

BAKER

....a passion for precision



CORE TEAM: BMI DIVISION



CORE TEAM: HIP DIVISION

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DIAL GAUGES



Plunger type

MODEL 40



K40

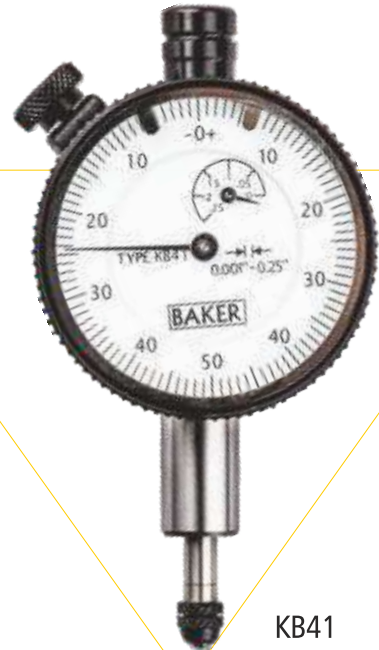


K36



K40Z

AGD TYPE A GROUP 1 (1 5/8")



KB41

METRIC

Bezel dia.	Type	Reading	Range	Graduation
40mm	K39	0.01mm	5.0mm	0-50-0
	K40			0-100
	K36			0-50
	K40Z		0-40-0	
	K35		10mm	0-10

INCH

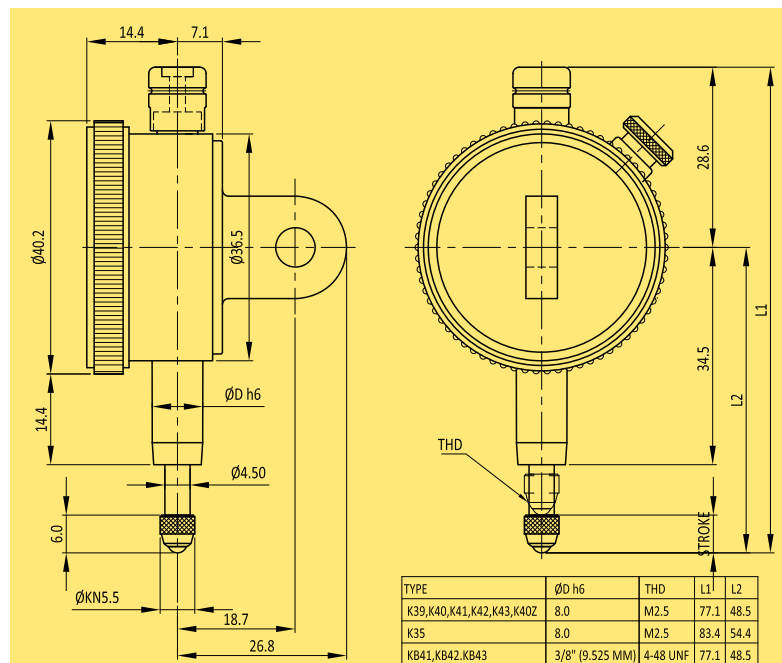
Bezel dia.	Type	Reading	Range	Graduation
40mm	K41	0.001"	0.25"	0-50-0
	K42			0-100
	K43			0-50

ANSI (AGD)

Bezel dia.	Type	Reading	Range	Graduation
1 5/8"	KB41	0.001"	0.25"	0-50-0
	KB42			0-100
	KB43			0-50

FEATURES

- Specification: IS, DIN, ANSI & JIS
- Small diameter dial – convenient for use where space is limited
- Ideal for small Bore Gauges like 10 to 18 mm
- Each gauge carries a calibration certificate giving actual values
- Spindle made of stainless steel
- Fitted with tungsten carbide ball anvil
- Rigid case for increased strength
- Strong and smooth metal bezel
- Supplied with tolerance pointers
- Aesthetically appealing protective top cap in black colour
- Inch Gauges confirm to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available



Plunger type (inch)



AGD TYPE A GROUP 2 1/4"



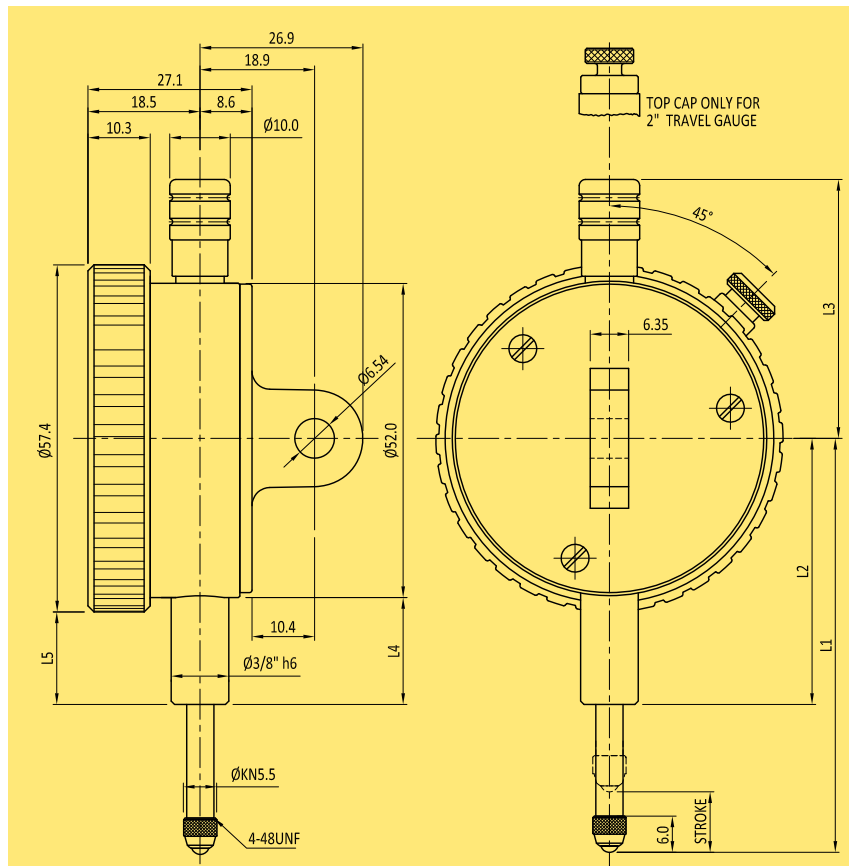
KB50

INCH

Bezel dia.	Type	Reading	Range	Graduation
2 1/4"	KB45	0.001 "	0.25"	0-50-0
	KB46			0-100
	KB51		0.5"	0-50-0
	KB52			0-100
	KB49		1"	0-50-0
	KB50			0-100
	KB21	2.0"	0-100	
	KB55	0.0005"	0.25"	0-25-0
	KB56			0-50
	KB53		0.5"	0-25-0
	KB54			0-50
	KB57		1"	0-25-0
	KB58			0-50
	KB59	0.0001"	0.05"	0-50-0
	KB60			0-100
	KB61		0.2"	0-50-0
	KB62			0-100
	KB63		0.5"	0-50-0
KB64	0-100			

FEATURES

- Specification: ANSI
- 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



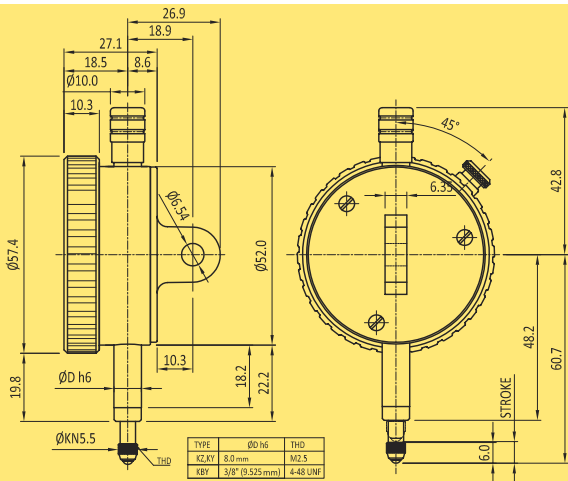
TYPE	L1	L2	L3	L4	L5
KB51,KB52,KB45,KB46,KB53,KB54,KB55,KB56,KB63,KB64	68.5	44.0	42.8	18	15.3
KB59,KB60,KB61,KB62	60.7	44.0	42.8	18	15.3
KB49,KB50,KB57,KB58	80.9	44.0	42.8	18	15.3
KB21	131.0	71.0	136	45.1	42.3

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

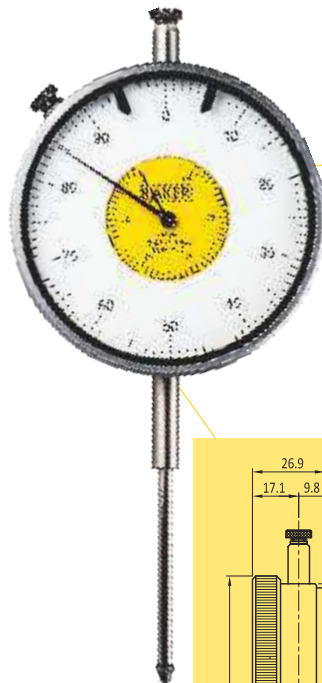
ANSI (AGD)

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

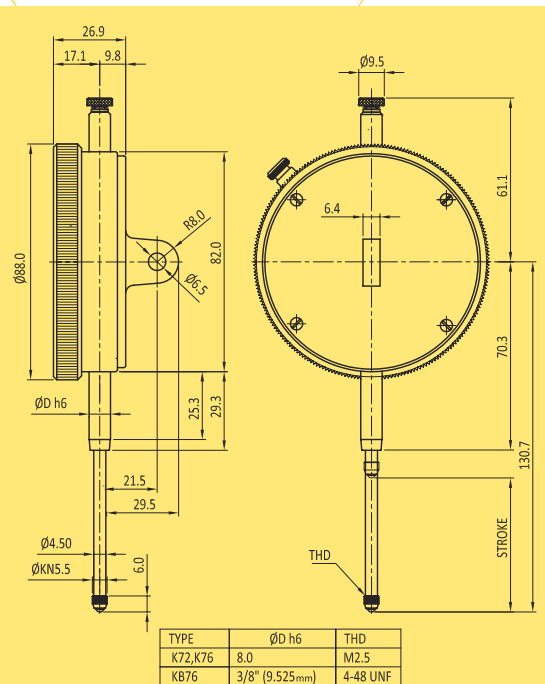
FEATURES

- 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

Plunger type



MODEL 105



K101

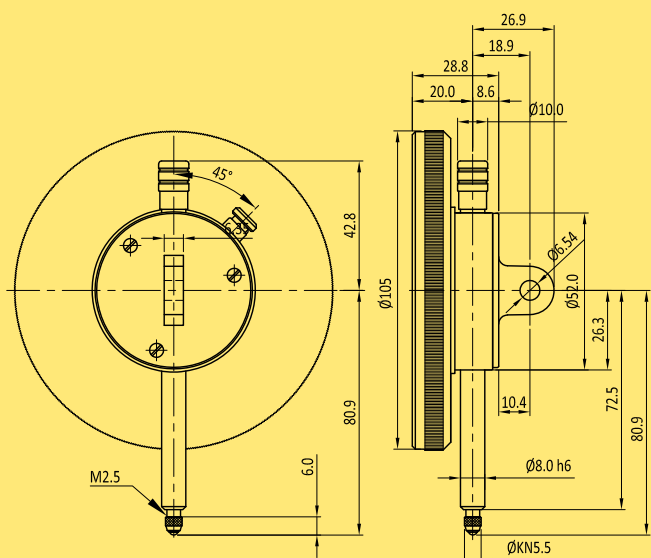
HARDNESS TESTER DIAL GAUGE



STANDARD



SUPERFICAL

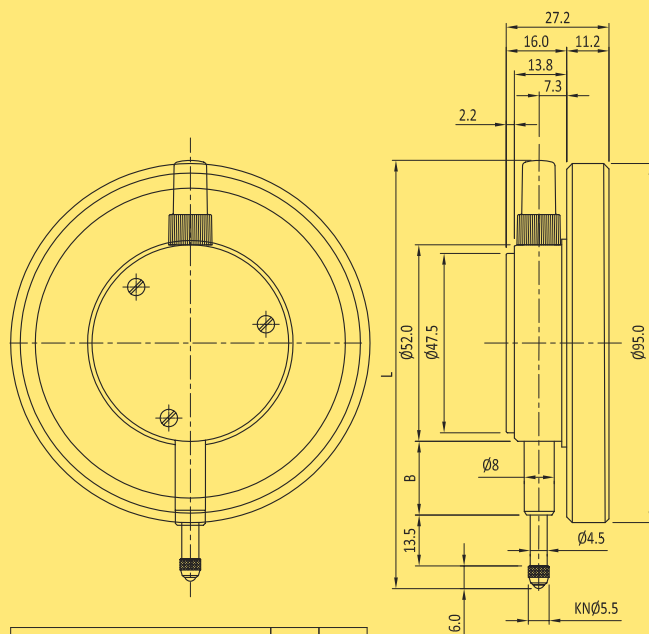


METRIC

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



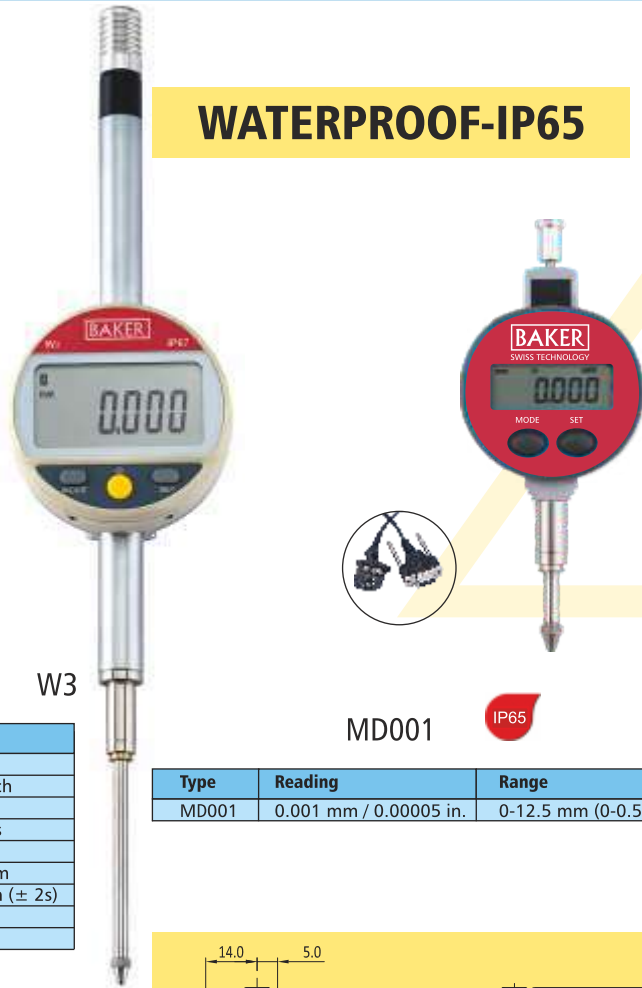
W1

IP67

W2

W3

WATERPROOF-IP65

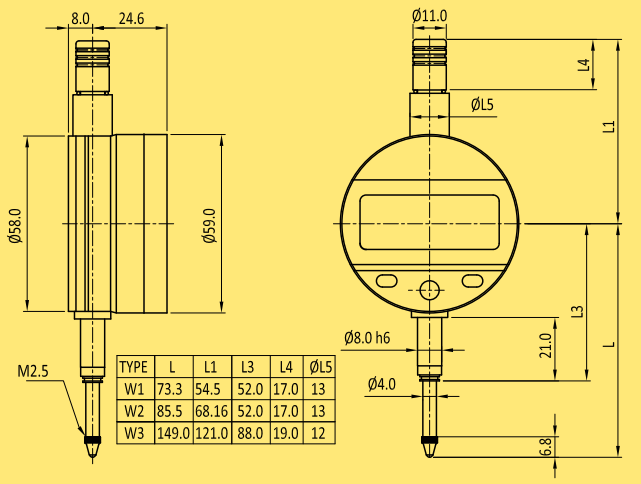


MD001

IP65

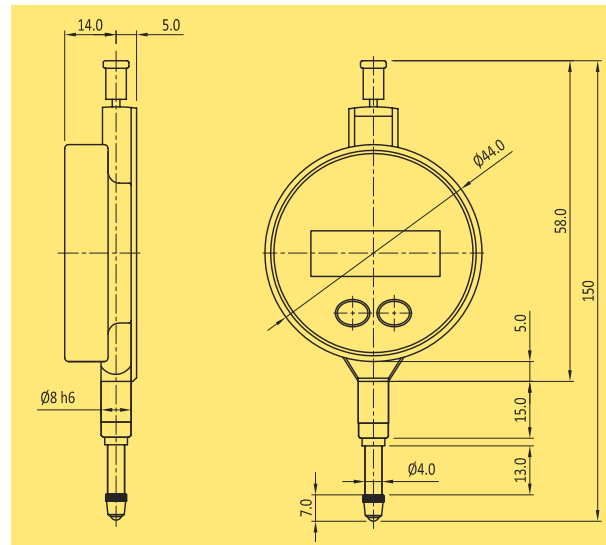
TYPE	W1/W1A	W2/W2A	W3/W3A
Reading	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch
Range	0 – 12.5 mm 0 – 0.5 Inch	0 – 25 mm 0 – 1 Inch	0 – 50 mm 0 – 2 Inches
Accuracy	0.003 mm	0.004 mm	0.005 mm
Repeatability	± 0.002 mm 0.0001 Inch (± 2s)	± 0.002 mm 0.0001 Inch (± 2s)	± 0.002 mm 0.0001 Inch (± 2s)
Measuring Force	0.65 – 0.9 N	0.65 – 1.15 N	1.1 – 2.6 N
Weight	90 g	94 g	168 g

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



FEATURES W1A, W2A, W3A

- 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
- W1, W2 & W3 Digital Dial Guages with integrated Bluetooth® Wireless technology - AVAILABLE ON REQUEST**



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



V1P



V2



V3

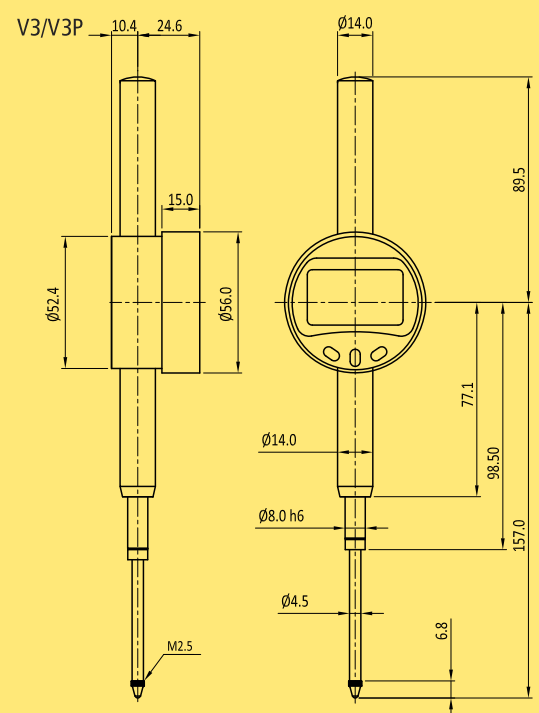
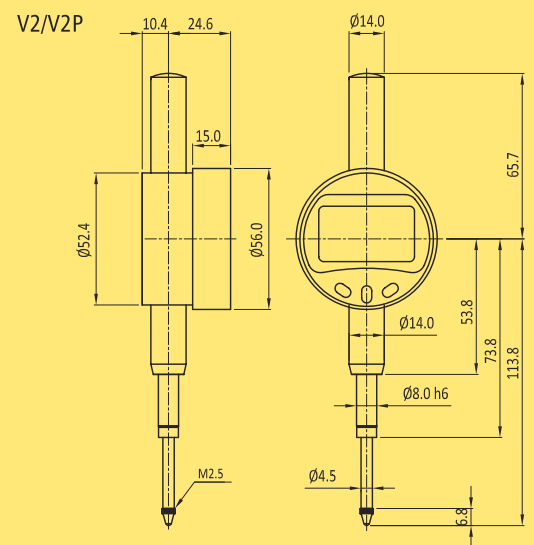
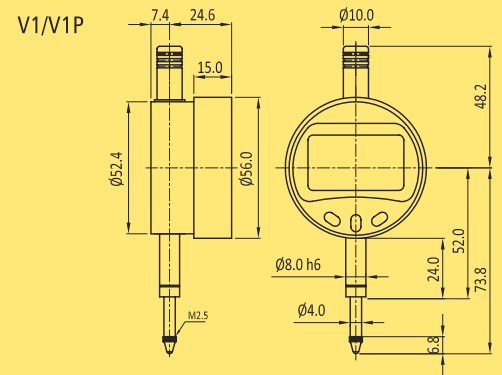
TYPE	V1	V2	V3	V1P	V2P	V3P
Reading	0.01 mm 0.0005 Inch	0.01 mm 0.0005 Inch	0.01 mm 0.0005 Inch	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch	0.001 mm 0.00005 Inch
Range	0 - 12.5 mm 0 - 0.5 Inch	0 - 25 mm 0 - 1 Inch	0 - 50mm 0 - 2 Inch	0 - 12.5 mm 0 - 0.5 Inch	0 - 25 mm 0 - 1 Inch	0 - 50 mm 0 - 2 Inch
Accuracy	0.02 mm	0.02 mm	0.02 mm	0.006 mm	0.007 mm	0.008 mm
Repeatability	± 0.01 mm	± 0.01 mm	± 0.01 mm	± 0.002 mm	± 0.002 mm	± 0.002 mm
Measuring Force	< 1 N	< 1.5 N	< 2 N	< 1 N	< 1.5 N	< 2 N
Weight	110 g	120 g	160 g	110 g	120 g	160 g

FEATURES

- Strong construction
- Large Digits for better viewing
- Display Resolution 0.001 mm & 0.00005 Inch
- Zero setting
- With Calibration certificate
- Data output

Useful functions :

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



Lever type Long Stylus



MODEL 29/38 | LONG STYLUS



302L

AGD TYPE | LONG STYLUS C (1⁵/₃₃"



B301L

METRIC

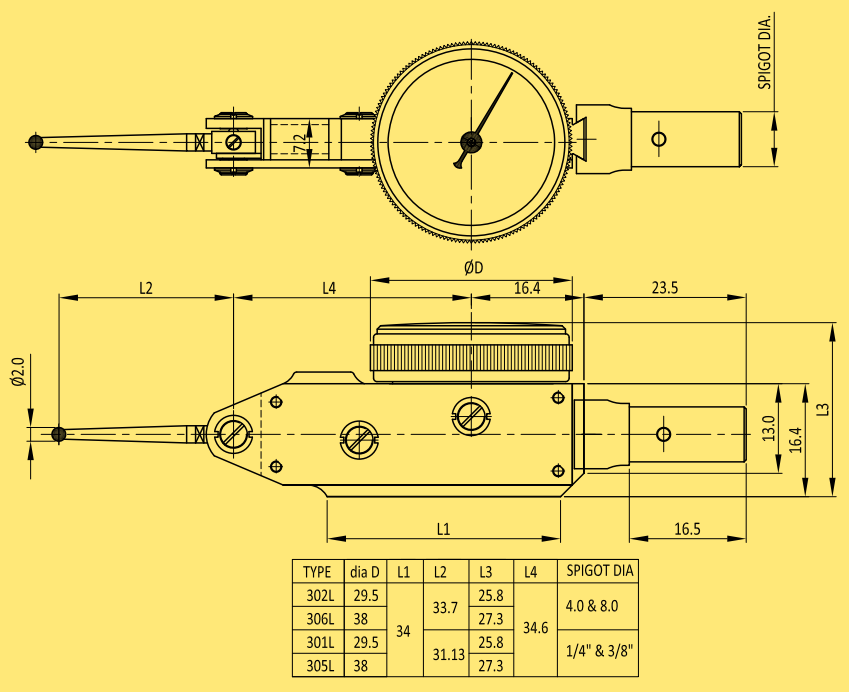
Bezel dia.	Type	Reading	Range	Graduation
29 mm	302L	0.01mm	0.8mm	0-40-0
	302AL			
38 mm	306L			
	306AL			

INCH

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

ANSI (AGD)

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



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 confirm to IS 11498 and for the European market to DIN 2270
- Inch Gauges confirm 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 gauges are supplied with Ø2 & Ø1 mm tungsten carbide ball stylus and Ø8 & Ø4 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

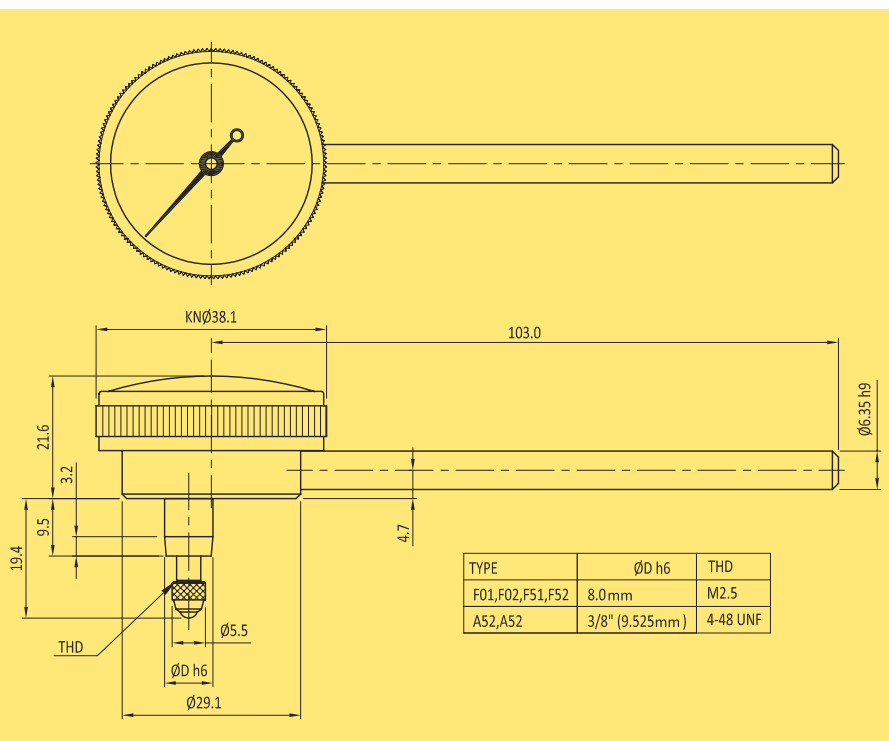
Bezel dia.	Type	Reading	Range	Graduation
38mm	F51	0.001"	0.1"	0-50-0
	F52			0-100

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 confirm to ASME B89.1.10M
- Special dial Gauges for OEMs also manufactured on request
- Complete spares and after sales service available



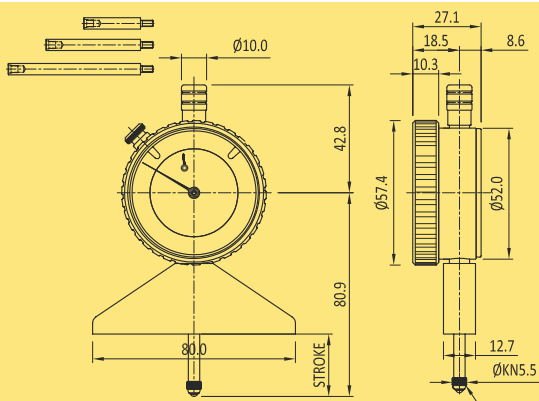
Depth Gauge & Universal Test Set

DIAL DEPTH GAUGE



K158/3

K158/D



METRIC

Bezel dia.	Type	Reading	Range	Graduation
56mm	K158A/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

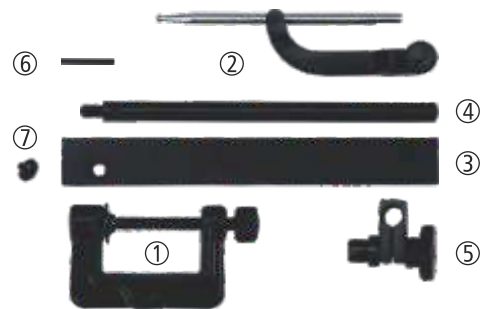
Bezel dia.	Type	Reading	Range	Graduation
38mm	UI01	0.01mm	2.0mm	0-50-0
	UI02			0-100

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



138D



142D



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
	K138A/0	0.1 mm	25 mm	0-10	50 mm
	K138A/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
K150A/0	0.1 mm	25 mm	0-10	200 mm	
K150/3	0.01 mm	25 mm	0-100	200 mm	

INCH

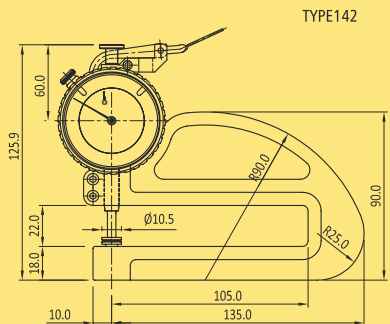
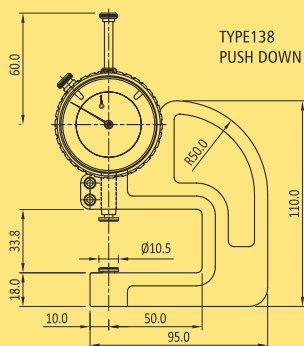
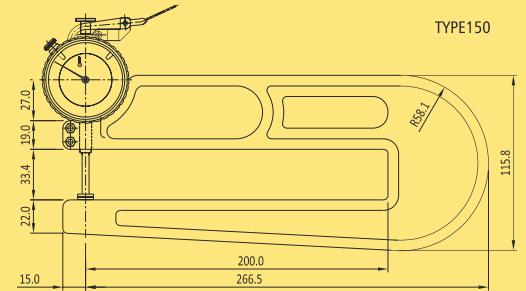
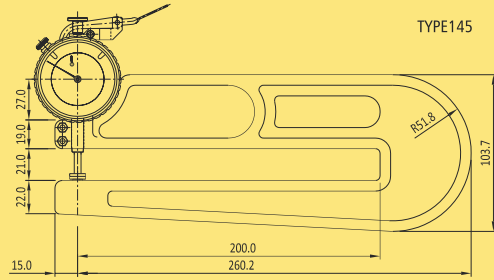
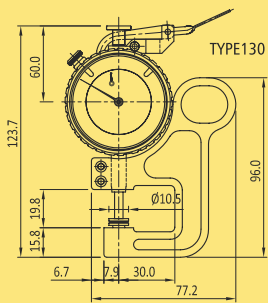
Bezel dia.	Type	Reading	Range	Graduation	Throat Depth
2 1/4"	K130/1	0.001"	0.5"	0-100	1.2"
	K130/8	0.0001"	0.05"		1.2"
	K130/9	0.0001"	0.2"		1.2"
	K138/1	0.001"	1.0"		2"
	K138/1L	0.001"	1.0"		2"
	K142/1	0.001"	0.5"		4"
	K145/1	0.001"	0.5"		8"
	K150/1	0.001"	1.0"		8"

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

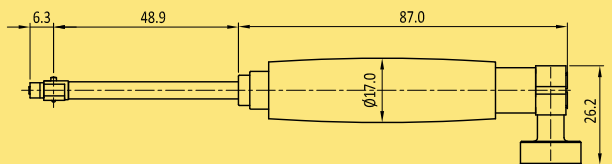
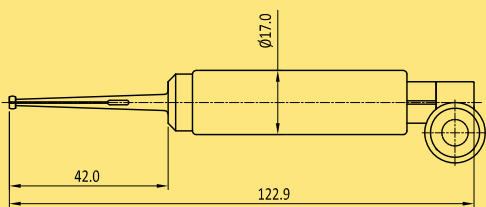
RANGE: 4-6MM

RANGE: 6-10MM



K439

K539



Type	Reading	Range
K439	0.01mm	4-6 mm

Type	Reading	Range
K539	0.01mm	6-10 mm

FEATURES

FEATURES

- For easy and accurate measurement of small inside diameters.
- The radial displacement of split ball anvil is converted to axial displacement of the measuring rod, which is shown on the dial indicator.
- Supplied with 4 interchangeable Measuring heads i.e. 4-4.6 mm, 4.5-5.1 mm, 5-5.6 mm, 5.5-6.1 mm)
- Supplied in a sleek sturdy case.
- Every gauge carries calibration certificate.

- For easy and accurate measurement of small inside diameters.
- 2 point type Design
- Supplied with 9 interchangeable anvils (extension) in steps of 0.5 mm from 6-10 mm
- Supplied in a sleek sturdy case.
- Every gauge carries calibration certificate

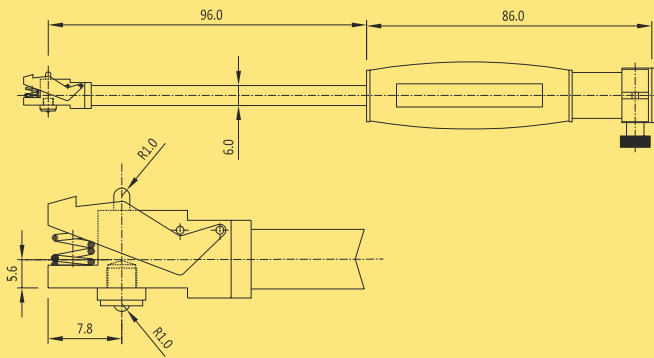
Dial Bore Gauge



RANGE: 10-18 mm



K639



WITHOUT DIAL GAUGE

Type	Depth
K600	100 mm

METRIC (WITH DIAL GAUGE)

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

INCH (WITH DIAL GAUGE)

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

DIGITAL (WITH DIAL GAUGE)

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

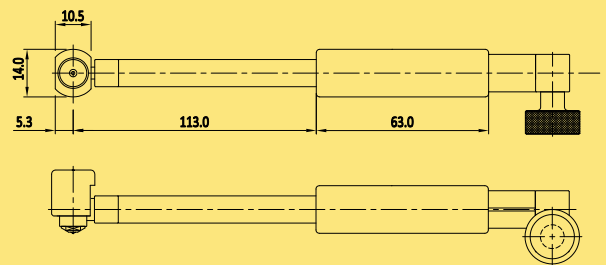
FEATURES

- 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	110 mm

METRIC (WITH DIAL GAUGE)

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 (WITH DIAL GAUGE)

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

DIGITAL (WITH DIAL GAUGE)

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 18-50 mm 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



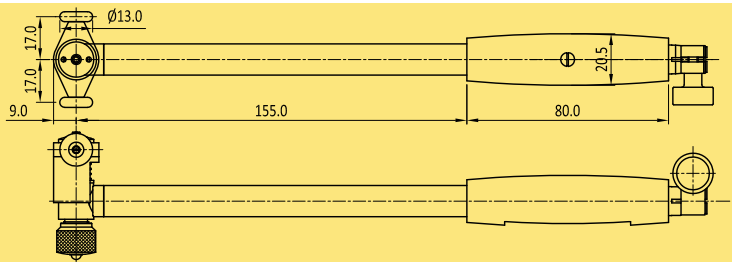
Dial Bore Gauge

RANGE: 50-150 mm



K803

Also available with digital dial gauge



Depth Extension 200mm

WITHOUT DIAL GAUGE

Type	Depth
K800	150 mm

METRIC (WITH DIAL GAUGE)

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 (WITH DIAL GAUGE)

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

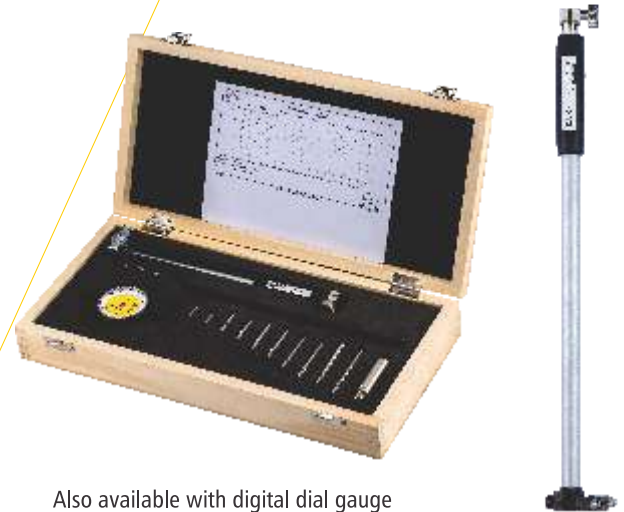
DIGITAL (WITH DIAL GAUGE)

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

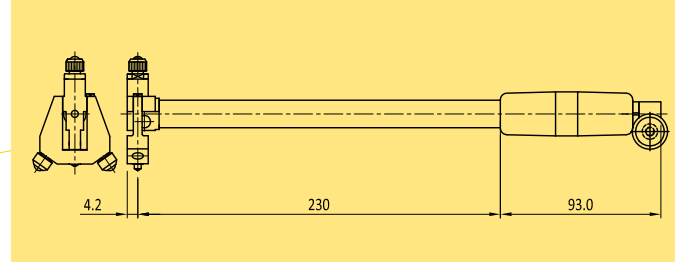
FEATURES

- 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

RANGE: 50-150 mm (SHALLOW)



Also available with digital dial gauge



WITHOUT DIAL GAUGE

Type	Depth
K800S	250 mm

METRIC (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K803S	0.01 mm	250 mm	0-50-0
	K809S	0.002 mm		0-10-0
	K817S	0.001 mm		0-100-0

INCH (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K853S	0.0005"	10"	0-25-0
	K861S	0.0001"		0-50-0

DIGITAL (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth
56 mm	K80DPS	0.001 mm/0.00005"	250 mm
56 mm	K80DS	0.01 mm/0.0005"	250 mm

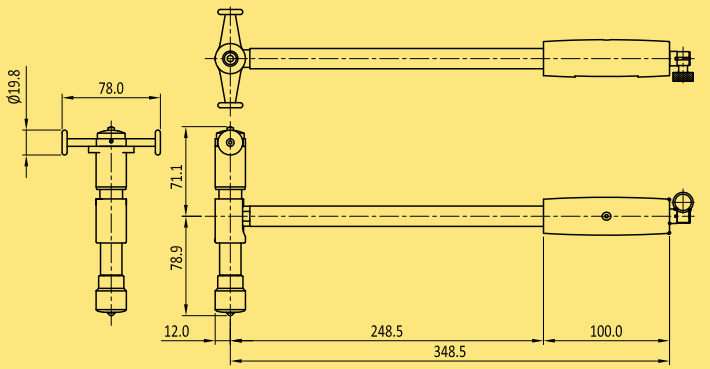
FEATURES

- Bore gauge covering a range of 50-150 mm, is widely used in 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 the measurement can be done with minimum of skill.
- Furnished in a sleek wooden case containing measurement anvils and extension rods with necessary tools.
- Each gauge carries a calibration certificate giving actual values.
- Suitable to measure blind bore

Dial Bore Gauge



RANGE: 150-250 MM



Depth Extension 200mm

WITHOUT DIAL GAUGE

Type	Depth
K900	250 mm

METRIC (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K903	0.01 mm	250 mm	0-50-0
	K909	0.002 mm		0-10-0
	K917	0.001 mm		0-100-0

INCH (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K953	0.0005"	10"	0-25-0
	K961	0.0001"		0-50-0

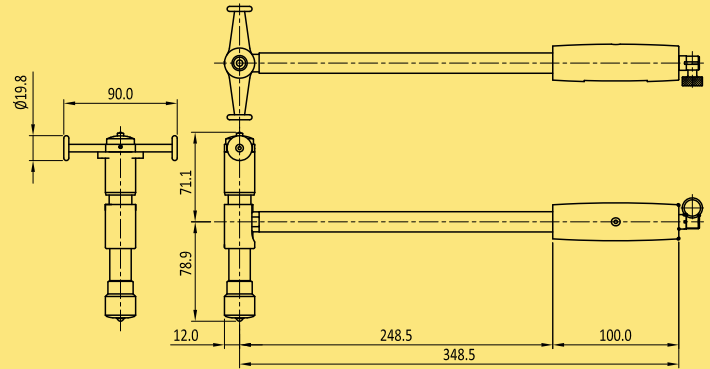
DIGITAL (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth
56 mm	K90DP	0.001 mm/0.00005"	250 mm
56 mm	K90D	0.01 mm/0.0005"	250 mm

FEATURES

- Every gauge carries a calibration certificate giving actual values.
- Bore gauges covering range of 150-250 mm, is widely used by the Automobile & Aircraft, Engine and pump manufacturers, among other industries.
- Designed using Carbide for fixed & Moving Anvils Ensures High wear Resistance.
- Extra wide bridge Design ensures automatic self-centralizing in the bore feature of this bore gauge ensures that measurement can be done with minimum skill.
- Packed in a sleek wooden case containing measurement anvils and extension rods with necessary tools.

