 mm, precisely and accurately. Based on its unique, robust design, Microtest are able to produce an instrument with unrivalled accuracy. These instruments are built very light and come with extra hard ratchets to achieve perfect self centering in a big bore. The instruments are suitable for both vertical and horizontal applications.

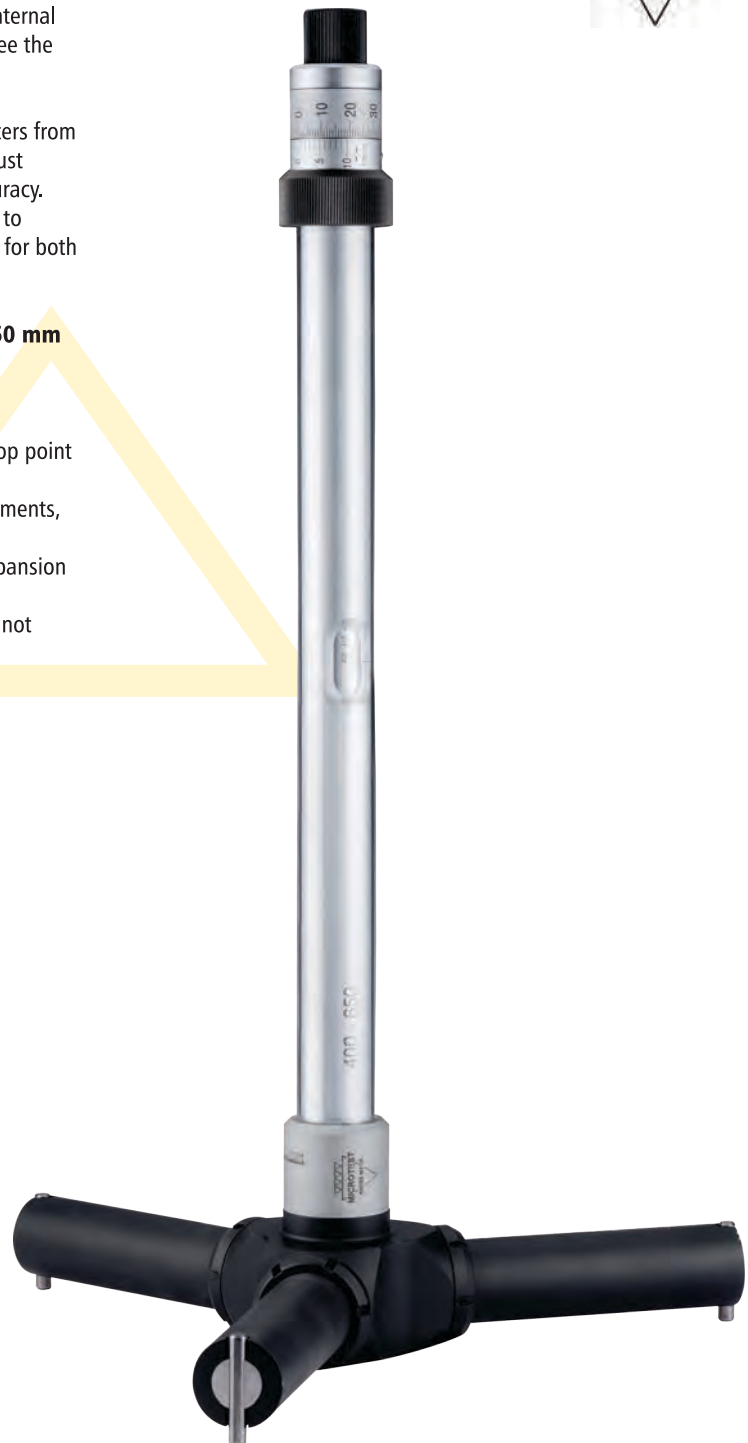
**Available measuring ranges are: Ø400-650, Ø650-900, Ø900-1150 mm**

### Why use the Microtest System?

- The Microtest Measuring System reaches the high accuracy through simultaneous operation of three measuring spindles to obtain the stop point at which the measurement is taken
- A good vibration generated by the ratchet gives repeatable measurements, independent of the user's sense of touch
- The plastic coating protects against spray water, dirt and thermal expansion
- The temperature-compensated design enables precise & accurate measurements even if the standard ambient temperature of 20 °C is not maintained, since the material expansions of the work piece and the measuring instrument are almost completely balanced out
- Over and above this, the Microtest System is maintenance free

## FEATURES

- Measuring Range: Ø400 – Ø1150 mm
- 1 µm reading with parallax-free readout
- Automatic self centering for easy & safe handling
- Deep blind hole measurement
- Extensions available on demand
- Insulated construction for thermal protection
- Automatic linear wear correction through easy adjustment
- Performance of higher accuracy at low cost
- High-strength aluminium housing
- Titanium-coated star housing
- Hardened chrome-steel measuring probes
- Tungsten carbide measuring anvils
- Torque-stable ratchet
- Made in Switzerland
- After sales service



IMMA400



# Digital Internal Micrometer



## XTH SERIES (PISTOL-GRIP)

Bowers' XT3 Hometric offers a new ergonomic design - including a larger and clearer LCD display - along with IP67 electronics protection, proximity output with optional built-in Bluetooth; both allow bi-directional communication giving greater flexibility for data acquisition and storage. The extended mechanical travel of the XT range means that special heads can also be manufactured to accommodate users most awkward measuring problems. Measuring heads for threads, splines, slots, grooves, deep-holes and many more applications are available. The XT3 Hometric pistol grip range of internal micrometers can be supplied as individual instruments or in complete sets.

### TECHNICAL SPECIFICATIONS: Individual Instruments supplied with Digital Pistol Grip, Head and Ring

Code No (mm)	Range (mm)	Code No (inch)	Range (inch)	Accuracy		Depth		Display Unit	Setting Ring	
				(mm)	(inch)	(mm)	(inch)		(mm)	(inch)
XTH1M-BT	2-2.5	XTH1i-BT	0.080-0.100"	0.004	0.00015"	9	0.35"	XTPG01-BT	2.50	0.1000"
XTH2M-BT	2.5-3	XTH2i-BT	0.100-0.120"	0.004	0.00015"	9	0.35"	XTPG01-BT	2.50	0.1000"
XTH3M-BT	3-4	XTH3i-BT	0.120-0.160"	0.004	0.00015"	12	0.47"	XTPG01-BT	4.00	0.1600"
XTH4M-BT	4-5	XTH4i-BT	0.160-0.200"	0.004	0.00015"	18	0.70"	XTPG01-BT	4.00	0.1600"
XTH5M-BT	5-6	XTH5i-BT	0.200-0.250"	0.004	0.00015"	18	0.70"	XTPG01-BT	5.00	0.2000"
XTH6M-BT	6-8	XTH6i-BT	1/4-5/16"	0.004	0.00015"	58	2.28"	XTPG02-BT	8.00	0.3125"
XTH8M-BT	8-10	XTH8i-BT	5/16-3/8"	0.004	0.00015"	58	2.28"	XTPG02-BT	8.00	0.3125"
XTH10M-BT	10-12.5	XTH10i-BT	3/8-1/2"	0.004	0.00015"	58	2.28"	XTPG02-BT	12.50	0.5000"
XTH12M-BT	12.5-16	XTH12i-BT	1/2-5/8"	0.004	0.00015"	62	2.44"	XTPG02-BT	12.50	0.5000"
XTH16M-BT	16-20	XTH16i-BT	5/8-3/4"	0.004	0.00015"	62	2.44"	XTPG02-BT	20.00	0.7500"
XTH20M-BT	20-25	XTH20i-BT	3/4-1"	0.004	0.00015"	66	2.62"	XTPG03-BT	20.00	0.7500"
XTH25M-BT	25-35	XTH25i-BT	1-1 3/8"	0.004	0.00015"	66	2.62"	XTPG03-BT	35.00	1.3750"
XTH35M-BT	35-50	XTH35i-BT	1 3/8-2"	0.004	0.00015"	80	3.15"	XTPG03-BT	35.00	1.3750"
XTH50M-BT	50-65	XTH50i-BT	2-2 5/8"	0.005	0.00020"	80	3.15"	XTPG03-BT	65.00	2.6250"
XTH65M-BT	65-80	XTH65i-BT	2 5/8-3 1/4"	0.005	0.00020"	80	3.15"	XTPG03-BT	65.00	2.6250"
XTH80M-BT	80-100	XTH80i-BT	3 1/4-4"	0.005	0.00020"	100	3.35"	XTPG03-BT	80.00	3.2500"
XTH100M-BT	100-125	XTH100i-BT	4-5"	0.006	0.00025"	115	3.94"	XTPG04-BT	125.00	5.0000"
XTH125M-BT	125-150	XTH125i-BT	5-6"	0.006	0.00025"	115	3.94"	XTPG04-BT	125.00	5.0000"
XTH150M-BT	150-175	XTH150i-BT	6-7"	0.007	0.00030"	115	3.94"	XTPG04-BT	175.00	7.0000"
XTH175M-BT	175-200	XTH175i-BT	7-8"	0.007	0.00030"	115	3.94"	XTPG04-BT	175.00	7.0000"
XTH200M-BT	200-225	XTH200i-BT	8-9"	0.008	0.00030"	118	3.94"	XTPG04-BT	225.00	9.0000"
XTH225M-BT	225-250	XTH225i-BT	9-10"	0.008	0.00030"	118	4.05"	XTPG04-BT	225.00	9.0000"
XTH250M-BT	250-275	XTH250i-BT	10-11"	0.009	0.00035"	118	4.05"	XTPG04-BT	275.00	11.0000"
XTH275M-BT	275-300	XTH275i-BT	11-12"	0.009	0.00035"	118	4.05"	XTPG04-BT	275.00	11.0000"

### EXTENSIONS:

Code No.	Length		To Fit Heads	
	mm	inch	mm	inch
EGX 0200	63	2.5"	6-10	1/4-3/8"
EGX 0400	76	3.0"	10-12.5	3/8-1/2"
EGX 0500	100	4.0"	12.5-20	1/2-3/4"
EGX 0001	150	6.0"	20-50	3/4-2"
EGX 0004	150	6.0"	50-300	2-12"

## FEATURES

- New ergonomic design with larger, clearer LCD swivel display
- IP67 Electronics
- Simple 2-button operation
- 4 preset memories
- Proximity RS232/USB output with optional built-in Bluetooth Low Energy (BLE)
- Bi-directional communication
- Range 2 - 300mm (0.080" - 12")
- 2 - 6mm 2 point / 6 - 300mm 3 point measurement
- Resolution 0.001 mm (0.00005")
- Tungsten carbide measuring faces on all 3-point heads from 12.5mm
- Blind bore measurement from 2mm - 6mm and above 12.5 mm (0.500")
- Extensions available above 6mm for deep hole measurement
- Setting rings included with individual instruments and sets
- UKAS certificates supplied as standard with all gauges
- Serial number on all digital readouts and measuring heads
- Heads with special anvils available to suit specific customer requirements (e.g., Threads, grooves, 2-point, spherical, splines etc)
- Internal Micrometers manufactured according to DIN 863, part 4
- After Sales Service



### SETS: Supplied with digital pistol grip, heads and rings

Range (mm)	Code No	Range (inch)	Code No
2 - 6mm	SXTH1M-BT	0.080-0.25"	SXTH1i-BT
6 - 10mm	SXTH3M-BT	1/4 - 3/8"	SXTH3i-BT
10-20mm	SXTH4M-BT	3/8 - 3/4"	SXTH4i-BT
20-50mm	SXTH5M-BT	3/4 - 2"	SXTH5i-BT
50-100mm	SXTH6M-BT	2 - 4"	SXTH6i-BT
100-150mm	SXTH7M-BT	4 - 6"	SXTH7i-BT
150-200mm	SXTH8M-BT	6 - 8"	SXTH8i-BT
100-200mm	SXTH9M-BT	4 - 8"	SXTH9i-BT

### LARGE SETS: Supplied with digital pistol grip, heads and rings

Range (mm)	Code No	Range (inch)	Code No
6 - 20 mm	SXTH10M-BT	1/4 - 3/4"	SXTH10i-BT
20 - 100mm	SXTH11M-BT	3/4 - 4"	SXTH11i-BT

# Digital Internal Micrometer



## XTD SERIES

Bowers' XT3 digital internal micrometers offer a new ergonomic design - including a larger and clearer LCD display - along with IP67 electronics protection, proximity output with optional built-in Bluetooth; both allow bi-directional communication giving greater flexibility for data acquisition and storage. The extended mechanical travel of the XT range means that special heads can also be manufactured to accommodate users most awkward measuring problems. Measuring heads for threads, splines, slots, grooves, deep-holes and many more applications are available. The Bowers XT range of internal micrometers can be supplied as individual instruments or in complete sets.

### TECHNICAL SPECIFICATIONS : Individual Instruments supplied with Digital Display Unit, Head and Ring

Code No (mm)	Range (mm)	Code No (inch)	Range (inch)	Accuracy		Depth		Display Unit	Setting Ring	
				(mm)	(inch)	(mm)	(inch)		(mm)	(inch)
XTD1M-BT	2-2.5	XTD1i-BT	0.080-0.100"	0.004	0.00015"	9	0.35"	XTDU2-BT	2.50	0.1000"
XTD2M-BT	2.5-3	XTD2i-BT	0.100-0.120"	0.004	0.00015"	9	0.35"	XTDU2-BT	2.50	0.1000"
XTD3M-BT	3-4	XTD3i-BT	0.120-0.160"	0.004	0.00015"	12	0.47"	XTDU2-BT	4.00	0.1600"
XTD4M-BT	4-5	XTD4i-BT	0.160-0.200"	0.004	0.00015"	18	0.70"	XTDU2-BT	4.00	0.1600"
XTD5M-BT	5-6	XTD5i-BT	0.200-0.250"	0.004	0.00015"	18	0.70"	XTDU2-BT	5.00	0.2000"
XTD6M-BT	6-8	XTD6i-BT	1/4-5/16"	0.004	0.00015"	58	2.28"	XTDU6-BT	8.00	0.3125"
XTD8M-BT	8-10	XTD8i-BT	5/16-3/8"	0.004	0.00015"	58	2.28"	XTDU6-BT	8.00	0.3125"
XTD10M-BT	10-12.5	XTD10i-BT	3/8-1/2"	0.004	0.00015"	58	2.28"	XTDU10-BT	12.50	0.5000"
XTD12M-BT	12.5-16	XTD12i-BT	1/2-5/8"	0.004	0.00015"	62	2.44"	XTDU10-BT	12.50	0.5000"
XTD16M-BT	16-20	XTD16i-BT	5/8-3/4"	0.004	0.00015"	62	2.44"	XTDU10-BT	20.00	0.7500"
XTD20M-BT	20-25	XTD20i-BT	3/4-1"	0.004	0.00015"	66	2.62"	XTDU20-BT	20.00	0.7500"
XTD25M-BT	25-35	XTD25i-BT	1-1 3/8"	0.004	0.00015"	66	2.62"	XTDU20-BT	35.00	1.375"
XTD35M-BT	35-50	XTD35i-BT	1 3/8-2"	0.004	0.00015"	80	3.15"	XTDU20-BT	35.00	1.375"
XTD50M-BT	50-65	XTD50i-BT	2-2 5/8"	0.005	0.00020"	80	3.15"	XTDU50-BT	65.00	2.625"
XTD65M-BT	65-80	XTD65i-BT	2 5/8-3 1/4"	0.005	0.00020"	80	3.15"	XTDU50-BT	65.00	2.625"
XTD80M-BT	80-100	XTD80i-BT	3 1/4-4"	0.005	0.00020"	100	3.94"	XTDU50-BT	80.00	3.2500"
XTD100M-BT	100-125	XTD100i-BT	4-5"	0.006	0.00025"	115	4.53"	XTDU100-BT	125.00	5.0000"
XTD125M-BT	125-150	XTD125i-BT	5-6"	0.006	0.00025"	115	4.53"	XTDU100-BT	125.00	5.0000"
XTD150M-BT	150-175	XTD150i-BT	6-7"	0.007	0.00030"	115	4.53"	XTDU100-BT	175.00	7.0000"
XTD175M-BT	175-200	XTD175i-BT	7-8"	0.007	0.00030"	115	4.53"	XTDU100-BT	175.00	7.0000"
XTD200M-BT	200-225	XTD200i-BT	8-9"	0.008	0.00030"	118	4.65"	XTDU200-BT	225.00	9.0000"
XTD225M-BT	225-250	XTD225i-BT	9-10"	0.008	0.00030"	118	4.65"	XTDU200-BT	225.00	9.0000"
XTD250M-BT	250-275	XTD250i-BT	10-11"	0.009	0.00035"	118	4.65"	XTDU200-BT	275.00	11.0000"
XTD275M-BT	275-300	XTD275i-BT	11-12"	0.009	0.00035"	118	4.65"	XTDU200-BT	275.00	11.0000"

### EXTENSIONS:

Code No.	Length		To Fit Heads	
	mm	inch	mm	inch
EGX 0200	63	2.5"	6-10	1/4-3/8
EGX 0400	76	3.0"	10-12.5	3/8-1/2
EGX 0500	100	4.0"	12.5-20	1/2-3/4
EGX 0001	150	6.0"	20-50	3/4-2
EGX 0004	150	6.0"	50-300	2-12

### FEATURES

- New ergonomic design with larger and clearer LCD display
- IP67 Electronics
- Simple 2-button operation
- 4 preset memories
- Proximity RS232/USB output with optional built-in Bluetooth Low Energy (BLE)
- Bi-directional communication
- Range 2 - 300mm (0.080" - 12")
- 2 - 6mm 2 point / 6 - 300mm 3 point measurement
- Resolution 0.001 mm / 0.00005"
- Tungsten carbide measuring faces on all 3-point heads from 12.5mm
- Blind bore measurement from 2mm - 6mm and above 12.5 mm (0.500")
- Extensions available above 6mm for deep hole measurement
- Ratchet stop to ensure consistent measurement
- Setting rings included with individual instruments and sets
- UKAS certificates supplied as standard with all gauges
- Serial number on all digital readouts and measuring heads
- Heads with special anvils available to suit specific customer requirements (e.g., Threads, grooves, 2-point, spherical, splines etc)
- Internal Micrometers manufactured according to DIN 863, part 4
- After Sales Service



### SETS: Supplied with digital display unit, heads and rings

Range (mm)	Code No	Range (inch)	Code No
2 - 6mm	SXTD1M-BT	0.080-0.25"	SXTD1i-BT
6 - 10mm	SXTD3M-BT	1/4-3/8"	SXTD3i-BT
10-20mm	SXTD4M-BT	3/8-3/4"	SXTD4i-BT
20-50mm	SXTD5M-BT	3/4-2"	SXTD5i-BT
50-100mm	SXTD6M-BT	2-4"	SXTD6i-BT
100-150mm	SXTD7M-BT	4-6"	SXTD7i-BT
150-200mm	SXTD8M-BT	6-8"	SXTD8i-BT
100-200mm	SXTD9M-BT	4-8"	SXTD9i-BT



# Digital Internal Micrometer



## XT500 SERIES



ANVIL SETS 300-400mm



### FEATURES

- Measuring range: 300-500mm
- New constant-force digital readout
- Single 300 mm setting ring covers full range
- Radiussed anvils of tool-steel for optimum centering
- Accuracy: 15  $\mu$ m
- Repeatability: 3  $\mu$ m
- IP67 electronics
- RS232 output
- Resolution 0.01/0.001 mm.
- Metric/inch switchable
- Fast, accurate measurement
- Extensions available for deeper bores
- Certificate of conformity with Internal Micrometer
- Supplied in fitted case
- After Sales Service

**INDIVIDUAL INSTRUMENTS:** Supplied with Digital Display Unit, measuring head with exchangeable anvils and setting ring.

**SETS:** Supplied with Digital Display Unit, measuring head with exchangeable anvils and setting ring.

Code No.	Range (mm)
SXT3000M-BT	300-400
SXT4000M-BT	300-325, 400-500
SXT5000M-BT	300-500

Code No.	Range mm	Accuracy	Depth mm	Setting Ring (mm)
XT5001M-BT	300-325	15 $\mu$ m	120	300
XT5002M-BT	300-325, 325-350			
XT5003M-BT	300-325, 350-375			
XT5004M-BT	300-325, 375-400			
XT5005M-BT	300-325, 400-425			
XT5006M-BT	300-325, 425-450			
XT5007M-BT	300-325, 450-475			
XT5008M-BT	300-325, 475-500			

## XTL SERIES (LEVER TYPE)



**INDIVIDUAL INSTRUMENTS:** Supplied with head & ring

Code No (mm)	Range (mm)	Code No (inch)	Range (inch)	Accuracy		Depth		Lever Holder	Setting Ring	
				(mm)	(inch)	(mm)	(inch)		(mm)	(inch)
XTL6M	6-8	XTL6i	1/4-5/16"	0.004	0.00015"	58	2.28"	XTLG01	8.00	0.312"
XTL8M	8-10	XTL8i	5/16-3/8"	0.004	0.00015"	58	2.28"	XTLG01	8.00	0.312"
XTL10M	10-12.5	XTL10i	3/8-1/2"	0.004	0.00015"	58	2.28"	XTLG02	12.50	0.500"
XTL12M	12.5-16	XTL12i	1/2-5/8"	0.004	0.00015"	62	2.44"	XTLG02	12.50	0.500"
XTL16M	16-20	XTL16i	5/8-3/4"	0.004	0.00015"	62	2.44"	XTLG02	20.00	0.750"
XTL20M	20-25	XTL20i	3/4-1"	0.004	0.00015"	66	2.62"	XTLG03	20.00	0.750"
XTL25M	25-35	XTL25i	1-1 3/8"	0.004	0.00015"	66	2.62"	XTLG03	35.00	1.375"
XTL35M	35-50	XTL35i	1 3/8-2"	0.004	0.00015"	80	3.15"	XTLG03	35.00	1.375"
XTL50M	50-65	XTL50i	2-2 5/8"	0.005	0.00020"	80	3.15"	XTLG03	65.00	2.625"
XTL65M	65-80	XTL65i	2 5/8-3 1/4"	0.005	0.00020"	80	3.15"	XTLG03	65.00	2.625"
XTL80M	80-100	XTL80i	3 1/4-4"	0.005	0.00020"	85	3.35"	XTLG03	80.00	3.250"

### FEATURES

- Measuring range 6-100mm (Diameters above 100 on request)
- Excellent for vertical bore measurement
- Simple 2-button operation
- 2 preset memories
- RS-232 output
- Self-centering heads
- Constant measuring pressure
- Fast, accurate measurement
- Resolution 0.001mm (0.00005")
- Tungsten carbide measuring faces on all 3-point heads from 12.5mm
- Blind bore measurement above 12.5mm (0.500")
- Extensions available for deep hole measurement
- Setting rings included with individual instruments and sets
- Serial number on all gauges and measuring heads
- Heads with special anvils available to suit specific customer requirements (e.g. Threads, grooves, 2-point, spherical, splines etc)
- Internal Micrometers manufactured according to DIN 863, part 4
- After Sales Service

**SETS:** Supplied with heads & rings.

Code No (mm)	Range (mm)	Code No (Inch)	Range (inch)
SXTL3M	6-10mm	SXTL3i	1/4-3/8"
SXTL4M	10-20mm	SXTL4i	3/8-3/4"
SXTL5M	20-50mm	SXTL5i	3/4-2"
SXTL6M	50-100mm	SXTL6i	2-4"



# Microgauge Internal Micrometer



## 2-POINT BORE GAUGE

The new Micro Gauge 2-point bore gauging system has been designed specifically for the measurement of small bores between 1.0-10.0mm. Featuring a completely new digital readout and extremely compact overall dimensions, the Micro Gauge is truly a pocket-sized instrument. Digital readout and measuring head together are about the same size and format as a ballpoint pen which represents a big advantage for those needing to measure small precision parts and who need to have their gauge with them all the time. The clear LCD display is easily set using only two buttons and results are shown with switchable 0.01/0.001/0.0005mm resolution. Data transfer is via Proximity-RS232 or Proximity-USB output. The measuring heads are equipped with spherical hard-chromed contact points and are set in appropriate setting rings. Like all Bowers bore gauging products the MicroGauge system is available as individual instruments or as full sets.

### TECHNICAL SPECIFICATION: Individual measuring set includes measuring head, cone, readout and setting ring

Measuring Head Code	Range (mm)	Range (Inch)	Min/Max Measuring Depth (mm)	Digital Readout	Cone	Setting Ring Code	Setting Ring (mm)
MGS11	0.95-1.15	0.037-0.045"	0.6 / 11	MGU1	MGC1	MGR100	1.00
MGS12	1.07-1.25	0.042-0.049"	0.6 / 11	MGU1	MGC1	MGR110	1.10
MGS13	1.17-1.35	0.046-0.053"	0.6 / 11	MGU1	MGC1	MGR120	1.20
MGS14	1.27-1.45	0.050-0.057"	0.6 / 11	MGU1	MGC1	MGR130	1.30
MGS15	1.37-1.55	0.054-0.061"	0.6 / 11	MGU1	MGC1	MGR140	1.40
MGS16	1.50-1.90	0.059-0.075"	0.9 / 17	MGU2	MGC2	MGR175	1.75
MGS17	1.80-2.20	0.071-0.087"	0.9 / 17	MGU2	MGC2	MGR200	2.00
MGS18	2.05-2.45	0.081-0.096"	0.9 / 17	MGU2	MGC2	MGR225	2.25
MGS19	2.25-2.75	0.089-0.108"	1.2 / 22	MGU2	MGC3	MGR250	2.50
MGS20	2.50-3.00	0.098-0.118"	1.2 / 22	MGU2	MGC3	MGR275	2.75
MGS21	2.75-3.25	0.108-0.128"	1.2 / 22	MGU2	MGC3	MGR300	3.00
MGS22	3.00-3.50	0.118-0.138"	1.2 / 22	MGU2	MGC3	MGR325	3.25
MGS23	3.25-3.75	0.128-0.148"	1.2 / 22	MGU2	MGC3	MGR350	3.50
MGS24	3.50-4.00	0.138-0.157"	1.2 / 22	MGU2	MGC3	MGR375	3.75
MGS25	3.75-4.25	0.148-0.167"	1.2 / 22	MGU2	MGC3	MGR400	4.00
MGS26	3.65-4.35	0.144-0.171"	2.0 / 40	MGU2	MGC4	MGR400	4.00
MGS27	4.15-4.85	0.163-0.191"	2.0 / 40	MGU2	MGC4	MGR450	4.50
MGS28	4.65-5.35	0.183-0.211"	2.0 / 40	MGU2	MGC4	MGR500	5.00
MGS29	5.15-5.85	0.203-0.230"	2.0 / 40	MGU2	MGC4	MGR550	5.50
MGS30	5.65-6.35	0.222-0.250"	2.0 / 40	MGU2	MGC4	MGR600	6.00
MGS31	6.15-6.85	0.242-0.270"	2.0 / 40	MGU2	MGC4	MGR650	6.50
MGS32	6.65-7.35	0.262-0.290"	2.0 / 40	MGU2	MGC4	MGR700	7.00
MGS33	7.15-7.85	0.281-0.309"	2.0 / 40	MGU2	MGC4	MGR750	7.50
MGS34	7.65-8.35	0.301-0.329"	2.0 / 40	MGU2	MGC4	MGR800	8.00
MGS35	8.15-8.85	0.321-0.349"	2.0 / 50	MGU2	MGC4	MGR850	8.50
MGS36	8.65-9.35	0.340-0.368"	2.0 / 50	MGU2	MGC4	MGR900	9.00
MGS37	9.15-9.85	0.360-0.388"	2.0 / 50	MGU2	MGC4	MGR950	9.50
MGS38	9.65-10.35	0.380-0.408"	2.0 / 50	MGU2	MGC4	MGR1000	10.00

### SETS: Including digital readout, measuring heads, cone, depth stops and setting rings.

Code No.	Range (mm)
SMG001M	0.95-1.55
SMG002M	1.50-2.45
SMG003M	2.25-4.25
SMG004M	3.65-6.35
SMG005M	6.15-10.35

### LARGE SETS: including digital readout, measuring heads, cone, depth stops and setting rings.

Code No.	Range (mm)
SMG010M	0.95-2.45
SMG011M	1.50-4.25
SMG012M	2.25-6.35

## FEATURES

- System range: 1-10 mm
- New slim-line digital display
- Switchable resolution 0.01 / 0.001 / 0.0005 mm
- Simple 2-button operation
- Clear LCD display
- Data output: RS232 / USB proximity sensor
- Linearity: -Diameter 1.0-1.5 max 2% of measuring travel, min 0.001 mm  
-Diameter 1.5-10 max 1% of measuring travel, min 0.001 mm
- Repeatability : 0.001 mm
- Hard-chromed ball-contacts
- Depth-stops available
- Stand available as an option
- After sales service





# Special Internal Micrometer

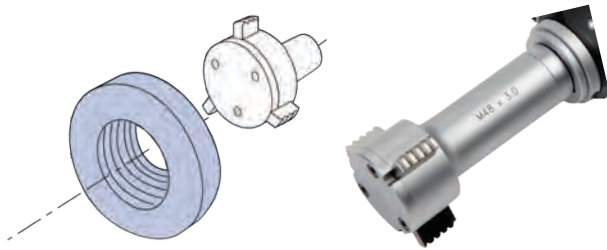


## SPECIAL APPLICATIONS

Although Bowers produce the most comprehensive series of internal measuring equipment available, not all applications can be covered by the standard instrument range. In line with the customer care ethos, Bowers have earned a reputation for manufacturing special heads for measuring non-standard applications. The following information illustrates some of the many difficult measuring problems easily solved by these special heads.

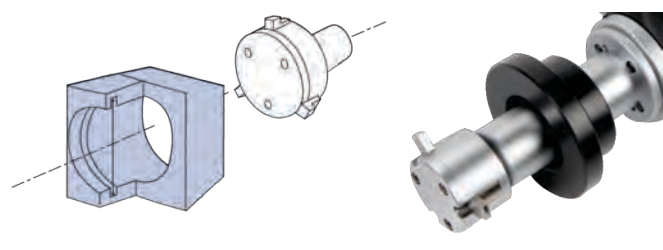
### Screw Threads

To measure effective diameter of internal threads. Also available for pitch diameter measurement and major diameter measurement.



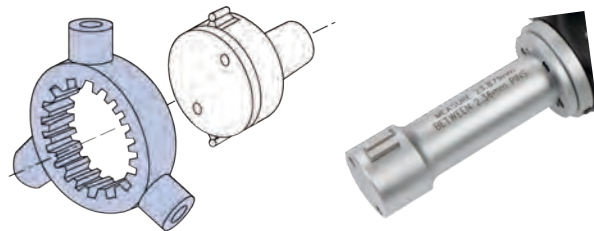
### Grooves

To measure diameter of internal grooves i.e. Oil Seal, 'O' Ring, Ball Race, Annular, Special form grooves.



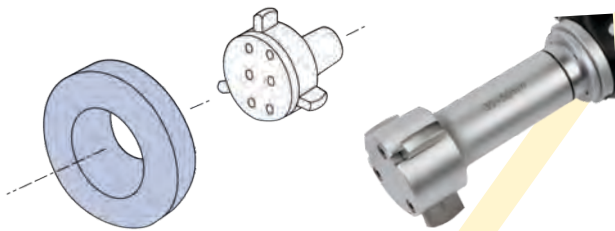
### Internal Splines

To measure between pin or between ball diameter of internal splines. 2 and 3 point heads available. Also available for minor and major diameter measurement. Anvils manufactured from tool steel.



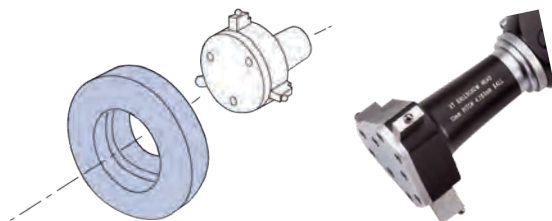
### Spherical Radius

To measure spherical bores. Gives good repeatability even when out of line with bore Centre. 2 and 3 point heads available. Preferred in case of deep hole measurement also.



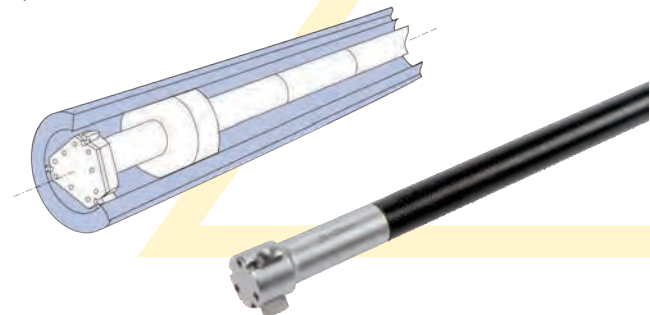
### Ball Screw Threads

To measure diameters of ball screw threads using ball anvils.



### Deep Hole

To measure bores up to 2 meters deep with standard extensions. Pneumatic system available from 50mm diameter for depths of up to 15 meters.



### Products on demand:

Special heads for taper bores, bores with irregular spacing, Gun barrel heads, Automotive Hose heads, Slot width heads.



