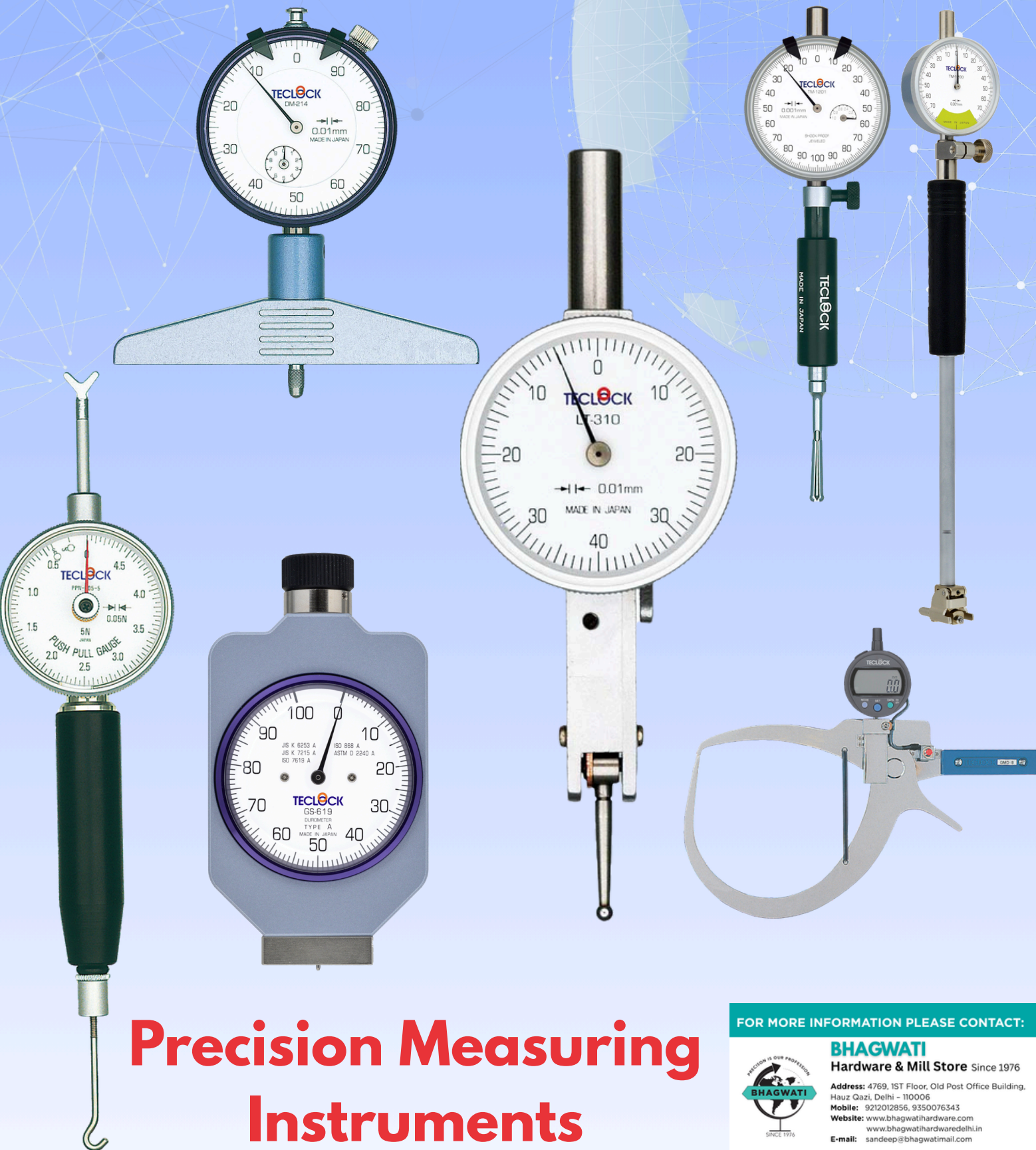


TECLOCK



Precision Measuring Instruments

FOR MORE INFORMATION PLEASE CONTACT:



BHAGWATI

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www.bhagwathardwaredelhi.in

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AN ISO 9001 : 2015 CERTIFIED COMPANY

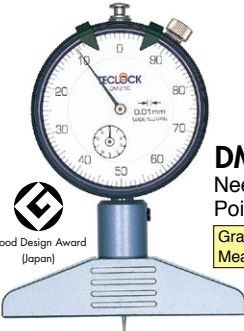
Depth Gauge

This is an exclusive instrument which measures steps and depth of work piece by hand. Setting "0" by sticking bottom face to measuring basics (zero point) and rotating bezel. (Bezel is fixed by clamp at that time.). Then, it reads with short hand and pointer how contact point is salient from that position. Analog and Digital models are available and they correspond to usage of shape of contact point and basic size. There are such standard models of stroke of 10mm, 20mm and 30mm and it can comparatively measure depth of 220mm to 240mm by connecting extension rods.

Dial Depth Gauge

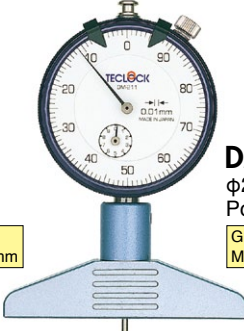
- Dial Depth Gauge can be used to measure depth and steps of work piece and coating thickness.
- 5-240mm range (with the supplied extension rods) are available for wide application.
- Special order is applicable for contact point and base.
- Low measuring force type is also available, which seldom hurts work piece.
- Lifting lever (Option) can be mounted.

Measuring Range:10mm



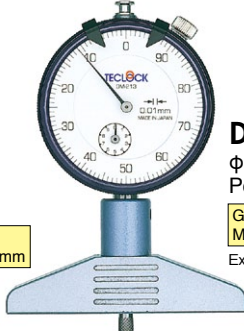
DM-210
Needle Contact Point

Graduation 0.01mm
Measuring Range 10mm



DM-211
φ2 Flat Contact Point

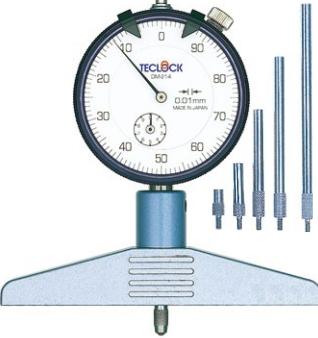
Graduation 0.01mm
Measuring Range 10mm



DM-213
φ2 Ball Contact Point

Graduation 0.01mm
Measuring Range 10mm

Extension rods options

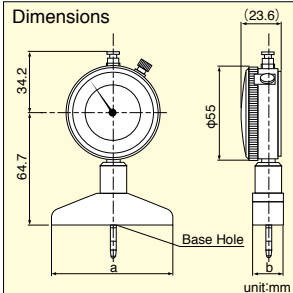


DM-214
Possible depth measurement of up to 220mm

Graduation 0.01mm
Measuring Range 10mm
Indication Range 10mm

with 5-Extension rods

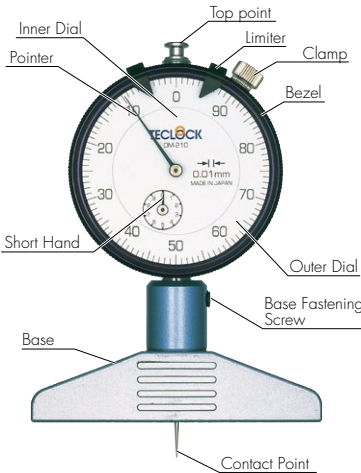
Dimensions



Dimensions Table

Model	Base Form a×b	Base Hole Diameter
DM-210	75×16	2.5
DM-211	75×16	2.5
DM-213	75×16	5.2
DM-214	100×16	5.2

unit:mm



Inner Dial
Pointer
Short Hand
Base
Base Fastening Screw
Contact Point
Top point
Limiter
Clamp
Bezel
Outer Dial

Specifications ※Measuring Range : () value is a range by using 5pcs extension rods.

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-210	0.01	10	±12	Needle	ZS-523	1.4以下	240
DM-211	0.01	10	±12	φ 2 Flat	ZS-530	1.4以下	240
DM-213	0.01	10	±12	φ 3.2 Ball	ZS-034	1.4以下	240
DM-214	0.01	10 (220)	±12	φ 3.2 Ball	ZS-034	2.5以下	335

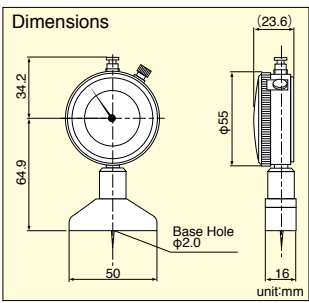
Measuring Range:5mm



DM-250
Small type

Graduation 0.01mm
Measuring Range 5mm

Dimensions



unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-250	0.01	5	±10	Needle	ZS-518	1.4 or less	230



Depth Gauge

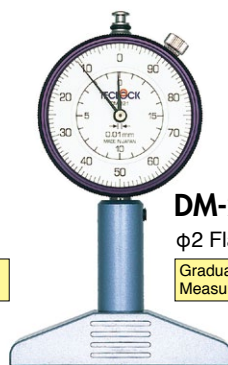
Measuring Range: 20mm / 30mm



DM-220 / 230

Needle Contact point

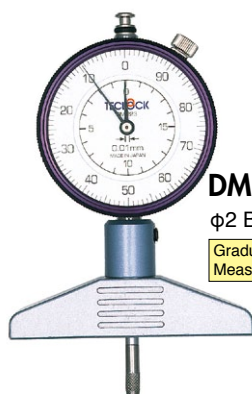
Graduation 0.01mm
Measuring Range 20mm/30mm



DM-221

φ2 Flat Contact Point

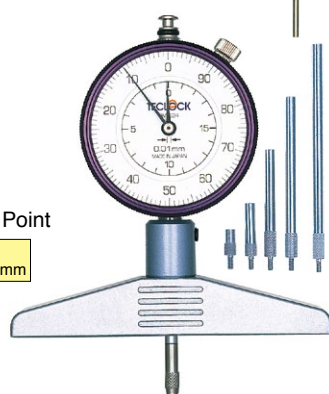
Graduation 0.01mm
Measuring Range 20mm



DM-223

φ2 Ball Contact Point

Graduation 0.01mm
Measuring Range 20mm

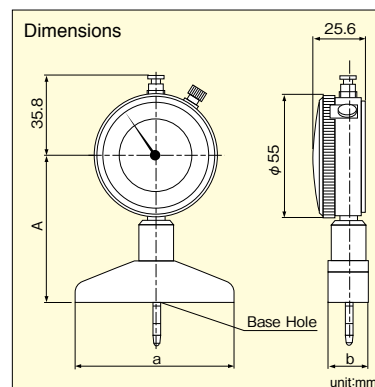


DM-224/233/234

Possible depth measurement
of up to 230mm (DM-224) /
240mm (DM-233/234)

Graduation 0.01mm
Measuring Range 230mm/240mm
Indication Range 20mm/30mm

with 5-Extension rods



Dimensions Table

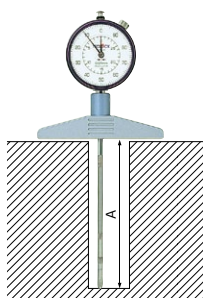
Model	A	Base Form a×b	Base Hole Diameter
DM-220	84.7	75×16	2.5
DM-221	84.7	75×16	2.5
DM-223	64.7	75×16	5.2
DM-224	64.7	100×16	5.2
DM-230	84.7	75×16	2.5
DM-233	64.7	75×16	5.2
DM-234	64.7	100×16	5.2

unit:mm

Specifications

※Measuring Range : () value is a range by using 5pcs extension rods.

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-220	0.01	20	±15	Needle	ZS-543	2.2以下	300
DM-221	0.01	20	±15	φ2 Flat	ZS-541	2.2以下	300
DM-223	0.01	20	±15	φ3.2 Ball	ZS-034	2.2以下	275
DM-224	0.01	20 (230)	±15	φ3.2 Ball	ZS-034	2.5以下	340
DM-230	0.01	30	±35	Needle	ZS-543	2.5以下	315
DM-233	0.01	30 (240)	±35	φ3.2 Ball	ZS-034	2.5以下	315
DM-234	0.01	30 (240)	±35	φ3.2 Ball	ZS-034	2.5以下	355



Depth Gauge with Extension Rods

When all of 5 extension rods of depth gauge with extension rods are connected, it can measure the dimension of deep concavity part of bottom. (Standard dimension set up with master gauge is necessary).

A dimension : Measuring range 10mm Depth Gauge : up to maximum 220mm
Measuring range 20mm Depth Gauge : up to maximum 230mm
Measuring range 30mm Depth Gauge : up to maximum 240mm

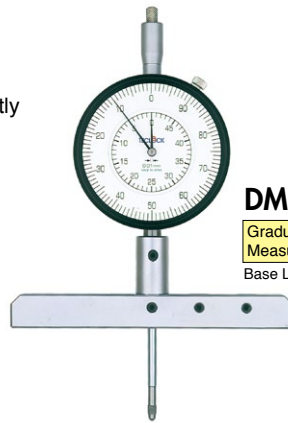


Measuring depth of concavity of work of which center is bored. The photo shows 2.03mm.



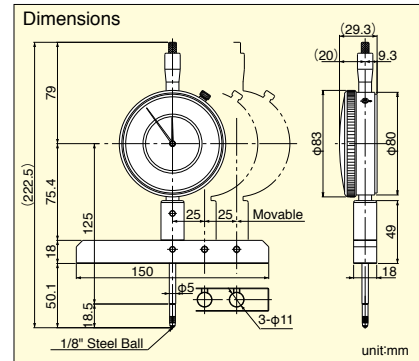
Measuring Range:50mm

- A large sized depth gauge measurable 0-50mm (actual dimension) depth directly without any extension rod.
- The dial part is a type movable by inserting it into one of 3 holes.



DM-295

Graduation 0.01mm
Measuring Range 50mm
Base Length 150mm



Specifications

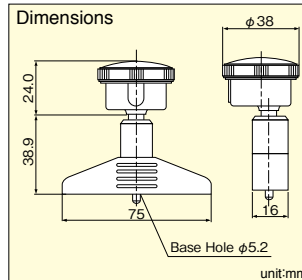
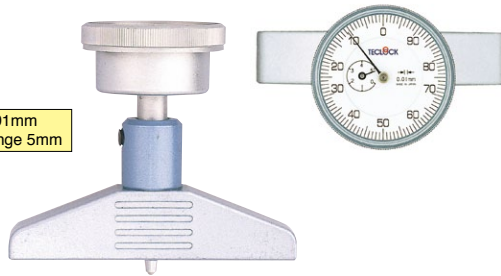
Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-295	0.01	50	±50	φ3.2 Ball	ZS-116	2.5以下	750

Dial Depth Gauge (Special)

Back plunger type

DM-273

Graduation 0.01mm
Measuring Range 5mm



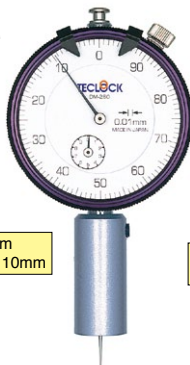
Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-273	0.01	5	±10	φ3.2 Ball	ZS-105	1.4 or less	210

Round Base type

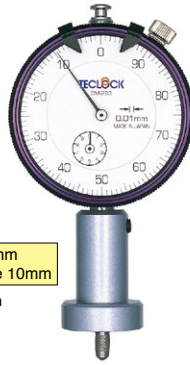
DM-280

Graduation 0.01mm
Measuring Range 10mm
Base form φ16mm

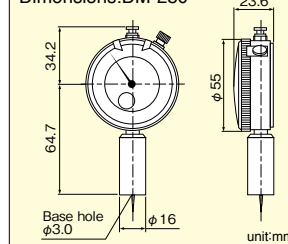


DM-283

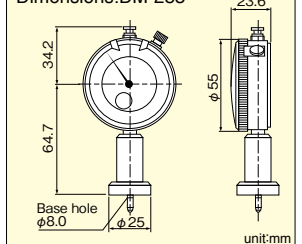
Graduation 0.01mm
Measuring Range 10mm
Base form φ25mm



Dimensions:DM-280



Dimensions:DM-283



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-280	0.01	10	±12	Needle	ZS-523	1.4 or less	175
DM-283	0.01	10	±12	φ3.2 Ball	ZS-034	1.4 or less	185



Depth Gauge

Measurement for printed circuit board



DM-251

Exclusive instrument to measure depth of V-groove of print circuit board.

Graduation 0.01mm
Measuring Range 5mm



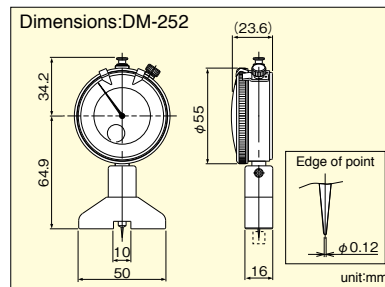
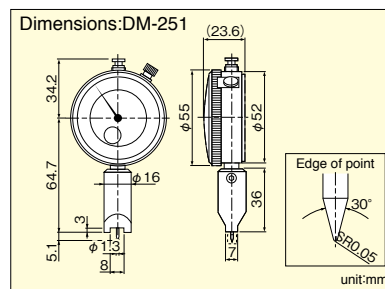
DM-252

Convex-concave surface can be measured.

Graduation 0.01mm
Measuring Range Concave 5mm
Convex 4mm



V-Grooved depth measurement of Print circuit board by using DM-251.



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-251	0.01	5	±10	Special Needle	ZS-106	1.4 or less	165
DM-252	0.01	Concave 5mm Convex 4mm	±10	Needle	ZS-595	1.4 or less	195

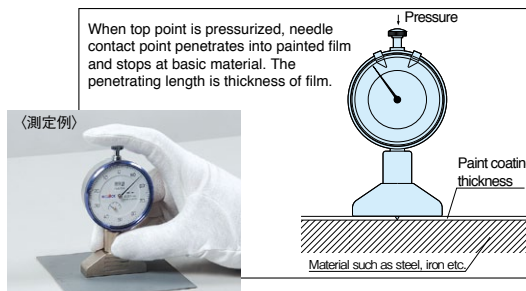
Coating Thickness Gauge

- Exclusive instrument to measure coating thickness of paint, coating materials and sealing materials.
- Handy type and operation is easy.

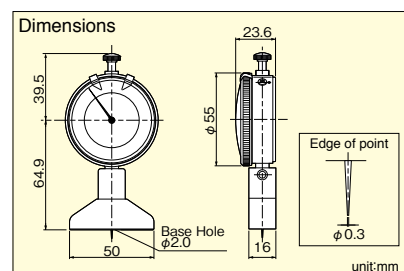
DM-264

Small-based handy type

Graduation 0.01mm
Measuring Range 5mm



Thickness measurement of painted film waterproof stuff (measuring by pressurization)



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-264	0.01	5	±10	Needle	ZS-518	1.4 or less	230

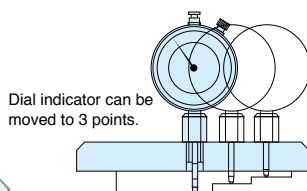
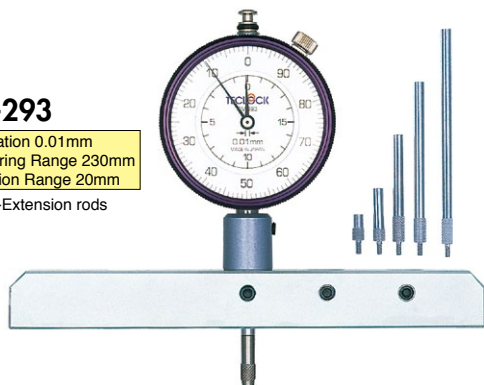
Gauge Slide type

- Steps measurement can be easily made by moving the gauge to 3 mounting holes.

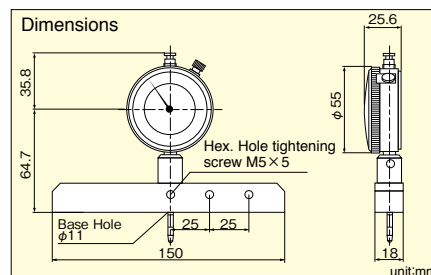
DM-293

Graduation 0.01mm
Measuring Range 230mm
Indication Range 20mm

With 5-Extension rods



Dial indicator can be moved to 3 points.



Specifications

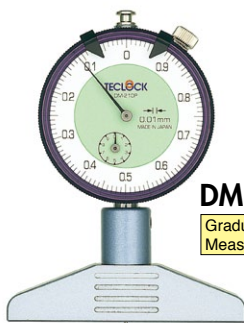
※Measuring Range : () value is a Range by using 5pcs extension rods.

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-293	0.01	20(230)	±15	φ3.2 Ball	ZS-034	2.5 or less	510



P Series (0.1mm type)

- This is direct reading specification of which graduation are 0.1-0.9mm.
- 1-10mm can be read by short hand and figure below can be read by pointer. It prevents misreading



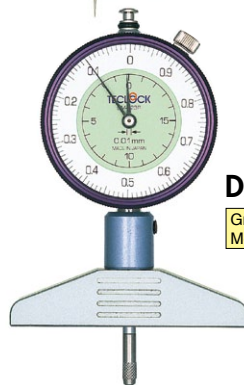
DM-210P

Graduation 0.01mm
Measuring Range 10mm



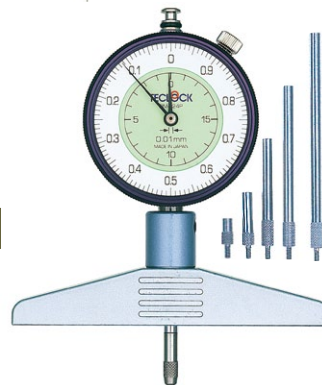
DM-250P

Graduation 0.01mm
Measuring Range 5mm



DM-223P

Graduation 0.01mm
Measuring Range 20mm

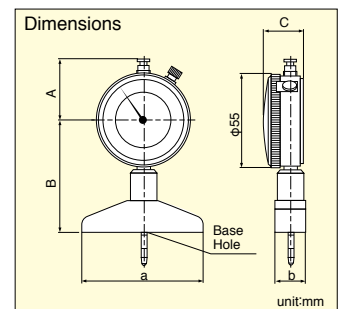


DM-224P

Graduation 0.01mm
Measuring Range 230mm
Indication Range 20mm
With 5-Extension rods



exp. 3.18mm of direct reading.



Dimension Table

Model	A	B	C	Base Form a×b	Base Hole Diameter
DM-210P	34.2	64.7	23.6	75×16	2.5
DM-250P	34.2	64.9	23.6	50×16	2.0
DM-223P	35.8	64.7	25.6	75×16	5.2
DM-224P	35.8	64.7	25.6	100×16	5.2

unit:mm

Specifications

※Measuring Range : () value is a Range by using 5pcs extension rods.

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Contact Point Form (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DM-210P	0.01	10	±12	Needle	ZS-523	1.4 or less	240
DM-250P	0.01	5	±10	Needle	ZS-518	1.4 or less	230
DM-223P	0.01	20	±15	φ3.2 Ball	ZS-034	2.2 or less	275
DM-224P	0.01	20 (230)	±15	φ3.2 Ball	ZS-034	2.5 or less	340



Conventional Digital Depth Gauge

- Digital Exclusive instrument to measure depth and steps of work piece.
- Low cost and conventional model of which preset function is deleted from standard digital depth gauges.

- Operation is equal to standard digital depth gauges, but it can not measure by installing extension rods. In case that measuring range is over 10mm, please use standard digital depth gauges.
- Printing out of measured data and statistics arithmetic operation can be implemented by connecting it to optional Digital mini-printer SD-763P shown on page 52.

0.01mm Conventional Digital Depth Gauge



DMD-210S2
Needle Contact Point
Resolution 0.01mm
Measuring Range 10mm



DMD-211S2
φ2 Flat Needle Contact Point
Resolution 0.01mm
Measuring Range 10mm



DMD-213S2
φ3.2 Steel Ball Contact Point
Resolution 0.01mm
Measuring Range 10mm



DMD-250S2
Needle Contact Point
Resolution 0.01mm
Measuring Range 5mm



DMD-252S2
φ3.2 Steel Ball Contact Point
Resolution 0.01mm
Measuring Range Concave 5mm
Convex 4mm

0.001mm Conventional Digital Depth Gauge



DMD-2100S2
Needle Contact Point
Resolution 0.001mm
Measuring Range 10mm



DMD-2110S2
φ2 Flat Needle Contact Point
Resolution 0.001mm
Measuring Range 10mm



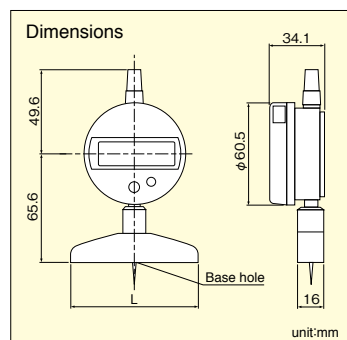
DMD-2130S2
φ3.2 Steel Ball Contact Point
Resolution 0.001mm
Measuring Range 10mm



DMD-2500S2
Needle Contact Point
Resolution 0.001mm
Measuring Range 5mm



DMD-2520S2
φ3.2 Steel Ball Contact Point
Resolution 0.001mm
Measuring Range Concave 5mm
Convex 4mm



Dimension Table

Model	Base Hole Diameter	L
DMD-210S2	φ2.5	75
DMD-211S2	φ2.5	75
DMD-213S2	φ5.2	75
DMD-250S2	φ2.0	50
DMD-252S2	φ8.0	50
DMD-2100S2	φ2.5	75
DMD-2110S2	φ2.5	75
DMD-2130S2	φ5.2	75
DMD-2500S2	φ2.0	50
DMD-2520S2	φ8.0	50

Specifications

Model	Resolution (mm)	Measuring Range (mm)	Accuracy* (μm)	Contact Point Form (or shape) (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DMD-210S2	0.01	10	±20	Needle	ZS-523	2.0 or less	280
DMD-211S2	0.01	10	±20	φ2 Flat	ZS-530	2.0 or less	270
DMD-213S2	0.01	10	±20	φ3.2 Steel Ball	ZS-034	2.0 or less	270
DMD-250S2	0.01	5	±20	Needle	ZS-518	2.0 or less	205
DMD-252S2	0.01	Concave 5, Convex 4	±20	Needle	ZS-595	2.0 or less	200
DMD-2100S2	0.001	10	±5	Needle	ZS-523	2.0 or less	300
DMD-2110S2	0.001	10	±5	φ2 Flat	ZS-530	2.0 or less	300
DMD-2130S2	0.001	10	±5	φ3.2 Steel Ball	ZS-034	2.0 or less	300
DMD-2500S2	0.001	5	±5	Needle	ZS-518	2.0 or less	235
DMD-2520S2	0.001	Concave 5, Convex 4	±5	Needle	ZS-595	2.0 or less	230

*The quantizing error function is not included.



Standard Digital Depth Gauge

- Digital Depth Gauge can be used for direct measuring depth and steps of work piece.
- Printing out of measured data and statistics arithmetic operation can be implemented by connecting it to optional Digital mini-printer SD-763P shown on page 52.
- Extension rods can be used by Preset function. (Expect DMD-210J, DMD-211J, DMD-240J, DMD-2100J, and DMD-240J).