RANGE: 250-450 MM



Depth Extension 200mm

WITHOUT DIAL GAUGE

Type	Depth
K1000	250 mm

METRIC (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K1003	0.01 mm	250 mm	0-50-0
	K1009	0.002 mm		0-10-0
	K1017	0.001 mm		0-100-0

INCH (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth	Graduation
56 mm	K1053	0.0005"	10"	0-25-0
	K1061	0.0001"		0-50-0

DIGITAL (WITH DIAL GAUGE)

Bezel dia	Type	Reading	Depth
56 mm	K10DP	0.001 mm/0.00005"	250 mm
56 mm	K10D	0.01 mm/0.0005"	250 mm

FEATURES

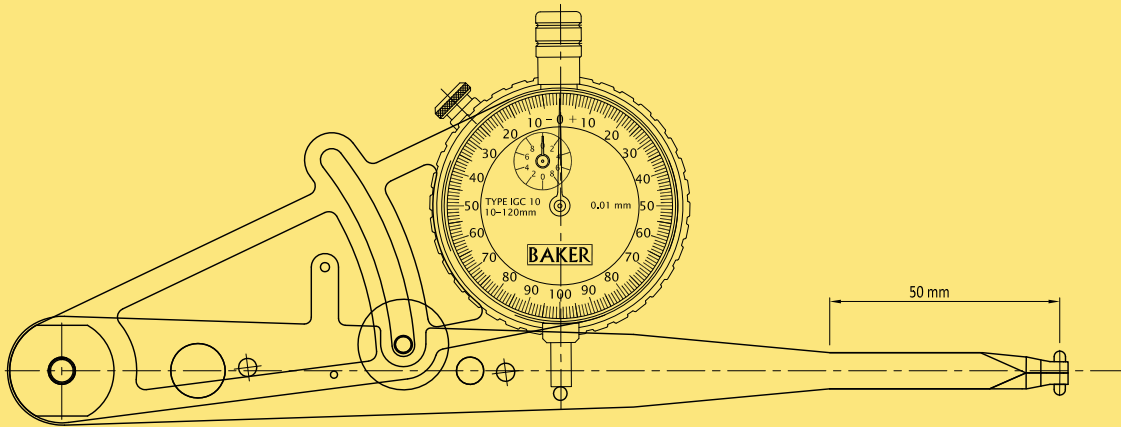
- Every gauge carries a calibration certificate giving actual values.
- Bore gauges covering range of 150-250 mm, is widely used by the Automobile & Aircraft, Engine and pump manufacturers, among other industries.
- Designed using Carbide for fixed & Moving Anvils Ensures High wear Resistance.
- Extra wide bridge Design ensures automatic self-centralizing in the bore feature of this bore gauge ensures that measurement can be done with minimum skill.
- Packed in a sleek wooden case containing measurement anvils and extension rods with necessary tools



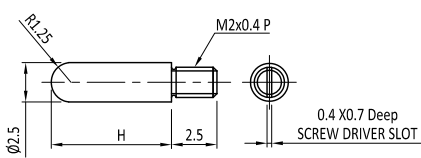
Internal Groove Caliper



Graduation (mm)	Measuring Range (mm)	Indicating Range (mm)	Indicating Error (mm)	Weight (g)	Contact Point (H)	Max. Measuring Depth A (mm)	Entrance Dia. ØD (mm)	Groove Depth. D (mm)	Min. Depth. Width B (mm)
0.01	10-120	±5.0	±0.03	500	2,3,4,5,6,7,8,9,10	50	10	10	2.5

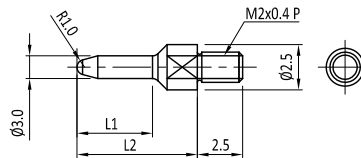


STANDARD ANVILS SUPPLIED WITH GAUGE

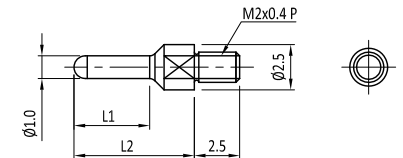


CODE	H	CODE	H
IGC-SPT1-1	2.0	IGC-SPT1-6	7.0
IGC-SPT1-2	3.0	IGC-SPT1-7	8.0
IGC-SPT1-3	4.0	IGC-SPT1-8	9.0
IGC-SPT1-4	5.0	IGC-SPT1-9	10.0
IGC-SPT1-5	6.0		

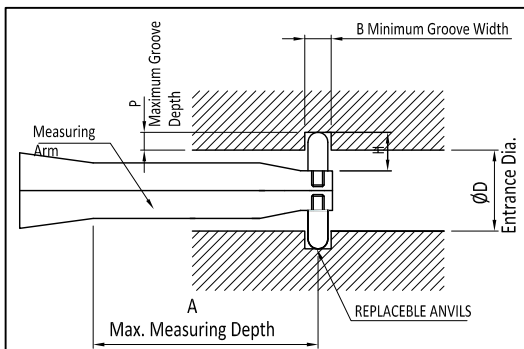
OPTIONAL ACCESSORIES ON REQUEST



CODE	L1	L2	CODE	L1	L2
IGC-SPT3-1	2.0	4.5	IGC-SPT3-6	7.0	9.5
IGC-SPT3-2	3.0	5.5	IGC-SPT3-7	8.0	10.5
IGC-SPT3-3	4.0	6.5	IGC-SPT3-8	9.0	11.5
IGC-SPT3-4	5.0	7.5	IGC-SPT3-9	10.0	12.5
IGC-SPT3-5	6.0	8.5			



CODE	L1	L2	CODE	L1	L2
IGC-SPT2-1	2.0	4.5	IGC-SPT2-6	7.0	9.5
IGC-SPT2-2	3.0	5.5	IGC-SPT2-7	8.0	10.5
IGC-SPT2-3	4.0	6.5	IGC-SPT2-8	9.0	11.5
IGC-SPT2-4	5.0	7.5	IGC-SPT2-9	10.0	12.5
IGC-SPT2-5	6.0	8.5			



FEATURES

- Internal caliper gauge to measure internal diameter of cylindrical workpiece and groove diameters.
- It can measure groove diameter of "O" ring by modifying spare contact point.
- Set dimension within ± 5 mm (indicating range 10 mm) can be comparatively measured
- For different groove shapes & sizes optional replaceable anvils available on request.
- Adjustable frame mechanism



TYRE TREAD DEPTH GAUGE



TTG01

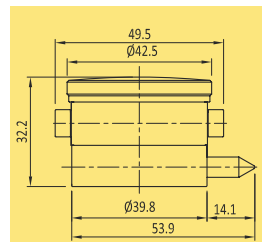
CRANKSHAFT WEB DEFLECTION GAUGE



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.

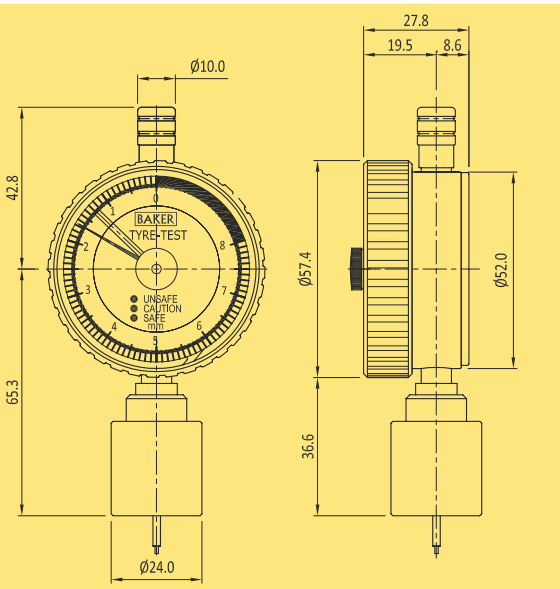
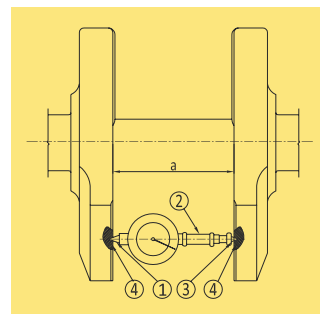


FEATURES

- 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



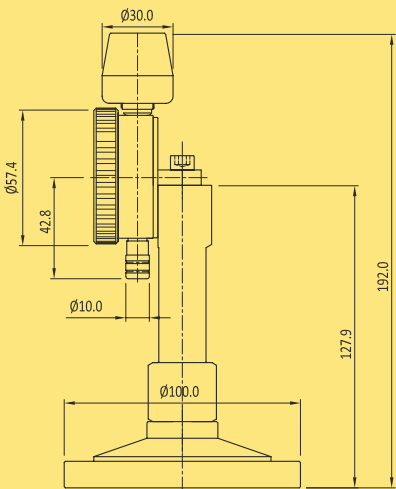
Bezel dia	Type	Reading	Range	Graduation
56 mm	TTG01	0.1 mm	8 mm	8 - 0
	TTG02	0.004 in	0.32 in	0.32 - 0

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

BALL 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

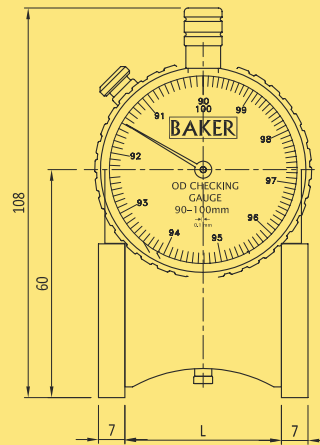
FEATURES

- 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

OUTER DIAMETER



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 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



RUBBER HARDNESS TESTER

Hardness is one of the most important properties which determine the suitability of any rubber component for its intended end use. Incorrect hardness may defeat the basic purpose for which the component is designed. Thus accurate and reliable determination of hardness is of extreme importance



Scale	Shore A	Shore D
Graduation	0-90	0-90
Range	10~90	30~90
Standard	JIS K 6253, JIS K 7215, ASTM D 2240 ISO 868, ISO 7619, DIN 53 505	JIS K 6253, JIS K 7215, ASTM D 2240 ISO 868, ISO 7619, DIN 53 505
Location area	Ø 18.0 mm.	Ø 18.0 mm.
Indenter	Blunt Taper	Sharp Point
Tip angle	35° ± 0.25°	30° ± 0.25°
Function	Maximum hand	Maximum hand
Mass	230 GMS	230 GMS
Test pressure	12.5 N	50.0 N

FEATURES

- Complete 360° clock
- Readings in units of hardness
- Ergonomic body design
- Models with maximum pointer available
- Delivered with calibration certificate
- Supplied with sturdy box
- The measuring tips are not interchangeable

APPLICATION

Shore A application

Rubber, elastomers, neoprene, silicone, vinyl, soft plastics, felt, leather and similar material

Shore D application

Plastics, Formica, epoxides, plexiglass etc.

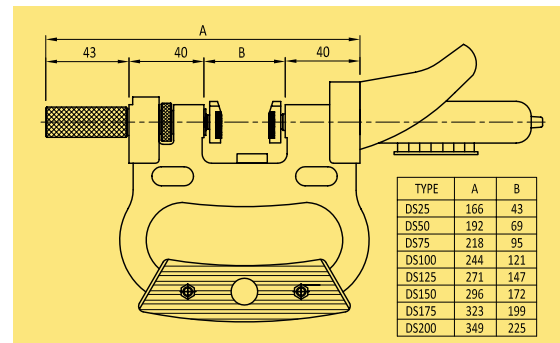
Shore AO application

Foam, sponge etc.

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

Type	Measuring Range (mm)
DS125	100-125
DS150	125-150
DS175	150-175
DS200	175-200

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 Ø8h6 mm holding shank can be fitted easily
- Also used with Electronic probe & digital dial gauge

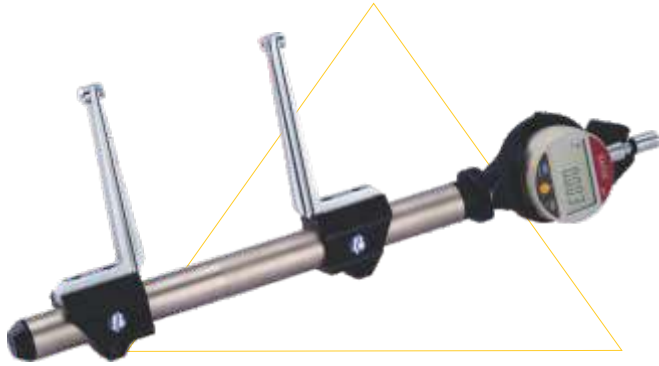
Application

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

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.

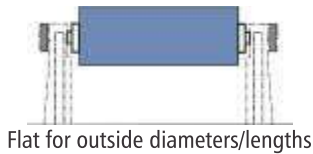


FEATURES

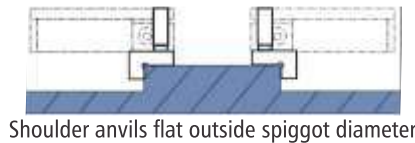
- Internal and External measurement
- Large measuring range possible 0-3000 mm (0-118") with interchangeable extensions
- Constant measuring force
- Digital or Mechanical readout display
- Large range of accessories for standard measurement of threads, grooves, splines, diameters, lengths, shallow spigots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



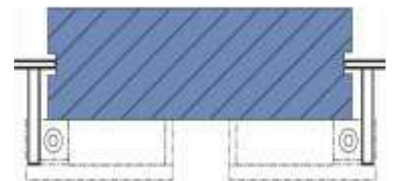
APPLICATIONS



Flat for outside diameters/lengths



Shoulder anvils flat outside spigot diameter



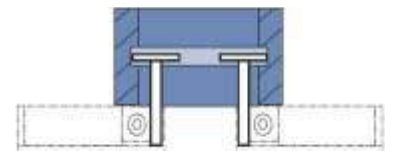
Disc anvils for measuring external groove diameter



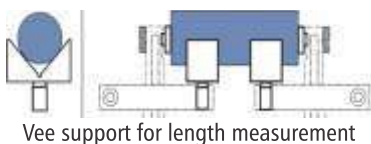
Spherical for inside diameters



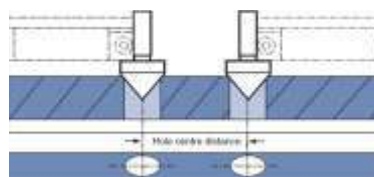
Semi-Cylindrical anvils for inside



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

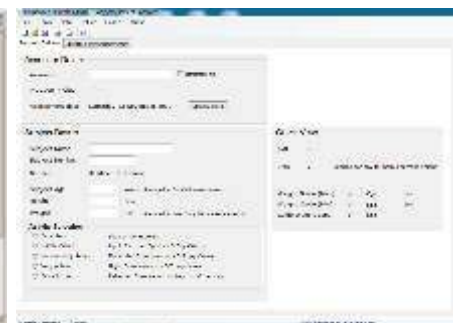
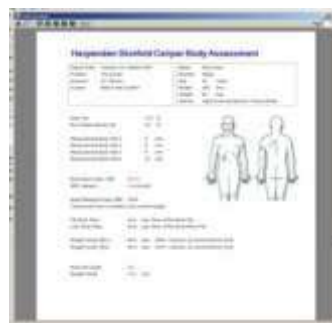
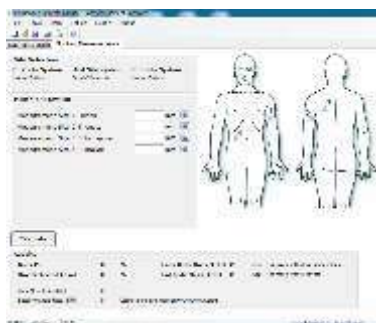
- Dial Graduation: 0.20 mm
- Measuring Range: 0 mm to 80 mm
- Measuring Pressure: 10 gms/mm² (constant over range)
- Accuracy: 99.00%
- Repeatability: 0.20 mm.

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 Magnetic Stand

MAGNETIC STAND



MS Magnetic Stand

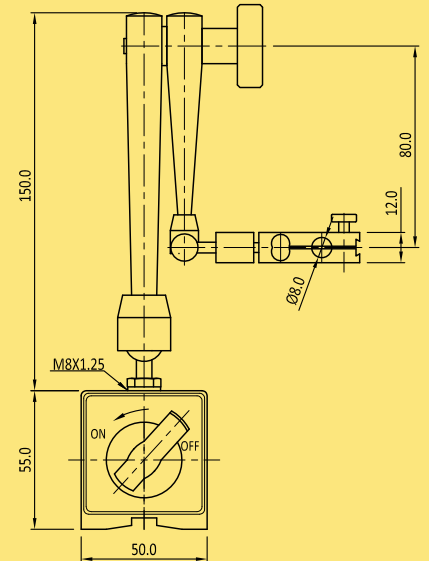
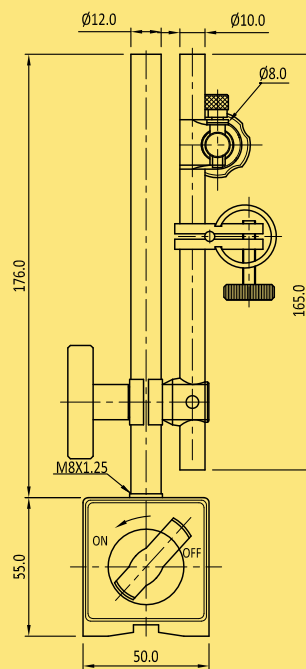
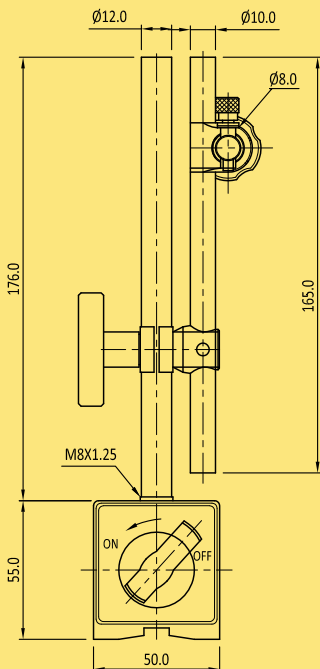
UNIVERSAL MAGNETIC STAND



MSF Magnetic Stand with fine adjustment



UMS Magnetic Stand



FEATURES

- Magnetic stand accepts all dial indicators and dial test indicators
- The On-Off switch offers instant mounting and dismounting without any adverse effect to the indicators or workpiece surface.
- With mechanical locking system.

SPECIFICATION

Type	Base Dimension (mm)	Magnetic Force (N)	Applicable Holding Stem	Fine Adjustment
MS	55 X 55 X 50	600	Ø4 mm, Ø8 mm, Ø3/8"	-
MSF	58 X 55 X 50	600	Ø4 mm, Ø8 mm, Ø3/8"	8 mm
UMS	60 X 55 X 50	800	Ø8 mm, Ø3/8" & Dovetail slot	9 mm

Dial Comparator Stand



PLAIN BASE

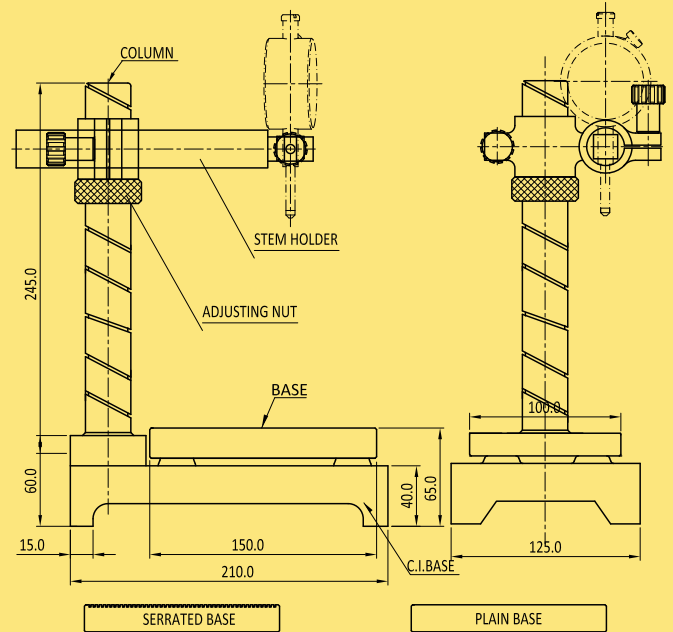
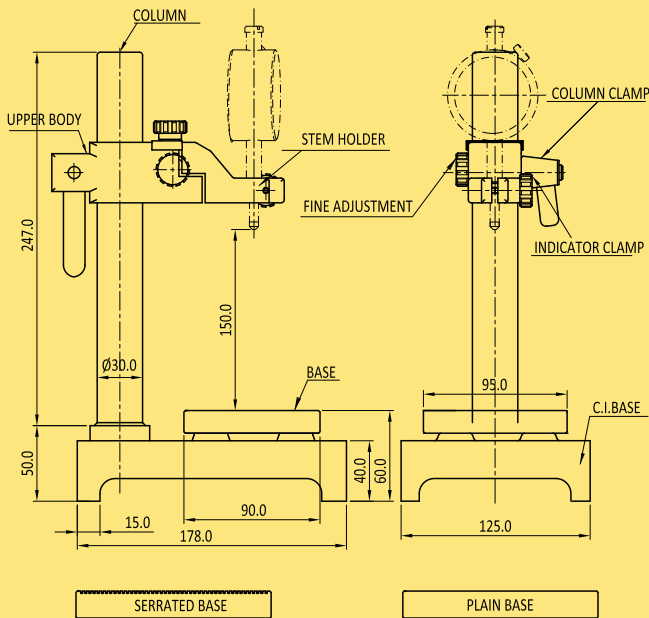


CS150

SERRATED BASE



CS200S

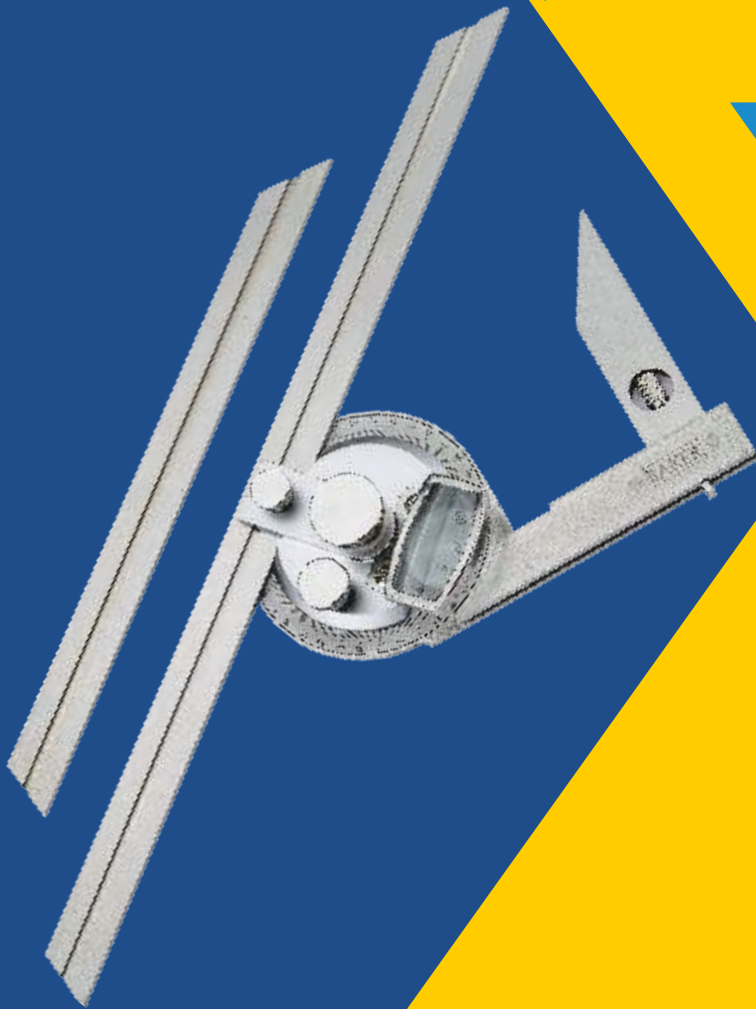
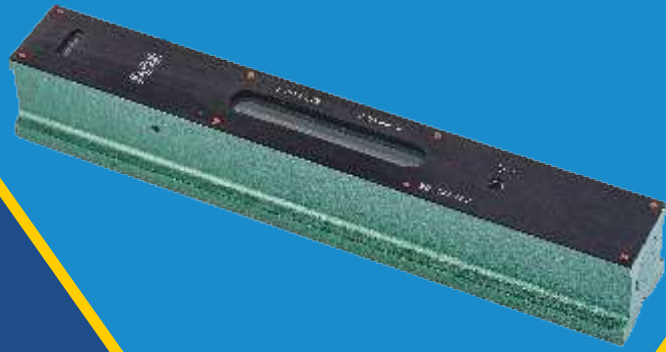


SPECIFICATION

Model	Measuring Range	Base Type	Base Size	Stem hole for dial	Fine adjustment
CS150	150 mm	Plain	90 mm x 95 mm	Ø8 mm	2 mm
CS150-S	150 mm	Serrated	90 mm x 95 mm	Ø8 mm	2 mm
CS200	200 mm	Plain	150 mm x 100 mm	Ø8 mm	Entire range
CS200-S	200 mm	Serrated	150 mm x 100 mm	Ø8 mm	Entire range

FEATURES

- Rigid cast iron base that enables precise measurement.
- The column has a helically threaded arm on which the dial gauge is fixed and can be accurately positioned on the job by means of a threaded nut
- The sliding arm allows the indicating devices to be brought in to any position above the plain table. This enables checking of work pieces of large dimensions.
- Available in plain and serrated steel base with flatness $3.0 \mu\text{m}$ and hardness HRC 60+2.



**UNIVERSAL BEVEL PROTRACTOR
& PRECISION LEVEL**

Universal Bevel Protractor / Precision Level



UNIVERSAL BEVEL PROTRACTOR



FEATURES

- High precision instrument for accurate angle measurement of machined components and tool room application.
- Made of hardened stainless steel.
- Supplied with 150 mm and 300 mm blades.
- Supplied with acute angle attachment.
- Supplied with magnifying glass for better readability.
- Can be attached to height gauges for easy and quick measurements.

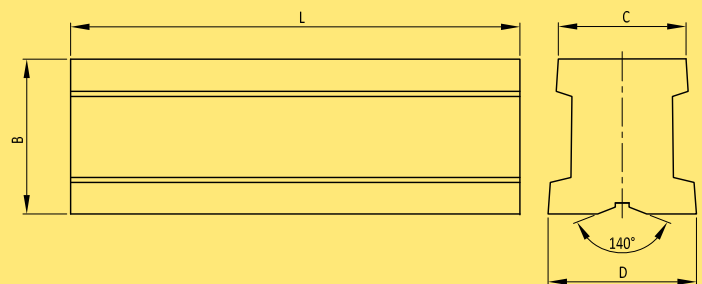
SPECIFICATION

- Graduation : 5'
- Measuring Range: 0-360° (4x90°)
- Accuracy: 5'

OPTIONAL ACCESSORIES

- Holder for height gauges

PRECISION LEVEL

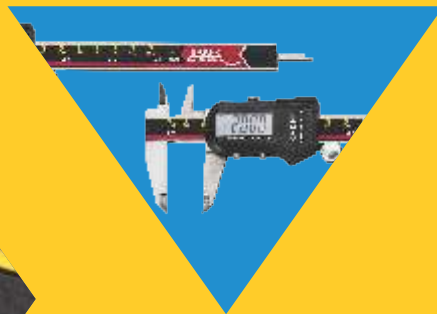


Model No	L	B	C	D
BSL 150	150	46	40.0	44.0
BSL 200	200	46	40.0	48.0
BSL 300	300	46	40.0	48.0

Model No	Sensitivity (mm/m)
BSL 150	0.02
BSL 200	0.02
BSL 300	0.02

FEATURES

- Made of high quality cast iron
- Measuring faces are lapped to a fine finish to maintain precision
- With longitudinal and transverse bubble.
- Accuracy of the main bubble: 1/10th of the nominal value of a scale division
- Supplied with calibration certificate
- Supplied in wooden box



CALIPERS

Vernier Caliper

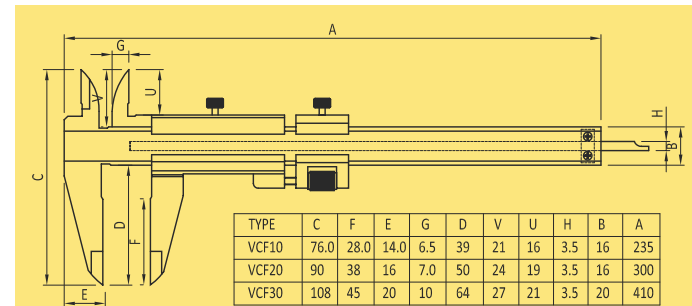
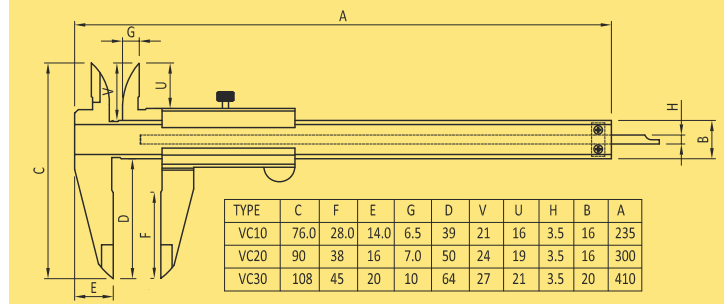
VC SERIES



VC30



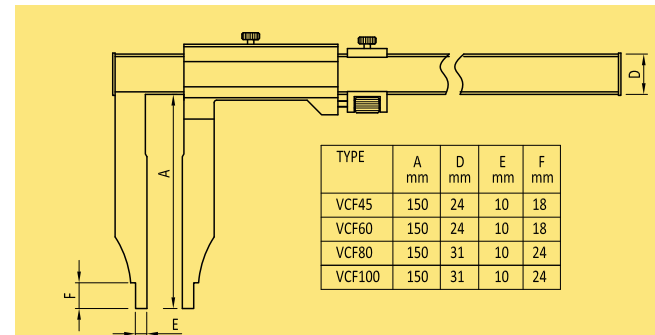
VCF20



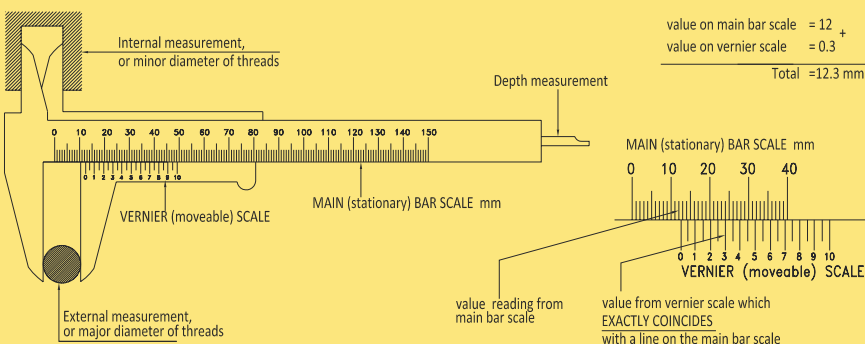
FEATURES

- Every gauge carries a calibration certificate giving actual values
- With 0.02 mm / 0.001" Least Count
- Measures OD, ID, Step and Depth
- MPE as per DIN EN ISO 13385-1
- 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"	
VCF150	0.02 mm / 0.001"	0-1500 mm / 0-60"	
VCF200	0.02 mm / 0.001"	0-2000 mm / 0-80"	



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



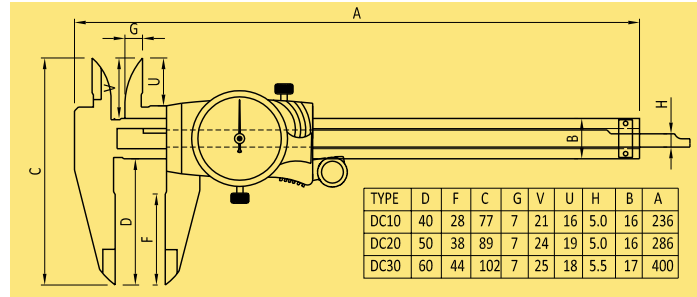
DC SERIES



DC10

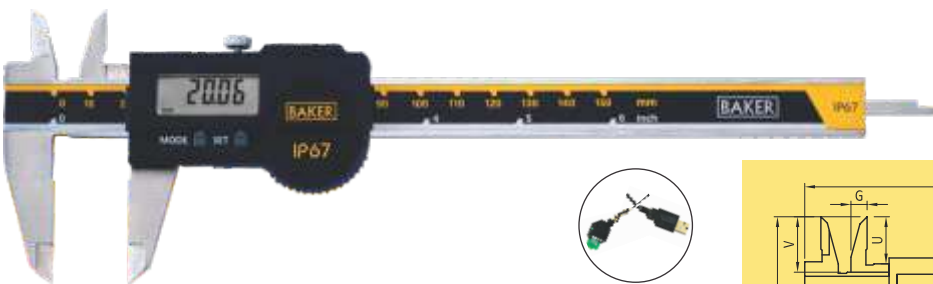
FEATURES

- 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
- MPE as per DIN EN ISO 13385-1
- 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

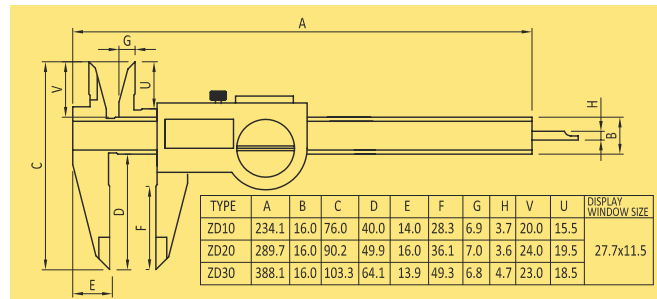


ZD10



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
- MPE as per DIN EN ISO 13385-1
- Power supply 1 Lithium battery, type CR2032, 3V, 220 mAh
- Working temperature 5 to 40 °C



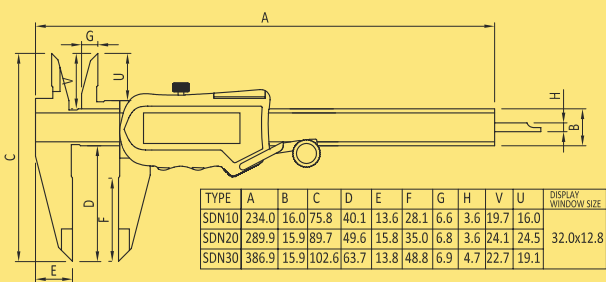
Type	Reading	Range	Weight
ZD10	0.01 mm / 0.0005"	0-150 mm / 0-6"	170 g
ZD20		0-200 mm / 0-8"	195 g
ZD30		0-300 mm / 0-12"	235 g

Digital Caliper

SDN SERIES



SDN10



TYPE	A	B	C	D	E	F	G	H	V	U	DISPLAY WINDOW SIZE
SDN10	234.0	16.0	75.8	40.1	13.6	28.1	6.6	3.6	19.7	16.0	
SDN20	289.9	15.9	89.7	49.6	15.8	35.0	6.8	3.6	24.1	24.5	32.0x12.8
SDN30	386.9	15.9	102.6	63.7	13.8	48.8	6.9	4.7	22.7	19.1	

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

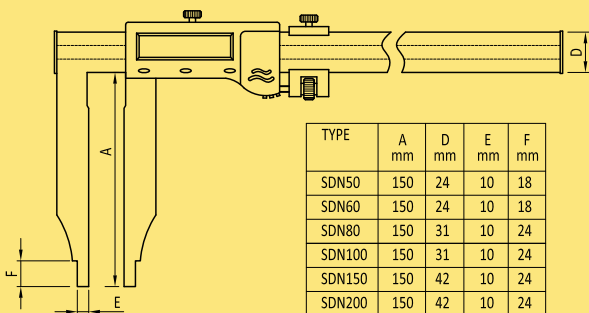
FEATURES

- Every gauge carries a calibration certificate giving actual values
- Robust, Hardened and Ground stainless steel jaws and beam
- MPE as per DIN EN ISO 13385-1
- 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



TYPE	A mm	D mm	E mm	F mm
SDN50	150	24	10	18
SDN60	150	24	10	18
SDN80	150	31	10	24
SDN100	150	31	10	24
SDN150	150	42	10	24
SDN200	150	42	10	24

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
- MPE as per DIN EN ISO 13385-1
- 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	0.01 mm/0.0005"	0 - 500 mm / 0 - 20"
SDN60		0 - 600 mm / 0 - 24"
SDN80		0 - 800 mm / 0 - 32"
SDN100		0 - 1000 mm / 0 - 40"
SDN150		0 - 1500 mm / 0 - 60"
SDN200		0 - 2000 mm / 0 - 80"

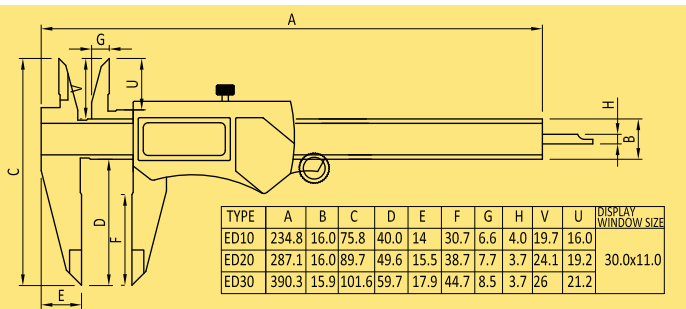
Digital Caliper



ED SERIES



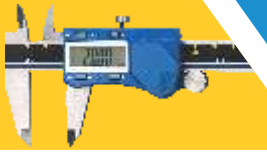
ED 10



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
- MPE as per DIN EN ISO 13385-1
- Every caliper carries a calibration certificate giving actual values



Digital Depth Caliper

DDC SERIES

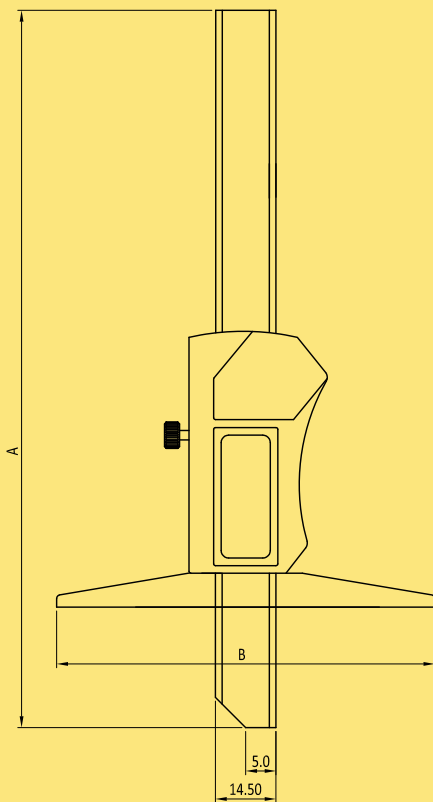


DDC 10

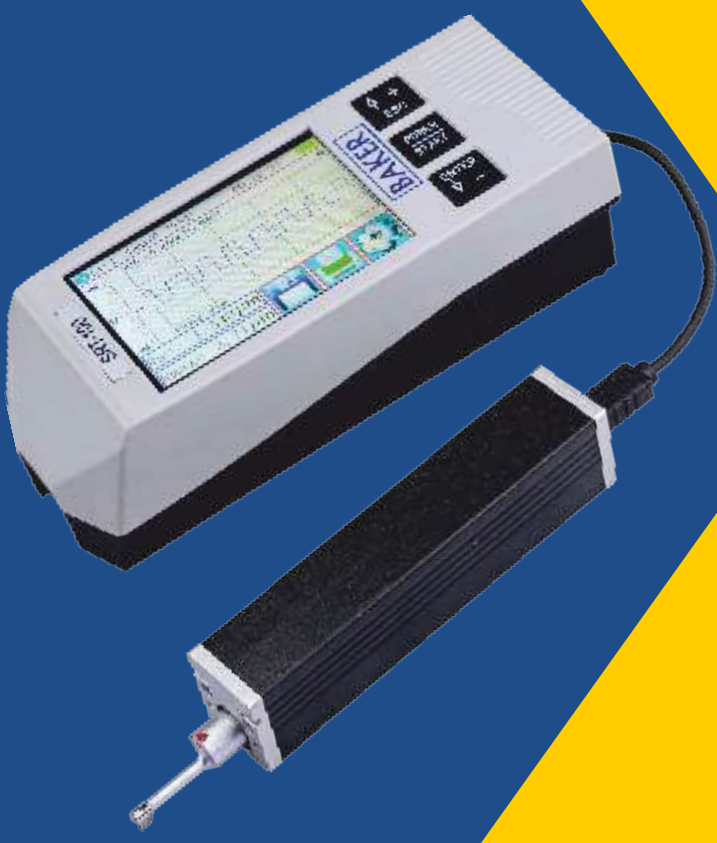
FEATURES

- Rigid STAINLESS STEEL construction
- MM / INCH conversion
- LC : 0.01mm/0.0005 IN
- Large Liquid Crystal Display for good visibility
- Ingress Protection : IP54
- MPE as per DIN EN ISO 13385-2
- Powerful and original lithium battery CR2032
- Working temperature +5°C to +40°C

Type	Reading	Range
DDC 10	0.01mm/0.0005"	0-150 mm/0-6"
DDC 20	0.01mm/0.0005"	0-200 mm/0-8"
DDC 30	0.01mm/0.0005"	0-300 mm/0-12"



TYPE	A	B	DISPLAY WINDOW SIZE
DDC10	232.0	100.0	30.0x11.0
DDC20	285.0	100.0	
DDC30	390.0	150.0	



PORTABLE SURFACE ROUGHNESS TESTER

Portable Surface Roughness Tester

SRT100

BAKER SRT100 is a mobile, lightweight and extremely easy to use surface roughness measurement instrument. It is designed as an handheld instrument that can be used on site.