**CONTACT TYPE PLUG GAUGES**



# Contact Type Plug Gauges



## CONTACT TYPE PLUG (CTP)



WITH A DIAL GAUGE



WITH AN ELECTRONIC PROBE

## FEATURES

- The CTP gauges are manufactured to a high precision from tool steel
- As standard, all CTPs are Titanium coated (surface hardness 2200 HV)
- Repeatability on a standard 2 point CTP,  $\leq IT 8$  is better than 0.001 mm
- All CTPs are supplied as standard with carbide measuring contacts
- In special case, we can deliver measuring contacts in Titanium Nitride coated or Diamond
- The practical design of the accessories make them universal for both CTPs and chamfer gauges
- For automatic measurement, we can deliver special accessories: centering holders, stands, fixtures, etc. are available



# Contact Type Plug Gauge



## MEASURING HEADS

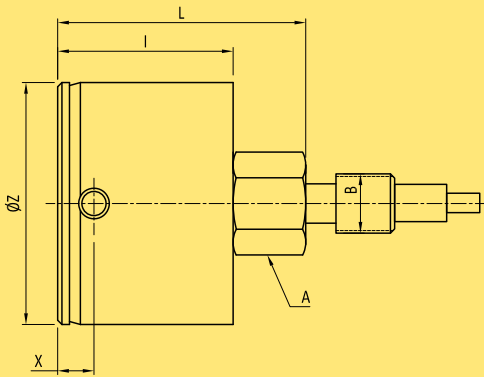
	<p>Standard 2 - point -</p>	<p>NO</p>
<p>From: <math>\varnothing 6 - \varnothing 280\text{mm}</math></p>		
	<p>True 3 - point -</p>	<p>3P</p>
<p>From: <math>\varnothing 15 - \varnothing 100\text{mm}</math></p>		
	<p>Blind - bore -</p>	<p>SL</p>
<p>From: <math>\varnothing 10 - \varnothing 100\text{mm}</math></p>		
	<p>Parallel - CTP</p>	<p>PA</p>
<p>From: <math>\varnothing 8 - \varnothing 100\text{mm}</math></p>		
	<p>Undercut/Bearing race CTP</p>	<p>EM</p>
<p>From: <math>\varnothing 15\text{mm}</math></p>		
	<p>Multi Bore CTP</p>	<p>ME</p>
<p>Supplied against quotation</p>		
	<p>External - diameter - CTP</p>	<p>AM</p>
<p>Supplied against quotation</p>		
	<p>Chamfer - gauge - CTP</p>	<p>FM</p>
<p>From: <math>\varnothing 1\text{mm}</math>, in <math>90^\circ</math> and <math>60^\circ</math></p>		
	<p>Taper - CTP</p>	<p>KE</p>
<p>For inquiries and orders we need the following dimensions: Diam. D1/D2/L1 and the angle.</p>		

# Contact Type Plug Gauge



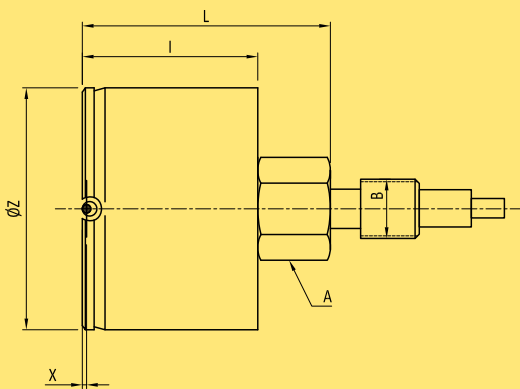
## DATA SHEET

### THROUGH BORE MEASURING PLUGS



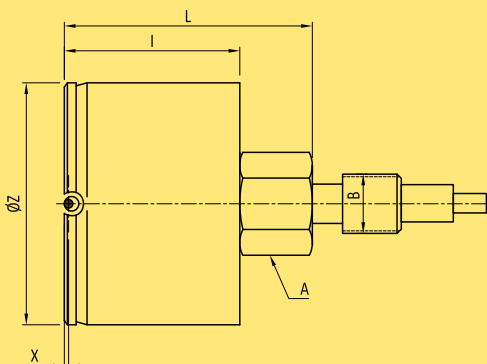
$\phi Z$	MEASURING RANGE	X	I	L	A	B
$\phi 6-\phi 20$	0.150 mm	5	27	35.5	SW7	M6x0.75
$\phi 15-\phi 40$	0.200 mm	6	29	41	SW13	M10x1
$\phi 40-\phi 50$	0.200 mm	6	29	41	SW17	M10x1
$\phi 50-\phi 100$	0.250 mm	7.5	33.5	42.5	SW22	M10x1
$\phi 100-\phi 280$	0.250 mm	10	36	45	SW22	M10x1

### BLIND BORE MEASURING PLUGS



$\phi Z$	MEASURING RANGE	X	I	L	A	B
$\phi 6-\phi 20$	0.150 mm	1.6	23.5	32	SW7	M6x0.75
$\phi > \phi 15$	0.200 mm	2.5	25.5	37.5	SW13	M10x1

### SUPER BLIND BORE MEASURING PLUGS



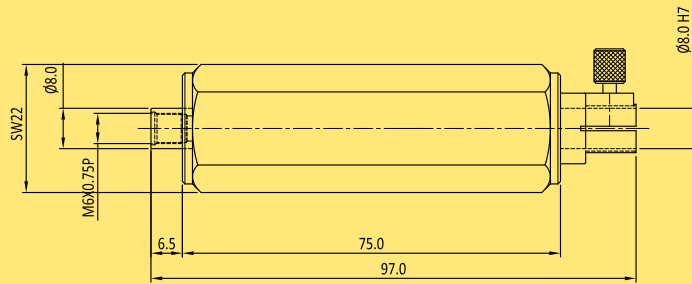
$\phi Z$	MEASURING RANGE	X	I	L	A	B
$\phi 10-\phi 20$	0.150 mm	0.6	23.5	32	SW7	M6x0.75
$\phi 15-\phi 40$	0.200 mm	1.2	25.5	37.5	SW13	M10x1
$\phi 40-\phi 50$	0.200 mm	1.2	25.5	37.5	SW17	M10x1
$\phi 50-\phi 100$	0.250 mm	1.2	33.5	42.5	SW22	M10x1
$\phi > \phi 100$	0.250 mm	SUPPLIED AGAINST QUOTATION				

# Contact Type Plug Gauge

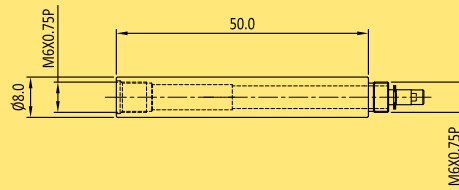


## HOLDERS

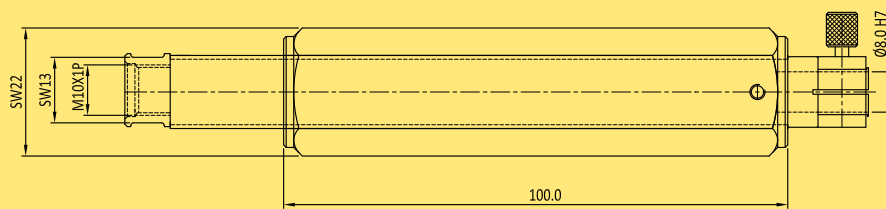
### STANDARD HOLDER 6-20



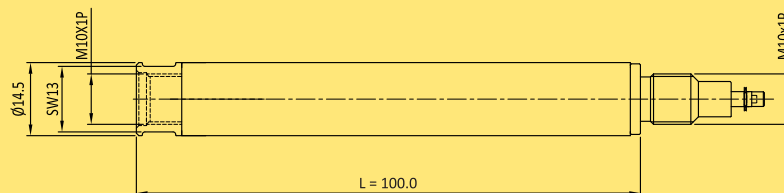
### EXTENSION 8-20 MM



### STANDARD HOLDER 20-280 MM



### EXTENSION 8-20 MM



L	These special extensions available on request
50	
65	
80	
125	
150	
250	





**HEIGHT GAUGES**

# Digital Height Gauge

**RANGE: 0-300mm, 0-600mm, 0-1000mm**



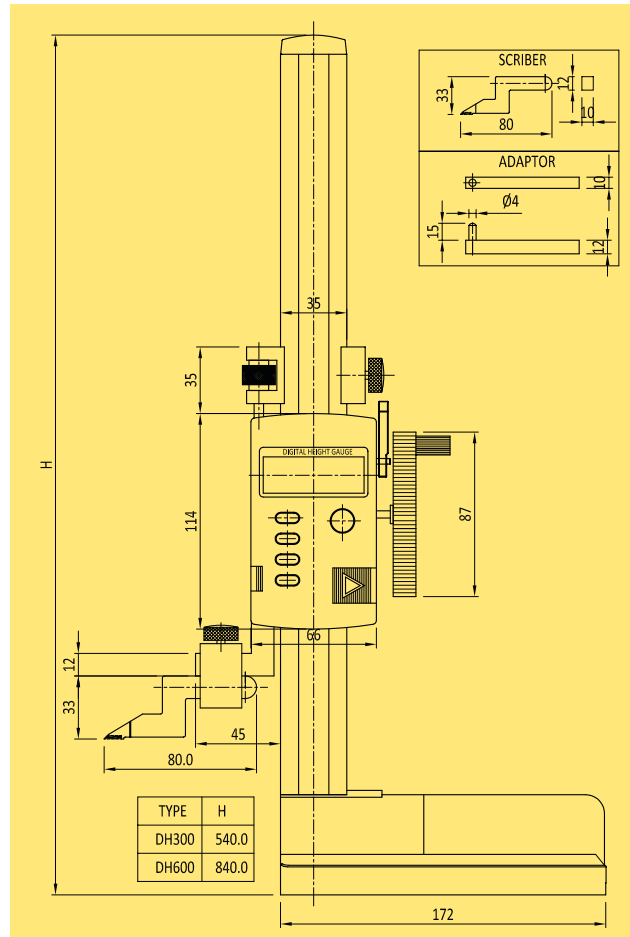
DH1000

DH600

DH300



Standard accessories 1. Scriber 2. Scriber holder  
3. Height gauge adaptor 4. Dial gauge holder  
5. Universal clamp assembly  
supplied with each height gauges.



Type	Range	Reading
DH300	0-300 mm / 0-12 inch	0.01 mm / 0.0005 inch
DH600	0-600 mm / 0-24 inch	0.01 mm / 0.0005 inch
DH1000	0-1000mm / 0-40 inch	0.01mm / 0.0005 inch

## FEATURES

- Robustly constructed, stainless steel column with clearly marked scale graduation
- A clear multifunction digital LCD display runs smoothly on an analogue vertical scale
- Fine adjustment with lock provided for ease of setting
- For easy and precise maneuverability, the base has a specially designed thumb grip
- Fitted with metal rack for better life
- Carbide tipped scriber helps fine scribing on work pieces
- Inch/mm conversion of measurement value at any position on the scale
- User defined preset value can be entered at any position on the scale
- Zero can be set at any point on the scale; suitable for Relative and Absolute measurement
- Display Hold and Tolerance limit setting
- Power ON/OFF. Powered by easily replaceable silver oxide battery (Type SR44, 1.55V)
- Operating environment:-  
Temperature 5 to 45 °C, Humidity  $\leq$  80% RH
- Each gauge carries a calibration certificate giving actual values
- Measurement and transfer of heights, scribing and marking of work pieces and other measurements like run out, center distance etc. by using a lever type dial indicator
- Accuracy :  
0-50mm 0.02mm,      50-200mm 0.03mm,  
200-400mm 0.04mm,    400-600mm 0.05mm,  
600-800mm 0.06mm,    800-1000mm 0.07mm

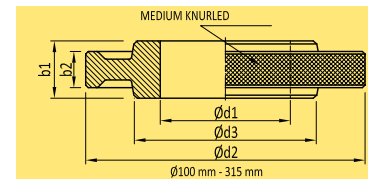
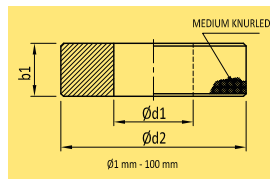


# PLAIN GAUGES & MASTERS



# Master Setting Ring

**RANGE: 1.5 - 315 mm**



Nominal Diameter Range (mm)	Size Tolerance (mm)	Roundness & Parallelism
1-3	±0.0015	0.0003
3-6	±0.002	0.0004
6-10	±0.002	0.0004
10-18	±0.0025	0.0005
18-30	±0.003	0.0006
30-50	±0.0035	0.0007
50-80	±0.004	0.0008
80-120	±0.005	0.001
120-180	±0.006	0.0012
180-250	±0.007	0.0014
250-315	±0.008	0.0016

$\phi d1$		$\phi d2$	$b1$
ABOVE	UPTO & INC.		
1.5	2.5	22	4
2.5	5.0	22	5
5.0	10.0	32	8
10.0	15.0	38	10
15.0	20.0	45	12
20.0	25.0	53	14
25.0	32.0	63	16
32.0	40.0	71	18
40.0	50.0	85	20
50.0	60.0	100	20
60.0	70.0	112	24
70.0	80.0	125	24
80.0	90.0	140	24
90.0	100.0	160	24

$\phi d1$		$\phi d2$	$\phi d3$	THICKNESS	
ABOVE	UPTO & INC.			$b1$	$b2$
100.0	110.0	170	132	28	14
110.0	120.0	180	140	28	16
120.0	130.0	190	150	28	16
130.0	140.0	200	160	28	18
140.0	150.0	212	170	28	18
150.0	160.0	224	180	28	20
160.0	170.0	236	190	32	20
170.0	180.0	250	200	32	20
180.0	190.0	265	212	32	22
190.0	200.0	280	224	32	22
200.0	212.0	300	236	32	22
212.0	224.0	315	250	32	25
224.0	236.0	335	265	36	25
236.0	250.0	355	280	36	28
250.0	265.0	375	300	36	28
265.0	280.0	400	315	36	28
280.0	300.0	425	335	36	32
300.0	315.0	450	355	36	32

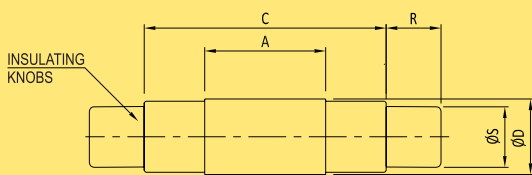
## FEATURES

- Used for setting of measuring instruments like horizontal comparators, length measuring machines for ID checking, dial bore gauges etc.
- Made from oil hardening non shrinking gauge steel, hardened and tempered to 60-62 HRC
- Sub-zero treated at -80 °C for long term dimensional stability
- Actual dimensions duly etched
- Calibrated at 20 °C under Standards room condition against national/international traceable standards
- Certificate of calibration is provided along with each master traceable to national/international standards, certificate under NABL (as per ISO 17025) as per request
- Manufactured as per DIN2250-1: 2008 Type C
- Master Setting Rings also supplied in standard set consisting of sizes:
  - Set 1: Ø4.0, Ø5.0, Ø6.0 & Ø8.0 mm
  - Set 2: Ø10.0, Ø12.0, Ø16.0, Ø20.0 & Ø25.0 mm
- Set also supplied as per customer's requirement
- MSR above Ø 315mm up to 365mm on request.

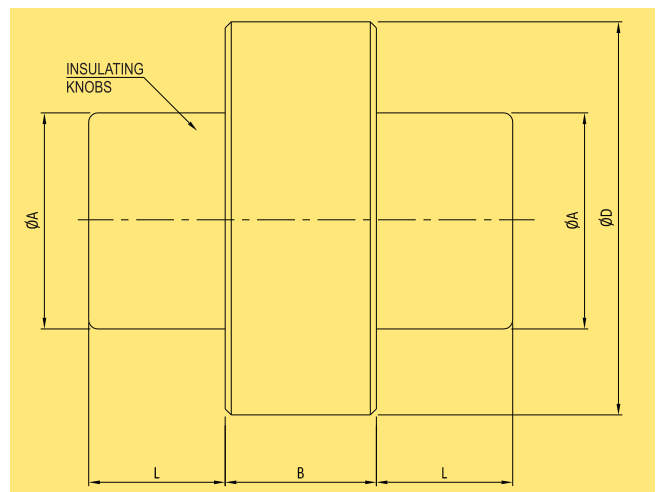
# Master Setting Disc



**RANGE: 3 - 200 mm**

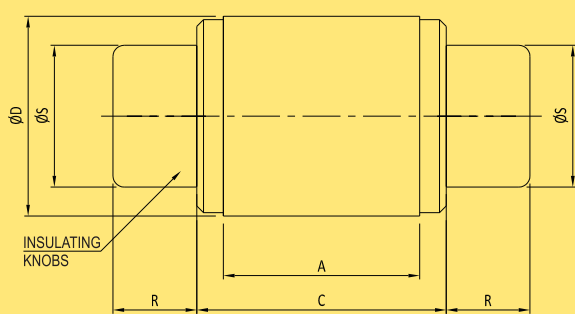


ØD		A	C	R	ØS
ABOVE	UPTO & INCLUDING				
3.0	3.81	9.52	17.46	11.1	2.4
3.81	5.84	11.11	19.05	11.1	3.2
5.84	9.27	12.7	20.64	11.1	5.6



ØD		B	ØA	L
ABOVE	UPTO & INCLUDING			
38.35	51.05	22.2	31.8	15.8
51.05	63.75	22.2	31.8	15.8
63.75	76.45	25.4	38.1	39.8
76.45	89.15	25.4	38.1	39.8
89.15	101.85	25.4	38.1	39.8
101.85	114.55	25.4	38.1	39.8
114.55	127.25	25.4	38.1	39.8
127.25	139.95	25.4	38.1	39.8
139.95	152.65	25.4	38.1	39.8
152.65	165.35	25.4	38.1	39.8
165.35	178.05	25.4	38.1	39.8
178.05	190.75	25.4	38.1	39.8
190.75	200.00	25.4	38.1	39.8

Above 200 mm upto 300 mm on request



ØD		A	C	R	ØS
ABOVE	UPTO & INCLUDING				
9.27	12.95	14.29	22.22	12.7	8.7
12.95	20.96	15.88	23.81	12.7	12.7
20.96	28.83	17.46	25.4	15.9	19
28.83	38.35	20.64	28.58	15.9	25.4

Nominal Diameter Range (mm)	Size Tolerance (mm)	Roundness & Parallelism
3-20.96	±0.0008	0.0005
20.96-38.35	±0.0011	0.0007
38.35-63.75	±0.0015	0.0010
63.75-114.55	±0.0019	0.0012
114.55-165.35	±0.0024	0.0016
165.35-200	±0.0030	0.0020

## FEATURES

- Used for setting of measuring instruments like horizontal comparators, length measuring machines for OD checking.
- Made from oil hardened non shrinking gauge steel, hardened and tempered to 60-62 HRC
- Sub-zero treated at -80 °C for long term dimensional stability
- Actual dimensions duly etched
- Calibrated at 20 °C under standards room conditions against national/international traceable standards
- Certificate of calibration is provided along with each master traceable to national/international standards
- Certificate under NABL (as per ISO 17025) as per request
- Manufactured as per ASME B47.1 (blank design) & ASME B89.1.5 (for form tolerance class X , size tolerance class Y & surface finish class XXX)



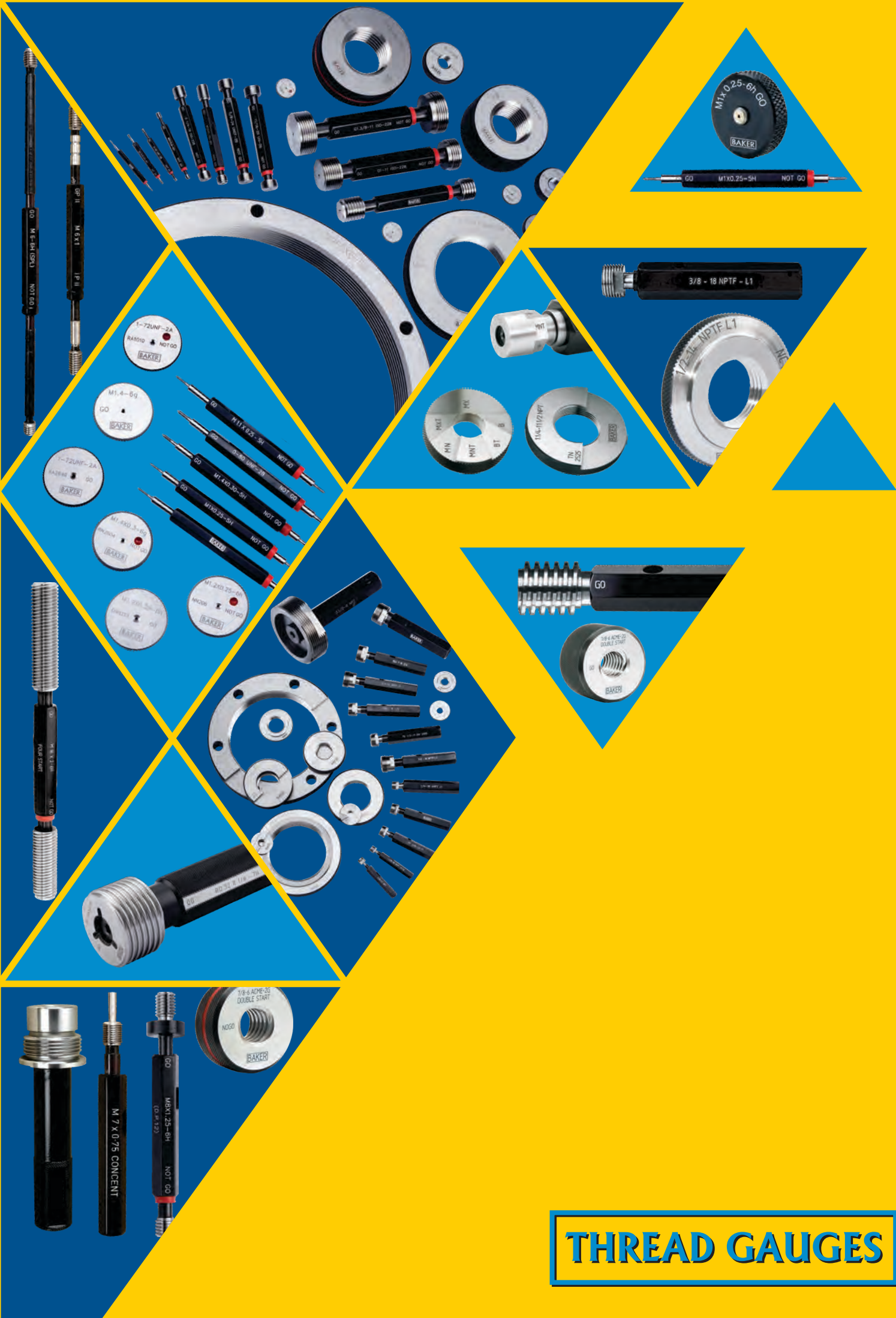
# Plain Plug Gauges

**RANGE: 3 - 40 mm**



## FEATURES

- Range:  $\varnothing$  3mm to  $\varnothing$ 40 mm with tolerance class H7.
- Other size and tolerance classes on request.
- Made as per DIN 2245/DIN 7164/DIN 1938.
- Made from oil hardening non shrinking gauge steel, hardened, tempered, subzero treated, ground and lapped.
- Calibration certificate is provided along with each gauge traceable to National/International standards. Certificate under NABL (as per ISO 17025) on request.
- Plug gauge set consisting of size  $\varnothing$ 3,  $\varnothing$ 4,  $\varnothing$ 5,  $\varnothing$ 6,  $\varnothing$ 8,  $\varnothing$ 10 and  $\varnothing$ 12 of tolerance class H7 can be supplied. Other sets on request.

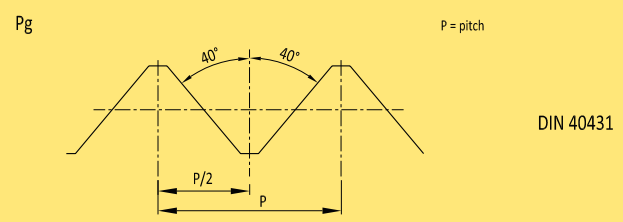
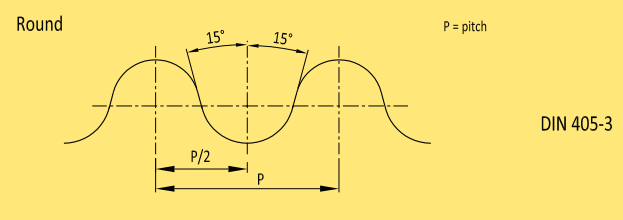
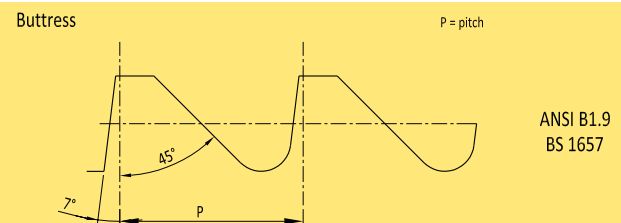
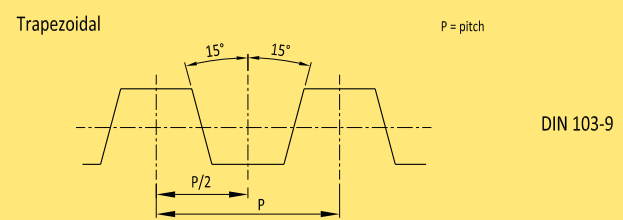
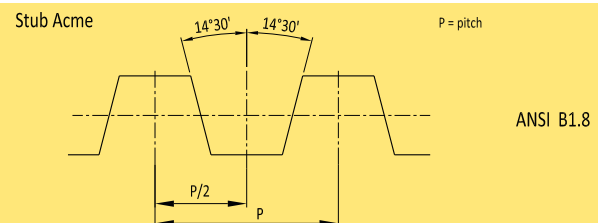
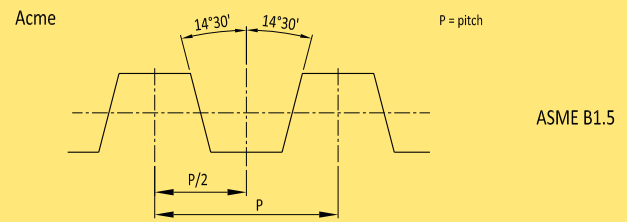
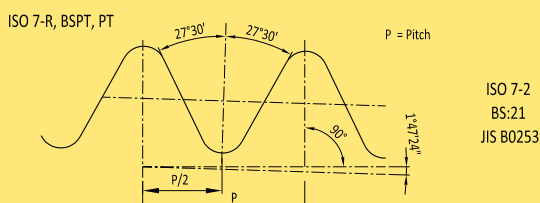
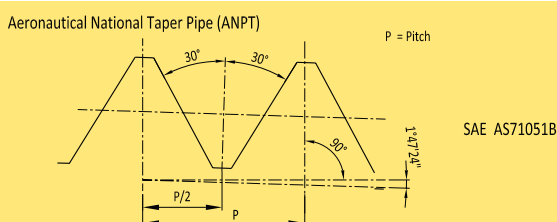
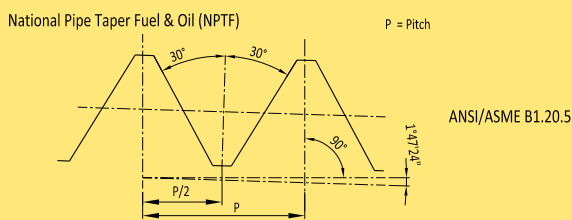
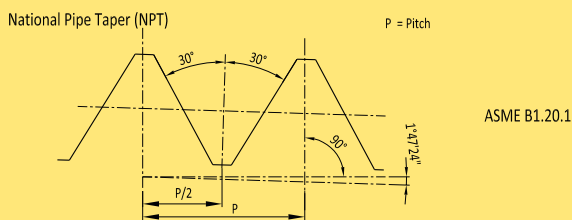
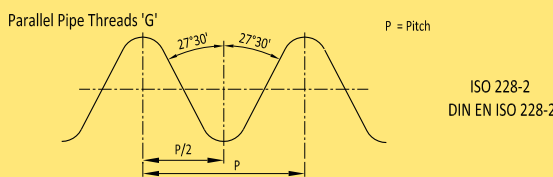
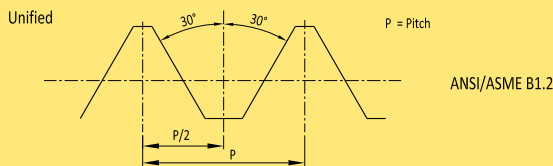
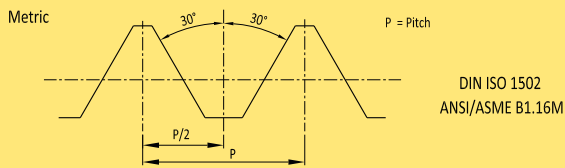


# THREAD GAUGES



# Thread Gauge profiles

We manufacture the following types of threads:



Please provide the following information to enable us to send a quote

- Type of gauge (Thread plug or Thread ring)
- Thread series (i.e. Metric, Unified, etc.) or thread angle
- Diameter & pitch/TPI of the thread
- Direction of thread (Right hand or Left hand) (Assumed Right hand if not specified)
- Tolerance class
- Lead or number of starts (Assumed single start if not specified)

**Note**

- PF, STI (Wire threads), NPSM, NPSC, NPTR, NPSH, NPSL, NPSF, NPSI, NGT, MJ, UNJF, UNJC, DIN 2999, DIN 158 are some of the other types of threads which we also manufacture.

# Thread Gauge

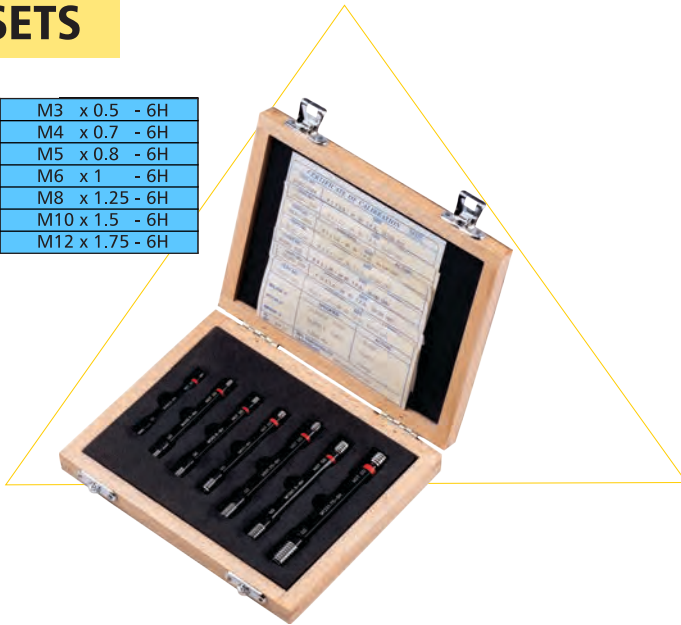


## RANGE

Thread Plugs	0.8 mm to 450 mm
Thread Rings	1 mm to 450 mm
Taper Thread Plugs	1/16 inch to 16 inch (Taper 1:16)
Taper Thread Rings	1/16 inch to 16 inch (Taper 1:16)

## SETS

M3 x 0.5 - 6H
M4 x 0.7 - 6H
M5 x 0.8 - 6H
M6 x 1 - 6H
M8 x 1.25 - 6H
M10 x 1.5 - 6H
M12 x 1.75 - 6H



Set of Double ended Metric Thread Plug gauges in an attractive box

M3 x 0.5 - 6g
M4 x 0.7 - 6g
M5 x 0.8 - 6g
M6 x 1 - 6g
M8 x 1.25 - 6g
M10 x 1.5 - 6g
M12 x 1.75 - 6g



Set of Metric Go Thread Ring Gauges in an attractive box

## MINIATURE

Nominal diameter	Pitch	Tolerance class	
		Thread plug	Thread ring
<b>METRIC</b>			
M1	0.25 mm	5H	6h
M1.1		5H	6h
M1.2		5H	6h
M1.4		5H	6h
<b>UNIFIED</b>			
1.00 UNM	0.25 mm	-	-
1.20 UNM		-	-
No.0 (0.060")UNF	80 TPI	2B	2A

Note: Below 1 mm on request



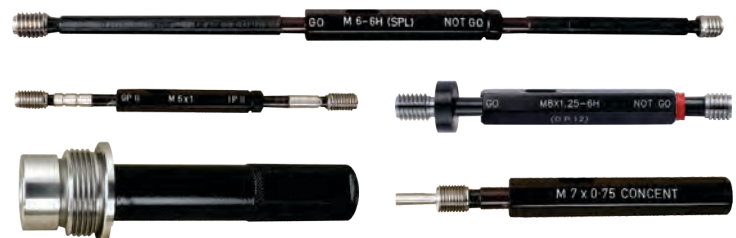
## MULTI START



## HOLE LOCATION



## CUSTOMIZED GAUGES AS PER REQUIREMENTS



### Note

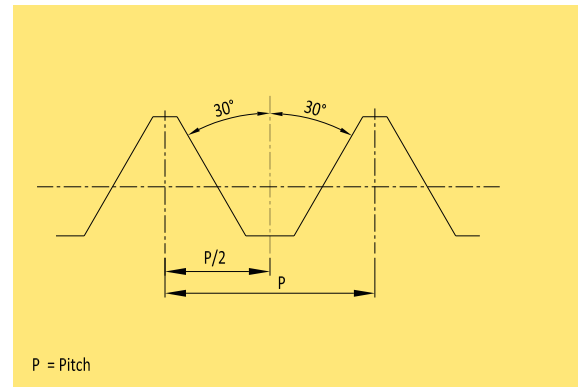
- Odd pitch and diameter combination, extra fine pitch gauges also manufactured.

# Thread Gauge

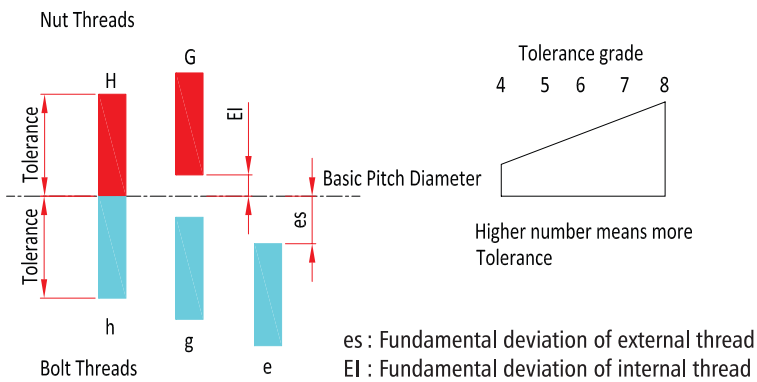
## METRIC



Thread gauge dimensions are as per DIN ISO 1502



## TOLERANCE DIAGRAM INTERNAL & EXTERNAL THREADS



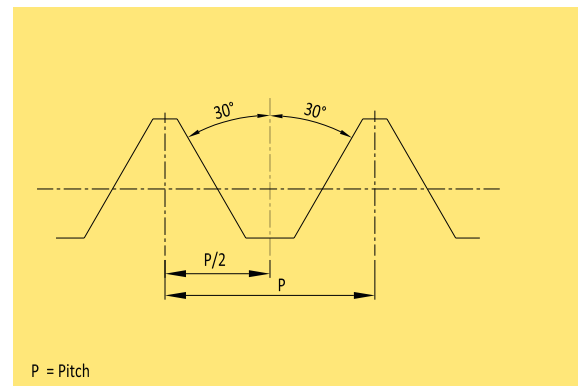
## Acceptance criteria for components:

The GO gauge when screwed by hand without using excessive force, should enter and pass the whole length of the workpiece thread. The NOT GO gauge when screwed by hand without using excessive force, should not enter the component by more than two turns of the thread from both ends.