0.01mm Standard Digital Depth Gauge



DMD-210J
Needle Contact Point

Resolution 0.01mm
Measuring Range 12mm



DMD-211J
φ2 Flat Needle Contact Point

Resolution 0.01mm
Measuring Range 12mm



DMD-213J
φ3.2 Steel Ball Contact Point

Resolution 0.01mm
Measuring Range 12mm



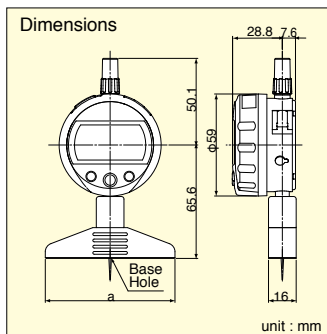
DMD-214J
φ3.2 Steel Ball Contact Point

Resolution 0.01mm
Measuring Range 220mm
Indication Range 12mm
With 5-Extension rods



DMD-215J
φ3.2 Steel Ball Contact Point

Resolution 0.01mm
Measuring Range 220mm
Indication Range 12mm
With 5-Extension rods



Dimension Table

Model	Base form a×b	Base hole diameter
DMD-210J	75×16	φ2.5
DMD-211J	75×16	φ2.5
DMD-213J	75×16	φ5.2
DMD-214J	75×16	φ5.2
DMD-215J	100×16	φ5.2

unit : mm



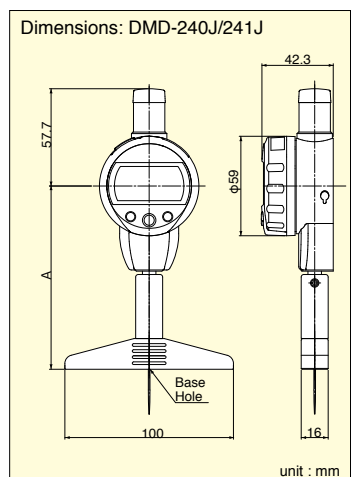
DMD-240J
Needle Contact Point

Resolution 0.01mm
Measuring Range 25.4mm



DMD-241J
φ3.2 Steel Ball Contact Point

Resolution 0.01mm
Measuring Range 25.4mm



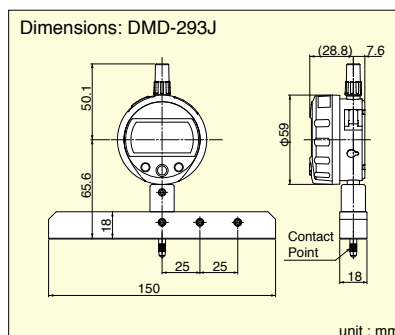
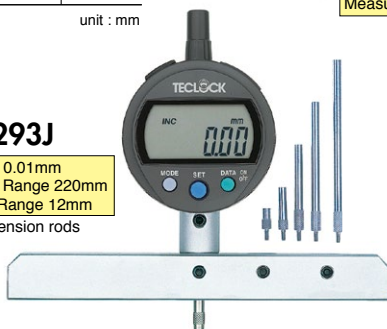
Dimension Table

Model	A
DMD-240J	108.7
DMD-241J	88.7

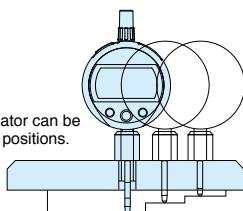
unit : mm

DMD-293J

Resolution 0.01mm
Measuring Range 220mm
Indication Range 12mm
With 5-Extension rods



Digital indicator can be moved to 3 positions.



Specifications

※Measuring Range : () value is a Range by using 5pcs extension rods.

Model	Resolution (mm)	Measuring Range (mm)	Accuracy* (μm)	Contact Point Form (or shape) (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DMD-210J	0.01	12	±20	Needle	ZS-523	1.0 or less	310
DMD-211J	0.01	12	±20	φ2 Flat	ZS-530	1.0 or less	310
DMD-213J	0.01	12	±20	φ3.2 Steel Ball	ZS-034	1.0 or less	310
DMD-214J	0.01	12(220)※	±20	φ3.2 Steel Ball	ZS-034	2.3 or less	335
DMD-215J	0.01	12(220)※	±20	φ3.2 Steel Ball	ZS-034	2.3 or less	375
DMD-240J	0.01	25.4	±20	Needle	ZS-113	1.6 or less	390
DMD-241J	0.01	25.4	±20	φ3.2 Steel Ball	ZS-600	1.6 or less	370
DMD-293J	0.01	12(220)※	±20	φ3.2 Steel Ball	ZS-034	2.3 or less	545

*The quantizing error function is not included.



Depth Gauge

0.001mm Standard Digital Depth Gauge



DMD-2100J
Needle Contact Point

Resolution 0.001mm
Measuring Range 12mm



DMD-2150J
φ3.2 Steel Ball Contact Point

Resolution 0.001mm
Measuring Range 220mm
Indication Range 12mm
With 5-Extension rods



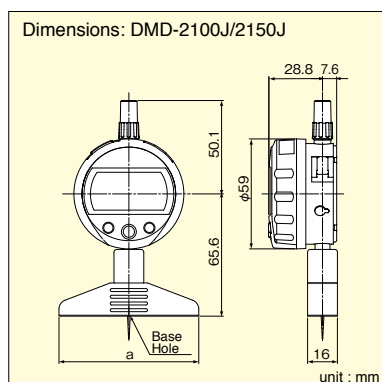
DMD-2400J
Needle contact point

Resolution 0.001mm
Measuring Range 25.4mm



DMD-2410J
φ3.2 Steel Ball Contact Point

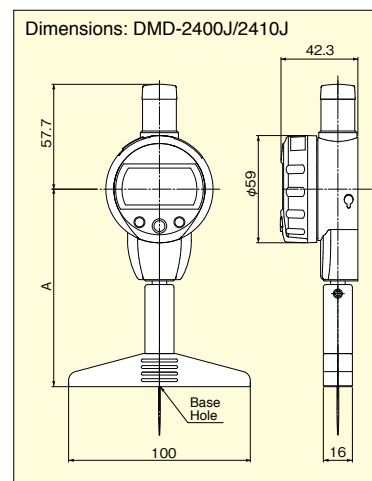
Resolution 0.001mm
Measuring Range 25.4mm



Dimension Table

Model	Base Foam a×b	Base Hole Diameter
DMD-2100J	75×16	φ2.5
DMD-2150J	100×16	φ5.2

unit : mm



Dimension Table

Model	A
DMD-2400J	108.7
DMD-2410J	88.7

unit : mm

Specifications

※Measuring Range : () value is a Range by using 5pcs extension rods.

Model	Resolution (mm)	Measuring Range (mm)	Accuracy* (μm)	Contact Point Form (or shape) (mm)	Standard Contact Point	Measuring Force (N)	Weight (g)
DMD-2100J	0.001	12	±5	Needle	ZS-523	1.0 or less	310
DMD-2150J	0.001	12(220)※	±5	φ3.2 Steel Ball	ZS-034	2.3 or less	375
DMD-2400J	0.001	25.4	±5	Needle	ZS-113	1.6 or less	390
DMD-2410J	0.001	25.4	±5	φ3.2 Steel Ball	ZS-600	1.6 or less	370

*The quantizing error function is not included.



Parts & Accessories

Contact Point

ZS-523		ZS-518		ZS-543		ZS-541	
Standard fitment DM-210 DM-210P DM-280 DMD-210J DMD-2100J DMD-210S2 DMD-2100S2		Standard fitment DM-250 DM-250P DM-264 DMD-250S2 DMD-2500S2		Standard fitment DM-220 DM-230		Standard fitment DM-221	
ZS-105		ZS-034		ZS-530		ZS-595	
Standard fitment DM-273		Standard fitment DM-213 DM-214 DM-223 DM-223P DM-224 DM-224P DM-233 DM-234 DM-283 DM-293 DMD-213J DMD-214J DMD-215J DMD-293J DMD-2150J DMD-213S2 DMD-2130S2		Standard fitment DM-211 DMD-211J DMD-211S2		Standard fitment DM-252 DMD-252J DMD-252S2 DMD-2520S2	
ZS-600		ZS-113					
Standard fitment DMD-241J DMD-2410J		Standard fitment DMD-240J DMD-2400J					

Extension Rods



ZS-663,664,665,666,670													
	<table> <tr> <th>Code No.</th><th>L</th></tr> <tr> <td>ZS-670</td><td>10</td></tr> <tr> <td>ZS-663</td><td>20</td></tr> <tr> <td>ZS-664</td><td>40</td></tr> <tr> <td>ZS-665</td><td>60</td></tr> <tr> <td>ZS-666</td><td>80</td></tr> </table>	Code No.	L	ZS-670	10	ZS-663	20	ZS-664	40	ZS-665	60	ZS-666	80
Code No.	L												
ZS-670	10												
ZS-663	20												
ZS-664	40												
ZS-665	60												
ZS-666	80												
Unit:mm													
Standard fitment	DM-214 DM-224 DM-224P DM-233 DM-234 DM-293 DMD-214J DMD-215J DMD-293J												

ZS-904

(5 types per set)

Depth Gauge by Contact Point List

Model	Base hole diameter	Standard contact point	Mountable contact point	Model	Base hole diameter	Standard contact point	Mountable contact point	Model	Base hole diameter	Standard contact point	Mountable contact point
DM-210	φ2.5	ZS-523	ZS-527 ZS-528 ZS-530	DM-213	φ5.2	ZS-034	ZS-527 ZS-528 ZS-530 ZS-523 ZS-594	DM-251	φ5.2	ZS-106	—
DM-210P				DM-214				DM-252	φ8.0	ZS-595	—
DMD-210S ₂				DM-223				DMD-252S ₂			
DMD-210J				DM-224				DMD-2520S ₂			
DMD-2100S ₂				DM-233				DM-273	φ5.2	ZS-105	—
DMD-2100J				DM-234				DM-280	φ3.0	ZS-523	ZS-527 ZS-528 ZS-530
DM-211	φ2.5	ZS-530	ZS-527 ZS-528 ZS-523	DM-223P							
DMD-211J				DM-224P				DM-283	φ8.0	ZS-034	ZS-527 ZS-528 ZS-530 ZS-523
DMD-211S ₂				DM-293							
DMD-2110S ₂				DMD-213S ₂							
				DMD-213J	φ2.0	ZS-518	—	DM-264	φ2.0	ZS-518	—
				DMD-2130S ₂				DMD-240J	φ2.5	ZS-113	—
				DMD-214J				DMD-2400J			
				DMD-215J				DMD-241J	φ5.2	ZS-600	—
				DMD-2150J				DMD-2410J			
				DMD-293J							
				DM-250							
				DM-250P							
				DMD-250S ₂							
				DMD-2500S ₂							

Dial Indicator

Dial Indicator is surely utilized at manufacturing sites where dimensional high accuracy is needed to be confirmed. The graduation (1- graduation) depends on usage and Teclock offers 6 kinds of graduations, namely 0.0005mm, 0.001mm, 0.005mm, 0.01mm, 0.05mm and 0.1mm. The strokes are available from 0.08mm (the shortest) up to 150mm. Dial Indicator is normally not used independent but its stem or lug back is fixed to a jig and holds work piece with the measuring stand and contact point, and displacement volume is read with short hand and pointer. The dial indicator is applied for direct measurement to measure actual dimension and comparative measurement for measuring displacement volume from a certain standard dimension.

0.001mm Dial Indicator

- Standard type dial indicators of graduation 0.001mm and bezel diameter 56mm.
- Durability is pursued by protecting mechanical parts like gears with shock absorbing mechanism (Teclock unique shock proof mechanism).
- Jeweled bearing is applied for improving durability.
- Stable repeatability accuracy is realized with lever enlargement mechanism built-in.
- Tolerance hand is provided as standard accessory for all models for positive tolerance setting.
- Lifting lever (Option) can be mounted . (Refer to page 25)
- Bezel clamp (Option) can be mounted (except for TM-1201PW).
- Measuring ability can be changed .
- In case that flat back is required, add suffix "F" to the end of model number (example =TM-1201F).



TM-1201
Popular type

Graduation 0.001mm
Measuring Range 1mm



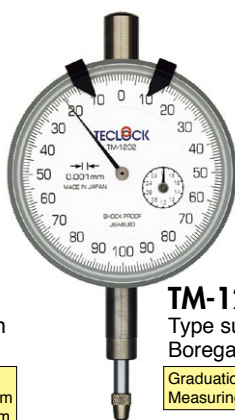
TM-1201PW
Oil-proof type

Graduation 0.001mm
Measuring Range 1mm



TM-1251
Wide graduation
width type

Graduation 0.001mm
Measuring Range 1mm
One Revolution 0.1mm



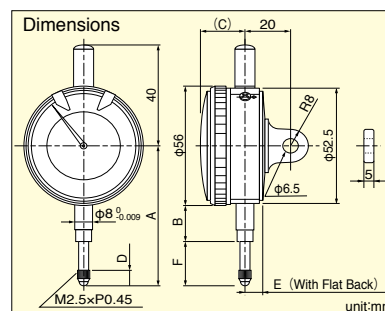
TM-1202
Type suitable to
Boregauge

Graduation 0.001mm
Measuring Range 2mm



TM-1205
5mm stroke type

Graduation 0.001mm
Measuring Range 5mm



Dimensions Table

Model	A	B	C	D	E	F
TM-1201	62	18	15	7.5	8	16
TM-1201PW	65.5 (18)	13.5	11	8.5 (19.5)		
TM-1251	62	18	15	7.5	8	16
TM-1202	62	19	15	7.5	8	16
TM-1205	62	19	15.5	7.5	8	16

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (Free Stroke) (mm)	Repeatability (μm)	Indication Error (μm)					Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1/2 Revolution	1 Revolution	2 Revolution	Total Range				
TM-1201	0.001	1 (3)	0.5	2.5	±3	±4	±4	±5	3	ZS-017	1.5 or less	170
TM-1201PW	0.001	1 (3)	0.5	2.5	±3	±4	±4	±5	3	ZS-028	1.5 or less	180
TM-1251	0.001	1 (3)	0.8	2.5	±3	±4	±4	±5	3	ZS-017	1.5 or less	170
TM-1202	0.001	2 (2)	0.5	4	±5	±6	±6	±7	3	ZS-017	1.5 or less	170
TM-1205	0.001	5 (-)	1	5	±6	±7	±8	±10	4	ZS-017	1.5 or less	170

*In case flat back is required, please add suffix "F" to the end of model number. (example=TM-1201F)

0.01mm Dial Indicator

- This is the most standard type dial indicator of graduation 0.01mm
- The model can be selected out of stainless stem, coaxial revolution pointer, oil discharge function and analog function depending on usage.
- These are standard series with high durability and high accuracy by pursuing parts accuracy.
- Lifting lever (Option) can be mounted (Refer to page 25).
- Bezel clamp (Option) can be mounted (except for TM-110PW / TM-110G).
- Measuring ability can be changed .
- In case that flat back is required, add suffix "F" to the end of model number (example =TM-110F).



TM-110
Standard type

Graduation 0.01mm
Measuring Range 10mm



TM-110R
Reversed dial
type

Graduation 0.01mm
Measuring Range 10mm



TM-110D
Coaxial revolution
pointers type

Graduation 0.01mm
Measuring Range 10mm



TM-110-4A
With oil ejection
holed bezel type

Graduation 0.01mm
Measuring Range 10mm



TM-110PW
Oil-Proof type

Graduation 0.01mm
Measuring Range 10mm



TM-110P
Direct reading
graduation type

Graduation 0.01mm
Measuring Range 10mm



TM-105
Type suitable to
Boregauge

Graduation 0.01mm
Measuring Range 5mm



TM-105W
Reversed type

Graduation 0.01mm
Measuring Range 5mm



TM-5106
Wide scale width type

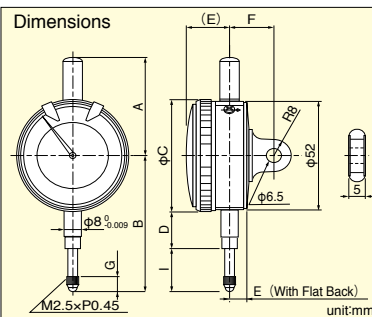
Graduation 0.01mm
Measuring Range 5mm



TM-5105

Graduation 0.005mm
Measuring Range 5mm

0.005mm Dial Indicators



Dimension Table

Model	A	B	C	D	E	F	G	H	I
TM-110	48	65	55	18	15.5	20	7.5	7.8	19.5
TM-110R	48	65	55	18	15.5	20	7.5	7.8	19.5
TM-110D	48	65	55	18	17.6	20	7.5	7.8	19.5
TM-110-4A	48	65	55	18	15.5	20	7.5	7.8	19.5
TM-110PW	44.5	68.5	56	(17.5)	14.5	20	11	8.3	23.0
TM-110P	48	65	55	18	15.5	20	7.5	7.8	19.5
TM-105	48	65	55	18	15.5	*	7.5	7.8	19.5
* TM-105W	48	65	55	18	15.5	20	7.5	7.8	19.5
TM-5106	48	65	55	19	15.5	20	7.5	7.8	19.5
TM-5105	48	65	55	19	15.5	20	7.5	7.8	19.5

*Indicator is supplied with Flat back.

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)					Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1/2 Revolution	1 Revolution	2 Revolution	Total Range				
TM-110	0.01	10	5	8	±9	±10	±15	±15	5	ZS-017	1.4 or less	110
TM-110R	0.01	10	5	8	±9	±10	±15	±15	5	ZS-017	1.4 or less	110
TM-110D	0.01	10	5	8	±9	±10	±15	±15	5	ZS-017	1.4 or less	115
TM-110-4A	0.01	10	5	8	±9	±10	±15	±15	5	ZS-017	1.4 or less	110
TM-110PW	0.01	10	5	8	±9	±10	±15	±15	5	ZS-028	1.4 or less	150
TM-110P	0.01	10	5	8	±9	±10	±15	±15	5	ZS-017	1.4 or less	110
TM-105	0.01	5	5	8	±9	±10	±12	±12	5	ZS-017	1.4 or less	110
TM-105W	0.01	5	5	8	±9	±10	±12	±12	5	ZS-017	1.4 or less	110
TM-5106	0.01	5	3	7	±8	±9	±10	±12	5	ZS-017	1.4 or less	145
TM-5105	0.005	5	3	7	±8	±9	±10	±12	5	ZS-017	1.4 or less	145

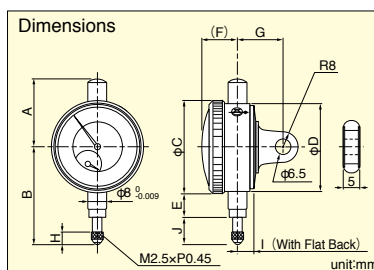
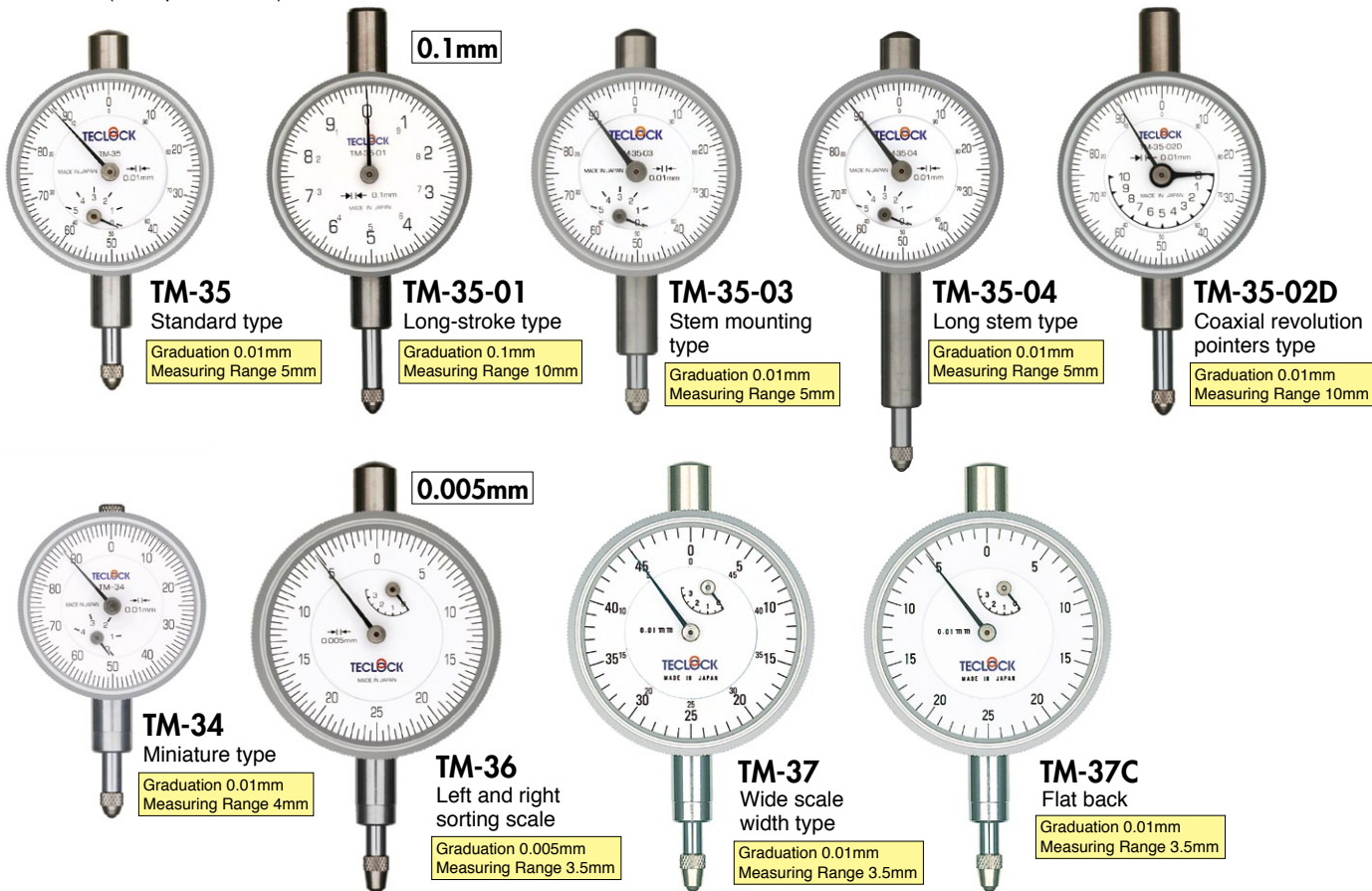
*In case flat back is required, please add suffix "F" to the end of model number. (example=TM-1201F)



Small Dial Indicator

- As bezel diameter is small (minimum diameter=36mm), these are suitable to measure at the narrow setting space of production lines and many measuring points by being mounted to the machine.
- Lifting lever (Option) can be mounted (except for TM-34).
- In case that flat back is required, add suffix "F" to the end of model number (example =TM-35f).

- Measuring range 3.5mm, 4mm, 5mm, and 10mm are available in spite of small size.
- Bezel clamp (Option) can be mounted.
- Measuring ability can be changed. (Refer to page 23)



Dimensions Table

Model	A	B	C	D	E	F	G	H	I	J
TM-35	27.4	41.3	39	36.5	10	14.5	19	5	6.2	11.8
TM-35-01	32.5	46	39	36.5	10	14.5	19	5	6.2	16.5
TM-35-03	27.4	46	39	36.5	15	14.5	19	5	6.2	11.5
TM-35-04	27.4	58	39	36.5	26	14.5	19	5	6.2	12.5
TM-35-02D	32.5	46	39	36.5	10	16.5	19	5	6.2	16.5
TM-34	20	39.5	35	32	10	13	19	5	6.5	12
TM-36	33.5	50	47	44	13	15.5	19.7	7.5	7	13.5
TM-37	33.5	50	47	44	13	15.5	19.7	7.5	7	13.5
* TM-37C	33.5	50	47	44	13	15.5	*	7.5	7	13.5

*Indicator is supplied with Flat back.

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)			Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1 Revolution	Total Range				
TM-35	0.01	5	5	9	±13	±15	6	ZS-014	1.3 or less	72
TM-35-01	0.1	10	—	—	—	±50	—	ZS-014	1.5 or less	72
TM-35-03	0.01	5	5	9	±13	±15	6	ZS-014	1.3 or less	72
TM-35-04	0.01	5	5	9	±13	±15	6	ZS-014	1.3 or less	75
TM-35-02D	0.01	10	5	9	±13	±18	7	ZS-014	1.6 or less	75
TM-34	0.01	4	5	8	±11	±15	6	ZS-014	1.0 or less	60
TM-36	0.005	3.5	5	8	±10	±12	5	ZS-017	1.2 or less	85
TM-37	0.01	3.5	5	8	±10	±12	6	ZS-017	1.2 or less	85
TM-37C	0.01	3.5	5	8	±10	±12	6	ZS-017	1.2 or less	85

*In case flat back is required, please add suffix "F" to the end of model number. (example=TM-1201f)



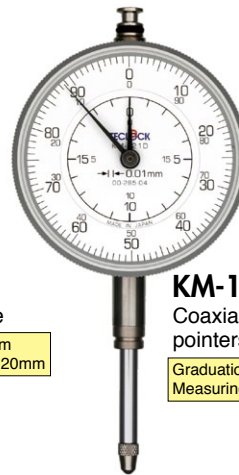
0.01mm Long Stroke Dial Indicator

- 20mm, 30mm long stroke dial indicators are available.
- Teclock unique shock proof mechanism is built-in to all models.
- Lifting lever (Option) can be mounted (except for KM-121PW).
- Bezel clamp (Option) can be mounted (except for KM-121PW).
- In case that flat back is required, add suffix "f" to the end of model number (example =KM-121f).



KM-121
Standard type

Graduation 0.01mm
Measuring Range 20mm



KM-121D
Coaxial revolution pointers type

Graduation 0.01mm
Measuring Range 20mm



KM-121PW
Oil-proof type

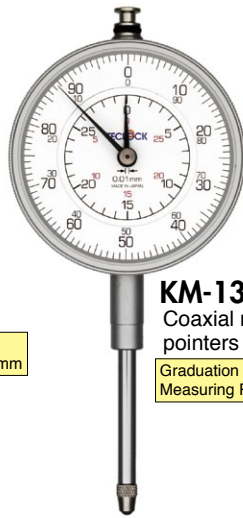
Graduation 0.01mm
Measuring Range 20mm

Measuring Range 30mm



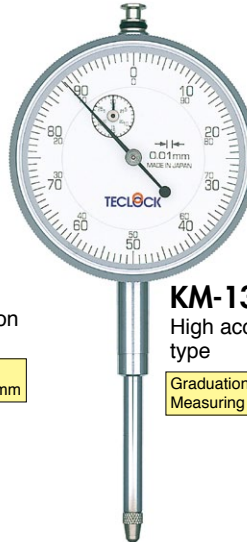
KM-131
Standard type

Graduation 0.01mm
Measuring Range 30mm



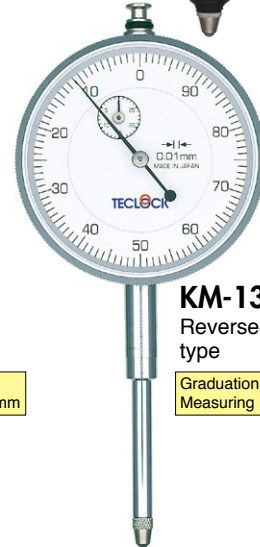
KM-132D
Coaxial revolution pointers type

Graduation 0.01mm
Measuring Range 30mm



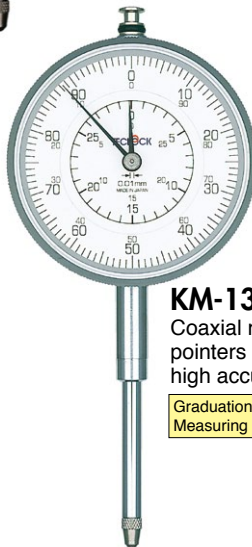
KM-130
High accurate type

Graduation 0.01mm
Measuring Range 30mm



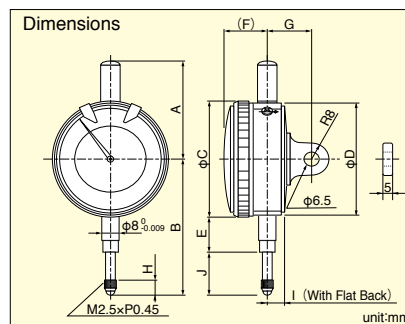
KM-130R
Reversed dial type

Graduation 0.01mm
Measuring Range 30mm



KM-130D
Coaxial revolution pointers type in the high accuracy

Graduation 0.01mm
Measuring Range 30mm



Dimensions Table

Model	A	B	C	D	E	F	G	H	I	J
KM-121	36	75	55	52	18	15.5	20	7.5	7.8	29.5
KM-121D	36	75	55	52	18	17.6	20	7.5	7.8	29.5
KM-121PW	55	89	56	52	(17.5)	14.5	20	11	8.3	(43.5)
KM-131	36	86	55	52	19	15.5	20	7.5	8	39.5
KM-132D	36	86	55	52	19	17.3	20	7.5	8	39.5
KM-130	38.5	92	59	54.5	22.7	17.5	22	7.5	9.6	39.8
KM-130R	38.5	92	59	54.5	22.7	17.5	22	7.5	9.6	39.8
KM-130D	38.5	92	59	54.5	22.7	19.5	22	7.5	9.6	39.8

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)			Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1 Revolution	Total Range				
KM-121	0.01	20	5	10	±15	±20	7	ZS-017	2.2 or less	110
KM-121D	0.01	20	5	10	±15	±20	7	ZS-017	2.2 or less	115
KM-121PW	0.01	20	5	10	±15	±20	7	ZS-028	2.2 or less	120
KM-131	0.01	30	5	14	±18	±35	8	ZS-017	2.5 or less	150
KM-132D	0.01	30	5	14	±18	±35	8	ZS-017	2.5 or less	155
KM-130	0.01	30	5	14	±18	±25	7	ZS-017	2.2 or less	150
KM-130R	0.01	30	5	14	±18	±25	7	ZS-017	2.2 or less	150
KM-130D	0.01	30	5	14	±18	±25	7	ZS-017	2.2 or less	155

*In case flat back is required, please add suffix "f" to the end of model number.