Technical Specification

Name		Content	
Measurement Range	The Z axis (vertical)	320 μm (-160 μm ~160 μm) / 12600 μin (-6300 μin ~+6300 μin)	
	The X axis (horizontal)	17.5 mm / 0.69"	
Resolution	The Z axis	0.002 μm / $\pm 20 \mu\text{m}$	0.004 μm / $\pm 40 \mu\text{m}$
	(vertical)	0.008 μm / $\pm 80 \mu\text{m}$	0.02 μm / $\pm 160 \mu\text{m}$
Measurement item	Evaluation Parameter	Ra, Rz, Rq, R, t Rc, R, p Rv, R3z, R3y, Rz(JIS), Ry, Rs, Rsk, Rku, Rmax, Rsm, Rmr, Rpc, Rk, Rpk, Rvk, Mr1, Mr2	
	Standard	ISO4287, ANSI B46.1, DIN4768, JIS B 0601	
	Graphic	Primary profile, Roughness profile, load curves	
LCD dimensions		3.5-inch, 480*320	
Filter		RC, PC-RC, Gauss, D-P	
The sampling length (lr)		0.25, 0.8, 2.5 mm	
Assessment length (ln)		ln = lr * n n=1~5	
Sensor	Principle	The displacement differential inductance	
	Stylus tip	Natural Diamond, 90° cone angle, 5 μm tip radius	
	Measuring force	4 mN	
	Skid force	Less than 400 mN	
	Skid	Ruby, Longitudinal radius 40 mm	
	Measuring speed	lr=0.25, Vt=0.135 mm/s	
lr=0.8, Vt=0.5 mm/s			
lr=2.5, Vt=1 mm/s			
	Return Vt=1mm/s		
Accuracy		$\pm (5 \text{ nm} + 0.1A)$, A: Ra of calibration test block	
Repeatability		Not more than 3%	
Residual profile		Not more than 0.010 μm	
Power supply		Built-in 3.7 V Lithium ion battery, Charger : DC 5V, 800 mA/5hour	
Working Time		More than 50 hours	
SIZE	Display unit	158*55*52mm	
	Drive unit	115*23*27mm	
Mass		About 500g (Display Unit + Drive Unit + Sensor)	
Working Environment		Temperature : - 20°C ~ 40°C	
		Humidity : < 90% RH	
Store and Transportation		Temperature : - 40°C ~ 60°C Humidity : < 90% RH	

Standard Accessories

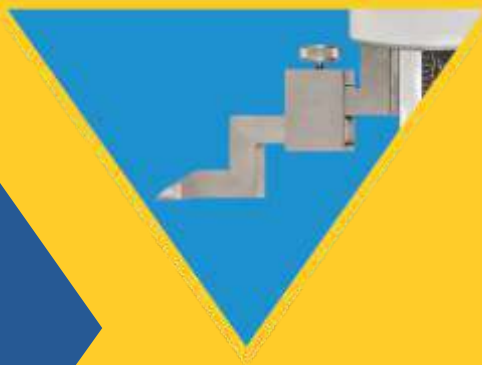
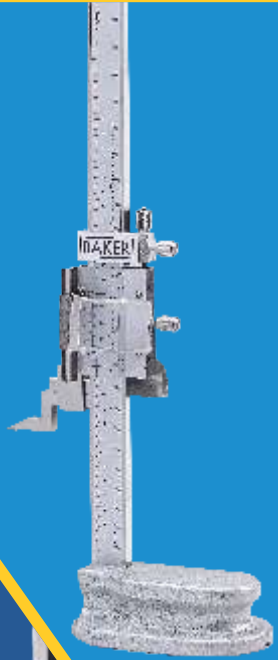
Description	QTY
SRT100 Main unit	1 No.
Sensor Drive	1 No.
Standard Sensor	1 No.
Calibration block and bracket	1 No.
Height adapter	1 No.
Power adapter	1 No.
Operating manual	1 No.

Optional Accessories

Sr. No.	Description
1	Magnetic Stand Adapter
2	Height Gauge Adapter
3	Measurement Stand Small size Aluminum plate Lifting Height: 200mm
4	Measurement Stand Marble plate Lifting height: 350mm
5	Extension Rod (50mm)
6	Small Hole Sensor
7	Extra Small Hole Sensor
8	Curved Surface Sensor
9	Deep Groove Sensor
10	Nosepiece For Flat Surface
11	Nosepiece for Cylindrical Surface
12	Miniature Thermal Printer

FEATURES

- Ergonomic design, small size, light weight, easy to operate.
- The stylus drive unit can be fitted in the main unit for standard measurement, or separated from the display unit, which allows more flexible measurement in any orientation.
- Complies with standards ISO, DIN, ANSI, JIS.
- 22 roughness Parameters
- 3.5 inch colour graphic TFT touch screen provides wide viewing angle, excellent readability and intuitive display that is easy to navigate.
- Bluetooth capability; supports wireless connection with mobile and mini printer.
- Built-in lithium battery, working time over 50 hours.
- Power-saving features as auto sleep & auto power off.
- Large capacity data storage; storage of 100 items of raw data and measured profiles.



HEIGHT GAUGES

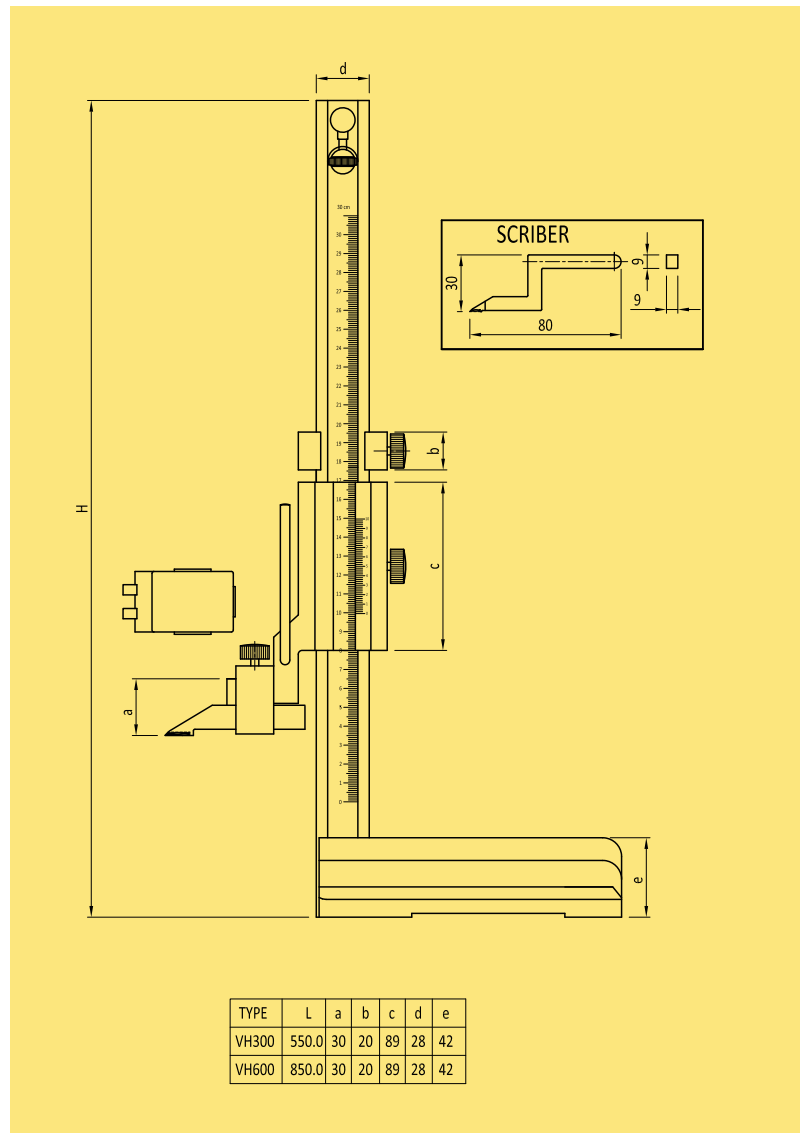
Vernier Height Gauge



VH600

VH300

Type	Reading	Range
VH 300	0.02 mm/0.001"	0-300 mm/0 -12"
VH 600	0.02 mm/0.001"	0-600 mm/0 -24"



FEATURES

- Rigid stainless steel construction
- Dual scale (in Metric & Inch)
- Adjustable main scale for quick and convenient zero setting.
- With fine adjustment
- Carbide tipped scriber
- Glass magnifier for better readability
- Accuracy specification based on JIS B 7517

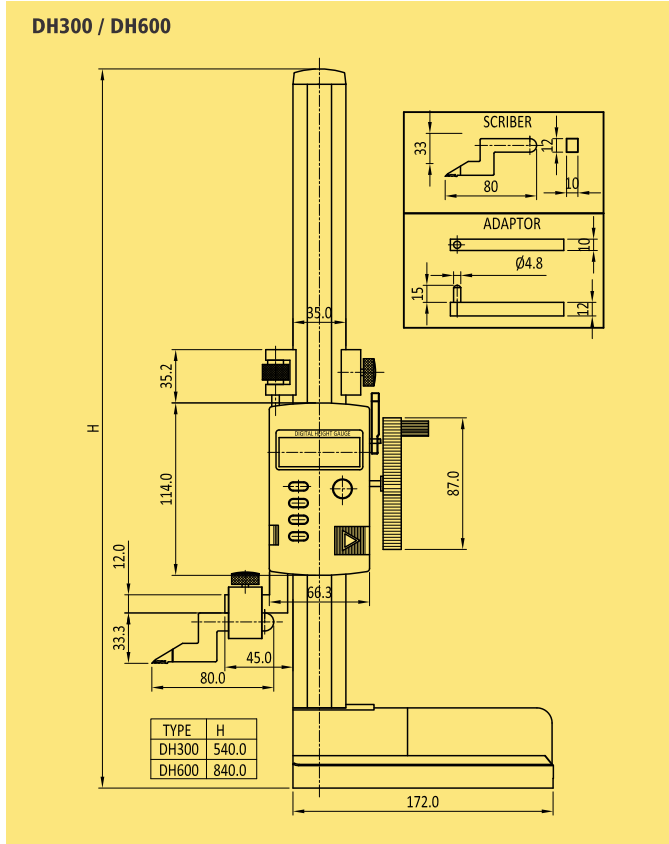
Digital Height Gauge



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



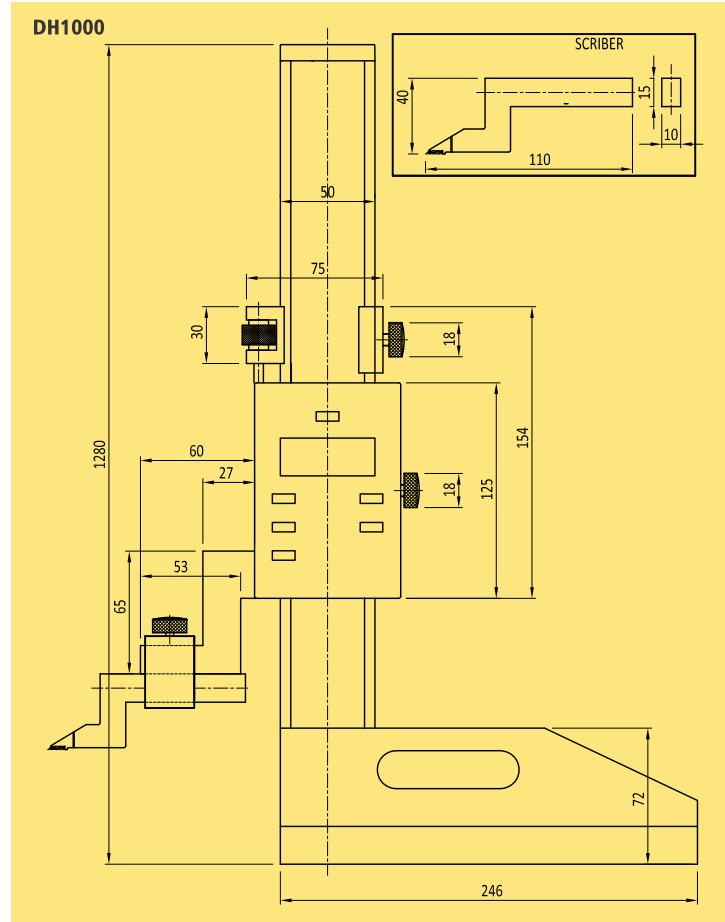
Standard accessories 1. Scriber 2. Scriber holder 3. Height gauge adaptor 4. Dial gauge holder 5. Universal clamp assembly supplied with each height gauges.



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 ≤ 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

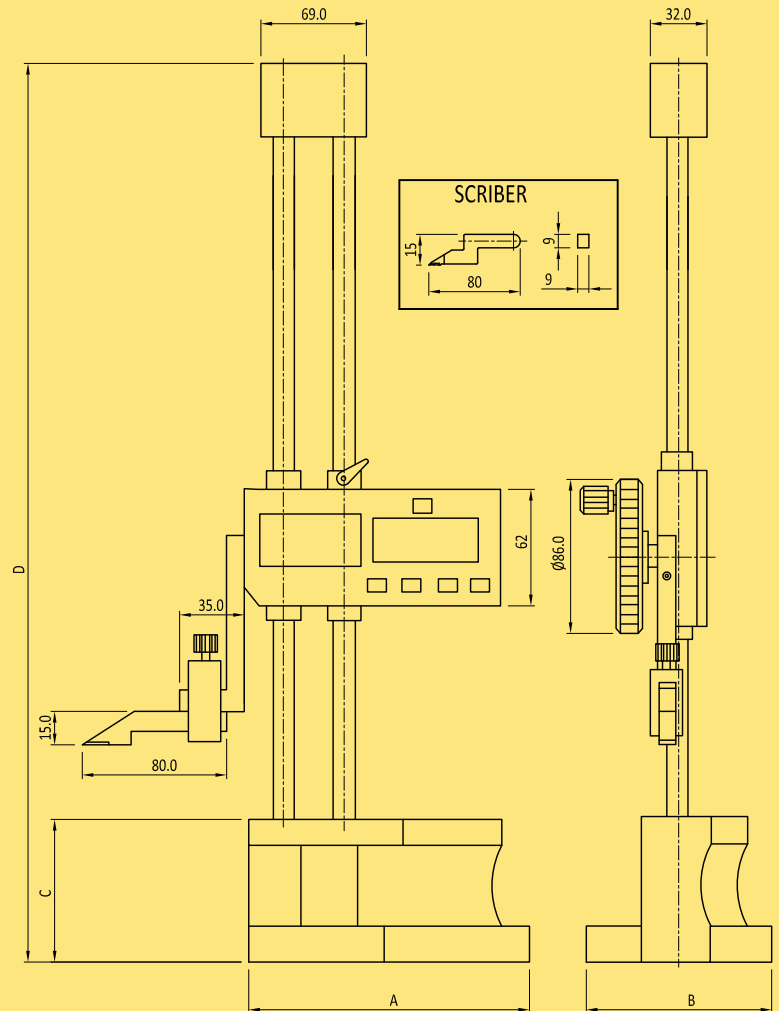


Digital Height Gauge

DOUBLE COLUMN DIGITAL HEIGHT GAUGE



DCDH 300/600



TYPE	A	B	C	D
DCDH 300	135.0	90.0	45.0	475.0
DCDH 600	180.0	120.0	55.0	800.0

	Model : DCDH - 300	Model : DCDH - 600
Range of Height Gauge	0-300 mm / 0-12"	0-600 mm / 0-24"
Least Count	0.01mm/0.0005"	0.01mm/0.0005"
Battery	1.5v SR44	1.5v SR44
Height gauge base	Rigid	Rigid
Adjustable Zero reference point	Zero can be set at any position (Height)	Zero can be set at any position (Height)
Scriber	Scriber with carbide tip and protection cap	Scriber with carbide tip and protection cap
Preset Facility	P+ & P- buttons used to preset any value at any height	P+ & P- buttons used to preset any value at any height
Calibration	With Calibration certificate traceable to National standard.	With Calibration certificate traceable to National standard.
Accuracy	±0.040mm	±0.050mm

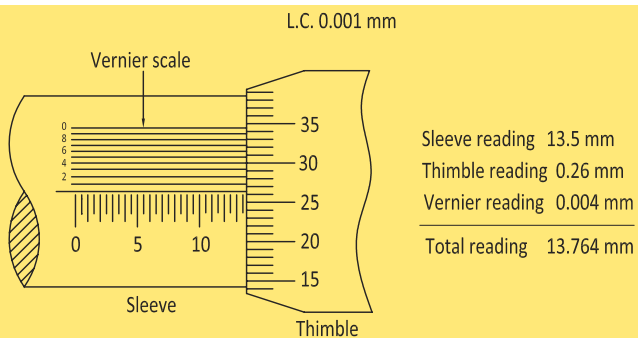
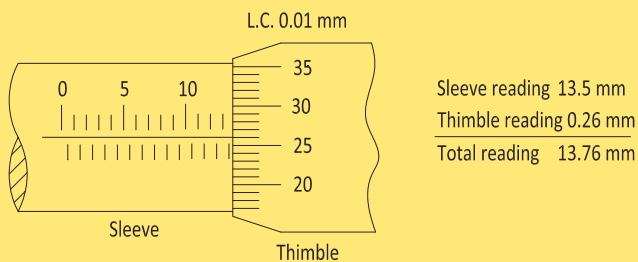


Micrometers

HOW TO READ A MICROMETER ?

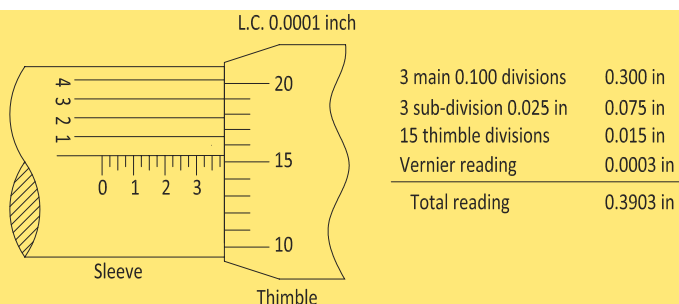
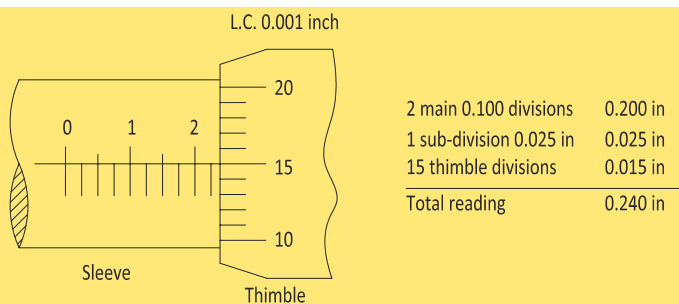
Metric Micrometer

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).

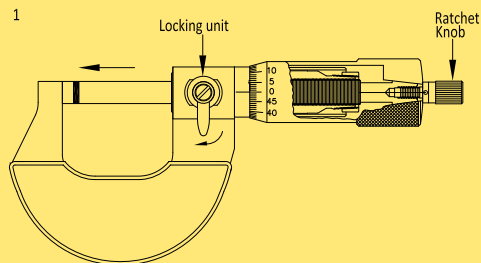


Inch Micrometer

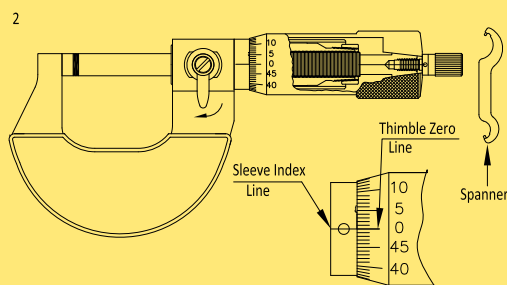
The main scale is divided into tenths of an inch (0.100 in) and each main division is subdivided into 4 equal parts, each division representing 0.025 in (0.1 divided by 4). One complete turn of the thimble, moves the spindle axially twenty five thousandths of an inch. The thimble has twenty five graduations,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



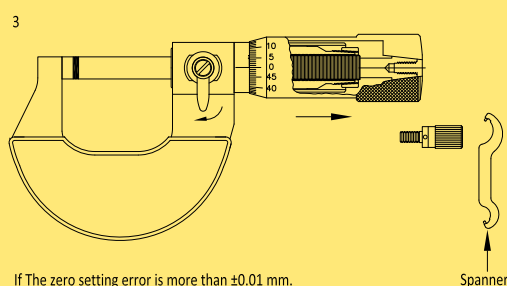
ZERO SETTING PROCEDURE



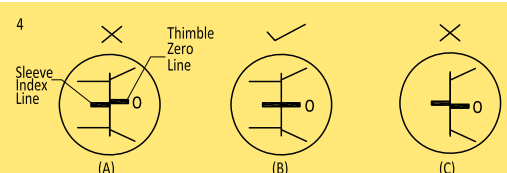
Clean the Measuring faces thoroughly. Use RATCHET KNOB to flush or bridge the measuring faces with each other (or with the faces of setting gauge for above 25 mm) & lock the SPINDLE by LOCKING UNIT & read the value.



If The zero setting error is about or less than ± 0.01 mm. Insert the spanner key into the hole on the sleeve on the opposite side of the index line, and rotate the sleeve to align the index line with the thimble zero line.



If The zero setting error is more than ± 0.01 mm. Loosen the ratchet knob by using the Spanner. Remove the ratchet knob outside & Press the thimble outward so that it can freely move, then align the thimble zero line with the sleeve index line. Lock the ratchet knob by using the Spanner at the original position to secure the thimble.

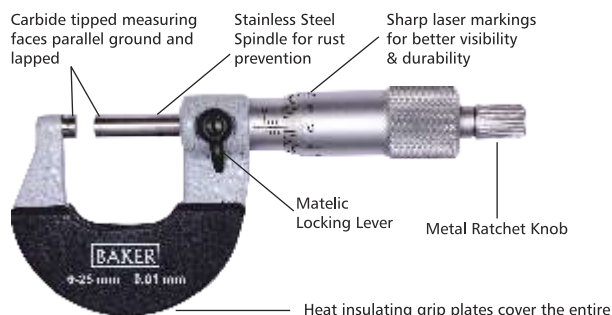


If Zero not set properly like fig.(B) then repeat the procedure.

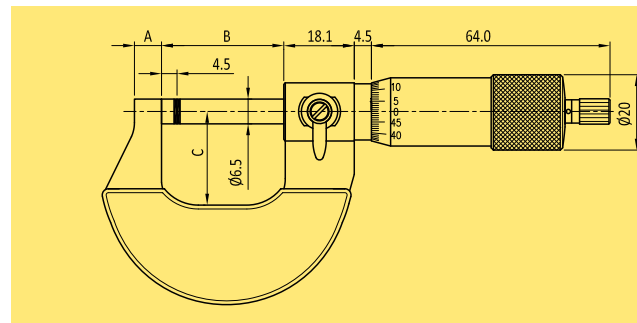
External Micrometer



RANGE: 0-200 mm/0-8"



MMC25



6MMC150



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

4MMC100



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

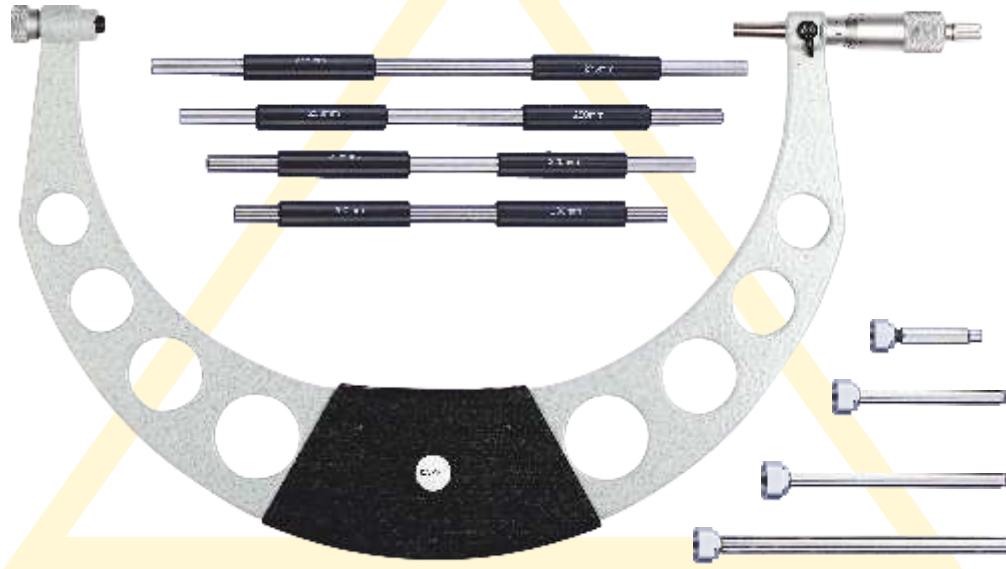
Measuring Range mm	Reading mm	Type	A mm	B mm	C mm	Measuring Range inch	Reading inch	Type
0-25	0.01	MMC25	7.1	32.5	25.5	0-1	0.001	INC1
	0.001	MMC25-1					0.0001	INC1-1
25-50	0.01	MMC50	7.1	57.5	30.5	1-2	0.001	INC2
	0.001	MMC50-1					0.0001	INC2-1
50-75	0.01	MMC75	8	83	45	2-3	0.001	INC3
	0.001	MMC75-1					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
Set of Micrometers								
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

- Specification : IS, DIN, ASME & JIS
- Robust design withstands toughest workshop conditions
- Stainless steel spindle for rust prevention
- Measuring faces : Carbide tipped, micro lapped
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

External Micrometer

EXTERNAL MICROMETER WITH INTERCHANGEABLE ANVILS

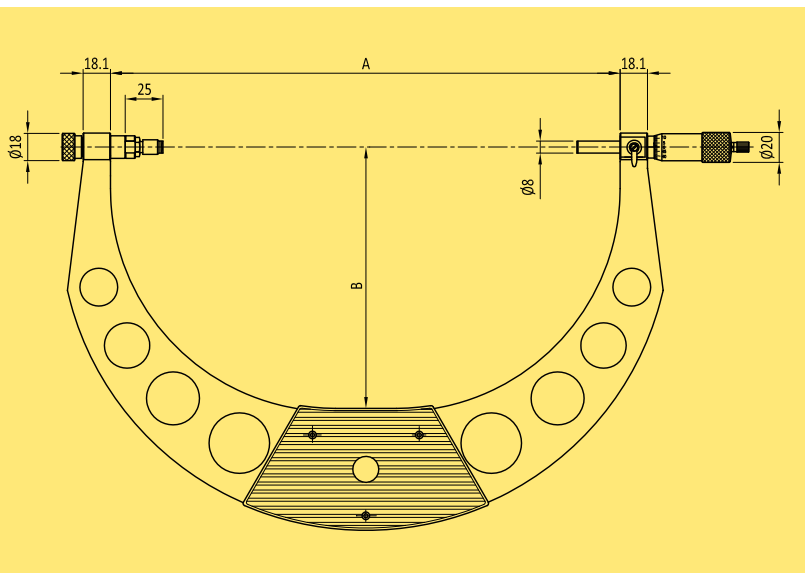


MMI200-300

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 300 mm & 12 Inch, supplied without insulation grip plates
- Setting Standards - up to 300 mm & 12 inch - Both Ends Flat Face
Above 300 mm & 12 inch - Both Ends Spherical



FEATURES

- Interchangeable anvils
- Robust design withstands toughest workshop conditions
- Stainless steel spindle (Ø8.0 mm, pitch 0.5mm & stroke 25 mm) for rust prevention
- Measuring faces : Carbide tipped, micro lapped spindle
: Carbide tipped, micro lapped anvils
- Measuring force : 5 to 15 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Metal spindle locking lever
- Delivered : Box, setting standard (refer table), wrench, setting standard holding sleeves over 300 mm, certificate of inspection

External Micrometer



EXTERNAL MICROMETER WITH ADD ON EXTENSION ANVIL



MME700-800

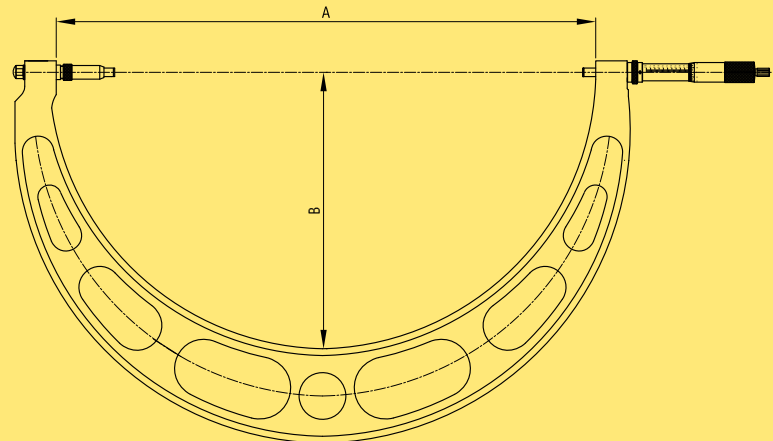
Measuring Range mm	Reading mm	Type	A mm	B mm	Measuring Range inch	Reading inch	Type	Number Of Setting Standards	Number Of Extension Anvil	Weight grams
500-600	0.01	MME500-600	644	325	20-24	0.001	INE20-24	1	1	3700
600-700	0.01	MME600-700	745	375	24-28	0.001	INE24-28	1	1	4300
700-800	0.01	MME700-800	846	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
- Stainless steel spindle (Ø10.0 mm, pitch 1.0 mm & stroke 50 mm) for rust prevention
- Measuring faces : Carbide tipped, micro lapped spindle
: Carbide tipped, micro lapped anvil & add on extension
- Measuring force : 5 -15 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Box, setting standard (refer table), add on extension, wrench, setting standard holding sleeve and certificate of inspection



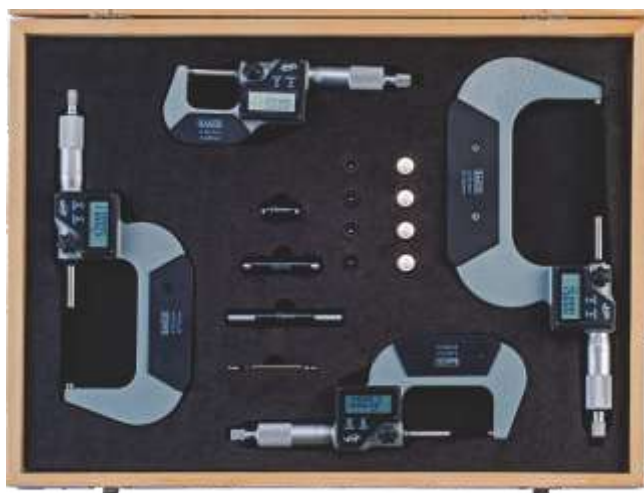


Digital External Micrometer

RANGE 0-200 mm/0-8"

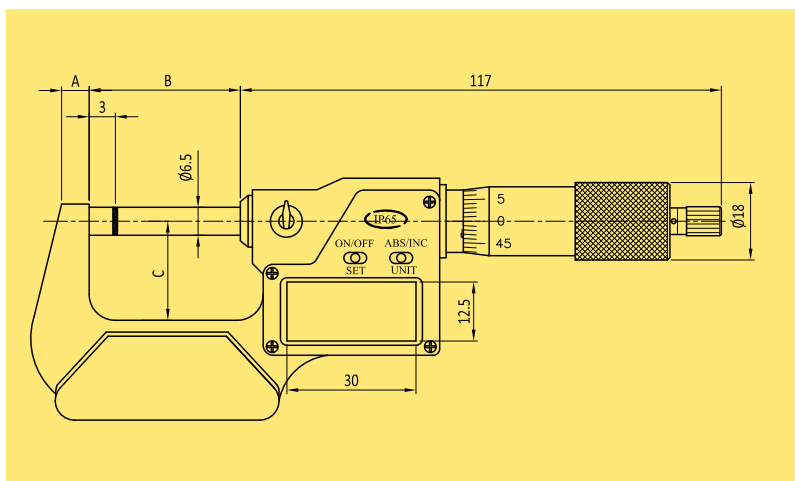


DMM25



4DMM100

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



FEATURES

- Protection level IP65 against dust & water (coolant proof)
- Stainless steel spindle for rust prevention
- mm / inch conversion
- Auto power off
- SR44 battery
- Absolute & incremental measuring mode
- Easy operations with 2 buttons
- Measuring faces : Carbide tipped, micro lapped
- Measuring force : 5 -10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Box, setting standard (from 25 mm upward), 1 battery, ball attachment, wrench, certificate of inspection

MEASURING RANGE	READING	TYPE	TYPE (With Data Out Put)	A mm	B mm	C mm
0-25 mm / 0-1"	0.001 mm / 0.00005"	DMM25	DMM25-1	6.5	31	25
25-50 mm / 1-2"		DMM50	DMM50-1	8.5	56	32
50-75 mm / 2-3"		DMM75	DMM75-1	8.5	81.5	44.5
75-100 mm / 3-4"		DMM100	DMM100-1	8.5	106	57
100-125 mm / 4-5"		DMM125		17	133	82
125-150 mm / 5-6"		DMM150		17	158	82
150-175 mm / 6-7"		DMM175		19.5	183	95
175-200 mm / 7-8"		DMM200		19.5	209	107
Set of Micrometers						
0-100 mm / 0-4" (Set of 4)		4DMM100				

DATA OUTPUT FEATURES

USB compatible data output interface
Can be connected to PC through SPC cable P1502 and data can be transferred by switch P1601

Special External Micrometer



DISC: ROTATING

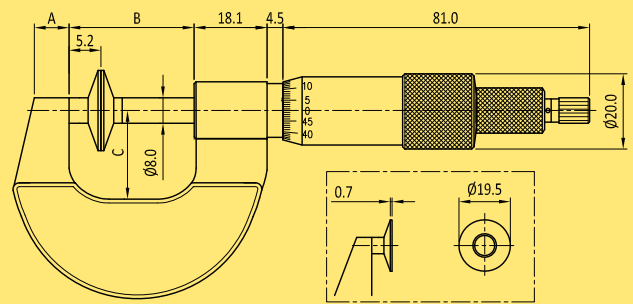
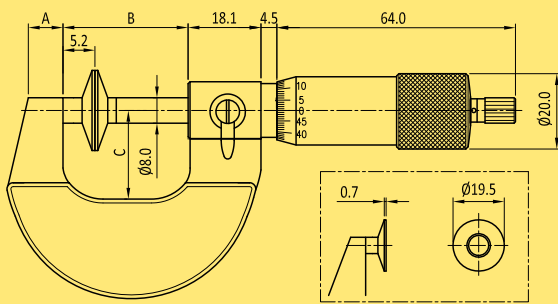


MMC25-D

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-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

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

- Robust design withstands toughest workshop conditions
- Stainless steel spindle (Ø8.0 mm, pitch 0.5mm & stroke 25 mm) for rust prevention
- Measuring faces : Hardened steel
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

Application

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

FEATURES

- Robust design withstands toughest workshop conditions
- Stainless steel spindle (Ø8.0 mm, pitch 0.5mm & stroke 25 mm) for rust prevention
- Measuring faces : Hardened steel
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

Application

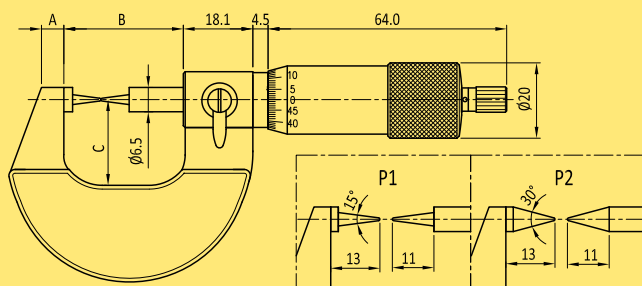
For measuring thickness of paper, felt, rubber, fabric etc

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		15°	MMC50-P1	8	83	45	1-2		INC2-P1
		30°	MMC50-P2						INC2-P2
50-75		15°	MMC75-P1	8	108	58	2-3		INC3-P1
		30°	MMC75-P2						INC3-P2
75-100	15°	MMC100-P1	8	133	67.5	3-4	INC4-P1		
	30°	MMC100-P2					INC4-P2		

FEATURES

- Robust design withstands toughest workshop conditions
- Stainless steel spindle for rust prevention
- Measuring faces : 15° & 30° hardened steel points having radius 0.3 mm approximately
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

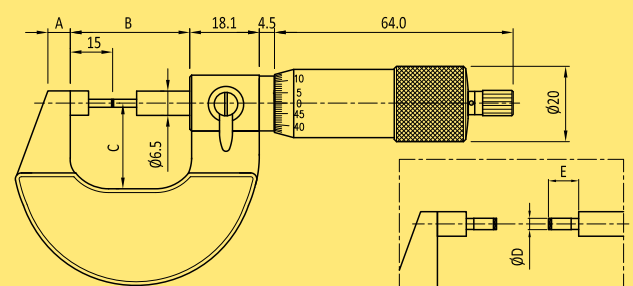
Application

For measuring web thickness of drills, small grooves, keyways

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		MMC50-S3	8	83	45	3	8	1-2		INC2-S3
50-75		MMC75-S3	8	108	58	3	8	2-3		INC3-S3
75-100		MMC100-S3	8	133	67.5	3	8	3-4		INC4-S3

FEATURES

- Robust design withstands toughest workshop conditions
- Stainless steel spindle for rust prevention
- Measuring faces : Carbide tipped, micro lapped available in two types Ø 2 x 5 mm & Ø 3 x 8 mm
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

Application

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

Special External Micrometer



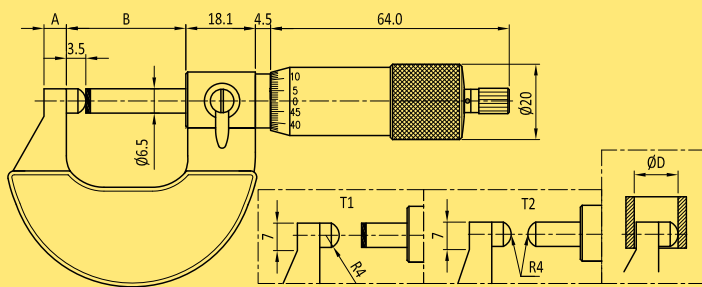
TUBE



MMC25-T1



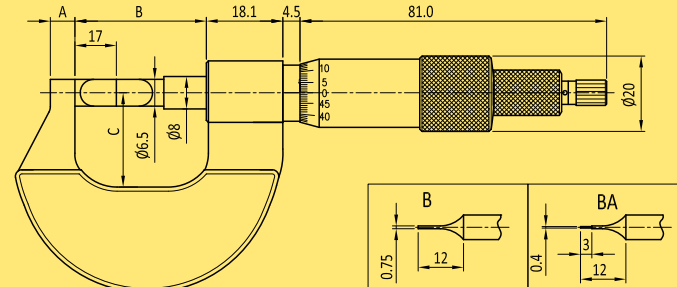
MMC25-T2



BLADE



MMC25-B



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-B	7.1	57.5	30.5	0-1	0.001	INC1-B
		MMC25-BA						INC1-BA
25-50	0.01	MMC50-B	8	83	45	1-2	0.001	INC2-B
		MMC50-BA						INC2-BA
50-75	0.01	MMC75-B	8	108	58	2-3	0.001	INC3-B
		MMC75-BA						INC3-BA
75-100	0.01	MMC100-B	8	133	67.5	3-4	0.001	INC4-B
		MMC100-BA						INC4-BA

NOTE-
Carbide measuring faces available on request

NOTE-
B-Blade Thickness 0.75 mm
BA-Blade Thickness 0.40 mm
Measuring Range : 100 to 200 mm & Carbide measuring faces available on request

FEATURES

- Robust design withstands toughest workshop conditions
- Stainless steel spindle for rust prevention
- Measuring faces : Hardened steel available in two types:
T1 – one end spherical
T2 – both ends spherical
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

Application

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

FEATURES

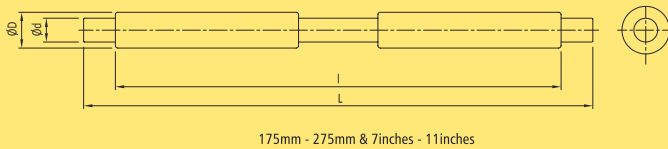
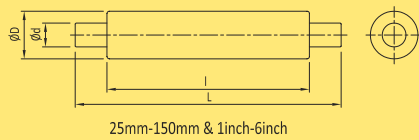
- Robust design withstands toughest workshop conditions
- Stainless steel spindle for rust prevention
- Measuring faces : Hardened steel
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Heat Insulation grip plates cover the entire handling portion of the micrometer frame
- Metal spindle locking lever
- Delivered : Box, setting standard (from 25 mm upward), wrench, certificate of inspection

Application

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

Setting Standard, Depth Micrometer

FOR EXTERNAL MICROMETER



METRIC

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

INCH

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

FEATURES

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

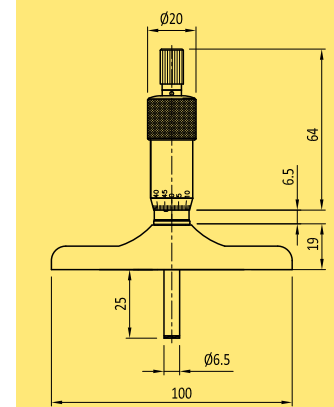
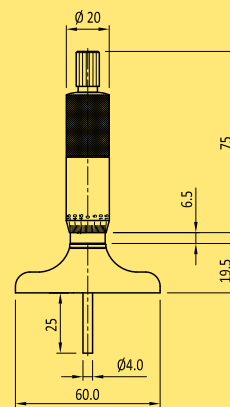
DEPTH



MMC100-DM60



MMC25-DM100



Measuring Range mm	Reading mm	Type	Measuring Range inch	Reading inch	Type
0-25	0.01	MMC25-DM60	0-1	0.001	INC1-DM60
	0.001	MMC25-1DM60		0.0001	INC1-1DM60
	0.01	MMC25-DM100		0.001	INC1-DM100
	0.001	MMC25-1DM100		0.0001	INC1-1DM100
	0.01	MMC25-DM60S		0.001	INC1-DM60S
	0.001	MMC25-1DM60S		0.0001	INC1-1DM60S
	0.01	MMC25-DM100S		0.001	INC1-DM100S
	0.001	MMC25-1DM100S		0.0001	INC1-1DM100S
0-100	0.01	MMC100-DM60	0-4	0.001	INC4-DM60
	0.01	MMC100-DM100		0.001	INC4-DM100
0-150	0.01	MMC150-DM60	0-6	0.001	INC6-DM60
	0.01	MMC150-DM100		0.001	INC6-DM100

FEATURES

- Robust design withstands toughest workshop conditions
- Base : Hardened, ground and lapped
- Stainless steel spindle for rust prevention
- Spindle Measuring faces:
carbide tipped, micro lapped (range 0-25 mm & 0- 1 inch)
Hardened steel, ground and lapped (range 0-100 mm & 0-4") & (0-150 mm & 0-6")
- Range (0-100 mm & 0-4") & (0-150 & 0-6") available with interchangeable rods
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Box, wrench, certificate of inspection

Application

For Measuring depth of steps, shoulders etc

Internal Micrometer & Micrometer Stand



TUBULAR INTERNAL MICROMETER WITH EXTENSIONS

This is an extension rod type inside micrometer.