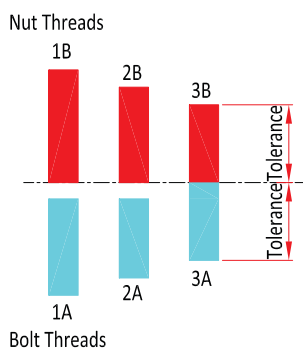
## UNIFIED



Thread gauge dimensions are as per ANSI/ASME B1.2



## TOLERANCE DIAGRAM INTERNAL & EXTERNAL THREADS



## Acceptance criteria for components:

The GO gauge when screwed by hand without using excessive force, should enter and pass the whole length of the workpiece thread. The NOT GO gauge when screwed by hand without being forced, should not enter the component by more than three complete turns.

# Thread Gauge

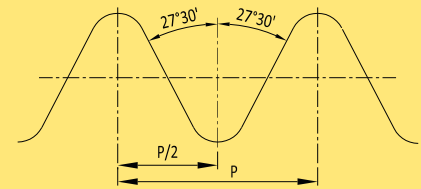


## 'G' PIPE



These are pipe threads where pressure-tight joints are not made on threads. Gauge dimensions are as per ISO 228-2.

	Tolerance class
Thread Ring gauge	'A' & 'B'
Thread Plug gauge	-

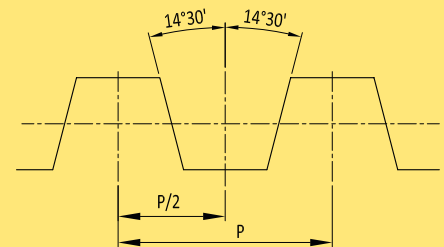


P = Pitch

### Acceptance criteria for components:

The GO gauge when screwed by hand without using excessive force, should enter and pass the whole length of the workpiece thread. The NOT GO gauge when screwed by hand without using excessive force, should not enter the component by more than two turns of the thread from both ends.

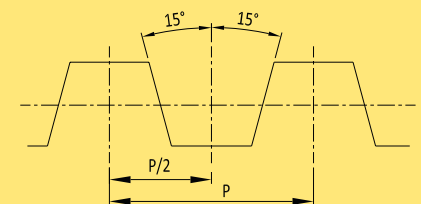
## ACME & STUB ACME



P = Pitch

- Gauge dimensions for Acme threads are as per ASME B1.5 and Stub Acme as per ANSI B1.8
- Most commonly used class is 2G. If less backlash is desired in acme threads, 3G & 4G class are used
- The height of Acme threads is  $0.5p$ , whereas the height of Stub Acme threads is  $0.3p$

## TRAPEZOIDAL



P = Pitch

- Gauge dimensions are as per DIN 103-9
- Recommended Tolerance classes are 7H/7e for medium tolerance quality and 8H/8c for coarse tolerance quality.



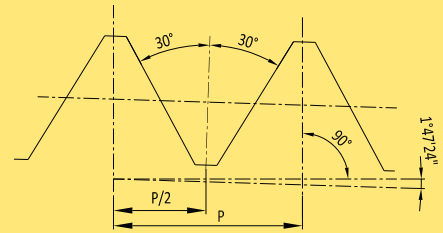
# Thread Gauge



## NPT



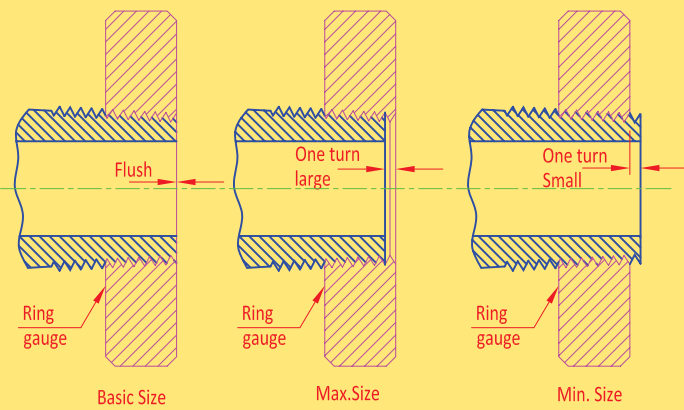
Gauge dimensions are as per ASME B1.20.1.  
Gauges are supplied as Basic Step & Min/Max Step.



P = Pitch

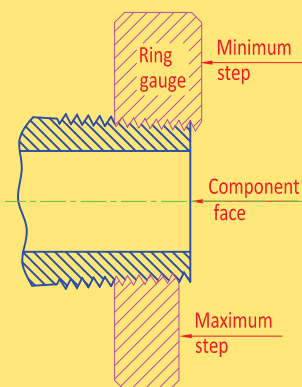
### GAUGING EXTERNAL TAPER THREADS

With Basic Step Taper Threads Ring Gauge



The Basic Step gauge when screwed onto the threads of the component by hand, should be flush with the end of the component face within 1 turn, as shown above

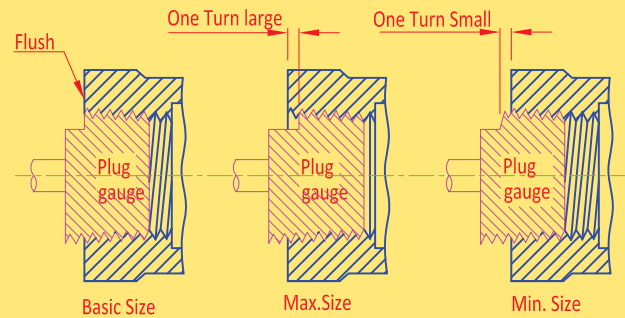
With Min / Max Step Taper Threads Ring Gauge



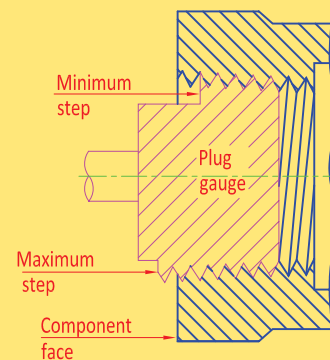
When using a Min/Max Step type gauge, the end of the component face should be flush between the Minimum and Maximum steps.

### GAUGING INTERNAL TAPER THREADS

With Basic Step Taper Threads Plug Gauge



With Min / Max Step Taper Threads Plug Gauge



# Thread Gauge



## NPTF, ANPT



L1 Ring



L2 Ring



6 Step Crest Check Ring



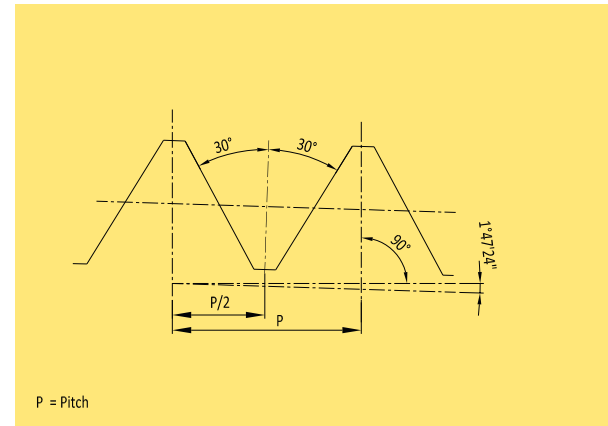
L1 Plug



L3 Plug



6 Step Crest Check Plug



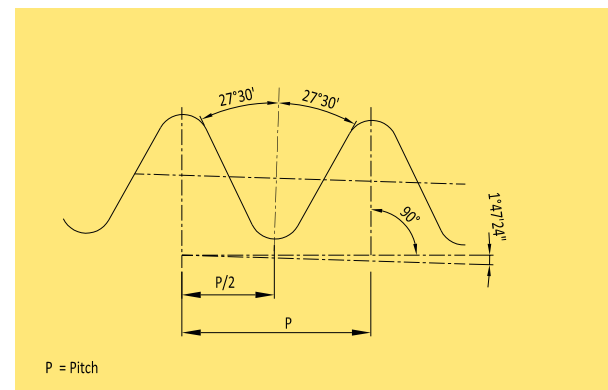
P = Pitch

NPTF threads are also known as Dryseal threads as they do not require a sealant to form a leak-proof joint.

Type	Standard	Plug gauges	Ring gauges
NPTF	ANSI/ASME B 1.20.5	Thread plug gauges L1 & L3 (Basic Step or Min/Max Step)	Thread ring gauges L1 & L2 (Basic Step or Min/Max Step)
ANPT	SAE AS71051B	6 Step Crest Check Plug	6 Step Crest Check Ring

- NPTF & ANPT threads require additional gauging as the truncation of these threads should be maintained within specified limits.
- L1 & L3 plug gauges and L1 & L2 Ring gauges are used in combination to verify the size and taper of the component threads along the thread length.
- 6 Step Crest check plug and ring gauges are used to verify the crest diameter and truncation of the component threads along the thread length.

## TAPER PIPE THREADS ISO 7-R, BSPT, PT



P = Pitch

- These are taper pipe threads where pressure tight joints are made on threads. The thread angle is  $55^\circ$
- Gauges are manufactured as per ISO 7-2, EN 10226, BS 21, JIS B0253

# Thread Gauge

## ADJUSTABLE THREAD RING GAUGES AND SET PLUGS



Adjustable Thread Ring Gauge



Set Plug

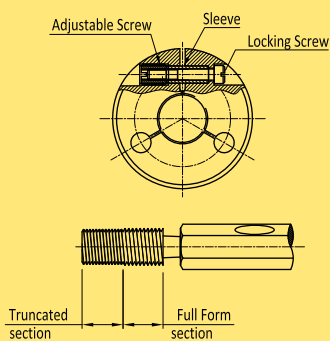


Adjustable Thread Ring Gauge



Set Plug

### CONSTRUCTION



#### Note

- These gauges are ring shaped, but they have a split and an adjusting and locking screw facility to finely adjust their correct gauging size. For setting these gauges, "Setting plugs" are needed.
- Truncated thread set plugs have threads with both truncated and full form threads for both the Go and the Not Go member.
- The truncated section controls the pitch diameter.
- Use thread setting plug to adjust & set adjustable thread ring gauges.
- A thread ring gauge should be set on the full form portion of the set plug (back portion). The ring is then turned onto the truncated portion and should have the same drag and fit as when turned through the full form.
- The setting of Adjustable Ring using a set plug involves high skill which is done by Adjusting screw followed by locking screw.
- It is strongly recommended that once the thread ring gauge has passed all the above processes, the locking screw and adjustment screw holes are sealed with sealing wax to prevent any tampering.

	From	Up to & including
Metric	M3	M28
Inches	0-80	1

## TUNGSTEN CARBIDE THREAD GAUGES

### FEATURES

- Tungsten carbide only for frequently used go-side gauges. NOT GO side in the conventional OHNS Steel material.
- Gauge life 5 to 10 times more than that for similar gauges made from steel.
- Life will vary greatly depending upon the work piece material.



Size	Pitch	ISO (Class)
M1.6	0.35	6H
M2	0.4	6H
M2.5	0.45	6H
M3	0.5	6H
M4	0.7	6H
M5	0.8	6H
M6	1.0	6H
M8	1.25	6H
M8	1.0	6H
M10	1.5	6H
M10	1.25	6H
M10	1.0	6H
M12	1.75	6H
M12	1.5	6H
M12	1.25	6H

# API (Oil) Thread Gauge



**BAKER**  
KURODA

## API

**BAKER** has collaborated with KURODA PRECISION INDUSTRIES, a leading Japanese thread gauge manufacturer, to distribute their high quality API thread gauges in India. KURODA has been granted the right of use of API Official Monogram for the following API Thread Gauges since 1957; Specification 5B under the License no. 5B-0015, Specification 7-2 under the License no. 7-2-0187.



### **Kuroda Precision Industries: A Brief introduction**

Kuroda was founded in 1925 as one of the first dedicated gauge manufacturers in Japan. Since then, they have developed various products based on precision measuring and processing technology. While working to preserve traditional skills, techniques and reputation for best quality, they also employ latest technologies through active R&D. Kuroda's mission continues to be that of support to the customers through their high precision measuring and processing technology based on the philosophy of P&P (Precision and Productivity) and the spirit of C&C (Challenge and Create).

## FEATURES

- Light construction
- Longer operating life
- Manufacturing to the highest Japanese quality standards
- Best Raw materials from Japan used
- Easy to use: The handle is standard-equipped on all products
- Upon request, a Hook Ring can be mounted on larger diameter ring gauges for better work ability

### **When ordering, please provide information on:**

- Type of gauge
- Size of gauge
- Reference master or working gauges
- Plug or ring or both
- Right hand or left hand, in case of API Spec. 7-2 thread gauges
- Inspection results to be stated in inches or mm



# API (Oil) Thread Gauge



## API SPEC. 5B (Casing & Tubing)

### LP

Line Pipe Thread Gauges  
Thread angle 60°

Size	T.P.I.	Taper
1/8	27	1 : 16
1/4	18	1 : 16
3/8	18	1 : 16
1/2	14	1 : 16
3/4	14	1 : 16
1	11 1/2	1 : 16
1 1/4	11 1/2	1 : 16
1 1/2	11 1/2	1 : 16
2	11 1/2	1 : 16
2 1/2	8	1 : 16
3	8	1 : 16
3 1/2	8	1 : 16
4	8	1 : 16
5	8	1 : 16
6	8	1 : 16
8	8	1 : 16
10	8	1 : 16
12	8	1 : 16
14D	8	1 : 16
16D	8	1 : 16
18D	8	1 : 16
20D	8	1 : 16

### CSG

Casing Round Thread Gauges  
Thread angle 60°

Size	T.P.I.	Taper
4 1/2	*8	1 : 16
5	*8	1 : 16
5 1/2	*8	1 : 16
6	*8	1 : 16
7	*8	1 : 16
7 1/2	*8	1 : 16
8 1/2	*8	1 : 16
9 1/2	*8	1 : 16
10 3/4	8	1 : 16
11 3/4	8	1 : 16
13 3/8	8	1 : 16
16	8	1 : 16
18 3/8	8	1 : 16
20	*8	1 : 16

Note : \*Short and long

### BUTTRESS CSG

Buttress Casing Thread Gauges  
Thread angle : 3° x 10°

Size	T.P.I.	Taper
4 1/2	5	1 : 16
5	5	1 : 16
5 1/2	5	1 : 16
6 3/8	5	1 : 16
7	5	1 : 16
7 5/8	5	1 : 16
8 3/8	5	1 : 16
9 5/8	5	1 : 16
10 3/4	5	1 : 16
11 3/4	5	1 : 16
13 3/8	5	1 : 16
16	5	1 : 12
18 3/8	5	1 : 12
20	5	1 : 12

### TBG

Non-Upset Tubing Thread Gauges  
Thread angle 60°

Size	T.P.I.	Taper
1.050	10	1 : 16
1.315	10	1 : 16
1.660	10	1 : 16
1.900	10	1 : 16
2 3/8	10	1 : 16
2 7/8	10	1 : 16
3 1/2	10	1 : 16
4	8	1 : 16
4 1/2	8	1 : 16

### UP TBG

External-Upset Tubing Thread Gauges  
Thread angle 60°

Size	T.P.I.	Taper
1.050	10	1 : 16
1.315	10	1 : 16
1.660	10	1 : 16
1.900	10	1 : 16
2 3/8	8	1 : 16
2 7/8	8	1 : 16
3 1/2	8	1 : 16
4	8	1 : 16
4 1/2	8	1 : 16

### Ex. Li. Casing

Extreme-Line Casing Thread & Seal Gauges  
Thread angle : 6° x 6°

Size	T.P.I.	Taper
5	6	1 : 8
5 1/2	6	1 : 8
6 3/8	6	1 : 8
7	6	1 : 8
7 5/8	6	1 : 8
8 3/8	5	1 : 9.6
9 5/8	5	1 : 9.6
10 3/4	5	1 : 9.6

Note : Taper of seal = 1 : 6

## API SPEC. 7-2 (Rotary Shouldered Connections)

### NC

Number Style  
Thread angle 60°

Size	T.P.I.	Taper
NC 23	4	1 : 6
NC 26	4	1 : 6
NC 31	4	1 : 6
NC 35	4	1 : 6
NC 38	4	1 : 6
NC 40	4	1 : 6
NC 44	4	1 : 6
NC 46	4	1 : 6
NC 50	4	1 : 6
NC 56	4	1 : 4
NC 61	4	1 : 4
NC 70	4	1 : 4
NC 77	4	1 : 4

### REG

Regular Style (Right or left hand)  
Thread angle 60°

Size	T.P.I.	Taper
1	6	1 : 8
1 1/2	6	1 : 8
2 3/8	5	1 : 4
2 7/8	5	1 : 4
3 1/2	5	1 : 4
4 1/2	5	1 : 4
5 1/2	4	1 : 4
6 3/8	4	1 : 6
7 5/8	4	1 : 4
8 3/8	4	1 : 4

### FH

Full-hole Style  
Thread angle 60°

Size	T.P.I.	Taper
3 1/2	5	1 : 4
4	4	1 : 6
4 1/2	5	1 : 4
5 1/2	4	1 : 6
6 3/8	4	1 : 6

### IF

Internal-flush Style  
Thread angle 60°

Size	T.P.I.	Taper
2 3/8	4	1 : 6
2 7/8	4	1 : 6
3 1/2	4	1 : 6
4	4	1 : 6
4 1/2	4	1 : 6
5 1/2	4	1 : 6



**SPLINE GAUGES & MASTER GEARS**

# Spline Gauges & Master Gears



## SPLINE PLUG, SPLINE RING



Baker has collaborated with Spline Gauges of England to bring spline plugs and rings to the Indian market.

Spline Gauges is the world's leading manufacturer of spline gauges and master gears. Its customers include leading global companies and their suppliers in the automotive, defense and aerospace industries, their OEMs and the precision engineering companies which support them.

Go and No Go spline rings, plugs and master gears are their speciality.

Together, we also offer:

- Taper master plugs, straight/helical
- Gear Artifacts
- Spline plug and ring, straight/helical
- Helical and spur master gears
- Spline indicator ring and plug gauges

Specifications	Spline Plug Gauges	Spline Ring Gauges
<b>Standards:</b>	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)	
<b>Range:</b>		
Min. diameter	3mm	3mm
Max. diameter	500mm	350mm
Max. number of teeth	500	500
Min. pitch	0.1 module	0.1 module
Max. pitch	25.4 module	25.4 module
Max. tooth length	300mm	150mm

## FEATURES

- Vast unmatched experience backed by around 500 standards from across the world, ensures the gauges are designed to the correct standards and manufactured to the correct tolerances
- Gauges are evaluated on a Gear Analyzer, which gives inspection charts detailing the errors
- Profile errors and tooth alignment are maintained within the allowable tolerance, resulting in the accumulative gauge variation being well within the allowable percentage variation of component tolerance, which can be matched by very few gauge manufacturers
- Low accumulative gauge variation results in gauge longevity, more tolerance for manufacturing, very low probability of component rework/rejection, leading to lower gauging cost/component, thus paying back the seemingly higher initial price
- Gauges are certified by UKAS accredited laboratory
- Equipped with latest CNC machines
- Small rings are wire-cut for better quality and stability

## MASTER GEARS-SPUR AND HELICAL



RANGE 6-300mm

Specifications	Master Gears
<b>Standards:</b>	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)
<b>Range:</b>	
Min. diameter	6mm
Max. diameter	300mm
Max. number of teeth	550
Min. pitch	0.1 module
Max. pitch	25.4 module
Max. tooth length	150mm
<b>Typical Tolerances:</b>	
Total Profile	0.003mm
Adjacent Pitch Error	0.0025mm
Total Pitch Error	0.009mm
Total Tooth Alignment Error	0.0025mm
Radial Runout	0.005mm

# Spline Gauges & Master Gears

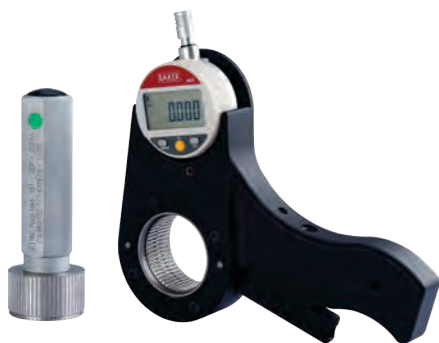


## VARIABLE SPLINE INDICATOR PLUG GAUGE WITH SETTING MASTER RING



Specifications	Variable Spline Indicator Plug Gauge
<b>Standards:</b>	ISO (International), DIN (Germany), ANSI/AGMA (American), JIS (Japanese)
<b>Range:</b>	
Min. diameter	3mm
Max. diameter	350mm
Max. number of teeth	500
Min. pitch	0.1 module
Max. pitch	25.4 module
Max. tooth length	150mm
<b>Typical Tolerances:</b>	
Profile	0.005mm
Total Spacing	0.005mm
Runout	0.005mm
Tooth Alignment	0.0025mm
Space Width	0.005mm

## VARIABLE SPLINE INDICATOR RING GAUGE WITH SETTING MASTER PLUG



Variable spline indicator ring gauges are ideally suited to measuring component effective tooth thickness. Spline indicators can also be supplied with two opposite sectors of teeth to measure actual tooth thickness.

Specifications	Variable Spline Indicator Ring Gauge
<b>Standards:</b>	ISO (International), DIN (Germany), ANSI/AGMA (American), JIS (Japanese)
<b>Range:</b>	
Min. diameter	3mm
Max. diameter	350mm
Max. number of teeth	500
Min. pitch	0.1 module
Max. pitch	25.4 module
Max. tooth length	150mm
<b>Typical Tolerances:</b>	
Profile	0.005mm
Total Spacing	0.005mm
Runout	0.005mm
Tooth Alignment	0.0025mm
Space Width	0.005mm

## SPLINED LOCK UP CONCENTRICITY RING GAUGE



### Specifications

Range available:  
 Min. diameter : 10mm  
 Max. diameter : 300mm  
 Max. tooth length of component : 300mm

### Concentricity Tolerance:

Between outside diameter and spline pitch circle diameter : 0.005mm

### Notes:

To use this gauge, the component under testing is mounted on centers while the concentricity ring is clamped onto it. The outside diameter of the ring is concentric to the pitch circle diameter. This means that, with the aid of a runout checking device—for example, dial indicators or transducers—the component's datum faces or diameters can be inspected.

## GO SPLINE RING GAUGE AND TAPER MASTER PLUG



Taper tooth master plugs with fit and wear lines beautifully exemplify Spline Gauges' exacting specialty engineering. These are used to monitor the wear of ring gauges during component manufacture. The ring gauge is ground to fit the master plug for original and replacement ring gauges.

Specifications	Taper Master Plug
<b>Standards:</b>	ISO (International), DIN (Germany), ANSI/AGMA (American), JIS (Japanese)
<b>Range:</b>	
Min. diameter	3mm
Max. diameter	350mm
Max. number of teeth	500
Min. pitch	0.1 module
Max. pitch	25.4 module
Max. tooth length	150mm
<b>Typical Tolerances:</b>	
Profile	0.005mm
Total Spacing	0.005mm
Runout	0.005mm
Tooth Alignment	0.0025mm
Space Width	0.005mm







# AIR & AIR-ELECTRONIC GAUGES



# Air Gauges

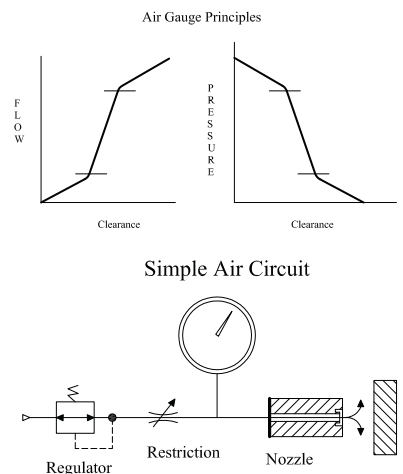
Air Gauging is a non-contact means of precise comparative measurement which offers users the advantages of improved workflow, increased productivity and decreased downtime.

## WHY AIR GAUGING?

- Air Gauging is the best proven method of gauging a bore of good surface finish with very high accuracy. The only system that gives 0.001mm accuracy and reliability in the harsh shop floor environment
- It is non-contact i.e the gauging element is a column of air – hence minimum wear
- It is a clearance type of gauging – large clearance between the body and the part. Ideal for rapid checking
- One of the main advantages is its ease of use. Even unskilled operators can use this method of gauging
- Non-contact characteristic makes it possible to check highly finished and soft surfaces
- Has self cleaning effect on the part
- Dimensional relationships such as taper, squareness, straightness , CD, match gauging –that cannot be checked by fixed limit gauging and costly by other means , are easily measured with air gauging
- Very high magnifications can be achieved
- To achieve reproducibility

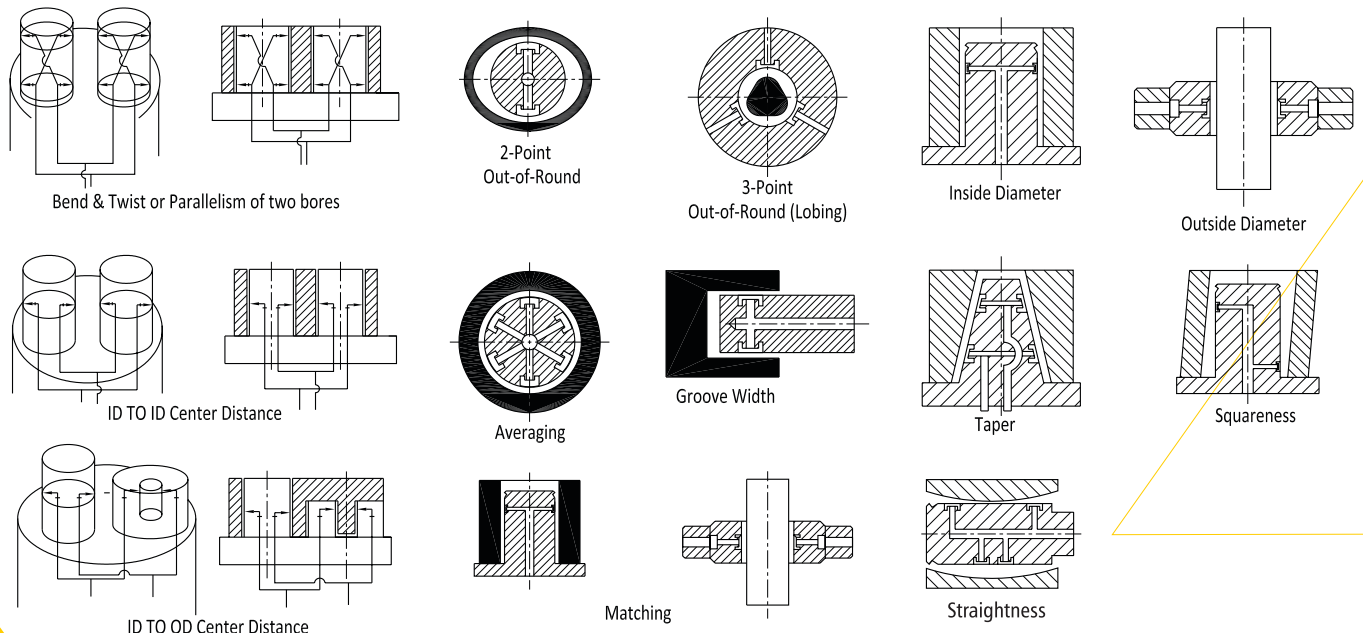
## WORKING PRINCIPLE

- Air gauging relies on the laws of physics which state that flow and pressure are proportionate to clearance and are inversely proportional to each other
- The regulated air flows through the restriction-needle valve, orifice and then through the nozzle
- When the nozzle is open to the atmosphere, there is maximum flow through it and there is a minimum of pressure called 'back-pressure' between the restriction and the nozzle
- As an obstruction is brought increasingly close to the front of the nozzle, air flow from the nozzle diminishes and back-pressure builds
- When the nozzle is completely obstructed, air flow is zero, and back-pressure reaches the pressure of the regulated air supply. In this example, air flow moved from maximum to minimum, while back-pressure moved in opposite direction i.e. minimum to maximum.
- These values each can be plotted against the nozzle's clearance from obstruction. Except for the extremes of both back-pressure and flow, the curves are straight-line, representing the linear proportions which establishes the basis of all air gauging
- Thus measured decreases in flow provide an accurate co-relation of the distance of the nozzles in the air gauge tool to the obstruction (surface of the work piece being measured). Similarly, increase in back-pressure indicates less distance between the tooling nozzle and workpiece



## AIR GAUGING APPLICATIONS

Following applications are possible with air gauges



# Air Gauge Unit



## UNIVERSAL



UNIVERSAL GAUGE

## FEATURES

- Every gauge carries a calibration certificate giving actual values
- Accommodates all jet diameters of Air Plug Gauges, Air Ring Gauges & Air Calipers
- Facilitates quick & easy setting through Mag & Zero knobs
- Supplied with a fixed adaptor which fits all types of connectors
- Foldable feet for better Readability
- High pressure system: high speed of response and self cleaning of gauging area ensures accurate reading of size, taper and ovality at a time
- Non-contact Gauging: long life due to minimal frictional wear
- Two Setting Masters: ensures correct magnification of reading at all times
- System pressure check gauge: provides a constant check on the system pressure i.e. 3 bars (45 psi) regulated by a high precision regulator built into the unit
- Minimum line pressure required 4.5 bars (67 psi)
- Air consumption 46 LPM

Reading	Range	Graduation
0.0005 mm	± 0.020 mm	20-0-20
0.001 mm	± 0.040 mm	40-0-40
0.00005"	± 0.002"	2-0-2
0.002 mm	± 0.080 mm	80-0-80

## MODULE - 3



MODULE-3

## FEATURES

- Accommodates 1.6mm jet diameters of Air Plug Gauges, Air Ring Gauges & Air Calipers.
- Works on differential principle.
- Suitable to High Clearance applications.
- Inclined and bigger dial face for better readability.
- System pressure check gauge: provides a constant check on the system pressure i.e. 3-4 bars (45-60 psi) regulated by a high precision regulator built into the unit.
- Minimum line pressure required 5-6 bars (75-90 psi).
- Air consumption 25 LPM.

Reading	Range	Graduation
0.0005 mm	± 0.020 mm	20-0-20
0.001 mm	± 0.040 mm	40-0-40



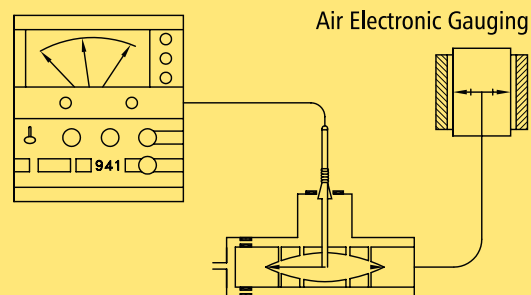
## AIR ELECTRONIC CONVERTER MODULE (AECM)



AECM

### FEATURES

- Combined advantages of non-contact air sensing and high precision electronics
- RS232 data output available for further processing like machine control through relay output or for SPC
- Can be supplied with analogue, column or digital readout units
- For diameter 6 mm and above AECM1 is to be used
- For diameter below 6 mm AECM2 is to be used



## MICROPROCESSOR BASED DIGITAL GAUGE



AEP 1

AEP 2

### FEATURES

- Seven segment, 6 character, 3 colour LED display, 1/2 inch tall
- Air-Electronic input from BAKER Air Plug and Ring Gauges (APG & ARG)
- Display resolution: 1 $\mu$ m, 0.1 $\mu$ m, 0.1 thou. inch, 0.01 thou inch
- Measurement display in Absolute or Comparative form
- Auto calibration with two setting masters
- Keyboard entered Upper & Lower tolerance limits (UTL & LTL), applicable to the values displayed
- Static or dynamic (max, min, average & TIR) measurements
- Non-volatile storage of all menu entered values
- Available in 1 / 2 / 3 or 4 independent channels
- Combined advantages of non-contact air sensing and high precision electronics
- RS232 data output available for further processing like machine control through relay output or for SPC
- Accuracy 0.001 mm.



## MICROPROCESSOR BASED COLUMN GAUGE



2045NAEP



2045NAEP 2/3/4



2045NAEPD

**2045NAEP** :- Single channel Air-Electronic column gauge using Piezo transducer

**2045NAEP4** :- Auto sensing, four channel Air-Electronic column gauge using Piezo transducers.

Scale	Reading	Measuring Range
+/- 0.03 mm	0.0001/ 0.001 mm	+/- 0.030 mm
+/- 0.1 mm	0.001 mm	+/- 0.040 mm

**2045NAEPD** :- Two input Air-Electronic column gauge using

Differential Piezo transducer

Scale	Reading	Measuring Range
+/- 0.03 mm	0.0001/ 0.001 mm	+/- 0.030 mm
+/- 0.1 mm	0.001 mm	+/- 0.040 mm

### FEATURES

- Air-electronic units are a combination of two highly reliable systems to give combined advantages of non-contact, self-cleaning, and high precision electronics.
- Accommodates all BAKER jet diameters of Air Plug Gauges, Air Ring Gauges & Calipers.
- Improved linearity.
- Piezo transducer; non-moving parts, long life.
- Fast response.
- Easy to calibrate.
- Simplified menu
- Slim design makes it convenient for multigauging, as they can be banked within a small space.
- Supplied with quick connecting adaptors to suit all BAKER Air Plug Gauges, Air Ring Gauges & Calipers.
- With Calibration certificate.