Long Stroke Dial Indicator

- 50mm, 100mm, 150mm long stroke dial indicators with a large graduation plates are available.
- Measuring up to 150mm is materialized with highest precision components of high durability and Teclock original and unique enlargement mechanism is built-in.

- Bezel clamp (Option) can be mounted (except for KM-05100 /KM-05150).
- Long stroke dial Indicator is widely used for construction, civil engineering industries etc.
- In case that flat back is required, add suffix "f" to the end of model number (example =KM-155f) (except for KM-05100 /KM-05150).



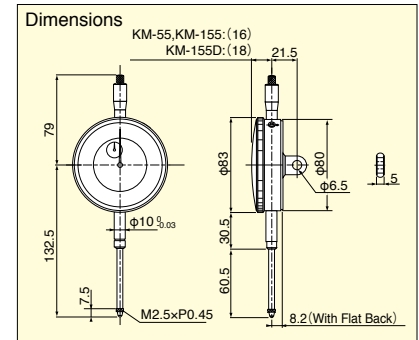
KM-55
Durability emphasis type
Graduation 0.05mm
Measuring Range 50mm



KM-155
Wide graduation width type
Graduation 0.01mm
Measuring Range 50mm



KM-155D
Coaxial revolution pointers type
Graduation 0.01mm
Measuring Range 50mm



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)			Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1 Revolution	Total Range				
KM-55	0.05	50	20	30	± 50	± 100	15	ZS-017	2.5 or less	290
KM-155	0.01	50	5	15	± 20	± 35	9	ZS-017	2.5 or less	290
KM-155D	0.01	50	5	15	± 20	± 35	9	ZS-017	2.5 or less	295

*In case flat back is required, please add suffix "f" to the end of model number.



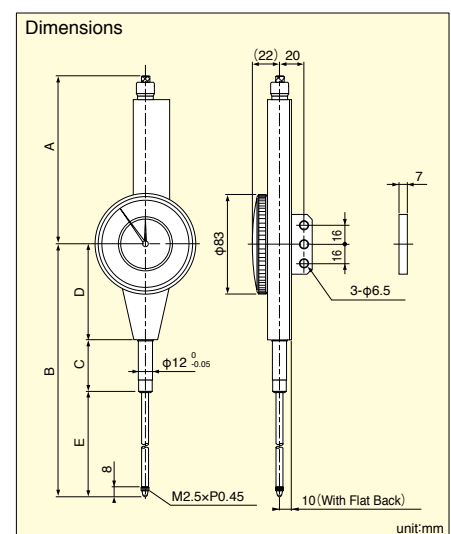
KM-05100
Coaxial revolution pointers type
Graduation 0.05mm
Measuring Range 100mm



KM-05150
Coaxial revolution pointers type
Graduation 0.05mm
Measuring Range 150mm



The longest mechanical type model: KM-05150



Dimensions Table

Model	A	B	C	D	E
KM-05100	140	235	44	80	111
KM-05150	190	335	55	120	160

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Total Range Indication Error (μm)	Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
KM-05100	0.05	100	30	± 100	15	ZS-018	2.5 or less	550
KM-05150	0.05	150	30	± 150	15	ZS-018	3.0 or less	680



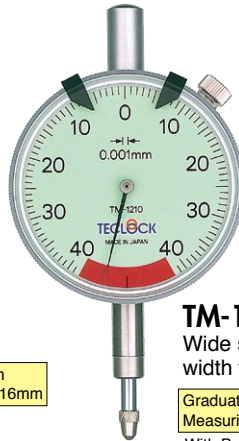
One Revolution Dial Indicator

- These are indicators that are effective for comparative measurement with 0.0005mm, 0.001mm, and 0.01mm.
- High durability is realized with Teclock original and unique enlargement mechanism is built-in.
- Limiter is mounted as standard.
- Measuring ranges are subdivided to 0.08mm, 0.16mm, 0.2mm and 1.0mm.
- Clump is attached to 0.001mm model.
- Lifting lever (Option) can be mounted.
- In case that flat back is required, add suffix "f" to the end of model number (example =TM-1200 f).



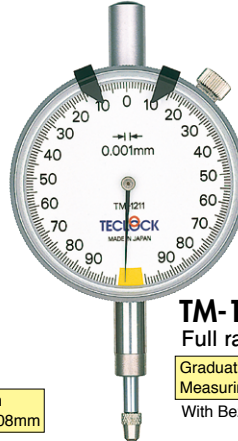
TM-1200
Standard type

Graduation 0.001mm
Measuring Range 0.16mm
With Bezel clamp



TM-1210
Wide scale width type

Graduation 0.001mm
Measuring Range 0.08mm
With Bezel clamp



TM-1211
Full range type

Graduation 0.001mm
Measuring Range 0.2mm
With Bezel clamp



TM-102
Graduation of 0.01mm type

Graduation 0.01mm
Measuring Range 1.0mm
Bezel clamp (Option)



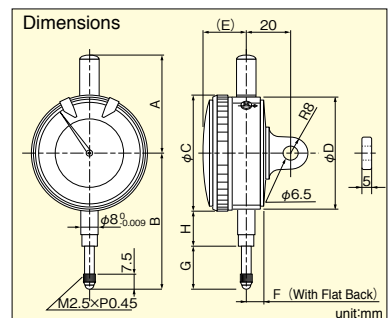
TM-98
Graduation of 0.1mm type

Graduation 0.1mm
Measuring Range 3.2mm
Bezel clamp (Option)



TM-5210
Minimum graduation type

Graduation 0.0005mm
Measuring Range 0.08mm



Specifications

Model	Graduation (mm)	Measuring Range (Free Stroke) (mm)	Repeatability (μm)	Indication Error (μm)			Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				Adjacent Error	1 Revolution	Total Range				
TM-1200	0.001	0.16 (3.5)	0.5	2.5	-	±5	3	ZS-017	1.5 or less	175
TM-1210	0.001	0.08 (3.5)	0.8	2.5	-	±3.5	3	ZS-017	1.5 or less	175
TM-1211	0.001	0.2 (3.5)	0.5	2.5	-	±5	3	ZS-017	1.5 or less	175
TM-102	0.01	1 (5)	5	7	-	±10	5	ZS-017	1.4 or less	150
TM-98	0.1	3.2 (6)	20	20	-	±40	20	ZS-017	1.4 or less	150
TM-5210	0.0005	0.08 (3.5)	0.8	2.5	-	±2.5	2.5	ZS-017	1.5 or less	175

*In case flat back is required, please add suffix "f" to the end of model number.

Dimensions Table

Model	A	B	C	D	E	F	G	H
TM-1200	44.5	62	56	52.5	15	8	16	18
TM-1210	44.5	62	56	52.5	15	8	16	18
TM-1211	44.5	62	56	52.5	15	8	16	18
TM-102	48	65	55	52	15.8	8	19	18.5
TM-98	48	65	55	52	15.8	7.8	19	18.5
TM-5210	44.5	62	56	52.5	15	8	16	18

unit:mm



Dial Indicator

0.1mm Dial Indicator

- These are 0.1mm graduation dial indicators.
- 3 types of 10mm, 20mm and 30mm are available depending on measuring ranges.
- Lifting lever (Option) can be mounted.
- This is used to measure approximate dimensional judgment for woodwork and leather goods etc. and also applicable for measurement of judge deviation dimension.
- Lifting lever (Option) can be mounted.
- Measuring ability can be changed. (Refer to page 23)
- In case that flat back is required, add suffix "f" to the end of model number (example =TM-91f).



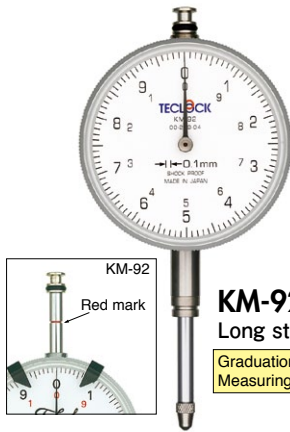
TM-91
Standard type

Graduation 0.1mm
Measuring Range 10mm



TM-91R
Reversed dial type

Graduation 0.1mm
Measuring Range 10mm



KM-92
Long stroke type

Graduation 0.1mm
Measuring Range 20mm



KM-93
Long stroke type

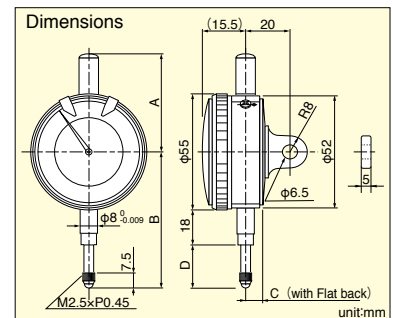
Graduation 0.1mm
Measuring Range 30mm



TM-35-01
Small type

Graduation 0.1mm
Measuring Range 10mm

(See page 20)



Dimensions Table

Model	A	B	C	D
TM-91	48	65	7.8	19.5
TM-91R	48	65	7.8	19.5
KM-92	36	75	7.8	29.5
KM-93	36	85	7.8	39.5

unit:mm

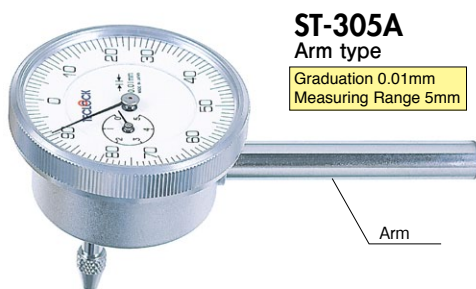
Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)		Hysteresis (μm)	Standard Contact Point	Measuring Force (N)	Weight (g)
				1 Revolution	Total Range				
TM-91	0.1	10	35	-	±50	-	ZS-017	1.4 or less	110
TM-91R	0.1	10	35	-	±50	-	ZS-017	1.4 or less	110
KM-92	0.1	20	35	±50	±60	-	ZS-017	2.2 or less	110
KM-93	0.1	30	35	±50	±70	-	ZS-017	2.5 or less	120

*In case flat back is required, please add suffix "f" to the end of model number.

Back Plunger Dial Indicator

- These are different from general indicators, of which gradation plate can be set in parallel to measuring face. It is suitable for leveling smooth surface and reading from the front of measuring point.



ST-305A
Arm type

Graduation 0.01mm
Measuring Range 5mm

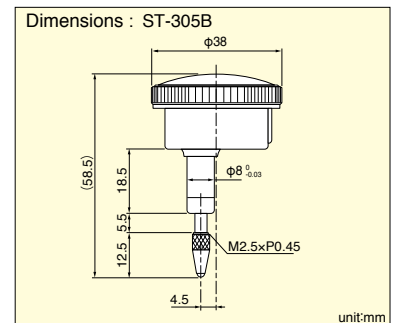
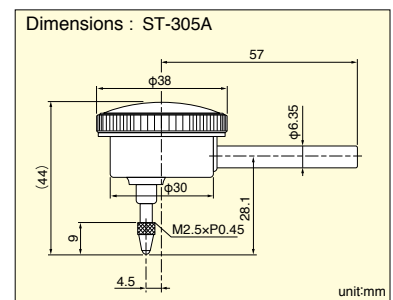


ST-305B
Stem type

Graduation 0.01mm
Measuring Range 5mm



Displacement of can be read from above.



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Repeatability (μm)	Indication Error (μm)					Hysteresis (μm)	Measuring Force (N)	Weight (g)
				Adjacent Error	1/2 Revolution	1 Revolution	2 Revolution	Total Range			
ST-305A	0.01	5	5	10	±12	±15	±20	±20	6	1.4 or less	80
ST-305B	0.01	5	5	10	±12	±15	±20	±20	6	1.4 or less	80



Table for low measuring forced dial indicator (Build to order)

Model	Start Measuring Force (N)	Stop Measuring Force (N)	Standard Measuring Force (N)
TM-1201	0.8	1.1	1.5
TM-1202	0.8	1.1	1.5
TM-1205	0.6	0.8	1.5
TM-5105	0.4	0.9	1.4
TM-110	0.2	0.4	1.4

Model	Start Measuring Force(N)	Stop Measuring Force(N)	Standard Measuring Force (N)
TM-34	0.15	0.3	1.0
TM-35	0.15	0.2	1.3
TM-36	0.4	0.7	1.2
TM-37	0.4	0.7	1.2
KM-92	0.18	0.35	2.2

Model	Start Measuring Force(N)	Stop Measuring Force(N)	Standard Measuring Force (N)
KM-121	0.3	0.5	2.2
KM-130	0.4	0.6	2.2
KM-155	0.7	1.2	2.5
KM-131	0.2	0.5	2.5

(Note) You can not use in the reverse posture.

Lifting Lever Set ZY Series

Spindle can be moved up and down by installing lift lever. It is convenient to use dial indicator by installing it to a stand.



With Lifting Lever
TM-110

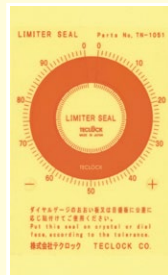


1. Moving lift lever down,
2. Spindle gets up
3. Pointer rotates in clockwise direction
4. Short hand rotates in counter clockwise direction.

Code No.	Applicable Models
ZY-900	TM-91, TM-110, TM-110P, TM-110D, TM-110-4A, TM-110G, DM-210, DM-210P, DM-211, DM-213, DM-214, DM-280, DM-283, TM-98, TM-91R, TM-110R
ZY-901	TM-35, TM-35-03, TM-35-04
ZY-902	TM-102, TM-5210, TM-105, TM-105W, TM-5105, TM-5106, TM-5210, TM-1200, TM-1201, TM-1202, TM-1205, TM-1251, TM-1210, TM-1211, DM-250, DM-250P, DM-251
ZY-922	KM-130, KM-130D, KM-130R
ZY-904	KM-121, KM-121D, KM-131, KM-132D, KM-92, KM-93, DM-220, DM-221, DM-223, DM-223P, DM-224, DM-224P, DM-230, DM-233, DM-234
ZY-905	TM-36, TM-37, TM-37C
ZY-913	TM-35-01, TM-35-02D
ZY-918	PC-440J, PC-465J, DMD-210J, DMD-211J, DMD-213J, DMD-214J, DMD-215J, DMD-293J PC-480S2, PC-485S2, DMD-210S2, DMD-211S2, DMD-213S2, DMD-250S2, DMD-252S2

Limiter Seal

Seal is for judging tolerance of dial indicator. Putting seal to cover plate of dial indicator becomes mark to judge tolerance.



TN-1051 Red



TN-1052 Blue



TN-1053 Green

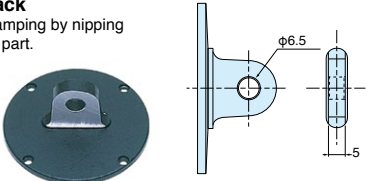
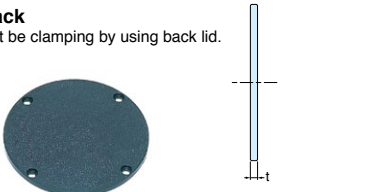
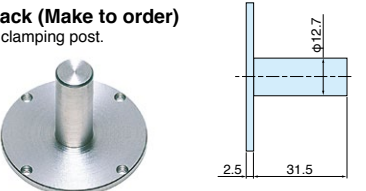
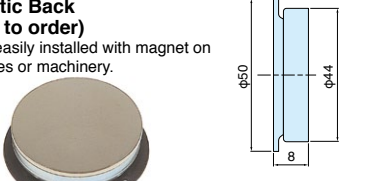


Dial Indicator used.
For outer frame diameter
φ55-φ59.
It can be used for TM-110 /
TM-1201



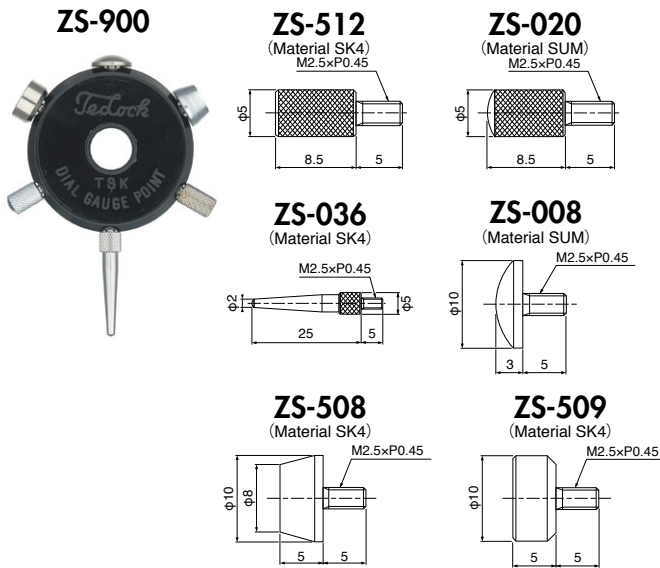
Parts & Accessories

Back

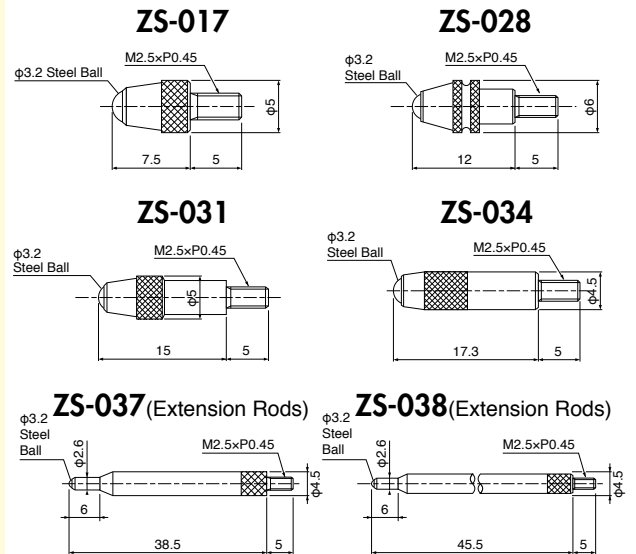
Backs	Code No.	Applicable Models
Lug Back Bezel clamping by nipping lug back part.  Small type have 2-holes. unit : mm	ZL-010 ZL-021 ZL-024 ZL-007 ZL-012 ZL-013 ZL-017	TM-1200, TM-1201, TM-1201PW, TM-1202, TM-1251, TM-102, TM-98, TM-5210, TM-110, TM-110R, TM-110D, TM-110-4A, TM-110PW, TM-110G, TM-110P, TM-105, TM-105W, TM-5105, TM-5106, TM-91, TM-91R, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-1210, TM-1211 TM-34 TM-35, TM-35-01, TM-35-02D, TM-35-03, TM-35-04 TM-36, TM-37, TM-37C TM-1205 KM-130, KM-130D, KM-130R KM-55, KM-155, KM-155D
Flat Back It can not be clamping by using back lid.  Small type have 2-holes. unit : mm	ZL-066 (t=2.3mm) (Plastic) ZL-067 (t=2mm) (Alumi) ZL-060 (t=1.5mm) ZL-062 (t=1.5mm) ZL-063 (t=1.5mm) ZL-073 (t=2mm) ZL-076 (t=2mm) ZL-072 (t=2mm)	TM-110, TM-110R, TM-110G, TM-110P, TM-105, TM-105W, TM-5105, TM-5106, TM-102, TM-91, TM-91R, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-98, TM-110D, TM-110-4A TM-1200, TM-1201, TM-1201PW, TM-1202, TM-5210, TM-1210, TM-1211, TM-1251, TM-110PW TM-34 TM-35, TM-35-01, TM-35-02D, TM-35-03, TM-35-04 TM-36, TM-37, TM-37C TM-1205 KM-130, KM-130D, KM-130R KM-55, KM-155, KM-155D
Post Back (Make to order) Used by clamping post.  Small type have 2-holes. unit : mm	ZL-120 ZL-121 ZL-122 ZL-123 ZL-124	TM-1200, TM-1201, TM-1201PW, TM-1202, TM-1251, TM-102, TM-5210, TM-110, TM-110R, TM-110D, TM-110-4A, TM-110PW, TM-110G, TM-105, TM-105W, TM-5105, TM-5106, TM-91, TM-91R, TM-98, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-1210, TM-1211 TM-35, TM-35-01, TM-35-02D, TM-35-03, TM-35-04 TM-36, TM-37, TM-37C KM-130, KM-130D, KM-130R KM-55, KM-155, KM-155D
Screw Post Back (Make to order) Used with screw as guide and clamping this with screw.  Small type have 2-holes. unit : mm	ZL-130 ZL-131 ZL-132 ZL-133 ZL-134	TM-1200, TM-1201, TM-1201PW, TM-1202, TM-1251, TM-102, TM-5210, TM-110, TM-110R, TM-110D, TM-110-4A, TM-110PW, TM-110G, TM-110P, TM-105, TM-105W, TM-5105, TM-5106, TM-91, TM-91R, TM-98, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-1210, TM-1211 TM-35, TM-35-01, TM-35-02D, TM-35-03, TM-35-04 TM-36, TM-37, TM-37C KM-130, KM-130D, KM-130R KM-55, KM-155, KM-155D
Adjustable Bracket Back (Make to order) Can be slide with gutter as guide. Clamped by screw.  Small type have 2-holes. unit : mm	ZL-140 ZL-142 ZL-141 ZL-143	TM-1200, TM-1201, TM-1201PW, TM-1202, TM-1251, TM-102, TM-5210, TM-110, TM-110R, TM-110D, TM-110-4A, TM-110PW, TM-110G, TM-105, TM-110P, TM-105W, TM-5105, TM-5106, TM-91, TM-91R, TM-98, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-1210, TM-1211 TM-35, TM-35-01, TM-35-02D, TM-35-03, TM-35-04 TM-36, TM-37, TM-37C KM-55, KM-155, KM-155D
Magnetic Back (Make to order) Can be easily installed with magnet on iron Plates or machinery.  Small type have 2-holes. unit : mm	ZL-900	TM-1200, TM-1201, TM-1201PW, TM-1202, TM-1251, TM-102, TM-5210, TM-110, TM-110R, TM-110D, TM-110-4A, TM-110PW, TM-110G, TM-105, TM-110P, TM-105W, TM-5105, TM-5106, TM-91, TM-91R, TM-98, KM-92, KM-93, KM-121, KM-121D, KM-121PW, KM-131, KM-132D, TM-1210, TM-1211



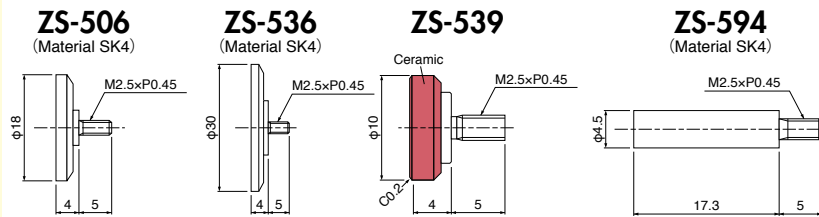
Contact Point Set



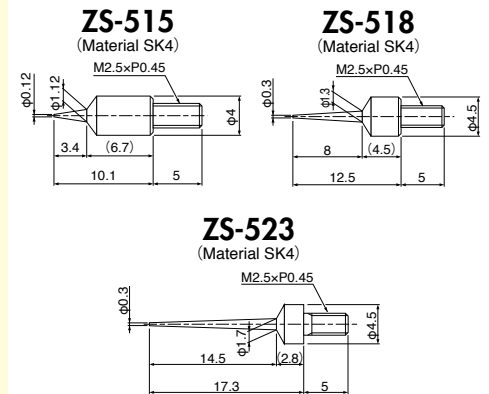
Steel Ball Contact Point



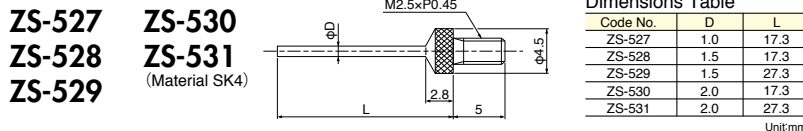
Flat Contact Point



Needle Contact Point



Flat Needle Contact Point



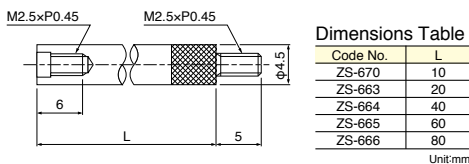
Dimensions Table

Code No.	D	L
ZS-527	1.0	17.3
ZS-528	1.5	17.3
ZS-529	1.5	27.3
ZS-530	2.0	17.3
ZS-531	2.0	27.3

Unit:mm

Extension Rods

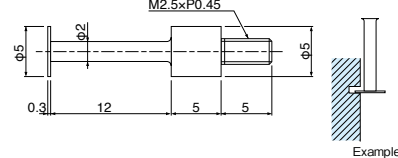
ZS-663·664·665·666·670
(Material SUM)



Unit:mm

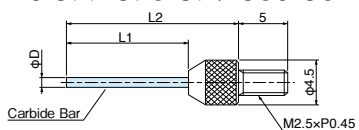
T-shape Contact Point

ZS-526
(Material SK4)



Carbide Flat Needle Contact Point

ZS-577·578·579·580·581·582·583



Dimensions Table

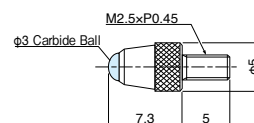
Code No.	D	L1	L2
ZS-577	0.5	12	18.3
ZS-578	0.8	12	18.3
ZS-579	1.0	12	18.3

Code No.	D	L1	L2
ZS-580	1.5	12	18.3
ZS-581	1.5	22	28.3
ZS-582	2.0	12	18.3
ZS-583	2.0	22	28.3

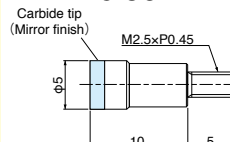
Unit:mm

Carbide Contact Point

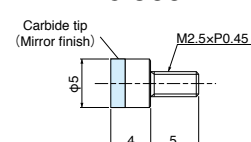
ZS-117



ZS-532



ZS-533



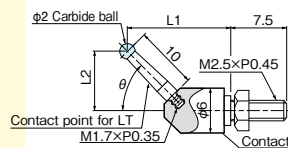


Dial Indicator

Special Contact Point

ZS-907·908·909

(Offset Contact Point with ZS-713)



Dimensions Table

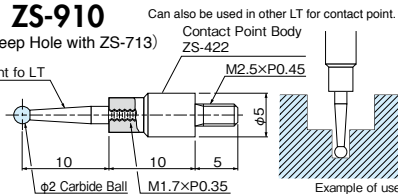
Code No.	Contact point body	θ	L1	L2
ZS-907	ZS-419	30°	17.1	7
ZS-908	ZS-420	45°	15.1	9.1
ZS-909	ZS-421	60°	12.3	10.7

Can also be used in other LT for contact point.

ZS-910

(for Deep Hole with ZS-713)

Contact point to LT



Can also be used in other LT for contact point.