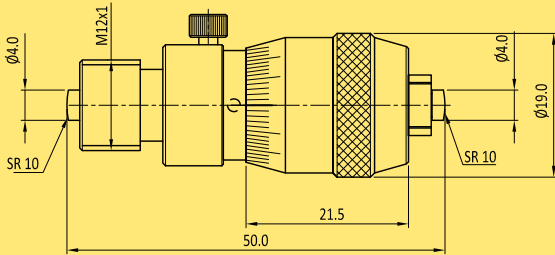
Interchangeable cylindrical extensions are spring-loaded in a protective sleeve with carbide tipped microlapped measuring faces



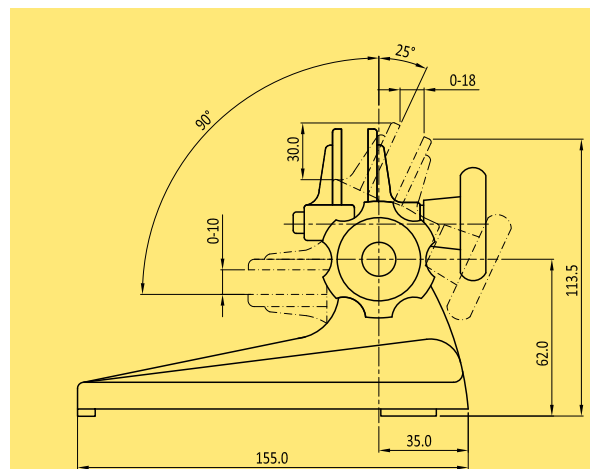
Measuring Range mm	Reading mm	Type	Extension Rods
50-150	0.01	MMT150	3 [13 mm, 25 mm 50 mm]
50-300		MMT300	5 [13 mm, 25 mm 50 mm (2 Nos.), 100 mm]
50-500		MMT500	6 [13 mm, 25 mm 50 mm (2 Nos.), 100 mm, 200 mm]
50-1000		MMT1000	8 [13 mm, 25 mm 50 mm (2 Nos.), 100 mm, 200 mm (2 Nos.), 300 mm]
50-1500		MMT1500	10 [13 mm, 25 mm 50 mm (2 Nos.), 100 mm, 200 mm (3 Nos.), 300 mm (2 Nos.)]

SPECIFICATIONS

- Robust design withstands toughest workshop conditions
- Accuracy : $\pm(3+n+L/50)\mu\text{m}$
 n = Number of extensions
 L = Maximum measuring range (mm)
- Measuring span : 13 mm
- Graduation : 0.010 mm
- Stainless steel spindle for rust prevention (pitch 0.5 mm)
- Measuring faces : carbide tipped, micro lapped
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Box, wrench, certificate of inspection



MICROMETER STAND



SPECIFICATIONS

- This stand keeps both hand free for operating the micrometer and positioning the workpiece.
- Useful for batch or mass type measurements in manufacturing and in quality assurance
- Suitable for micrometers up to 100 mm/4"
- Adjustable angle type

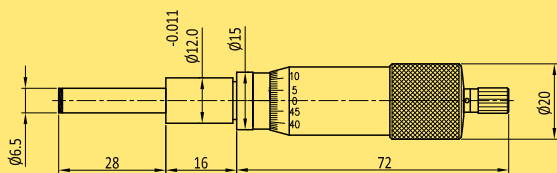


Micrometer Heads

ROTATING SPINDLE



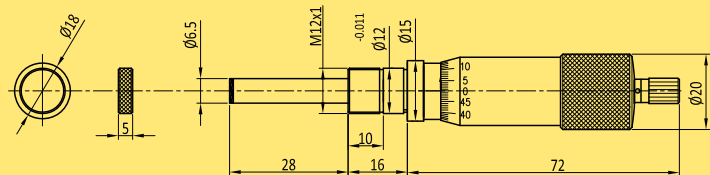
MM25-HP
Plain holding Ø12.0 mm



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 ØM12x1



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

- Stainless steel spindle for rust prevention
- Measuring faces : carbide tipped, micro lapped
- Measuring force : 5 to 10 N
- Metal ratchet stop for consistent measuring force
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Plastic container & certificate of inspection

CUSTOMIZED MICROMETER HEAD

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



NON-ROTATING SPINDLE

Differential Head (Extra fine feed) type

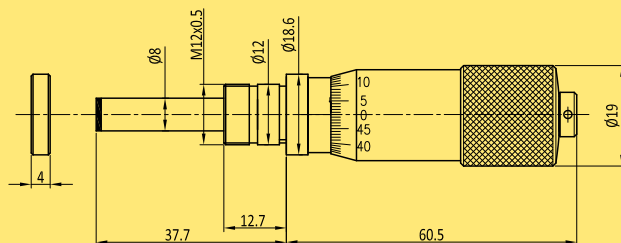
It is a differential mechanism micrometer head (extra fine feed) with a non-rotating spindle.

Differential travel allows ultra-fine, sensitive movement

Range : 0-1 mm

Reading : 0.001 mm

Spindle End : Flat (Carbide Tipped), micro lapped



FEATURES

- Stainless steel spindle for rust prevention
- Measuring faces : carbide tipped, micro lapped
- Scale : Sleeve and thimble dull chrome plated
- Sharp Laser marking for better visibility & durability
- Delivered : Plastic container & certificate of inspection



Micrometer heads with Non-rotating spindle

Internal Micrometer



BAKER



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 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.

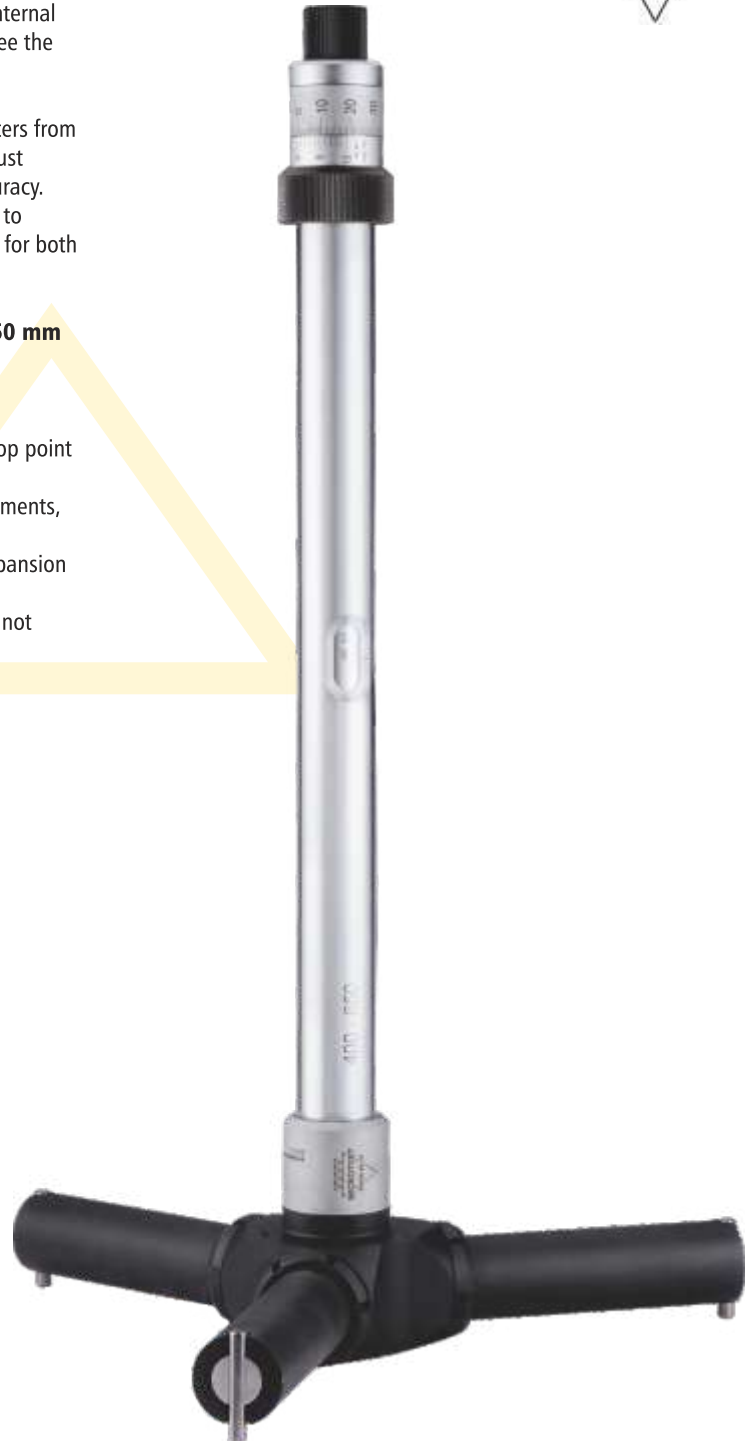
Available measuring ranges are: Ø400-650, Ø650-900, Ø900-1150 mm

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	0.500
XTH12M-BT	12.5-16	XTH12i-BT	1/2-5/8	0.004	0.00015	62	2.44	XTPG02-BT	12.50	0.500
XTH16M-BT	16-20	XTH16i-BT	5/8-3/4	0.004	0.00015	62	2.44	XTPG02-BT	20.00	0.750
XTH20M-BT	20-25	XTH20i-BT	3/4-1	0.004	0.00015	66	2.62	XTPG03-BT	20.00	0.750
XTH25M-BT	25-35	XTH25i-BT	1-1 3/8	0.004	0.00015	66	2.62	XTPG03-BT	35.00	1.375
XTH35M-BT	35-50	XTH35i-BT	1 3/8-2	0.004	0.00015	80	3.15	XTPG03-BT	35.00	1.375
XTH50M-BT	50-65	XTH50i-BT	2-2 5/8	0.005	0.00020	80	3.15	XTPG03-BT	65.00	2.625
XTH65M-BT	65-80	XTH65i-BT	2 5/8-3 1/4	0.005	0.00020	80	3.15	XTPG03-BT	65.00	2.625
XTH80M-BT	80-100	XTH80i-BT	3 1/4-4	0.005	0.00020	100	3.94	XTPG03-BT	80.00	3.250
XTH100M-BT	100-125	XTH100i-BT	4-5	0.006	0.00025	115	3.94	XTPG04-BT	125.00	5.000
XTH125M-BT	125-150	XTH125i-BT	5-6	0.006	0.00025	115	3.94	XTPG04-BT	125.00	5.000
XTH150M-BT	150-175	XTH150i-BT	6-7	0.007	0.00030	115	3.94	XTPG04-BT	175.00	7.000
XTH175M-BT	175-200	XTH175i-BT	7-8	0.007	0.00030	115	3.94	XTPG04-BT	175.00	7.000
XTH200M-BT	200-225	XTH200i-BT	8-9	0.008	0.00030	118	3.94	XTPG04-BT	225.00	9.000
XTH225M-BT	225-250	XTH225i-BT	9-10	0.008	0.00030	118	4.05	XTPG04-BT	225.00	9.000
XTH250M-BT	250-275	XTH250i-BT	10-11	0.009	0.00035	118	4.05	XTPG04-BT	275.00	11.000
XTH275M-BT	275-300	XTH275i-BT	11-12	0.009	0.00035	118	4.05	XTPG04-BT	275.00	11.000

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

BAKER



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	0.500
XTD12M-BT	12.5-16	XTD12i-BT	1/2-5/8	0.004	0.00015	62	2.44	XTDU10-BT	12.50	0.500
XTD16M-BT	16-20	XTD16i-BT	5/8-3/4	0.004	0.00015	62	2.44	XTDU10-BT	20.00	0.750
XTD20M-BT	20-25	XTD20i-BT	3/4-1	0.004	0.00015	66	2.62	XTDU20-BT	20.00	0.750
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	3.250
XTD100M-BT	100-125	XTD100i-BT	4-5	0.006	0.00025	115	4.53	XTDU100-BT	125.00	5.000
XTD125M-BT	125-150	XTD125i-BT	5-6	0.006	0.00025	115	4.53	XTDU100-BT	125.00	5.000
XTD150M-BT	150-175	XTD150i-BT	6-7	0.007	0.00030	115	4.53	XTDU100-BT	175.00	7.000
XTD175M-BT	175-200	XTD175i-BT	7-8	0.007	0.00030	115	4.53	XTDU100-BT	175.00	7.000
XTD200M-BT	200-225	XTD200i-BT	8-9	0.008	0.00030	118	4.65	XTDU200-BT	225.00	9.000
XTD225M-BT	225-250	XTD225i-BT	9-10	0.008	0.00030	118	4.65	XTDU200-BT	225.00	9.000
XTD250M-BT	250-275	XTD250i-BT	10-11	0.009	0.00035	118	4.65	XTDU200-BT	275.00	11.000
XTD275M-BT	275-300	XTD275i-BT	11-12	0.009	0.00035	118	4.65	XTDU200-BT	275.00	11.000

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



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

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 μ m
- Repeatability: 3 μ 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.

Code No.	Range mm	Accuracy	Depth mm	Setting Ring (mm)
XT5001M-BT	300-325	15 μ 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

BAKER



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



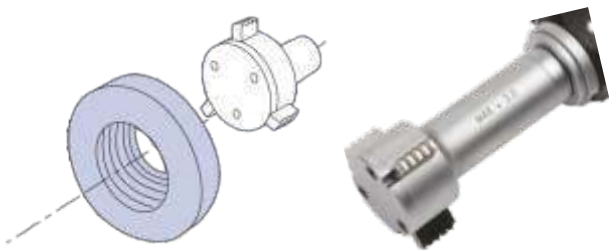


SPECIAL APPLICATIONS

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.

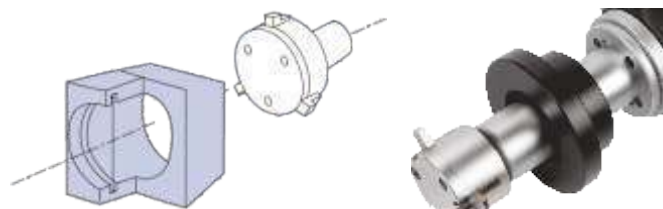
Screw Threads

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



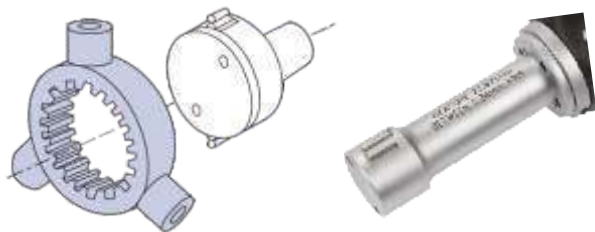
Grooves

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



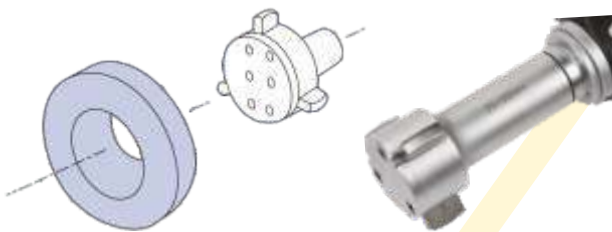
Internal Splines

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.



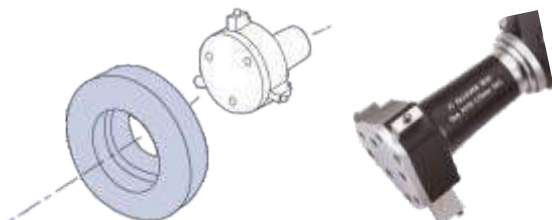
Spherical Radius

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.



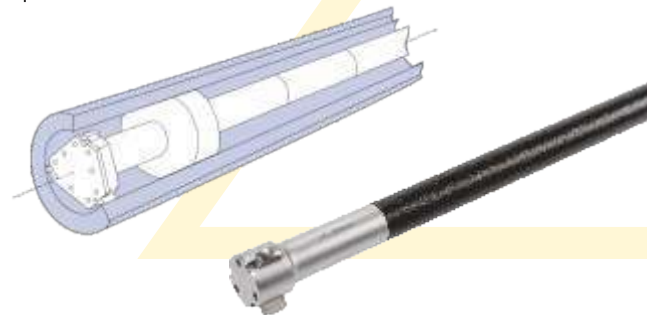
Ball Screw Threads

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

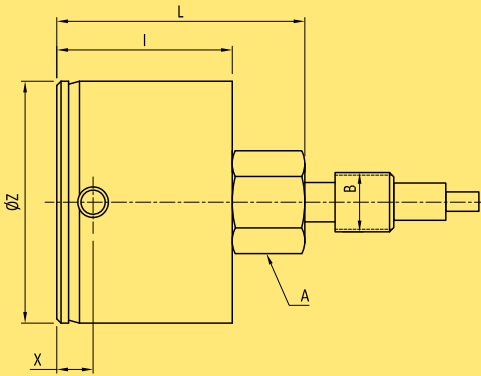
	Standard 2 - point -	NO
From: $\varnothing 6 - \varnothing 280\text{mm}$		
	True 3 - point -	3P
From: $\varnothing 15 - \varnothing 100\text{mm}$		
	Blind - bore -	SL
From: $\varnothing 10 - \varnothing 100\text{mm}$		
	Parallel - CTP	PA
From: $\varnothing 8 - \varnothing 100\text{mm}$		
	Undercut/Bearing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

Contact Type Plug Gauge



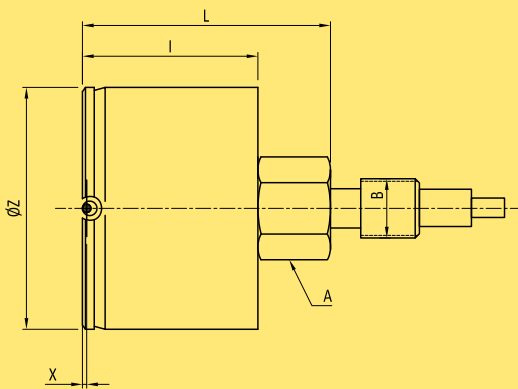
DATA SHEET (MEASURING HEADS)

THROUGH BORE MEASURING PLUGS



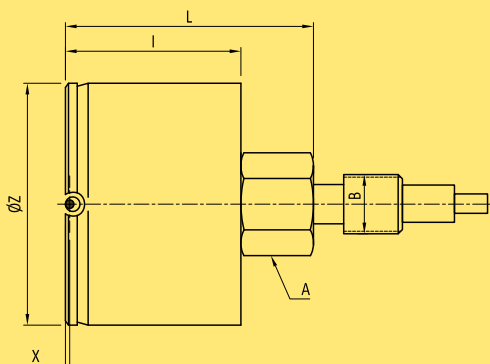
ϕZ	MEASURING RANGE	X	I	L	A	B
$\phi 6-\phi 20$	0.150 mm	5	27	35.5	SW7	M6x0.75
$\phi 15-\phi 40$	0.200 mm	6	29	41	SW13	M10x1
$\phi 40-\phi 50$	0.200 mm	6	29	41	SW17	M10x1
$\phi 50-\phi 100$	0.250 mm	7.5	33.5	42.5	SW22	M10x1
$\phi 100-\phi 280$	0.250 mm	10	36	45	SW22	M10x1

BLIND BORE MEASURING PLUGS



ϕZ	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



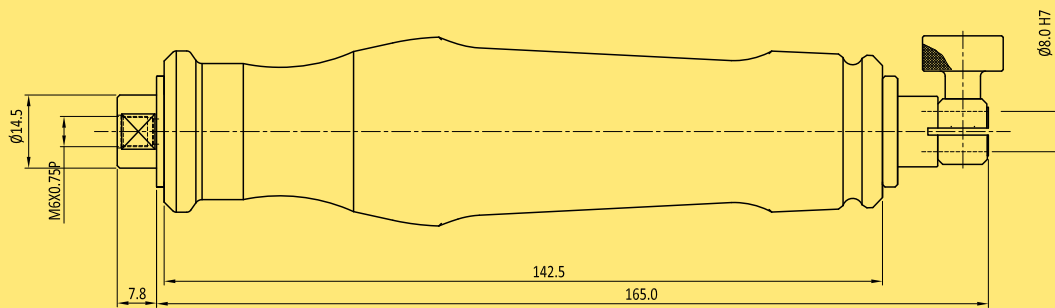
ϕZ	MEASURING RANGE	X	I	L	A	B
$\phi 10-\phi 20$	0.150 mm	0.6	23.5	32	SW7	M6x0.75
$\phi 15-\phi 40$	0.200 mm	1.2	25.5	37.5	SW13	M10x1
$\phi 40-\phi 50$	0.200 mm	1.2	25.5	37.5	SW17	M10x1
$\phi 50-\phi 100$	0.250 mm	1.2	33.5	42.5	SW22	M10x1
$\phi > \phi 100$	0.250 mm	SUPPLIED AGAINST QUOTATION				

Contact Type Plug Gauge

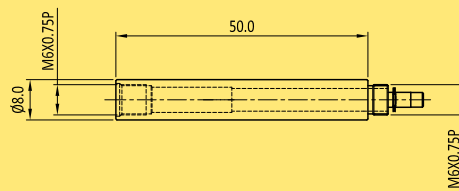


HOLDERS

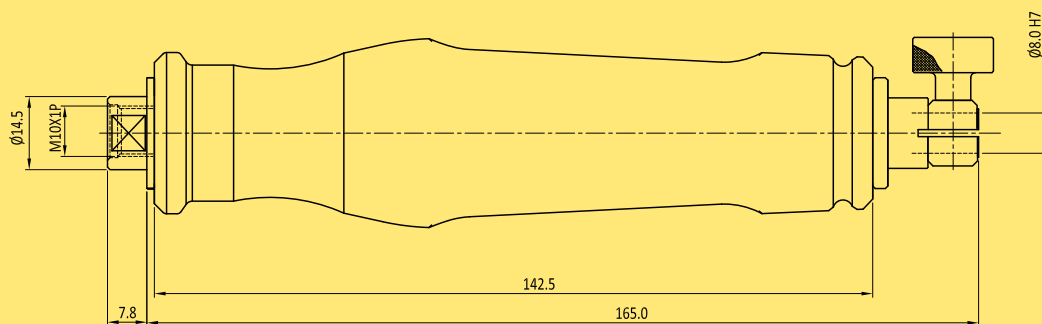
STANDARD HOLDER 6-20



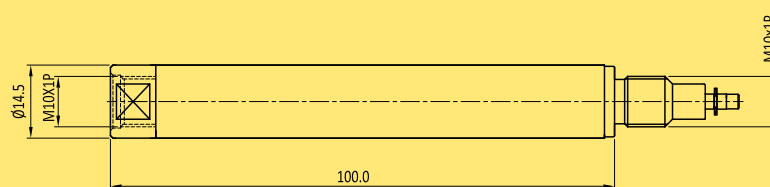
EXTENSION 8-20 MM

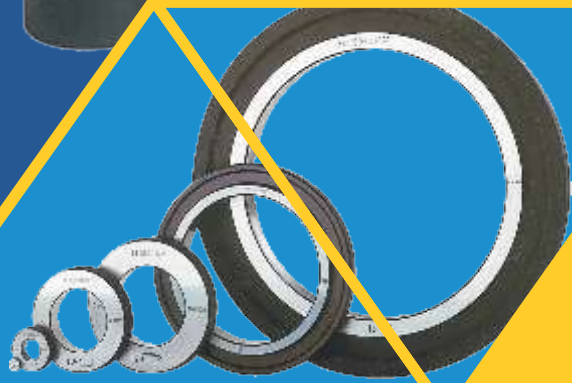


STANDARD HOLDER 15-240 MM



EXTENSION 15-240 MM

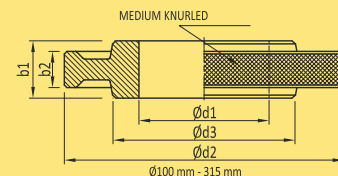
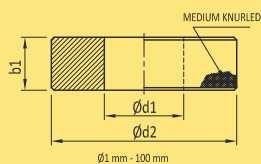




PLAIN GAUGES & MASTERS

Master Setting Ring

RANGE: 1.5 - 315 mm



$\phi d1$		$\phi d2$	$b1$
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

$\phi d1$		Size Tolerance (mm)	Roundness & Parallelism (mm)
ABOVE	UPTO & INC.		
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

$\phi d1$		$\phi d2$	$\phi d3$	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

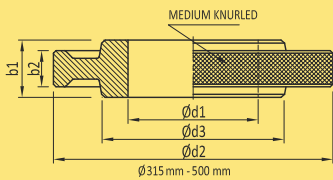
FEATURES

- Used for setting any kind 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.
- Subzero 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 DIN2250-1 Type C.
- Master Setting Rings also supplied in standard set consisting of sizes –
Set 1: $\phi 4.0$, $\phi 5.0$, $\phi 6.0$ & $\phi 8.0$ mm
Set 2: $\phi 10.0$, $\phi 12.0$, $\phi 16.0$, $\phi 20.0$ & $\phi 25.0$ mm

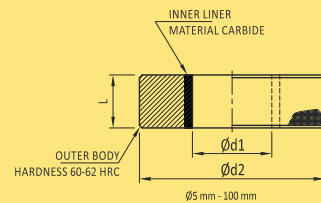
Master Setting Ring



LARGE DIAMETER MASTER SETTING RING



CARBIDE MASTER SETTING RING



$\phi d1$		$\phi d2$	$\phi d3$	THICKNESS	
ABOVE	UPTO & INC.			b1	b2
315	325	450	365	36	32
325	340	460	380	36	32
340	350	460	390	36	32
350	360	460	390	40	36
360	370	500	420	40	36
370	380	510	430	40	36
380	390	520	440	40	36
390	400	530	450	40	36
400	410	540	460	45	40
410	420	550	470	45	40
420	430	560	480	45	40
430	440	570	490	45	40
440	450	580	500	45	40
450	460	590	510	45	40
460	470	600	510	45	40
470	480	610	520	45	40
480	490	620	530	45	40
490	500	620	540	45	40

$\phi d1$		Size Tolerance (mm)	Roundness & Parallelism (mm)
ABOVE	UPTO & INC.		
315	400	± 0.009	0.003
400	450	± 0.010	0.004
450	500	± 0.010	0.004

$\phi d1$		$\phi d2$	L
ABOVE	UPTO & INC.		
5.0	10.0	32.0	12.0
10.0	15.0	38.0	12.0
15.0	20.0	45.0	12.0
20.0	25.0	53.0	20.0
25.0	32.0	63.0	20.0
32.0	40.0	71.0	20.0
40.0	50.0	85.0	20.0
50.0	60.0	100.0	20.0
60.0	70.0	112.0	20.0
70.0	80.0	125.0	20.0
80.0	90.0	140.0	20.0
90.0	100.0	160.0	20.0

$\phi d1$		Size Tolerance (mm)	Roundness & Parallelism (mm)
ABOVE	UPTO & INC.		
5.0	10.0	± 0.0025	0.0015
10.0	20.0	± 0.003	0.0015
20.0	32.0	± 0.004	0.0015
32.0	50.0	± 0.005	0.0020
50.0	80.0	± 0.006	0.0020
80.0	100.0	± 0.006	0.0025

FEATURES

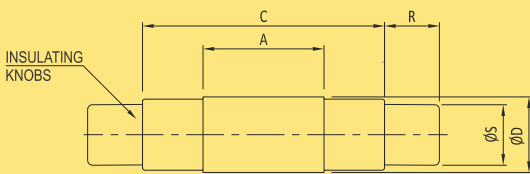
- Range: $\phi 315 \text{ mm}$ to $\phi 500 \text{ mm}$.
- Used for setting of measuring instruments like horizontal comparators, length measuring machines for ID checking, dial bore gauges etc.
- Made from high quality oil hardened non-shrinking gauge steel, hardened and tempered to 60-62 Hrc.
- Subzero treated at -80°C for long term dimensional stability.
- Certificate of calibration is provided along with each master traceable to National/International standards
- Manufactured with the highest levels of precision based on the DIN 2250 standard.

FEATURES

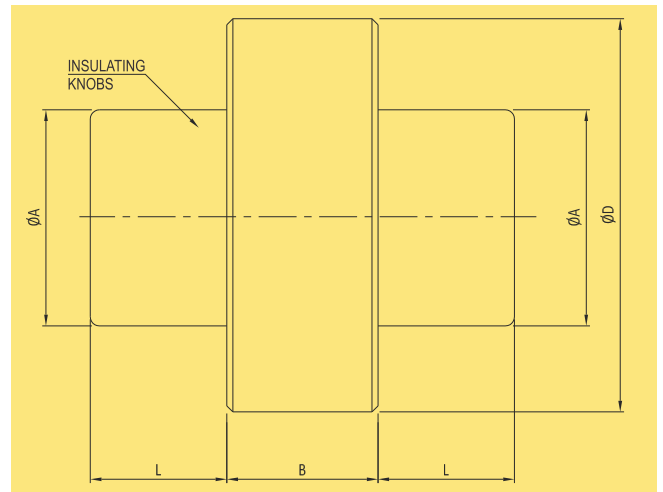
- Range: $\phi 5 \text{ mm}$ to $\phi 100 \text{ mm}$.
- Carbide sleeve press fit in steel body for high wear resistance
- Used for setting any kind of measuring instruments like horizontal comparators, length measuring machines for ID checking, dial bore gauges etc.
- Steel body Sub-zero treated at -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.

Master Setting Disc

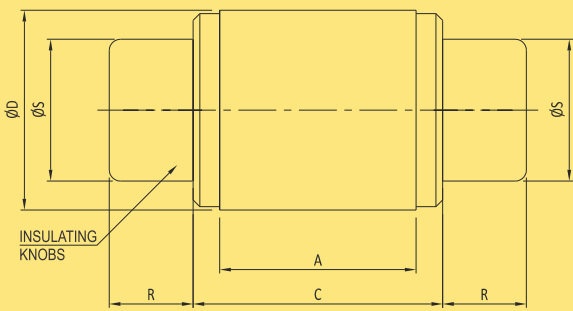
RANGE: 3 - 200 mm



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



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

Above 200 mm upto 300 mm on request

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 Gauge



RANGE: 3 - 40 mm

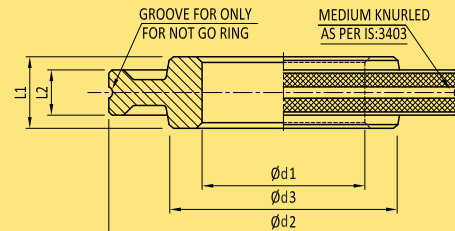
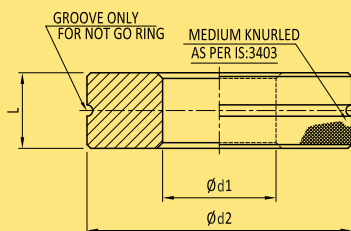


FEATURES

- Range: \varnothing 3 mm 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.

Plain Ring Gauge

RANGE: 1.5 - 315 mm



ød1		ød2	L	
ABOVE	UPTO & INC.		GO	NOT GO
1.5	2.5	22	6	4
2.5	5.0	22	10	5
5.0	10.0	32	12	8
10.0	15.0	38	14	10
15.0	20.0	45	16	12
20.0	25.0	53	18	14
25.0	32.0	63	20	16
32.0	40.0	71	24	18
40.0	50.0	85	32	20
50.0	60.0	100	32	20
60.0	70.0	112	32	24
70.0	80.0	125	32	24
80.0	90.0	140	32	24
90.0	100.0	160	32	24

ød1		ød2	ød3	GO		NOT GO	
ABOVE	UPTO & INC.			L1	L2	L1	L2
100.0	110.0	170	132	36	14	28	14
110.0	120.0	180	140	36	16	28	16
120.0	130.0	190	150	36	16	28	16
130.0	140.0	200	160	36	18	28	18
140.0	150.0	212	170	36	18	28	18
150.0	160.0	224	180	36	20	28	20
160.0	170.0	236	190	40	20	32	20
170.0	180.0	250	200	40	20	32	20
180.0	190.0	265	212	40	22	32	22
190.0	200.0	280	224	45	22	32	22
200.0	212.0	300	236	45	22	32	22
212.0	224.0	315	250	45	25	32	25
224.0	236.0	335	265	50	25	36	25
236.0	250.0	355	280	50	28	36	28
250.0	265.0	375	300	50	28	36	28
265.0	280.0	400	315	56	28	36	28
280.0	300.0	425	335	56	32	36	32
300.0	315.0	450	355	56	32	36	32

FEATURES

- GO & NOTGO ring gauges are manufactured as per IS 3485, DIN 2250-1/DIN2254 or as per customer specification.
- Made from high quality oil hardened non-shrinking gauge steel, hardened and tempered to 60-62 Hrc.
- Subzero treated at -80°C for long term dimensional stability.
- Certificate of calibration is provided along with each ring traceable to National/International standards.



CARBIDE GAUGE BLOCK SET



FEATURES

- Manufactured from specially selected grade of carbide with hardness of 1400 HV.
- High resistance to wear & corrosion.
- Excellent surface finish with superior wringing quality.
- Good dimensional stability for long term use.
- Coefficient of thermal expansion: $5.5 \pm 1.0 \times 10^{-6} / ^\circ\text{C}$.
- Standard Metric/Inch sets are available in Grade 'O' & Grade 'I' as per ISO 3650/BS4311.

MEASURING PIN

RANGE: 0.5 - 20 mm



FEATURES

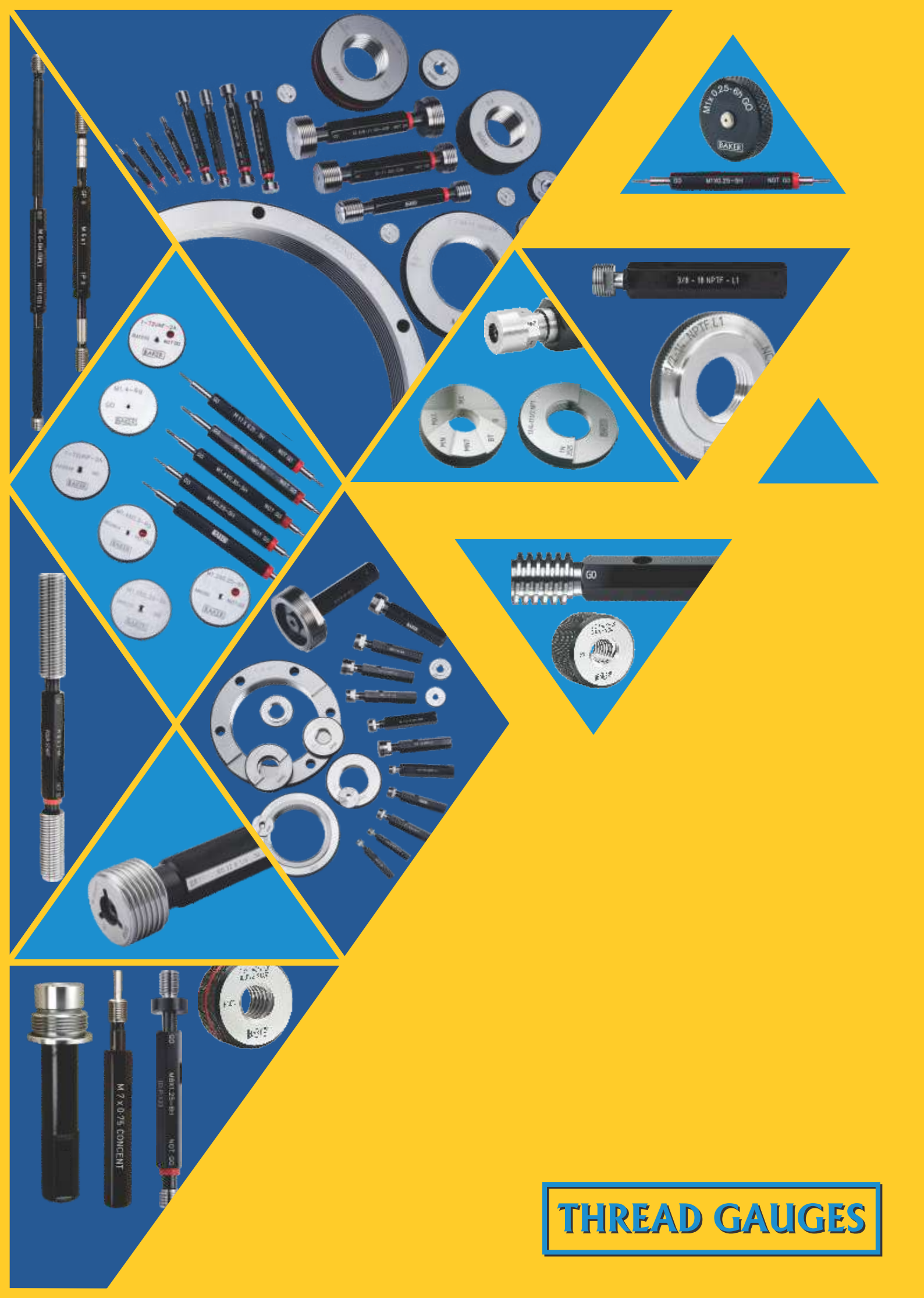
- Measuring pins are manufactured based on relevant IS specification from graded steel.
- Used for checking holes, centre distance between holes, as cylindrical masters for checking gear PCD, to check the slot width etc.
- Range: $\varnothing 0.5$ mm to $\varnothing 20$ mm.
- Metric and inch dimensions.
- Hardness: 60 ± 2 HRC
- Material: Steel.
- Grade 1 ± 0.001 mm as per IS standard.
- Available in steps of 0.010mm, 0.020mm, 0.050mm.
- Pins with knob / without knob available.

STEEL GAUGE BLOCK SET



FEATURES

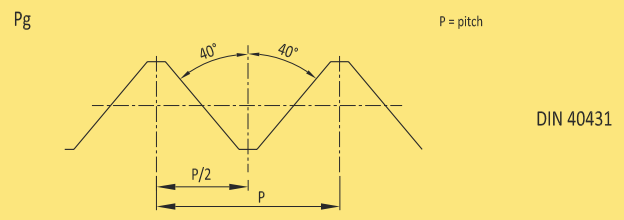
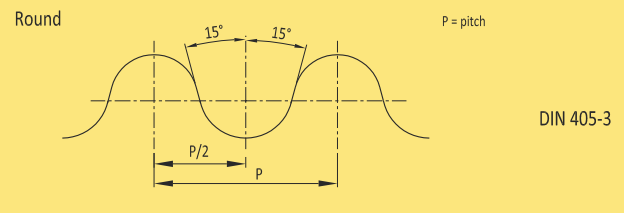
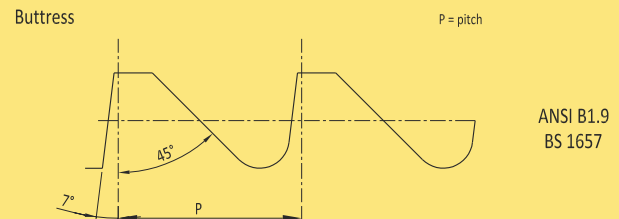
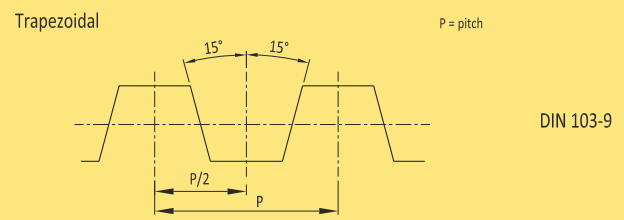
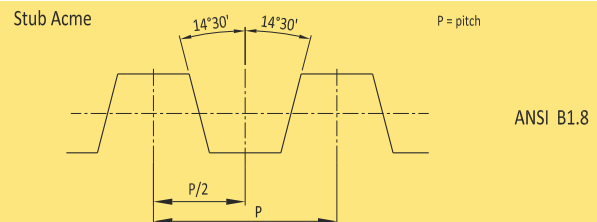
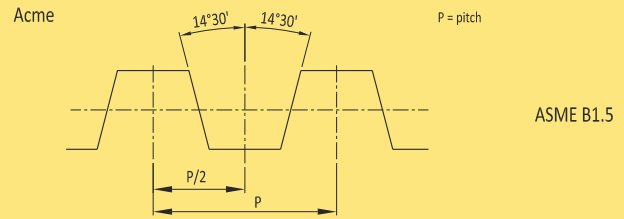
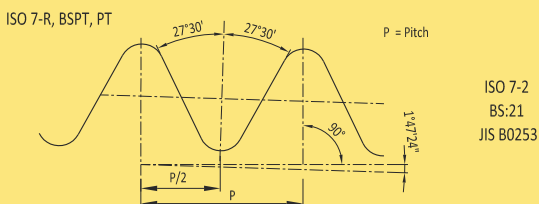
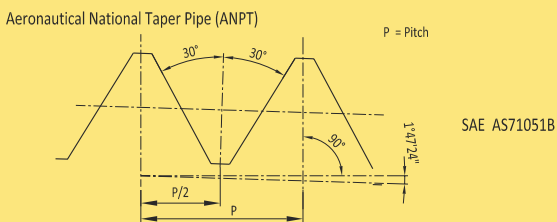
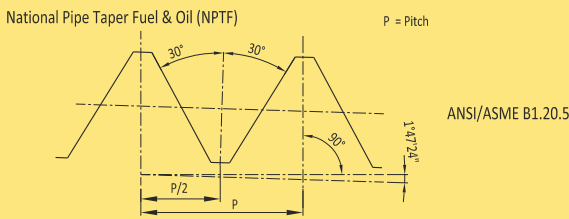
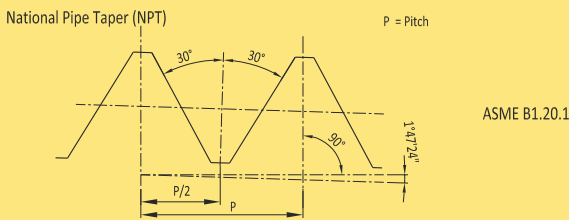
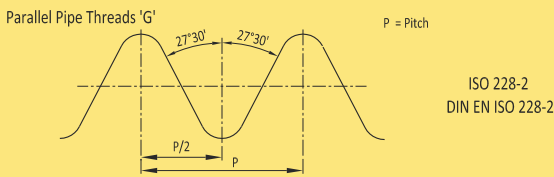
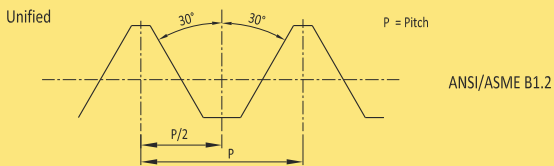
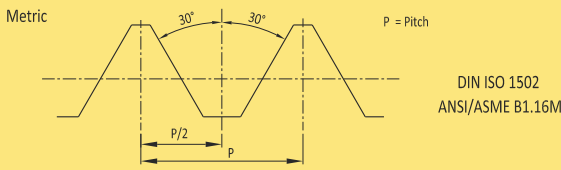
- Manufactured from special alloy steel heat treated to 800 HV giving very good wear resistance.
- Good dimensional stability for long term use.
- Coefficient of thermal expansion: $11.5 \pm 1.0 \times 10^{-6} / ^\circ\text{C}$.
- Standard Metric/Inch sets are available in Grade 'O' & Grade 'I' as per ISO 3650/BS4311.