### FEATURES

- Air-electronic units are a combination of two highly reliable systems to give combined advantages of non-contact, self-cleaning, and high precision electronics.
- Accommodates BAKER jet diameter 2.07mm of Air Plug Gauges, Air Ring Gauges & Air Calipers. Jet diameter 1.50mm available on request.
- Improved linearity.
- Piezo transducer; non-moving parts, long life.
- Fast response.
- Easy to calibrate.
- Simplified menu
- Slim design makes it convenient for multigauging, as they can be banked within a small space.
- Supplied with quick connecting adaptors to suit all BAKER Air Plug Gauges, Air Ring Gauges & Calipers.
- With Calibration certificate.
- This BAKER unit works on a differential principle.

# Air Plug Gauge

**RANGE: 1.5 - 250 mm**



## FEATURES

- Quick and easy checking of bore
- Standard 2 jets for checking size, taper, ovality
- 3 jets at 120 degree for average size & tri-lobed effect (for diameter 6 mm & above)
- With extensions to check deeper bores
- Can be supplied to check through or blind bores
- Can be supplied with multiple jets
- Hard chrome plated for extended life
- Can be supplied with carbide sleeve on request
- For specific depth or land width checking, adjustable depth collars can be provided

## SPECIAL APPLICATIONS



### BRACKET MOUNTED AIR PLUG

- Air plugs can be bracket mounted for independent and easy checking of small components



### RIGHT ANGLE ATTACHMENT

- Right angle attachment can be provided for checking of bores in restricted areas



### EXTENSIONS

- Extensions in lengths of 25 mm/50 mm/100 mm/200 mm can be provided for deeper bores as required



### AIR PLUG WITH CARBIDE SLEEVE

- Air plug with carbide sleeve for better life



### MULTILEVEL AIR PLUG GAUGE

- Air plugs can be made with jets at multi-level to check the component at different level to check taper



### AIR PLUG WITH DEPTH COLLAR

- Air plugs can be provided with depth collar for measurement of diameter at a fixed distance from face



### BENCH MOUNTED AIR PLUG GAUGE

- Air plugs can be bench mounted for easy checking of components



### FLAT AIR PLUG GAUGE

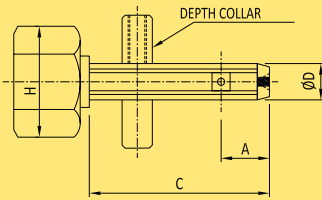
- Special flat air plug can be used for checking groove width i.e. the grooves of piston

# Air Plug Gauge



## DATA SHEET

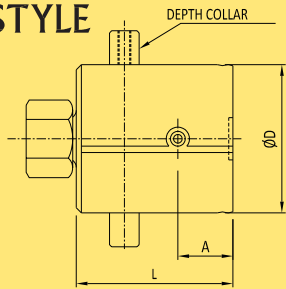
### 'S' STYLE



ø D mm	A		C		F**	G*	H	MIN RANGE	MAX RANGE
	THROUGH	BLIND	THROUGH	BLIND					
1.5-3.0 #	4.00	-	16.0	-	2.50	-	7.0	±0.005	±0.015
3.0-4.0	6.50	3.0	24.0	20.5	2.50	4.0	18.5		
4.0-6.0	9.00	3.0	31.0	25.0	2.50	4.0	18.5		

- Ø 1.5 to 3 mm air plugs are not supplied with extensions and are supplied in hand held design only with PVC tubing
- For deeper holes, use extensions which increase by 25 & 50 mm (above Ø 3 mm only)
- Ø 1.5 to 6 mm air plug gauges are supplied on MOD-2A and ClearLine ±0.025 mm unit
- # not supplied in blind bore design

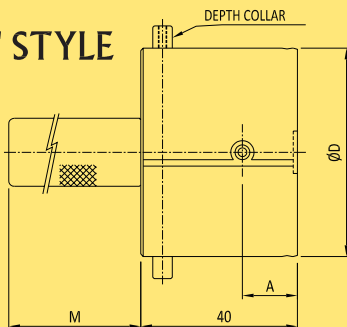
### 'M' STYLE



ø D mm	A		L	F** MOD1A/CL	G* MOD1A/CL	MIN RANGE	MAX RANGE
	THROUGH	BLIND					
6.0-13.0	13.0	4.0	38	4.5/3.5	6.5/6.0	±0.005	±0.030
13.0-20.0	15.0	4.5	40				
20.0-35.0							
35.0-60.0							

- For deeper holes, use extensions which increase by 50, 100, 200 and 300 mm
- Quick entry pilot is provided for air plug gauges above 13 as a standard (others on request)
- As a special case, air plug gauges can be supplied on MOD 2A unit up to Ø 50 mm only to suit super blind or for less land. Maximum range for this will be ±0.020 mm only (others on request)

### 'L' STYLE



ø D mm	A		F** MOD1A/CL	G* MOD1A/CL	M	MIN RANGE	MAX RANGE
	THROUGH	BLIND					
60.0-100.0	15.0	4.5	4.5/3.5	6.5/6.0	100.00	±0.005	±0.030
100.0-150.0#					150.00	±0.010	
150.0-200.0#					200.00	±0.015	

- Supplied hand held as standard for PFL MOD-1A only
- For deeper holes, extended "M" can be provided
- # not supplied for use on ±0.025 mm ClearLine unit and MOD-2A
- Above 200 mm and up to 250 mm on request

### General notes

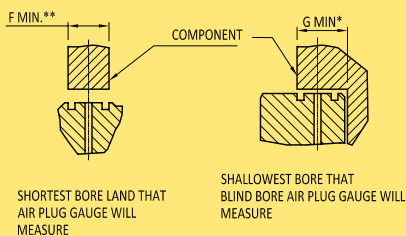
- Air plug gauge for 0.0005 mm least count are given up to Ø 50 mm only
- Each air plug gauge requires two setting rings to set the air plug on the read out unit. The difference between the high and low setting rings supplied covers the component tolerance or the maximum range mentioned in the above table whichever is lower
- Depth collar is supplied against order for positioning air plug gauge jets to fixed depth
- The minimum bore land "F" and "G" mentioned, is excluding chamfer distance and fillet radius
- For special blind bore air plugs (super blind - G less than mentioned in the above chart) or any other special requirement (3 jet or 5 jet design to check lobing), please send the component drawing and ask for a quote

### Abbreviations

- MOD 1A = PFL Air Gauge Unit Module 1A
- MOD 2A = PFL Air Gauge Unit Module 2A
- CL = ClearLine air gauge unit

### Important rule in air gauging

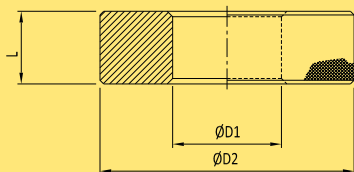
Lesser the clearance, higher the accuracy and vice versa



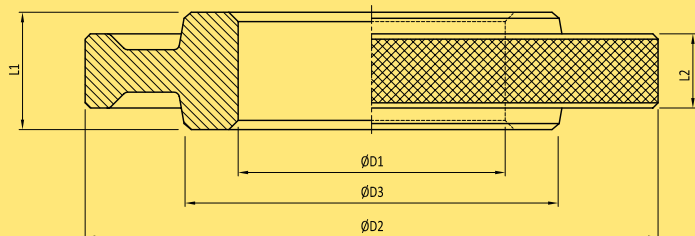


# Setting Rings for Air Plug Gauge

**RANGE: 1.5-315 mm**



DIA. 1.5 mm - 100 mm



DIA. 100 mm - 315 mm

$\varnothing D1$ ABOVE	UPTO & INC.	$\varnothing D2$	L
1.5	2.5	22	6
2.5	5.0	22	10
5.0	10.0	32	12
10.0	15.0	38	14
15.0	20.0	45	16
20.0	25.0	53	18
25.0	32.0	63	20
32.0	40.0	71	24
40.0	50.0	85	32
50.0	60.0	100	32
60.0	70.0	112	32
70.0	80.0	125	32
80.0	90.0	140	32
90.0	100.0	160	32

$\varnothing D1$ ABOVE	UPTO & INC.	$\varnothing D2$	$\varnothing D3$	THICKNESS	
				L1	L2
100.0	110.0	170	132	36	14
110.0	120.0	180	140	36	16
120.0	130.0	190	150	36	16
130.0	140.0	200	160	36	18
140.0	150.0	212	170	36	18
150.0	160.0	224	180	36	20
160.0	170.0	236	190	40	20
170.0	180.0	250	200	40	20
180.0	190.0	265	212	40	22
190.0	200.0	280	224	45	22
200.0	212.0	300	236	45	22
212.0	224.0	315	250	45	25
224.0	236.0	335	265	50	25
236.0	250.0	355	280	50	28
250.0	265.0	375	300	50	28
265.0	280.0	400	315	56	28
280.0	300.0	425	335	56	32
300.0	315.0	450	355	56	32

## FEATURES

- Used for setting of pneumatic length measuring instruments
- Made from oil hardening non shrinking gauge steel, hardened and tempered to 60-62 HRC
- Subzero treated at  $-80^{\circ}\text{C}$  for long term dimensional stability
- Actual dimensions duly etched
- Calibrated at  $20^{\circ}\text{C}$  under Standards Room conditions against National/International traceable standards
- Certificate of calibration is provided along with each master traceable to National/International standards. Certificate under NABL (as per ISO 17025) as per request
- Manufactured as per DIN2250-1 Type B



# Air Ring Gauge



**RANGE: 1.5-150mm**



## FEATURES

- Two Jet Air Ring gauge to check outside diameter, taper & ovality
- Three jet Air Ring gauge for detecting tri-lobed effect for diameter above 6 mm only
- Can be supplied with tungsten carbide sleeve on request for checking hardened job
- Can be supplied with multiple jets

## SPECIAL APPLICATIONS



### AIR RING GAUGE WITH PEDESTAL MOUNTING

- Air ring gauge can be supplied with pedestal mounting for ease of gauging



### AIR RING GAUGE WITH CARBIDE SLEEVE

- Air ring gauge can be supplied with carbide sleeve for extended life



### AIR RING GAUGE WITH BENCH MOUNTING

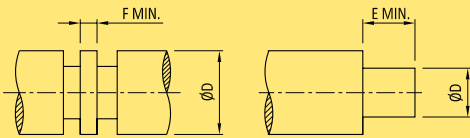
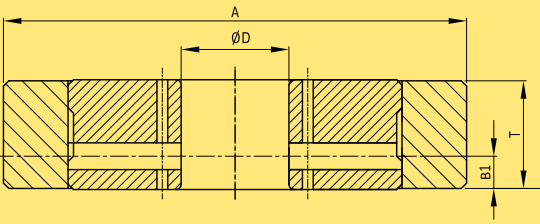
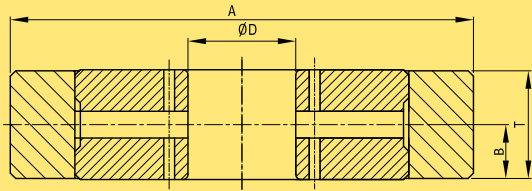
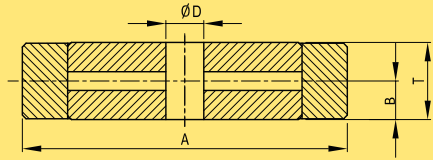
- Air ring gauge can be supplied with bench mounting for ease of gauging



### AIR RING GAUGE FOR GUDGEON PIN

# Air Ring Gauge & Setting Plug

## AIR RING GAUGE DATA SHEET



Ø D mm	A	T	B	E	F	MIN RANGE	MAX RANGE
2.0 - 3.0	35.0	9.0	4.5	6.6	2.5	±0.005	80% OF SCALE
3.0 - 6.0	35.0	9.0	4.5	6.6	2.5	±0.005	

- Supplied hand held as standard
- Supplied on MOD 2A / ClearLine only
- Supplied with 2 jets as standard
- Not supplied in offset design

Ø D mm	A	T	B	B1	E (OFFSET) MOD 1A/ CL	F (CENTRAL) MOD 1A/ CL	MIN RANGE	MAX RANGE
6.0-20.0	60.0	20.0	10.0	4.5	6.5/5.5	4.5/3.5	±0.005	80% OF SCALE
20.0-40.0	86.0						±0.010	
40.0-65.0	120.0						±0.015	
65.0-100.0	154.0						±0.020	
100.0-120.0	184.0						±0.020	
120.0-150.0	225.0						±0.020	

- Supplied unit mounted as standard
- As a special case, air ring can be supplied on MOD-2A up to dia. 50 mm only, to suit super blind and less land

### General notes

- Air ring gauge for 0.0005 mm least count are given up to Ø 50 mm only
- Each air ring gauge requires two setting masters to set the air ring on the read-out unit. The difference between the high and low setting masters supplied covers the component tolerance or the maximum range mentioned in the above table, whichever is lower
- The minimum gauging land "E" and "F" mentioned above, is excluding chamfer distance and fillet radius
- For special blind shafts (super blind- 'E' less than mentioned in the above chart) or any other special requirement (3 Jet design to check lobing), please send the component drawing and ask for a quote

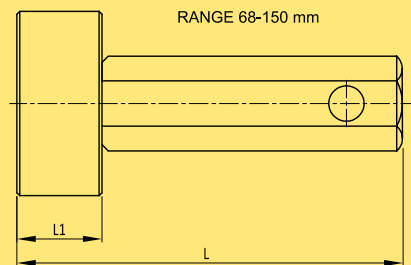
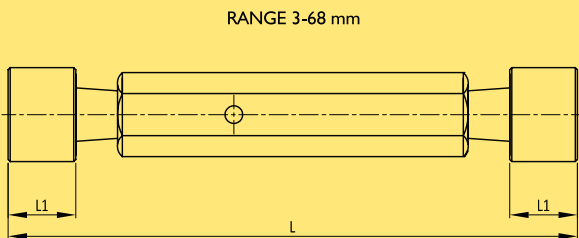
### Abbreviations

- MOD 1A = PFL Air Gauge Unit Module 1A
- MOD 2A = PFL Air Gauge Unit Module 2A
- CL = ClearLine air gauge unit

### Important rule in air gauging

Lesser the clearance, higher the accuracy and vice versa.

## SETTING PLUGS DATA SHEET



DIA RANGE	L	L1
3.0-6.0	75.0	8.0
6.0-10.0	110.0	20.0
10.0-14.0	119.0	
14.0-18.0	130.0	
18.0-24.0	144.0	
24.0-30.0	128.0	
30.0-40.0	160.0	
40.0-65.0	160.0	
65.0-68.0	160.0	

DIA RANGE	L	L1
68.0- 150.0	175.0	25.0

**Note:** For diameter below 3 mm, pin type & collet design are applicable.

# Air Caliper



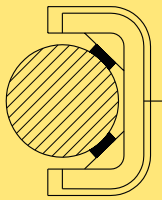
**RANGE: 10-225 mm**

## FEATURES

- Air calipers are ideal for measuring diameters of jobs held between the centers on machine or interrupted shafts like crankshafts
- "V" support for perfect centering and stability
- "V" support with tungsten carbide pads for diameter above 16 mm
- Ideal for collared diameters i.e. crankshaft pin and journal
- Multi-jet air calipers available for multi-point measurement i.e. to check crowning of crank pins and journal diameters
- Can be supplied bench mounted for checking small diameters or against specific needs

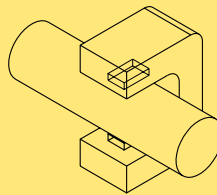


OPEN JET AIR CALIPER GAUGE



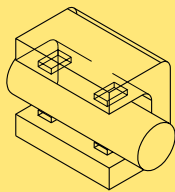
e.g : GENERAL PURPOSE USE

HAND CALIPER GAUGE



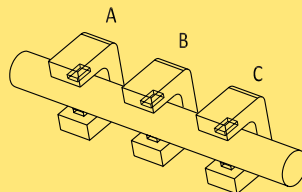
e.g : CHECKING COMPONENT BETWEEN CENTER ON M/C

MULTI-POINT HAND CALIPER GAUGE



e.g : MEASUREMENT OF CRANKSHAFT PIN & JOURNAL

FIXTURE MOUNTED CALIPER GAUGE FOR INTERRUPTED DIAMETER



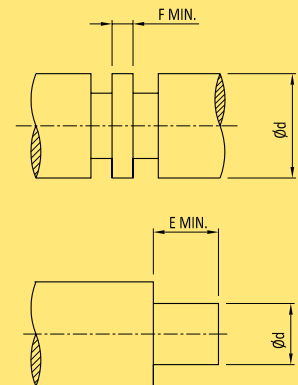
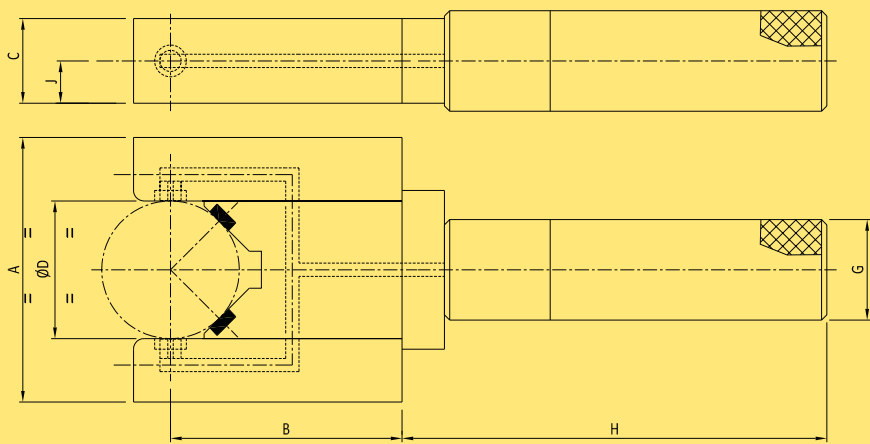
e.g : CAMSHAFT MEASUREMENT





# Air Caliper & Setting Discs

## AIR CALIPER DATA SHEET



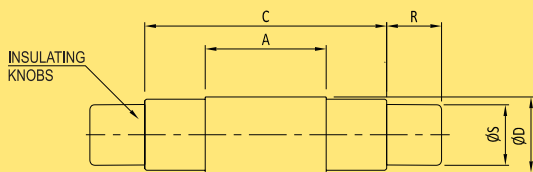
Ø D mm	A	B	C	J		H	Ø G	E (OFFSET) MOD 1A/ CL	F (CENTRAL) MOD 1A/ CL	MIN RANGE	MAX RANGE
				CENTRAL	OFFSET						
10.0-16.0	D+34	54	12	6.0	4.0	100	18.0	6.5/5.5	4.5/3.5	±0.005	80% OF SCALE
16.0-26.0	D+24	54	12	6.0							
26.0-50.0	D+24	60	16	8.0							
50.0-75.0	D+28	75	18	9.0							
75.0-100.0	D+32	80	20	10.0							
#100.0-125.0	D+32	100	20	10.0							
#125.0-150.0	D+40	105	20	10.0	150	25.5			±0.010		
#150.0-225.0	D+40	155	20	10.0							

- Air calipers are supplied hand held as standard
- # not supplied for use on ± 0.025 mm ClearLine unit

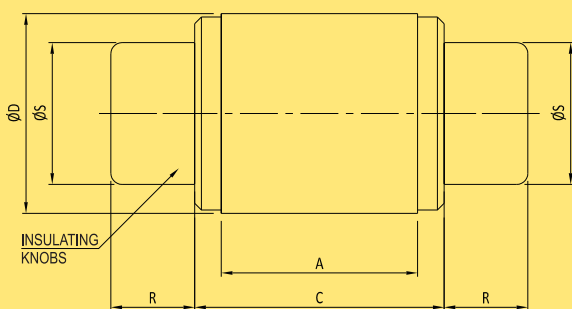
### General notes

- Air calipers for 0.0005 mm least count are given up to Ø 50 mm only
- Each air caliper requires two setting masters to set the air caliper on the read-out unit. The difference between the high and low setting masters supplied, covers the component tolerance or the maximum range mentioned in the above table, whichever is lower
- The minimum gauging land "E" and "F" mentioned above is excluding chamfer distance and fillet radius
- For special blind shafts (super blind- 'E' less than mentioned in the above chart) or any other special requirement (multi jet design air caliper), please send the component drawing and ask for a quote

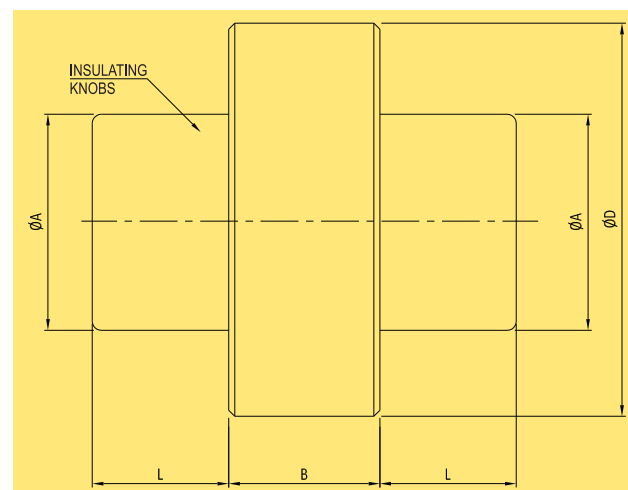
## SETTING DISC DATA SHEET



ØD		A	C	R	S
ABOVE	UPTO & INCLUDING				
2.4	3.81	9.52	17.46	11.1	2.4
3.81	5.84	11.11	19.05	11.1	3.2
5.84	9.27	12.7	20.64	11.1	5.6



ØD		A	C	R	S
ABOVE	UPTO & INCLUDING				
9.27	12.95	14.29	22.22	12.7	8.7
12.95	20.96	15.88	23.81	12.7	12.7
20.96	28.83	17.46	25.4	15.9	19
28.83	38.35	20.64	28.58	15.9	25.4



ØD		B	ØA	L
ABOVE	UPTO & INCLUDING			
38.35	51.05	22.2	31.8	15.8
51.05	63.75	22.2	31.8	15.8
63.75	76.45	25.4	38.1	39.8
76.45	89.15	25.4	38.1	39.8
89.15	101.85	25.4	38.1	39.8
101.85	114.55	25.4	38.1	39.8
114.55	127.25	25.4	38.1	39.8
127.25	139.95	25.4	38.1	39.8
139.95	152.65	25.4	38.1	39.8
152.65	165.35	25.4	38.1	39.8
165.35	178.05	25.4	38.1	39.8
178.05	190.75	25.4	38.1	39.8
190.75	225.00	25.4	38.1	39.8



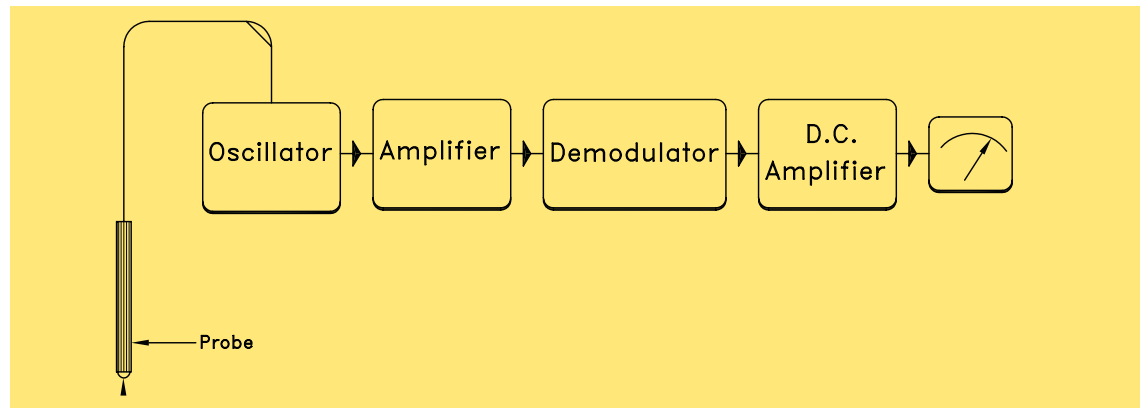
**ELECTRONIC GAUGES**



# Electronic Gauge

## WORKING PRINCIPLE

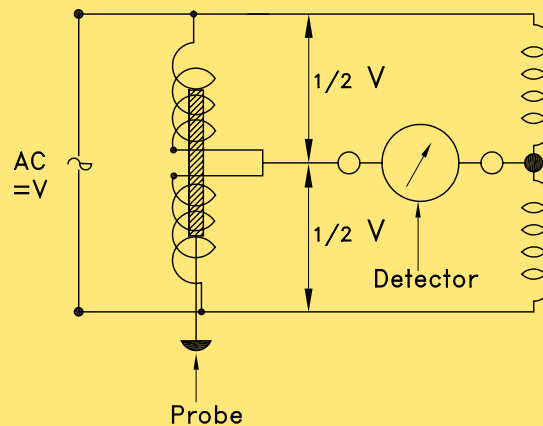
Electronic gauges are basically comparative in function i.e. the measurements are made in comparison to a calibrated setting master. A transducer commonly termed as 'PROBE', senses variations in the dimension of component under measurement. The movement of the plunger is converted to an electrical output which is processed by an Electronic circuit, this in turn drives a display in a form appropriate to the application.



The gauge unit consists of a highly stable oscillator which applies the voltage to the Wheatstone bridge. The small amplitude output A.C. signal generated by the bridge due to the unbalanced condition caused by the linear displacement of the armature during measurement, is amplified by an A.C. amplifier.

The demodulator then converts this amplified A.C. output into a D.C. signal which is then amplified by a variable gain D.C. amplifier that provides range selection. The output of this amplifier operates a display which can be in the form of a moving coil meter, digital display or bar graph column.

WHEATSTONE BRIDGE



A piece of magnetic material called 'armature' attached to the probe plunger is located between two coils. The position of the armature in the coils is such that if the armature is more inside one coil, it is less in the other coil. The plunger, the armature and the coil are housed in a metallic shell.

The two coils in the probe combined with two more coils inside the gauge unit form a Wheatstone bridge which is fed by an A.C. power source. The bridge is said to be balanced when the armature is exactly halfway between the coils windings. The axial movement of the probe which in turn moves the armature, causes a change in the inductance. This generates a small signal which is processed and finally displayed by the gauge unit.

# Electronic Gauge



## PROBE COMBINATIONS

## APPLICATIONS

Multiple probe & polarity combinations are possible to achieve relation gauging as shown below:

Probe arrangement	Probe Socket Connections		Probe Tip Movement		Display Movement	Units of Display Movement per Unit Tip Movement
	A Probe	B Probe	A Probe	B Probe		
1 Probe only Probe A	A+		↑		↻ +	+1
	A+		↓		↻ -	-1
	A-		↑		↻ -	-1
	A-		↓		↻ +	+1
2 Probes A and B	A+	B+	↑	↑	↻ +	+2
	A+	B+	↓	↓	↻ -	-2
	A+	B+	↓	↑	↻ 0	0
	A+	B+	↑	↓	↻ 0	0
	A-	B+	↑	↑	↻ 0	0
	A-	B+	↓	↓	↻ 0	0
	A-	B+	↓	↑	↻ +	+2
	A-	B+	↑	↓	↻ -	-2
	A+	B-	↑	↑	↻ 0	0
	A+	B-	↓	↓	↻ 0	0
	A+	B-	↓	↑	↻ -	-2
	A+	B-	↑	↓	↻ +	+2
	A-	B-	↑	↑	↻ -	-2
	A-	B-	↓	↓	↻ +	+2
	A-	B-	↓	↑	↻ 0	0
	A-	B-	↑	↓	↻ 0	0

 THICKNESS HEIGHT		 INTERNAL DIAMETER	
 DIAMETER CYLINDRICITY		 WALL THICKNESS	
 CONCENTRICITY TO DATUM CENTRE		 SQUARENESS	
 DIAMETER LOBING		 CONCENTRICITY DIAMETERS TO CENTRE	
 STRAIGHTNESS		 TWO DIAMETERS	
 CONTINUOUS THICKNESS		 TAPER	
 INTERNAL DIAMETER		 POSITION	
 INTERNAL DIAMETER		 RUN-OUT TO DATUM CENTRE	
 FLOATING DIAMETER		 POSITION	





# Electronic Gauge

## TWIN CHANNEL



941



### 941 ANALOGUE

- Dual scale 3-0-3 and 10-0-10 galvanometer with enclosed tolerance pointers
- 5 Metric and 5 Inch ranges



943



### 943 DIGITAL

- Large 1", 3½" digits bright red LED display
- 2 Metric and 2 Inch ranges



945



### 945 COLUMN

- 254 mm tall analogue red LED bar graph display with 100 segments
- Variable bar graph intensity selection
- 5 Metric and 5 Inch ranges

	941	943	945
Metric Ranges	±10, ±30, ±100, ±300, ±1000 μm	±200 & ±2000 μm	±10, ±30, ±100, ±300, ±1000 μm
Resolution	0.5, 1, 5, 10, 50 μm	0.1 & 1 μm	0.2, 1, 2, 10, 20 μm
INCH Ranges	±0.0003, ±0.001, ±0.003, ±0.01, ±0.03 inch	±0.020 & ±0.200 inch	±0.0003, ±0.001, ±0.003, ±0.01, ±0.03 inch
Resolution	0.00001, 0.00005, 0.0001, 0.0005, 0.001 inch	0.00001 & 0.0001 inch	0.00001, 0.00002, 0.0001, 0.0002, 0.001 inch

## FEATURES

- Twin channel gauge units with selectable probe combinations of +A, -A, +B, -B, +A +B, +A -B, -A +B, -A -B
- Inch and Metric measuring ranges
- RED, GREEN and YELLOW tolerance lamps for REJECT, ACCEPT and REWORK indications
- RS232 data output
- Comprehensive outputs for further processing
- Compatible with Half-bridge and LVDT type inductive measuring probes
- Sturdy, Ergonomic design, suitable for shop floor environment
- Splash proof and sealed against dust
- Add-on Modules available for various applications e.g. Light Grading Module, Relay Module, etc.
- Mains supply 220 volts AC



## MICROPROCESSOR BASED TWIN CHANNEL



2041N

### 2041N ANALOGUE

- Digitally driven, Analogue Galvanometer type measurement display
- Five Metric & Five Inch Measuring ranges



2043N

### 2043N DIGITAL

- 8 character, LED type, 7 segment digital display shows measurements either in absolute or comparative form
- Exclusive 8-character alphanumeric dot-matrix type digital display for menu setting
- Two metric & two inch measuring ranges



2045N

### 2045N COLUMN

- 101 segment, 3 colour LED bar-graph column type measurement display
- Column can be configured to originate from the centre or one end of scale
- 8-character alphanumeric dot-matrix digital type display shows measurements either in absolute or comparative form
- Exclusive 8 character alphanumeric dot-matrix digital type display for menu setting
- Five metric & five inch measuring ranges

	2041N	2043N	2045N
Metric Ranges	$\pm 10, \pm 30, \pm 100, \pm 300, \pm 1000 \mu\text{m}$	$\pm 200$ & $\pm 2000 \mu\text{m}$	$\pm 10, \pm 30, \pm 100, \pm 300, \pm 1000 \mu\text{m}$
Resolution	0.5, 1, 5, 10, 50 $\mu\text{m}$	0.1 & 1 $\mu\text{m}$	Bar graph : 0.2, 1, 2, 10, 20 $\mu\text{m}$ Dig. Display : 0.1, 0.1, 0.1, 1, 1 $\mu\text{m}$
INCH Ranges	$\pm 0.0003, \pm 0.001, \pm 0.003, \pm 0.01, \pm 0.03$ inch	$\pm 0.020$ & $\pm 0.200$ inch	$\pm 0.0003, \pm 0.001, \pm 0.003, \pm 0.01, \pm 0.03$ inch
Resolution	0.00001, 0.00005, 0.0001, 0.0005, 0.001 inch	0.00001 & 0.0001 inch	Bar Graph : 0.00001, 0.00002, 0.0001, 0.0002, 0.001 inch Digital Display : 0.00001, 0.00001, 0.00001, 0.0001, 0.0001 inch

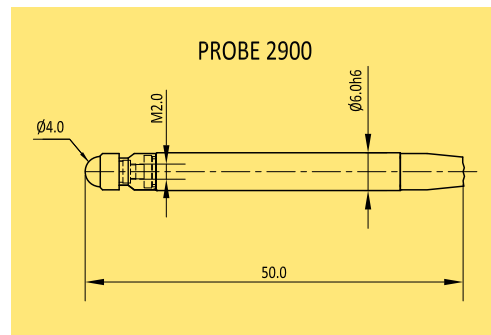
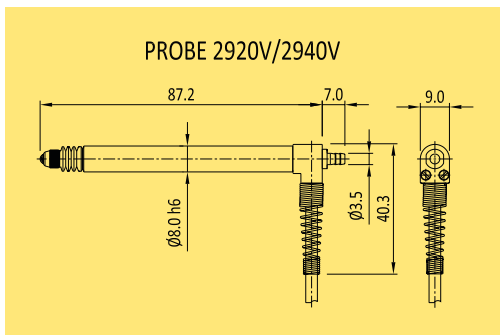
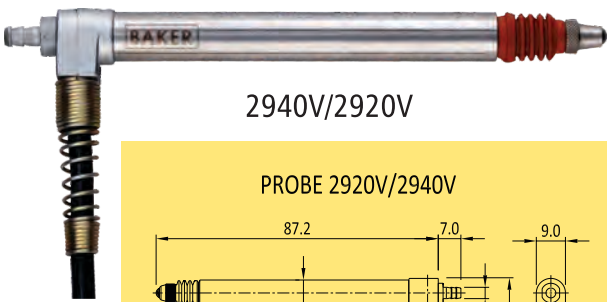
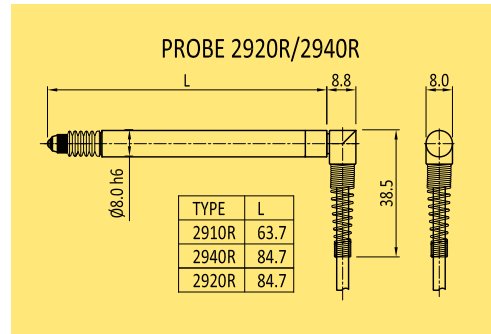
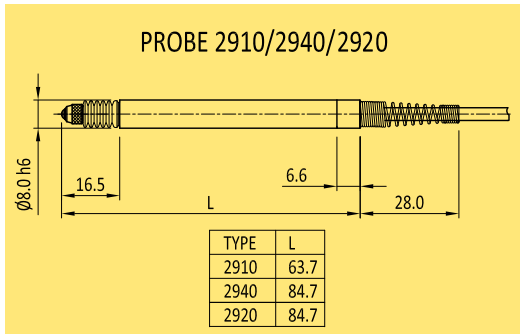
## FEATURES