Roller Point

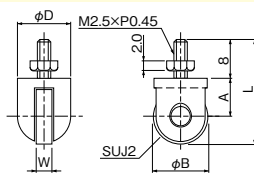
ZS-802·803·804

(Material SUJ2)

Dimensions Table

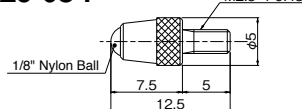
Code No.	A	B	D	L	W
ZS-802	5.5	6	6	16.5	2.6
ZS-803	8	11	11	21.5	4
ZS-804	13.5	22	14	32.5	7

unit:mm



Nylon Ball Point

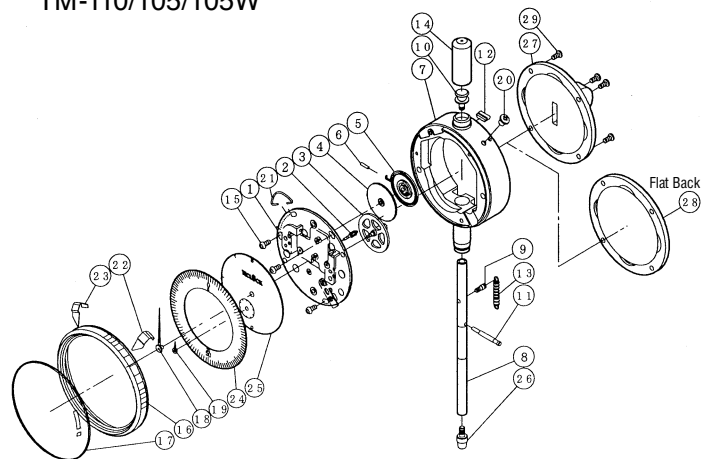
ZS-054



Parts List

0.01mm Dial Indicator

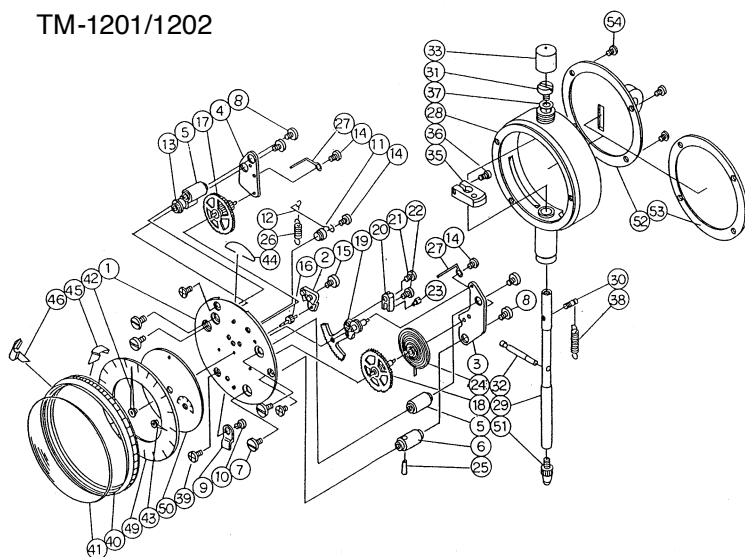
TM-110/105/105W



Key No.	Model No. Product No.	TM-110 00-465-04	TM-105 00-461-04	TM-105W 00-463-03
	Part Name			
1	Bottom Plate Assy		DG-110501S	
2	Center Pinion		DG-110009S	
3	#1 Gear Assy		DG-110511S	
4	#2 Gear Assy		DG-110514P	
5	Hair Spring		DG-110516	
6	Hair Spring Pin		DG-921018	
7	Case		DG-110541S	
8	Spindle	DG-110046S	DG-105046S	
9	Stop Screw		DG-110047	
10	Top Point		DG-110048S	
11	Slide Pin		DG-110049S	
12	Shock Pillow		DG-110056S	
13	Spring		DG-110067	
14	Cap		ZY-006	
15	Bottom Plate Screw		001523	
16	Bezel	DG-110081S	DG-121081S	
17	Dial Cover	DG-110088		
18	Pointer		DG-110584	
19	Counter Hand		DG-110586	
20	#0 Screw		021033	
21	Bezel Spring		DG-110090S	
22	Tolerance Hand R		DG-110092	
23	Tolerance Hand L		DG-110093	
24	Dial Plate	T-5101	T-62	T-5101
25	Counter Hand Dial Plate	T-5262	T-5271	T-5269
26	Contact Point		ZS-017	
27	Lug Back	ZL-010		ZL-010
28	Flat Back		ZL-066	
29	#0 Screw		001328	

0.001mm Dial Indicator

TM-1201/1202



Key No.	Part name	TM-1201	TM1202	Key No.	Part name	TM-1201	TM1202
1	Bottom Plate			28	Case		DG-1201641
2	Center Bearing			29	Spindle		DG-1201046
3	#1 Upper Plate			30	Stop Screw		DG-1201047
4	#2 Upper Plate			31	Top Screw		DG-36048
5	#1 Post			32	Slide Pin		DG-1201049
6	#2 Post			33	Cap		ZY-012
7	Upper Plate Screw A			35	Contacting Point Assy.		DG-1201554
8	Upper Plate Screw B			36	Contacting Point Assy.		DG-1201056
9	Bezel Clamp			37	Top Washer		DG-1201058
10	Bezel Clamp Screw			38	Spring		DG-1201067
11	Lever Statto			39	Base Plate Screw		001314
12	Spring Lever			40	Bezel		DG-1201081
13	#3 Post			41	Dial Cover		DG-1201088
14	Spring Lever Screw			42	Pointer		DG-1201584
15	#0 Screw			43	Counter Hand		DG-1201586
16	Center Pinion	DG-1201009	DG-1202009	44	Bezel Spring		DG-110090
17	#1 Gear Assy.	DG-1201511	DG-1202511	45	Tolerance Hand R		DG-110092
18	#2 Gear Assy.	DG-1201514		46	Tolerance Hand L		DG-110093
19	Sector Gear Assy.	DG-1201323		49	Dial Plate		T-5304B
20	Bracket	DG-1201331		50	Counter Hand Dial Plate	T-5004B	T-5005B
21	Bracket Screw A	DG-1201032		51	Contact Point		ZS-017
22	Bracket Screw B	DG-1201033		52	Lug Back		ZL-010
23	Cam	DG-1201034		54	Lug Back Screw		001314
24	Hair Spring	DG-121516					
25	Hair Spring Pin	DG-131018					
26	Spring B	DG-1201037					
27	Stopper	DG-1201038					

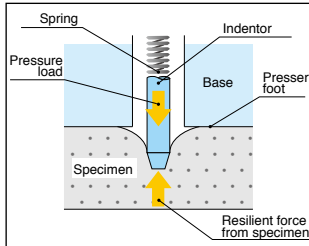
Durometer & IRHD Hardness Tester

Durometers show the degree of hardness by value whether a non-rigid material like rubber is soft or hard (hardness gauge for rubber or plastic). Recently, JIS standard and ISO standard have been drastically revised and details of hardness tester of rubber and method of measuring hardness are changed.

As an all embracing manufacturer of non-rigid material hardness tester, Teclock proposes lots of measuring methods of measuring hardness of not only rubber and plastic but many non-rigid materials and elastic materials.

Model Selection of Durometer

As to measured value by durometer (rubber and plastic hardness tester), when the base of durometer and work piece are



cohered each other, the indentor changes shape of work piece by pressurized force caused by spring of durometer and work piece makes force against this force. Force amount of indentor is indicated as hardness when this pressurized force and repulsive force are equivalent.

If repulsive force is weak, it shows low value (soft), on the contrary, if repulsive force is strong, it shows high value (hard). There are various type of durometers of which force of springs and shape of indentors are different. The reason why there are various kinds of durometers, it is for the purpose of showing degree of hardness with higher sensitivity against difference of material characteristics and shape of surface which work pieces have. Select a suitable product referring to the figure in the right.

FO GS-744G	Soft material	•Urethane foam •Shock absorb material for car sheet •Sponge for dish washer •Konjac
OO GS-754G		•Ultra-soft rubber •Foam rubber •OA equipment roll •Chewing gum
E2 GS-743G		•Very soft rubber •Processed cheese •Cloth scroll •Chine clay •Sealant
C GS-701N E GS-721N		•Very soft rubber •Eraser •Film roll •Spinning roll •Foam rubber roll
O GS-753G		•Very soft rubber •Spinning roll •Leather •Cardboard •Polystyrene foam
A GS-719N GS-709N GS-706N	Hard material	•General rubber elastomer •Rubber roll •Tire •Rubber hose •Soft plastic
B GS-750G		•Medium-hard rubber •Unglazed China clay •wood
DO GS-752G		•Medium-hard rubber •Flooring and building •Car handle
C GS-751G GS-703N		•Hard rubber •Golf ball •Brake rubber
D GS-720N GS-702N		•Hard rubber •Plastic •Ebonite



As to measuring hardness by pushing by hand, durometer to work piece form the top and read value by making pressed surface adhere to durometer.



In order to solve individual difference of measured value, it is clearly mentioned in the standard to measure hardness by mounting durometer to stand.

Measuring hardness with Durometer

1. In case of measuring by pushing by hand, putting pressurized surface of durometer held by hand from the top vertically with a certain speed to the flat face of work piece which is put on the flat face. Then, after adhering it, regard the value measured within the passed time prescribed by standard as "hardness".
2. In case of measuring hardness by mounting durometer to stand, measuring speed (not more than 3.2mm/sec.), pressurized load (type A, E is 1kgf, type D is 5kgf) and pressurized surface diameter ($\phi 18\text{mm}$) of type A / D durometers including tolerance are standardized.
3. Measuring point of test piece is to be inside from its edge by 12mm or more and clearance is to be 6mm and more. Thickness is normally 6mm and more, and 10mm and more for type E.
4. Test environment : Temperature is $23^{\circ}\text{C} \pm 2$, humidity is $50 \pm 5\%$ and median or average is applied for measured value. If 50 show in type A case, it is described [A50].

These are ruled for each standard.



Analog

New JIS compliance

Digital

ISO compliance

Compliance with JIS K 6253 standard for Hardness test of vulcanized or thermoplastic rubber

This is Durometer to comply with JIS K 6253 (new JIS) standard established in 1993 for the purpose of conforming to ISO (International Standard Organization). Durometers consist of 3 types namely, Type A for medium hardness, Type D for high hardness and Type E for low hardness. Type A tends to indicate higher value by 1~2 points compared with former Type A durometers. Type D is suitable for hard rubber having more than 90 hardness measured by type A durometer and Type E is suitable for soft rubber of which hardness is 20 and below measured by Type A durometers.

Standard Type

**GS-719N**Type A Durometer
General rubber**GSD-719K**Type A Durometer
Digital type
With peak detection

Digital Durometer with Peak Hold Function

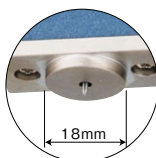
This is the model for which peak hold (Maximum value is held) function is mounted.

This is effective to measure hardness of Elastomer of which maximum value is unreadable due to relaxation phenomenon. Minimum read value is 0.5 and it is a half of analog type.

Measured data can be treated as statistics by connecting with optional printer SD-763P.

Pressurized Face $\phi 18\text{mm}$ Durometer mounted to Stand

Pressurized face diameter of type A and type D durometer mounted to a stand is defined 18mm by JIS standard and ISO standard. $\phi 18\text{mm}$ type A (GS-719R) and type D (GS-720R) can be used as they are for measuring by pushing by hand.

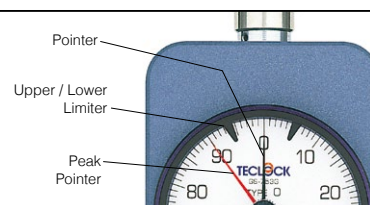
**GS-719R**Type A Durometer
Stand mounting compatible type
Peak pointer type**GSD-719K-R**Type A Durometer
Digital type
Stand mounting compatible type
Peak pointer type

Specifications

Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
GS-719N	Type A	General rubber (Medium hardness)	JIS K 6253	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	200
GS-719G	Type A (Peak Pointer Type)	General rubber (Medium hardness)		550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	208
GS-719R	Type A $\phi 18\text{mm}$ / stand combined	General rubber (Medium hardness)		550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	213
GS-720N	Type D	Hard rubber (High hardness)	ISO 868	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	200
GS-720G	Type D (Peak Pointer Type)	Hard rubber (High hardness)	ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	208
GS-720R	Type D $\phi 18\text{mm}$ / stand combined	Hard rubber (High hardness)		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	213
GS-721N	Type E (AO)	(High hardness) Soft rubber	JIS K 6253 ISO 7619 ASTM D 2240	550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	200
GS-721G	Type E (Peak Pointer Type)	(High hardness) Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	208
GS-719P	Type A (Pocket Type)	General rubber (Medium hardness)	JIS K 6253	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	100
GSD-719K	Type A	General rubber, soft plastic	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	313
GSD-720K	Type D	Hard rubber, Plastic		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	313
GSD-721K	Type E (AO)	Very soft rubber	JIS K 6253, ISO 7619 ASTM D 2240	550-8050mN (56.1-821.1gf)	Hemisphere of SR2.50	2.50	313
GSD-719K-R	Type A $\phi 18\text{mm}$ / Stand combined	General rubber (Medium hardness)	JIS K 6253, ISO 7619 ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of $\phi 0.79$ with 35° angle	2.50	320
GSD-720K-R	Type D $\phi 18\text{mm}$ / Stand combined	Hard rubber (High hardness)		0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	2.50	320

Peak Pointer Type

Some of Rubbers, Elastomer' elastic body is not easily read the maximum value after firm contacting with a presser foot of durometer, due to the stress relaxation. The pointer indicates the descendent value but the peak pointer is holding the maximum measured value. The peak pointer type can easily read the maximum value efficiently. In case the pointer cannot be read directly due to some obstacles although the measuring can be done, the measured value can be confirmed from peak pointer after measuring. The upper / lower limiters equipped will be effectively used in tolerance judgment.





Deep Hole / Long Leg Type

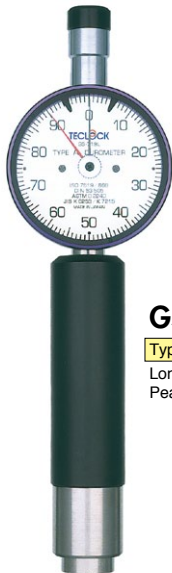
Analog

Digital

In some cases, such as the measurement surface of uneven or with a narrow flat area and the bottom of deep hollow, it may be impossible to achieve the proper results because of the difficult contact of the presser foot. The Deep Hole (H) type and the Long Leg (L) type make such measurements possible with a small or long presser foot. Both are supplied with Peak Pointer and the upper/lower limiters. The Long Leg type meets also to DIN 53505 standard.

**GS-720H**

Type D Durometer

Deep hole type
Peak pointer type**GS-719L**

Type A Durometer

Long leg type
Peak pointer type**GSD-719K-H**

Type A Durometer

Digital type
Deep hole type
With peak detection**GSD-719K-L**

Type A Durometer

Digital type
Long leg type
With peak detection

Specifications

	Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Presser Foot Diameter (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-719H	Type A	General rubber / Deep hole type (narrow hole)	JIS K 6253, ISO 7619 ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 12	2.50	140
	GS-719L	Type A	General rubber / Long leg type (thick hole)	JIS K 6253, ISO 7619 ASTM D 2240, DIN 53 505	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 18	2.50	360
	GS-720H	Type D	Hard rubber / Deep hole type (narrow hole)	JIS K 6253, ISO 7619 ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 12	2.50	140
	GS-720L	Type D	Hard rubber / Long leg type (thick hole)	JIS K 6253, ISO 7619 ASTM D 2240, DIN 53 505	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 18	2.50	360
Digital	GSD-719K-H	Type A	General rubber / Deep hole type (narrow hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 12	2.50	194
	GSD-719K-L	Type A	General rubber / Long leg type (thick hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240, DIN 53 505	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	ϕ 18	2.50	380
	GSD-720K-H	Type D	Hard rubber / Deep hole type (narrow hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 12	2.50	194
	GSD-720K-L	Type D	Hard rubber / Long leg type (thick hole)	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240, DIN 53 505	0-44450mN (0-4533gf)	Conical Cone of R0.1 with 30° angle	ϕ 18	2.50	380

Mounting impossible to stand with all varieties.

Pocket Type

Analog

New JIS compliance

Durometer of pocket type it is convenient to carry.

**GS-719P****GS-709P**

Type A Durometer

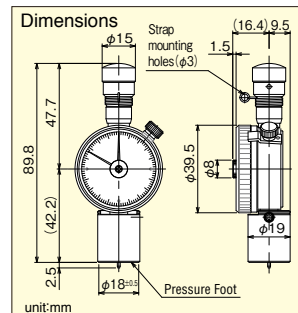
Peak pointer type



Comparison with standard type. (Left)

Specifications

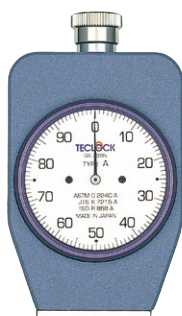
Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
GS-719P	Type A	General rubber (Medium hardness)	JIS K 6253	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	100
GS-709P	Type A	Soft plastic, General rubber	JIS K 7215	549-8061mN (55-822gf)			100
GS-755	Type 000	Ultra soft rubber	ASTM D 2240	203-1111mN (20.7-113.3gf)	Hemisphere of SR6.35	1	125
GS-779G	Type A approximate	Thin Sheet Hardness	—	388-1288mN (9-131gf)	ϕ 0.35		100



※Dimensions of the GS-755 is
page 62.

※Dimensions of the GS-779G
is Page 63.

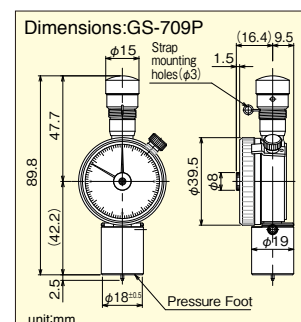
Digital

Plastics
Hard rubber

General rubber
Soft plastic

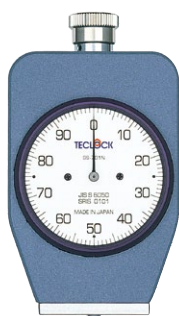


Peak pointer type
Pocket type



Specifications								
	Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-702N	Type D	Plastics / Hard rubber	JIS K 7215	0-44483mN (0-4536gf)	Conical Cone of R0.1 with 35° angle	2.50	200
	GS-702G	Type D (Peak pointer type)	Plastics / Hard rubber		0-44483mN (0-4536gf)	Conical Cone of R0.1 with 35° angle	2.50	208
	GS-709N	Type A	Soft plastic / General rubber	ISO 868	549-8061mN (56-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	200
	GS-709G	Type A (Peak pointer type)	Soft plastic / General rubber	ASTM D 2240	549-8061mN (56-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	208
	GS-709P	Type A (Pocket type)	Soft plastic / General rubber	JIS K 7215	550-8050mN (56.1-821.1gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50	100
	Digital	GSD-719K	Type A	Soft plastic / General rubber	JIS K 6253, JIS K 7215, ISO 7619, ISO 868, ASTM D 2240	549-8061mN (55-822gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.50
GSD-720K		Type D	Plastics / Hard rubber	0-44450mN (0-4533gf)		Conical Cone of R0.1 with 35° angle	2.50	313

Digital



Soft rubber
for Windings yarn

Model		Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-701N	Type C	Soft rubber, Foam rubber	JIS K 7312	539-8385mN (55-85gf)	Hemisphere of SR5.08	2.54	200
	GS-701G	Type C (Peak pointer type)			539-8385mN (55-85gf)	Hemisphere of SR5.08	2.54	208
Digital	GSD-701K	Type C	Eraser, Windings yarn	JIS S 6050	539-8385mN (55-85gf)	Hemisphere of SR5.08	2.54	313

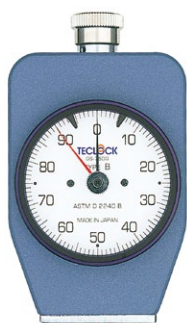


Compliance with ASTM D 2240 standard Durometers for hardness test of rubber characteristic

Analog

Digital

ASTM (American Society for Testing and Materials) is historically old and various types of durometers are prescribed. Teclock provides all of this ASTM durometers for the usage of hard material application to ultra soft material application in our line up.



GS-750G

Type B Durometer
Medium-hard rubber



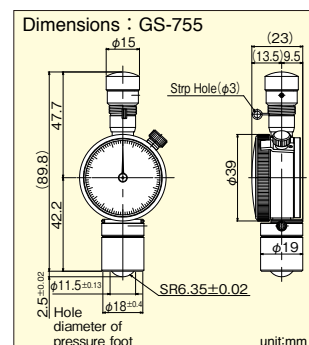
GS-754G

Type OO Durometer
Very soft rubber



GS-755

Type OOO Durometer



Specifications

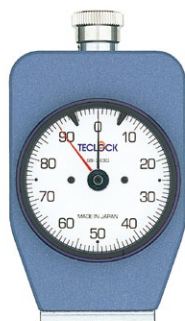
	Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
Analog	GS-750G	Type B (Peak Pointer type)	Medium-hard rubber	ASTM D 2240	550-8050mN (56.1-821.1gf)	Conical corn of R 0.1 with 30° angle	2.50	208
	GS-751G	Type C (Peak Pointer type)	Hard rubber		0-44450mN (0-4533gf)	Truncated cone of ϕ 0.79 with 35° angle	2.50	208
	GS-752G	Type DO (Peak Pointer type)	Medium-hard rubber		0-44450mN (0-4533gf)	Hemisphere of SR 1.19	2.50	208
	GS-753G	Type O (Peak Pointer type)	Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR 1.19	2.50	208
	GS-754G	Type OO (Peak Pointer type)	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 1.19	2.50	208
	GS-755	Type OOO	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 6.35	2.50	125
Digital	GSD-750K	Type B	Medium-hard rubber		550-8050mN (56.1-821.1gf)	Conical corn of R 0.1 with 30° angle	2.50	313
	GSD-751K	Type C	Hard rubber		0-44450mN (0-4533gf)	Truncated cone of ϕ 0.79 with 35° angle	2.50	313
	GSD-752K	Type DO	Medium-hard rubber		0-44450mN (0-4533gf)	Hemisphere of SR 1.19	2.50	313
	GSD-753K	Type O	Soft rubber		550-8050mN (56.1-821.1gf)	Hemisphere of SR 1.19	2.50	313
	GSD-754K	Type OO	Very soft rubber		203-1111mN (20.7-113.3gf)	Hemisphere of SR 1.19	2.50	313

Analog

Digital

TECLOCK Original Standard Durometer

This is available as TECLOCK original standard based on customers' requirement, even though they are not prescribed in JIS or ISO. Type E 2 durometer for soft rubber with around half of spring load value of Type E, and Type FO to measure hardness of polystyrene sponge for the level of sponge for washing dishes are available.



GS-743G

Type E2 Durometer
Soft rubber



GS-744G

Type FO Durometer
Soft styrene foam



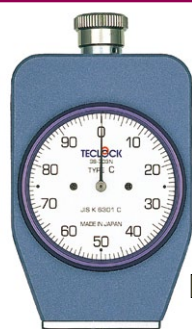
Hardness is measured by placing GS-744G on the sponge sheet. Dispersion of polystyrene level can be judged.

Specifications

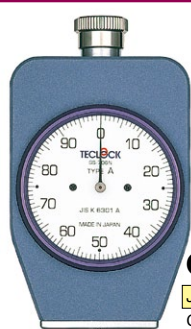
	Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height (mm)	Weight (g)
Analog	GS-743G	Type E2 (Peak Pointer type)	Soft rubber	TECLOCK E2	550-4300mN (56.1-438.6gf)	Hemisphere of SR2.50	2.50	208
	GS-744G	Type FO (Peak Pointer type)	Soft styrene foam	TECLOCK FO	550-4300mN (56.1-438.6gf)	Cylindrical cone of ϕ 25.2	2.50	500
Digital	GSD-743K	Type E2	Soft rubber	TECLOCK E2	550-4300mN (56.1-438.6gf)	Hemisphere of SR2.50	2.50	313
	GSD-744K	Type FO	Soft styrene foam	TECLOCK FO	550-4300mN (56.1-438.6gf)	Cylindrical cone of ϕ 25.2	2.50	500



Compliance with JIS K 6301 standard Vulcanized Rubber Physical Test (discontinued in 1998 August)

**GS-703N**

JIS C (old type)

Hard rubber
Ebonite**GS-706N**

JIS A (old type)

General rubber

JIS K 6301 was established in 1950 and had sustained base of rubber industry of our country but was discontinued in 1998 because it did not comply with ISO and also JIS K 6253 was prescribed on its behalf. However, It had been used for 60 years as "Rubber hardness tester" and even now it is used as test data between certain parties in charge with mutual consensus although movement to new JIS has progressed and standard is discontinued. There are 2 models such as Spring type A and type C for hard rubber.

Specifications

	Model	Type	Application / Materials	Conform Standards	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
Analog	GS-703N	JIS C(old type)	Hard rubber	JIS K 6301	980-44100mN (100-4500gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.54	200
	GS-703G	Type C(old type) Peak Pointer type	Hard rubber	JIS K 6301	980-44100mN (100-4500gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.54	208
	GS-706N	JIS A(old type)	General rubber	JIS K 6301	539-8385mN (55-855gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.54	200
	GS-706G	Type A(old type) Peak Pointer type	General rubber	JIS K 6301	539-8385mN (55-855gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.54	208
Digital	GSD-706K	Type A(old type)	General rubber	JIS K 6301	539-8385mN (55-855gf)	Truncated Cone of ϕ 0.79 with 35° angle	2.54	313

Simplified Micro-Hardness Tester for Thin Sheet Hardness

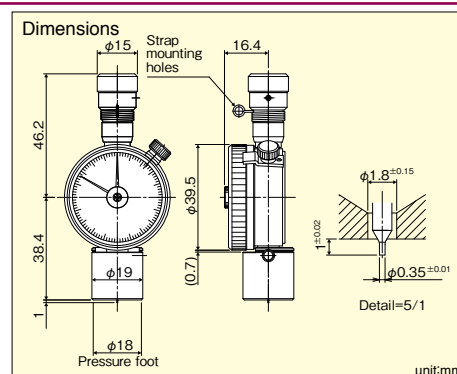
**GS-779G**

Peak pointer type

This is simplified micro-hardness tester which measures hardness of thin sheet such as rubber and Estolamer. Height of indenter is 1mm that is 1per 2.5 of that of normal durometer. It is effective for dispersiveness of sheet hardness and its relative comparison. It is original standard of Teclock and designed so as to obtain the value similar to type A durometer.

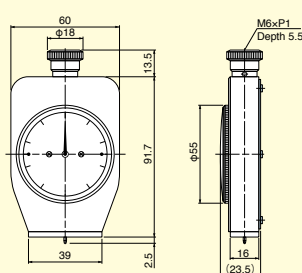
Specifications

Model	Type	Spring Load Value 0-100	Indenter Shape (mm)	Indenter Height(mm)	Weight (g)
GS-779G	Type A approximate	388-1288mN (9-131gf)	ϕ 0.35	1	100

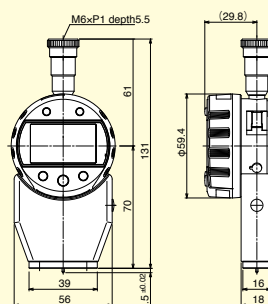


Dimensions

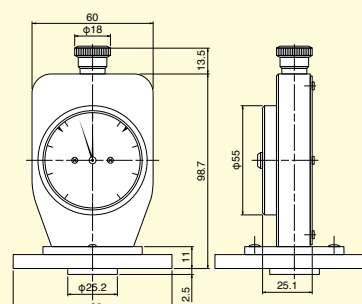
Analog type



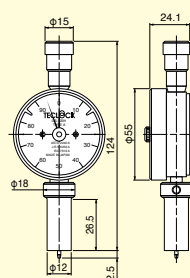
Digital type



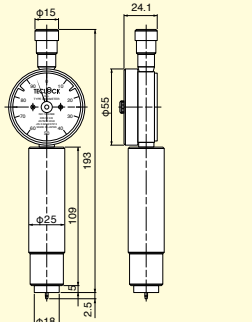
Type FO(744G)



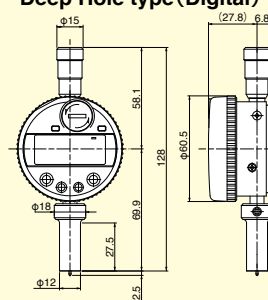
Deep Hole type (Analog)



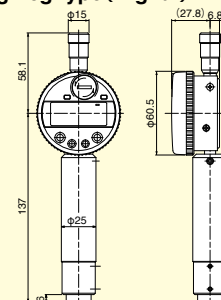
Long Leg type (Analog)



Deep Hole type (Digital)



Long Leg type (Digital)





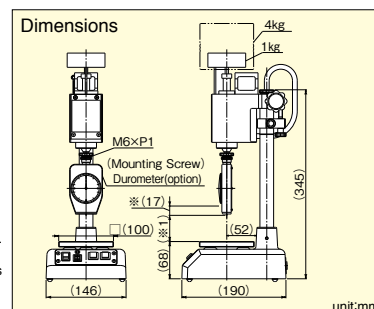
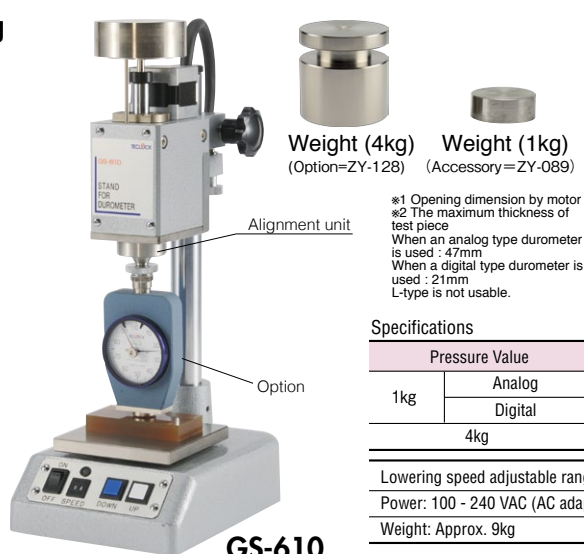
Measuring Stand for Durometer

New JIS compliance

In case of measuring with durometer by pushing by hand, measuring values vary in some degree due to individual difference. Therefore, Measuring stand is materialized as measuring method for high reproducibility, which is prescribed in JIS and ISO.

Automatic type Motor Driving Durometer Stand

- Hardness can be measured by durometer with load and speed prescribed as standard only by operating switch.
- Varying in some degree of data measured by pushing by hand has been dramatically improved due to adopting stepping motor driving system.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 1kg can be measured by type A and type E durometer as they are. Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-090 for measuring 1kg..
- Calibration certificate can be issued.