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

- We also manufacture gauges for PF, STI (wire threads), NPSM, NPSC, NPTR, NPSH, NPSL, NPSF, NPSI, NGT, MJ, UNJF, UNJC, DIN 299, DIN 158 threads

Thread Gauge



RANGE

Thread Plugs	0.8 mm to 450 mm
Thread Rings	1 mm to 500 mm
Taper Thread Plugs	1/16 inch to 16 inch
Taper Thread Rings	1/16 inch to 16 inch

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
METRIC			
M0.8	0.2	5H	6h
M1	0.25		
M1.1			
M1.2			
M1.4	0.3		
UNIFIED			
No.0 (0.060")UNF	80 TPI	2B	2A



MULTI START



HOLE LOCATION



CUSTOMIZED GAUGES AS PER REQUIREMENTS



Note

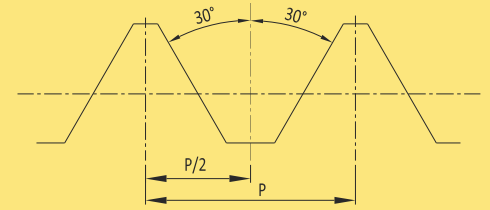
- Odd pitch and diameter combination, extra fine pitch gauges also manufactured.

Thread Gauge

METRIC

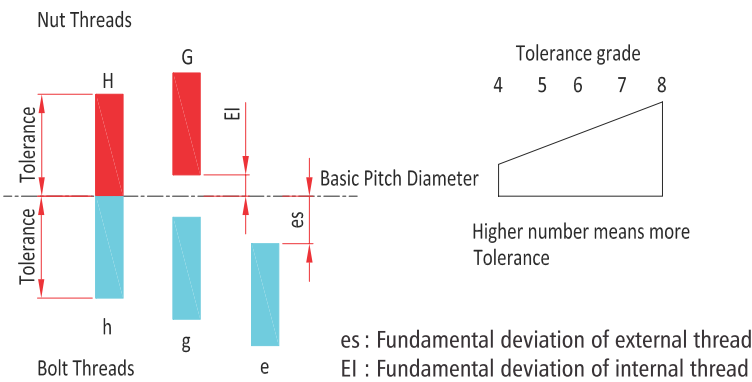


Thread dimensions are as per DIN ISO 1502



P = Pitch

TOLERANCE DIAGRAM INTERNAL & EXTERNAL THREADS



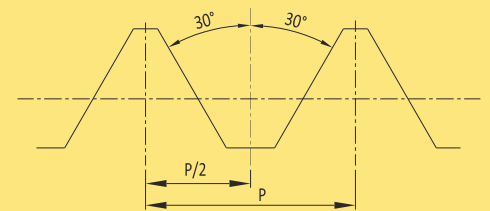
Acceptance criteria for components:

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

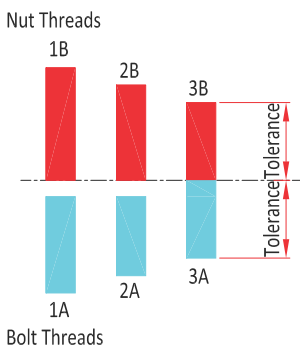


Thread dimensions are as per ANSI/ASME B1.2



P = Pitch

TOLERANCE DIAGRAM INTERNAL & EXTERNAL THREADS



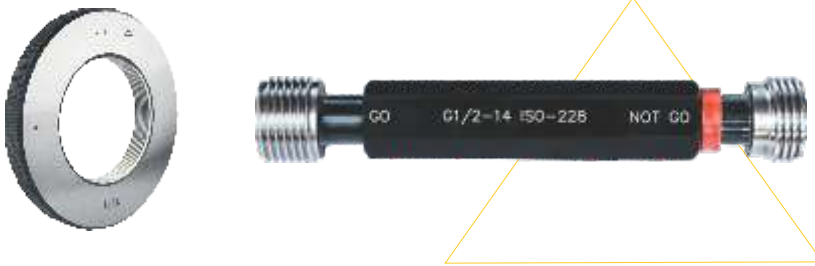
Acceptance criteria for components:

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

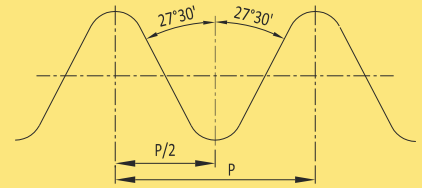


'G' PIPE



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

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

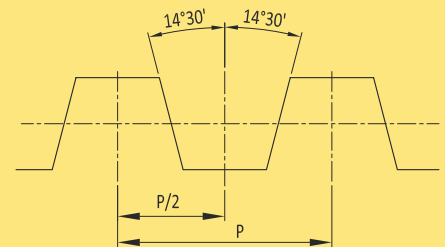


P = Pitch

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.

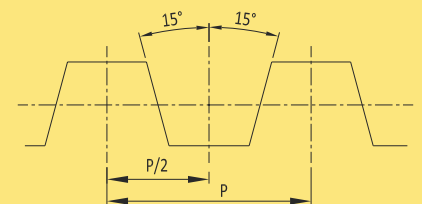
ACME & STUB ACME



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 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

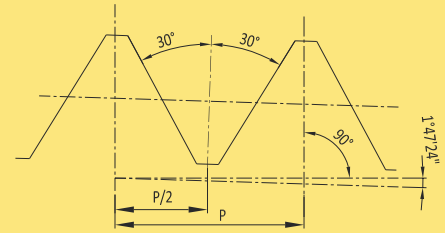
- Gauge dimensions are as per DIN 103-9
- Recommended Tolerance classes are 7H/7e for medium tolerance quality and 8H/8c for coarse tolerance quality.

Taper Thread Gauge

NPT



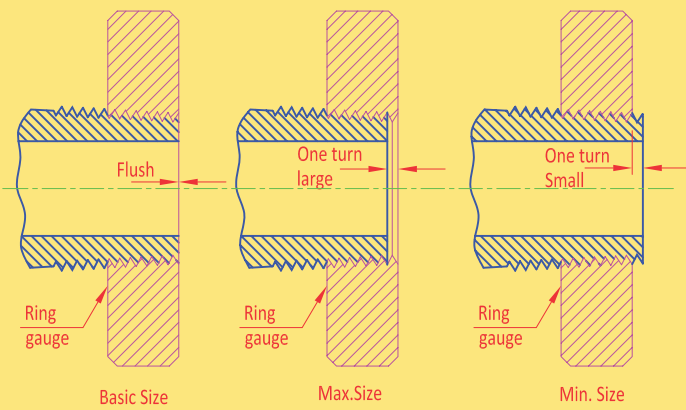
Thread dimensions are as per ASME B1.20.1.
Gauges are supplied as Basic Step & Min/Max Steps.



P = Pitch

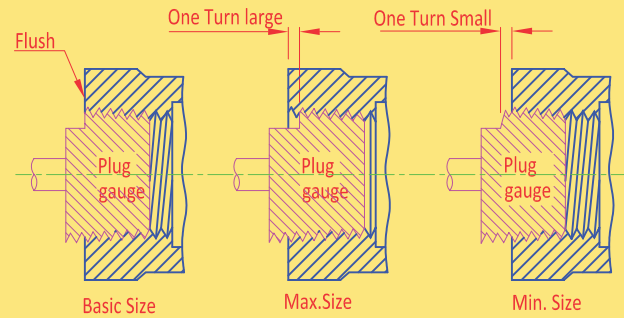
GAUGING EXTERNAL TAPER THREAD

With Basic Step Taper Thread Ring Gauge



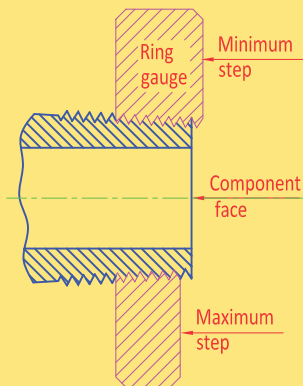
GAUGING INTERNAL TAPER THREAD

With Basic Step Taper Thread Plug Gauge

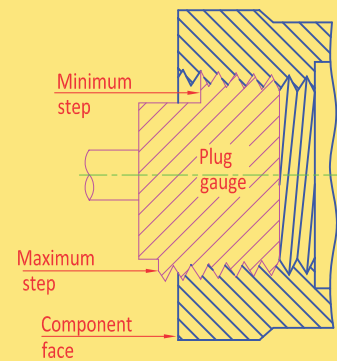


The Basic Step gauge when screwed onto the threads of the component by hand, should be flush with the end of the component face within 1 turn, as shown above

With Min / Max Step Taper Thread Ring Gauge



With Min / Max Step Taper Thread Plug Gauge



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

Taper Thread Gauge



NPTF, ANPT



L1 Ring



L2 Ring



6 Step Crest Check Ring



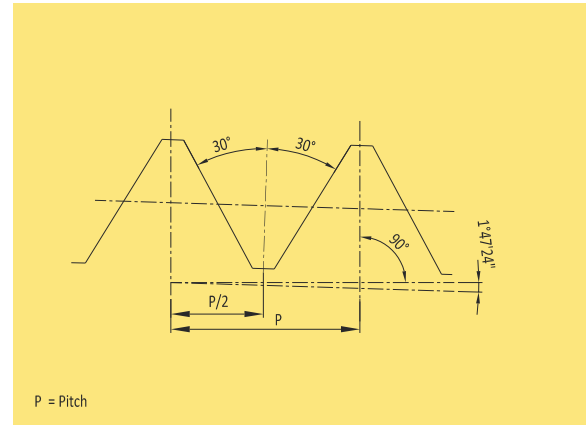
L1 Plug



L3 Plug



6 Step Crest Check Plug



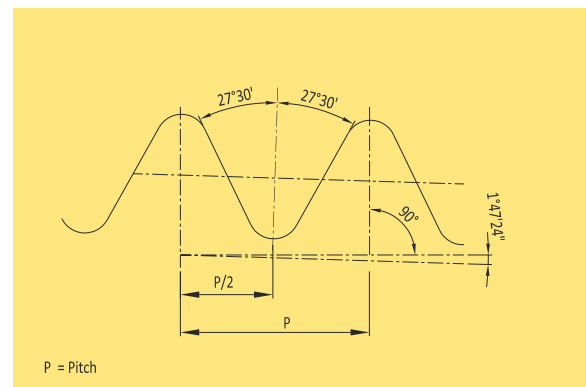
P = Pitch

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

- 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°
- Threads 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

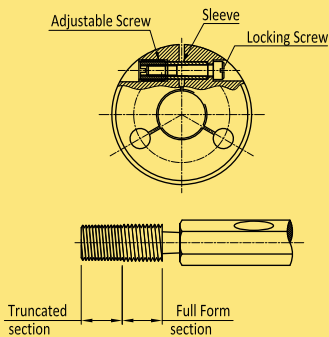


Adjustable Thread Ring Gauge



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
Inch	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

Thread Depth Gauge & Gauge Handle



ANALOGUE THREAD DEPTH GAUGE

For fast and accurate thread depth and size measurement, thread depth gauges use ISO & ANSI standard taper lock thread plug members. Thread depth is a manually operated gauge for gauging threads and their depths in one single step, by pushing the spring loaded scale sleeve into the handle, the fully cut thread depth can be read off quickly and precisely from marked sleeve. These gauges are used in components with identical thread dimensions but different thread depths as well as for setting up a thread depth for any kind of internal thread production.



HANDLES FOR PLAIN AND THREADED PLUG GAUGES

ISO & ANSI HANDLES

The external surfaces of the gauge handles are matt anodized finish.



DIN HANDLES



Handle Type	Reading mm	Measuring Depth mm	Metric Threads	Inch Threads
BDG-03	0.5	20	M4,M5,M6	No 8, No 10, No 12, 1/4
BDG-04		35	M8,M10	5/16, 3/8, 7/16
BDG-05		45	M12,M14,M16	1/2, 9/16, 5/8

Handle No. Based on ISO : 5388	Handle no Based on ANSI/ASME B47.1	Handle no Based on DIN 2240
1	000	1
2	00	2
3	0	3
4	1	4
5	2	5
6	3	6
7	4	7
8 - GO	5	8 - GO
8 - NOT GO		8 - NOT GO
9 - GO		9 - GO
10 - NOT GO		10 - NOT GO

FEATURES

- Interchangeable thread plug gauge members permit checking different thread sizes with single gauge handle
- Analogue scale L.C. 0.5 mm
- GO & NOTGO gauging with a single handle
- Scale : Sleeve dull chrome plated
- Delivered : Box, setting master, wrench & certificate of Inspection
- Light weight

Note

- ISO handle 1 to 7 : Taper lock (1:50) double end
- ANSI handle 1 to 5 : Taper lock (1:48) double end
- DIN handle 1 to 7 : Taper lock(1:50) double end
- ISO handle 8, 9 & 10 : Fastening type single end
- DIN handle 8, 9 & 10 : Fastening type single end



**AUTO / SEMI-AUTO THREAD
VERIFICATION SOLUTIONS**

Auto / Semi-Auto Thread Verification Solutions

BAKER

NEW VISTA
CORPORATION

"I just want to avoid spinning thread gauges all day"

As leaders in thread gauging technology, we hear this sentiment from many manufacturing professionals who machine large quantities of threaded parts. Their customers require them to verify the threads in every part.

Unfortunately, when operators are manually spinning thread gauges into parts for high-volume production, there is increased risk of operator error and repetitive motion injury. Automatic and semi-automatic thread gauging methods reduce or eliminate the burdens and risks of manual gauging.

At Baker Gauges, we are introducing thread verification solutions using New Vista Corporation's (USA) innovative technology.



INCLUDES

- Hand-Held Thread Verification Units
- Application Oriented Thread Verification & Sorting Machines
- Thread Verification Units for System Integration & Automation

BENEFITS

- Quick thread verification using a motorized power unit consists a low-inertia torque-limiting mechanism
- Work with both internal and external threaded features
- Thread depth verification is also possible
- Interchangeability of thread members with suitable quick change chucks
- Allows measurement cycle time in seconds
- Electric and air powered versions of hand held thread verification units are available
- Integration of thread verification units with auto-gauging systems or robotic automation cell
- Thread verification & sorting of small threaded components
- Compliance for out-of-position or angularly-dislocated threads
- The low-inertia torque limiter permits the thread gauge member to stall harmlessly when encountering wrong size, wrong-pitch, short, incomplete, damaged or missing threads
- More than 35 different models of New Vista Thread-Verification Units are available
- Robust design and build quality



RT HAND-HELD TVU

- Battery-powered verification (or remediation) of threaded holes (or external threads)
- Versatile. Powerful. Portable. Two-speed gear drive. Can be used anywhere
- Will process most threads in less than 3 seconds
- Sensitive patented clutch unit allows the thread tool to stop harmlessly in case of hopelessly obstructed threads
- Fast-change snap-in Type FP chuck enables tool changes in 4 seconds
- Tool Adapters will accommodate all the popular tool shanks: taper, straight, Type BH and full-threaded (reversible)
- Compliant feature prevents jamming. It will follow the existing thread, not fight it
- Forward (driving-in) torque settings are made with an external knob. Torque in reverse is always at maximum power



TG HAND-HELD TVU

- Ultra-fast thread verification or chasing without gouging or jamming
- Outperform "retappers" by 3X
- Pushbutton reverse-out
- Will verify most threads in 2-1/2 seconds (hole-to-hole time)
- Breakaway feature protects delicate tools from damage
- Sensitive patented high speed drive allows the spindle to stop in case of bad or short threads. Won't jam or damage threads at entry or if it "bottoms out"
- External graduated collar sets the going-in torque for any application
- Full motor torque is always applied in reverse
- Does not subject the operator to high torque levels
- Compliant Toolholders allow Chasing Tools (or Thread Gauge Members) to follow the hole if alignment is not perfect. See "VTG" videos on the New Vista website
- Toolholders available that accept all the standard tool shank configurations: taper, straight, all-threaded ("reversible") and Types BH and EXT



CRD HAND-HELD TVU

- Battery-powered verification (or remediation) of threaded holes (or external threads) with right angle adapter
- Versatile. Powerful. Portable. Two-speed gear drive. Can be used anywhere
- Will process most threads in less than 3 seconds
- Sensitive patented clutch unit allows the thread tool to stop harmlessly in case of hopelessly obstructed threads
- Fast-change snap-in Type FP chuck enables tool changes in 4 seconds
- Tool Adapters will accommodate all the popular tool shanks: taper, straight, Type BH and full-threaded (reversible)
- Compliant feature prevents jamming. It will follow the existing thread, not fight it
- Forward (driving-in) torque settings are made with an external knob. Torque in reverse is always at maximum power



Application Oriented Thread Verification Machines



BAKER

NEW VISTA
CORPORATION

SC-TYPE THREAD VERIFICATION MACHINES

- Models available that will run a large variety of internal or external, straight or tapered threads.
- Utilizes production-proven, patented New Vista mechanisms and controls.
- Low maintenance and long thread tool life.
- Sensitive high-speed drive allows spindle to stop harmlessly if an obstruction is encountered.
- Will not subject the part or the tooling to damaging force or torque levels.
- Will not jam or stick in undersize or short threads.
- Outputs are available for integrated applications.



PPT-TYPE THREAD VERIFICATION MACHINES

- Supplied standard with New Vista 62020AC composite clutch and Type FP quick-change chuck
- Will follow existing thread. It won't cross thread (with the Squaring-up Plate)
- Tools won't jam in the threads (reverse-out is at higher torque than run-in)
- won't damage the thread at entry
- No programming required at all
- Tool Adapters available to run any gauge or remediation tool and any shank configuration: taper shank, straight shank, all-threaded and Type BH
- Variable speed settings: from 0 to 1,400 rpm
- Slow-start feature is available with the basic unit
- Green light illuminates when correct thread depth has been achieved (with the Thread Depth Option)



IND-TYPE THREAD VERIFICATION MACHINES

- Automatically inspects threaded features in parts. Rejects are automatically sorted out
- Indexing wheel transfers part from load-in to various inspection positions
- Checks threaded holes (or external threads) by powering a Thread Gauge Member into (or onto) the part. "GO" gauging, "NO GO" gauging, and combination gauging are all possible
- Sensitive high speed drive causes the spindles to stop in case of missing, short or improperly formed threads. This creates a "reject" signal
- Will check blind holes accurately for thread depth
- Will not jam or stick in undersize (reject) threads. Rejects are separated out without stopping the process
- Does not subject the part (or the spindle) to high force or torque levels... even with a reject
- Multispindle Stations are available for multiple parts or multiple centres work
- Automatic gauging of non-threaded features can be incorporated into one solution



Thread Verification Units For System Integration

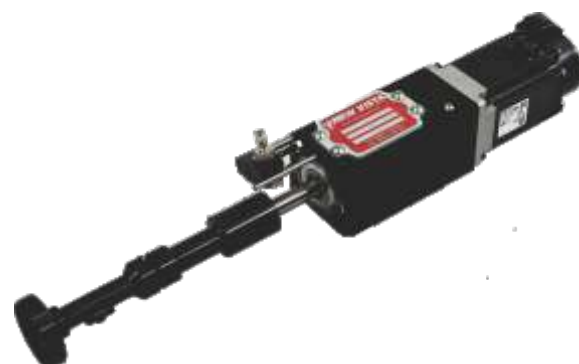


BAKER

NEW VISTA
CORPORATION

STH SERIES

- Quickly and automatically verifies or reconditions (chases) threaded holes (or external threads) by powering a suitable tool into (or onto) and back out of (or off of) the part. Versions are capable of "GO" gauging, "NO GO" gauging, combination gauging or thread chasing
- Sensitive high speed drive allows the tool to stop in case of missing, short, or improperly formed threads. This creates a "reject" signal
- Spring-biased spindle nose prevents damage to end of thread at start of engagement
- Will verify blind holes (or male threads) accurately for thread depth (length). Will mount in any orientation
- Will not jam or stick in short or obstructed (reject) threads
- Does not subject the part (or the spindle) to high force or torque levels...even with a reject
- M2 to M100 thread size can be verified with 4 STH models



FLX THREAD STATIONS

- Available as single-spindle Modules, multiple-spindle Heads or complete Stations
- Used to form, verify or recondition threaded holes (or external threads) by engaging appropriate thread tools with various threaded features
- Will simultaneously form, verify or recondition threads of different sizes and pitches
- Spindles are set individually for different torques and thread depths
- Spindle Units supplied equipped with compliant tool holders - to accommodate out-of-position holes
- Not subject to damage from broken taps, missing or displaced holes, etc
- Will not jam or stick in undersize or short threads. Won't cross thread



RTU UNITS

- You can accommodate nearly any thread size between M1 and M75 with any new standard-issue RTU-SM2. Different models for different thread sizes (or different pitches) are no longer necessary. Any RTU-SM2 can now be used to gauge or remediate nearly any thread
- With the new tooling for RTUs, torques and rpms are selectable right off the screen
- Specialty tool shanks are no longer a necessity. New tooling options for the new RTU-SM2s accommodate straight shank, taper shank, all-threaded reversible or Type BH tools
- The weight of an RTU with a set of tooling is about 3.6 kg (8 lbs.)





SPLINE GAUGES & MASTER GEARS



Spline Gauge & Master Gear

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
Standards:	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)	
Range:		
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

MASTER GEARS-SPUR AND HELICAL



RANGE 6-300mm

Specifications	Master Gears
Standards:	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)
Range:	
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
Typical Tolerances:	
Total Profile	0.003mm
Adjacent Pitch Error	0.0025mm
Total Pitch Error	0.009mm
Total Tooth Alignment Error	0.0025mm
Radial Runout	0.005mm

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
- Equipped with latest CNC machines
- Small rings are wire-cut for better quality and stability

Spline Gauge & Master Gear



VARIABLE SPLINE INDICATOR PLUG GAUGE WITH SETTING MASTER RING



Specifications	Variable Spline Indicator Plug Gauge
Standards:	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)
Range:	
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
Typical Tolerances:	
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
Standards:	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)
Range:	
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
Typical Tolerances:	
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
Standards:	ISO (International), DIN (Germany), ANSI / AGMA (American), JIS (Japanese)
Range:	
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
Typical Tolerances:	
Profile	0.005mm
Total Spacing	0.005mm
Runout	0.005mm
Tooth Alignment	0.0025mm
Space Width	0.005mm



AIR & AIR-ELECTRONIC GAUGES



Air Gauge

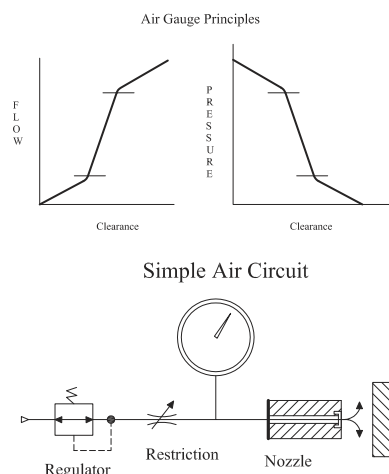
Air Gauging is a non-contact means of precise comparative measurement which offers users the advantages of improved workflow, increased productivity and decreased downtime.

WHY AIR GAUGING?

- Air Gauging is the best proven method of gauging a bore of good surface finish with 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

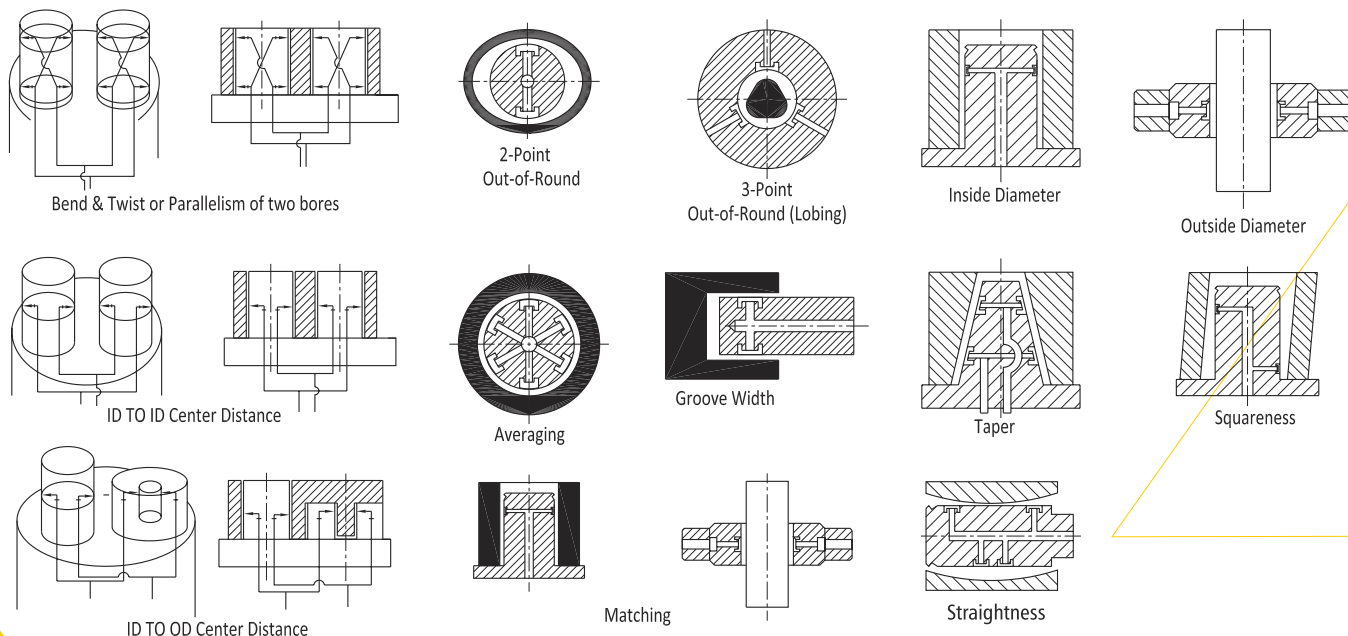
WORKING PRINCIPLE

- 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

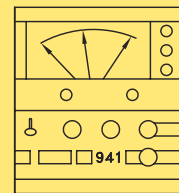
AIR ELECTRONIC CONVERTER MODULE (AECM)



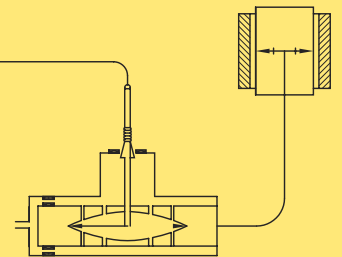
AECM

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



Air Electronic Gauging



MICROPROCESSOR BASED DIGITAL GAUGE (AEP)



AEP 1

AEP 2

FEATURES

- Seven segment, 6 character, 3 colour LED display, ½ inch tall
- Air-Electronic input from BAKER Air Plug and Ring Gauges (APG & ARG)
- Display resolution: 1µm, 0.1µm, 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 variants AEP 1, AEP 2, AEP 3, AEP 4, AEP 6
- 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 / 2045NAEPH



2045NAEP 2/3/4



2045NAEPD

2045NAEP :- Single channel Air-Electronic column gauge using Piezo transducer
Measuring Range $\pm 0.040\mu\text{m}$.

2045NAEPH :- Single channel Air-Electronic column gauge using Piezo transducer
Measuring Range $\pm 0.080\mu\text{m}$.

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

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
+/- 0.1 mm	0.001 mm	+/- 0.080 mm

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 all BAKER jet diameters of Air Plug Gauges, Air Ring Gauges & Air 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.
- 2045NAEPD works on a differential principle.

Air Electronic Gauge

GAUGING SYSTEMS WITH STATISTICAL PROCESS CONTROL



SPC 3000 P4/P8

SPC 3000 (PNEUMATIC)

BAKER SPC 3000 is built to cater to the gauging requirements on any industrial shop floor. Besides the main activity of dimensional measurement, it is also capable of Statistical Process Control (SPC). It has the capability to digitalise your gauging system output via Ethernet, Wi-Fi, USB (for flash drive, external keyboard, scanner) etc. in line with Industry 4.0 requirements.

The BAKER SPC 3000 is available in 2 configurations

PNEUMATIC GAUGE
SPC 3000 P4 (4 PNEUMATIC INPUTS)
SPC 3000 P8 (8 PNEUMATIC INPUTS)

FEATURES

- 7 Inch Graphic colour LCD Display
- Resolution- 0.0001mm / 0.001mm
- Available with 4 / 8 Air Electronic Piezo inputs
- SPC Calculations
- Internal memory
- Internal memory storage : 8 GB
- Ethernet output
- RS232 data output
- Air saver control
- View to store measurements
- Status of stored measurements
- Connectivity to USB flash drive
- Connectivity to External keyboard
- Barcode scanner output (Optional)

Air Electronic Gauge



TECHNICAL SPECIFICATION SPC 3000 (PNEUMATIC)

SPECIFICATION	SPC3000 P4	SPC3000 P8
7 inch Graphic LCD Display	✓	✓
Analogue + Digital Display	6 (Max)	6 (Max)
Digital + Bar graph Column Display	8 (Max)	8 (Max)
Pneumatic inputs	4	8
Probe inputs	–	–
No. of Results	8 (Max)	8 (Max)
Static measurements	✓	✓
Combination of inputs for Results	8 (Max)	8 (Max)
Dynamic measurements	✓	✓
Inch / Metric selection	✓	✓
Display Resolution : 0.0001mm/0.001mm; 0.00001/0.0001 in.	✓	✓
Double Mastering	✓	✓
Maximum Permissible Error (MPE)	±30µm : 0.5µm	±30µm : 0.5µm
	±30µm to ±40µm : 1µm	±30µm to ±40µm : 1µm
Single Mastering	✓	✓
RS232 Data output	✓	✓
Ethernet Data output	✓	✓
Internal Memory storage	8GB	8GB
USB flash drive connectivity	✓	✓
Barcode reader input	Optional	Optional
Logic output; OK/Not OK, Hi/OK/Lo	✓	✓
Auto Air cut-off	Optional	Optional
External key board connectivity	✓	✓

TAPER ANGLE MEASURING SYSTEM (SPC 3000PTA)



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
- Display can show three diameters, angle in Ø or 2Ø, gauge plane height and gauge plane diameter
- Available as Probe or Air Electronic Piezo inputs

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
- For specific depth or land width checking, adjustable depth collars can be provided
- Dia above 250 mm on request

SPECIAL APPLICATIONS



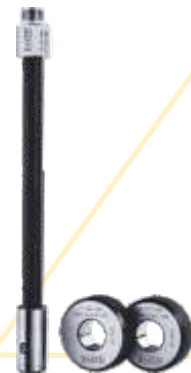
BRACKET MOUNTED AIR PLUG

- 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

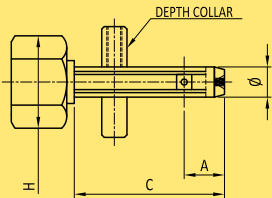
- Special flat air plug can be used for checking groove width i.e. the grooves of piston

Air Plug Gauge



DATA SHEET

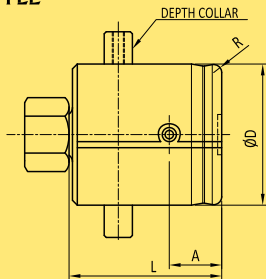
'S' STYLE



Ø D mm	A		C	F**	G*	H	MIN RANGE
	THROUGH	BLIND					
1.5-3.0 #	4.00	-	16.0	2.50	-	7.0	±0.005
2.0-3.0 #	4.00	-	20.0	2.50	-	7.0	
3.0-4.0	6.50	3.0	24.0	2.50	4.0	18.5	
4.0-6.0	9.00	3.0	31.0	2.50	4.0	18.5	

- Ø1.5 to Ø3.0 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 "C" by 25 & 50 mm (above Ø 3 mm only).
- Ø1.5 to 6 mm air plug gauges are supplied on PFL module -2A and clear line ±0.025 mm unit.
- # - not supplied in blind bore design.

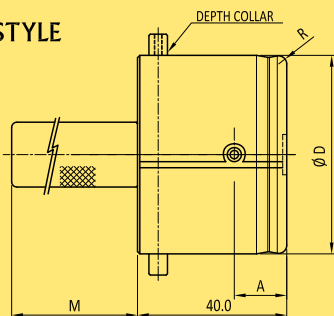
'M' STYLE



Ø D mm	A		L		F** MOD1A/CL	G* MOD1A/CL	MIN RANGE
	THROUGH	BLIND	THROUGH	BLIND			
6.0-13.0	13.0	4.0/3.0	37	29	4.5/3.5	6.0/5.5	±0.005
13.0-20.0	15.0	4.5	40	40			
20.0-35.0							
35.0-60.0							

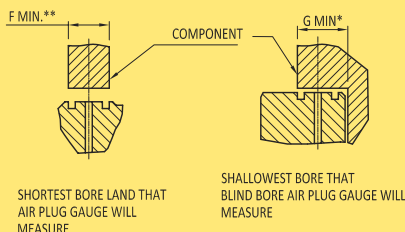
- For deeper holes, use extensions which increase by 50, 100, 200, and 300 mm.
- Quick entry pilot (QEP) is provided for air plug gauges above Ø13 mm as standard (others on request).
- As a special case, air plug gauges can be supplied on module 2A unit up to Ø50 mm only to suit super blind or for less 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
	THROUGH	BLIND				
60.0-100.0	15.0	4.5	4.5/3.5	6.0/5.5	100.00	±0.005
100.0-150.0#					150.00	±0.010
150.0-200.0#					200.00	±0.015

- Supplied hand held as standard.
- For deeper holes, extension "M" can be increased.
- # Not supplied for use on ±0.025 mm clear line unit and mod 2A.
- Above 200 mm and up to 25 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 minimum range mentioned in the above table whichever is maximum
- 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 multiple jet design to check lobing/avergae), 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

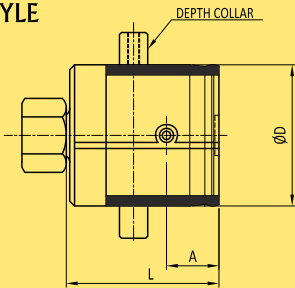
Lesser the clearance, higher the accuracy and vice versa

Carbide Air Plug Gauge

RANGE: 12-100 mm



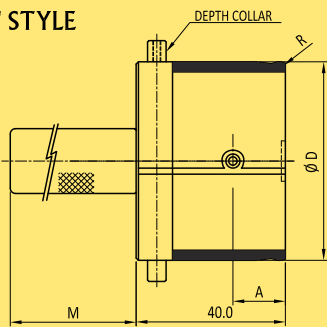
'M' STYLE



$\varnothing D$ mm	A		L		F**	G*	MIN RANGE
	THROUGH	BLIND	THROUGH	BLIND	MOD1A/CL	MOD1A/CL	
12.0-13.0	13.0	5.0	37	29	4.5/3.5	6.0/5.5	± 0.005
13.0-20.0	15.0	5.0	40	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 (QEP) is provided for air plug gauges above $\varnothing 13$ mm as standard (others on request).
- As a special case, air plug gauges can be supplied on module 2A unit up to $\varnothing 50$ 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

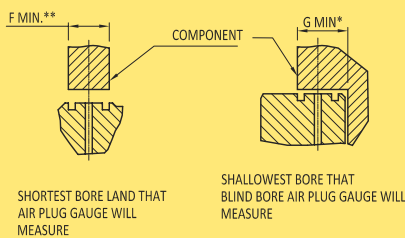


$\varnothing D$ mm	A		F**	G*	M	MIN RANGE
	THROUGH	BLIND	MOD1A/CL	MOD1A/CL		
60.0-100.0	15.0	5.0	4.5/3.5	6.0/5.5	100.00	± 0.005

- Supplied hand held as standard.
- For deeper holes, extension "M" can be increased.
- # Not supplied for use on ± 0.025 mm clear line unit and mod 2A.
- Above 200 mm and up to 25 mm on request.

General notes

- Air plug gauge for 0.0005 mm least count are given up to $\varnothing 50$ 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 minimum range mentioned in the above table whichever is maximum
- 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 multiple jet design to check lobing/average), 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

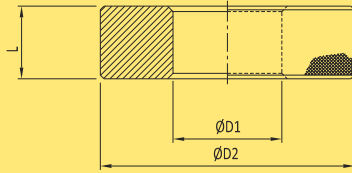
Important rule in air gauging

Lesser the clearance, higher the accuracy and vice versa

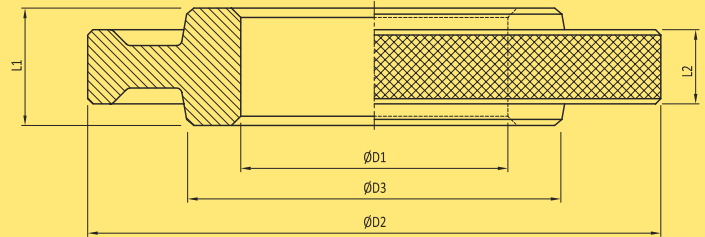
Setting Rings for Air Plug Gauge



RANGE: 1.5-315 mm



DIA. 1.5 mm - 100 mm



DIA. 100 mm - 315 mm

øD1		øD2	L
ABOVE	UPTO & INC.		
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

øD1		øD2	øD3	THICKNESS	
ABOVE	UPTO & INC.			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 linear measuring instruments
- Made from oil hardening non shrinking gauge steel, hardened and tempered to 60-62 HRC
- Subzero 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 DIN2250-1 Type B





Air Ring Gauge

RANGE: 2-120 mm



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 multiple jets
- Dia above 120 mm on request

SPECIAL APPLICATIONS



AIR RING GAUGE WITH BENCH MOUNTING

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



AIR RING GAUGE WITH PEDESTAL MOUNTING

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



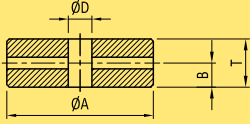
AIR RING GAUGE FOR GUDGEON PIN

Air Ring Gauge & Setting Plug



AIR RING GAUGE DATA SHEET

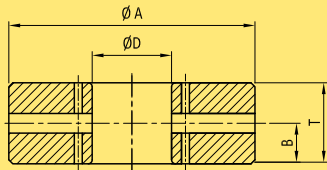
Central



ϕD mm	A	T	B	E	F	MIN RANGE
2.0 - 3.0	30.0	6.0	3.0	6.6	2.5	± 0.005
3.0 - 6.0	30.0	6.0	3.0	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

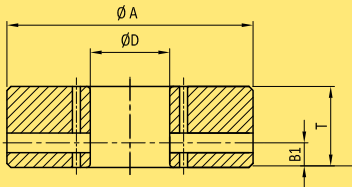
Central



ϕD mm	A	T	B	B1	E (OFFSET) MOD 1A/ CL	F (CENTRAL) MOD 1A/ CL	MIN RANGE
6.0-12.0	48.0	20.0	10.2	4.5	6.5/5.5	4.5/3.5	± 0.005
12.0-20.0	56.0						
20.0-30.0	70.0						
30.0-40.0	77.0						
40.0-60.0	102.0						
60.0-70.0	112.0						
70.0-80.0	122.0						
80.0-90.0	13.0						
90.0-100.0	142.0						
100.0-110.0	152.0						
110.0-120.0	162.0						

- 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

Offset



General notes

- Air ring gauge for 0.0005 mm least count are given up to $\phi 50$ 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 minimum range mentioned in the above table, whichever is maximum
- 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

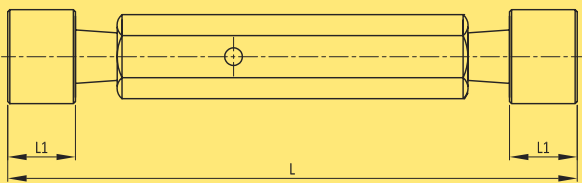
- MOD 1A = PFL Air Gauge Unit Module 1A
- MOD 2A = PFL Air Gauge Unit Module 2A
- CL = ClearLine air gauge unit

Important rule in air gauging

Lesser the clearance, higher the accuracy and vice versa.