- State-of-the-art technology with host of features, a must for today's shop process quality engineering
- Two level password, prevents unauthorized alteration
- Multiple-level display intensity for operators comfort
- Inch & metric measuring ranges
- Static & dynamic measurement
- Permits incorporation of complex formulae for probe combination
- Display of tolerance and control limit status – supports process control
- Classifies tolerance band into uniform or non-uniform tailor made grades
- Permits menu entries up to 16 different settings for quick application changeover
- Wide range of process control based electrical outputs facilitates automation
- Auto calibration
- Compatible with half bridge and LVDT type inductive measuring probe
- RS232 based interface with real time tagged measurements
- Aesthetically appealing, sturdy and ergonomic design, suitable for shop-floor applications
- USB interface to PC and flash drive



# Electronic Probe

## PROBE



## SPECIFICATION & FEATURES

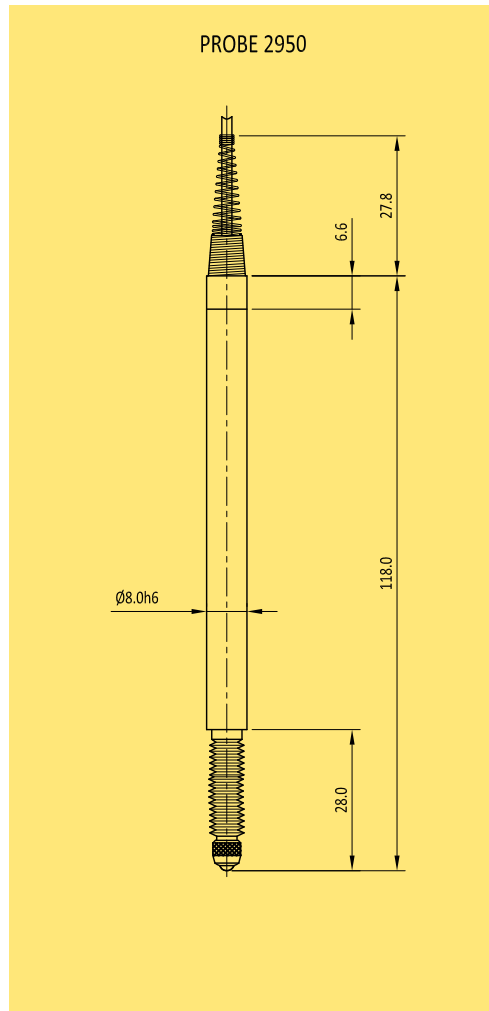
Specifications	2920 / 2920R	2940 / 2940R	2920V / 2940V (Vacuum Lift)	2910/2910R	2900
Measuring Travel	± 1 mm	± 2 mm	± 2 mm (± 1 mm for 2920V)	± 0.5 mm	± 0.3 mm
Total Travel	3 mm	4.5 mm	4.5 mm (3 mm for 2920V)	2.25 mm	1 mm
Linearity	±0.3%	± 0.3% (in ± 1000 μm range)	± 0.3% (in ± 1000 μm range)	± 0.3% (of total measuring range)	± 0.5% (of total measuring range)
Repeatability	0.02 μm	0.02 μm	0.02 μm	0.02 μm	0.15 μm
Measuring force	0.6 N	0.6 N	0.45 to 0.75 N	0.6 N	0.8 N
Pre-travel	Variable	Variable	Variable	Variable	Fixed
Application	Universal	Universal	Vacuum Lift	Universal	Universal
Environmental Protection (IEC 529)	IP 64	IP 64	IP 66	IP 64	IP 64
Plunger guide	Pre-loaded, caged linear ball bearing	Pre-loaded, caged linear ball bearing	Pre-loaded, caged linear ball bearing	Preloaded, caged linear ball bearing	Preloaded, caged linear ball bearing
Cable	2 m (Axial) Polyurethane	2 m (Axial) Polyurethane	2 m (Axial) Polyurethane	2 m., Polyurethane.	2 m., Polyurethane.
Cable support spring	Present	Present	Present	Present	N.A.
Connecting adaptor	5-pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)
Total Length (with support spring)	112 mm	112 mm	114 mm	87	50
Probe Body	Hardened & ground stainless steel (55HRC) (Diameter 8h6)	Hardened & ground stainless steel (55HRC) (Diameter 8h6)	Hardened & ground stainless steel (55HRC) (Diameter 8h6)	Hardened and ground stainless steel (55HRC); Diameter 8h6	Hardened and ground stainless steel (55HRC); Diameter 5h6
Reference temperature	20 °C ± 1°C	20 °C ± 1°C	20 °C ± 1°C	20 °C ± 1°C	20 °C ± 1°C
Contact Tip	Tungsten Carbide Ball 3 mm Dia, M2.5 Thread	Tungsten Carbide Ball 3 mm Dia, M2.5 Thread	Tungsten Carbide Ball 3 mm Dia, M2.5 Thread(240°) with screw	Tungsten carbide ball 3 mm Dia, M2.5 Thread.	Tungsten carbide ball 4 mm Dia, M2 Thread.
Sealing bellow	Viton with the metal clips	Viton with the metal clips	Viton	Viton	Viton



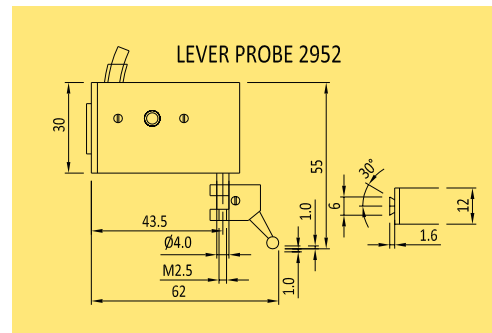
## PROBE



2950



2952



## SPECIFICATION & FEATURES

Specifications	2950	2952 Lever Type
Measuring Travel	± 5 mm	± 1 mm
Total Travel	10.5 mm max.	2 mm
Linearity	± 1.5 % (of total measuring range)	± 0.3%
Repeatability	0.15 µm	0.5 µm
Measuring force	2.5 N	0.25 N
Pre-travel	Variable	Fixed
Application	Universal	Low Measuring Force
Environmental Protection (IEC 529)	IP 64	IP50
Plunger guide	Preloaded, caged linear ball bearing	Parallel Leaf Spring
Cable	2 m., Polyurethane.	PVC
Cable support spring	Present	NA
Connecting adaptor	5-pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)
Total Length (with support spring)	145	-
Probe Body	Hardened and ground stainless steel (55HRC); Diameter 8h6	-
Reference temperature	20 °C ± 1°C	20 °C ± 1°C
Contact Tip	Tungsten carbide ball 3 mm Dia, M2.5 Thread.	9 mm long stylus having M1.6 threads & Ø 2 mm tungsten carbide ball tip
Sealing bellow	Viton	-

# Special Electronic Gauge

## SPECIAL MEASURING SYSTEMS

Non-standard solutions sought by customers, for purpose of measurement, control or analysis, may warrant the undertaking of special development processes to satisfy needs of such variations. Features and specifications of a sample non-standard system developed by us is shown below

## TAPER ANGLE MEASURING SYSTEM (TA 2000)



### FEATURES

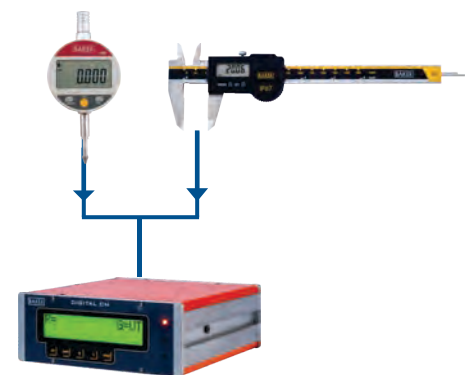
- Derives Taper or Included angle from known values of two diameters
- Unit of displayed angle : "Degree", "Minutes" & "Seconds"
- Resolution : 1 second
- Extrapolates values of unmeasured diameters
- Shows tolerance status of measured or extrapolated values in form of lamps or icons
- Can be modified for special applications like ovality, length checking and clearance measurement as per customer requirement

## DIGITAL CLASSIFYING MODULE



### FEATURES

- Accepts and displays RS232 based measurement data from Baker electronic instruments / gauges
- Tolerance status of measurement data is displayed in form of icons and lamps
- The acceptable measurement band can be graded into as many as 99 classes
- If required for the application, control outputs can be provided against tolerance or grade limits
- RS232 output tagged with tolerance and grade status can be sent to receiving PC



### Application

- Remote display for Baker Digital Instruments. For e.g. In some cases where the digital dial is in a fixture or mounted in a position where the display is not directly visible then we can extend its display on the digital classifying module.
- For ease of viewing if the display size need to be enlarged.



## STANDARD PROBE MODULE



## FEATURES

- Eight measuring channels having pre-determined full-scale DC output voltage, based on a pre-determined measuring range
- Interfaced to eight Baker Inductive probes
- Recessed 'Zero' control per channel: Travel 50 to 60  $\mu\text{m}$
- Recessed calibration control per channel
- Max. permissible error (MPE) per channel is less than or equal to  $\pm 1\%$  of the full scale measuring range
- Reference temperature of calibration is 20  $^{\circ}\text{C}$
- Output drift over operating temperature range :  $< 0.5\% / ^{\circ}\text{C}$
- Drift of sensitivity over operating temperature range :  $< 0.5\% / ^{\circ}\text{C}$
- Output instability:  $< 200\text{ mV}$
- Display stability time:  $< 500\text{ ms}$
- Power consumed by module 20 VA (max)
- Voltage supply to the read-out module: 230 V AC  $\pm 10\%$ , 50 Hz
- Operating temperature range 0  $^{\circ}\text{C}$  to 45  $^{\circ}\text{C}$ . Humidity should not exceed 60 % Rh (non-condensing)
- All measuring channels are compatible only to the Baker Axial probes
- Also available in 4 & 2 Channel (Probe inputs)

# Electronic Gauge Interface

## SMART PROBE MODULE

4/8 CHANNEL



## FEATURES

- Interfaces with 4 / 8 Baker Half-Bridge inductive probes
- The new Smart Probe module is equipped with probe signal conditioner as well as analog to digital conversion capability  
Therefore, now the computer does not have to be equipped with an ADC interface card, as required by the old probe module
- RS232/USB serial data communication between PC and Smart Probe module
- Digital measurement value is data tagged with input and output Digital status, which eliminates requirement of a separate input / output interface card in the PC. 7 Digital inputs and 8 digital outputs (TTL compatible)
- Compact size

## Note

- For applications requiring more than 8 probes, two or more smart probe modules of appropriate input capability may be used



# Electronic Gauge Interface



## MULTIPLEXER

The Baker Multiplexer is a simple measurement data transfer device. It serves as a hub for interfacing more than one Baker Digital input (from digital instruments or digital readout units) to the PC for data acquisition, storage and analysis.



## TECHNICAL DATA

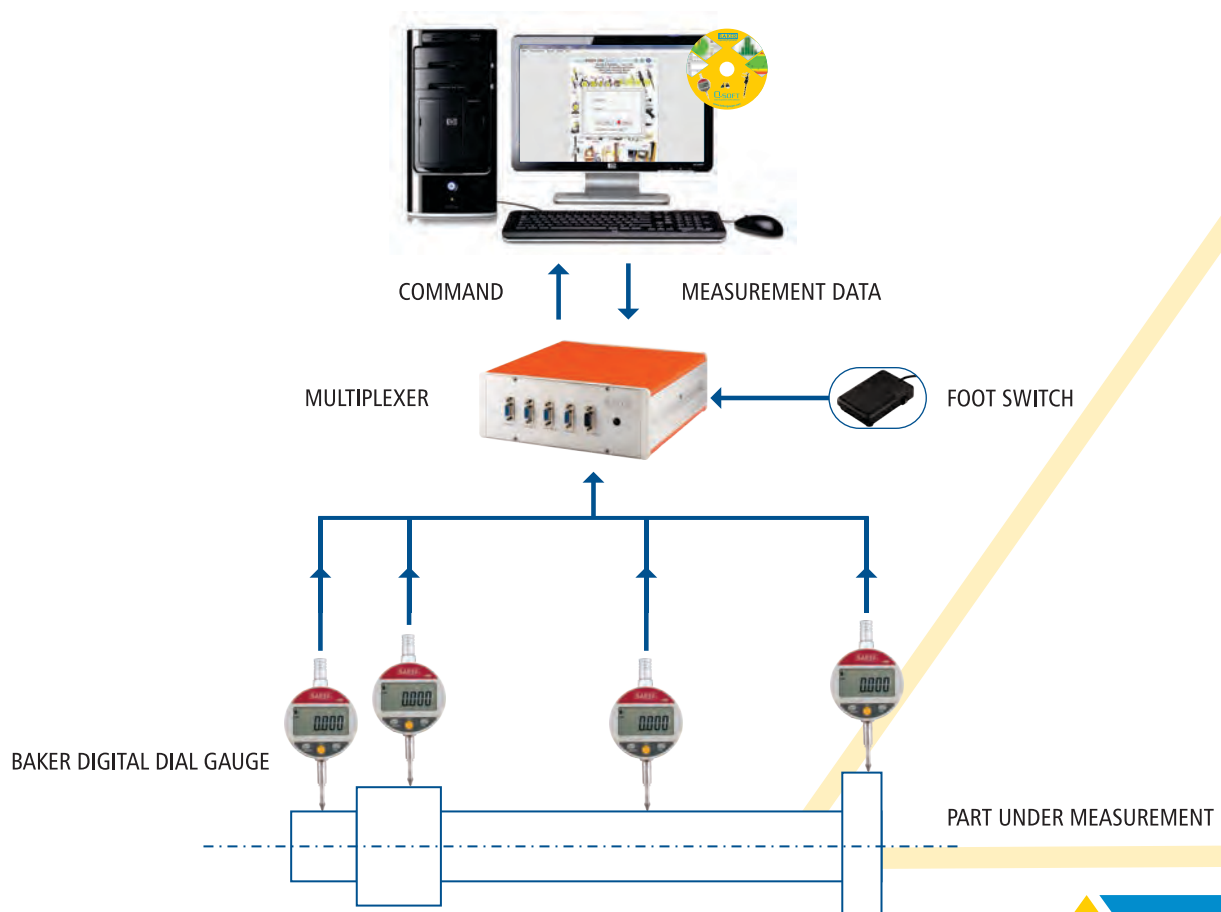
- Data Input port : 4 Channels (RS232)
- Data Output port : One (RS232)
- Data Output format : RS232 C
- Data transmission method : Simplex or Half-duplex
- Data transmission code : ASCII
- Data length : 8 bits
- Start bit : 1
- Stop bit : 1
- Parity check : None
- Baud rate : 9,600 / 19,200
- Power supply : 230 V AC
- Dimensions : (W x D x H) : 235 x 245 x 90 mm
- Optional Accessory : Foot switch

## FEATURES

- Up to 4 RS232 compatible Baker electronic measuring inputs can be interfaced to one 4 channel multiplexer
- PC can access RS232 data from the four Baker electronic measuring instruments through RS232 Output port of the 4 channel multiplexer
- Maximum distance between Baker multiplexer and PC is 2 meters, and that of Baker instrument to the multiplexer is 3 meters
- Data from each Baker instrument is tagged by a unique ID to prevent data loss, corruption or mixing

### Data acquisition possible in following methods

- By pressing data switch on digital instrument / digital read out unit
- By pressing a foot switch
- Calling command from PC to fetch data from the digital instrument / digital read out unit





# Wireless Data Acquisition

Baker provides a wireless data transfer system to transfer reading from Baker digital instruments and read out units to a centralized PC.

## DATA TRANSMISSION SIDE



## DATA RECEIVING SIDE

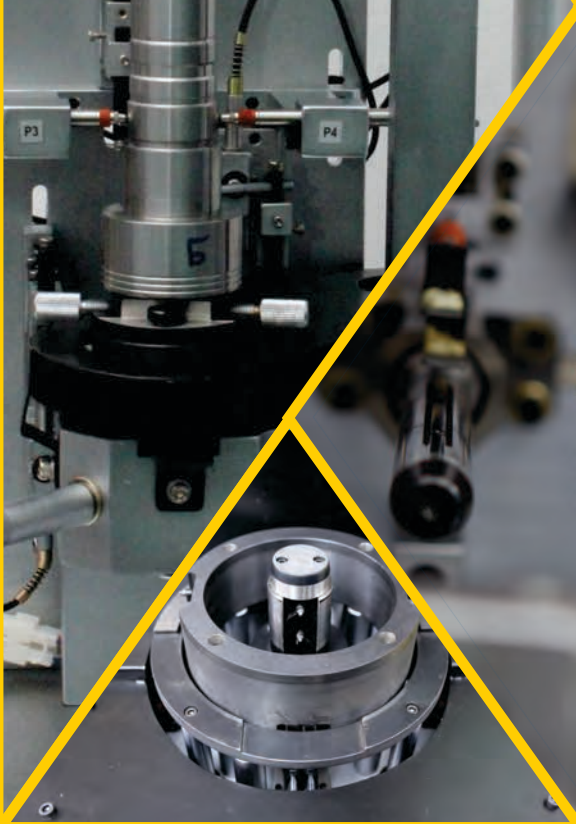


## FEATURES

- RS232 compatible Baker electronic measuring instruments, each equipped with a Wireless Transmitter (WT), can be interfaced to a Wireless Receiver (WR) at PC end
- Small and compact wireless modules, easy to use
- License free operating frequency (2.4GHz), ISM (Industrial Scientific & Medical) frequency band
- RS232 interface
- Wireless communication up to 250Kbps
- In-built network security like: 128 bit AES (Advanced Encryption Standard) Encryption, 16 bit customized Network ID
- Supports Mesh network topology
- Transmission range 100 meters, this depends on environment and clear line of sight
- Transmission range can be extended using active Baker instruments fitted with Wireless Transmitters or Wireless Repeaters (WRP)
- Very high receiver sensitivity and low power operation

## NOTE

- If clear line of sight, between antennas of WT and WR is interrupted, then one or more WRPs will have to be introduced
- Number of WRPs that will be required for a networking project, cannot be ascertained at the beginning, and can be fully determined only during installation and commissioning



**CUSTOMISED GAUGING SOLUTIONS**



# Customised Gauging Solutions

## 1. Automotive

### 1.a. Engine

- Crankshaft 101
- Camshaft 103
- Connecting Rod 104
- Cylinder Head 105
  - Valve Seat
  - Valve Guide
- Cylinder Block 106
- Liner 107
- Piston 108
- Piston Pin & Piston Ring 109
- Flywheel 111

### 1.b. Transmission

- Gears 112
- Case Differential 112
- Shafts 113
- Brake 114

### 1.c. Shim & Spacer Selection

- Cylinder Head Tappet 115
- Gear Box 116
- Wheel Hub 116

## 2. Fuel, Oil & Water Pumps

- Body & Rotor Clearance 117
- Housing & Cover 117

## 3. Medical (Pharmaceutical)

- Punch 118
- Die 118
- Capsule 118

## 4. High Speed Dimensional Grading & Sorting

- Bearing Inner/outer Race 119
- Valve Seat 119

## 5. Other Engineering Applications

- Flatness Measurement 120
- Match Gauging 120
- Taper Measurement 121
- Turbo Chargers 122
- Shell Bearing 122



## INTRODUCTION



- Our customised multi-gauging solutions range from a simple multi level diameter checking to relational parameters like squareness, center distance etc. to Semi-Automatic to completely automatic inline multi-gauging machines. The process of realizing a customised gauging solution in reality is a complex and elaborate one. It consists of the following steps.
  - **Enquiry from the customer:** The customer plays a key role of providing the correct and vital information to us which forms the basis of conceptualizing the solution to the customer
  - **Conceptualizing:** At this stage our concept cell visualizes a solution to gauge the required parameters as per the enquiry
  - **Design Approval:** Once the concept is frozen, the design team makes an overall layout for the customer to verify whether there is any gap in the inputs at the enquiry stage and what has been put on paper
  - **Design:** Once the basic design layout is finalized with the customer, based on the concept, the design team gets down to make production drawings of the conceptualized gauging fixture. Constant interaction takes place between the two departments as well as with the customer to clear doubts etc.
  - **Manufacturing:** Individual parts are carefully produced as per drawings
  - **Assembly:** An experienced and skilled set of operators assemble the gauging fixture and give shape to the concept
  - **In-house Gauge trials and tests:** A separate applications team then takes over and conducts extensive trials on the gauging station and ensures the desired results are obtained
  - **Customer joint inspection and approval:** The output on the gauging fixture is jointly confirmed with the customer at our premises before it is shipped out
- The customer plays an important role in this process. Each machine is one off and highly customised. It's a whole new ball game each time. We believe the customer is the expert in manufacturing the part and can provide valuable inputs. Such a collaborative effort from both ensures a one way passage to success.
- Over the years, we have manufactured many customised gauging solutions for a variety of components. Many of these solutions have become industry standard. This has been achieved through in depth Application Engineering exercises that we have carried out to understand the component and the manufacturing processes. This gave us the cutting edge needed to deliver total solutions to the satisfaction of the Customer. As a part of continuous technology development, the company also has developed expertise in computerised gauging with semi-auto and fully automatic gauging machines.

### The following tips are useful when you send your requirement to us:

- While specifying requirement, please give the complete drawing with all the dimensions to be measured properly highlighted, to our sales representative.
- It is strongly recommended to give us a sample component and 3D model also, because what the drawing may not reveal is disclosed by the actual component and 3D model. Size, shape and weight gives a lot of information for designing a good gauge.
- The gauge acceptance criteria should be discussed and agreed upon at the very beginning.
- When 'General Layout' is sent to you giving overall scheme of gauging, please go through it carefully. If you have any suggestions, communicate to us as early as possible. Reconfirm all the dimensions carefully because in the interim period your drawing or process may have changed.
- Please give sufficient time to manufacture. These projects are one off type.
- During gauge installation, ensure that your operators who are going to use the gauge are properly trained in the usage.



# Customised Gauging Solutions

## WHY BAKER CUSTOMISED GAUGING SOLUTIONS ?

- Expert in-house team to handle your requirement right from Conceptualization, Design, Manufacturing, Assembly, Trials and Testing
- An experience of 50 years in gauging solutions
- Imported, high precision machines like Hauser Jig Grinder and Borer to ensure high accuracy in manufacturing
- A perfect combination of in-house developed software and electronics to ensure the solution is at par with international standards
- Strong after sales and support service. We have our own sales and service employees across India to cater to our customers in person, whenever needed.
- Expert and specialised partners overseas to ensure a complete solution is given to a customer for their most demanding needs



**IN-HOUSE DESIGN TEAM**



**JIG BORING MACHINE**

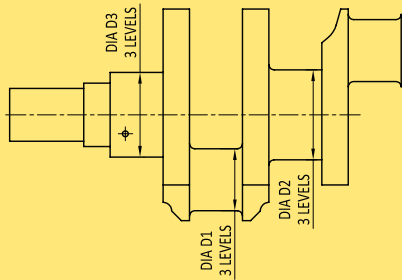


**JIG GRINDING MACHINE**



## MULTICYLINDER

### HAND HELD DIAMETER GAUGE



#### PARAMETERS

- Outer diameter at various levels
- Ovality at various levels
- Taper
- Crowning

#### ELECTRONIC



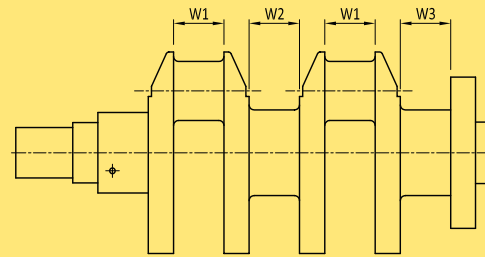
ELECTRONIC CALIPER FOR DIAMETER

#### AIR



AIR CALIPER FOR DIAMETER

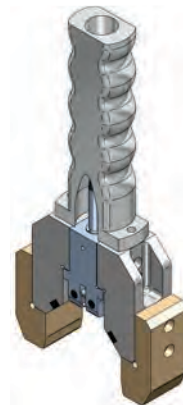
### HAND HELD WIDTH GAUGE



#### PARAMETERS

- Width

#### ELECTRONIC

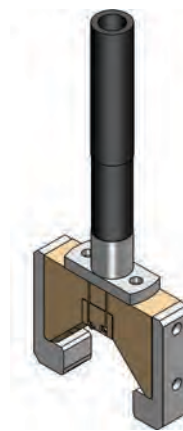


ELECTRONIC WIDTH GAUGE

#### FEATURES

- Precise measurement
- Easy and quick to use
- Can be used on machine
- Read out units and PC based system with SPC analysis
- Contact type principle of measurement

#### AIR



AIR WIDTH GAUGE

#### FEATURES

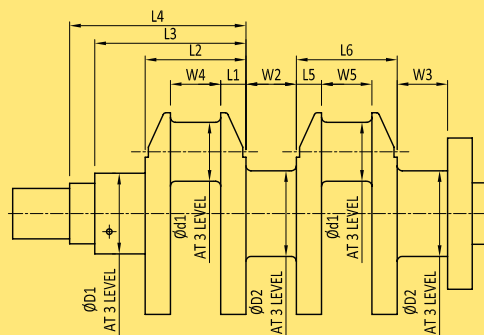
- Precise measurement
- Easy and quick to use
- Can be used on machine
- Read out units and PC based system with SPC analysis
- Non contact type principle of measurement
- Self cleaning



# Crankshaft

## MULTICYLINDER

SEMI AUTOMATIC MACHINE



## PARAMETERS

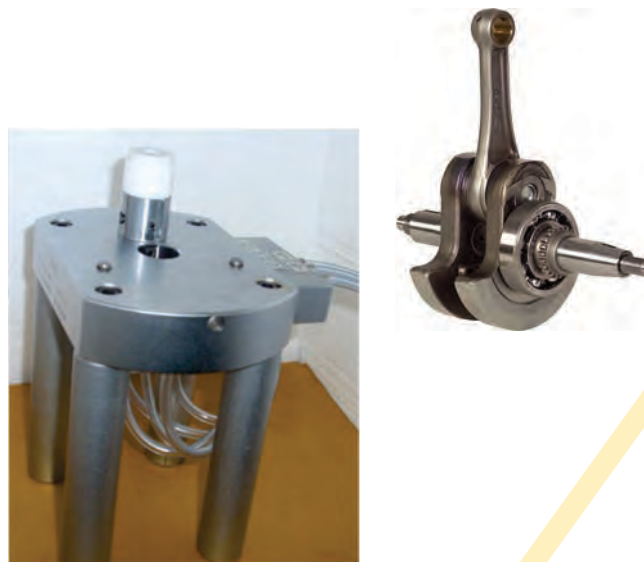
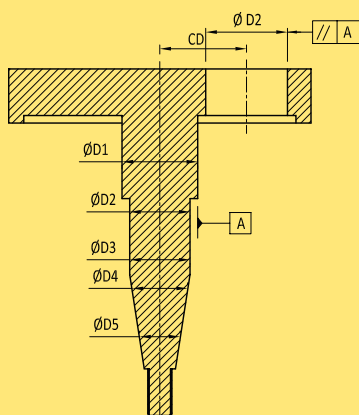
- All journal & pin diameters at multi levels
- Ovality of all journal and pin diameters
- Taper of all journal & pin diameters
- Width of journals & pins
- Lengths
- Runout of all journal & pin diameters
- Crowning effect of diameters

## FEATURES

- All measurements in one rotation
- Optimum cycle time
- User friendly customised software with SPC analysis
- No operator fatigue
- Can be used as a final inspection equipment
- Robust design for shop floor conditions
- Fully automated in line system also available

## SINGLE CYLINDER

PNEUMATIC GAUGING FIXTURE



## PARAMETERS

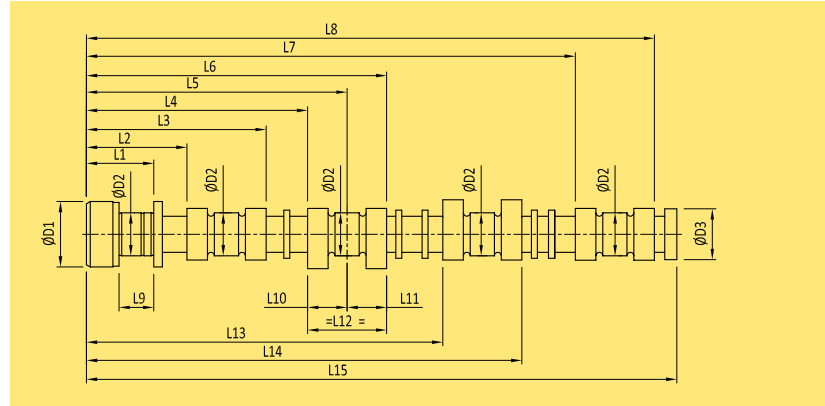
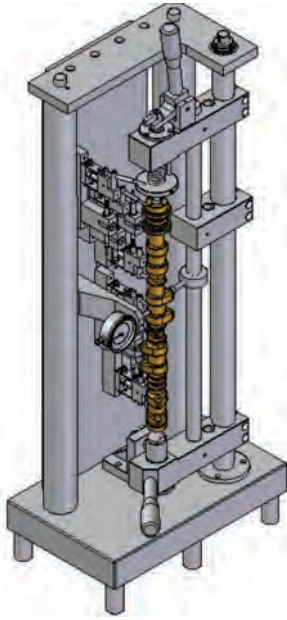
- Pin hole diameter
- Center distance
- Bearing diameter
- Shaft diameter at multiple levels
- Parallelism between bearing & Pin hole diameter (bend & twist)
- Taper angle

## FEATURES

- Precise, easy and quick measurement of multiple parameters in one go
- Readout unit or computerised system with SPC analysis
- Fully electronic contact type system also available
- Grading and grade marking integration



## LENGTHS & RUNOUT GAUGE



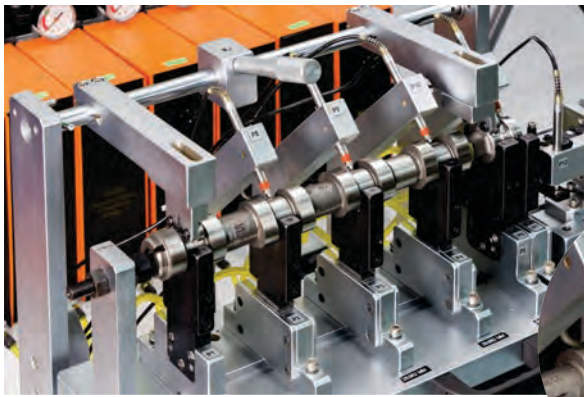
### PARAMETERS

- Multiple Lengths
- Runout of diameters

### FEATURES

- Shaft held vertically between center
- Read out units or computerised system with SPC analysis

## DIAMETERS & RUNOUT GAUGE



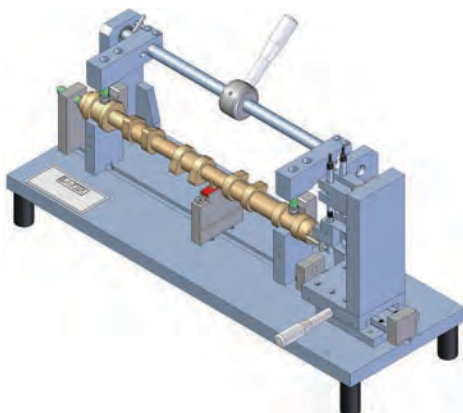
### PARAMETERS

- Multi level Diameters
- Runouts of journal diameters

### FEATURES

- Component rested on two fixed 'V' Calipers
- Floating self aligning Air Calipers
- Precise and easy to use
- Read out units or computerised system with SPC analysis
- Also available with contact type solution

## SLOT PARALLELISM GAUGE



### PARAMETERS

- Keyway slot position w.r.t. chilling pad

### FEATURES

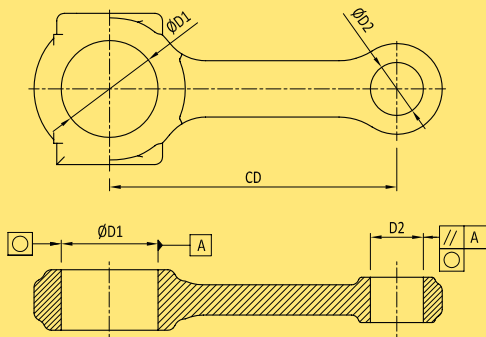
- Component rested on 'V' and resting on chilling pad
- Digital readout system



# Connecting Rod



## ELECTRONIC GAUGING



## AIR GAUGING



## PARAMETERS

Sr. No.	Big end	Sr. No.	Small end	Sr. No.	
1.	Dia. Top: 'X'	9	Dia. Top: 'X'	17	Center Distance: Top
2.	Dia. Top: 'Y'	10	Dia. Top: 'Y'	18	Center Distance: Bottom
3.	Dia. Bottom: 'X'	11	Dia. Bottom: 'X'	19	Bend ( Parallelism of 'X' Axis)
4.	Dia. Bottom: 'Y'	12	Dia. Bottom: 'Y'	20	Twist (Parallelism of 'Y' Axis)
5.	Taper: 'X'	13	Taper: 'X'	21	Perpendicularity of Big End Dia.
6.	Taper: 'Y'	14	Taper: 'Y'	22	Crank Bore Thickness
7.	Ovality: TOP	15	Ovality: Top		
8.	Ovality: Bottom	16	Ovality: Bottom		

## PARAMETERS

- Big end and small end diameters
- Center distance
- Parallelism between big end and small end
- Bend
- Twist

## FEATURES

- Precise, easy & quick measurement
- Fully automated gauging, grading, grade marking and sorting machine also available
- Self cleaning

## FEATURES

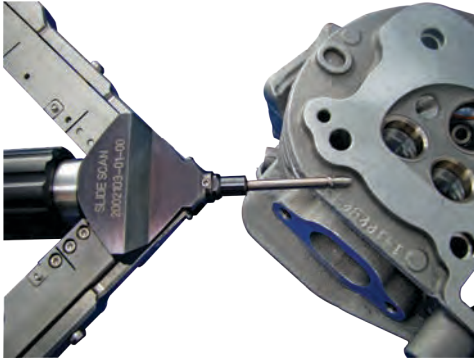
- Auto /Manual Load/Unload of Component.
- Machine Operate automatically by using signal handshaking with Gudel Gantry.
- Robust steel Structure to ensure error free measurement in shop floor condition.
- Contact Type measurement with LVDT Probes.
- Combined system for two Models.
- Scanner to scan 2D Data matrix on component.
- Three point resting Principle.
- Optimum Cycle Time.
- Component Presence and orientation confirmed by sensor & seat check.
- Facility to Accommodate Temperature compensation.
- Inbuilt Probe Protection.
- "22" parameter checking facility in One Go.