Specifications

Pressure Value	Weight Code-No.	Applicable Durometer Model
1kg	Analog	ZY-089(Accessory)
	Digital	ZY-090(Optional)
4kg	ZY-128(Optional)	D, ASTM C, DO, JIS C(old type)

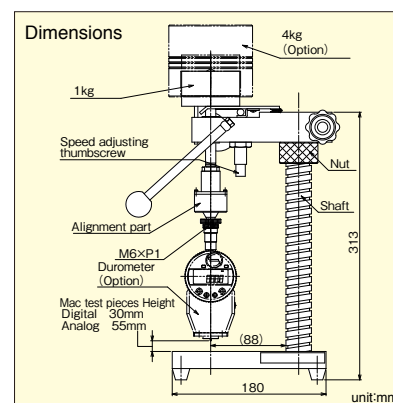
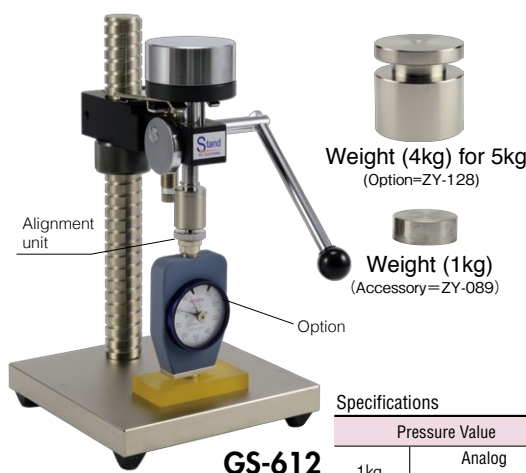
Lowering speed adjustable range: 1[mm/sec] – 19[mm/sec], by 1[mm/sec]

Power: 100 - 240 VAC (AC adapter accessory)

Weight: Approx. 9kg

Manual Operation type Durometer Stand with Speed Controller

- Speed controller with high reliability is adopted for moving down speed adjustment unit.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 65mm for analog and 40mm for digital are obtained for possible measuring range.
- Shaft with square thread is adopted that can prevent holder falling down and moving up and down.
- 1kg can be measured by type A and type E durometer as they are. Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-090 for measuring 1kg..
- Calibration certificate of mass (with durometer) can be issued, which are prescribed in ISO / JIS.

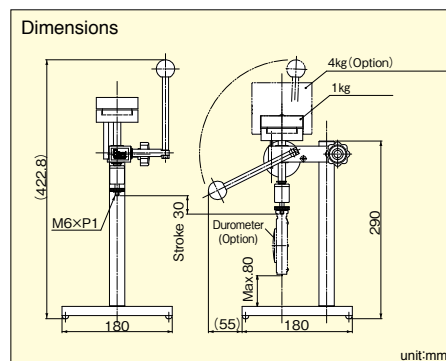
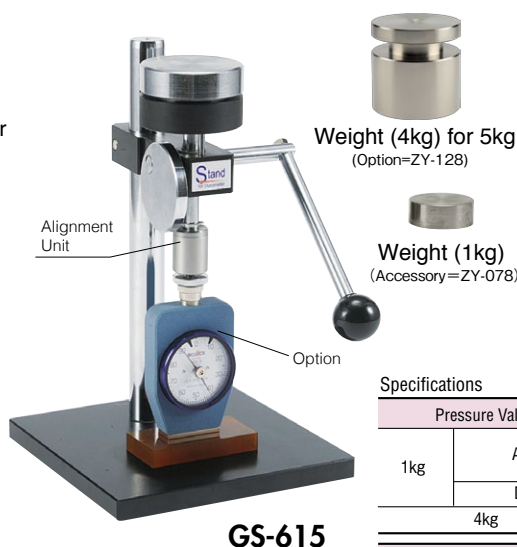


Specifications

Pressure Value	Weight Code-No.	Applicable Durometer Model
1kg	Analog	ZY-089(Accessory)
	Digital	ZY-090(Optional)
4kg	ZY-128(Optional)	D, ASTM C, DO, JIS C(old type)
Weight	8.5kg	

Manual Operation type Durometer Stand

- Hardness can be measured by durometer with load prescribed by JIS by mounting durometer and manual operation.
- Adopting cam has realized easy operation and cost performance.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 1kg can be measured by type A and type E durometer as they are. Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-079 for measuring 1kg..
- Calibration certificate can be issued (Operation speed certificate can not be issued.).



Specifications

Pressure Value	Weight Code-No.	Applicable Durometer Model
1kg	Analog	ZY-078 (Accessory)
	Digital	ZY-079 (Optional)
4kg	ZY-128 (Optional)	D, ASTM C, DO, JIS C(old type)
Weight	3.9kg	



Durometer Periodical Inspection / Calibration

Durometer is a testing machine. In case that it corresponds to "Monitoring Machine" and "Measuring Machine" of ISO 9001 (JIS G 9001), controlling machines along with it is needed. Teclock is one of a few manufacturers of durometer which has obtained the authentication of ISO 9001 and can originally issue 3 kinds of traceability system diagram, calibration certificate and inspection report that are needed for calibration documents. In addition, Teclock can issue 3 kinds of documents for durometer tester and indenter height gauge, that are needed for internal inspection. Use these for control based on internal calibration standard.

Durometer Tester

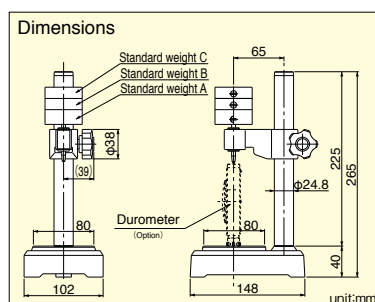


GS-607

Durometer is optional.

This is inspection machine which simply checks spring load value of analog type durometer. Putting defined load with 3 pieces of standard weight to the inverted durometer and inspecting whether graduation of 25, 50 and 75 correctly point out. Calibration certificate can be issued. (Digital type durometer and other makes products can not be calibrated.)

In addition, in the standard of overseas and also domestic, inspection method by using mechanism of even balance and with normal position of durometer is introduced.

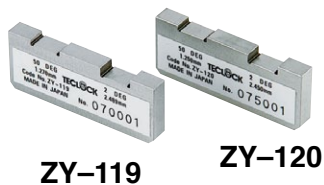


Specifications

Code.No.	対応機種	Weight (kg)
GS-607	GS-701N/GS-701G/GS-706N/GS-706G	3.7
GS-607A	GS-709N/GS-709G	3.7
GS-607B	GS-719N/GS-719G/GS-721N/GS-721G/GS-750G/GS-753G	3.7
GS-607C	GS-743G	3.7

Type D durometer for tester does not manufacture. Calibration certificate is Available.

Indenter Extension Gauge



ZY-119

ZY-120

Height of indenter (contact point) of durometer is simply checked. ZY-119 is for JIS K 6301 and ZY-120 is for JIS K 6253. Products of other makers can be checked.

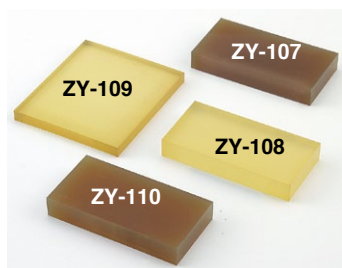
Specifications

Code No.	Indenter Height (mm)	50DEG	2DEG	Applicable Durometer
ZY-119	2.54 type	1.27mm	2.489mm	GS-701N/G, 706N/G
ZY-120	2.5 type	1.25mm	2.45mm	GS-GSD-719, 720 Series

Calibration certificate is possible.

Rubber Piece for Durometer Measuring

This is not rubber test piece. It is used for easy checking to find out failure of durometer. Measuring hardness when it is purchased and use it for daily control of durometer.



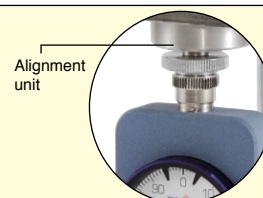
Specifications

Code No.	Type	Dimension (mm)	Applicable Durometer
ZY-107	Durometer A Hardness:50	40×80×12 Thickness	TypeA (GS,GSD-719J Series)
ZY-108	Durometer A Hardness:80	40×80×12 Thickness	
ZY-109	Durometer D Hardness:40	70×80×7 Thickness	TypeD (GS,GSD-720J Series)
ZY-110	Durometer E Hardness:80	40×80×12 Thickness	TypeE (GS,GSD-721J Series)

* Durometers complying with these test pieces are Type A, Type D, Type E, which are compliant with JIS K 6253.
* Calibration Certificate about test pieces can not be issued.

Alignment Unit for Durometer Stand

As it can move front / back and left / right it is the new function which has materialized high adhesion between pressurized face of durometer and face to be measured of test piece. It is mounted to GS-610, GS-612, GS-615 and all durometers including GX-02 type. Unmovable type is also available. Ask our branch nearby for details.





Automatic Hardness Tester GX-02series

JIS K 6253 compliance

ISO compliance

Automatic hardness tester [GX-02 series] can perform the measurement with the operating speed, the measuring weight and the pressing-surface dimensions which are specified in JIS K 6253 "Determination of hardness - Vulcanized rubber and Thermoplastic rubber".

Outline

This product is the automatic hardness meter. The hardness measurement is able to be done with the button- touch by a built-in motor.

This product is dedicated for Digital durometer sensor [GSS-619/GS-620/GSS-621].

The product equips the measuring modes of 3 types.

The control part pursues the clarity and easiness of use by adopting a touch panel.

Main features

Measuring modes: 3 types

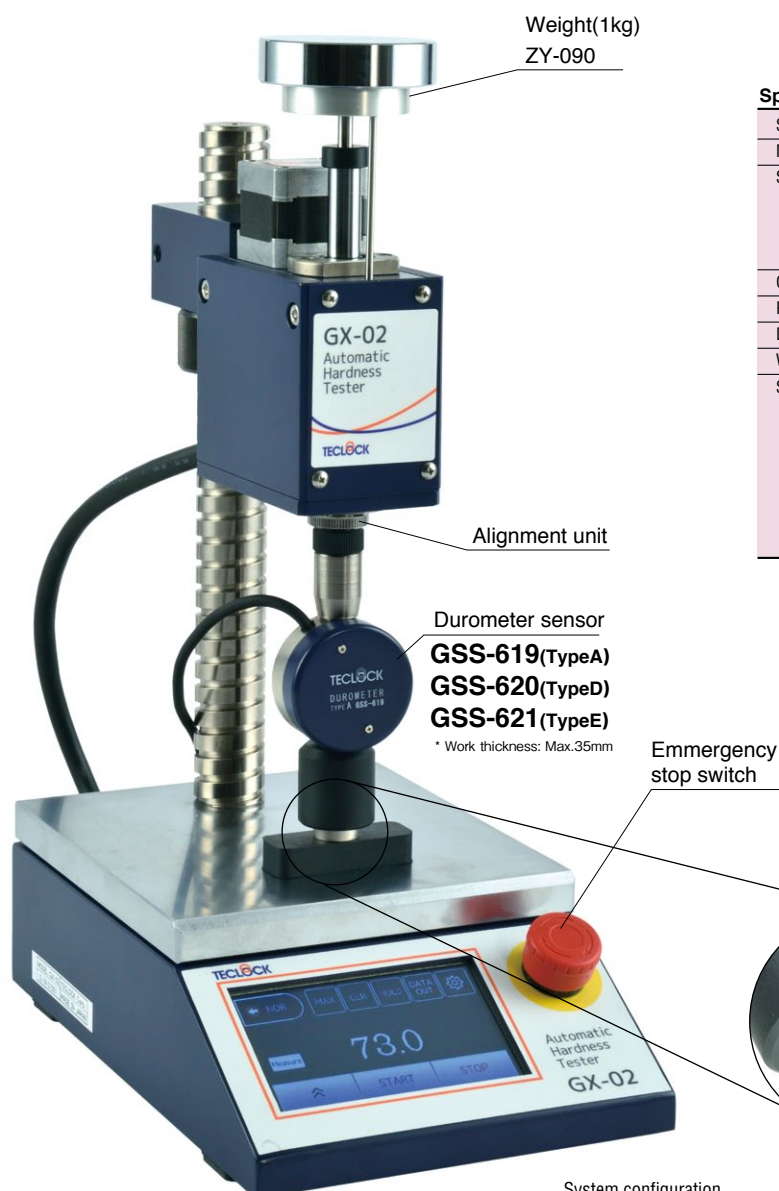
Normal mode (the maximum value is acquirable), Test time mode (the median value and mean value are calculated), PC mode (operable by PC by using the dedicated software)

Features

- Tolerance judging feature

Specifications

Standards	ISO 7619 / JIS K 6253 compliance
Minimum indication	0.1
System features	Peak-holding function, Timer-holding function (Timer value 0.5, 1 to 99sec), Tolerance judging function, Mean value outputting function (n=1 to 30), Data output (PC printer), Outer functions control output
Outside interface	RS-232C
Power	AC100~240V(ACAdapter)
Dimensions	170(W)×160(L)×470(H)mm
Weight	11kg (Including weight 1kg)
Sensor unit	Model : GSS-619 (Type A) GSS-620 (Type D) GSS-621 (Type E) Pressing-surface diameter : $\phi 18$ mm (ESS-621, type E is 127mm) Code length : 2m Dimensions : 50(W)×35(L)×124(H)mm Weight : 320g



System configuration

Model	Body	1kg for weight (Accessories)	Sensor unit	Measuring object
GX-02A	Display unit (with stand)	ZY-090	GSS-619	Normal rubber & soft plastic
GX-02D		ZY-090+ZY-128 (5kg for weight)	GSS-620	Hard rubber & plastic
GX-02E		ZY-090	GSS-621	Soft rubber
GX-02F0		—	GSS-644	Urethane foam



Totally Automatic type IRHD / M method Micro – size International Rubber Hardness Tester

- Micro-hardness can be measured by 1/8 scale each durometer of type A, E, E2, OO, FO in addition to IRHD / M method.
- Hardness of O ring and small rubber parts can be measured with totally automatic.
- Voice coil motor is adopted for load system. Friction and reproducibility of inner mechanism is improved, which is different from weight system.
- It is plug-in type that plunger (contact point) can be easily changed and recalibration on test method change is not needed.
- As test piece table is wide, various measuring jigs can be set up.



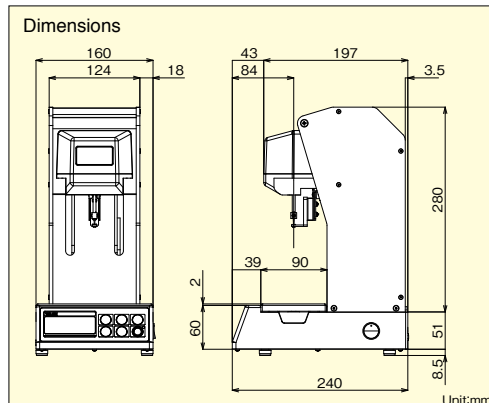
GS-680sel

PC connecting example

Specifications

Hardness testing method	IRHD · M-method	Durometer Hardness
Compliance standards	ISO 48/JIS K 6253	ISO 7619/JIS K 6253
Measuring accuracy	±0.1 IRHD	TECLOCK Standards/ASTM D 2240
		Type A/E ±1 JIS K 6253
		Type E2/FO ±1 TECLOCK Standards
Measuring range	30~100 IRHD	Type OO ±2 ASTM D 2240
		0 ~100
Minimum indication unit	0.1	
Measurement part movable distance	100mm	
Measurable test-piece dimensions	W=160 / D=110 / H=100mm	
Conformity standards	EC Directive (EN61326)	
Outside interface	RS-232C	
Power	AC100~200 V / AdapterDC24V	
Weight	7.8kg (Main unit)/0.6kg (Power unit)	
Accessories	PC application CD (for Windows XP & 7)	
	PC connecting cables/AC adapter	
	Spare plunger (x1) (ZS-121) for IRHD	
Rubber specimen	ZY-917 6 types set (w/Inspection table)	_____

Other functions: Measurement time extension, Return-measurement function, Self-diagnosis function, Statistical processing (Relaxation curve, Average value, Median value etc)



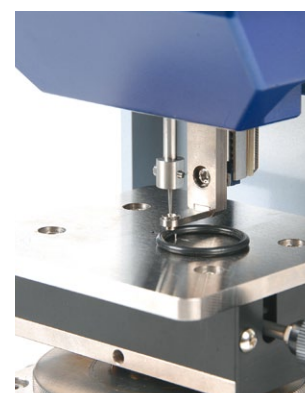
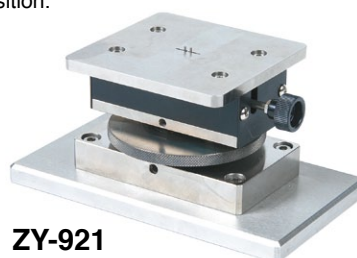
O Ring Measuring Device for GS-680

This is the device for centering of O ring of which wire diameter is 0.5mm-10mm. The pin at stage center which fixes position of O ring slightly moves up/down and left/right independently and fixes the position. In addition, it is possible to rotate it to an arbitrary position.

Specifications

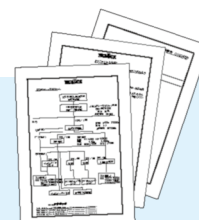
Model	ZY-921
Stage dimensions	90×86mm
Applicable O-ring diameter	φ0.5~φ10mm
Weight	2.9kg

ZY-921



Calibration certificate can be issued to all Teclock durometers.

There is a case that durometers correspond to "Monitoring Machine" and "Measuring Machine" of ISO 9001. Teclock has obtained the authentication of ISO 9001 and can originally issue 3 kinds of traceability system diagram, calibration certificate and inspection report.



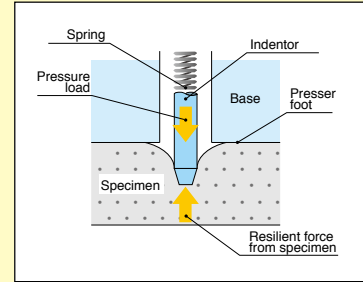


Model Selection of Durometer

There are many type of durometers based on spring force, contact point size and its shape. This is according to the international standard, in order to have the most accurate and the precise results with the several shape of works and those material characteristic. Teclock durometers are in comply with the international standards, but also have an own standard to measure the variety of materials. Please refer to the table below to choice the most suitable model.

Mechanism of the hardness measurement

Contact point with the pressurizing force gives deformed surface. Then, a work piece makes force against this force. Hardness means that when both pressurizing force and repulsive force are equivalent, measure the depth of indenter. The depth of indenter indicates from 0 to 100. This figure shows the values of hardness. The figure has no force unit, but only relative physical value.



Note : If model number is the same, it means to apply the same specification. ex : GS-719N and GS-719G are the same specification.

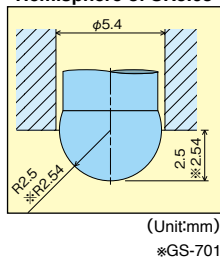
Soft material →

Model	Type	Materials
GS-744	TYPE FO	- Urethane foam - Shock absorb material for car sheet - Sponge for dish washer - Konjac
GS-754	TYPE OO	- Ultra-soft rubber - Foam rubber - OA equipment roll - Chewing gum
GS-743	TYPE E2	- Very soft rubber - Processed cheese - Cloth scroll - Chine clay - Sealant
GS-701 / GS-721	TYPE SRIS E	- Very soft rubber - Eraser - Film roll - Spinning roll - Foam rubber roll
GS-753	TYPE O	- Very soft rubber - Spinning roll - Leather - Cardboard - Polystyrene foam

Shape of Contact Point of Durometer

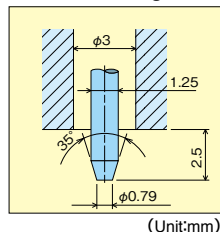
Teclock Durometer has 5 types of contact point shape. Besides, there are some different spring force types. Combination contact point surface and spring force, it can apply the most suitable durometer to a work piece. These shape and pressurizing force are referred to ISO and JIS standard.

Hemisphere of SR5.08



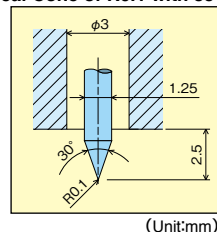
GS-701
GS-721
GS-743

Truncated Cone of $\Phi 0.79$ with 35° angle



GS-703
GS-706
GS-709
GS-719
GS-751

Conical Cone of R0.1 with 35° angle



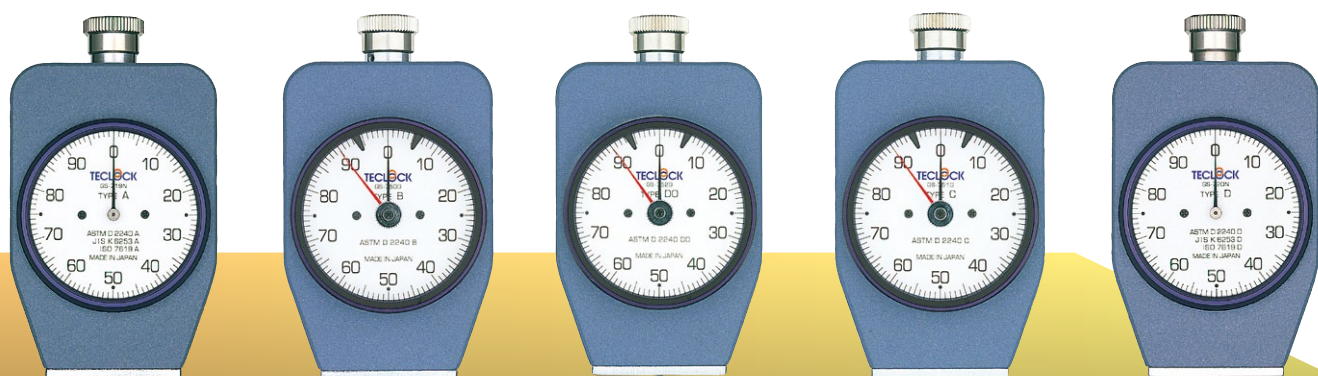
GS-702
GS-720
GS-750



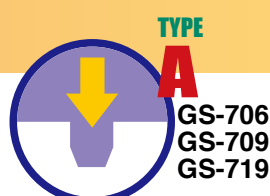
Comparison of Measured Value by Durometer

It is the comparison list of measured data by each durometer based on type A. As hardness values fluctuate owing to various factors temperature and humidity on measuring, dimension and shape, and vulcanizing condition in a certain range, it is impossible to verify complete relative relation between each type. However, refer to the list in right side for comparison value.

TYPE A JIS K6253 JIS K7215	0	10	20	30	40	50	60	70	80	90	100				
(old A) JIS K6301 (Discontinued standard)		10	20	30	40	50	60	70	80	90					
TYPE E JIS K6253		20	30	40	50	60	70	80	90						
TYPE SRIS SRIS 0101 (Discontinued standard)		20	30	40	50	60	70	80	90						
TYPE E2 TECLOCK E2		30	40	50	60	70	80	90							
TYPE D JIS K6253 JIS K7215						10		20	30	40	50				
TYPE DO ASTM D2240			10		20		30		40	50	60	70	80	90	
TYPE O ASTM D2240			20	30	40	50	60	70	80						
TYPE OO ASTM D2240			50	60	70	80	90								
TYPE B ASTM D2240		10		20		30		40	50	60	70	80	90		
TYPE C ASTM D2240						10		20		30	40	50	60	70	80



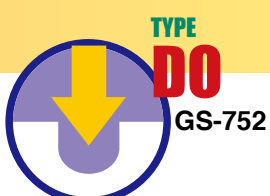
Hard material



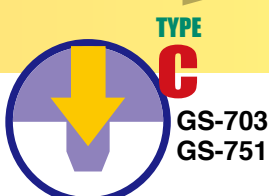
- TYPE A**
GS-706
GS-709
GS-719
- General rubber elastomer
 - Rubber roll
 - Rubber roll
 - Tire
 - Rubber hose
 - Soft plastic



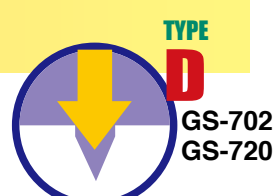
- TYPE B**
GS-750
- Medium-hard rubber
 - Unglazed China clay
 - Wood



- TYPE DO**
GS-752
- Medium-hard rubber
 - Flooring and building
 - Car handle

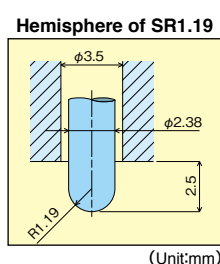


- TYPE C**
GS-703
GS-751
- Hard rubber
 - Golf ball
 - Brake rubber

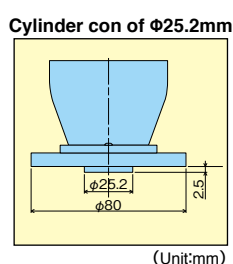


- TYPE D**
GS-702
GS-720
- Hard rubber
 - Plastic
 - Ebonite

The above table also refers to the digital types.



**GS-752
GS-753
GS-754**

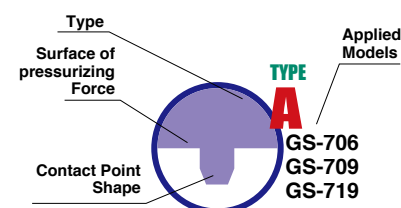


GS-744

How to read table

Pressurizing Force to a work piece.

The arrow size above shows the strength of the pressurizing force. The biggest arrow shows the most pressurizing force which are type D, C and DO. The smallest arrows the minimum pressurizing force.