SETTING PLUGS DATA SHEET

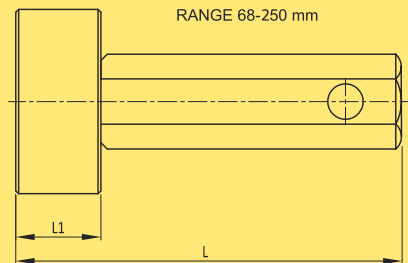
RANGE 3-68 mm



DIA RANGE	L	L1	TAPER & OVALITY
3.0-6.0	75.0	8.0	0.0005
6.0-10.0	110.0	20.0	0.0005
10.0-14.0	119.0		0.0005
14.0-18.0	130.0		0.0005
18.0-24.0	144.0		0.0005
24.0-30.0	128.0		0.0008
30.0-40.0	160.0		0.0008
40.0-65.0	160.0		0.0008
65.0-68.0	160.0		0.0010

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

RANGE 68-250 mm



DIA RANGE	L	L1	TAPER & OVALITY
68.0-80.0	175.0	25.0	0.0008
80.0-120.0			0.0010
120.0-180.0			0.0012
180.0-200.0			0.0014



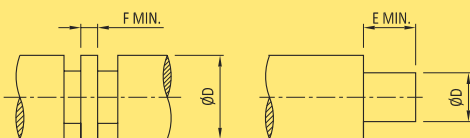
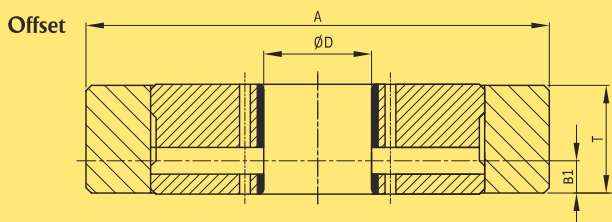
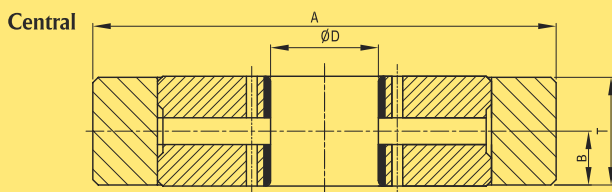
Carbide Air Ring Gauge

RANGE: 8 mm to 100 mm



FEATURES

- Can be supplied with tungsten carbide sleeve on request for checking hardened job
- Two Jet Air Ring gauge to check outside diameter, taper & ovality
- Three jet Air Ring gauge for detecting tri-lobed effect for diameter above 8 mm only
- Can be supplied with multiple jets
- Dia below 8 mm & above 80 mm on request



$\varnothing D$ mm	A	T	B	B1	E (OFFSET) MOD 1A/ CL	F (CENTRAL) MOD 1A/ CL	MIN RANGE
8,0-20,0	62,0	20,0	10,0	4,5	6,5/5,5	4,5/3,5	$\pm 0,005$
20,0-30,0	72,0						
30,0-40,0	86,0						
40,0-51,0	120,0						
51,0-67,0	120,0						
67,0-100,0	154,0						

- 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 $\varnothing 50$ 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 minimum range mentioned in the above table, whichever is maximum
- 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.

Air Caliper



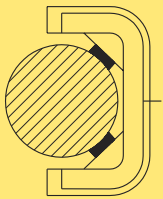
RANGE: 6 - 225 mm

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

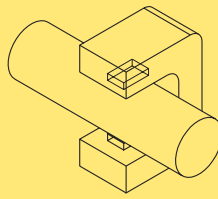


OPEN JET AIR CALIPER GAUGE



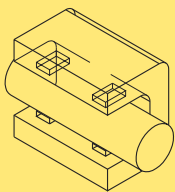
e.g : GENERAL PURPOSE USE

HAND CALIPER GAUGE



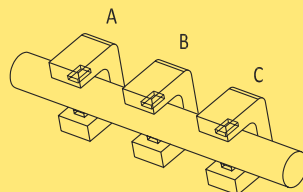
e.g : CHECKING COMPONENT BETWEEN CENTER ON M/C

MULTI-POINT HAND CALIPER GAUGE



e.g : MEASUREMENT OF CRANKSHAFT PIN & JOURNAL

FIXTURE MOUNTED CALIPER GAUGE FOR INTERRUPTED DIAMETER



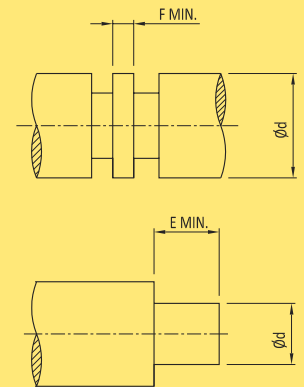
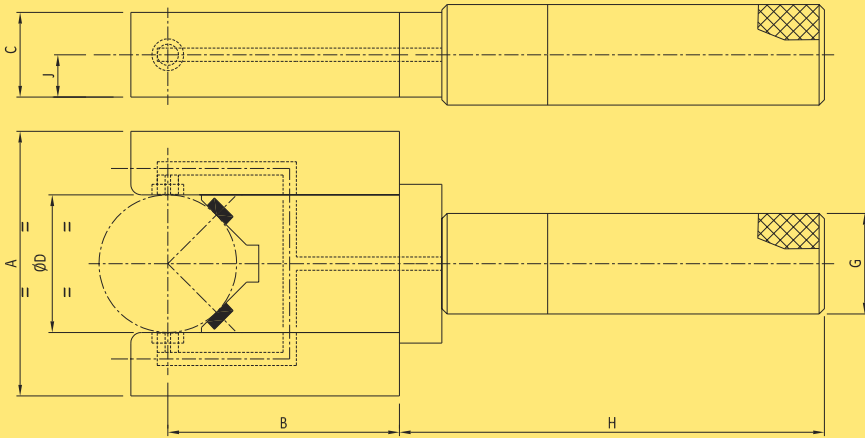
e.g : CAMSHAFT MEASUREMENT





Air Caliper & Setting Discs

AIR CALIPER DATA SHEET



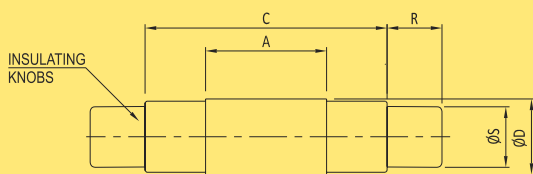
Ø D mm	A	B	C	J		H	Ø G	E (OFFSET) MOD 1A/ CL	F (CENTRAL) MOD 1A/ CL	MIN RANGE
				CENTRAL	OFFSET					
6.0-16.0	D+34	54	12	6.0	4.0	100	18.0	6.5/5.5	4.5/3.5	±0.005
16.0-26.0	D+24	54	12	6.0						
26.0-50.0	D+24	60	16	8.0						
50.0-75.0	D+28	75	18	9.0						
75.0-100.0	D+32	80	20	10.0						
#100.0-125.0	D+32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

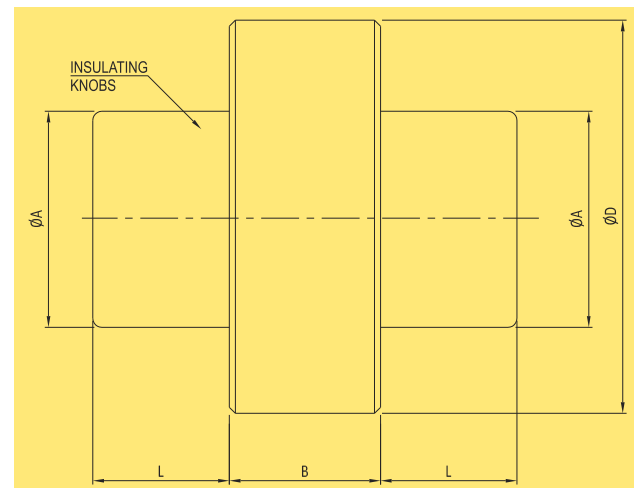
General notes

- 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 minimum range mentioned in the above table, whichever is maximum
- 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

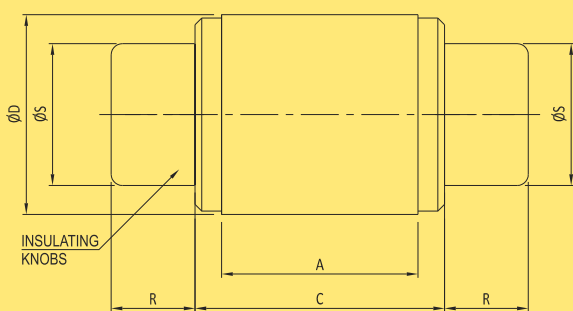
SETTING DISC DATA SHEET



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		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



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

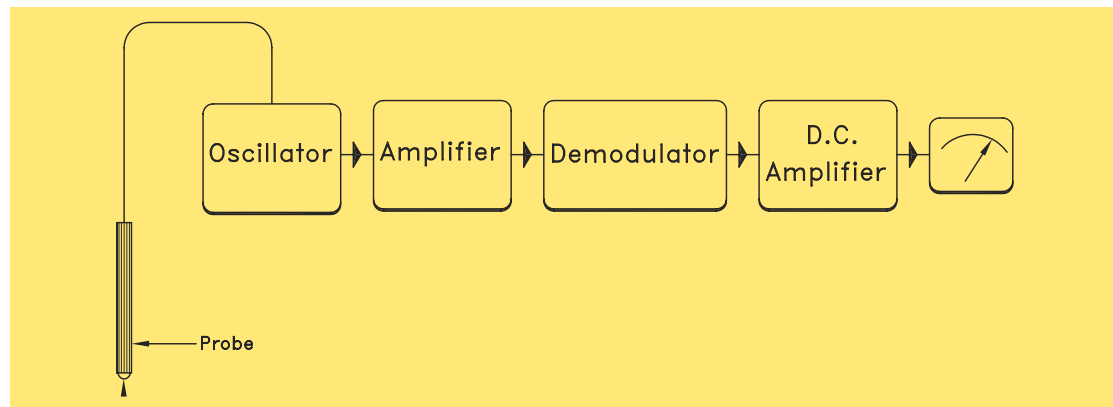


ELECTRONIC GAUGES

Electronic Gauge

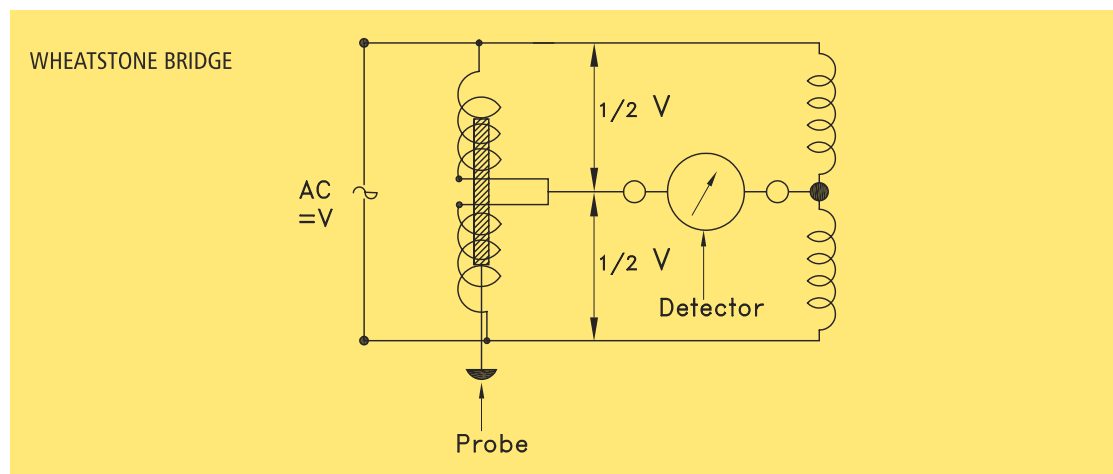
WORKING PRINCIPLE

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.



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.



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
	A+	B+	↑	↓	○	0
	A-	B+	↑	↑	○	0
	A-	B+	↓	↓	○	0
	A-	B+	↓	↑	○ +	+2
	A-	B+	↑	↓	○ -	-2
	A+	B-	↑	↑	○	0
	A+	B-	↓	↓	○ -	-2
	A+	B-	↓	↑	○ +	+2
	A-	B-	↑	↑	○ -	-2
	A-	B-	↓	↓	○ +	+2
	A-	B-	↓	↑	○	0
	A-	B-	↑	↓	○	0



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

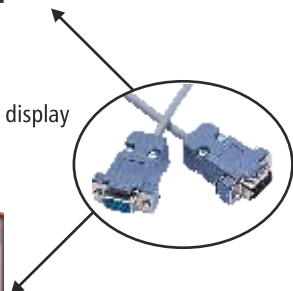
- Digitally driven, Analogue Galvanometer type measurement display
- Five Metric & Five Inch Measuring ranges



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	$\pm 10, \pm 30, \pm 100, \pm 300, \pm 1000 \mu\text{m}$	$\pm 200 \text{ \& } \pm 2000 \mu\text{m}$	$\pm 10, \pm 30, \pm 100, \pm 300, \pm 1000 \mu\text{m}$
Resolution	0.5, 1, 5, 10, 50 μm	0.1 & 1 μm	Bar graph : 0.2, 1, 2, 10, 20 μm Dig. Display : 0.1, 0.1, 0.1, 1, 1 μm
INCH Ranges	$\pm 0.0003, \pm 0.001, \pm 0.003, \pm 0.01, \pm 0.03 \text{ inch}$	$\pm 0.020 \text{ \& } \pm 0.200 \text{ inch}$	$\pm 0.0003, \pm 0.001, \pm 0.003, \pm 0.01, \pm 0.03 \text{ inch}$
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 Gauge

GAUGING SYSTEMS WITH STATISTICAL PROCESS CONTROL



SPC 3000 E4/E8

SPC 3000

BAKER SPC 3000 is built to cater to the gauging requirements on any industrial shop floor. Besides the main activity of dimensional measurement, it is also capable of Statistical Process Control (SPC). It has the capability to digitalise your gauging system output via Ethernet, Wi-Fi, USB (for flash drive, external keyboard, scanner) etc. in line with Industry 4.0 requirements.

The BAKER SPC 3000 is available in 2 configurations

ELECTRONIC GAUGE
SPC 3000 E4 (4 PROBE INPUTS)
SPC 3000 E8 (8 PROBE INPUTS)

FEATURES

- 7 Inch Graphic colour LCD Display
- Resolution- 0.0001mm / 0.001mm
- Available with 4/ 8 probe inputs
- SPC Calculations
- Internal memory
- Internal memory storage : 8 GB
- Ethernet output
- RS232 data output
- View to store measurements
- Status of stored measurements
- Connectivity to USB flash drive
- Connectivity to External keyboard
- Barcode scanner output (Optional)



SPC 3000 E8

Electronic Gauge



TECHNICAL SPECIFICATION SPC 3000

SPECIFICATION	SPC3000 E4	SPC3000 E8
7 inch Graphic LCD Display	✓	✓
Analogue + Digital Display	6 (Max)	6 (Max)
Digital + Bar graph Column Display	8 (Max)	8 (Max)
Pneumatic inputs	—	—
Probe inputs	4	8
No. of Results	8 (Max)	8 (Max)
Static measurements	✓	✓
Combination of inputs for Results	8 (Max)	8 (Max)
Dynamic measurements	✓	✓
Inch / Metric selection	✓	✓
Display Resolution : 0.0001mm/0.001mm; 0.00001/0.0001 in.	✓	✓
Double Mastering	✓	✓
Maximum Permissible Error (MPE)	±0.5% of measuring range	±0.5% of measuring range
Single Mastering	✓	✓
RS232 Data output	✓	✓
Ethernet Data output	✓	✓
Internal Memory storage	8GB	8GB
USB flash drive connectivity	✓	✓
Barcode reader input	Optional	Optional
Logic output; OK/Not OK, Hi/OK/Lo	✓	✓
Auto Air cut-off	Optional	Optional
External key board connectivity	✓	✓

CONSISTENT

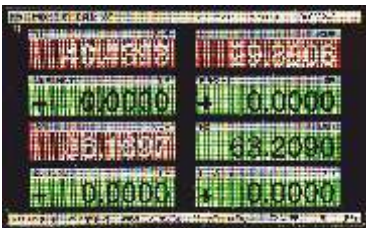
ADAPTABLE



ROBUST & VERSATILE

INDUSTRY 4.0 READY

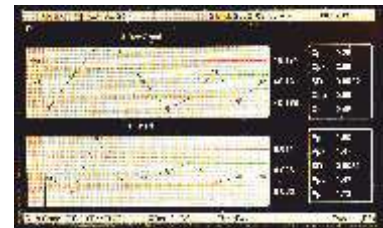
MEASUREMENT DISPLAY



RUN CHART



X BAR R CHART



X BAR S CHART



HISTOGRAM



PIE CHART

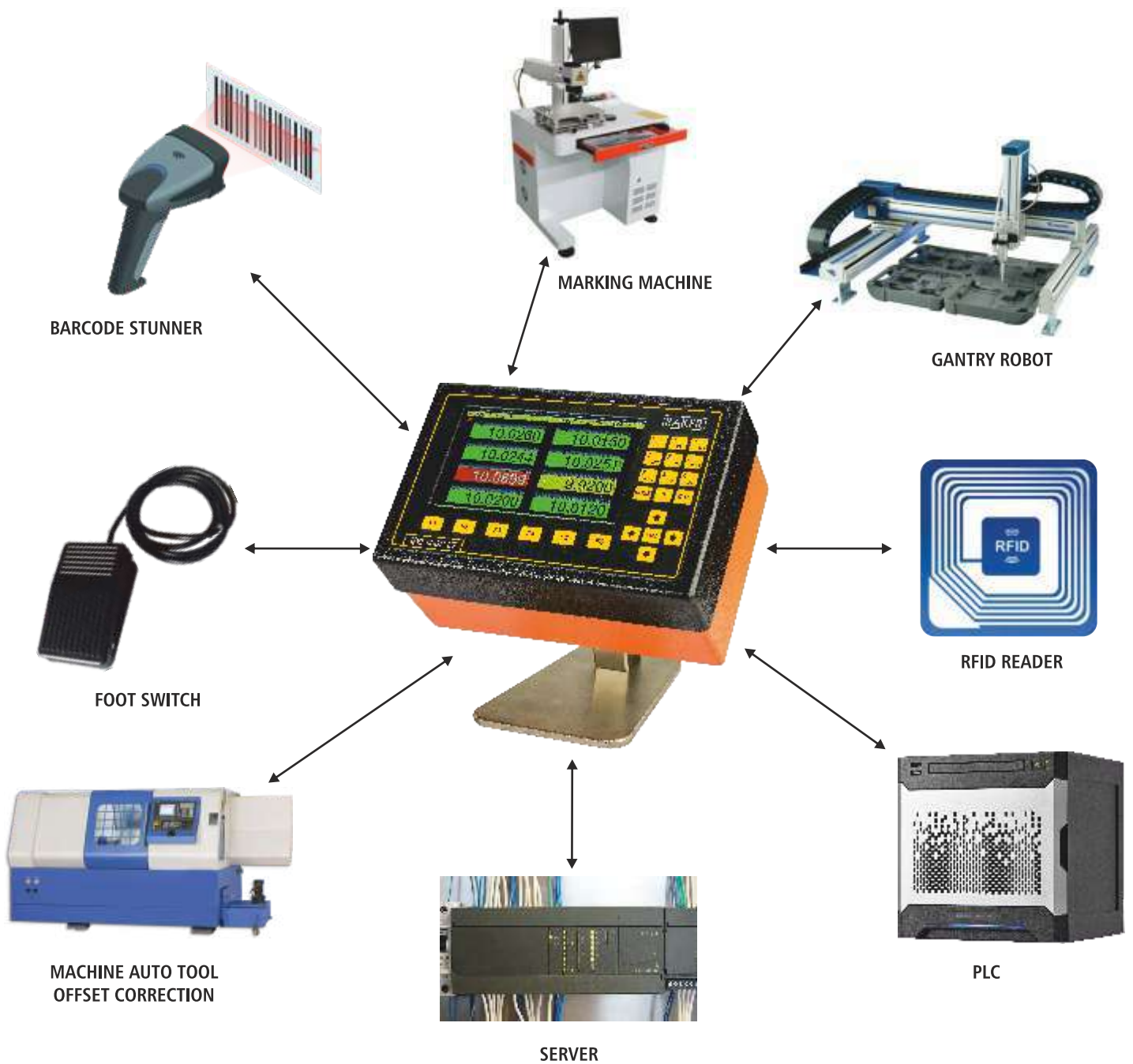


LOGGED DATA



INDUSTRY 4.0

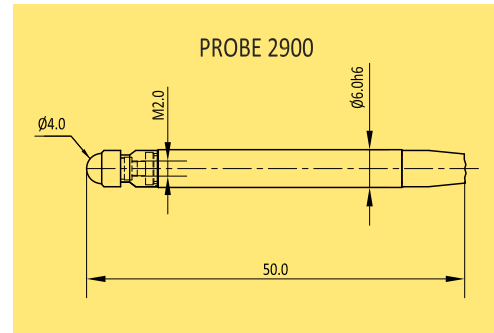
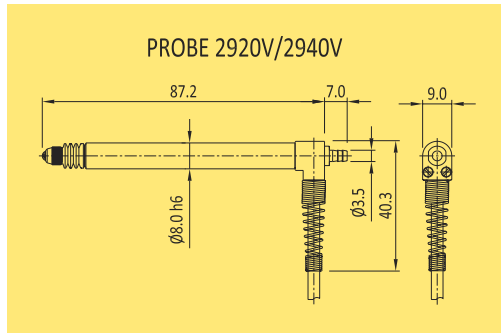
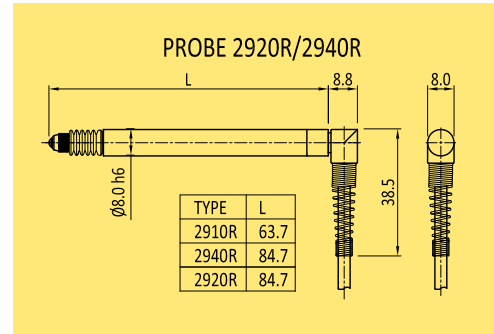
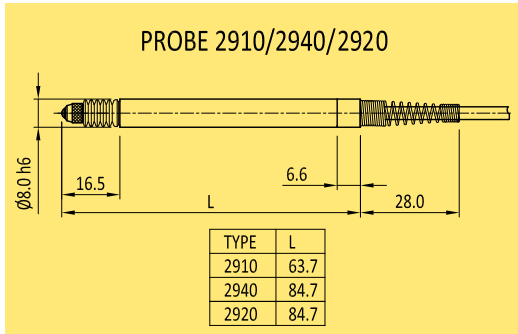
Industry 4.0 refers to “smart” and “connected” production systems that are designed to sense, predict, and interact with the physical world, so as to make decisions that support production in real-time. In manufacturing, it can increase productivity, energy efficiency, and sustainability.



Electronic Probe



PROBE



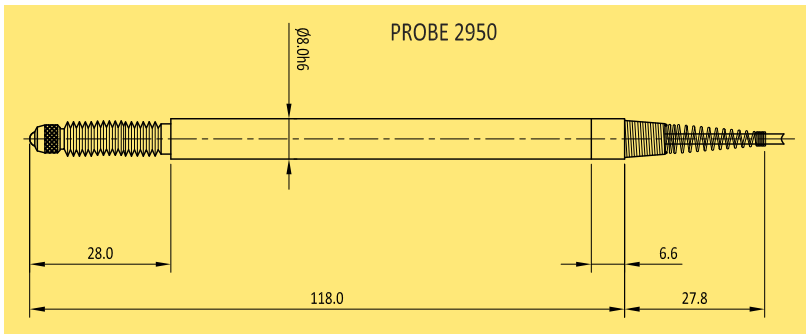
SPECIFICATION & FEATURES

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 metal clips	Viton with metal clips	Viton with metal clips	Viton with metal clips	Viton

PROBE

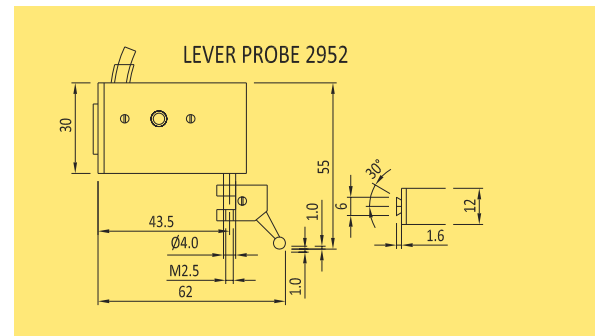
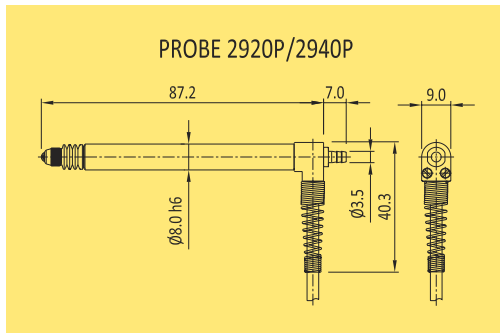
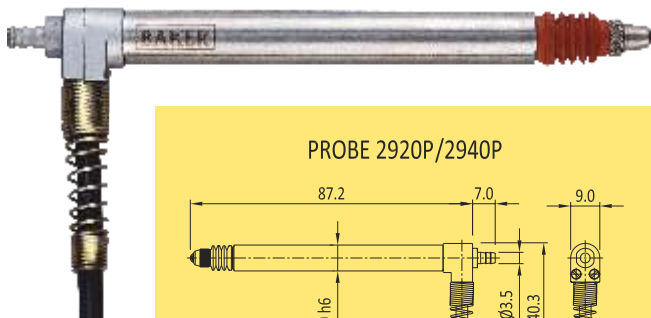


2950



2952

2920P/2940P



SPECIFICATION & FEATURES

Specifications	2950	2920P/2940P Pneumatic Push	2952 Lever Type
Measuring Travel	± 5 mm	± 2 mm (± 1 mm for 2920P)	± 1 mm
Total Travel	10.5 mm max.	4.5 mm (3 mm for 2920P)	2 mm
Linearity	± 1.5 % (of total measuring range)	± 0.3% (in ± 1000 µm range)	± 0.3%
Repeatability	0.15 µm	0.02 µm	0.5 µm
Measuring force	2.5 N	0.45 to 0.75 N	0.25 N
Pre-travel	Variable	Variable	Fixed
Application	Universal	Pneumatic push	Low Measuring Force
Environmental Protection (IEC 529)	IP 64	IP 66	IP50
Plunger guide	Preloaded, caged linear ball bearing	Pre-loaded, caged linear ball bearing	Parallel Leaf Spring
Cable	2 m., Polyurethane.	2 m (Axial), Polyurethane	PVC
Cable support spring	Present	Present	NA
Connecting adaptor	5-pin, Male DIN plug (240°)	5 pin, Male DIN plug (240°)	5-pin, Male DIN plug (240°)
Total Length (with support spring)	145	114 mm	-
Probe Body	Hardened and ground stainless steel (55HRC); Diameter 8h6	Hardened & ground stainless steel (55HRC)(Diameter 8h6)	-
Reference temperature	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, 3mm Dia, M2.5 thread.	9 mm long stylus having M1.6 threads & Ø 2 mm tungsten carbide ball tip
Sealing bellow	Viton	Viton	-

SPECIAL MEASURING SYSTEMS

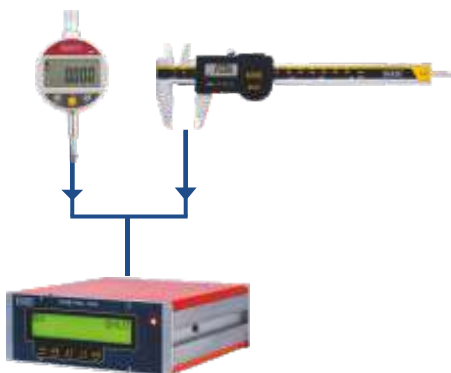
Non-standard solutions sought by customers, for purpose of measurement, control or analysis, may warrant the undertaking of special development processes to satisfy needs of such variations. Features and specifications of a sample non-standard system developed by us is shown below

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.

Electronic Gauge Interface

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 μm
- 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



SERIAL PROBE MODULE



4/8 CHANNEL

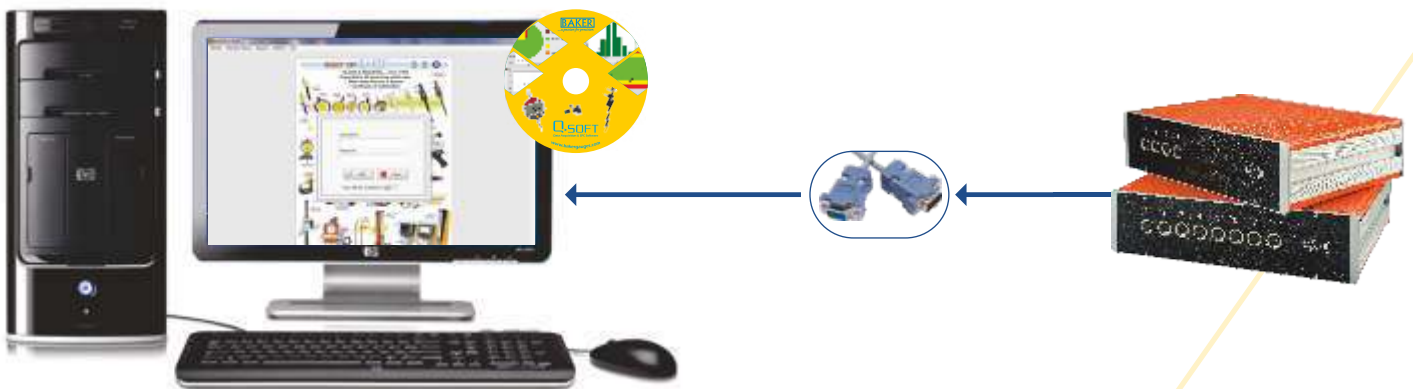


FEATURES

- Interfaces with 4 / 8 Baker Half-Bridge inductive probes
- The new Serial 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 serial data communication between PC and Serial 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. 8 Digital inputs and 8 digital outputs (TTL compatible)
- Compact size

Note

- For applications requiring more than 8 probes, two or more serial 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

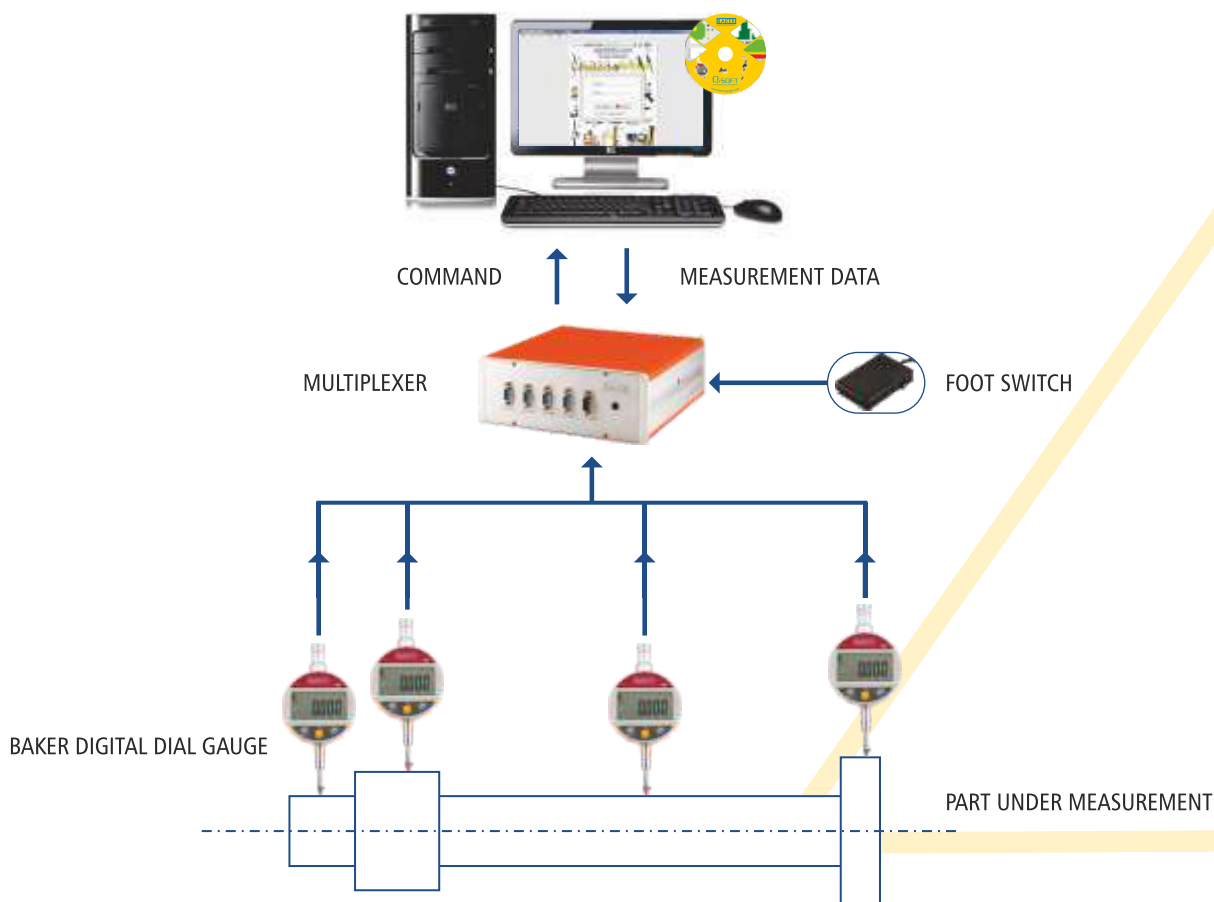
- Data Input port : 4 Channels (RS232)
- Data Output port : One (RS232)
- Data Output format : RS232 C
- Data transmission method : Simplex or Half-duplex
- Data transmission code : ASCII
- Data length : 8 bits
- Start bit : 1
- Stop bit : 1
- Parity check : None
- Baud rate : 9,600 / 19,200
- Power 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



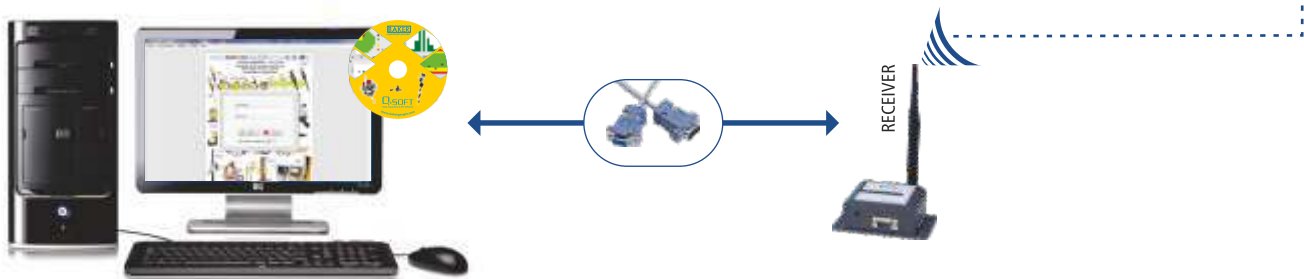
Wireless Data Acquisition

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



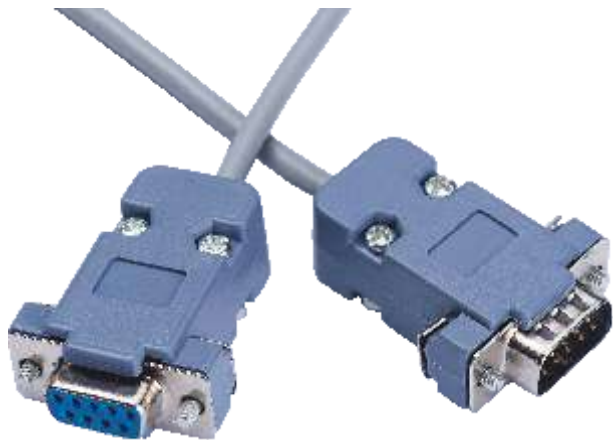
FEATURES

- 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 WTs 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

CABLES



BAKER readout RS232 cable
Used to interface BAKER
204x, AEPx, SPC3000Px, SPC3000Ex.



Ethernet Cable to interface
Baker SPC3000Px, SPC3000Ex



Proximity RS232 Cable
Used to interface BAKER
W1, W1A, W2, W2A,W3, W3A, ZD10, ZD20, ZD30.



Power RS Cable
Used to interface BAKER
W1, W1A, W2, W2A,W3, W3A.



USB Data Cable for V series Digital dial gauges
Used to interface BAKER
V1, V1P, V2, V2P, V3, V3P.



Proximity USB Cable
Used to interface BAKER
W1, W1A, W2, W2A,W3, W3A, ZD10, ZD20, ZD30.



USB Data Cable P1502 and Switch P1601 for
Digital External Micrometers.
Used to interface BAKER
DMM25-1, DMM50-1, DMM75-1, DMM100-1



CUSTOMISED GAUGING SOLUTIONS



Customised Gauging Solutions

1. Automotive

1.a. Engine

• Crankshaft	135
• Camshaft	139
• Connecting Rod	140
• Cylinder Head	141
• Valve Seat	
• Valve Guide	
• Cylinder Block	142
• Liner	143
• Piston	144
• Piston Pin & Piston Ring	145
• Flywheel	147

1.b. Transmission

• Gears	148
• Case Differential	148
• Shafts	149
• Brake	150

1.c. Shim & Spacer Selection

• Cylinder Head Tappet	151
• Gear Box	152
• Wheel Hub	152

2. Fuel, Oil & Water Pumps

• Body & Rotor Clearance	153
• Housing & Cover	153

3. Medical (Pharmaceutical)

• Punch	154
• Die	154
• Capsule	154

4. High Speed Dimensional Grading & Sorting

• Bearing Inner/outer Race	155
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5. Other Engineering Applications

• Flatness Measurement	156
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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

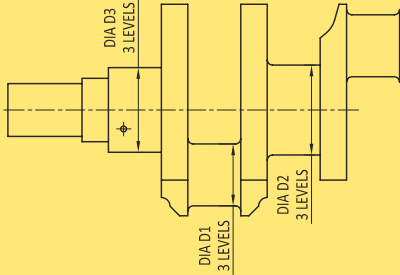


JIG GRINDING MACHINE



MULTICYLINDER

HAND HELD DIAMETER GAUGE



PARAMETERS

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

ELECTRONIC



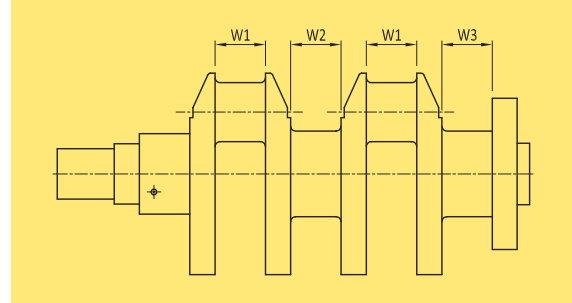
ELECTRONIC CALIPER FOR DIAMETER

AIR



AIR CALIPER FOR DIAMETER

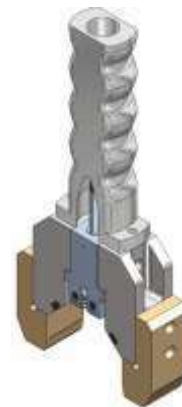
HAND HELD WIDTH GAUGE



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

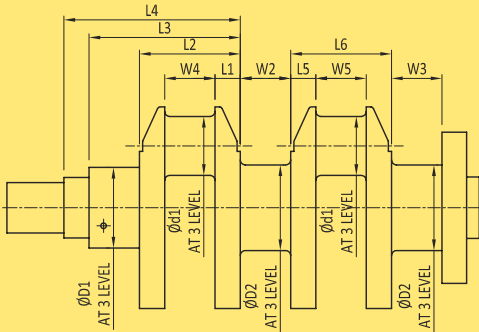
- Precise measurement
- Easy and quick to use
- Can be used on machine
- Read out units and PC based system with SPC analysis
- Non contact type principle of measurement
- Self cleaning



Crankshaft

MULTICYLINDER

FULLY AUTOMATIC MACHINE



PARAMETERS

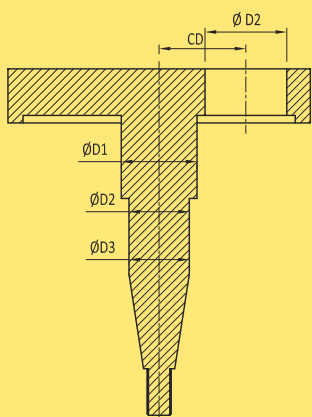
- All journal & pin diameters at multi levels
- Ovality of all journal and pin diameters
- Taper of all journal & pin diameters
- Width of journals & pins
- Lengths
- Runout of all journal diameters
- Crowning effect of diameters
- Throw of pin

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 possible

SINGLE CYLINDER

PNEUMATIC GAUGING FIXTURE



PARAMETERS

- Pin hole diameter
- Center distance
- Bearing diameter
- Shaft diameter at multiple levels

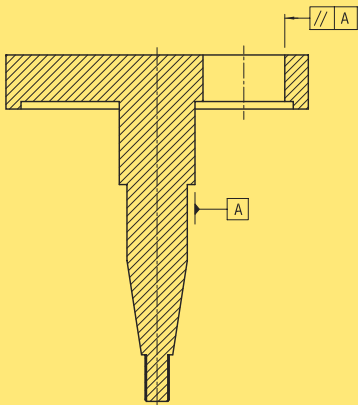
FEATURES

- 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



SINGLE CYLINDER

PNEUMATIC GAUGING FIXTURE (BEND & TWIST)



PARAMETERS

- Parallelism between Bearing & pin hole diameter (bend & twist).

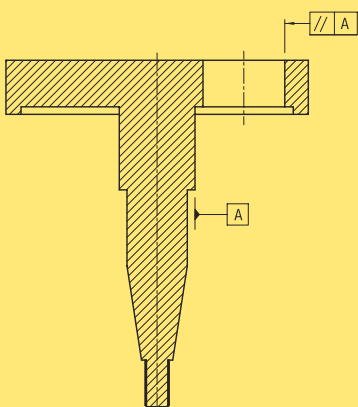


FEATURES

- Fully Air electronic type system.
- Contactless measurement system.
- Precise, easy and quick measurement for critical parameters on shop floor.
- PC & Read out Base system.

SINGLE CYLINDER

CONTACT GAUGING FIXTURE (BEND & TWIST)



PARAMETERS

- Parallelism between Bearing & pin hole diameter (bend & twist).



FEATURES

- Fully electronic contact type system.
- Precise, easy and quick measurement for critical parameters on shop floor.
- PC Base system.