# Cylinder Head



## VALVE SEAT

### VALVE SEAT PROFILE



#### PARAMETERS

- Seat angle
- Seat Width
- Seat Straightness
- Angular gauge line position

#### FEATURES

- Scans the outline of valve seats
- Available for all kinds of gauge diameters in between 24 to 34 mm or others
- Safe and reliable since it processes about 1000 values within a scan of 1mm
- Realises this complex measurement within few seconds

### VALVE SEAT & VALVE GUIDE

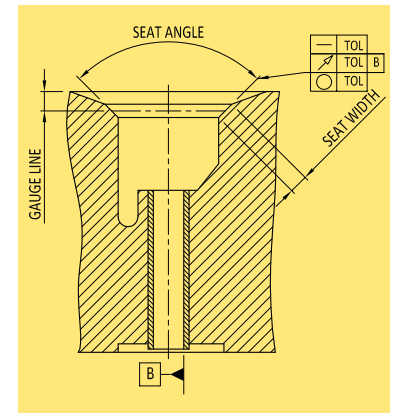


#### PARAMETERS

- Seat angle to valve guide concentricity / runout
- Seat roundness

#### FEATURES

- Measures without operator influence and hence is extremely reliable
- Available for all kinds of valve seats
- Can be used not only in vertical handling, but also in inclined handling
- Can be designed as a combined gauge for intake / exhaust



## ROCKER BORE

### ROCKER BORE GAUGE



#### PARAMETERS

- Internal Diameter of bore at multiple levels
- Bore to bore concentricity

## CAM/CRANK BORE

### CAM / CRANK BORE GAUGE



#### FEATURES

- Contact type gauging
- Can check all Cam bores at one time
- Enters easily in all Cam bores
- Suitably Designed long tubular handle for easy insertion of gauge into bores

# Cylinder Block

## BORE MEASURING, GRADING & GRADE MARKING

### MULTI CYLINDER

#### CYLINDER BORE

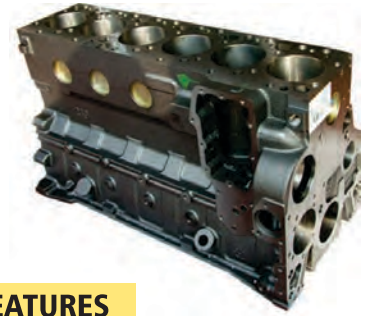


#### PARAMETERS

- Internal diameter in 2 axis and at 3 levels of bore
- Ovality at each level
- Taper of each bore
- Grading of each bore
- Grade marking – engraving

#### FEATURES

- Fully automatic gauging cycle
- Periodic auto mastering
- Servo driven precision slides
- Close loop operation for optimum safety
- Air-Electronic gauging principle
- Data acquisition and SPC analysis
- Grade marking based on individual status of bores
- Fault indications and buzzers
- Ensured component orientation



#### CRANK, CAM & IDLER BORE



#### PARAMETERS

- Internal diameter in 2 axis and at 3 levels of bore
- Ovality at each level
- Taper of each bore
- Grading of each bore
- Grade marking – engraving

#### FEATURES

- Internal diameter of crank bores at multi levels & in 2 axis
- Ovality
- Grading of each bore
- Grade marking

### SINGLE CYLINDER

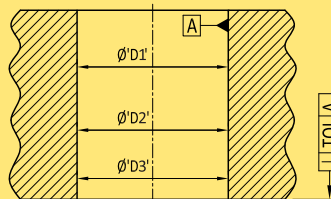


#### PARAMETERS

- Bore diameter at 3 different levels
- Ovality at each level
- Taper of bore
- Squareness of resting face

#### FEATURES

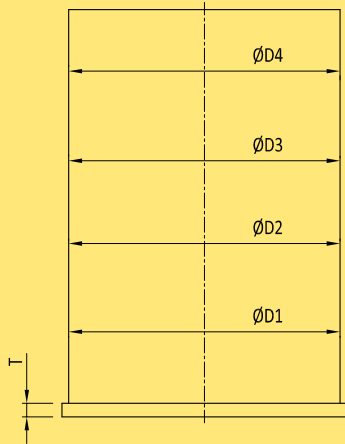
- Multi-level measurement
- Grading
- Grade marking
- Data acquisition & SPC analysis



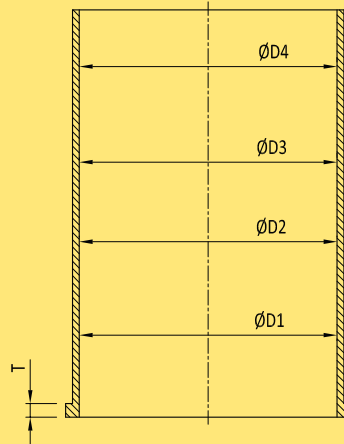


## PNEUMATIC GAUGING FIXTURES

### OUTER DIAMETER MEASUREMENT



### INTERNAL DIAMETER MEASUREMENT



### PARAMETERS

- Outer diameter at different levels
- Collar thickness

### FEATURES

- Contact-less gauging (air gauging)
- Multilevel diameter gauging in one go

### PARAMETERS

- Internal diameter at different levels
- Collar thickness

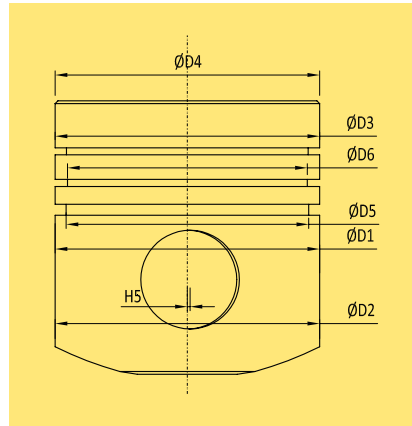
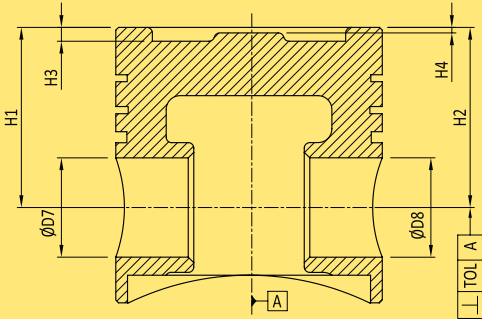
### FEATURES

- Contact-less gauging (air gauging)
- Multilevel diameter gauging in one go



# Piston

## MULTI GAUGING, WEIGHING & MARKING



### PARAMETERS

- Ref. Diameter D1
- Diameter D2
- Diameter D3
- Top Land Diameter D4
- Groove Diameter D5 & D6

- Pin Bore Diameter at 2 levels (D7 & D8)
- Compression Height H1 & H2
- Cavity Depth H3
- Button Depth H4
- Offset H5
- Weight
- Grading

## SEMI AUTOMATIC MACHINE



### FEATURES

- Compact design
- Grading based on weight
- Grade marking
- Temperature compensation
- User friendly
- Optimum cycle time
- Computerised system with SPC analysis

## FULLY AUTOMATIC MACHINE



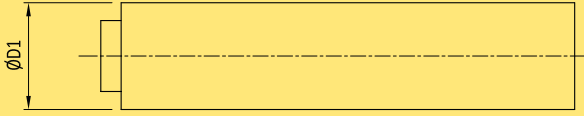
### FEATURES

- Smartly automated to suit fully automatic production line
- Data acquisition & quick SPC analysis
- Reduce measurement cycle time
- Checking degree of occurrence of maximum diameter
- Automatic grade laser marking
- Automatic grade-wise sorting
- Temperature compensation

# Piston Pin & Piston Ring



## PISTON PIN



### PARAMETERS

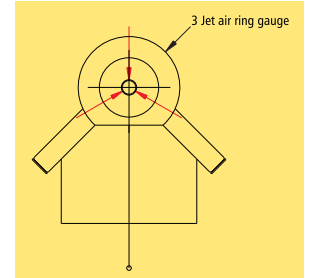
- Outer Diameter 'D1'
- 3-Point Lobing

### FEATURES

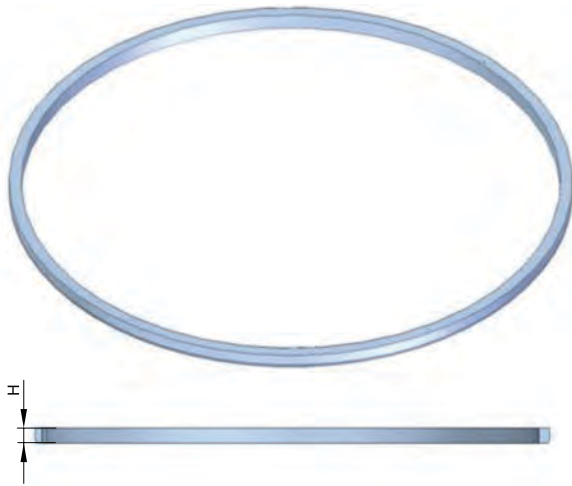
- 'V' guide way support for ease of measurement
- 3 jet air ring gauge to detect tri lobing



Pneumatic measurement



## PISTON RING



### PARAMETERS

- Height 'H' (At three places)

### FEATURES

- Fully automatic gauging cycle
- Auto dispensing component
- All static parameters
- Data acquisition & SPC analysis
- Sorting
- Optimum cycle time





# Gudgeon Pin Gauging & Sorting System

## Pin Gauging

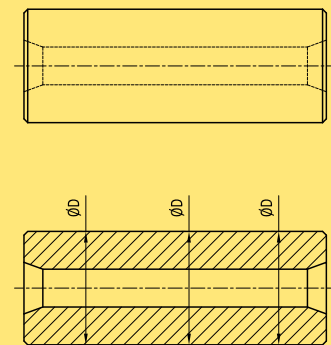


### PARAMETERS

- O.D. AT 3 LEVEL  
(Range - Dia 21mm to Dia. 55mm ,  
length 55mm to 110 mm)

### FEATURES

- Auto /Manual Load/Unload of Component.
- Machine Operate automatically by using PLC through HMI.
- Robust steel Structure to ensure error free measurement in shop floor condition.
- Contact Type measurement with LVDT Probes.
- Suitable to check particular range of Outer Dia. ie. 21 to 55 mm (Tol. 0.004 mm).
- Static measurement of OD at Three levels.
- Auto sorting facility for OK/Rejected Component through conveyor.
- Optimum Cycle Time.
- Measured value displayed on HMI.





## MULTI GAUGING AND SORTING SYSTEM

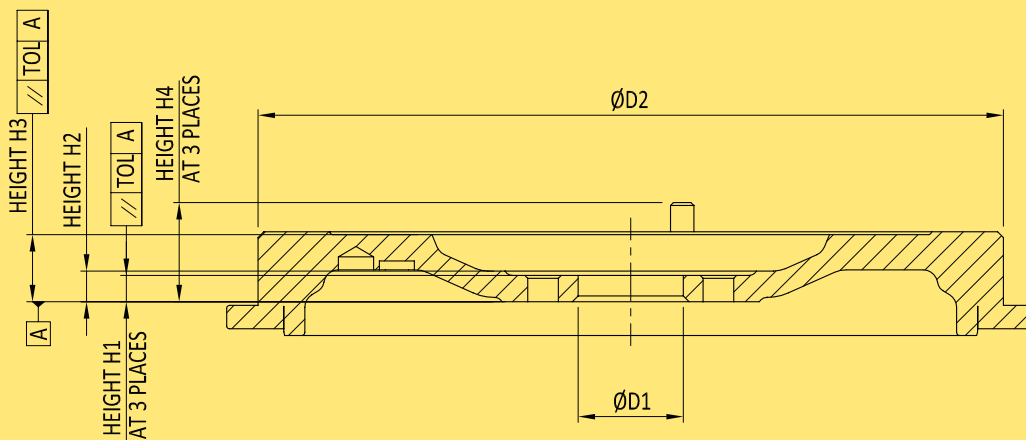


### PARAMETERS

- Inner Diameter  $\varnothing D1$
- Outer Diameter  $\varnothing D2$
- Height H1, H2 & H3
- Dowel pin height H4 at 3-Places
- Parallelism

### FEATURES

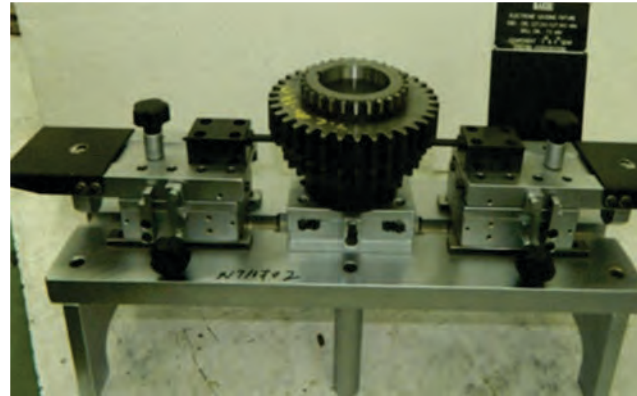
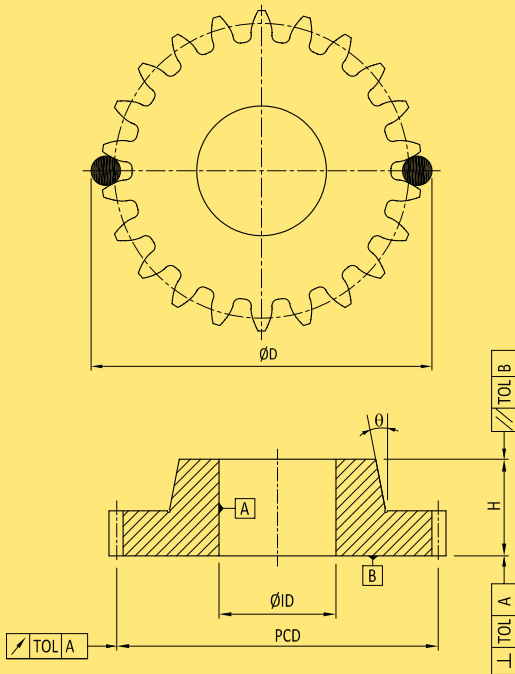
- Auto gauging cycle
- Auto gauging
- Auto sorting
- Optimum cycle time
- User friendly
- Data acquisition & SPC analysis







## GEARS



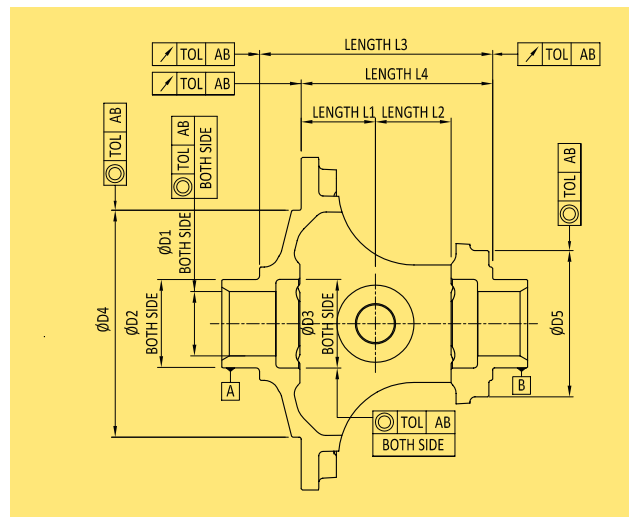
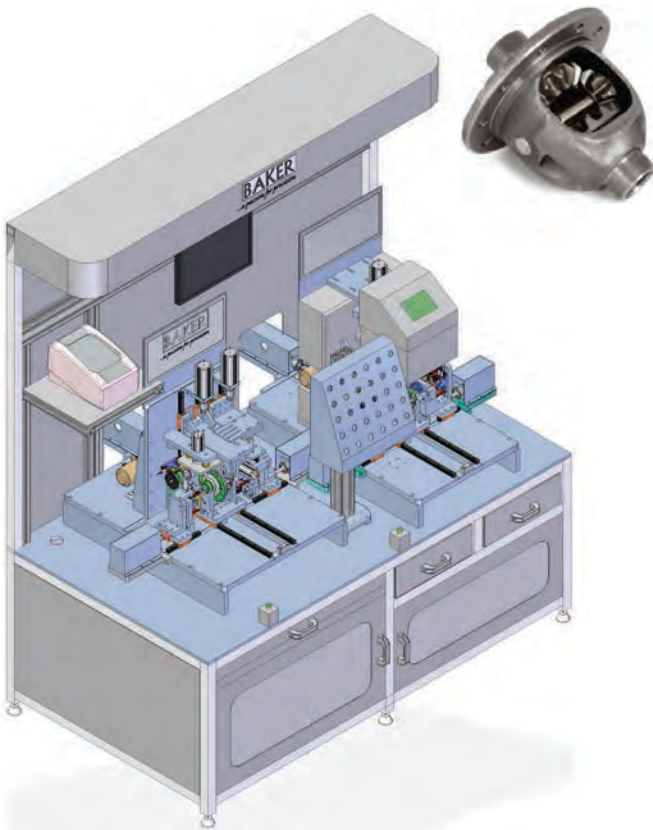
### PARAMETERS

- Over ball diameters
- Bore dia. at 2 levels
- Height 'H'
- Parallelism
- Squareness
- Cone angle 'θ'

### FEATURES

- Gauging system for over ball diameter measurement
- Easy loading & unloading
- Data acquisition and SPC analysis
- Odd and even numbers of teeth
- For spur and helical gears

## CASE DIFFERENTIAL



### PARAMETERS

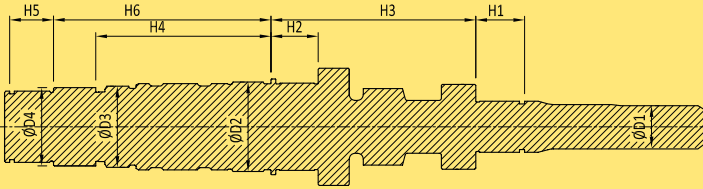
- Inner diameters
- Outer diameters
- Lengths
- Runouts
- Concentricity
- Symmetry

### FEATURES

- Automated gauging solution
- Dynamic measurement
- User friendly
- Data acquisition & SPC analysis
- Poka Yoke with marking



## STANDARD SOLUTION



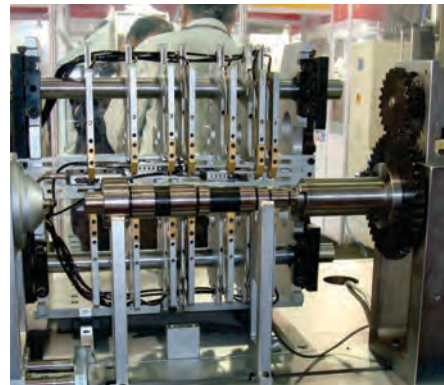
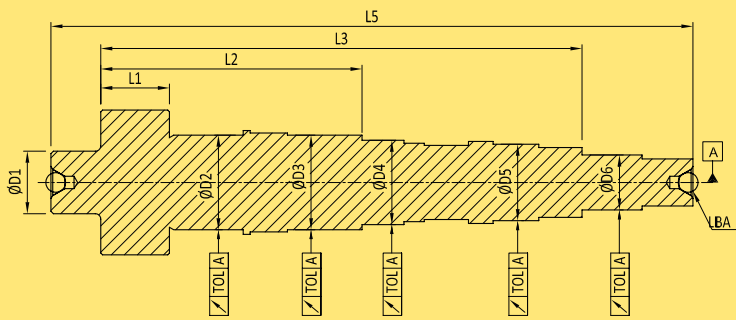
### PARAMETERS

- Multiple Diameters
- Multiple Lengths
- Runouts
- Ovality
- Taper

### FEATURES

- Swinging arms for easy loading & unloading
- Provision to hold components between centers
- Vertical fixture which occupies less space
- Motorised component rotation

## ABBE PRINCIPLE SOLUTION

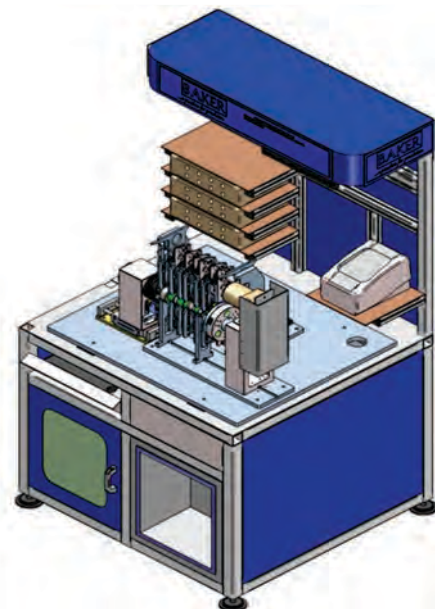


### PARAMETERS

- All Outer Diameter  $\text{ØD1}$  to  $\text{ØD6}$
- All lengths  $L1$  to  $L5$
- Run Out of ODs w.r.t. both side ball centers

### FEATURES

- Automated gauging solution
- Multiple outer diameters & lengths in a single setup
- Measured in ABBE Principle by 'True-Line' measuring element (in Technical Collaboration with REORG Germany)
- Solution for Input shaft, output shaft & various types of shafts
- Dynamic parameter measurement can be easily done
- Small variation in shaft can be accommodated in a single fixture
- Diameters only 2 mm apart can be measured with special bridge
- Highly robust & durable technology
- Probe protection inbuilt
- Modular design



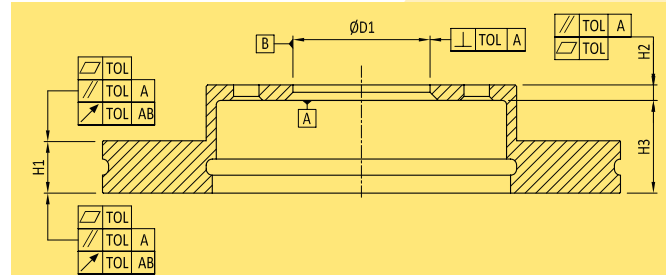
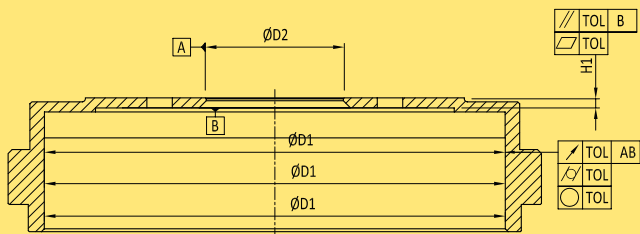
## BRAKE DRUM AND BRAKE DISC



BRAKE DRUM



BRAKE DISC



### PARAMETERS

- Brake ID at 3 levels
- Pilot Diameter
- Face thickness
- Roundness at 3 levels
- Runout
- Face flatness
- Calculated Cylindricity
- Fourier analysis

### PARAMETERS

- Brake Plate Thickness
- Wheel Face Thickness
- Offset
- Pilot Internal Diameter
- Outer/Inner Brake Surface Straightness
- Outer/Inner Brake Surface Runout
- Outer/Inner Brake Surface Parallelism
- Wheel Face Parallelism
- Wheel Face Flatness
- Fourier analysis



### FEATURES

- Automated measuring cycle
- Minimisation of human errors
- Dynamic measurement by component rotation
- Precision grade slide used
- Auto seat check sensor to ensure proper seating of component
- Rigid and robust construction for harsh shop floor environment
- Fourier calculation for analysis of heat dissipation while applying brake
- Computerised SPC analysis

# Shim & Spacer Selection



## WHY ?

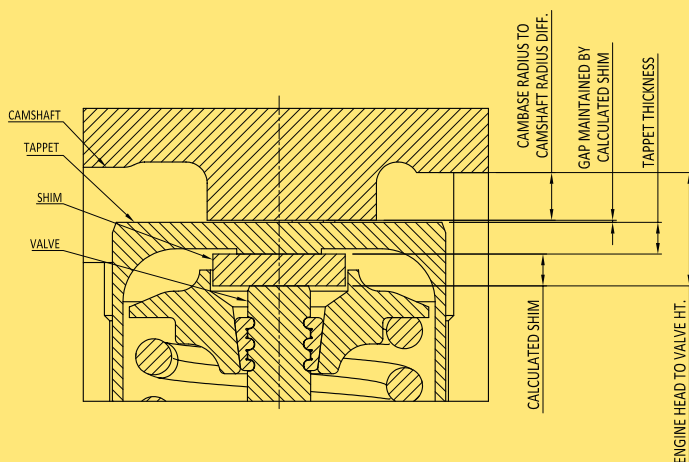
Any assembly which requires free movement & noise reduction demands a proper clearance amongst its parts. Hence shims and spacers come into the picture to achieve this requirement

## HOW ?

To maintain the proper clearance, various parts are individually measured for particular dimension & based on clearance formula, the Shim or Spacer size is derived. After defining the Shim or Spacer size, the proper Shim or Spacer is selected. An independent station verifies whether the selected shim dimension matches the calculated dimension. After selection of correct Shim or Spacer, it is put in that particular assembly & the performance of the assembly is checked.



## CYLINDER HEAD TAPPET SHIM SELECTION



## PARAMETERS

- Cam base radius to journal radius distance
- Tappet thickness
- Engine head to valve height distance
- Calculated shim thickness based on measurements
- Shim verification

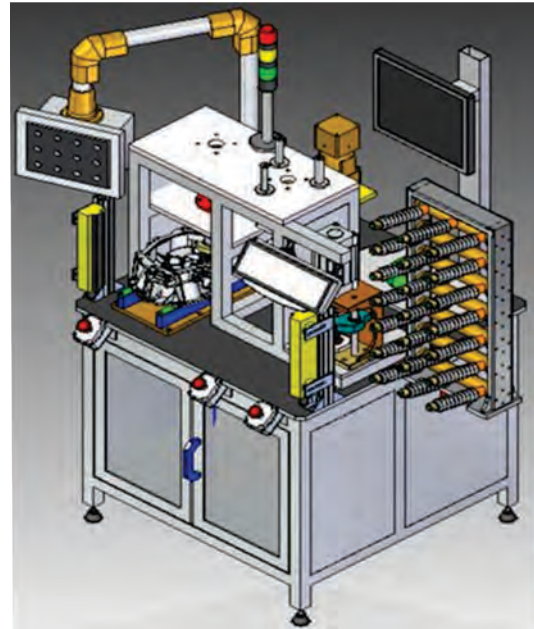
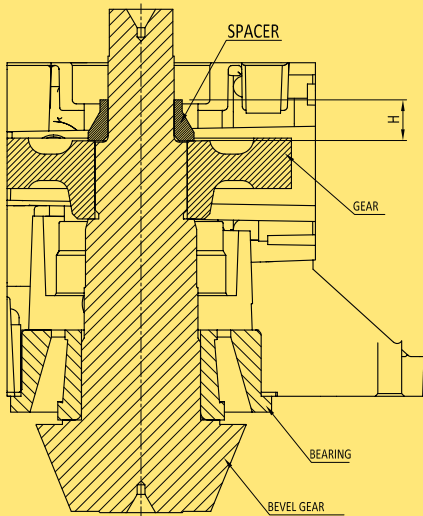
## FEATURES

- Integration with customer's auto palletted conveyor
- Fully integrated in-line gauging system
- Ergonomic design for operator efficiency and safety
- Shim calculation, clearance verification is independent & integrated in software
- Poka Yoke to ensure correct shim is picked up and assembled



# Shim & Spacer Selection

## GEAR BOX



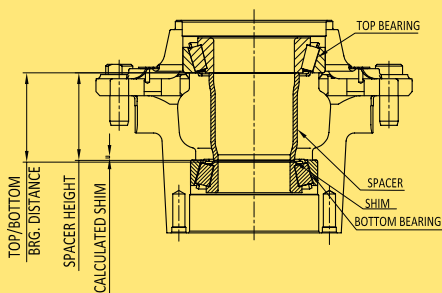
### PARAMETERS

- Calculated spacer height 'H'

### FEATURES

- Dynamic gauging
- Actual assembly condition simulated
- Pick to light facility for shim selection
- Optimum cycle time
- Measurement done under pre loaded condition of bearing

## WHEEL HUB



### PARAMETERS

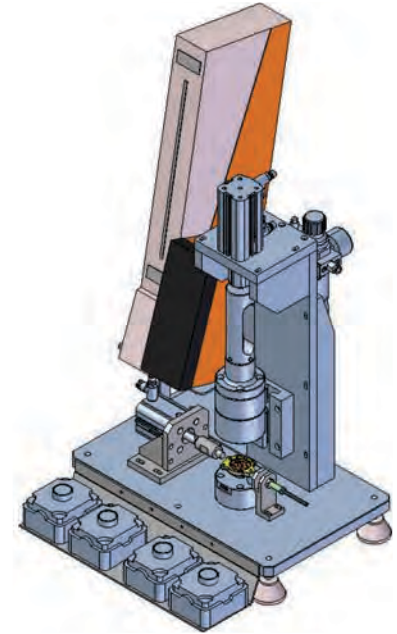
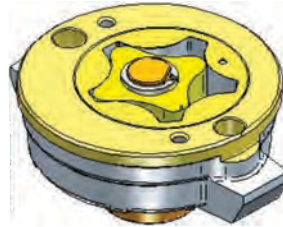
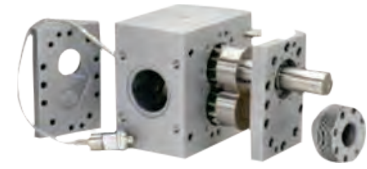
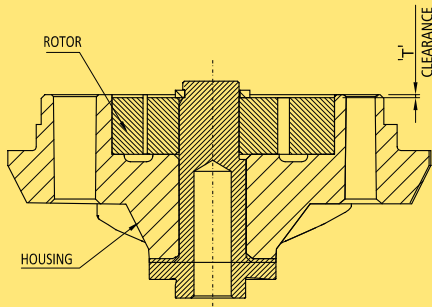
- Hub bearing inner face distance
- Spacer height
- Calculated shim thickness based on above measurement

### FEATURES

- Dynamic gauging
- Actual assembly condition simulated
- Common system for front and rear hub by tool changing facility
- Pick to light facility for shim selection
- Optimum cycle time
- Measurement done under pre loaded condition of bearing



## BODY & ROTOR CLEARANCE



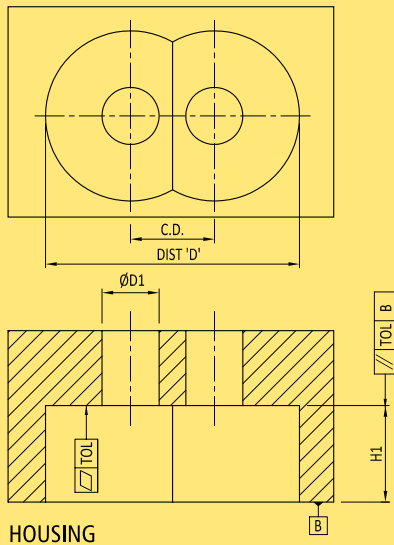
### PARAMETERS

- Clearance 'T'

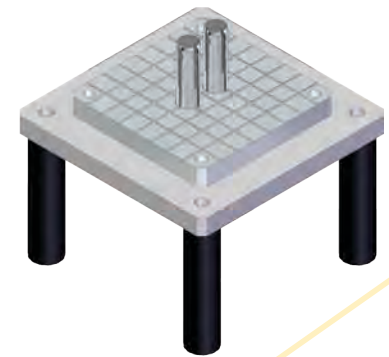
### FEATURES

- Poka Yoke component location arrangement
- Optimum cycle time
- Automatic Punch Marking for OK components

## HOUSING AND COVER



HOUSING

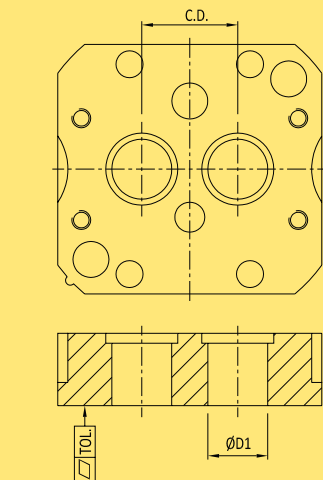
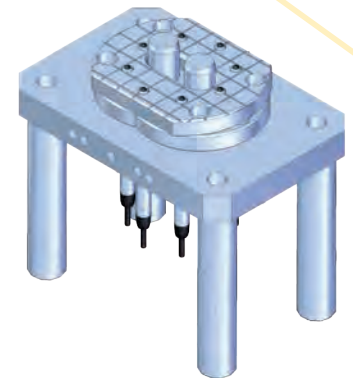


### PARAMETERS

- Distance 'D'
- Height 'H1'
- Center distance 'C.D.'
- Flatness
- Parallelism
- Diameter 'D1'

### FEATURES

- Contactless measurement.
- Offered with analogue or electronic read out or computerised space solution with SPC analysis
- Easy to use
- Compact & Robust
- Multiple parameters at a time

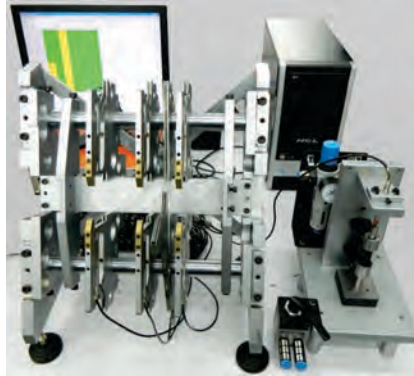
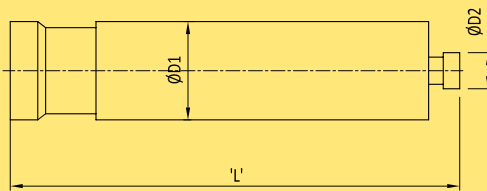