Durometer Standard Table

Specification of Testers	Name of standard		JIS K 6253-2012			JIS K 6301-1995 (1998 Abolition)	
			Type A	Type D	Type E ※Note1	Type A	Type C
	Presser foot dimension		More than 12mm			More than Diameter 10mm , Approx. 3.2mm hole	
	Indenter shaft diameter						
	Indenter tip diameter		0.79 ± 0.01	0.79 ± 0.01	0.79 ± 0.01	0.79 ± 0.02	0.79 ± 0.02
	Indenter tip angle		35° ± 0.25°	30° ± 0.25°	30° ± 0.25°	35° ± 0.25°	35° ± 0.25°
	Indenter amount exceeding from presser foot		0.79 ± 0.01	0.79 ± 0.01	0.79 ± 0.01	0.79 ± 0.02	0.79 ± 0.02
	Weight at 0		550mN (56.1gf)	0 mN (0 gf)	550mN (56.1gf)	539.5mN (55gf)	981mN (100gf)
	Weight at 100		8,050mN (821.1gf)	44,450mN (4,533gf)	8,050mN (821.1gf)	8,385mN (855gf)	44,130mN (4,500gf)
	Load accuracy		Load allowance value ±75mN (8.16gf) Indicating tolerance value ± 1	Load allowance value ±445mN (44.9gf) Indicating tolerance value ± 1	Load allowance value ±75mN (8.16gf) Indicating tolerance value ± 1	Load allowance value ± 8 gf Indicating tolerance value ± 1	Load allowance value ±20gf Indicating tolerance value ±0.45
Other standards		ASTM D 2240 - ISO 7619					—
Test Piece and Measuring Condition	Test pieces	Flat area dimension	—			More than pressurized surface	
		Thickness	More than 6mm			More than 12mm	More than 6mm
	Measuring position		More than 12mm			More than 15mm	
	Time to read		—			Read at once (Or after regulating time)	
	Number of measurement and data summary		5-points median more than 6mm off			5-points average value	
			Test report (Example):A45	Test report (Example):D50	Test report (Example):E 60	Test report (Example):Hs (JIS A) 50	Test report (Example):Hs (JIS C) 50
	Weight of constant pressure weight		1 ^{±0.1} ₀ kg	1 ^{±0.5} ₀ kg	1kg (Preferable) ^{±0.1} ₀	1kg	5kg
	Temperature condition		23±2°C / More than 3 hours			20°~30°C / One hour	
	Acclimate time of specimen		—			—	
	Use range		More than A90 Use TypeD Under D20 Use TypeA			A > 70 Use C type C type is preferable for range of 30-90	
Suitable specimen to the standards		Normal Rubber	Normal Rubber (Hard)	Soft Rubber	Normal Rubber	Hard Rubber	—
Our original durometers		Standard GS-719N	Standard GS-720N	Standard GS-721N	Standard GS-706N	Standard GS-703N	—
Our original digital durometers		Peak Pointer GS-719G	Peak Pointer GS-720G	Peak Pointer GS-721G	Peak Pointer GS-706G	Peak Pointer GS-703G	—
Our original digital durometers		GSD-719K Series	GSD-720K Series	GSD-721K Series	GSD-706K	GSD-703K	—

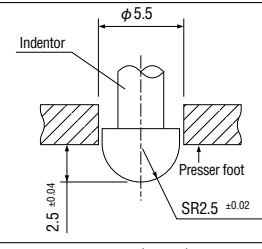
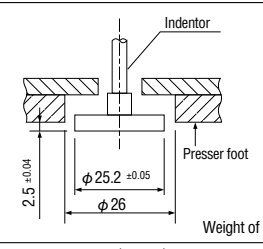
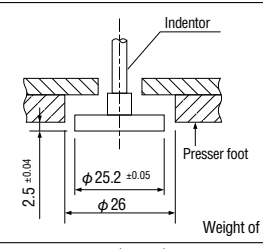
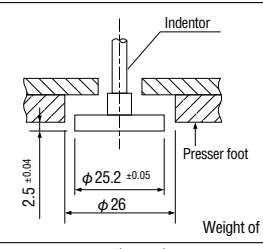
Note1 ISO 7619 is referred to as a type A Note2 For stand 500mm² more

Specification of Testers	Name of standard		JIS K 7215-1986			JIS S 6050 / JIS K 7312	
			Type A	Type D	Type E	Type A	Type C
	Presser foot dimension		More than diameter 12mm, diameter 3 ^{±0.5} mm hole Center			About 14×50mm Approx. 5.2mm hole in Center	
	Indenter shaft diameter						
	Indenter tip diameter		0.79 ± 0.03	0.79 ± 0.03	0.79 ± 0.03	0.79 ± 0.02	0.79 ± 0.02
	Indenter tip angle		35° ± 0.25°	30° ± 1°	30° ± 0.25°	35° ± 0.25°	35° ± 0.25°
	Indenter amount exceeding from presser foot		0.79 ± 0.03	0.79 ± 0.03	0.79 ± 0.03	0.79 ± 0.02	0.79 ± 0.02
	Weight at 0		549mN (56gf)	0 mN (0 gf)	549mN (56gf)	0.54N (55,185gf)	9.81N (1000gf)
	Weight at 100		8,061mN (822gf)	44,483mN (4,536gf)	8,061mN (822gf)	8.39N (855,595gf)	44,130mN (4,500gf)
	Load accuracy		Load allowance value ±78mN (± 8 gf) Indicating tolerance value ± 1	Load allowance value ±441mN (±45gf) Indicating tolerance value ± 1	Load allowance value ±78mN (± 8 gf) Indicating tolerance value ± 1	Load allowance value ± 8 gf Indicating tolerance value ± 1	Load allowance value ±20gf Indicating tolerance value ±0.45
Other standards		ASTM D 2240 / ISO 868 (SHORE A) (DIN 53505)	ASTM D 2240 / ISO 868 (SHORE D) (DIN 53505)	ASTM D 2240 / ISO 868 (SHORE A) (DIN 53505)	ASTM D 2240 / ISO 868 (SHORE D) (DIN 53505)	JIS S 6050 (Plastics Erasers)	—
Test Piece and Measuring Condition	Test pieces	Flat area dimension	Width : about 25mm or more			More than pressurized surface	
		Thickness	6mm or more, 2mm acceptable for HDD 40 pr above			More than 10mm	
	Measuring position		12mm or more from edge			—	
	Time to read		1sec or less (Time to be specified for over 1sec)			At first weighing and 30sec later	
	Number of measurement and data summary		5 or preferably 10meas, at 6mm or more			Average value of 3initial and 30sec later measurement. JIS S 6050 Average value of 5initial and 30sec later measurement. JIS K 7312	
	Weight of constant pressure weight		Approx. 1kg	Approx. 5kg	Approx. 1kg	1kg	—
	Temperature condition		23±2°C	50± 5 % (humidity)	23±2°C	20 ^{±10} ₀ /h	—
	Acclimate time of specimen		88h (Time can be shortened if measured value does not vary)	—	88h	—	—
	Use range		As a rule, use in range 20-90 Use D for A>90, Use A for D<20			—	
	Suitable specimen to the standards		Plastic (Plastic Film, Tape and Foam Plastic Excluded) (Usable for Elastomer)			Expanded rubber	
Our original durometers		Standard GS-709N	Standard GS-702N	Standard GS-701N	Standard GS-701N	Standard GS-701G	—
Our original digital durometers		Peak Pointer GS-709G	Peak Pointer GS-702G	Peak Pointer GS-701G	Peak Pointer GS-701G	Peak Pointer GS-701K	—
Our original digital durometers		GSD-719K Series	GSD-720K Series	GSD-721K Series	GSD-706K	GSD-703K	—



Durometer Standard Table

Specification of Testers			Name of standard		ASTM D 2240-05				
			Type B		Type C		Type D0		Type O
Presser foot dimension			6mm diameter 2.5~3.2mm hole						
Indenter shaft diameter									
Indenter tip diameter									
Indenter tip angle									
Indenter amount exceeding from presser foot									
Weight at 0			550mN (56.1gf)		0 mN (0 gf)		550mN (56.1gf)		203mN (20.7gf)
Weight at 100			8,050mN (821.1gf)		44,450mN (4,533gf)		8,050mN (821.1gf)		1,111mN (113.3gf)
Load accuracy	Load allowance value		±0.075N		±0.4445N		±0.075N		±0.0182N
	Indicating tolerance value				±1				±2
Other standards			—————						
Test Piece and Measuring Condition	Test pieces	Flat area dimension	More than radius 6mm than						
		Thickness	More than 6mm						
	Measuring position		More than 12mm (Length and Width)						
	Time to read		Within 1-sec.						
	Number of measurement and data summary		5-points of average value or medium 6mm off						
	Weight of constant pressure weight		1kg Recommendation		5kg		1kg		—————
	Temperature condition		23±2℃						
	Acclimate time of specimen		20~90						
	Use range		20~90						
Suitable specimen to the standards			Rubber, Cellular, Elasticity material, Thermoplastic elastomers, Hard plastic, Soft plastic						
Our original durometers	Standard	—————		—————		—————		—————	
	Peak Pointer	GS-750G		GS-751G		GS-752G		GS-753G	
Our original digital durometers		GSD-750K		GSD-751K		GSD-752K		GSD-753K	

Specification of Testers	Name of standard		Teclock standard	
			Type E2	Type F0
	Presser foot dimension		More than 16mm, Diameter 5.5mm hole	
	Indenter shaft diameter			
	Indenter tip diameter			
	Indenter tip angle			
	Indenter amount exceeding from presser foot			
	Weight at 0		550mN (56.1gf)	
	Weight at 100		4,300mN (438.6gf)	
	Load allowance value		0.4N (±4gf)	
Test Piece and Measuring Condition	Indicating tolerance value		±1	
	Other standards		—	
	Test pieces	Flat area dimension	More than pressurized surface	
		Thickness	More than 10mm	
	Measuring position		More than 30mm	
	Time to read		Within 1-sec.	
	Number of measurement and data summary		5-points median more than 6mm off	
	Weight of constant pressure weight		5-points median more than 80mm off	
	Temperature condition		23±2°C	
	Acclimate time of specimen		23±2°C	
Use range		Soft sponge		Foam sponge, Polyurethane foam
Suitable specimen to the standards		—		—
Our original durometers		Standard	—	—
Our original digital durometers		Peak Pointer	GS-743G	GS-744G
			GSD-743K	GSD-744K

Precautions on use of Durometer (Rubber / Plastic hardness measurement)

1. Confirmation of performance

Please confirm requested standard and type of durometer on the occasion of receiving.
Please refer to the standard of JIS K 6253, K 7215, K 6301, ISO 7619, ISO 868 and ASTM D 2240 in detail.

2. Test environment

- (1) Test environment for measuring samples is prescribed at internal and external standard as " $23\pm 2^{\circ}\text{C}$, humidity $50\pm 5\%$ ".
- (2) please avoid using it where dust and oil mist attach to it.

3. Precaution on use

- (1) Check before using
 - ① Confirm whether operation is smooth.
 - ② Confirm whether accretion is on pressurized surface or indenter.
 - ③ Confirm whether the indicator indicates "0 point".)
- (2) Never disassemble device and loose screws.
- (3) Do not give the products any shock by being dropped or excessive load.
- (4) Keep the products away from direct sun light, excessive high or low temperature, and high humidity or dust. Avoid using and storing the products under the circumstances of water or oil.
- (5) Do not press the products to hard samples like glass or metals excepting for the purpose of checkup and inspection.
- (6) Do not clean with organic detergent (thinner or benzine) and not put oil onto the products.
- (7) Do not apply a load to the indenter in right angle. Do not hit the products with a hard item.

4. Maintenance

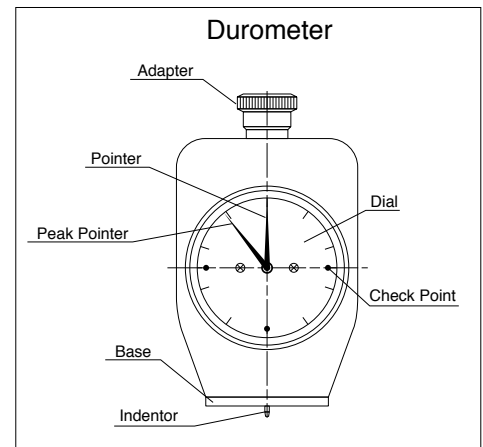
- (1) In case that outer dial can not be read due to dirt of crystal, please wipe stains from the crystal by using a dry cloth or a cloth dampened with neutral detergent.
- (2) In case that some sort of defect is observed for indicator, indenter and spring load value by check up and repair or adjustment is needed, please inform the sales outlet where the products are bought. Products repaired or adjusted by parties not authorized by TECLOCK can not be warranted by us.

5. Periodical inspection

Durometers are needed to be inspected during a certain period, which depends on usage frequency. Especially, in case that instruments are controlled by "inspection, measuring and test instruments " of ISO 9000 series, it is important element.

- (1) Indenter height : Indicator should indicate 0 on free condition. Then it is checked whether indicator is in 100 by pressing pressurized surface onto hard and flat and smooth surface. Meanwhile, be careful so that indenter edge shape of Type D durometer is not changed.
- (2) Indenter shape : It is checked by measuring microscope whether dimension and shape of indenter edge is in the permissible value of standard. In case that there is abrasion or damage , indenter needed to be changed.
- (3) Spring force : It is checked by giving load against each indicated value whether indicator correctly indicates. Please use durometer tester "GS-607 series" to check load of ● mark check point of 25, 50 and 75 on outer dial. Permissible error of indicated value is ± 1 .

Nomenclature



Electronic Equipment

Electronic Digital Indicator (0.01 / 0.001mm), PC-Series

- Data output and statistics transaction can be easily made by using digital indicator.
- 0.01mm and 0.001mm resolution digital indicators are available.
- Standard models are equipped with preset function and conventional models deleting preset functions are available.

As compact as standard dial indicators and can be placed where dial indicator is used. Application can be enlarged like statistical calculation of measured value, comprising measuring system by output signal.

The photo shows connection sample that PC-440J is mounted to granite stand and SD-763P Digital Mini Printer.



Measuring Range 12.7mm Type / Standard Model

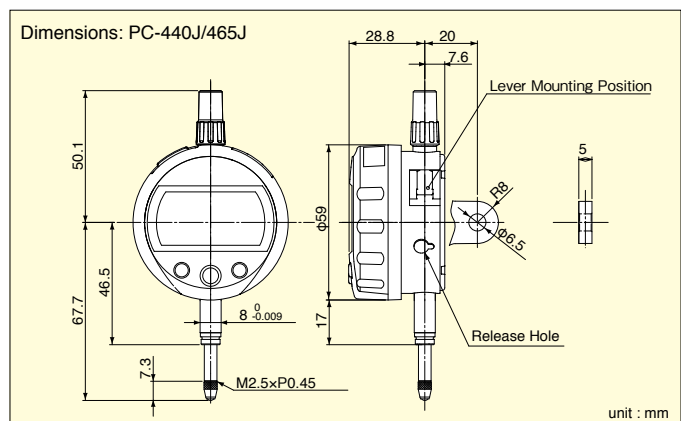


PC-440J

Resolution 0.01mm
Measuring Range 12.7mm

PC-465J

Resolution 0.001mm
Measuring Range 12.7mm



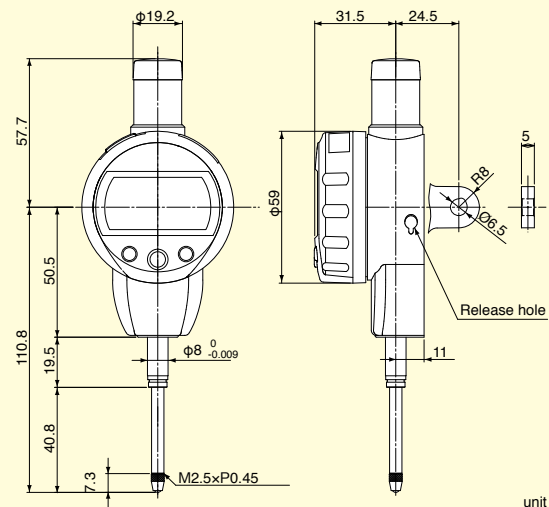
Supplied with Lug back as standard models.
Flat back and Lift lever are optional.



Measuring Range 25.4mm Type / Standard Model



Dimensions: PC-450J-f / 455J-f

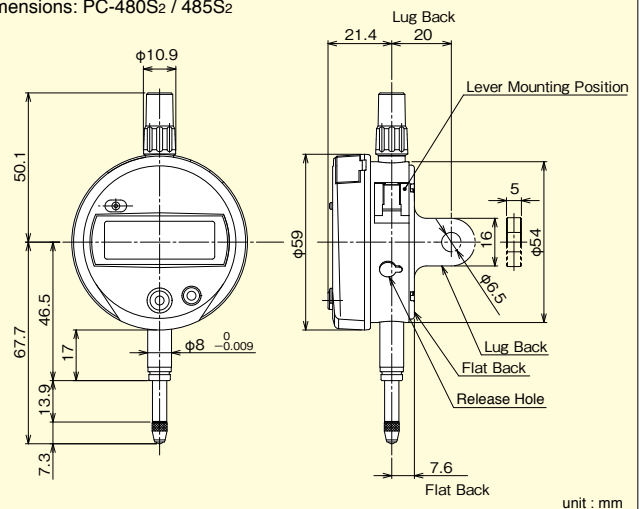


Supplied with Flat back as standard models.
Lug back and Lift lever are optional.

Measuring Range 12.7mm Type / Popular Model



Dimensions: PC-480S2 / 485S2



Supplied with Lug back as standard models (ZL-026).
Flat back (ZY-080) and Lift lever (ZY-918) are optional.

Specifications

Model	PC-440J	PC-465J	PC-450J-f	PC-455J-f	PC-480S ₂	PC-485S ₂
Measuring Range	0~12.7mm		0~25.4mm		0~12.7mm	
Resolution	0.01mm	0.001mm	0.01mm	0.001mm	0.01mm	0.001mm
Accuracy	0.02mm *	0.003mm*	0.02mm or less	0.003mm	0.02mm or less*	0.003mm or less*
Maximum response speed	1000mm/sec	480mm/sec	480mm/sec	480mm/sec	Unlimited	
Contact force	1.0N or less	1.5N or less*	1.8N or less*		2.0N or less*	
Display	LCD display (6-digital & minus)				LCD display (5-digital & minus)	LCD display (6-digital & minus)
Operating temp	0~40°C					
Functions	Preset, Zero-set, Power OM/OFF, Counting direction switching, Digimatic code output				Origin-set, Power ON/OFF, Counting direction Switching, Digimatic code output Display rotation(330°)	
Power supply	SR44 (Button, Silver oxide cell)					
Battery life	Approx. 5,000hours in continuous service				Approx. 20,000hours in continuous service	
Contact Point	R=1.5mm (carbide)					
Contact point thread (ISO/JIS type)	M2.5×P0.45mm					
Weight	170g		186g		120g	150g

* The quantising error is not included.

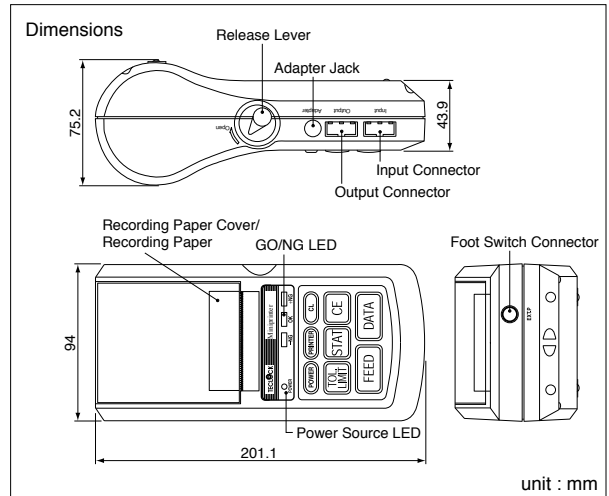


Digital Mini Printer

- Multi-function mini printer for Digital Indicator



SD-763P



unit : mm

Mode 0

To print measured data, and judgement.

```

* MODE 0 *
DATE 2002/ 7/ 9
TIME 13:45

*LIMIT MODE*
*LIMIT DATA 1*
*NO LIMIT DATA*
LIMIT1 7.472 mm

LIMIT2 2.849 mm

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:47

LSL 2.849 mm
USL 7.472 mm
TOL 4.623 mm

1 5.395 mm
2 4.827 mm
3 4.826 mm
4 -1.089 mm
5 -2.727 mm
6 4.385 mm
7 10.392 mm
8 9.045 mm
9 2.098 mm
10 3.747 mm
11 -3.130 mm

```

Judgement

Perform statistical calculations

Histogram

Mode 1

To print measured data, judgement, perform statistical calculations, and generate histogram.

```

* MODE 1 *
DATE 2002/ 7/ 9
TIME 13:45

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:51

LSL -0.016 mm
USL 4.543 mm
TOL 4.559 mm

* RESULT *
N 12
MAX 6.507 mm
MIN -1.414 mm
R 7.921 mm
σ 2.74216 mm
σn-1 2.43469 mm
σn-1 2.54295 mm

-NG 2
+NG 2
P 33.333 %
Cp 0.299
Cpk 0.236

* HISTOGRAM *
LSL -0.016 mm
USL 4.543 mm
TOL 4.559 mm

DIV 10

-NG 2
LSL 1
A 1
B 1
C 0
D 0
E 1
F 1
G 1
H 1
I 1
J 3
+NG 2

```

Mode 2

To print D-chart, perform statistical calculations, and generate histogram.

```

* MODE 2 *
DATE 2002/ 7/ 9
TIME 13:55

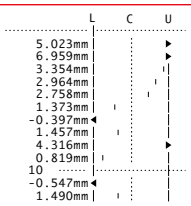
1 -3.132 mm
2 1.782 mm
3 2.608 mm
4 6.590 mm
5 -0.737 mm
6 -0.737 mm
7 1.705 mm
8 1.705 mm

* CANCEL *
8 1.925 mm
9 1.762 mm
10 4.316 mm

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:58

LSL 0.452 mm
USL 3.591 mm
TOL 3.139 mm

```



D-Chart

Mode 3

By entering data, it will calculate and draw a R-control chart.

```

* CLEAR SUB DATA *
* EXIT SUB GR. *

* CLEAR ALL DATA *

SUB GR. NO. 1
1 4.121 mm
2 0.326 mm
3 0.326 mm
4 4.643 mm
5 2.733 mm

```

```

* CONTROL LIMIT *
DATE 2002/ 7/ 9
TIME 14: 7
NO. OF SUB GR. 1
SAMPLE SIZE 5

X 1.14478 mm
UCL 1.52963 mm
LCL 0.75992 mm
X 1.14200 mm
UCL 2.07387 mm
LCL 0.21013 mm

```

Operation result

Specifications

Item	Description	Remarks
Printing Method	Line thermal 384 dot	
Character format	36 × 24 (Large) 24 × 16 (Normal)	
Printing Speed	0.5 sec. per line	When using AC adapter
Printing line numbers per printing roll	6500 lines / 1 roll (normal)/ 12000 lines / 1 roll (large)	
Power supply	AC adapter (6V, 500 mA) 4 Alkali batteries size AA (LR6) or 4 size AA Ni-MH batteries	Dual power supply *AC adapter input voltage within a range of 100VAC 5%
Operating Temperature	0 ~ 45°C (AC Adapter) 10 ~ 45°C (batteries)	
Storage Temperature	-10 ~ 50°C	In a package as specified by TECLOCK
Accuracy	2 min. max / month	
Clock battery life expectancy	Approx. 10 years	Average life expectancy
Battery life	10000 lines 1600 mAh Ni-MH Printing every 5 sec.	Average life expectancy but varies with usage
Dimensions	201.1 × 94 × 75.2 (D × W × H)	
Weight	390 g	Without accessories
Printouts	Measurements, GO/NG judgment results	Mode 0
	Measurements, GO/NG judgment results, Number of measurements, MAX., MIN., Range, Standard deviation (σ-n, σn-1), Number of defects, Percentage of defects, Process capability index (Cp, Cpk), Histogram	Mode 1
	Same as above plus D-Chart	Mode 2
	Function of calculating the center value between the control limits required for generating various control charts	Mode 3
Processing capability	100000	Mode 0
	9999	Both Mode 1 and 2
	10 × 9999 = 99990 (Sample size × Number of sub-groups = total number of measurements) 5 sets of limit data	Mode3
Output function	Measured data (RS-232C, TTL level) GO/NG Judgment results (+NG, GO, -NG)	
Timer-controlled data input	0.25 sec, 1 sec, 5 sec, 30 sec, 1 min, 30 min, 60 min.	
Standard accessories	AC Adapter	100V-240V ZE-217 (JAPAN, USA, KOREA) 100V-240V ZE-218 (GERMANY) 100V-240V ZE-219 (U.K. and Other)
	Recording paper: 1 pc. (58 mm (W) 48 m (L))	When ordering Part No. ZE-304 (10 packs.)
	Strap	ZY-111
	Quick Reference	Q-036
	Operation manual	Q-035

Options

Model	Accessories
ZE-304	Recording Paper (10 packs)
ZE-110	RS-232C conversion cable 9 pins for AT connector
ZE-018	Extension cable 1m
ZE-019	Extension cable 2m
ZE-020	Extension cable 5m
ZE-109	Judgment result output cable
ZE-013	Foot switch



Digital Comparators

- These are exclusive equipments which comparatively measure dimension of internal diameter and outer diameter.
- After placing master gauge on measuring table and setting up standard value (zero point set up), tolerance judging measurement against standard value is possible by measuring work piece.
- Cemented carbide is provided to stylus and anvil (anvil pin).
- Special made products are complied for the measuring range except for below.



**Digital Inside Comparator
FM-55J**

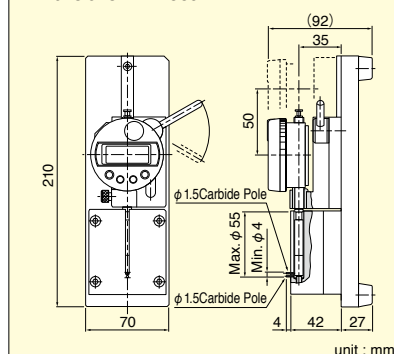
Resolution 0.001mm
Measuring Range 4~55mm



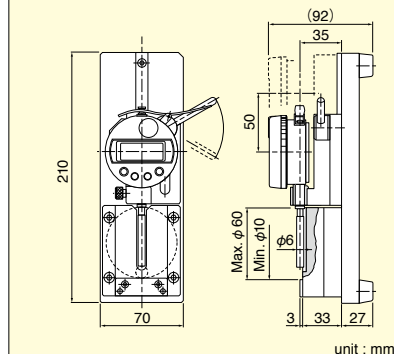
**Digital Outside Comparator
FM-60J**

Resolution 0.001mm
Measuring Range 10~60mm

Dimensions : FM-55J



Dimensions : FM-60J



Example

Effective for measuring internal diameter of thin ring (FM-55)

Specifications

Model	Resolution (mm)	Gauge Accuracy* (mm)	Measuring Range (mm)	Indicating Range (mm)	Measuring Force (N)
FM-55	0.001	0.003	4~55	12	1.5 or less
FM-60	0.001	0.003	10~60	12	1.5 or less

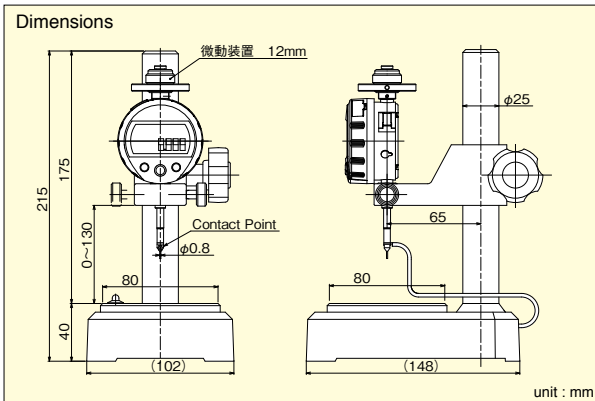
*The quantizing error is not included.

Both models can print out data with SD-763P digital mini printer and ZE-018 connection cable.

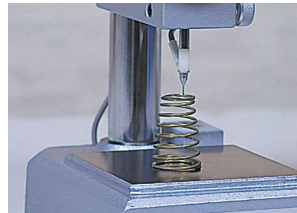


Sensor Gauge Digital Type

- Springs and pressed parts which are used for precision equipments, computer terminal and home electric goods can be measured just before their shapes are changed due to measuring force.
- If detecting contact between sensor (contact point) and work piece by energizing, it simultaneously sounds (buzzer) when LED lamp is lighting.. Then read the value which is detected.
- Micro-motion is adjusted by 12mm with upper knob.
- Work piece of maximum 150mm can be measured by using block gauge.
- As detection is implemented by energizing, work piece which is not energized can not be measured.



Example



Measuring height of coil spring

SD-465A

Resolution 0.001mm
Measuring Range 12mm



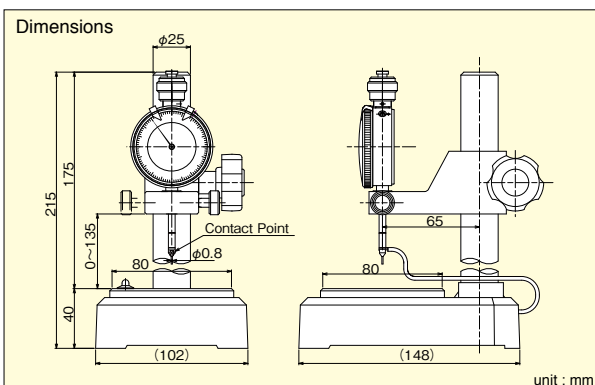
Specifications

Model	Display	Resolution (mm)	Indicating Range (mm)	Measuring Range (mm)	Gauge Error (μm)	Specimen Table Size (mm)	Power Supply	Weight (kg)
SD-465A	Digital	0.001	12	Max. 150	$\pm 3^{*1}$	W80×D80	DC3V (AA size battery×2) ^{*2}	3.4

^{*1} The quantizing error is not included. ^{*2} SR-44 battery for digital indicator

Sensor Gauge Dial Type

- Micro-motion is adjusted by 10mm with upper knob.



SD-101A

Graduation 0.001mm
Measuring Range 10mm



Specifications

Model	Display	Resolution (mm)	Indicating Range (mm)	Measuring Range (mm)	Gauge Error (μm)	Specimen Table Size (mm)	Power Supply	Weight (kg)
SD-101A	Dial (Analog)	0.01	10	Max. 150	± 15	W80×D80	DC3V (AA size battery×2)	3.4

- Specification of minimum display 0.01mm digital type, that of dial type of its graduation 0.001mm and type without stand can be produced with treatment of special order. Please contact our branch nearby for detail.

Electronic Equipment

Electronic Digital Indicator (0.01 / 0.001mm), PC-Series

- Data output and statistics transaction can be easily made by using digital indicator.
- 0.01mm and 0.001mm resolution digital indicators are available.
- Standard models are equipped with preset function and conventional models deleting preset functions are available.

As compact as standard dial indicators and can be placed where dial indicator is used. Application can be enlarged like statistical calculation of measured value, comprising measuring system by output signal.

The photo shows connection sample that PC-440J is mounted to granite stand and SD-763P Digital Mini Printer.