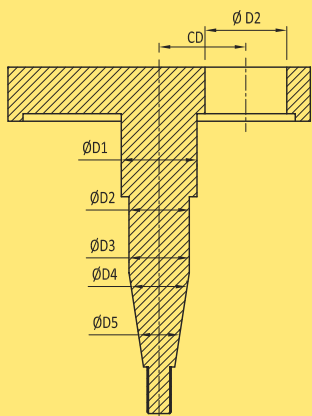
Crankshaft

FULLY AUTO GAUGING SYSTEM- TWO WHEELER CRANKSHAFT(L.H & R.H).



SINGLE CYLINDER

CONTACT GAUGING FIXTURE



PARAMETERS

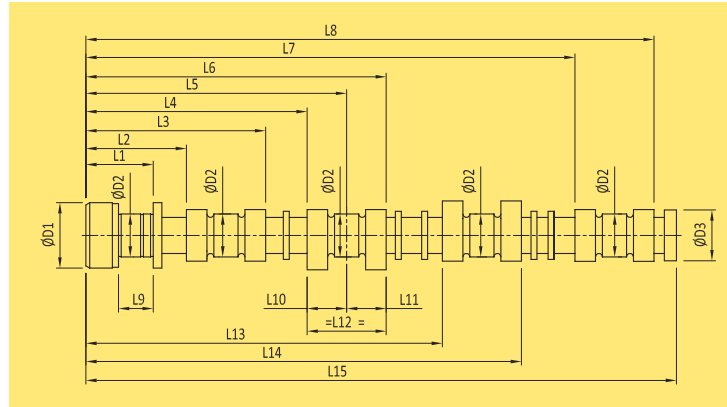
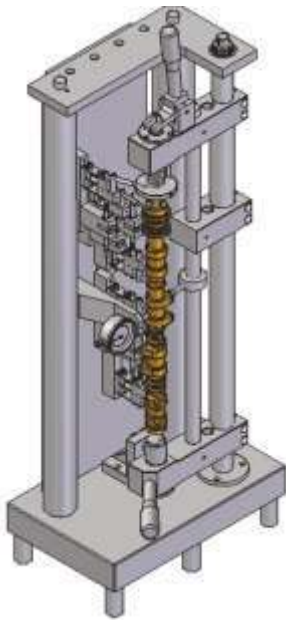
- Inner Diameter at 2 Level.
- Outer diameter at 4 Levels & its runouts.
- Center Distance, between bearing diameter and Pin hole diameter.
- Measurement Over Pin at 2 Level and its runout.
- Dowel hole diameter.
- Heights at 4 Places.
- Internal and external thread verification (Automated).
- Keyway width/symmetry
- Position of dowel hole
- Over ball center height
- Face runout
- Taper angle

FEATURES

- Fully Automated system, with robust and rigid design, suitable for the shop floor conditions.
- System includes auto traceability of the component.
- System Consist of carousel Conveyor, High Speed gantry system, auto sorting for Good & NG component.
- System includes Auto verification of Internal and external threads.
- Precise, Easy and Quick measurement for critical parameters on shop floor.
- PC Base system.

Camshaft

LENGTHS & RUNOUT GAUGE



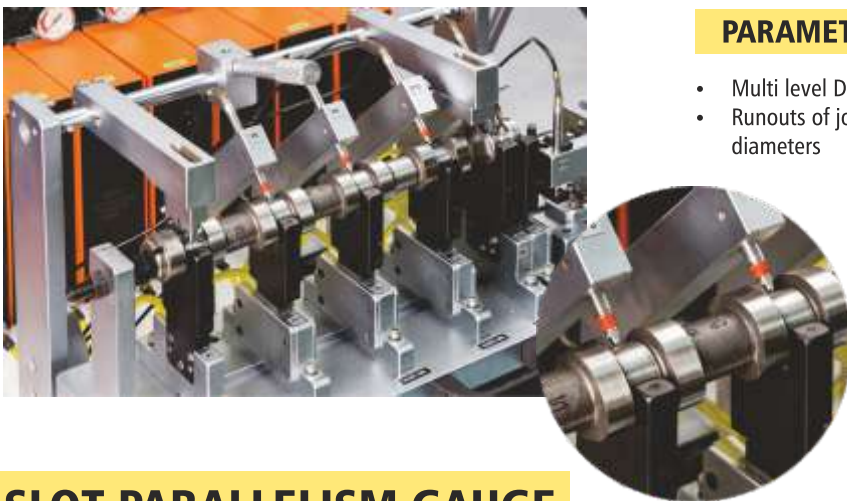
PARAMETERS

- Multiple Lengths
- Runout of diameters

FEATURES

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

DIAMETERS & RUNOUT GAUGE



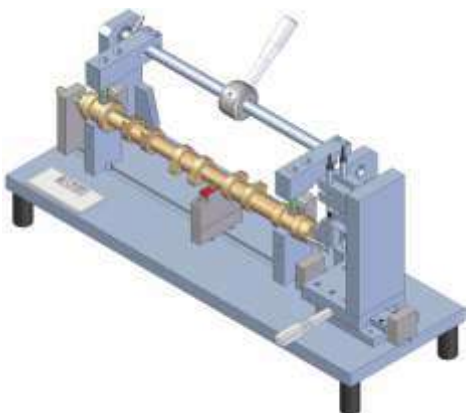
PARAMETERS

- 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



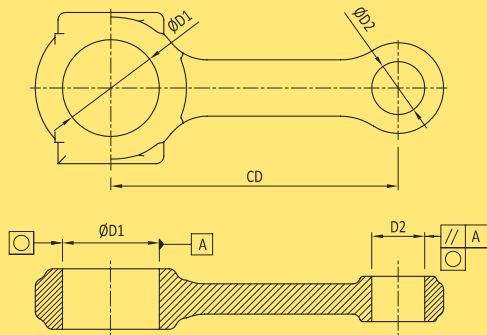
PARAMETERS

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

FEATURES

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

Connecting Rod



AIR GAUGING



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

ELECTRONIC 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		

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.



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

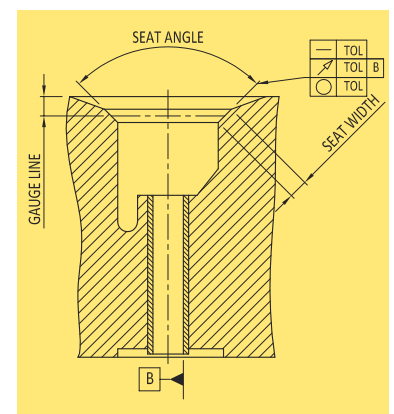


PARAMETERS

- 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

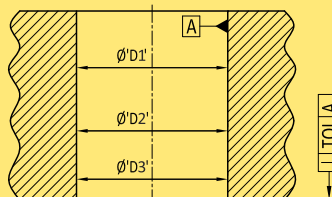


PARAMETERS

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

FEATURES

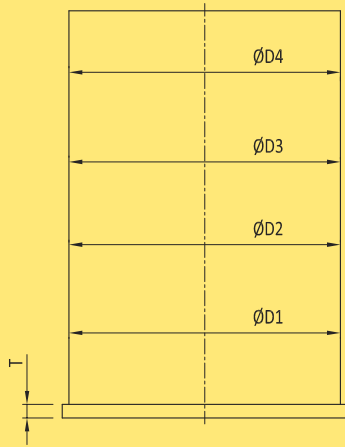
- Multi-level measurement
- Grading
- Grade marking
- Data acquisition & SPC analysis



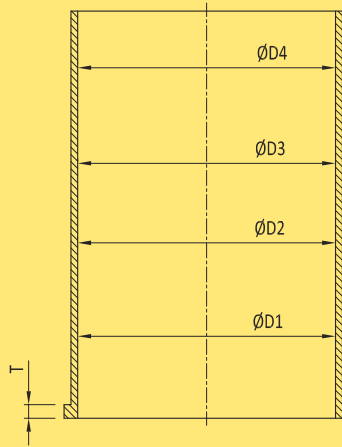


PNEUMATIC GAUGING FIXTURES

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

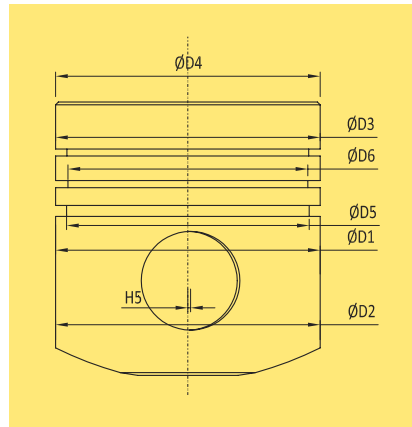
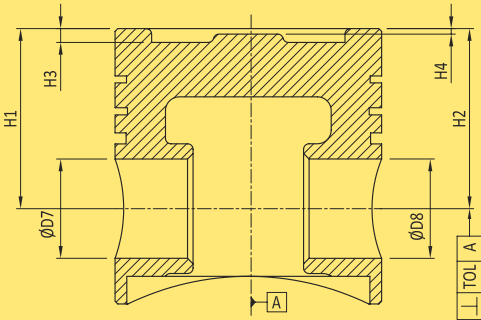
- Internal diameter at different levels
- Collar thickness

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

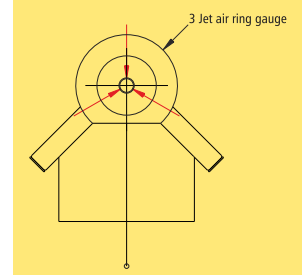
- Outer Diameter 'D1'
- 3-Point Lobing

FEATURES

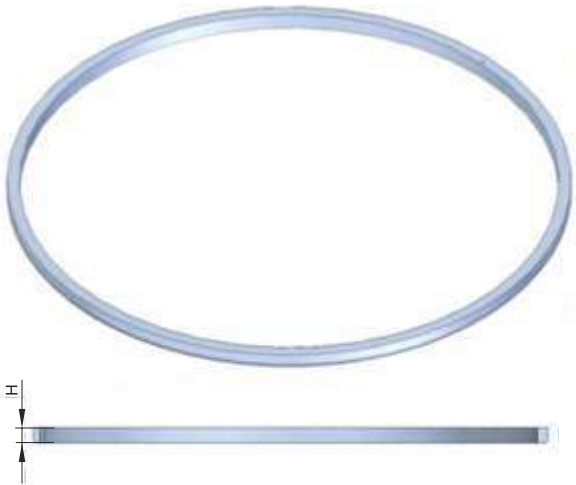
- 'V' guide way support for ease of measurement
- 3 jet air ring gauge to detect tri lobing



Pneumatic measurement



PISTON RING



PARAMETERS

- Height 'H' (At three places)

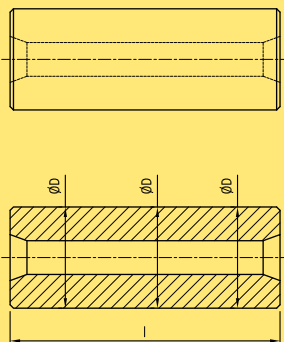
FEATURES

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



Piston Pin & Piston Ring

GUDGEON PIN GAUGING & SORTING SYSTEM



PARAMETERS

- OD at levels
- Taper
- Length

FEATURES

- Fully Automated system, with robust and rigid design, suitable for the shop floor conditions.
- System includes Grade wise sorting & rejection of the component.
- System consist of laser marking for component Identification.
- Precise, easy and quick measurement for critical parameters on shop floor.
- PC Base system.



MULTI GAUGING AND SORTING SYSTEM

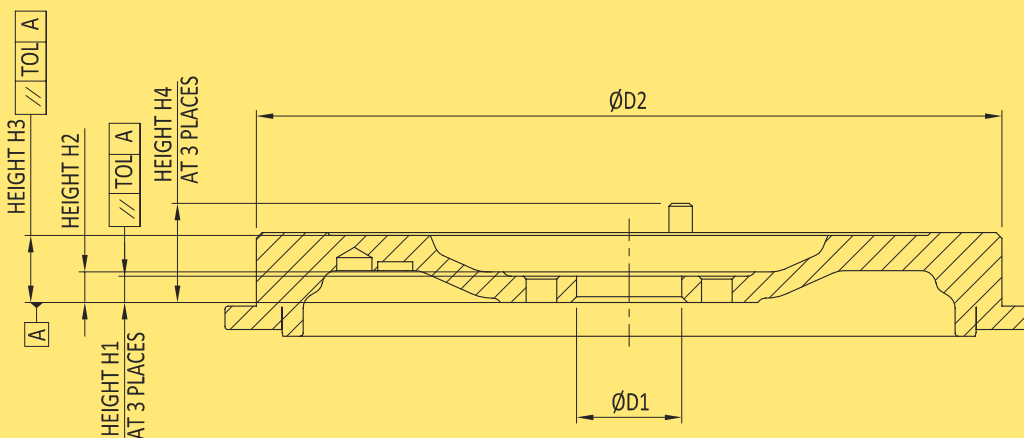


PARAMETERS

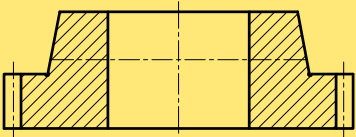
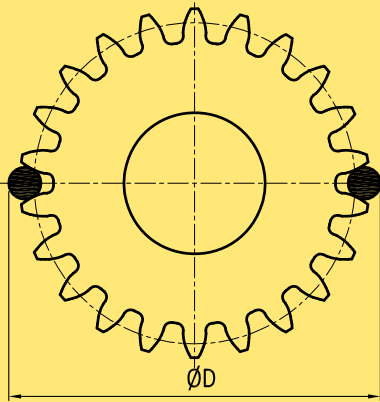
- Inner Diameter ØD1
- Outer Diameter ØD2
- Height H1, H2 & H3
- Dowel pin height H4 at 3-Places
- Parallelism

FEATURES

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



GEARS



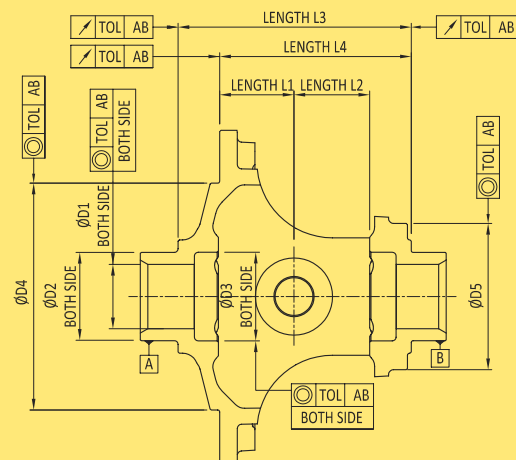
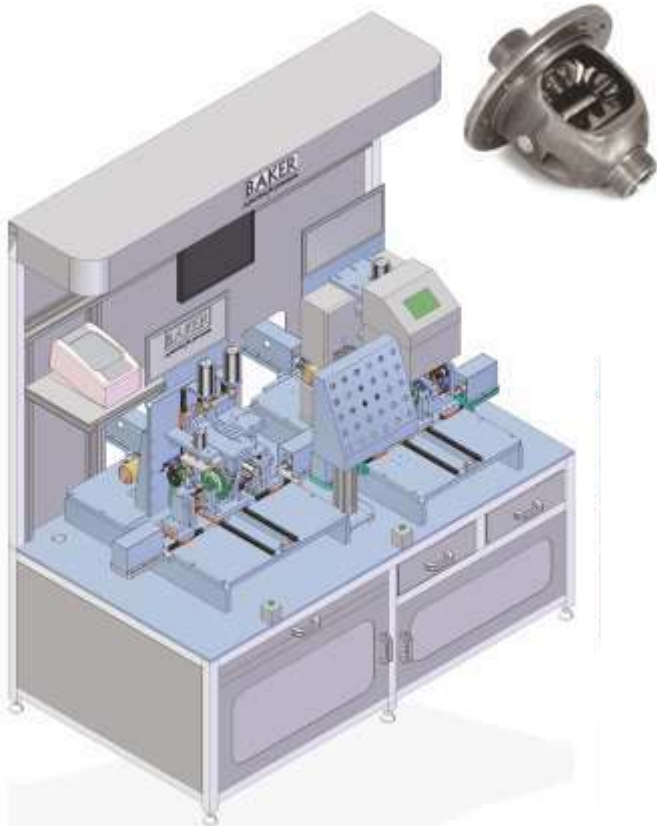
PARAMETERS

- 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

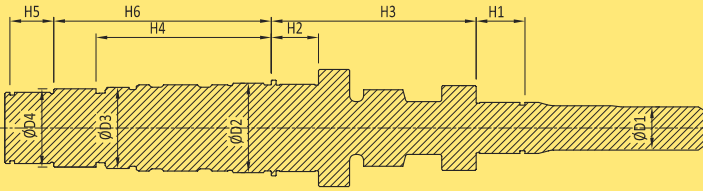
- Inner diameters
- Outer diameters
- Lengths
- Runouts
- Concentricity
- Symmetry

FEATURES

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



STANDARD SOLUTION



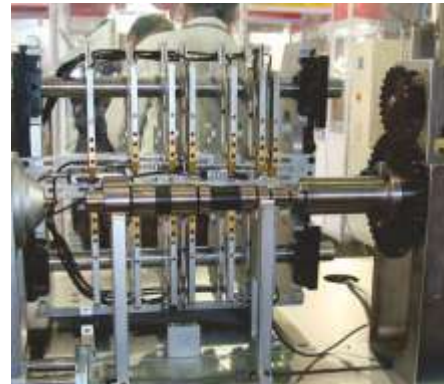
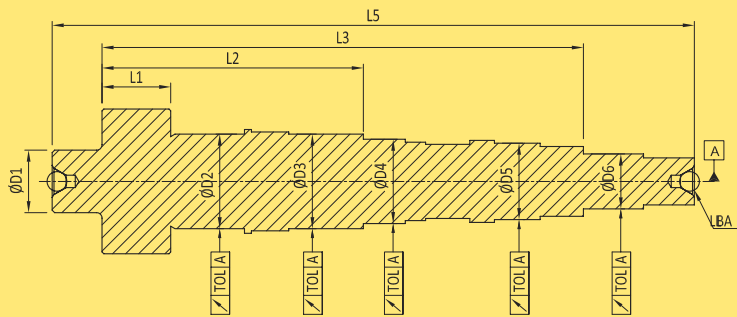
PARAMETERS

- 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

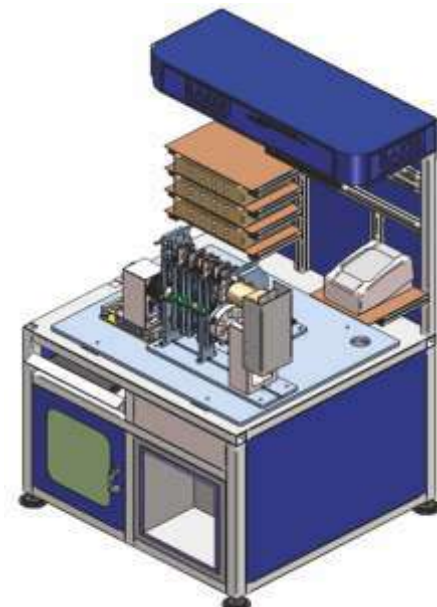


PARAMETERS

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

FEATURES

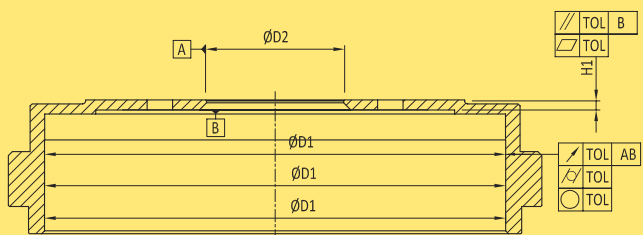
- Automated gauging solution
- Multiple outer diameters & lengths in a single setup
- Measured in ABBE Principle by 'True-Line' measuring element (in Technical Collaboration with REORG Germany)
- Solution for Input shaft, output shaft & various types of shafts
- Dynamic parameter measurement can be easily 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



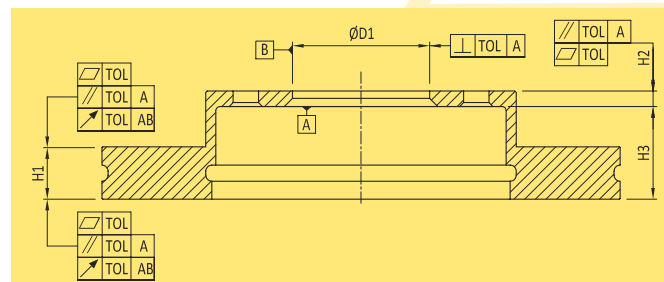
BRAKE DRUM AND BRAKE DISC



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 ?

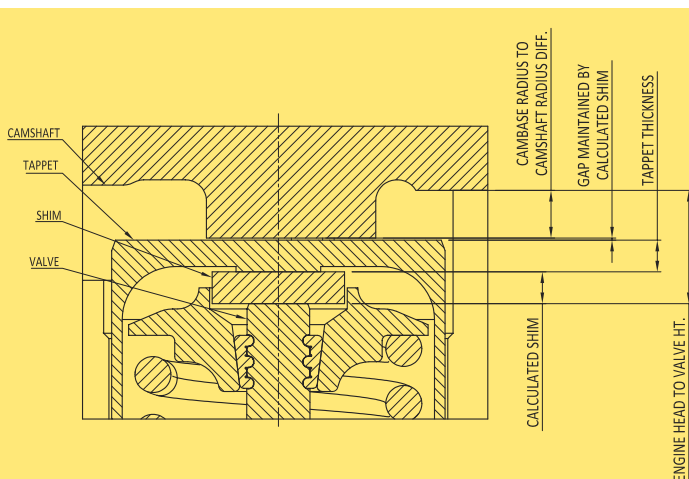
Any assembly which requires free movement & noise reduction demands a proper clearance amongst its parts. Hence shims and spacers come into the picture to achieve this requirement

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

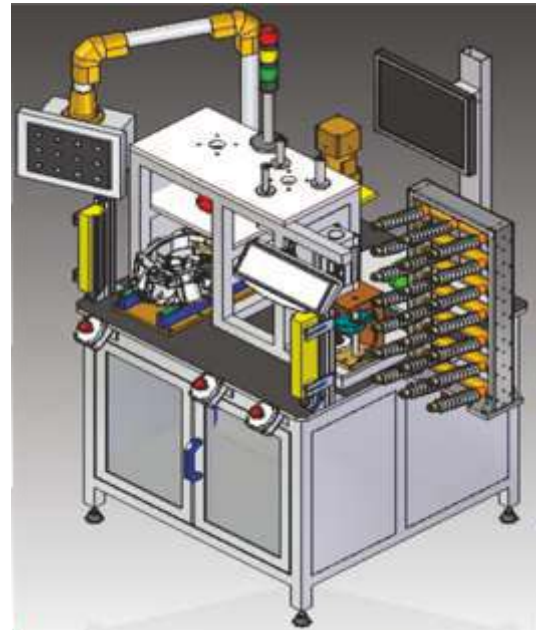
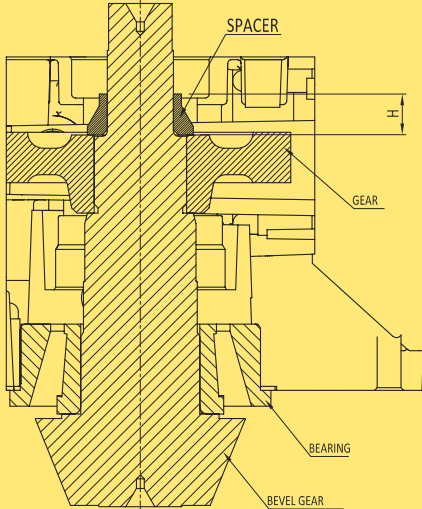
- Cam base radius to journal radius distance
- Tappet thickness
- Engine head to valve height distance
- Calculated shim thickness based on measurements
- Shim verification

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



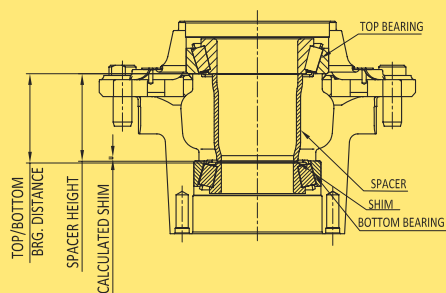
PARAMETERS

- 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

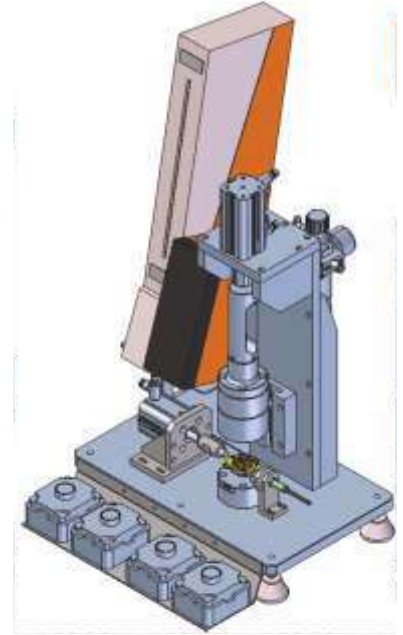
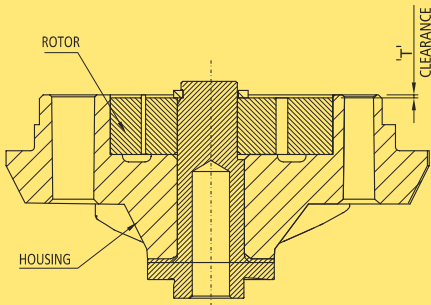
- Hub bearing inner face distance
- Spacer height
- Calculated shim thickness based on above measurement

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

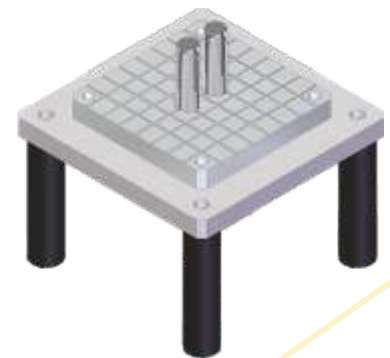


PARAMETERS

FEATURES

- Clearance 'T'
- Poka Yoke component location arrangement
- Optimum cycle time
- Automatic Punch Marking for OK components

HOUSING AND COVER

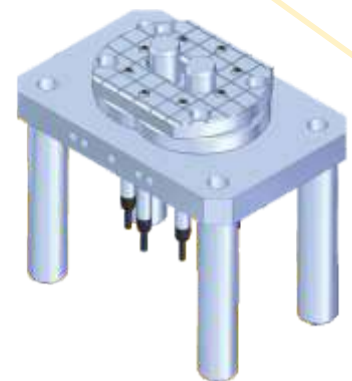
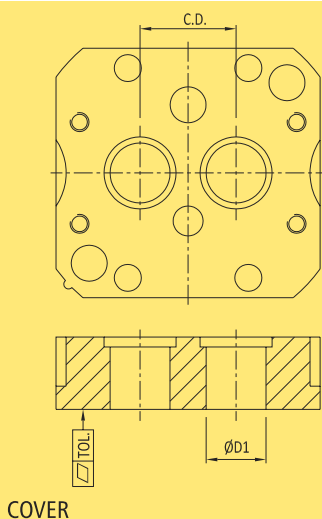


PARAMETERS

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

FEATURES

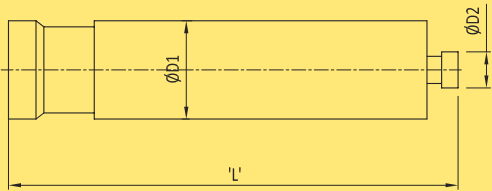
- Contactless measurement.
- Offered with analogue or electronic read out or computerised space solution with SPC analysis
- Easy to use
- Compact & Robust
- Multiple parameters at a time





Medical (Pharmaceutical)

PUNCH



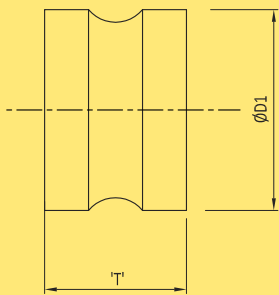
PARAMETERS

- 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



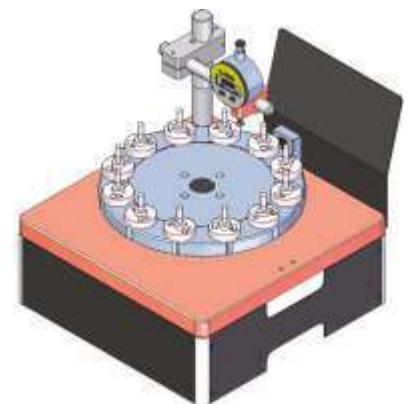
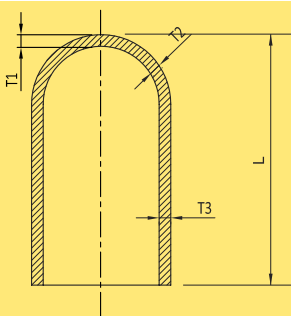
PARAMETERS

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

FEATURES

- Direct probe measurement
- Probe adjustment facility

CAPSULE BODY & CAP



PARAMETERS

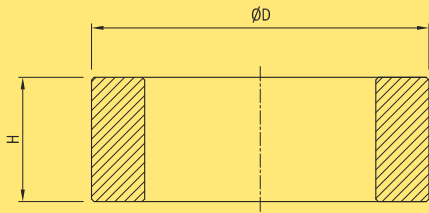
- Dome thickness 'T1'
- Shoulder thickness 'T2'
- Wall thickness 'T3'
- Cut Length 'L'

FEATURES

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



BEARING INNER/OUTER RACE

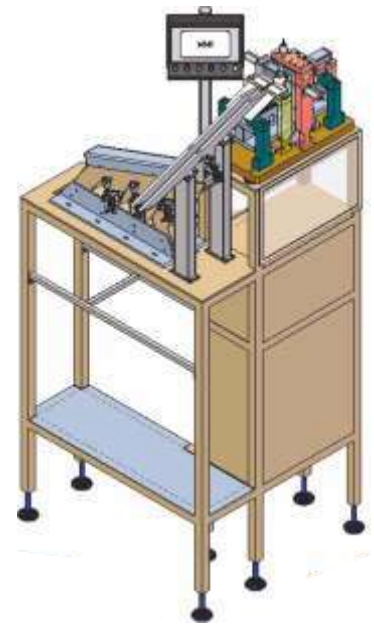
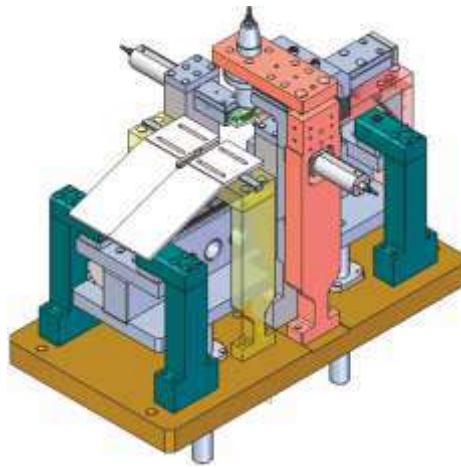


PARAMETERS

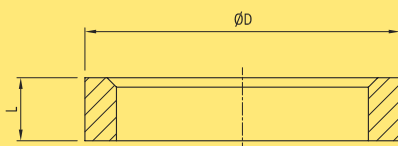
- Outer Diameter ØD
- Height 'H'

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

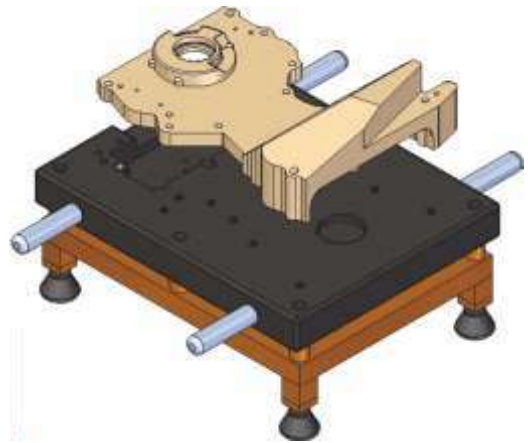
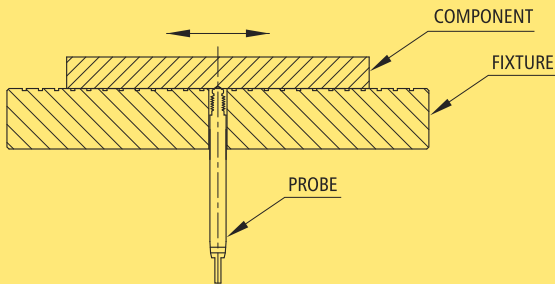
- Outer Diameter
- Length



FEATURES

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

FLATNESS MEASUREMENT



PARAMETERS

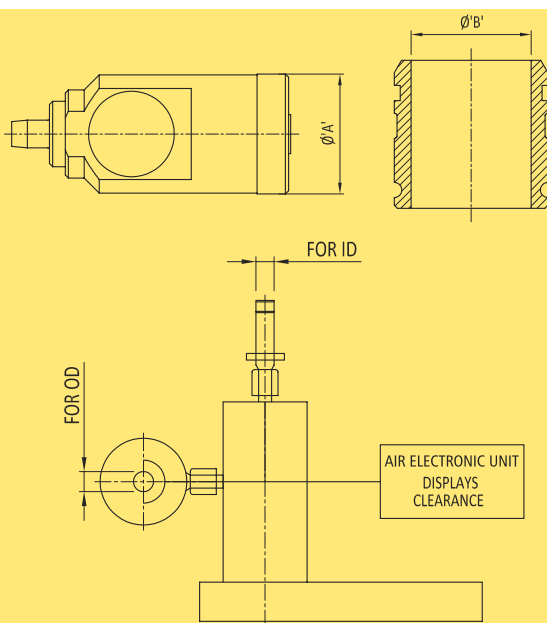
- Flatness of the surface

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: $\text{Ø}150$, $\text{Ø}200$ and $\text{Ø}250$ 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



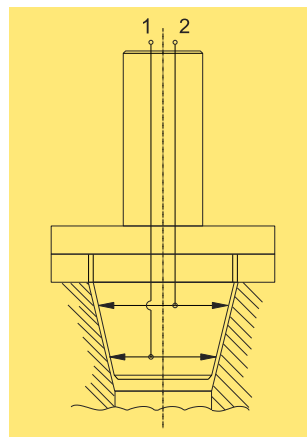
ISO / BT TAPER



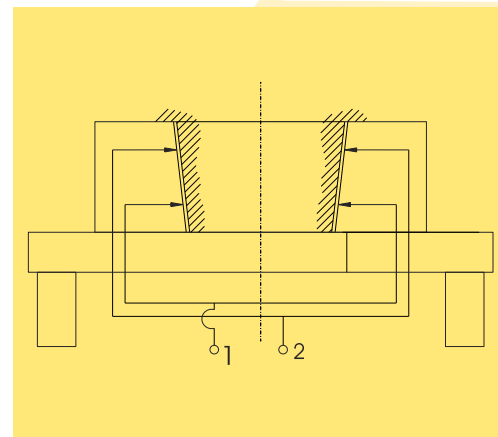
ER TAPER



HSK TAPER



Internal taper measurement



External taper measurement



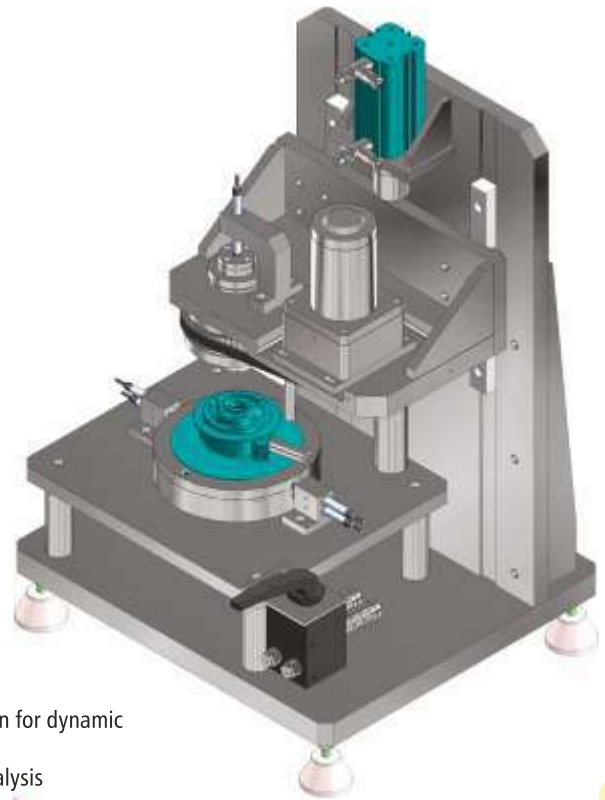
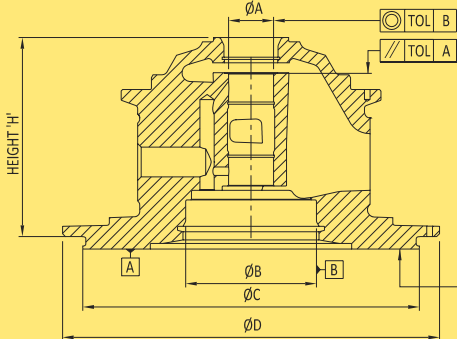
TAPER ROLLER BEARING



GEARS

TURBO CHARGER

TURBINE HOUSING



PARAMETERS

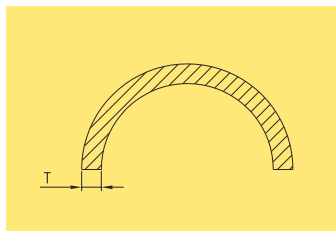
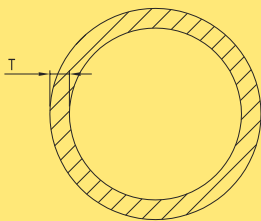
- Height 'H'
- Outer diameter
- Internal diameter
- Internal diameter at two levels
- Flatness of resting face
- Face runout
- Concentricity
- Parallelism
- Profile

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

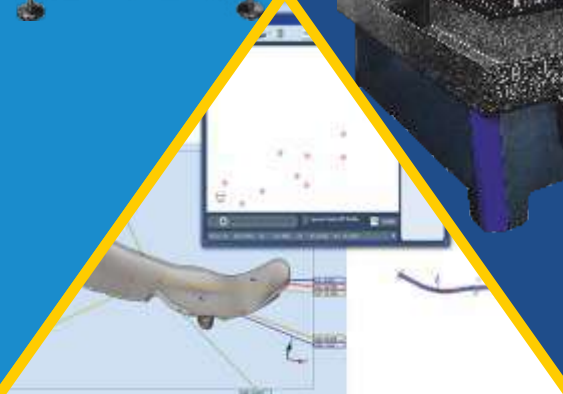
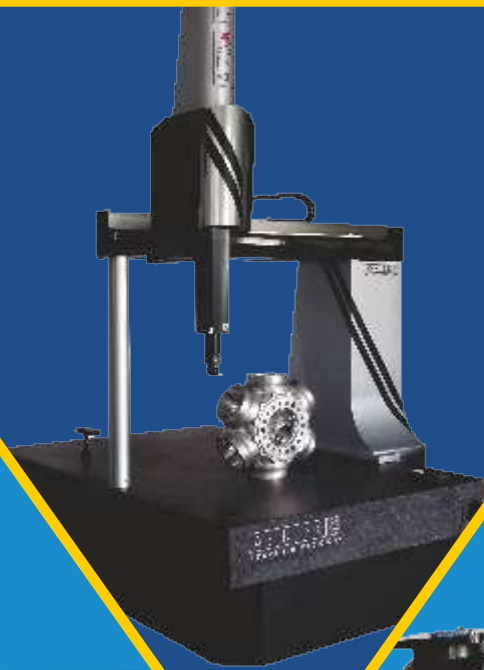
- Contactless measurement
- Range:
Internal diameter ϕ 15 - 36 mm & ϕ 36 - 160 mm
- Adjustable arms provided to support & guide the shell while measuring
- Offered with analogue or electronic read out



WITHOUT FRONT SUPPORT



WITH FRONT SUPPORT



**COORDINATE
MEASURING MACHINES**



Coordinate Measuring Machines



EXTOL SHOP FLOOR CNC CMM - CMM Accuracy Wherever You Need It

True to Aberlink's heritage for innovation, the Extol is the world's first CMM to utilise a Delta Mechanism. Designed for robustness and reliability, the Extol CMM will run around the clock making it ideal whether it is positioned next to a machine tool, in a manufacturing cell, or used in a dedicated inspection area.

Five temperature sensors monitoring both the machine and ambient temperature ensure that the Extol is capable of operating in uncontrolled environments and reporting measurements as though they had been taken at 20°C. The software will also produce a warning should the temperature change at a rate that is not conducive with reasonable metrology practice.

The Automatic Tool Offset Correction available with the Aberlink 3D software compliments the attributes of the Extol perfectly, allowing utilisation as part of a fully automated production process in the midst of a manufacturing environment.

The ergonomics of the Extol have also been a significant design factor. It is not only quick and easy to perform one-off inspections, but also has ample access for either batch inspection or to facilitate automatic loading. With a larger measuring volume and smaller overall footprint than its predecessor, the Xtreme, the Extol can be positioned exactly where the measurement is needed.

Robust, accurate and reliable, the Extol CMM is the perfect solution to automatically verify part quality for critical components.