COVER



# Medical (Pharmaceutical)

## PUNCH



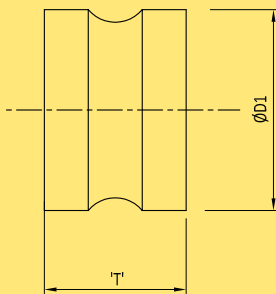
### PARAMETERS

- Diameter D1
- Diameter D2
- Length L

### FEATURES

- Baker provides the gauging solution for punch and dies
- Measured in ABBE Principle by 'TrueLine' Measuring
- Element (in Technical Collaboration with REORG Germany)

## DIE



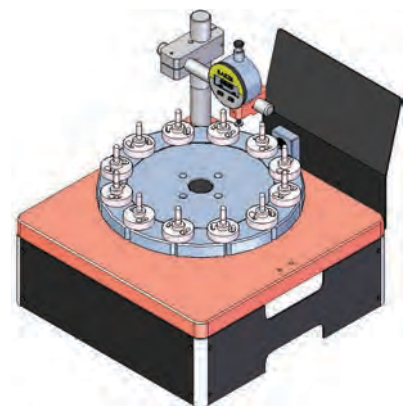
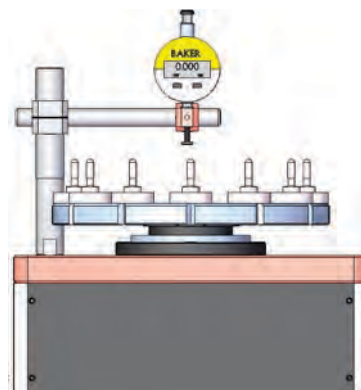
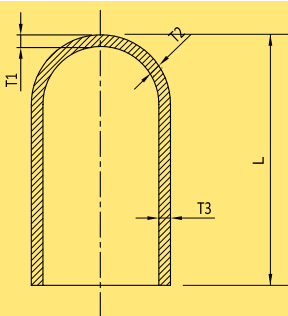
### PARAMETERS

- Thickness 'T'
- Diameter  $\phi D1$

### FEATURES

- Direct probe measurement
- Probe adjustment facility

## CAPSULE BODY & CAP



### PARAMETERS

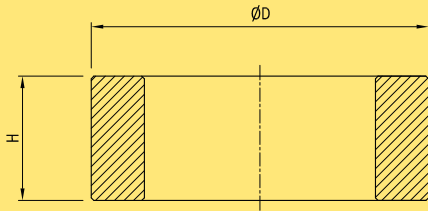
- Dome thickness 'T1'
- Shoulder thickness 'T2'
- Wall thickness 'T3'
- Cut Length 'L'

### FEATURES

- Rotary gauging bed.
- Captures highest measuring point.
- Multiple component loading facility
- Optimum measuring cycle time



## BEARING INNER/OUTER RACE

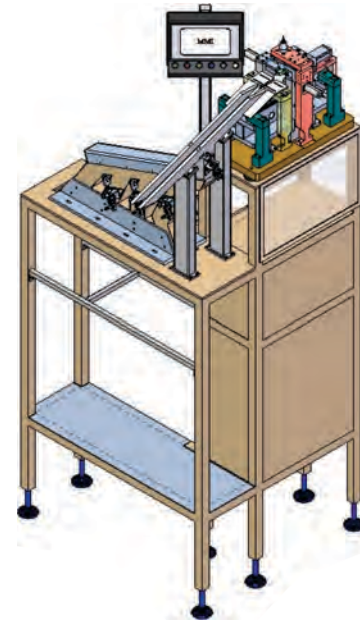
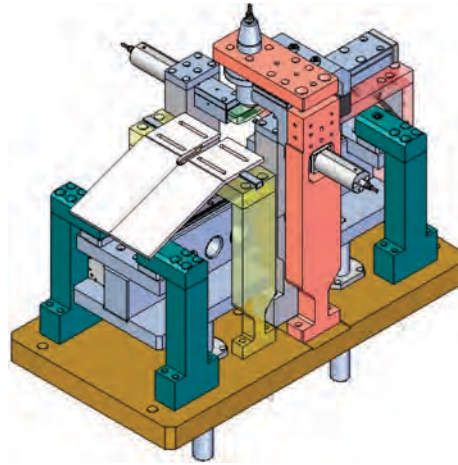


### PARAMETERS

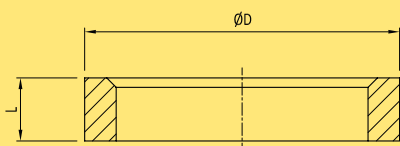
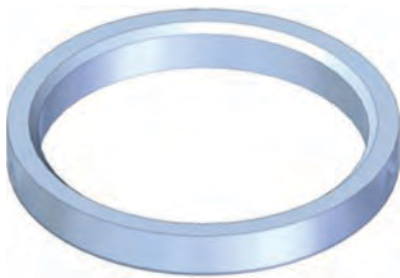
- Outer Diameter  $\text{ØD}$
- Height 'H'

### FEATURES

- Auto loading through bowl feeder
- Auto grading on Outer Diameter and sorting
- Optimum cycle time
- Solution for roller grading and sorting is also available
- Fast & reliable measurement



## VALVE SEAT



### PARAMETERS

- Outer Diameter
- Length



### FEATURES

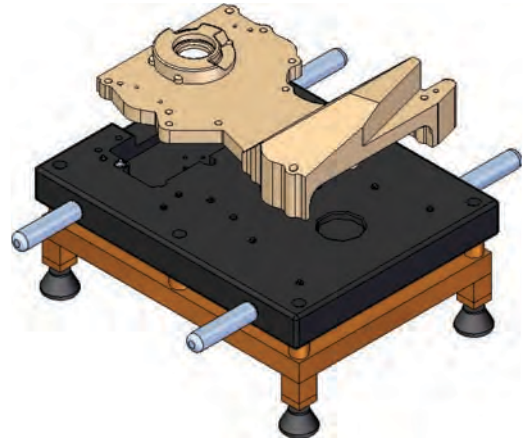
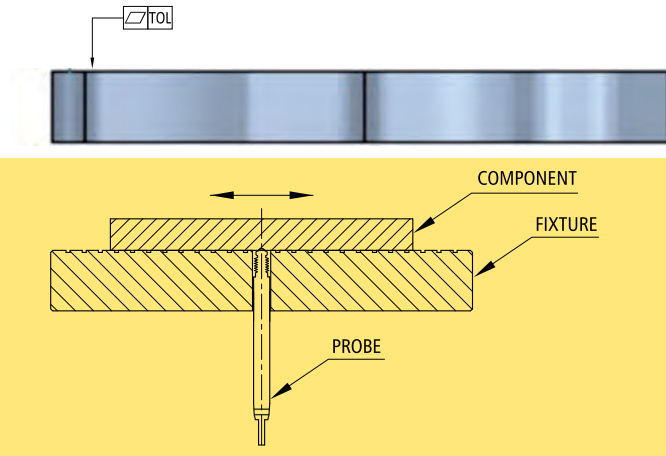
- Auto loading through bowl feeder
- Auto sorting
- Optimum Cycle time
- Fast & reliable measurement





# Other Engineering Applications

## FLATNESS MEASUREMENT

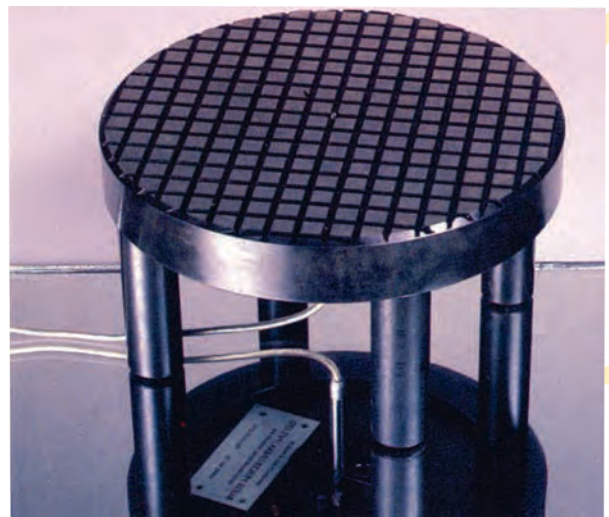


### PARAMETERS

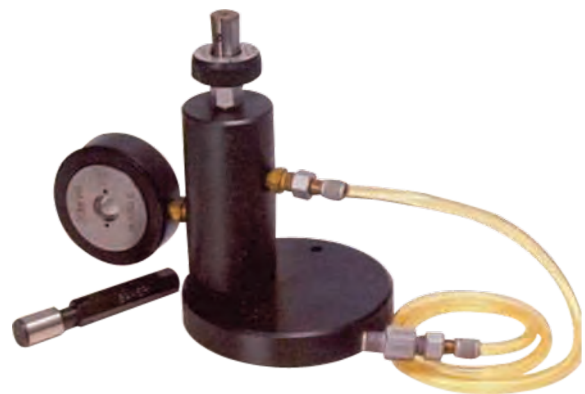
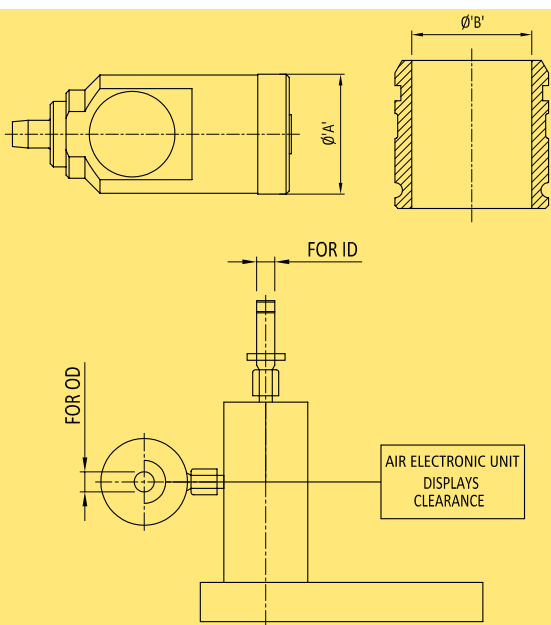
- Flatness of the surface

### FEATURES

To check flatness of a surface of small parts like valve plates used in refrigeration and industrial hydraulics. This fixture is supplied in three table sizes:  $\text{\O}150$ ,  $\text{\O}200$  and  $\text{\O}250$  mm. The top surface of the table is ground to a high degree of flatness. Depending on the specific requirement, surface of the table can be lined with carbide strips to render more wear resistance. At the center of the table, an electronic probe is fitted with tip of the probe protruding outside. When a component whose flatness is to be measured is slowly moved over the probe contact, variation in the readings is recorded, which is flatness.



## MATCH GAUGING



### PARAMETERS

- Outer diameter
- Internal diameter
- Clearance / interference between internal diameter & external diameter

### FEATURES

- Useful for selective assembly
- Useful for parts with high accuracy and small tolerance of clearance



## TAPER MEASUREMENT



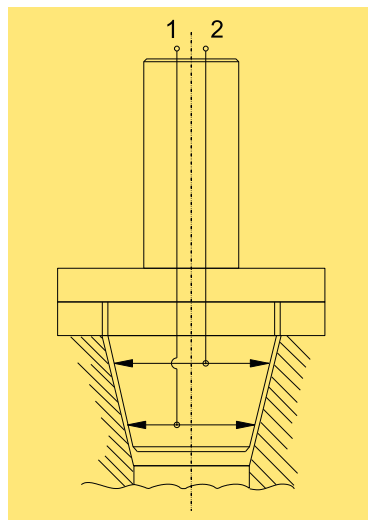
ISO / BT TAPER



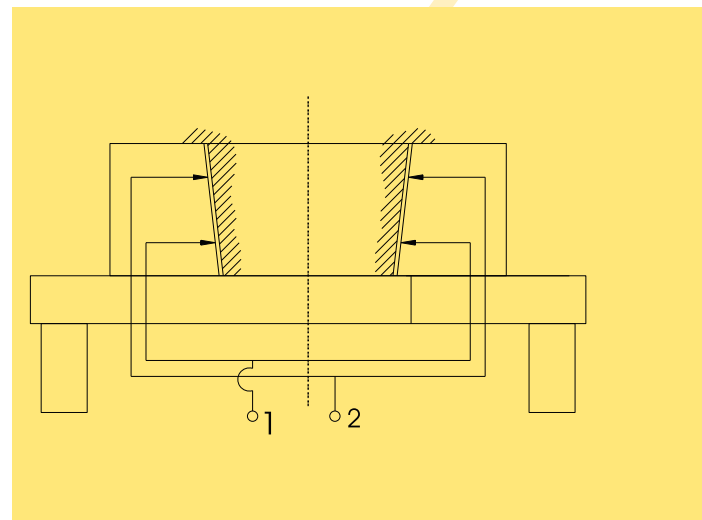
ER TAPER



HSK TAPER



Internal taper measurement



External taper measurement



TAPER ROLLER BEARING



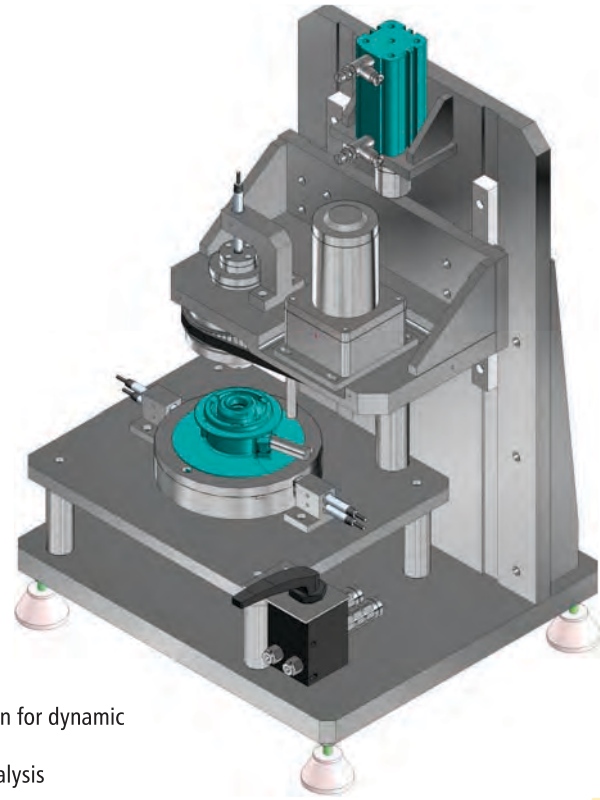
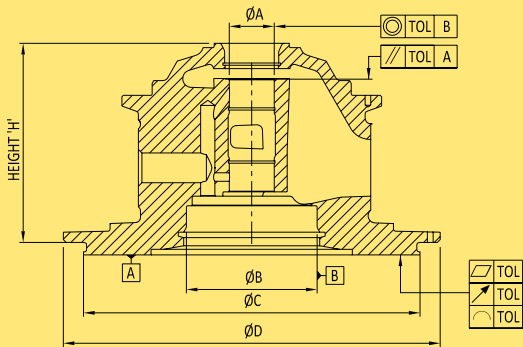
GEARS



# Other Engineering Applications

## TURBO CHARGER

### TURBINE HOUSING



### PARAMETERS

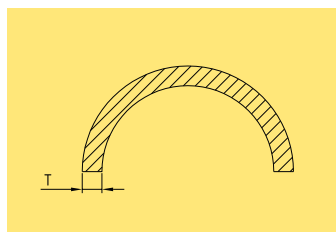
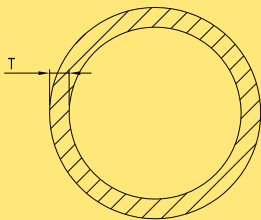
- Height 'H'
- Outer diameter
- Internal diameter
- Internal diameter at two levels
- Flatness of resting face
- Face runout
- Concentricity
- Parallelism
- Profile

### FEATURES

- All parameters in one go
- Easy to operate
- Optimum cycle time
- Motorised component rotation for dynamic measurement
- Data acquisition with SPC analysis

## SHELL BEARING

### PNEUMATIC MEASUREMENT



### PARAMETERS

- Thickness 'T'

### FEATURES

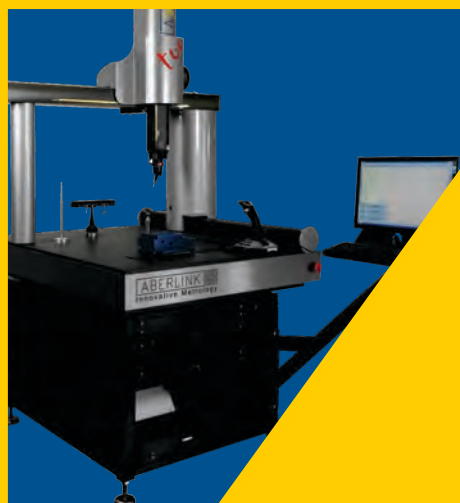
- Contactless measurement
- Range:  
Internal diameter  $\varnothing$  15 - 36 mm &  $\varnothing$  36 - 160 mm
- Adjustable arms provided to support & guide the shell while measuring
- Offered with analogue or electronic read out



WITHOUT FRONT SUPPORT



WITH FRONT SUPPORT



**COORDINATE  
MEASURING MACHINES**



# COORDINATE MEASURING MACHINES

## Xtreme SHOP FLOOR CNC CMM

Designed using a non-Cartesian structure and utilising linear motors and mechanical bearings, as its name implies, the Xtreme CNC CMM provides a robust solution for providing precision inspection results. The unique CMM's advantageous configuration ensures that it maintains its accuracy at very fast measurement rates and does not suffer from the accumulative inaccuracies that occur in conventional 3-axis Cartesian designs.

The Xtreme is a self-contained inspection unit. It has no air bearings, so no requirement for compressed air—just plug it in and go. Built-in temperature control and a compact footprint allow the Xtreme to be placed wherever it is needed.

Another unique advantage of the Xtreme is that all of the struts are temperature controlled to operate above ambient air temperature. This means that the measurement accuracy is maintained even when the surrounding environment is not temperature controlled.

The innovative Xtreme CMM is an evolution of CMM technology. However, it is the price of this machine that is the primary reason why the new Xtreme has had such a significant effect on the market.

### FEATURES

- No compressed air required - the Xtreme is 'plug and go'.
- The Xtreme's mechanical bearings mean that it is robust, so ideal for less than perfect environments.
- Built-in temperature control - accuracy is maintained even when ambient temperature is not controlled.
- Aberlink's revolutionary easy-to-use measurement software
- Shortest learning curve of any equivalent system - 1 day without prior CMM experience.
- Smallest overall footprint of any comparable size CMM.
- Free software upgrades till machine life.

Axis Travel (mm)	Overall Size (mm)
X 300	X 770
Y 300	Y 860
Z 200	Z 2025 (when on bench)
*Volumetric Accuracy:	(3 + 0.4L/100) μm
Scale Resolution:	0.5μm
Operational Temp Range:	0 - 45°C
Table:	Solid granite plate
Max. Velocity Vector:	750mm/sec
Max. Acceleration Vector:	750mm/sec <sup>2</sup>
Air Consumption:	None
Required Air Pressure:	Not required
*The machine should not be positioned where it will be subjected to rapid changes in temperature. Max rate of ambient temperature change should not be more than 1°C/hour.	



### MACHINE OPTIONS:

- 3-Port Auto-change Rack & TP20 Stylus Module
- Ergonomic monitor arm or touch-screen mointor
- Fixture Kit
- Steel Bench

# COORDINATE MEASURING MACHINES



## Axiom too... Manual or CNC CMM

Fast, accurate and reliable, the Axiom too CMM comes in four different sizes with Y axis travel up to 1500mm. Available as either a manual machine or with full CNC control, the Axiom too can be used with touch trigger probe, continuous contact scanning probe or with Aberlink's revolutionary non-contact camera system.

The all aluminium bridge structure not only ensures that the Axiom too has low inertia and hence high acceleration to get the job done quickly, but also that the temperature of the machine rapidly follows the temperature of the room, ideal when the CMM is not housed in a controlled environment. Temperature compensation in the software reports results as if they had been measured at 20°C.

The standard high-tech granite and aluminium table, originally developed for the optics industry, provides fantastic natural damping of high frequency vibration and the granite Y rail allows pre-loading of the bridge air bearings in both directions for superior accuracy.

Another unique feature of the Axiom too is that manual machines can be simply upgraded to CNC at any point in the future, which is great if you are not initially sure of your requirement or perhaps can't initially justify the additional cost of a CNC machine.

Because of Aberlink's fully integrated manufacturing processes, the Axiom too offers unbelievable value, but above all it is simple to use. Aberlink 3D measurement software is way out on its own as the market leader for ease-of-use, perfect for both occasional user and also metrology professional alike.

## FEATURES

- Shortest learning curve of any equivalent system
- Smallest overall footprint of any comparable size CMM
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimized friction free air bearings, all aluminium bridge and granite table
- Free software upgrades till machine life.

Axis Travel (mm)	Overall Size (mm)
X 640	X 1130
Y 600, 900, 1200, 1500	Y 900, 1200, 1500, 1800
Z 500	Z 2320
*Volumetric Accuracy:	TP20 (2.4 + 0.4L/100) $\mu\text{m}$ TP200 (2.3 + 0.4L/100) $\mu\text{m}$ SP25M (2.1 + 0.4L/100) $\mu\text{m}$
Scale Resolution:	0.5 $\mu\text{m}$
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	600mm/sec (CNC)
Max. Acceleration Vector:	600mm/sec <sup>2</sup> (CNC)
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

## COMMON PROBE OPTIONS

- MH20i
- RTP20
- PH10T (w/TP20, TP200)
- PH20
- PH10M (w/SP25)
- PH6M (w/SP25)

## MACHINE OPTIONS

- Automatic Temperature Compensation
- Touch Screen Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor





## Axiom too HS... High Specification CNC CMM

Since 2004 the Axiom too CMM has been providing manufacturing industry with a fast and accurate solution for their measurement problems. but, as ever, Aberlink are continually striving to improve the solutions which we offer. The Axiom too HS is both faster and more accurate than the standard model, and all without compromising the fantastic value for money for which Aberlink have become renowned.

Rather than using the belt drive system, the Axiom too HS incorporates drive rod technology developed on our larger machines and vision products. This allows even greater accelerations to be achieved meaning that the HS model measures approximately 20% quicker than the standard variant – ideal for high volume measurement.

The Axiom too HS also utilizes  $0.1\mu\text{m}$  resolution scales on each axis. Incorporated with state-of-the-art error mapping techniques this means that the HS model is the most accurate machine ever produced by Aberlink – ideal when measuring tight tolerances.

### FEATURES

- Shortest learning curve of any equivalent system
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Fitted with  $0.0001\text{mm}$  linear encoders for superior accuracy
- Angled bearing zero backlash drive system for quicker acceleration and faster travel
- Suitable for the workshop environment
- Optimized friction free air bearings, all aluminium bridge and granite table
- Free software upgrades till machine life.

Axis Travel (mm)	Overall Size (mm)
X 640	X 1130
Y 600, 900, 1200, 1500	Y 900, 1200, 1500, 1800
Z 500	Z 2320
*Volumetric Accuracy:	TP20 ( $2.1 + 0.4L/100$ ) $\mu\text{m}$ TP200 ( $2.0 + 0.4L/100$ ) $\mu\text{m}$ SP25M ( $1.8 + 0.4L/100$ ) $\mu\text{m}$
Scale Resolution:	$0.1\mu\text{m}$
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	866mm/sec
Max. Acceleration Vector:	1200mm/sec <sup>2</sup>
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change $<1^\circ\text{C/hr}$ and $<2^\circ\text{C/24hr}$ . Temperature gradient $<1^\circ\text{C/m}$	

### COMMON PROBE OPTIONS

- MH20i
- RTP20
- PH10T (w/TP20, TP200)
- PH20
- PH10M (w/SP25)
- PH6M (w/SP25)

### MACHINE OPTIONS

- Automatic Temperature Compensation
- Touch Screen Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor





## Zenith 3... High Speed, Medium Volume CNC CMM

The Zenith 3 CNC CMM is the result of a design evolution of the award winning Zenith too range of machines. Many of the design improvements revolve around the right leg of the machine, which has been modelled on the hugely successful Azimuth machine.

Greater air bearing separation results in greater stiffness, and so has improved the accuracy significantly. The first term error for this new model is more than a micron better than the Zenith too.

All moving parts are light and this, combined with good design, means that the Zenith 3 has low inertia and therefore optimal acceleration characteristics. The improved Zenith is fast, minimising inspection times.

The Zenith 3 range is the best value-for-money for the measuring volume of any CMM available in the market – the perfect affordable metrology solution for big and heavy parts.

### FEATURES

- Aberlink's revolutionary easy-to-use measurement software
- Shortest learning curve of any equivalent system - 1 day without prior CMM experience
- Smallest overall footprint of any comparable size CMM
- Choice of Y axis sizes ranging from 1000mm to 3000mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimised friction free air bearings, all aluminium bridge and granite table
- CMM Touch Screen Joystick supplied as standard
- Free software upgrades till machine life.

Axis Travel (mm)	Overall Size (mm)
X 1000	X 1520
Y 1000, 1500, 2000, 2500, 3000	Y 1700, 2200, 2700, 3200, 3700
Z 600, 800	Z 2500, 2900
*Volumetric Accuracy:	TP20 (2.7 + 0.4L/100) $\mu\text{m}$ TP200 (2.6 + 0.4L/100) $\mu\text{m}$ SP25M (2.4 + 0.4L/100) $\mu\text{m}$
Scale Resolution:	0.5 $\mu\text{m}$
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Solid granite
Table Load Capacity:	1500kg as standard (Options up to 4400kg)
Max. Velocity Vector:	600mm/sec
Max. Acceleration Vector:	600mm/sec <sup>2</sup>
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	



### COMMON PROBE OPTIONS

- RTP20
- PH10T (w/TP20, TP200)
- PH20
- PH10M (w/SP25)
- PH6M (w/SP25)

### MACHINE OPTIONS

- Automatic Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor





# COORDINATE MEASURING MACHINES

## Azimuth... Rapid, High Accuracy Large Volume CNC CMM

As CMMs get larger, it is not simply a case of scaling up the design of smaller models. Stiffness of the structure is critical, but weight must also be kept to a minimum. The Azimuth CMM is not only Aberlink's largest in their range of CMM products, but it is the culmination of over twenty years' experience and excellence in the design and manufacture of innovative metrology equipment incorporating the very latest materials technology.

The revolutionary bridge of the Azimuth incorporates aluminium honeycomb sheets developed for use in formula one and the aerospace industry. The remarkable stiffness to weight ratio that this provides gives the Azimuth an edge in both performance and speed. For a machine of this size, the Azimuth is not only fast, but extremely accurate.

The drive systems designed for the Azimuth offer simplicity and reliability and the novel system used on the Y axis ensures that there is no degradation of performance across the full range of machine sizes offered up to 3m. A big machine should also be able to measure a heavy component and this is another area where Aberlink have applied innovative thinking. Rather than simply increasing the depth of the granite table, which adds huge cost and weight to the machine, we offer a specially designed load plate to sit on the granite base. This plate can accept up to a six tonne load which will then be transmitted directly through the feet of the machine bench directly to the floor, meaning no loss of metrology performance whatsoever – just another really clever idea!

### FEATURES

- Capable of measuring parts up to 6000kg in weight.
- Fitted with 0.0001mm linear encoders for superior accuracy.
- Unique self-contained drive system ensures excellent performance over the entire measuring volume.
- Anti-vibration mounts as standard.
- Choice of Y axis sizes ranging from 1000mm to 3000mm.
- Free software upgrades till machine life.

Axis Travel (mm)	Overall Size (mm)
X 1200	X 1940
Y 1000, 1500, 2000, 2500, 3000	Y 2000, 2500, 3000, 3500, 4000
Z 1000	Z 3595
*Volumetric Accuracy:	TP20 (2.9 + 0.4L/100) $\mu\text{m}$ TP200 (2.8 + 0.4L/100) $\mu\text{m}$ SP25M (2.6 + 0.4L/100) $\mu\text{m}$
Scale Resolution:	0.1 $\mu\text{m}$
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	0 - 45°C
Table:	Solid Granite
Table Load Capacity:	1500kg as standard (Options up to 6000kg)
Max. Velocity Vector:	650mm/sec
Max. Acceleration Vector:	850mm/sec <sup>2</sup>
Air Consumption:	50 l/min (1.8 cfm)
Required Air Pressure:	4 bar (60 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr, Temperature gradient <1°C/m	

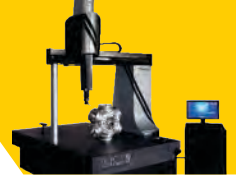
### COMMON PROBE OPTIONS

- PH10T (w/TP20, TP200)
- PH20
- PH10M (w/SP25)
- PH6M (w/SP25)

### MACHINE OPTIONS

- Automatic Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Load plate for loads up to 6 tonnes
- Dual Monitor





## Aberlink 3D Measurement Software - Making Measurement Easy

The whole philosophy for Aberlink is to make measurement easy. Aberlink 3D software has been written by engineers for engineers and sets the industry standard for simple-to-use software. Designed around a graphical interface, Aberlink 3D can work in 2D or 3D, on manual or CNC CMMs and is equally at home when used with either touch, scanning or vision systems.

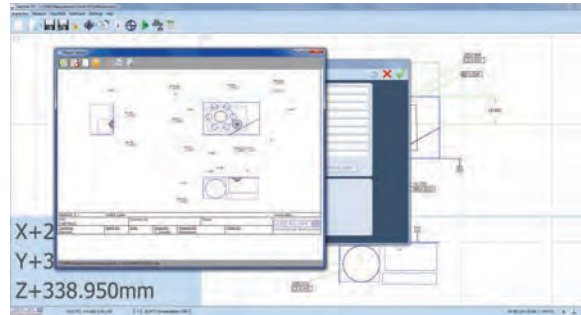
Aberlink 3D software is not only ahead of its competition in being the industry standard for 'easy-to-use' software, but also has the depth of functionality to make it the choice for either occasional users or full-time inspection professionals.

Aberlink 3D software is revolutionary. For example, Feature Predict enables you to just take measurement points and the software automatically determines if you are measuring a Plane, Line or Circle feature. Move from feature to feature and the software predicts what you are measuring. As a component is measured a representation of it is built up on the screen. The user simply clicks on the measured features to call up dimensions exactly as they would appear on a drawing.

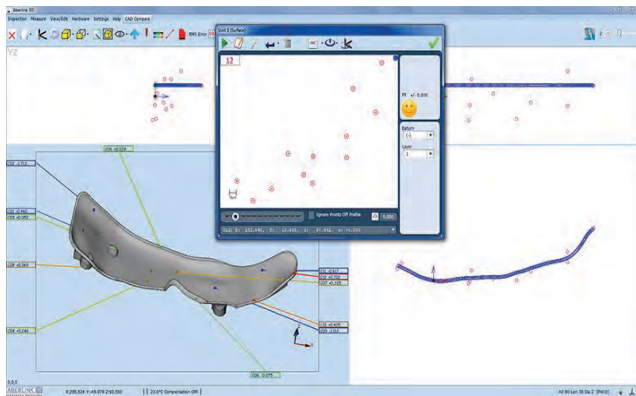
Inspection reports can be in the form of fully dimensioned graphical representations as created on the screen, or tabulated reports in various formats that can show nominals, tolerances, errors, pass/fails, geometric tolerances etc. These reports can also be output to an Excel spreadsheet.

Further reports are available to show the form of features (roundness, straightness etc.), hole or point positions, or complete batch results on one report. The user's company name also appears on all outputs.

Every time a component is inspected, a programme for measuring subsequent components is automatically created. The software also calculates 'safe' moves between features, even when the probe is indexing – just another thing that the operator doesn't have to worry about.



## Aberlink CAD Comparison Software Module



The Aberlink CAD Comparison software module enhances Aberlink 3D with the capability to compare measured points to a CAD model. Often this will be the only way to measure complex parts, or perhaps sometimes drawings for the component simply don't exist.

Powerful alignment routines allow measurement points to be best-fitted to the model. Colour coded errors can then be displayed on the model to produce both graphical and tabulated reports that are extremely clear and very easy to understand.

Aberlink's CAD comparison module allows the input of either STEP or IGES files as standard and allows reports to be exported as an Excel spreadsheet. It really does make measuring complex parts easy, whether on a manual or CNCMM.

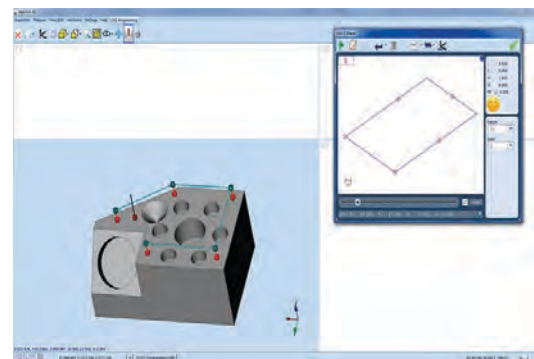
## Aberlink CAD Programming Software Module

For many years Aberlink 3D software has been setting the industry standard for both ease of use and speed of programming. However, until now this has been best done by using the teach-and-repeat method of programming when measuring a component. But what if you want to prepare the measurement programme before you even have the first component? Now, we are pleased to introduce our new CAD programming module, which in true Aberlink fashion, allows the simplest programming possible from either an IGES or STEP CAD model.

If you can use Aberlink 3D software then you will already know how to use the CAD programming module – it couldn't be easier. Rather than taking measurement points on a component, you can now just click on the surface of the model where you would like the points to be taken.

Feature Predict works in the same way as when measuring, for instance, if you click in four places on the same plane on the model, then the software will automatically create a Plane Measure unit with those four points in it. Then click on a different feature and it will automatically close the Plane window and look for another feature. If you click on a circular feature it will take just one click to produce a circle or two for a cylinder. Suddenly programming in Aberlink 3D just got even easier!