Measuring Range 12.7mm Type / Standard Model

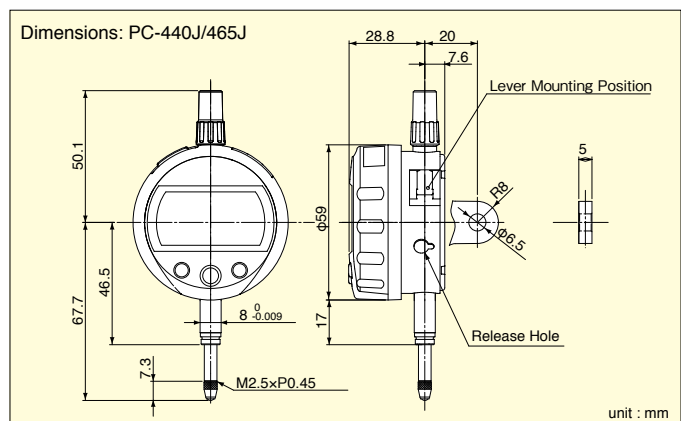


PC-440J

Resolution 0.01mm
Measuring Range 12.7mm

PC-465J

Resolution 0.001mm
Measuring Range 12.7mm



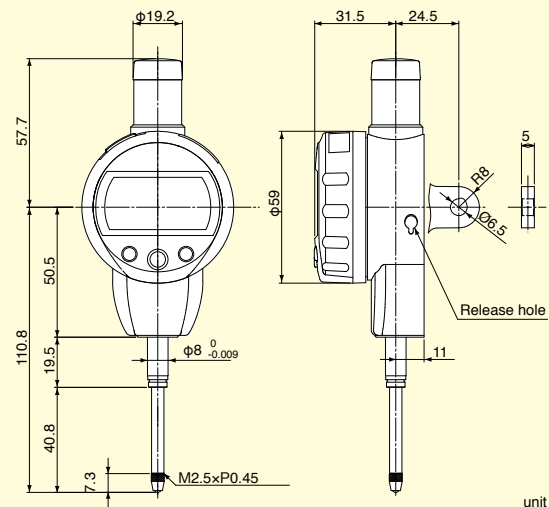
Supplied with Lug back as standard models.
Flat back and Lift lever are optional.



Measuring Range 25.4mm Type / Standard Model



Dimensions: PC-450J-f / 455J-f

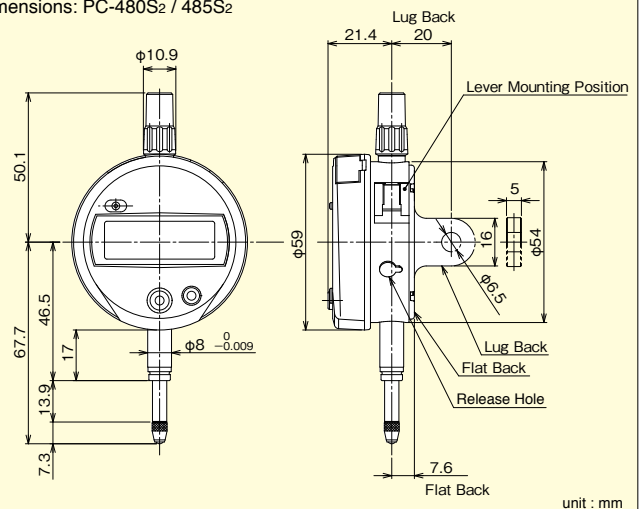


Supplied with Flat back as standard models.
Lug back and Lift lever are optional.

Measuring Range 12.7mm Type / Popular Model



Dimensions: PC-480S2 / 485S2



Supplied with Lug back as standard models (ZL-026).
Flat back (ZY-080) and Lift lever (ZY-918) are optional.

Specifications

Model	PC-440J	PC-465J	PC-450J-f	PC-455J-f	PC-480S ₂	PC-485S ₂
Measuring Range	0~12.7mm		0~25.4mm		0~12.7mm	
Resolution	0.01mm	0.001mm	0.01mm	0.001mm	0.01mm	0.001mm
Accuracy	0.02mm *	0.003mm*	0.02mm or less	0.003mm	0.02mm or less*	0.003mm or less*
Maximum response speed	1000mm/sec	480mm/sec	480mm/sec	480mm/sec	Unlimited	
Contact force	1.0N or less	1.5N or less*	1.8N or less*		2.0N or less*	
Display	LCD display (6-digital & minus)				LCD display (5-digital & minus)	LCD display (6-digital & minus)
Operating temp	0~40°C					
Functions	Preset, Zero-set, Power OM/OFF, Counting direction switching, Digimatic code output				Origin-set, Power ON/OFF, Counting direction Switching, Digimatic code output Display rotation(330°)	
Power supply	SR44 (Button, Silver oxide cell)					
Battery life	Approx. 5,000hours in continuous service				Approx. 20,000hours in continuous service	
Contact Point	R=1.5mm (carbide)					
Contact point thread (ISO/JIS type)	M2.5×P0.45mm					
Weight	170g		186g		120g	150g

* The quantising error is not included.



Digital Mini Printer

- Multi-function mini printer for Digital Indicator



SD-763P

Mode 0

To print measured data, and judgement.

```

* MODE 0 *
DATE 2002/ 7/ 9
TIME 13:45

*LIMIT MODE*
*LIMIT DATA 1*
*NO LIMIT DATA*
LIMIT1 7.472 mm

LIMIT2 2.849 mm

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:47

LSL 2.849 mm
USL 7.472 mm
TOL 4.623 mm

1 5.395 mm
2 4.827 mm
3 4.826 mm
4 -1.089 mm
5 -2.727 mm
6 4.385 mm
7 10.392 mm
8 9.045 mm
9 2.098 mm
10 3.747 mm
11 -3.130 mm

```

Judgement

Perform statistical calculations

Histogram

Mode 1

To print measured data, judgement, perform statistical calculations, and generate histogram.

```

* MODE 1 *
DATE 2002/ 7/ 9
TIME 13:45

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:51

LSL -0.016 mm
USL 4.543 mm
TOL 4.559 mm

* RESULT *
N 12
MAX 6.507 mm
MIN -1.414 mm
R 7.921 mm
σ 2.74216 mm
σn-1 2.43469 mm
σn-1 2.54295 mm

-NG 2
+NG 2
P 33.333 %
Cp 0.299
Cpk 0.236

* HISTOGRAM *
LSL -0.016 mm
USL 4.543 mm
TOL 4.559 mm

DIV 10

-NG 2
LSL 1
A 1
B 1
C 0
D 0
E 1
F 1
G 1
H 1
I 1
J 3
+NG 2

```

Mode 2

To print D-chart, perform statistical calculations, and generate histogram.

```

* MODE 2 *
DATE 2002/ 7/ 9
TIME 13:55

1 -3.132 mm
2 1.782 mm
3 2.608 mm
4 6.590 mm
5 -0.737 mm
6 -0.737 mm
7 1.705 mm
8 1.705 mm

* CANCEL *
8 1.925 mm
9 1.762 mm
10 4.316 mm

*NEW LIMIT DATA*
*LIMIT DATA 1*
DATE 2002/ 7/ 9
TIME 13:58

LSL 0.452 mm
USL 3.591 mm
TOL 3.139 mm

```

D-Chart

Mode 3

By entering data, it will calculate and draw a R-control chart.

```

* CLEAR SUB DATA *
* EXIT SUB GR. *

* CLEAR ALL DATA *

SUB GR. NO. 1
1 4.121 mm
2 0.326 mm
3 0.326 mm
4 4.643 mm
5 2.733 mm

```

```

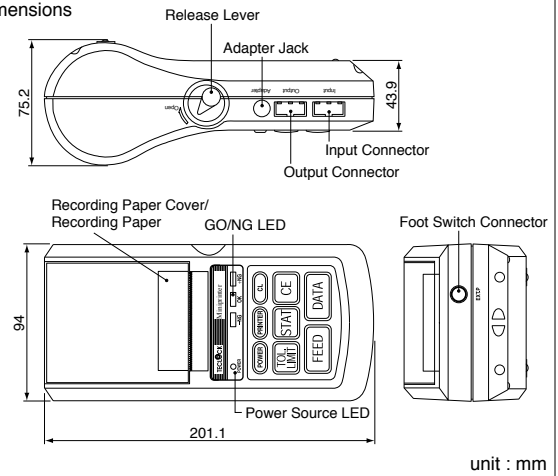
* CONTROL LIMIT *
DATE 2002/ 7/ 9
TIME 14: 7
NO. OF SUB GR. 1
SAMPLE SIZE 5

X 1.14478 mm
UCL 1.52963 mm
LCL 0.75992 mm
X 1.14200 mm
UCL 2.07387 mm
LCL 0.21013 mm

```

Operation result

Dimensions



unit : mm

Specifications

Item	Description	Remarks
Printing Method	Line thermal 384 dot	
Character format	36 × 24 (Large) 24 × 16 (Normal)	
Printing Speed	0.5 sec. per line	When using AC adapter
Printing line numbers per printing roll	6500 lines / 1 roll (normal)/ 12000 lines / 1 roll (large)	
Power supply	AC adapter (6V, 500 mA) 4 Alkali batteries size AA (LR6) or 4 size AA Ni-MH batteries	Dual power supply *AC adapter input voltage within a range of 100VAC 5%
Operating Temperature	0 ~ 45°C (AC Adapter) 10 ~ 45°C (batteries)	
Storage Temperature	-10 ~ 50°C	In a package as specified by TECLOCK
Accuracy	2 min. max / month	
Clock battery life expectancy	Approx. 10 years	Average life expectancy
Battery life	10000 lines 1600 mAh Ni-MH Printing every 5 sec.	Average life expectancy but varies with usage
Dimensions	201.1 × 94 × 75.2 (D × W × H)	
Weight	390 g	Without accessories
Printouts	Measurements, GO/NG judgment results	Mode 0
	Measurements, GO/NG judgment results, Number of measurements, MAX., MIN., Range, Standard deviation (σ-n, σn-1), Number of defects, Percentage of defects, Process capability index (Cp, Cpk), Histogram	Mode 1
	Same as above plus D-Chart	Mode 2
	Function of calculating the center value between the control limits required for generating various control charts	Mode 3
Processing capability	100000	Mode 0
	9999	Both Mode 1 and 2
	10 × 9999 = 99990 (Sample size × Number of sub-groups = total number of measurements) 5 sets of limit data	Mode3
Output function	Measured data (RS-232C, TTL level) GO/NG Judgment results (+NG, GO, -NG)	
Timer-controlled data input	0.25 sec, 1 sec, 5 sec, 30 sec, 1 min, 30 min, 60 min.	
Standard accessories	AC Adapter	100V-240V ZE-217 (JAPAN, USA, KOREA) 100V-240V ZE-218 (GERMANY) 100V-240V ZE-219 (U.K. and Other)
	Recording paper: 1 pc. (58 mm (W) 48 m (L))	When ordering Part No. ZE-304 (10 packs.)
	Strap	ZY-111
	Quick Reference	Q-036
	Operation manual	Q-035

Options

Model	Accessories
ZE-304	Recording Paper (10 packs)
ZE-110	RS-232C conversion cable 9 pins for AT connector
ZE-018	Extension cable 1m
ZE-019	Extension cable 2m
ZE-020	Extension cable 5m
ZE-109	Judgment result output cable
ZE-013	Foot switch



Digital Comparators

- These are exclusive equipments which comparatively measure dimension of internal diameter and outer diameter.
- After placing master gauge on measuring table and setting up standard value (zero point set up), tolerance judging measurement against standard value is possible by measuring work piece.
- Cemented carbide is provided to stylus and anvil (anvil pin).
- Special made products are complied for the measuring range except for below.



**Digital Inside Comparator
FM-55J**

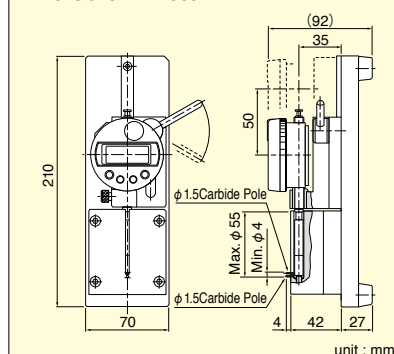
Resolution 0.001mm
Measuring Range 4~55mm



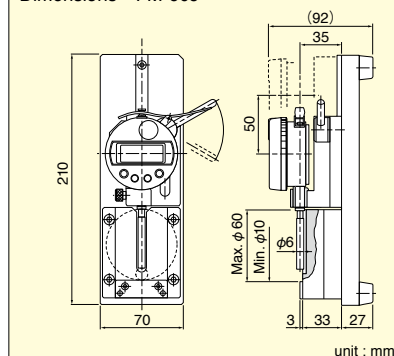
**Digital Outside Comparator
FM-60J**

Resolution 0.001mm
Measuring Range 10~60mm

Dimensions : FM-55J



Dimensions : FM-60J



Example

Effective for measuring internal diameter of thin ring (FM-55)

Specifications

Model	Resolution (mm)	Gauge Accuracy* (mm)	Measuring Range (mm)	Indicating Range (mm)	Measuring Force (N)
FM-55	0.001	0.003	4~55	12	1.5 or less
FM-60	0.001	0.003	10~60	12	1.5 or less

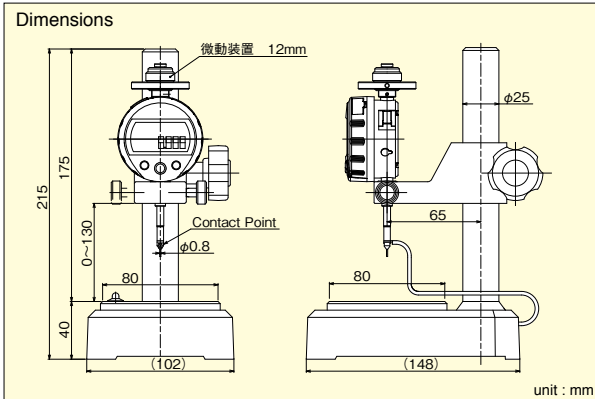
*The quantizing error is not included.

Both models can print out data with SD-763P digital mini printer and ZE-018 connection cable.

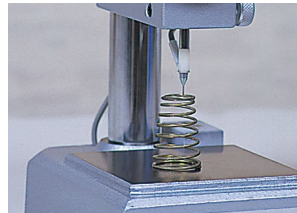


Sensor Gauge Digital Type

- Springs and pressed parts which are used for precision equipments, computer terminal and home electric goods can be measured just before their shapes are changed due to measuring force.
- If detecting contact between sensor (contact point) and work piece by energizing, it simultaneously sounds (buzzer) when LED lamp is lighting.. Then read the value which is detected.
- Micro-motion is adjusted by 12mm with upper knob.
- Work piece of maximum 150mm can be measured by using block gauge.
- As detection is implemented by energizing, work piece which is not energized can not be measured.



Example



Measuring height of coil spring

SD-465A

Resolution 0.001mm
Measuring Range 12mm



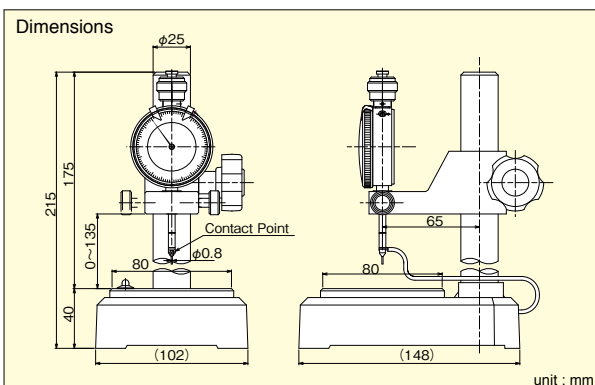
Specifications

Model	Display	Resolution (mm)	Indicating Range (mm)	Measuring Range (mm)	Gauge Error (μm)	Specimen Table Size (mm)	Power Supply	Weight (kg)
SD-465A	Digital	0.001	12	Max. 150	±3 ^{*1}	W80×D80	DC3V (AA size battery×2) ^{*2}	3.4

^{*1} The quantizing error is not included. ^{*2} SR-44 battery for digital indicator

Sensor Gauge Dial Type

- Micro-motion is adjusted by 10mm with upper knob.



SD-101A

Graduation 0.001mm
Measuring Range 10mm



Specifications

Model	Display	Resolution (mm)	Indicating Range (mm)	Measuring Range (mm)	Gauge Error (μm)	Specimen Table Size (mm)	Power Supply	Weight (kg)
SD-101A	Dial (Analog)	0.01	10	Max. 150	±15	W80×D80	DC3V (AA size battery×2)	3.4

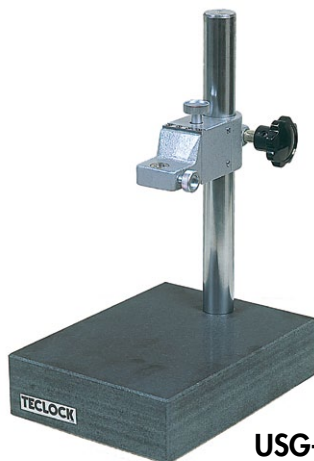
- Specification of minimum display 0.01mm digital type, that of dial type of its graduation 0.001mm and type without stand can be produced with treatment of special order. Please contact our branch nearby for detail.

Stand

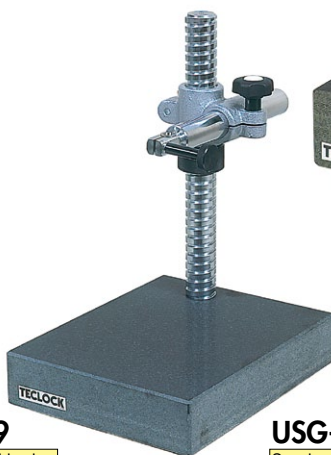
These are stands which can make precision measurement of work piece by mounting Dial Indicator or Digital Indicator. As to natural granite (micro-granite) base, its organization is fine particle and work piece slides smoothly without ringing. Stable and high flatness accuracy within 0.001mm / 200mm square is also characteristics. Please select referring to size of base or fine adjustment device from various lineup.

Granite Comparator Stand

- Natural micro-granite is used for all granite comparator stands.
- Flatness accuracy : within 0.001mm / 200mm square.
- Sliding smoothly and objects to be measured are not damaged. It is superior for anti-abrasion.
- The rigid granite base is free from burrs and pileups.
- It is easy for maintenance as base never suffers from rust.



USG-29
Specimen table size
150×200×50mm



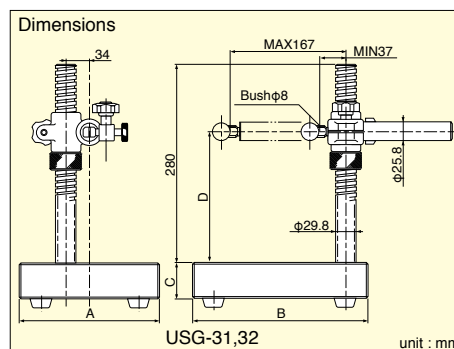
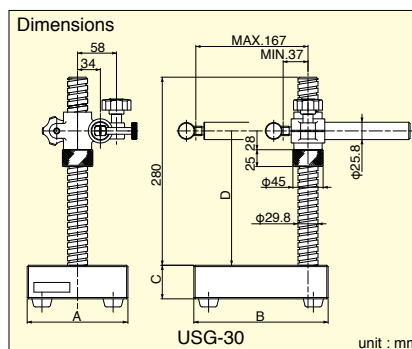
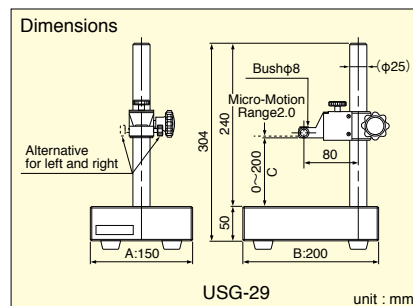
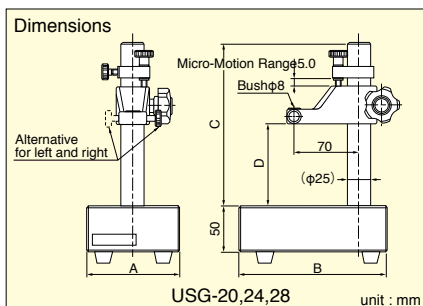
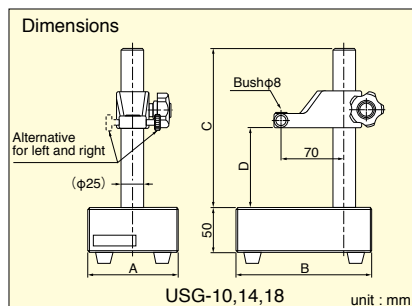
USG-30
Specimen table size
150×200×50mm



USG-10
Specimen table size
100×150×50mm



USG-24
Specimen table size
150×150×50mm



Specifications

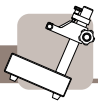
Model	Type	Specimen Table Size (A×B) (mm)	Height of Pole (C) (mm)	Movable Range (D) (mm)	Weight (kg)
USG-10	Standard	100×150	175	0~130	3.5
USG-14	Standard	150×150	175	0~130	4.9
USG-18	Standard	150×200	240	0~200	5.8
USG-20	Fine Adjustment	100×150	175	0~115	3.5
USG-24	Fine Adjustment	150×150	175	0~115	4.9
USG-28	Fine Adjustment	150×200	240	0~180	5.8
USG-29	Precision Fine Adjustment	150×200	240	0~200	6.0

Model	Type	Specimen Table Size (A×B×C) (mm)	Movable Range (D) (mm)	Bush φE (mm)	Weight (kg)
USG-30	Square Screw, Arm Slide	150×200×50	53~250	φ8	7.3
USG-31	Square Screw, Arm Slide	200×250×50	53~250	φ8	10.5
USG-32	Square Screw, Arm Slide	250×250×50	53~250	φ8	12.5

For USG30~32, depending on the measuring device in use, the probe may not contact to the base surface since the effective movable range is 53mm or more. Use an extension rod or the like to extend.

Other combinations of specimen table and pole unit than the above chart are also possible.

The specimen table is possible to be made up to 500x500mm according to the requested size.



Upright Stand

- This can be easily used by only mounting Dial Indicator for comparison measurement.
- This small stand is suitable for measuring small parts etc.



US-16B

Specimen table size 80×80mm
Standard Type
Precision Grinding Cast Iron base



US-22B

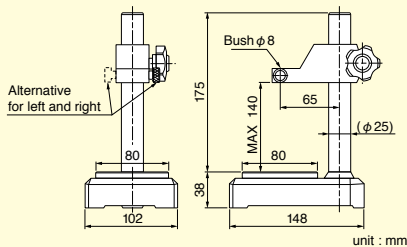
Specimen table size 80×80mm
With fine adjustment device
Precision Grinding Cast Iron base



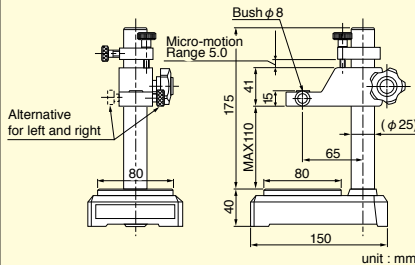
US-25

Specimen table size ϕ 60mm
With fine adjustment device
 ϕ 60mm Ceramics base

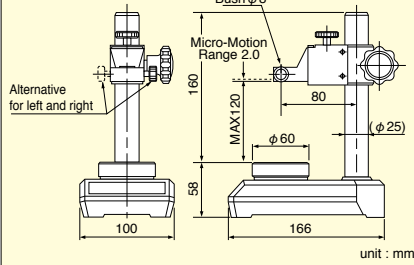
Dimensions : US-16B



Dimensions : US-22B



Dimensions : US-25



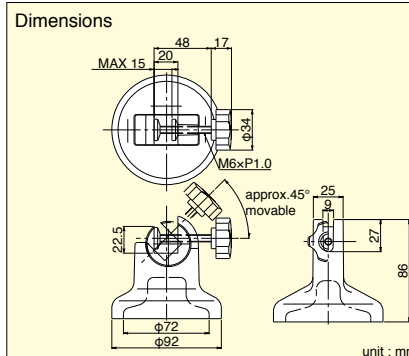
Specifications

Model	Type	Specimen Table Size (mm)	Movable Range (mm)	Weight(kg)
US-16B	Standard Type	80×80	0~140	3.4
US-22B	With Micro-Motion Device	80×80	0~110	3.5
US-25	Parallel Spring Type Precision Micro-Motion Device	ϕ 60	0~120	3.9

Holder Stand for Thickness Gauge



FM-18



Specifications

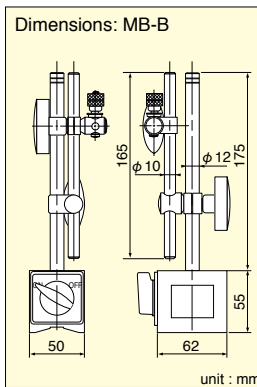
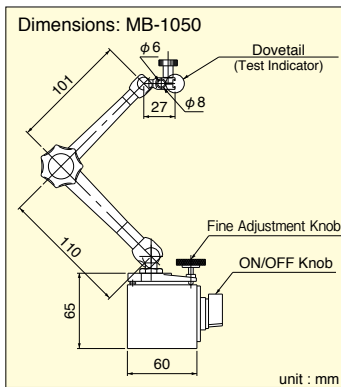
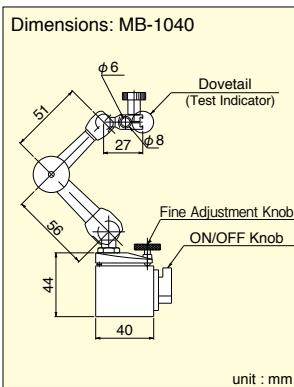
Model	Size (mm)	Weight(g)
FM-18	base ϕ 92 , hight 86	850

Magnetic Base

- Magnetic base can hold a measuring device such as dial indicator.
- Adaptor (Internal diameter $\phi 6\text{mm}$) is supplied for holding test indicators on model : MB-1040 and MB-1050
- MB-1040 / 1050 can also be fixed with dovetail of auto-clutch lever test.
- Dial indicator is mounted to MB-B with lug back and test indicator is clamped with stem (It can not be clamped with dovetail).
- MB-1040 / 1050 can not be clamped with dovetail.



Example
Magnetic Base with Test Indicator.
Dial indicator is also applied.



Specifications

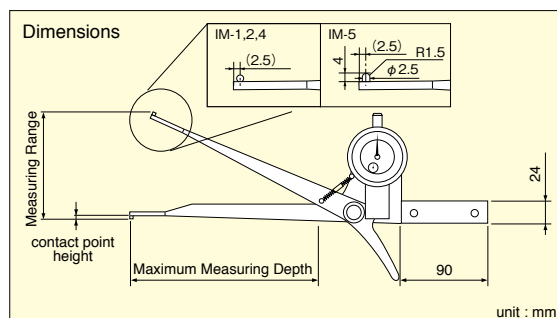
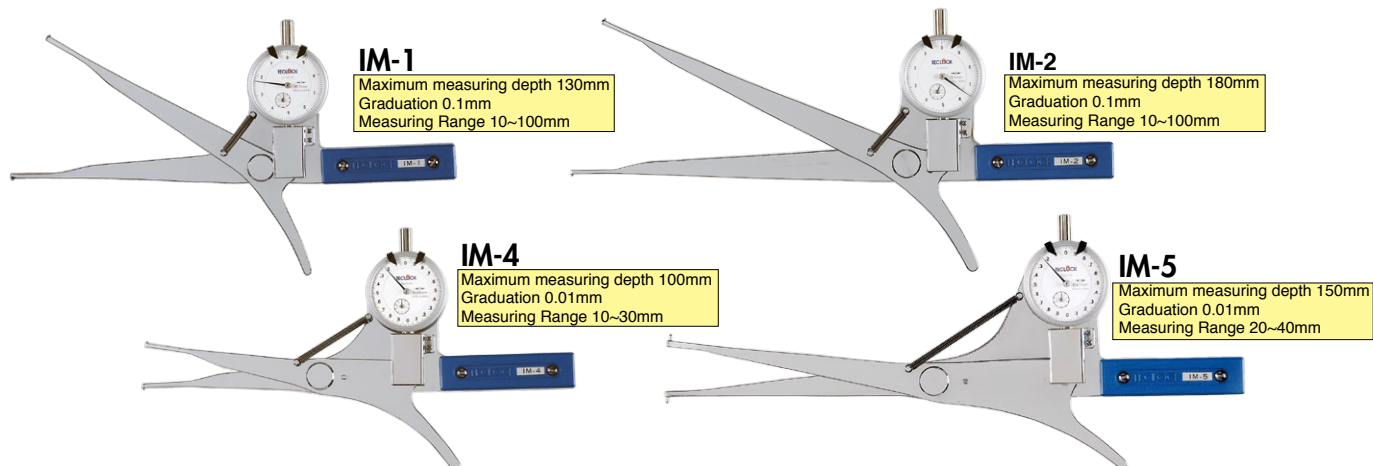
Model	Type	Holding Power (N)	Mount Hole Diameter(mm)	Weight (kg)
MB-1040	One-touch, fine adjustment, small	320	6.0/8.0	0.5
MB-1050	One-touch, fine adjustment	800	6.0/8.0	1.4
MB-B	Standard	800	4.5/6.5	1.5

Caliper Gauge

As to internal caliper gauge IM-880 series, the distance between contact points facing outside is firstly set at standard dimension with ring gauge or micrometer. Then, it is measured by inserting contact point into internal dimension part to be measured after its outer dial of which moves together with rotated bezel is set at "0". The displacement of indicator from "0" point of outer dial is to be measured at that time. The value adding to the read displacement to standard dimension or deducting it from standard dimension is the dimension of internal diameter. This series attaches spare contact point which can set accurate dimension corresponding to size of internal dimension. External caliper gauge is opposite, namely reading the value by holding work piece with 2 contact points facing outside.