FEATURES

- No compressed air required - the Extol is 'plug and go'
- Built-in temperature control - accuracy is maintained even when ambient temperature is not controlled
- Automation and automatic tool offset compensation options mean that the Extol is ideally suited for automated manufacturing cells
- Fully sealed recirculating bearings that improve smoothness and dirt immunity
- The Extol's direct drive belts eliminate the need for a gearbox and any associated backlash issues
- Aberlink's revolutionary easy-to-use measurement software
- Free software upgrades till machine life



Model	Extol 370	Extol 520
Axis Travel (mm)	XY : Ø370mm	XY : Ø520mm
Cylindrical	Z : 270mm	Z : 300mm
At Centre	Z : 365mm	Z : 400mm
Overall Size (mm)	X 715	X 950
	Y 730	Y 990
	Z 2000	Z 2200
Overall Size (mm) with monitor arm	X 1000	X 1180
	Y 1030	Y 1320
	Z 2000	Z 2200
*Volumetric Accuracy:	TP20 (2.4 + L/250) µm	TP20 (2.4 + L/250) µm
	TP200 (2.3 + L/250) µm	TP200 (2.3 + L/250) µm
	SP25M (2.1 + L/250) µm	SP25M (2.1 + L/250) µm
Scale Resolution:	0.1 µm	0.1 µm
Operational Temp Range:	5 - 45°C	5 - 45°C
Table:	Granite plate	Granite plate
Max. Velocity Vector:	500mm/sec	500mm/sec
*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

- Dual monitors, ideal for use with CAD software options
- TP200B Probe upgrade available where high volume or high accuracy solutions are required
- 3 or 6-Port change racks available for both TP20 & TP200 options.
(6-Port recommended for Extol 520 only)
- Fixturing automation & integration with Robot allows Extol to work in the automated manufacturing cells

Coordinate Measuring Machines



Axiom too... Manual or CNC CMM

Fast, accurate and reliable, the Axiom too CMM comes in three different sizes with Y axis travel up to 1200mm. 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)	X 640 Y 600, 900, 1200 Z 500
Overall Size (mm)	X 1040 Y 900, 1200, 1500 Z 2320
*Volumetric Accuracy:	TP20 (2.4 + L/250) μm TP200 (2.3 + L/250) μm SP25M (2.1 + L/250) μm
Scale Resolution:	0.5 μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 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 ² (CNC)
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 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)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

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

Coordinate Measuring Machines



Axiom too HS... High Specification CNC CMM

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 utilises 0.1µm 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

- Fitted with 0.0001mm linear encoders for superior accuracy
- Angled bearing zero backlash drive system for quicker acceleration and faster travel
- Shortest learning curve of any equivalent system
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimised friction free air bearings, aluminium bridge and granite table
- Free software upgrades till machine life

Axis Travel (mm)	X 640 Y 600, 900, 1200 Z 500
Overall Size (mm)	X 1040 Y 900, 1200, 1500 Z 2320
*Volumetric Accuracy:	TP20 (2.1 + L/250) µm TP200 (2.0 + L/250) µm SP25M (1.8 + L/250) µm
Scale Resolution:	0.1µm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 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 ²
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 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)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

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

Horizon 800... Starting The Linear Drive Revolution

The Horizon CMM breaks new ground in design and innovation using frictionless linear drives, which are the key to its fast and exceptionally smooth motion.

The kinematic isolated drive structure is completely independent of the CMM structure and ensures that the motor thrust is directed through the centre of gravity of the moving parts. This not only avoids acceleration induced metrology errors but also has the effect of thermally isolating the motors from the metrology structure of the CMM.

Linear motors are non-contact and therefore have no wearing parts and thus provide the perfect solution for CMM drives, improving reliability and reducing maintenance.

The Horizon is the stand-out machine with fast, smooth, silent motion ideally suited to contact scanning and with a first-term accuracy specification of under two microns.

FEATURES

- Linear motors offer frictionless, smooth, silent motion.
- No wearing parts means greater reliability and reduced maintenance.
- Drives applied through the centre of gravity improves both speed and accuracy.
- Thermal isolation of linear motors from the metrology structure avoids thermally induced metrology errors.
- Smooth motion allows for fast and accurate contact scanning.
- The most accurate machine in the Aberlink range. First term volumetric error specification under 2µm
- Automatic temperature compensation ensures that measurement results are reported as if they had been measured at 20°C
- Free software upgrades till machine life

Axis Travel (mm)	X 800 Y 1000, 1600 Z 600
Overall Size (mm)	X 1403 Y 1530, 2130 Z 2700
*Volumetric Accuracy:	TP20 (1.9 + L/250) µm TP200 (1.8 + L/250) µm SP25M (1.75 + L/250) µm
Scale Resolution:	0.1µm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Granite
Table Load Capacity:	1000kg as standard
Max. Velocity Vector:	1020mm/sec
Max. Acceleration Vector:	1020mm/sec ²
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 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)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

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

Coordinate Measuring Machines



Horizon 1000... Extending The Linear Drive Horizon

Drawing upon the tremendous success of the Horizon 800, the Horizon 1000 has a larger X-Y-Z axis travel whilst utilising the same frictionless linear drives.

The entire design of the Horizon 1000 has been optimised to take full advantage of parts already used on the Horizon 800 whilst improving the stiffness-to-weight ratio across the bridge assembly. Most notably: The Y-axis rail is 200mm taller so that the same right-hand-side linear drive system is common and improves rigidity; the carriage assembly has reduced in size and weight, without compromising metrology performance.

To improve the stiffness-to-weight ratio; the Z-axis motor has increased power to optimise its performance; the left-hand-side air bearing assembly has a custom extruded profile to keep weight to an absolute minimum and maintain stiffness.

FEATURES

- Linear motors offer frictionless, smooth, silent motion.
- No wearing parts means greater reliability and reduced maintenance.
- Drives applied through the centre of gravity improves both speed and accuracy.
- Thermal isolation of linear motors from the metrology structure avoids thermally induced metrology errors.
- Smooth motion allows for fast and accurate contact scanning.
- The most accurate machine in the Aberlink range. First term volumetric error specification under $2\mu\text{m}$
- Automatic temperature compensation ensures that measurement results are reported as if they had been measured at 20°C
- Free software upgrades till machine life

Axis Travel (mm)	X 1000 Y 1200, 2000 Z 800
Overall Size (mm)	X 1603 Y 1830, 2630 Z 3070
*Volumetric Accuracy:	TP20 $(1.9 + L/250)\mu\text{m}$ TP200 $(1.8 + L/250)\mu\text{m}$ SP25M $(1.75 + L/250)\mu\text{m}$
Scale Resolution:	0.1 μm
**Optimum Temp Range:	18 - 22 $^{\circ}\text{C}$
Operational Temp Range:	5 - 45 $^{\circ}\text{C}$
Table:	Granite
Table Load Capacity:	1000kg as standard
Max. Velocity Vector:	1020mm/sec
Max. Acceleration Vector:	1020mm/sec ²
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 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

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

MACHINE OPTIONS

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



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.

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
- Choice of Y axis sizes ranging from 1000mm to 3000mm
- Supplied with the CMM touch screen joystick as standard
- Free software upgrades till machine life

Axis Travel (mm)	X 1200 Y 2000, 3000 Z 1000
Overall Size (mm)	X 1940 Y 3000, 4000 Z 3595
*Volumetric Accuracy:	TP20 (2.9 + L/250) μ m TP200 (2.8 + L/250) μ m SP25M (2.6 + L/250) μ m
Scale Resolution:	0.1 μ m
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Granite
Table Load Capacity:	1500kg as standard (Options up to 6000kg)
Max. Velocity Vector:	600mm/sec
Max. Acceleration Vector:	600mm/sec ²
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 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)
- 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
- Fixture Kit



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.

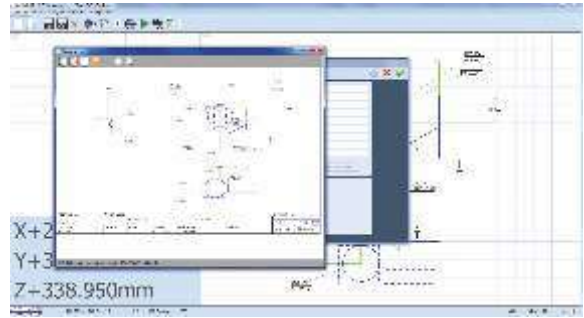
Aberlink 3D software is revolutionary. For example, Feature Predict enables you to just take measurement points and the software automatically determines if you are measuring a Plane, Line or Circle feature. Move from feature to feature and the software predicts what you are measuring. As a component 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. Real-time SPC is included.

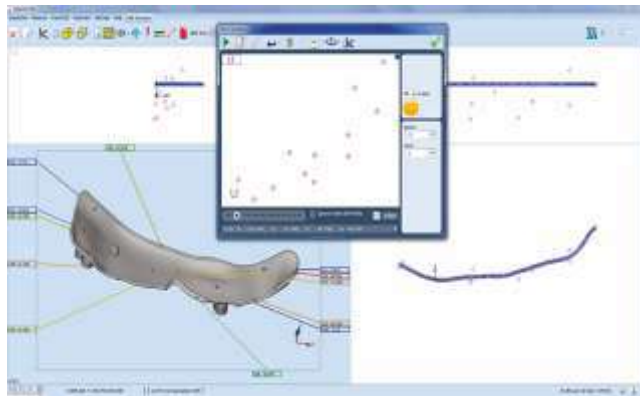
Further reports are available to show the form of features (roundness, straightness etc.), hole or point positions, or complete batch results on one report. The user's company name also appears on all outputs.

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.

The new Leapfrog Feature in Aberlink 3D version allows to measure the component larger than the measuring volume of the machine.



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 CNC CMM.

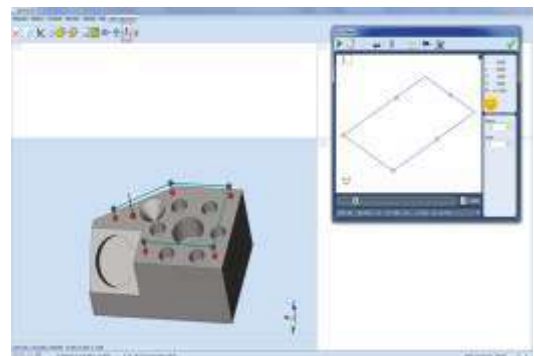
Aberlink CAD Programming Software Module

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.



Coordinate Measuring Machines



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.

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
PH6M	No	No	450mm	No	No	No	Yes
PH10M	No	Motorised	450mm	7.5°	720	Yes	Yes

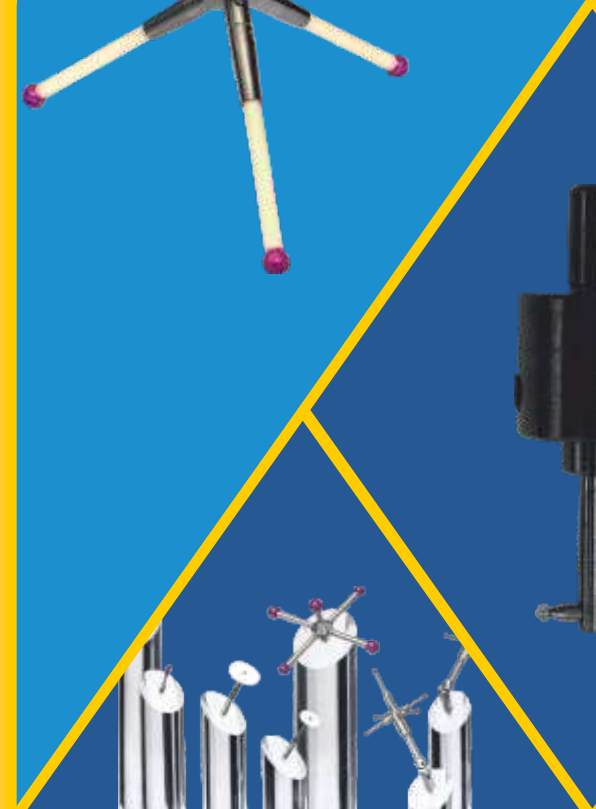
CMM CAMERA

(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.





CMM STYLI & ACCESSORIES



CMM Styli & Accessories



Precision for the highest standards is the only Aim of Nüssler Precision AG of Switzerland founded in 1988. The company concentrates on the production, development and worldwide distribution of styli and accessories for dimensional measurement technology. The sale of Nüssler products is supported by a global distribution network in the major European, American and Asian countries.

We Baker Gauges India Pvt. Ltd. are proud to take complete responsibility of the sales of Nüssler's wide range of styli and accessories for the Indian market.

Successful measurement depends largely on the stylus and its ability to reach the measuring point.



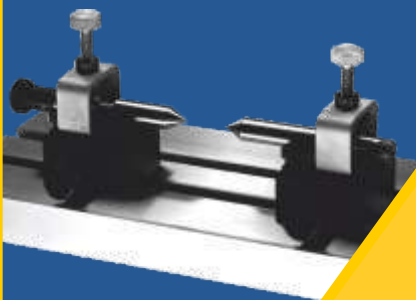
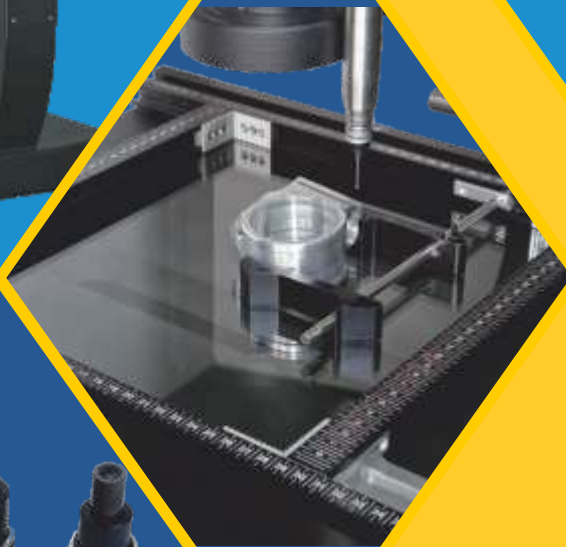
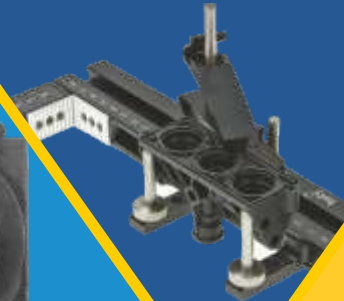
THE STYLI AND ACCESSORIES ARE AVAILABLE FOR

- Coordinate Measuring Machines (CMMs)
- Measuring Arms
- Thread Measuring Equipment
- 2D Height gauges
- Special Measuring Devices
- CNC Machine Tools
- Dial gauges



T - Styli





PROFILE PROJECTORS & VISION SYSTEMS



Profile Projectors

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R14 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 340mm (14") screen with 90° crosslines and chart clips
- Profile illumination with halogen lamp and green filter
- Lens magnification choice: 10x, 20x, 25x, 50x and 100x
- Fibre optic surface illumination
- Helix adjustment of light source $\pm 7^\circ$ for accurate thread form projection
- Workstage with machined slot for holding accessories
- Workstage measuring range of 175mm (7") x 100mm (4")
- Digital angle measurement to 1 minute
- 0.5 micron resolution

R400 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 400mm (16") screen with 90° crosslines and chart clips
- Profile illumination with halogen lamp and green filter
- Lens magnification choice: 10x, 20x, 25x, 50x and 100x
- Fibre optic surface illumination
- Helix adjustment of light source for accurate thread form projection
- Workstage with two machined slots for holding accessories
- Workstage measuring range of 300mm (12") x 150mm (6")
- Digital angle measurement to 1 minute



R600 HORIZONTAL PROFILE PROJECTOR



FEATURES

- 600mm (24") screen with 90° cross lines and chart clips
- Heavy duty workstage with 450mm (18") x 200mm (8") measuring range and 2 machine slots for workpiece holders
- Angular rotation of $\pm 15^\circ$ on workstage for measuring threadforms or cutting tools
- Vertical 200mm (8") Y axis power driven with joystick control
- Lens magnification choice - 5x (single lens mount), 10x, 20x, 25x, 50x, 100x
- 4 position rotating lens turret for ease of lens changing (excluding 5x)
- Profile illumination with halogen lamp and green filter
- Screen hood and curtains for use in bright ambient light conditions
- Fibre optic surface illumination
- Digital angle measurement
- 0.5 micron resolution

SM300 VERTICAL PROFILE PROJECTOR



FEATURES

- 300mm diameter screen
- Top quality profile projector highly versatile and easy to operate
- Large travel range 150mm (6") x 50mm (2") as standard
- Linear scale stage with 0.0005mm resolution
- Fine ground glass screen for clear image with cross hairs
- Screen complete with cross hair lines and chart clips
- Built-in profile and surface illumination
- 10x, 20x, 50x, 100x projection lenses available
- Display-readout unit GMR included in standard delivery



Profile Projectors

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SM350 VERTICAL PROFILE PROJECTOR



FEATURES

- Fully usable 350mm screen
- Digital screen protractor
- Built in helix adjustment
- Sturdy all-steel design
- Heavy duty cross roller bearings
- Quick release 'X' and 'Y' travel
- Easy-view vertical screen
- Large stage travel 250mm (10") x 125mm (5")
- Rotating chart clips
- Fibre optic illumination for surface measurement
- 0.5 micron resolution

SM20 VERTICAL PROFILE PROJECTOR



FEATURES

- 500mm screen with 90 degree crosslines and chart clips
- Angled screen for easy viewing
- Profile illumination with halogen lamp and green filter
- Surface illumination through twin fibre optics for bright full colour surface inspection
- Single lens mounting
- Lens magnification choice: 5x, 10x, 20x, 25x, 50x and 100x
- Helix adjustment of light source for accurate thread form projection
- Large stage travel 250mm (10") x 125mm (5")
- Digital angle measurement
- 0.5 micron resolution

Profile Projectors



FUSION TOUCH READOUT

FT2: Complete TOUCH SCREEN DRO with 2D Fusion touch software. Full geometric functionality, view of measured part can be printed as a fully dimensioned drawing. Full reporting capability includes, SPC, tabulated details with pass / fail analysis, auto link to Excel and auto sequence programming feature. Windows O/S and built in 22"portrait touch screen monitor.

FT2-E: Complete TOUCH SCREEN DRO with 2D Fusion Touch software as above. Built-in optical edge detection allows data points to be taken 'on the fly' as the projected image is passed under the screen-mounted fibre optic sensor.



Model Name	R14	R400	R600
X,Y measuring Range	175mm(7") x 100mm(4")	300mm(12") x 150mm(6")	450mm(18")(optional 300mm(12")) x 200mm(8")
Work stage Area	325mm(12.8") x 100mm(4")	480mm(19") x 127mm(5")	600mm(24") x 200mm(8")
Screen Size	340mm(14") (Rotating)	400mm(16") (Rotating)	600mm(24") (Rotating)
Max Work Piece Load	10 kg	15 kg	50 kg
Drive Type	Manual	Manual/CNC	Manual/CNC
Image	Inverted and Reversed	Erect, reversed left to right	Erect, reversed left to right
Optics/Lens Magnification	x10, x20, x25, x50, x100 (condenser required for x50 and x100)	x10, x20, x25, x50, x100 (condenser required for x50 and x100)	5x (special order, single lens mount), x10, x20, x25, x50, x100 (condenser required for x50 and x100)
Resolution	0.0005mm	0.0005mm	0.0005mm
Accuracy	3 + L/80 µm	2.5 + L/80 µm	2.5 + L/80 µm
Light Source	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 24v 150w lamp (Tungsten Halogen) Surface 24v 250w lamp (twin adjustable fiber optics) Profile 0.05% Surface 0.1%
Magnification accuracy	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%	Angular rotation of ± 15° on work stage for measuring thread forms or cutting tools
Helix Adjustment	± 7° by light source alignment	Profile 0.05% Surface 0.1% ± 7° by light source alignment	
Height	966mm	1019mm	1920mm
Width assembled	400mm	849mm	1550mm (without hood 728mm)
Depth (length)	1210mm	1028mm	1872mm (without hood 1500mm)
Weight - average	60kg	140kg net	530kg nett
Powers Supply (Volt)	220 / 240 Volt 50Hz or 110 60Hz		

Model Name	SM20	SM300	SM350
X,Y measuring Range	250mm(10") x 125mm(5")	150mm (6") x 50mm (2")	250mm(10") x 125mm(5")
Work stage Area	412mm(16") x 260mm(10.5")	340mm(13.4") x 152mm(6")	412mm(16") x 260mm(10.5")
Screen Size	500mm(20") (Rotating)	300mm(11.8") (Rotating)	350mm(14") (Rotating)
Max Work Piece Load	15 kg	15 kg	15 kg
Drive Type	Manual	Manual	Manual/CNC
Image	Inverted and reversed	Erect and reversed	Erect and reversed
Optics/Lens Magnification	x5, x10, x20, x25, x50, x100 (condenser required for x50 and x100)	x10, x20, x50, x100 (condenser required for x50 and x100)	x10, x20, x25, x50, x100 (condenser required for x50 and x100)
Resolution	0.0005mm	0.001mm	0.0005mm
Accuracy	2.5 + L/80 m	2.5+L/80µm	2.5 + L/80 m
Light Source	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)	Profile 24v 150w lamp (Tungsten Halogen) Surface 12v 100w lamp (half reflecting mirror)	Profile 12v 100w lamp (Tungsten Halogen) Surface 12v 100w lamp (twin adjustable fiber optics)
Magnification accuracy	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%	Profile 0.05% Surface 0.1%
Helix Adjustment	± 7° by light source alignment	± 7° by light source alignment	± 7° by light source alignment
Height	1925mm	1115mm	1001mm
Width assembled	790mm	775mm	846mm
Depth (length)	10201	7806mm	946mm
Weight - average	50kg	130kg	133kg
Powers Supply (Volt)	220 / 240 Volt 50Hz or 110 60Hz		

The highly successful Venture range combines both Manual and CNC axis that cover two differing stage sizes.

Venture models take the power of fusion software one stage further by completely automating the inspection process. Now advanced features like scanning and best fitting can be done quickly without taking up the time of skilled operators.

CNC programming is a simple teach and repeat process. Just measure the part once and a full CNC program is created automatically. The zoom lens can also be controlled so that magnification and auto focus changes are all recorded into the program.

The use of a touch probe is optimised on a CNC system. Measurements from data points taken using the touch probe can be combined with those taken using video edge detection for optimum speed and reduced inspection times.

A probe changer rack can be installed so that probe modules fitted with a variety of pre-calibrated styli can also be used in the same inspection.

Model Name	Description
VM-4030-CNC	Vμ MASTER - CNC CNC – X: 400mm, Y: 300mm with Digital Anemos Scale Technology on a granite base.
VI-2510-MAN	MANUAL – X: 250mm, Y: 125mm, Z: 150mm 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-2510-TOUCH	MANUAL – X: 250mm, Y: 125mm, CNC Z: 150mm and Auto Focus 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-2510-CNC	CNC – X: 250mm, Y: 112mm, Z: 150mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-3030-TOUCH-XT	MANUAL – X: 300mm, Y: 300mm, CNC Z: 200mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.
VI-3030-CNC-XT	CNC – X: 300mm, Y: 300mm, Z: 200mm and Auto Focus. 0.5 Micron resolution scales. Manually operated 6.5:1 Micro Zoom Lens.

FEATURES

- Teach and Repeat programming
- Programmable segmented LED lighting
- 6.5:1 zoom optics (with optional CNC control)
- Optional 12x zoom optics
- High resolution 0.5μm scales for increased accuracy
- Optional CAD import / export
- Auto program from CAD
- Adding DXF scanning and best fitting
- Fully dimensioned part view
- Real-time SPC included
- One click output to Excel™
- Autofocus
- Free software upgrades till machine life



Venture Plus Vision Systems



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The Venture Plus range includes all of the standard Venture features with a little more... measuring range.

The bridge type construction is all aluminium resulting in low inertia and low thermal mass. Air bearings are used on all axes and a granite Y beam is used for increased accuracy. This ensures that the machine will expand and contract uniformly with temperature changes ensuring minimal distortion and subsequent errors. Ambient temperature can be compensated for within the Fusion software making Venture Plus ideal for use on the shop floor.

Complete with our standard zoom optics and programmable, segmented LED surface lighting, Venture Plus offers the same level of camera based functionality as every other Venture.

The use of a touch probe is optimised on a CNC system. Measurements from data points taken using the touch probe can be combined with those taken using Video Edge Detection for optimum speed and reduced inspection times.

A probe changer rack can be installed so that probe modules fitted with a variety of pre-calibrated styli can also be used in the same inspection.

When a change of stylus is required, the system automatically puts the current probe module back in the rack and picks up the next to continue the inspection process. This functionality can be combined with our sophisticated Edge Detection to offer the ultimate in large format multi-sensing Vision systems - Venture Plus.

Model Name	Measuring Range XYZ
VP-6460-CNC	640mm x 600mm x 250mm
VP-6490-CNC	640mm x 900mm x 250mm
VP-80100-CNC	800mm x 1000mm x 460mm
VP-80160-CNC	800mm x 1600mm x 460mm
VP-100120-CNC	1000mm x 1200mm x 750mm
VP-100200-CNC	1000mm x 2000mm x 750mm

FEATURES

- Rigid, low mass bridge construction
- Integral 6.5:1 CNC zoom optics
- Teach and repeat programming
- Programmable segmented LED lighting
- High resolution 0.5 μ m scales for increased accuracy
- Optional CAD import / export
- Adding DXF scanning and best fitting
- Fully dimensioned part view
- Real-time SPC included
- One click output to Excel™
- Autofocus
- Renishaw TP20 touch probe joint
- CNC controlled collimated profile lighting
- Optional automatic temperature compensation
- Free software upgrades till machine life





Fusion Software

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VIDEO EDGE DETECTION

Video Edge Detection (VED) ensures a repeatable result without relying on the skill of the operator. Hundreds of data points can be taken in an instant to calculate standard geometric features. Standard VED tools include arc, circle, line, point, focus and curve.

IMAGE STITCHING AND PROFILE SCANNING

A camera image can be taken and stored every time the XY stage is paused. These images may be "stitched" together to allow the user to zoom out and view the entire component in the camera image view. Imported dxf files may be used as overlays which can be super imposed on top of the stitched image, providing a visual comparison of the entire part to the tolerance bands shown on the dxf. If a profile measurement is required, the curve tool can be used to automatically trace the profile of the part. The resulting data-point cloud can then be viewed both in the part view, for reporting, as well as the stitched camera image. A profile dimension can easily be added to define the best fit profile error. Image stitching can also be used to quickly grab all of the features of a large 2D component. A CNC inspection routine can then be created by simply clicking on the feature to be measured using the "one click" feature or "all features in an area" tools.

TOUCH PROBE COMPATIBLE

Fusion metrology software is ready to accept touch probe measurements as well as optical and camera based. Offsets for each measuring system can be calculated enabling you to use a combination of non-contact measurements in the same inspection. An optional probe storage rack can also be used to allow automatic probe changes mid program. For touch probe scanning applications, Renishaw's SP25 scanning probe option can be specified.

CNC OPERATION

The CNC option enables fully automatic part inspection with teach and repeat programming and manual joystick control. Parts can be palletised for batch inspection and reports are generated automatically.

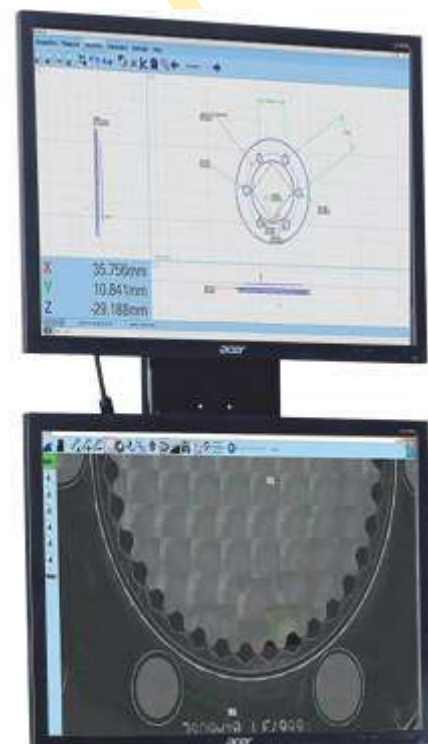
CAD OPTION

Allows measurement data points taken anywhere on the part surface to be compared to a 3D IGES or STEP CAD model.

Zoom Lens Magnification Specification in mm

6.5:1 Zoom Lens (6X Lens)					
Zoom	Effective Mag	Pixel Size	Field of View		
			X Axis	Y Axis	Diagonal
MIM	37	3.9	8.0	6.0	10.0
1	50	2.9	6.0	4.4	7.4
2	72	2.0	4.2	3.1	5.2
3	110	1.3	2.7	2.0	3.4
4	154	1.0	1.9	1.5	2.4
MAX	194	0.8	1.5	1.2	1.9

12:1 Zoom Lens (12X Lens)					
Zoom	Effective Mag	Pixel Size	Field of View		
			X Axis	Y Axis	Diagonal
MIM	25	4.8	9.9	7.4	12.3
1	33	3.7	7.6	5.7	9.4
2	46	2.6	5.4	4.0	6.7
3	65	1.9	3.8	2.9	4.8
4	92	1.3	2.7	2.0	3.4
5	130	0.96	1.9	1.5	2.4
6	180	0.68	1.4	1.0	1.7
MAX	220	0.56	1.1	0.9	1.4



Technical Specifications - Vision System



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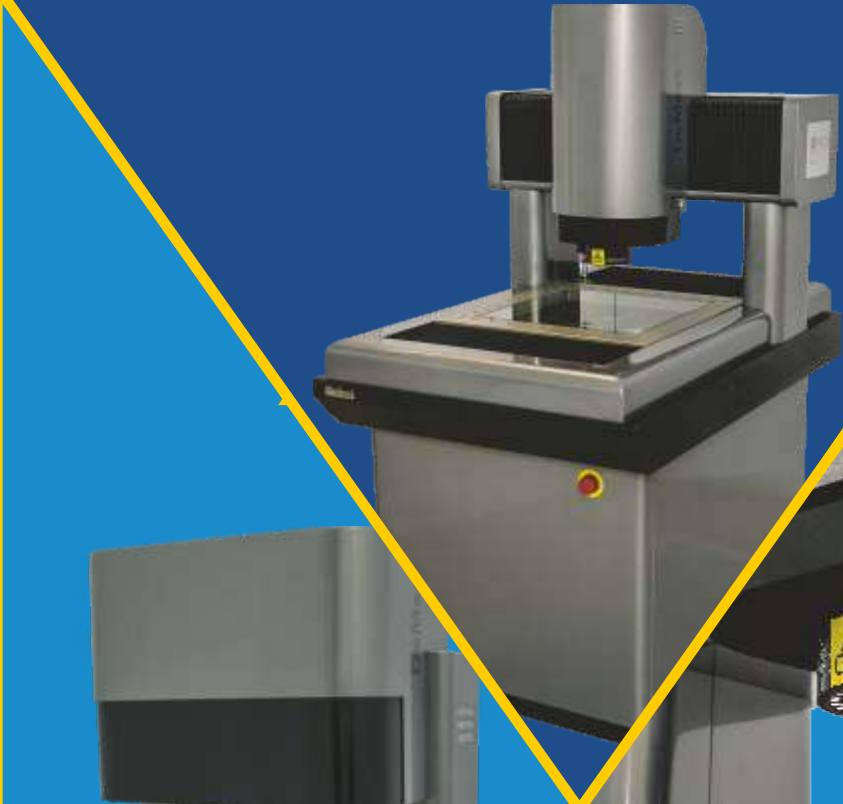
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		MANUAL SYSTEMS	SEMI AUTOMATIC
	VM-4030 VuMaster	VI-2510 Venture	Venture-Touch-3030
X Y Z measuring range (mm)	400 x 300	250 x 125 x 165	300 x 300 x 300
Workstage area (mm)	420 x 320	414 x 262	464 x 462
Max workpiece load (kg)	25	25	25
Drive type	Manual	Manual	Manual XY CNC Z
Bearings	Air bearings	Cross roller rail guide	Cross roller rail guide
Camera type	2048 x 1590 pixel colour USB2 camera with 8 x 9mm chip and dynamic latch		
Optics / lighting	Fixed objective telecentric lens with programmable LED lighting	6.5:1 detent zoom lens. Fully programmable software controlled white LED segmented surface lighting head with understage and through the lens (TTL) lighting as standard	
Resolution	0.001mm	0.0005mm	0.0005mm
Accuracy	7.5µm	2+L / 100	2+L / 100
Max field of view (FOV)	12mm	16mm*	16mm*
Magnification	20x 350x	Optical zoom ratio 27x - 175x on 17" monitor with digital zoom enhancement to over 1200x	
Touch probe option available	No	Yes	No
Probe type	N/A	Renishaw TP20	N/A
Change rack compatible?	N/A	N/A	N/A

*using optional 0.5x adapter lens

CNC Systems					
Model	VM-4030 VuMaster	VI-2510 Venture	VI-3030 Venture XT CNC	VP-6460 Venture Plus	VP-6490 Venture Plus
X Y Z measuring range (mm)	400 x 300	250 x 125 x 165	300 x 300 x 200	640 x 600 x 250	640 x 900 x 250
Workstage area (mm)	420 x 320	414 x 262	464 x 462	700 x 940	700 x 1240
Max workpiece load (kg)	25	25	25	75	75
Drive type	CNC / hand wheel	CNC / joystick	CNC / joystick	CNC / joystick	CNC / joystick
Bearings	Air bearings	Cross roller rail guide	Cross roller rail guide	Air bearings	Air bearings
Max drive speed	100mm / sec	200mm / sec	200mm / sec	350mm / sec	350mm / sec
Camera type	2048 x 1590 pixel colour USB2 camera with 8 x 9mm chip and dynamic latch				
Optics / lighting	Fixed objective telecentric lens with programmable LED lighting	6.5:1 CNC zoom lens. Fully programmable software controlled white LED segmented surface lighting head with under stage and through the lens (TTL) lighting as standard			
Optional	12:1 CNC zoom lens option for increased FOV				
Resolution	0.001mm	0.0005mm	0.0005mm	0.0005mm	0.0005mm
Accuracy	7.5µm	2+L / 100	2+L / 100	2.4 + 0.4/ 100 Volumetric	2.4 + 0.4/ 100 Volumetric
Max field of view (FOV)	12mm	16mm*	16mm*	16mm*	16mm*
Magnification	20x 350x				
Touch probe option available	No	Yes	Yes	Yes	Yes
Probe type	N/A	Renishaw TP20			
Optional	N/A	Renishaw SP25 scanning probe			
Change rack compatible?	N/A	Yes	Yes	Yes	Yes

*using optional 0.5x adapter lens



VIDEO MEASURING MACHINES

Multi Sensor 3D CNC CMM

BAKER

DeMeet

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 ²)	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.



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.



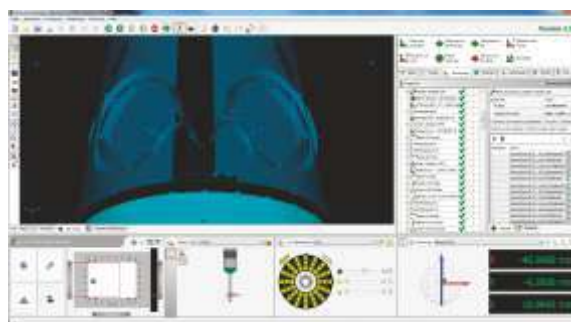
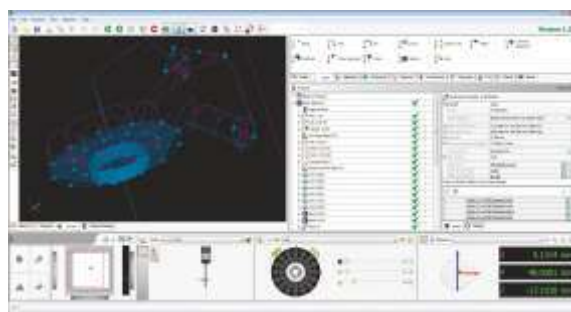
MULTI-SENSOR MEASUREMENTS

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.

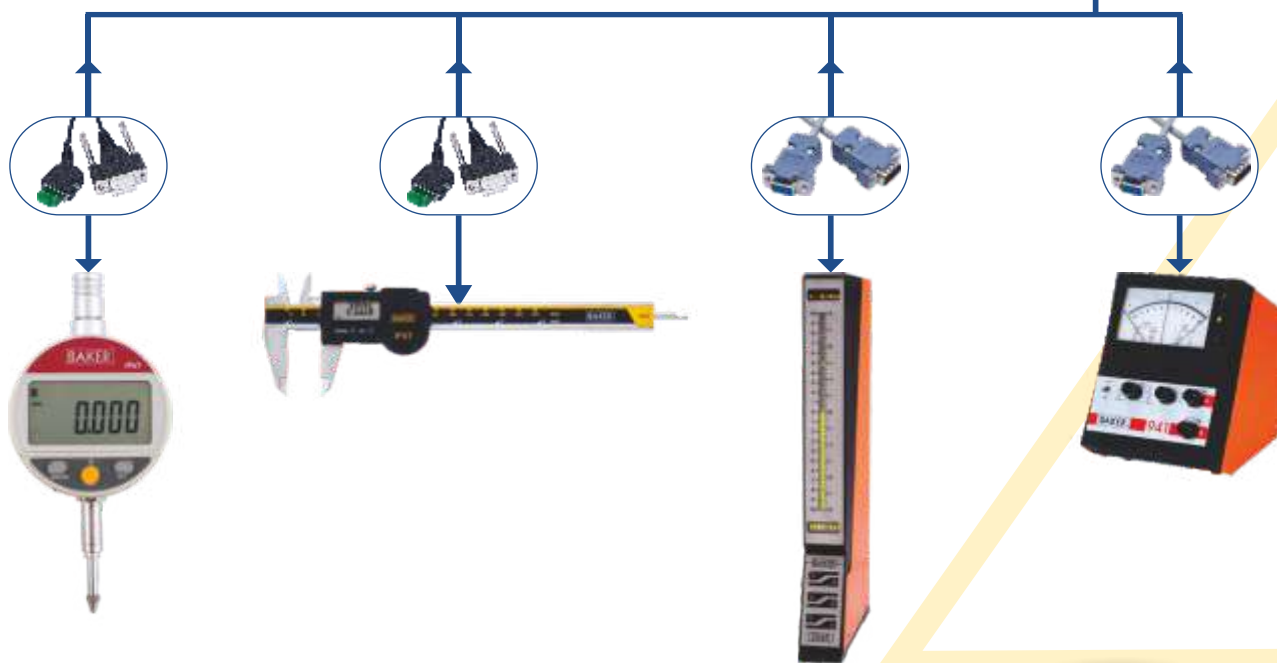




The world today is moving toward Statistical process control techniques at a lightning pace. It is likely that in the near future, the use of statistical process control is mandated in the automobile industry. In order to keep its customers at par with international requirements, Baker Gauges has developed 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.



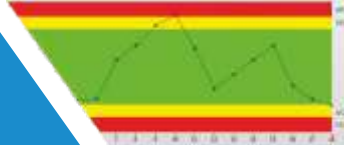
BAKER Q-Soft



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	6:32:08 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	< -1.75 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	< -1.75 um
10/16/2013	12:03:33	od7	1	VICKY	1	1	> 1.8 um
10/16/2013	12:05:30	od8	1	VICKY	1	7	> 1.8 um

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

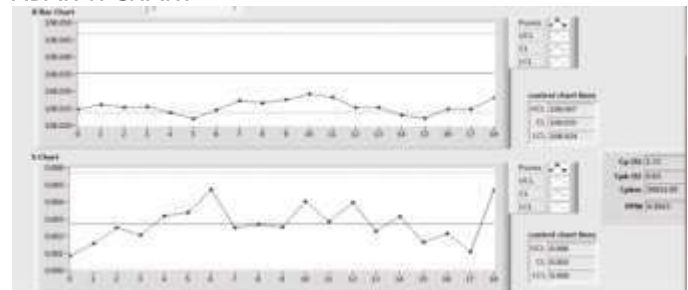
Online information includes - Date, time, part name, parameter, machine, measurement values and count of individual measurements.

STATISTICAL INFORMATION INCLUDES

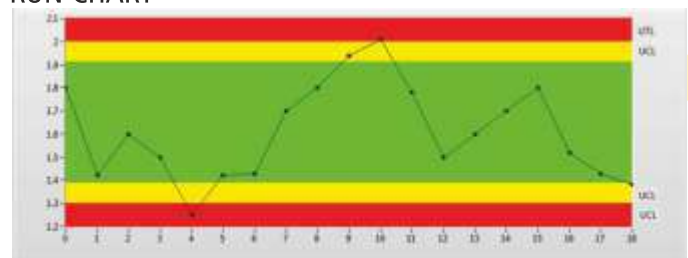
CP, CPK, CPM, PPM

Part No.	Parameter	Part Name	Cp	Cpk	Cpm	PPM
1	od1	1	0.377624	0.334886	0.700000	14272
1	od2	1	0.490888	0.596427	0.722288	30309.1
1	od3	1	0.493114	0.622382	0.248833	18783.3
1	od4	1	0.886522	0.609982	0.811372	12448.1
1	od5	1	0.76006	0.56284	0.89448	84838.6
1	od6	1	0.885383	0.548387	0.739277	17423.8
1	od7	1	0.885482	0.734278	0.743345	14574.8
1	od8	1	0.853223	0.800482	0.678188	37545.7

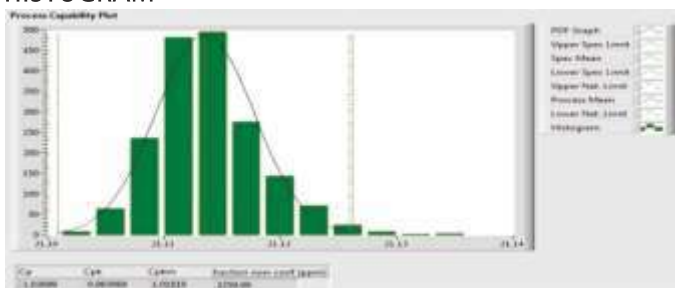
XBAR-R CHART



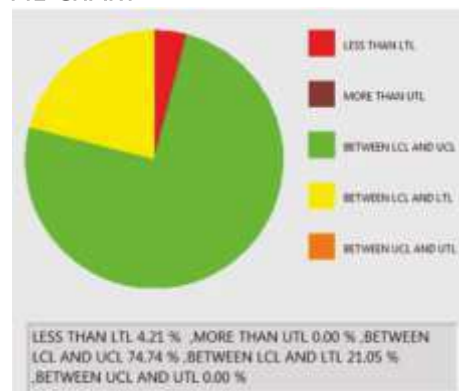
RUN CHART



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