Aberlink's CAD programming module can be used either on the CMM or off-line... nothing could be more straightforward.



## Probe Options

Every bridge-type Aberlink CMM fully supports the range of probe heads and both touch trigger and scanning probes supplied by Renishaw. The following are common options:



### TP8 PROBE

The TP8 probe offers an entry level option for customers that require infrequent indexing of the probe and no indexing during the running of a measurement programme. The TP8 is supplied with two knuckle joints to allow infinite alignment of the probe to the feature being measured, but this alignment is non-repeatable, meaning that the stylus will need to be requalified following each index. The TP8 probe accepts the M3 range of styli.

### MH20i Probe Head

The MH20i probe offers repeatable manual indexing of the probe head from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments. Ideal for manual CMMs, it can also be used on CNC models, but will require intervention from the operator whenever indexing is required. The MH20i uses a TP20 stylus module, which in turn accepts the M2 range of styli.



### RTP20 Probe Head

The RTP20 probe offers a really cost effective solution for customers that require automatic indexing on CNC machines. Modelled on the MH20i body, the RTP20 uses the CNC motion of the CMM to position itself using a post mounted to the bed of the machine. Like the MH20i it is able to index from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments and uses a TP20 stylus module, which in turn accepts the M2 range of styli. The RTP20 is also fully compatible with the MCR20 change rack to provide an option that provides both automatic stylus changing as well as automatic indexing.

### PH10T Probe Head

The PH10T is a fully motorised probe head that offers immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. This probe head should be used by customers requiring frequent indexing or when more precise alignment to the features being measured is required.



## Common probe options for the PH10T :

### TP20

The TP20 is a robust probe for general purpose measurement that can be used in conjunction with the MCR20 change rack to facilitate automatic stylus changing. The TP20 stylus modules can be supplied with different trigger forces which accept M2 styli up to 60mm long, and with different length modules to assist with probing at greater depths.

### TP200

The TP200 probe utilizes strain gauge technology and so does not exhibit lobing characteristics and therefore should be considered by customers requiring more accurate measurement of form. It can be used with the SCR200 change rack for automatic stylus changing and the TP200 modules are available as standard or low force for use with M2 styli up to 100mm long.



### PH10M Probe Head

Like the PH10T probe head, the PH10M is also a fully motorised probe head that offer immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. The M head, however, incorporates an autojoint with multiwire capability, which is necessary for the SP25M scanning probe. The PH10M probe head can also be fitted with either TP20 or TP200 probes and should be chosen in preference to the PH10T when using these probes if the future use of a scanning technology may be required.

### PH6M Probe Head

This head provides a fixed autojoint for when an SP25M scanning probe is needed without the requirement for indexing.



## SP25M Scanning Probe

The SP25M scanning probe uses an isolated optical metrology transducer system to enable extremely accurate measurements to be taken with the stylus in continuous contact with the feature being inspected. This enables more data to be taken which is important when form is critical. A range of modules are available for the SP25M to provide optimised scanning performance using M3 styli up to 400mm long.

# COORDINATE MEASURING MACHINES



## PH20 Probe Head

Incorporating the latest 5-axis technology, the PH20 head offers infinite indexing to assist with alignment to any feature being measured at any angle up to 120°. The probe is able to perform 'head touches', where it flicks the stylus on to the surface of the component being measured, while the machine remains stationary. This increases both the speed of measuring and accuracy achievable. Please note that if selecting the PH20 head, then the machine would also have to be fitted with a Renishaw CMM controller. The PH20 uses TP20 stylus modules, which in turn accept the M2 range of styli.



Probe Head Comparison	Integral Probe	Index Motion	Maximum Length	Index Resolution	Index Positions	Repeatable Indexing	Repeatable Stylus Changing
TP8	Yes	Manual	105mm	Infinite	Infinite	No	No
MH20i	Yes	Manual	150mm	15°	168	Yes	Yes
RTP20	Yes	Automated	168mm	15°	168	Yes	Yes
PH10T	No	Motorised	450mm	7.5°	720	Yes	Yes
PH20	Yes	Motorised	168mm	Infinite	Infinite	Yes	Yes
PH6M	No	No	450mm	No	No	No	Yes
PH10M	No	Motorised	450mm	7.5°	720	Yes	Yes

## CMM CAMERA

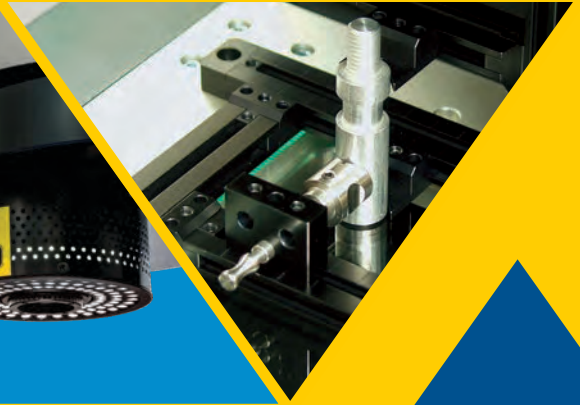
(TOUCH & VISION ON THE SAME MACHINE)

Aberlink's camera system offers a non-contact facility on any Aberlink CMM. A clever design of magnetic, kinematic joint allows the probe and camera to be swapped in just seconds. This means that components can be inspected using both touch trigger and vision inspection technology on the same machine.

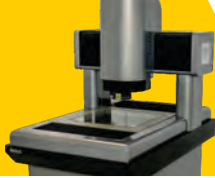
The camera incorporates a telecentric lens that gives a distortion-free image on the monitor. It also contains a fully programmable 16-LED light ring which contains alternate white and UV LEDs. The white LEDs provide surface illumination in the normal manner while the UV LEDs provide an ingenious solution to the perennial problem of backlighting on a CMM - the component to be measured is simply placed on a plate containing special reflective paper.







# VIDEO MEASURING MACHINES



# Multi Sensor 3D CNC CMM



## VIDEO & TOUCH

Baker has collaborated with Schut Geometrical Metrology to present 3D CNC Coordinate Measuring Machines manufactured in the Netherlands with Video Measurement (Optical) & Touch Probe Measurement facility depending upon the customer's requirements & are available in 5 measuring range models.

With an excellent price-performance ratio, the DeMeet measuring machines break the barrier for high precision quality control on the production floor as well as in measuring laboratories.

Applications of the Video & Multi-Sensor measuring are among others in the Precision Engineering, Medical, Plastics and Electronics industry.



## SPECIFICATIONS

	DeMeet-220	DeMeet-400	DeMeet-404	DeMeet-443	DeMeet-705
Measuring range (mm)	X = 220, Y = 150, Z = 100	X = 400, Y = 250, Z = 200	X = 400, Y = 400, Z = 200	X = 400, Y = 400, Z = 300	X = 700, Y = 500, Z = 300
Table size (mm)	X = 357, Y = 260	X = 560, Y = 422	X = 560, Y = 580	X = 560, Y = 580	X = 930, Y = 700
Dimensions (mm)	W= 520, L = 700, H = 615	W= 865, L = 930, H = 1570	W= 865, L = 1245, H = 1580	W= 865, L = 1245, H = 1785	W=1520, L = 1550, H = 1820
Weight (approx. kg)	110	530	700	720	1400
Maximum load (kg)	20	50	50	50	60

Technical Specifications		
General Specifications	Video Model	Combo Model
Video System	DeMeet Sony sensor camera	
Touch Probe System	-----	Renishaw TP20
Nikon Telecentric Lenses	3.0x (1.0x, 5.0x and 10.0x optional)	
Leica design Telecentric Lenses	2.0x (1.0x, 5.0x and 10.0x optional)	
Ringlight*	White LED: 3 Rings, 16 Segments and 48 Cells (adjustable)	
Backlight and Coaxial Light	Adjustable	
Measuring Table	Tension relieved, hard anodized aluminum	
Drive System	DC Servo Motors	
Operating Mode	Motorized joystick control / CNC	
Construction DeMeet-220	Cast iron, extremely tension relieved	
Construction	Fixed bridge with granite base plate DIN876/00	
Structure	Extremely tension relieved, flat grinded cast iron	
Linear guides	THK linear guides	
Linear encoders	Renishaw TONIC linear encoders	
* For video models (except DeMeet-220) a Ring light with 4 rings, 16 segments and 64 cells can be supplied as an option.		
Measuring Specifications		
Resolution (µm)	0.5 (0.1 optional)	
Accuracy in µm for 0.5µm model (L in mm)	X/Y/Z = 4+L/150*	XYZ = 5+L/150*
Accuracy in µm for 0.1µm model (L in mm)	X/Y/Z = 3+L/200*	XYZ = 4+L/200*
Travel Speed Max. (mm/s)	X/Y = 250, Z = 55	
Acceleration Max. (mm/s <sup>2</sup> )	X/Y/Z = 500	
* The accuracy of the probing system should be taken into account.		
Environmental Conditions		
Operating Temperature (°C)	15 - 35	
Measuring Temperature (°C)	20 ± 0.5	
Humidity (%)	40 - 70 (no condensation)	

- Specifications apply to all DeMeet models, unless otherwise specified.
- Machines with higher specifications and/or modifications are available upon request.
- Specifications are subject to change without prior notice.

# Multi Sensor 3D CNC CMM



**BAKER**

*DeMeet*

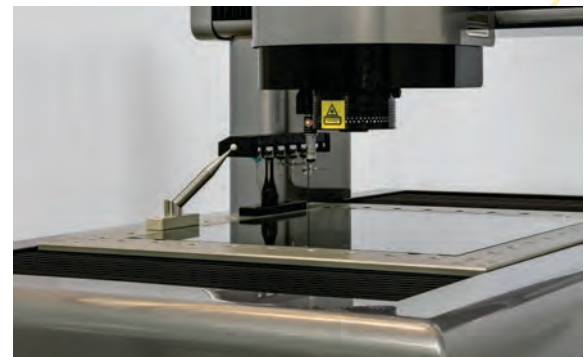
## VIDEO MEASUREMENTS

With non-contact measuring, the measurements in 2D and/or 3D are performed without the risk of product deformation or damage. Within the (camera) field of view, a very high accuracy can be achieved. The measuring speed of optical measurements with the DeMeet is very high. A combination of high quality optics and camera is integrated for a clear image with an excellent contrast and a high resolution. Telecentric optics are supplied as a standard to avoid perspective image distortion around the center of the field of view. The DeMeet is either equipped with Nikon or Leica-Design optics for a brilliant image with high contrast. The lenses generate a display magnification from 40x to 400x. Optimal illumination is essential for accurate measurements. The DeMeet is standard equipped with three different light sources. A ring light consisting of a 3 rings LED pattern, which can be controlled per individual ring, segment and cell, is standard supplied for optimal light configuration. The ring light can be set in intensity and angle to achieve the best contrast with clearly defined edges. The LED based backlight and coaxial light can be adjusted in intensity. The coaxial light can be used for illumination inside deep located structures.



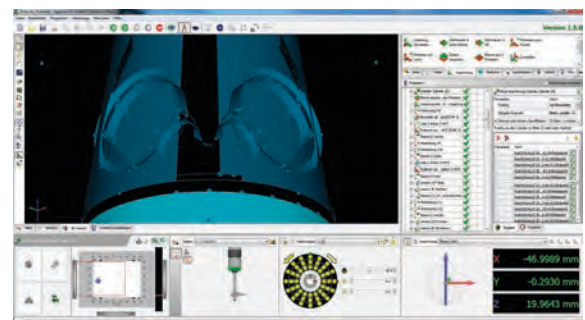
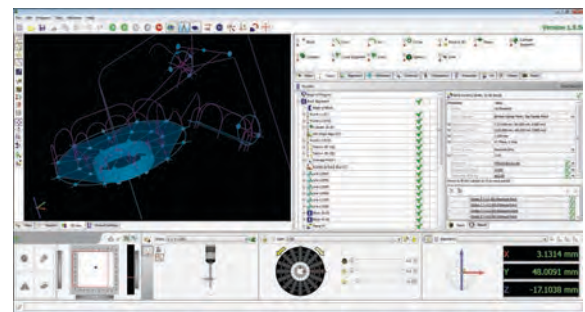
## MULTI-SENSOR MEASUREMENTS

For measurement of certain features, we encounter the physical limitations of non-contact measurement. To overcome this the DeMeet machines can be additionally equipped with a touch probe system. With the DeMeet Combo model both principles are integrated and measurements can be performed by the optical and the probing system. Standard Renishaw TP20 with a 5-way stylus configuration is supplied.



## AfDM MULTI - SENSOR SOFTWARE

Approve for DeMeet (AfDM) is a true multi-sensor software package. It has been developed from the ground up, keeping the measurement inputs of the different measuring devices in mind to adjust the necessary differences. AfDM is designed to be a user-friendly software package, but still is flexible and very elaborate to measure many products. High accurate measurements in 2D and/or 3D can be done for all kinds of industries like precision mechanics, medical, plastics or electronics to improve quality control. All the measuring results of video and touch probe can be displayed, reported, exported and used in constructs together, and are dynamically updated.









Points  
UCL  
CL  
LCL

control chart lines  
UCL 108.047  
CL 108.035  
LCL 108.024

Points  
UCL  
CL  
LCL

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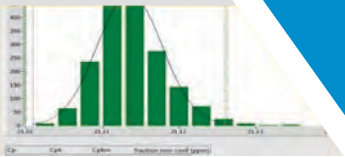
Channel 14 Channel 15 Channel 16  
Channel 15 Channel 6 Channel 7 Channel 8 Channel 9 Channel 10 Channel 11

Parameter Values 9-16  
Histogram  
Dell  
mergauge.com

LESS THAN L  
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BETW  
B  
OR

HAN UT  
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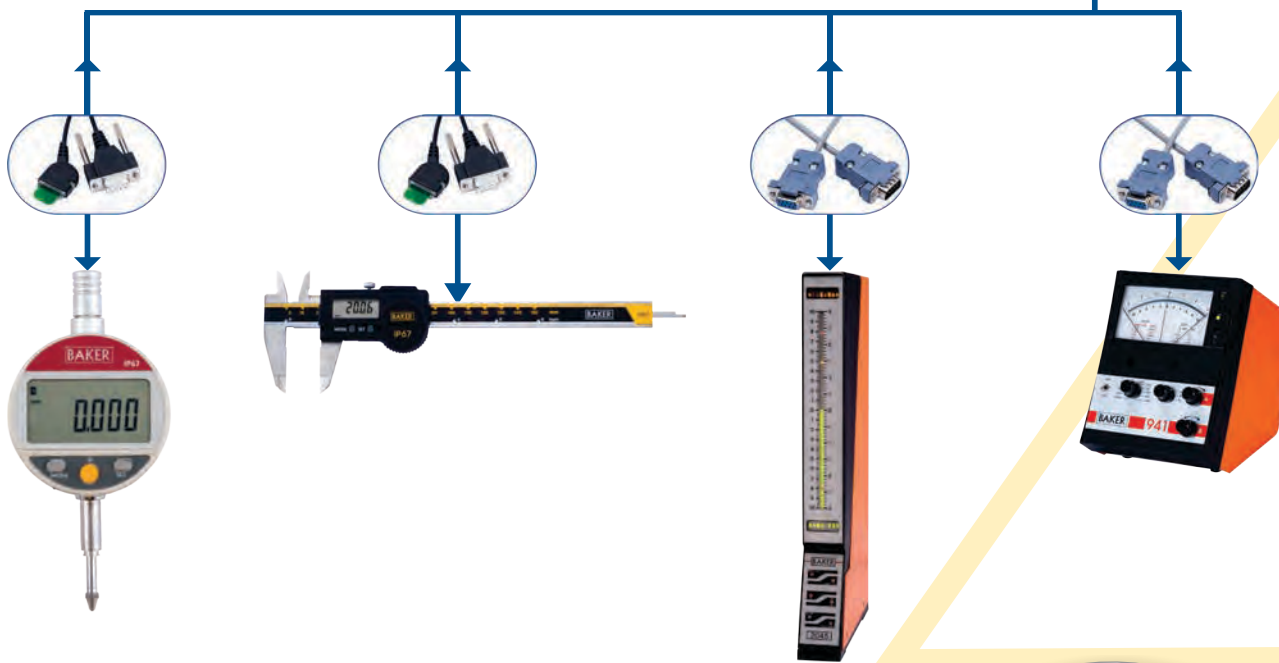
# DATA ACQUISITION & SPC SOFTWARE



The world today is moving toward Statistical process control techniques at a lightning pace. It is likely that in the near future, the use of statistical process control is mandated in the automobile industry. In order to keep its customers at par to international requirements, Baker Gauges has developed Q-Soft a simple yet effective data acquisition and SPC software, which can be easily installed by anyone, ranging from a small workshop to a big organization. It is as simple as plug and play.

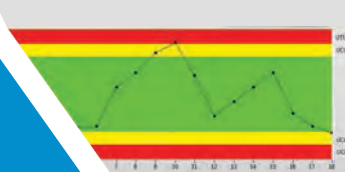


**BAKER** Q-Soft



**REQUIREMENTS**

- Baker digital instruments capable of data output
- Connecting cables
- Multiplexer (optional)
- PC (Minimum Configuration Win XP and Above)
- Q Soft Software



## REAL TIME PROCESS CONTROL

Date	Time	Parameter	Machine No	Operator	Part Name	Count	Reading
10/16/2013	6:31:08 PM	od1	1	VICKY	1	19	- 1.8 um
10/16/2013	11:50:00	od2	1	VICKY	1	22	- 1.7 um
10/16/2013	11:50:01	od3	1	VICKY	1	18	- 1.35 um
10/16/2013	11:50:02	od4	1	VICKY	1	19	- 1.5 um
10/16/2013	11:50:03	od5	1	VICKY	1	24	- 1.4 um
10/16/2013	11:50:02	od6	1	VICKY	1	20	- 1.35 um
10/16/2013	12:03:33	od7	1	VICKY	1	3	- 1.2 um
10/16/2013	12:05:30	od8	1	VICKY	1	7	- 1.1 um

Various representations of data, displayed on one screen with tabs for navigation.

Part Number: 123, Part Name: trial, Back Color: Reading > UTL, Fore Color: Reading > UTL

Parameter: 002, Channel: 1

UTL Value: 105, UCL Value: 10.3125, LTL Value: 10, LCL Value: 10.3875

Manual/Automatic: [Manual] [Automatic]

Buttons: Add, Save, Modify, Delete, Close

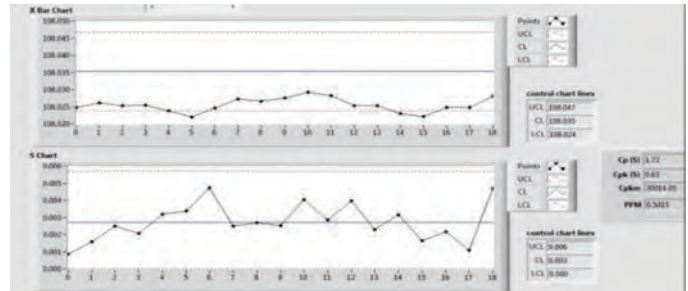
Online information includes - Date, time, part name, parameter, machine, measurement values and count of individual measurements.

## STATISTICAL INFORMATION INCLUDES

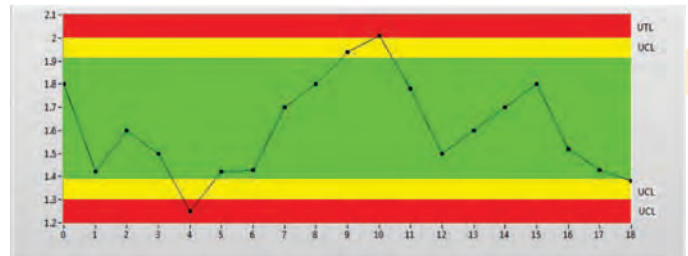
CP, CPK, CPM, PPM

Part No	Parameter	Part Name	Cp	Cpk	Cpm	PPM
1	od1	1	0.577924	0.511006	0.785908	18272
2	od2	1	0.650589	0.590437	0.722389	30164.1
3	od3	1	0.692114	0.622382	0.848023	10870.3
4	od4	1	0.806322	0.628052	0.811571	12440.1
5	od5	1	0.76006	0.51204	0.599409	68928.8
6	od6	1	0.680343	0.540182	0.729177	27423.5
7	od7	1	0.891413	0.734579	0.745745	24574.8
8	od8	1	0.853221	0.800462	0.676196	17545.7

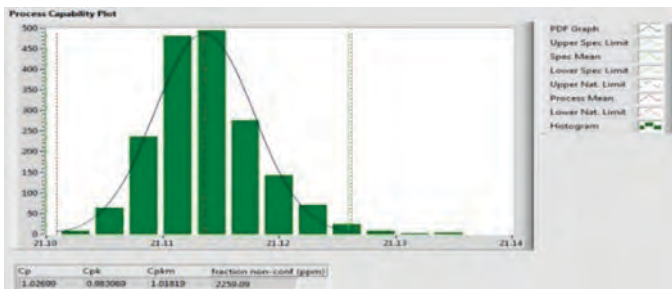
### XBAR-R CHART



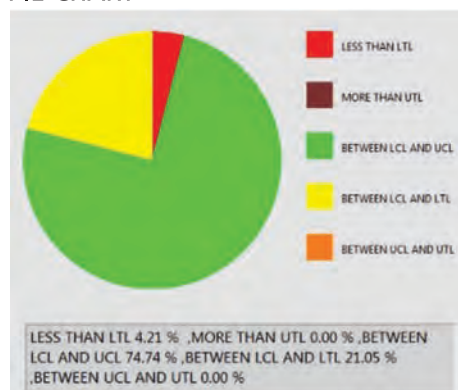
### RUN CHART



### HISTOGRAM



### PIE CHART



## REPORT OUTPUT

- Results of statistical data can be offered as :-
  - Xbar-R control chart
  - Xbar control chart
  - Xbar-S control chart
  - Histogram
  - Runchart
- All Statistical charts can be exported to html format and can be also printed.
- During runtime, statistical charts could be further customized.
- Results such as X dbar, Standard Deviation (Rbar/d2), Process capability (Cp, Cpk, Cpm, Ppm) are standard in the report.
- Optional outputs in the form of Pie charts and tabular form also available.
- In the table form, data can be exported to Excel, html format and can also be printed





**CALIBRATION SERVICES**

**IAC** GEO METRICAL ENGINEERS

IAC Master Scanner XP

IBB TECHNOLOGY

Mahr

Mahr

REVOISE sip 305M

550M

550M

# Calibration Services

**BAKER GAUGES INDIA PRIVATE LIMITED** is dedicated to the pursuit of excellence in the field of dimensional metrology. We have embodied our wealth of experience and expertise in this fine science of measurement into our Calibration Laboratories, which are equipped with the most reliable and sophisticated world class measuring equipment available and operated under controlled environmental conditions. Our measuring equipment are periodically calibrated by National Physical Laboratory, New Delhi and our masters have National and International traceability.

We are confident that our calibration services can form the backbone of your Quality Assurance system.

## WHY SHOULD YOU CHOOSE CALIBRATION SERVICES FROM **BAKER** ?

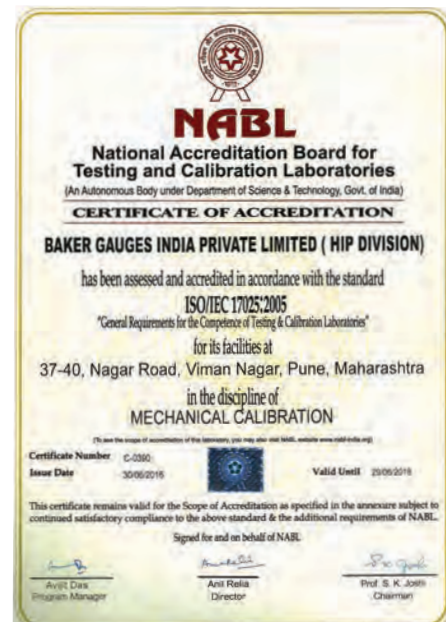
- ISO/IEC 17025 calibration laboratories accredited by NABL (National Accreditation Board for Testing & Calibration Laboratories), India, signatory to ILAC & APLAC MRAs.
- Highly precision and reliable world class measuring equipment and reference masters traceable to national / international standards to ensure highest possible accuracy and our measurement uncertainties are comparable with some of the leading calibration laboratories in dimensional measurement.
- Our measuring equipment includes:
  - ▶ SIP 550M Computer aided Universal Calibration and Measuring Machine with a resolution of 0.00001 mm
  - ▶ Carl Zeiss Universal Horizontal Metroscopes
  - ▶ Mahr make form tester MMQ400
  - ▶ Automatic photo dial calibrator
  - ▶ Rank Taylor Hobson Surtronic 4 + surface finish analyzer
  - ▶ Sigma high precision electronic outside diameter calibration comparator
  - ▶ Co-ordinate Measuring Machine – DEA make Model Micra 4.5.3
  - ▶ IBB Twin Check Length Measuring Machine with laser interferometer
  - ▶ IAC Master Scanner
- Excellent Controlled Environment for calibration:
  - ▶ Temperature 20 °C ± 1 °C
  - ▶ Relative Humidity 40-60 %
- Well trained and experienced laboratory technicians.



BMI DIVISION



HIP DIVISION



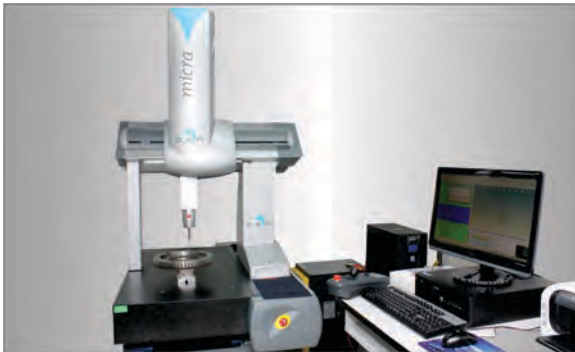
# Scope - BMI & HIP



## OUR CAPABILITY INCLUDES CALIBRATION OF :

BMI Division		
Sr.no.	Parameter/Gauge/Instrument	Range
1	Ring Gauge & Snap Gauge	Ø1 mm to Ø400 mm
2	Setting Disc, Plain Plug Gauge, Height Masters	Upto 500 mm
3	Plunger /Lever Type Dial Gauge, Digital Gauge	Upto 30 mm
4	Electronic Probe	Upto 30 mm
5	Bore Gauge	Upto 1.2 mm (Transmission error)
6	Digital/Vernier/Dial Caliper	Upto 300 mm
7	External/Internal Plain Taper Gauge	Upto Ø300 mm
8	Surface Roughness	Upto 0.006 mm Ra
9	Roundness	Upto Ø 500 mm and Roundness Deviation 1 mm
10	Three point Internal Micrometer	2 mm to 300 mm
11	Height Gauge	600 mm
12	Gauge Block	0.5 - 100 mm

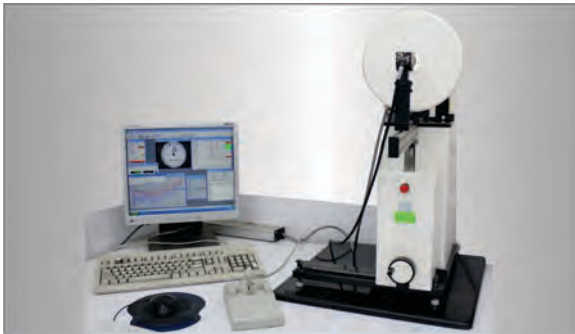
HIP Division		
Sr.no.	Parameter/Gauge/Instrument	Range
1	Thread plug gauge	1 to 400 mm
2	Thread ring gauge	1 to 350 mm
3	Taper thread plug gauge	1/16" to 10"
4	Taper thread ring gauge	1/16" to 8"
5	External micrometer	Upto 500 mm
6	External diameter	Upto 400 mm
7	Internal diameter	3 to 350 mm



PRECISION CO-ORDINATE MEASURING MACHINE



LASER LENGTH MEASURING MACHINE



AUTOMATIC PHOTO DIAL CALIBRATOR



THREAD MASTER SCANNER



PRECISION LENGTH MEASURING MACHINE



PRECISION LENGTH MEASURING MACHINE



FORM TESTER MMQ 400



PRECISION OD COMPARATOR



GAUGE BLOCK CALIBRATOR







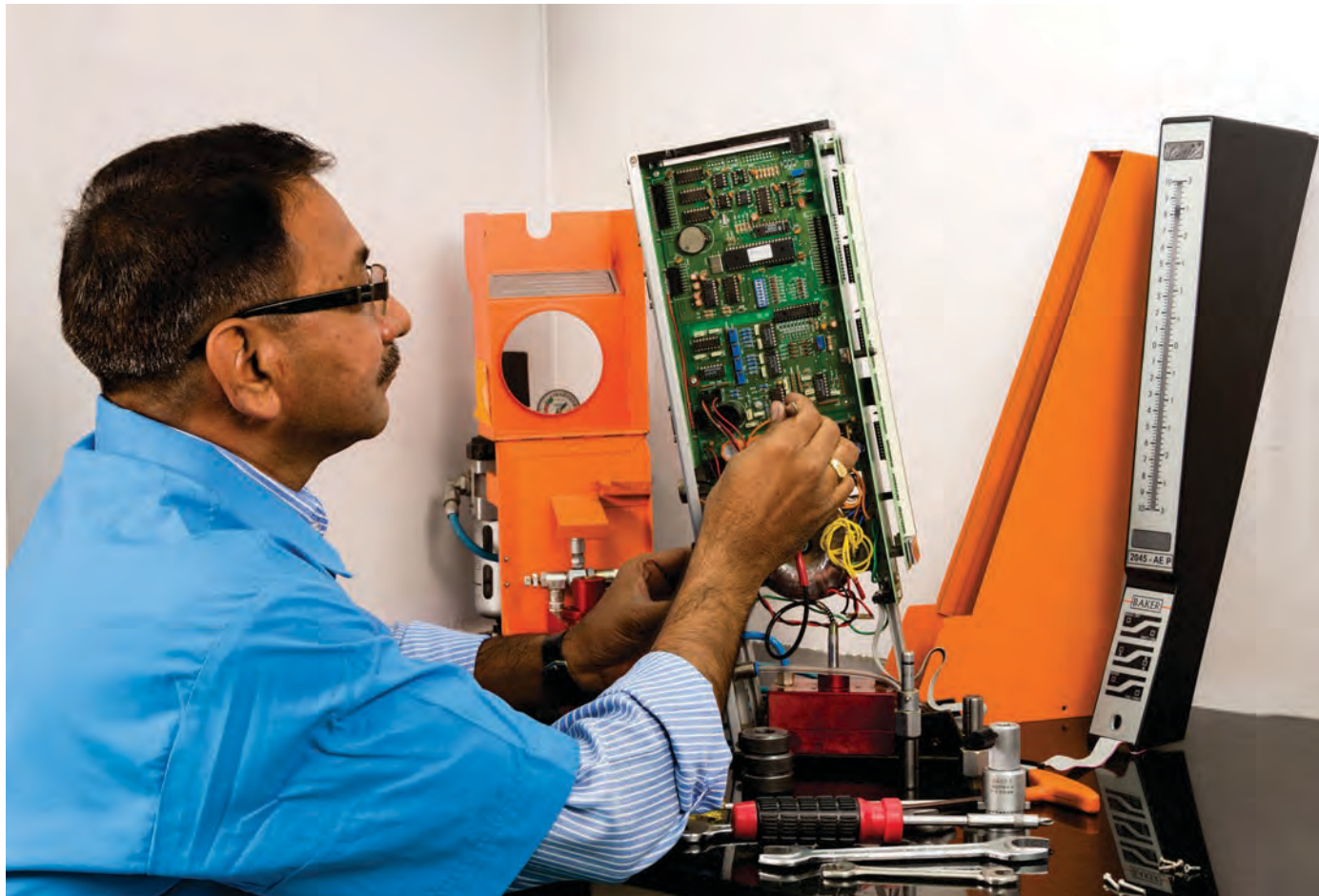
**AFTER SALES**



# After Sales

We understand that whenever a customer buys any product, what he buys is not just the physical product, but also the service support that comes along with it, so that the product keeps on giving the desired results year on year.

## REPAIR



Our team maintains all spares in stock and offers quick response and solutions to customers who are looking for immediate support for repair of their measuring equipments. Our team co-ordinates with plant and customers to ensure timely delivery of repairs. This is being achieved through better planning and data management to ultimately provide better service support. We believe we have the strongest after sales support in the market. This is the main distinguishing factor and key advantage of why Baker Gauges is a preferred supplier when it comes to precision linear dimensional measuring gauges and equipments. Our global exports to 60 countries is a proof of our consistent quality and reliability.

## ANNUAL MAINTENANCE CONTRACT

We, at Baker Gauges, have a team of dedicated and well trained people who offer service and support to all customers for repairs and maintenance of all **Air Gauge Units, Air – Electronic units, Precision Measuring Instruments and Multi Gauging Fixtures.**

We offer onsite support to customers, based on their request. Our team maintains a list of customers under AMC and provides them with scheduled maintenance visits as per their requirement. We also send all our customers timely reminders of the due date of servicing to take better care of all their equipment and keep them under the preventive maintenance schedule. This enhances efficiency and life of the customer's gauging equipments and ensures only good quality production is dispatched out of their factories. Our aim is to provide the customer with better value for Money and full trust of using Baker products, for ensuring quality of production, in line with our customer's requirements.



## TRAINING

Our well trained team provides onsite training and support to train customers on how to use our products and keep them running in good condition. With such support in place, we are one step ahead of the expectations of our customer and this places us ahead of our competition. So, the next time you decide to buy a simple dial gauge or a complex customized multi-gauging solution, please check up on the following:

- Will the supplier be around to give you service in the future?
- Will their services be prompt and up to the mark?
- Will their services burn a hole in your pocket?

# World Class Infrastructure



SMS CNC Thread Grinding Machine



Reishauer RAG - Thread Grinding Machine



Reishauer NRK - Thread Grinding Machine



Mori Seiki - CNC Turn Mill Centre



Star CNC Sliding Head Automatic



# World Class Infrastructure



Wahli CNC Gear Hobbing Machine



Citizen CNC Sliding Head Automat



Brother CNC - Drill Tap Centre



Matrix 37 - Thread Grinding Machine