Internal Dial Caliper Gauge

- These gauges are designed for use in measuring deep internal diameter of bores of castings etc, and for internal reading in fabrications. Clearance has been provided for use in recessed bores. The convenient retraction lever allows one-hand operation.



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Indication Error (mm)	Maximum Measuring Depth (mm)	Contact Point Height (mm)	Measuring Force (N)	Weight (g)
IM-1	0.1	10~100	±0.1	130	2	5 or less	500
IM-2	0.1	10~100	±0.1	180	2	5 or less	620
IM-4	0.01	10~30	±0.02	100	2	5 or less	500
IM-5	0.01	20~40	±0.02	150	4	5 or less	600

Internal size of workpiece is 10mm, 15mm, 20mm and 30mm or over against measuring applicable depth.

Measuring applicable depth	Internal Size			
	10	15	20	30~
Model				
IM-1	35	50	80	130
IM-2	35	50	80	180
IM-4	35	50	80	100
IM-5	—	—	140	150

Inside of workpiece should be straight or round shape without step etc.



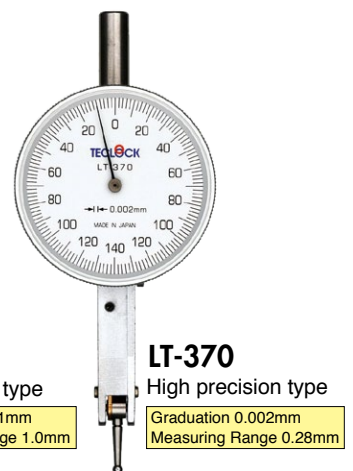
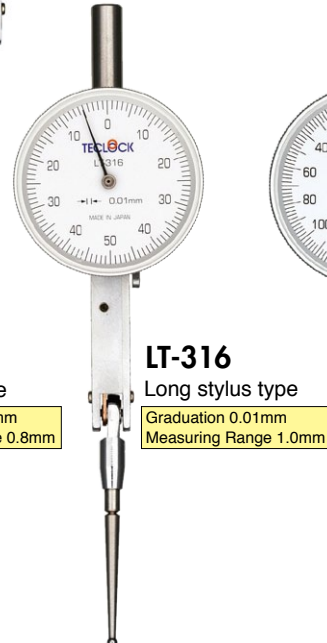
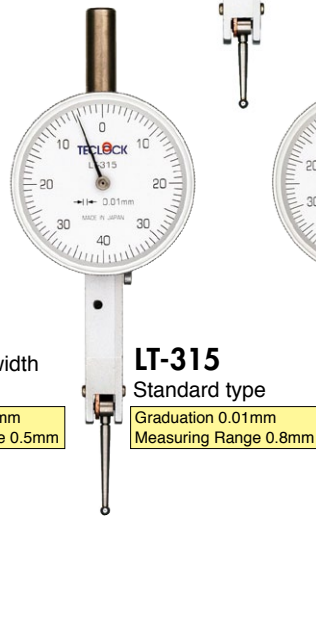
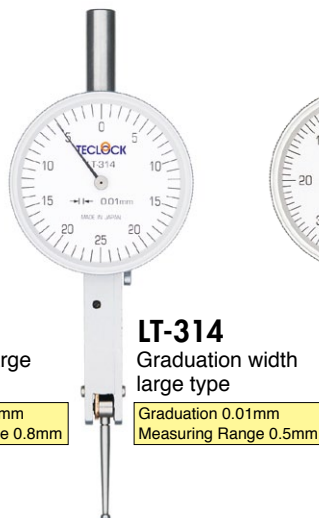
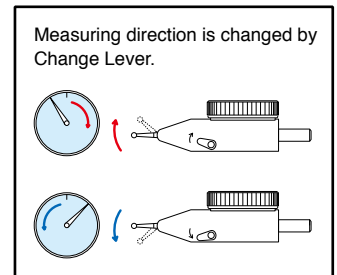
Measuring example of inner diameter of a small metal work piece.

Test Indicator

Dial Test Indicators are designed to be positioned for easy and accurate readability and are applicable for various usages such as measuring dimension, parallelism and centering of work piece and measuring revolution axis of machinery equipment and turnout of work pieces processed by lathe etc., and making table face of machinery equipment parallel. This has strong point if compared with standard dial indicator and has sensitivity for microscopic dimension displacement measurement. As its stylus is leg type with ball edge, narrow space can be measured, where its edge (standard $\phi 2\text{mm}$ ultra hand ball) can enter. $\phi 0.6\text{mm}$, $\phi 0.8\text{mm}$ and $\phi 1.0\text{mm}$ are available.

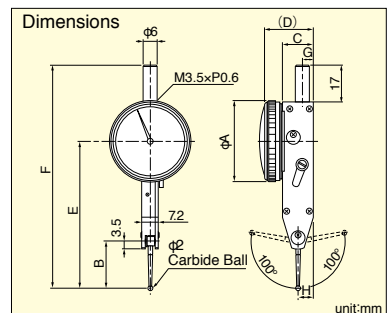
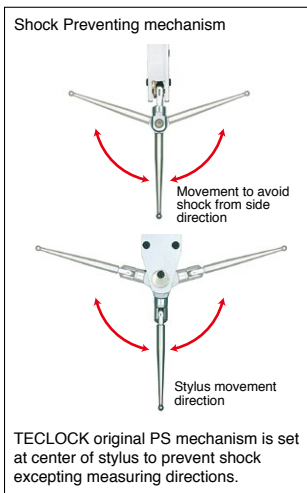
Lever Type Test Indicator

- Measuring direction can be changed with change lever.
- Main bearings are jeweled for all models.
- A carbide ball stylus is provided for less abrasion.
- Stylus is made of $\phi 2\text{mm}$ stainless steel and it is unique threaded type which can be changed easily.
- Stylus and pointer are anti-magnetic and not affected by magnetism.
- Due to the low measuring force, this is suitable for measurement of thin work piece as well.

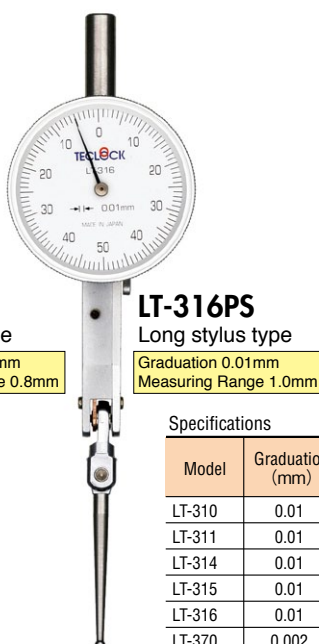
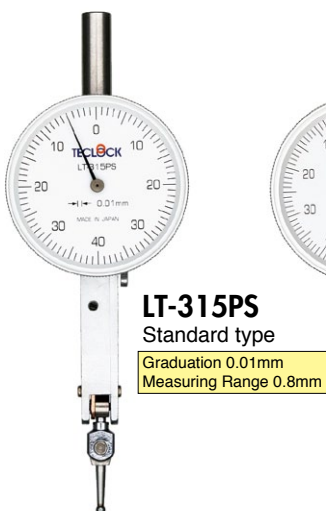


PS Type Test Indicator

- Shock from the angle excepting measuring direction can be avoided and body is protected by Teclock original shock preventing mechanism (PS mechanism) of center of stylus.



Model	A	B	C	D	E	F	G	H
LT-310	28.4	15.3	14	22.4	47.3	79.3	5	7
LT-311	35	15.3	14	23.3	47.3	79.3	5	7
LT-314	35	21.5	13.5	23	64.5	98.5	4.8	6.8
LT-315	35	20.1	13.5	23	63.1	97.1	4.8	6.8
LT-316	35	42.9	13.5	23	85.9	120	4.8	6.8
LT-370	38.4	12	13.5	23.2	55	89	4.8	6.8



Major dimension is equal to LT-315 and LT-316.

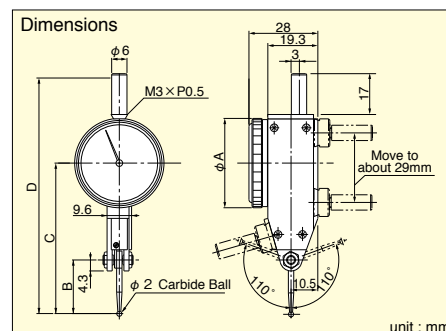
Specifications

Model	Graduation (mm)	Measuring Range (mm)	Dial Reading	Measuring Force	Repeatability (μm)	Adjacent Error (μm)	Accuracy on full range (μm)	Hysteresis (μm)	Standard Stylus	Weight (g)
LT-310	0.01	0.8	0-40-0	0.4 or less	3	5	8	3	ZS-700	50
LT-311	0.01	0.8	0-40-0	0.4 or less	3	5	8	3	ZS-700	55
LT-314	0.01	0.5	0-25-0	0.4 or less	3	5	5	3	ZS-701	70
LT-315	0.01	0.8	0-40-0	0.4 or less	3	5	8	3	ZS-702	65
LT-316	0.01	1.0	0-50-0	0.4 or less	3	5	10	4	ZS-704	65
LT-370	0.002	0.28	0-140-0	0.4 or less	1	2	3	2	ZS-713	75
LT-315PS	0.01	0.8	0-40-0	0.4 or less	3	5	8	3	ZS-703	70
LT-316PS	0.01	1.0	0-50-0	0.4 or less	3	5	10	4	ZS-705	70



- As miniature bearing (pivot ball bearing) is used for stylus revolution bearing. It is not affected by shaft looseness and indication is stable.
- Measuring direction is automatically changed for proper and opposite by auto-clutch mechanism without changing lever. It is always read accurately in any case, as stylus rotates in clockwise direction..
- Stylus can be set at any desired position of angle of 220 °circle.

- Stem with dovetail groove (Option) can be mounted to 2 points of front and back part.
- A carbide ball stylus is provided for less abrasion and stylus is made of stainless steel..
- Stylus and pointer are anti-magnetic and not affected by magnetism.



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Dial Reading	Measuring Force	Repeatability (µm)	Adjacent Error (µm)	Accuracy on full range (µm)	Hysteresis (µm)	Standard Stylus	Weight (g)
LT-352	0.01	0.8	0-40-0	0.2 or less	3	5	8	3	ZS-709	75
LT-353	0.01	0.8	0-40-0	0.2 or less	3	5	8	4	ZS-710	75
LT-354	0.01	0.5	0-25-0	0.2 or less	3	5	5	3	ZS-799	75
LT-355	0.002	0.28	0-140-0	0.25 or less	1	2	3	2	ZS-711	75
LT-358	0.001	0.2	0-100-0	0.25 or less	1	2	3	2	ZS-712	75

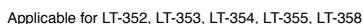
Dimensions Table

Model	A	B	C	D
LT-352	35	21	59	95
LT-353	35	40.6	78.6	114.6
LT-354	35	25.4	63.4	99.4
LT-355	38.4	18	56	92
LT-358	38.4	15	53	89

unit : mm

Stems with dovetail slot for Auto-Clutch Test indicator (Option)

Standard stem diameter is 6mm but $\phi 4\text{mm}$ and $\phi 8\text{mm}$ are also available on request



Leveling, parallelism and center run out of work piece are measured by fixing lever test with holder or chuck and moving work piece. Above photo shows that leveling is measured by installing test indicator to electric discharge machine machining center.



Parts & Accessories

Stylus

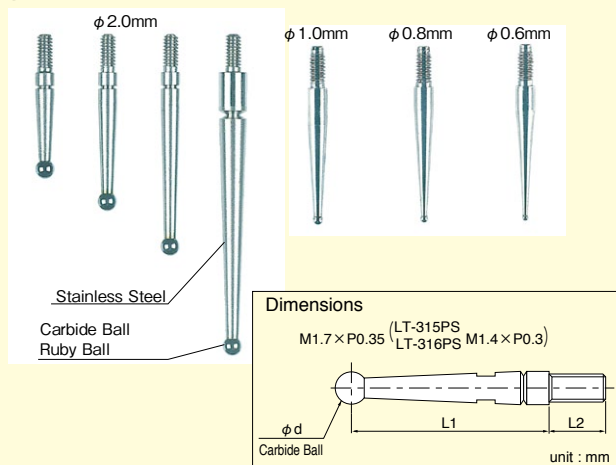
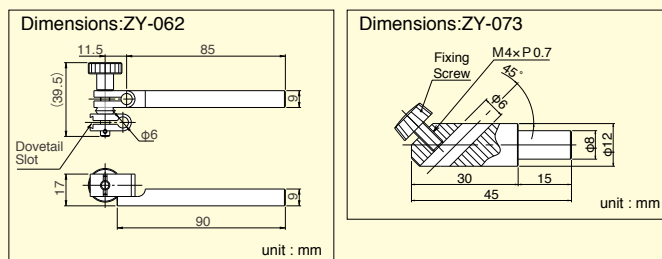
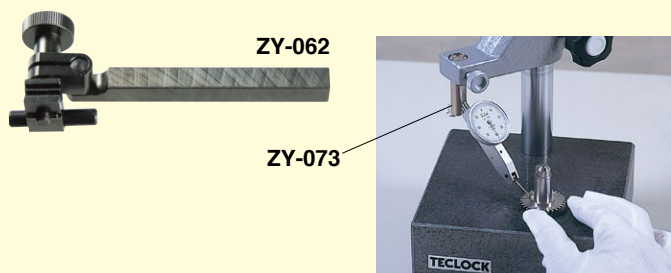


Table for applicable Stylus and Parts

Model	L1 (mm)	L2 (mm)	φd (mm)				
			φ0.6	φ0.8	φ1.0	φ2.0 (Standard)	φ2.0 (Carbide Ball)
LT-310	13.30	4.00	ZS-744	ZS-755	ZS-766	ZS-700	ZS-787
LT-311	13.30	4.00	ZS-744	ZS-755	ZS-766	ZS-700	ZS-787
LT-314	19.45	4.00	ZS-745	ZS-756	ZS-767	ZS-701	ZS-788
LT-315	18.10	4.00	ZS-746	ZS-757	ZS-768	ZS-702	ZS-789
LT-316	28.40	4.00	ZS-748	ZS-759	ZS-770	ZS-704	ZS-790
LT-370	10.00	4.00	ZS-754	ZS-765	ZS-776	ZS-713	ZS-795
LT-352	17.80	4.00	ZS-750	ZS-761	ZS-772	ZS-709	ZS-791
LT-353	37.38	4.00	ZS-751	ZS-762	ZS-773	ZS-710	ZS-792
LT-354	22.16	4.00	ZS-811	ZS-812	ZS-813	ZS-799	ZS-815
LT-355	14.80	4.00	ZS-752	ZS-763	ZS-774	ZS-711	ZS-793
LT-358	11.80	4.00	ZS-753	ZS-764	ZS-775	ZS-712	ZS-794
LT-315PS	8.65	1.80	ZS-747	ZS-758	ZS-769	ZS-703	ZS-796
LT-316PS	28.40	1.80	ZS-749	ZS-760	ZS-771	ZS-705	ZS-797

Lever Test Holder

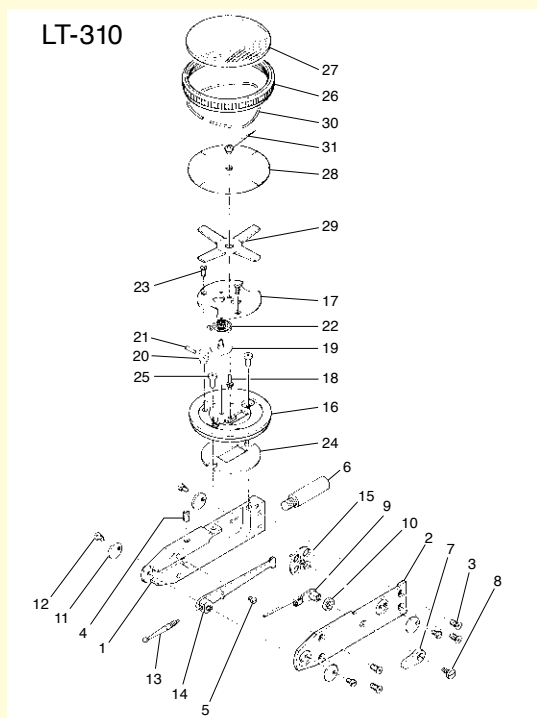
This holder fixes lever test with φ6mm hole or dovetail.



Code No.	Specification
ZY-062	Dovetail slot or φ6mm stem
ZY-073	φ6mm Stem (Setting angle 45°)

Parts List

Test Indicator



Key No.	Parts No.	Parts name	Key No.	Parts No.	Parts name
1	DG-310001	Frame	17	DG-310032	Upper Plate Ass'y
2	DG-310002	Frame Cover	18	DG-310033	Center Pinion
3	002301	Frame Cover Screw	19	DG-310535	2# Gear Ass'y
4	DG-310008	Stop Screw A	20	DG-310037	Received Hair Spring
5	DG-310009	Stop Screw B	21	DG-310038	Hair Spring Pin
6	ZY-030	Stem	22	DG-310539	Hair Spring
7	DG-310011	Lever	23	002301	Upper Plate Screw
8	DG-310012	Lever Screw	24	DG-310042	Cover
9	DG-310515	Stopper Ass'y	25	001315	Base Plate Screw
10	DG-310016	Washer	26	DG-310045	Bezel
11	DG-310017	Fulcrum Cover	27	DG-310046	Dial Cover
12	001329	Fulcrum Cover Screw	28	T-5400B	Dial Plate
13	ZS-700	Contact Point	29	DG-310048	Dial Plate Spring
14	DG-310522	1# Fulcrum Ass'y	30	DG-310049	Bezel Spring
15	DG-310525	Crown Gear Ass'y	31	DG-310551	Pointer
16	DG-310031	Base Plate Ass'y			

Precautions on use of Dial Indicator / Test Indicator

1. Confirmation of performance

Please confirm whether prescribed performance is maintained with implementation of receiving inspection based on purchasers' specifications. Please refer to contents of standard of Dial Indicator JIS B 7503, JMAS2001, and Dial Test Indicator JIS B 7533 on the occasion of their treatment.

2. Operating environments / storage

- (1) Temperature : 0°C to 40°C, Relative Humidity : 30% ~ 70%
(No condensation)
- (2) Please do not use the indicator with little dust, oil mist and where it will be exposed to direct sunlight.
- (3) Please keep it in good condition that oil mist and dust will not be adhered

3. Usage condition

- (1) Dial Indicator : Please do not suddenly displace spindle and not force perpendicular to the spindle.
- (2) Dial Test Indicator : In case of adding more than enough force to contact point from the excepting contact point direction, its performance will get worse or it will be damaged.

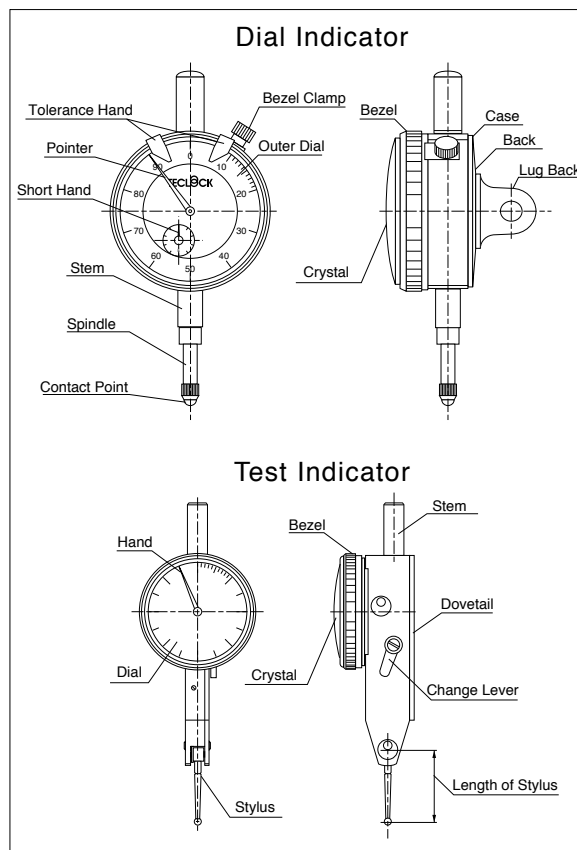
4. Precautions on use

- (1) Check before using
 - ① Confirm whether operation is smooth.
 - ② Confirm whether quiescent point of indicator (pointer / short hand) is stable.
 - ③ Dial Indicator : Confirm whether contact point and lug back (back lid) are not loose.
 - ④ Dial Test Indicator : Please confirm whether contact point and stem are not loose. Torque for fastening screws of contact point is to be in the range 1.5 ~ 2.0kg·cm. If it is fastened too strong, screw part will be damaged.
- (2) Installation method
 - ① Dial Indicator should be installed with only stem or lug back. (Dial Test Indicator should be with stem or dovetail)
 - ② Holding tool should be sufficiently stiff.
 - ③ Whether installation is right or wrong can be confirmed by that the pointer will return to the set position even after contact point of Dial indicator (Test Lever) is touched to measured substance and inner frame (case) is pushed from up and down by finger.
 - ④ Angle of Dial Test Indicator contact point Please set contact point to be perpendicular to measuring direction. In case of measuring large angle, please correct it. Otherwise, angle error will occur.
- (3) Suppose dial is read from oblique direction of outer dial, error will happen. Please read from front face.
- (4) In case of changing contact point and back lid of dial indicator, please use only the parts designated by Teclock.
- (5) In case of changing contact point of dial test indicator, please use only the parts designated by Teclock. As to contact point, please use the same length. As to dial test indicator, since expansion mechanism is provided, large error will occur, in case of using contact point of different length.
- (6) In case of using it where temperature changes, please frequently confirm the setting point of pointer with master gauge etc.
- (7) In case of dropping it down or making impact with it, please use it after inspection.

5. Maintenance, inspection and repair

- (1) In case of operation is deteriorated due to dirt of sliding part of spindle, please wipe stains from the spindle by using a dry cloth or a cloth dampened with alcohol.
- (2) In case that outer dial can not be read due to dirt of crystal, please wipe stains from the crystal by using a dry cloth or a cloth dampened with neutral detergent. Please do not use organic solvent like benzine, thinner and alcohol etc.
- (3) The performance of the indicator may deteriorate depending on the operating environment and conditions. Please determine the inspection period according to user's operating frequency, environment, and method and periodically inspect the performance.
- (4) Instruments repaired or disassembled by parties not authorized by TECLOCK can not be warranted by us.

Nomenclature



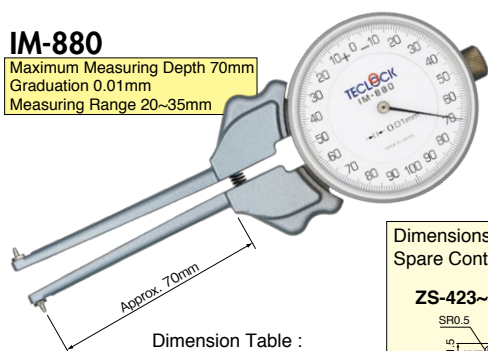


Dial Depth Gauge

- Internal caliper gauge to measure internal diameter of cylindrical workpiece and recessed groove diameter. It can measure groove diameter of "O" ring by modifying spare contact point.
- Set dimension within $\pm 1\text{mm}$ (indication range 2mm) can be comparatively measured (880 series) by alternatively using auxiliary spare contact point in accordance with measured dimension.

IM-880

Maximum Measuring Depth 70mm
Graduation 0.01mm
Measuring Range 20~35mm



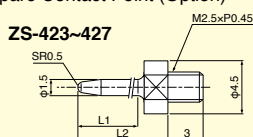
Dimension Table :
Spare Contact Point (Option)

Code No.	L1	L2	Measuring Range
ZS-423	2.5	4	20-23
ZS-424	3.5	5	22-25
ZS-425	4.5	6	24-27
ZS-426	5.5	7	26-29
ZS-427	5.5	8	28-31
ZS-428	5.5	9	30-33
ZS-429	5.5	10	32-35

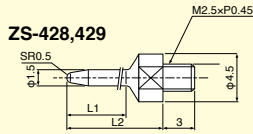
unit : mm

Dimensions :
Spare Contact Point (Option)

ZS-423~427



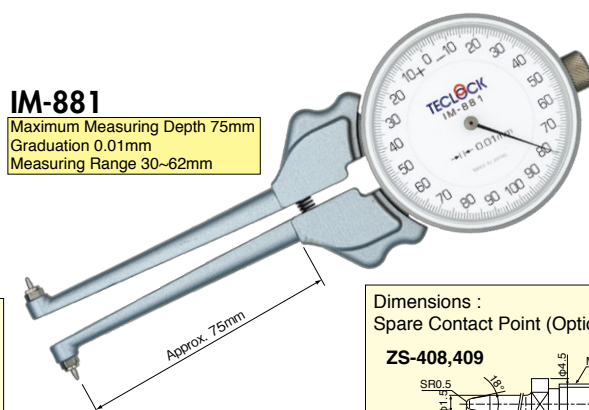
ZS-428,429



unit : mm

IM-881

Maximum Measuring Depth 75mm
Graduation 0.01mm
Measuring Range 30~62mm



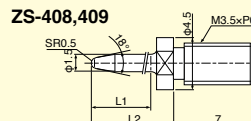
Dimension Table :
Spare Contact Point (Option)

Code No.	L1	L2	Measuring Range
ZS-408	3	4.5	30-38
ZS-409	5.5	7.5	36-44
ZS-410	6	10.5	42-50
ZS-411	6	13.5	48-56
ZS-412	6	16.5	54-62

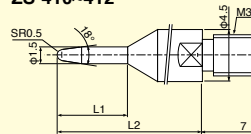
unit : mm

Dimensions :
Spare Contact Point (Option)

ZS-408,409



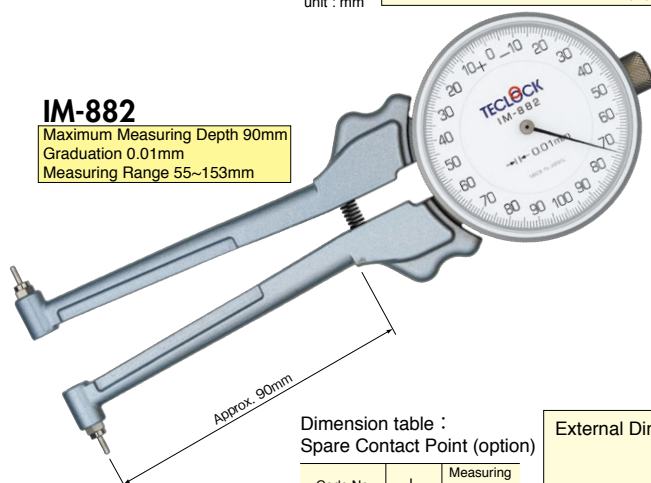
ZS-410~412



unit : mm

IM-882

Maximum Measuring Depth 90mm
Graduation 0.01mm
Measuring Range 55~153mm

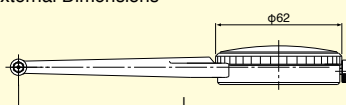


Dimension table :
Spare Contact Point (option)

Code No.	L	Measuring Range
ZS-413	7	55~73
ZS-414	15	71~89
ZS-415	23	87~105
ZS-416	31	103~121
ZS-417	39	119~137
ZS-418	47	135~153

unit : mm

External Dimensions

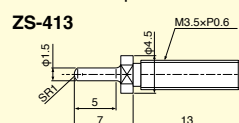


Model	L
IM-880	165
IM-881	170
IM-882	183

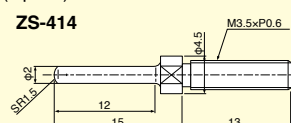
unit : mm

Dimensions : Spare Contact Point (Option)

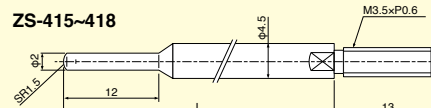
ZS-413



ZS-414

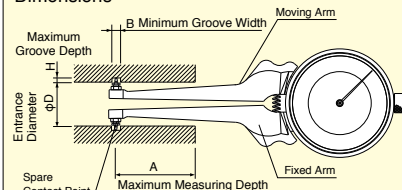


ZS-415~418



unit : mm

Dimensions



unit : mm

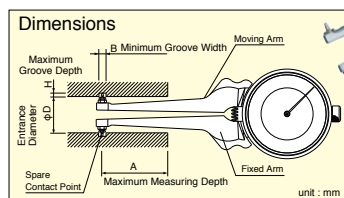
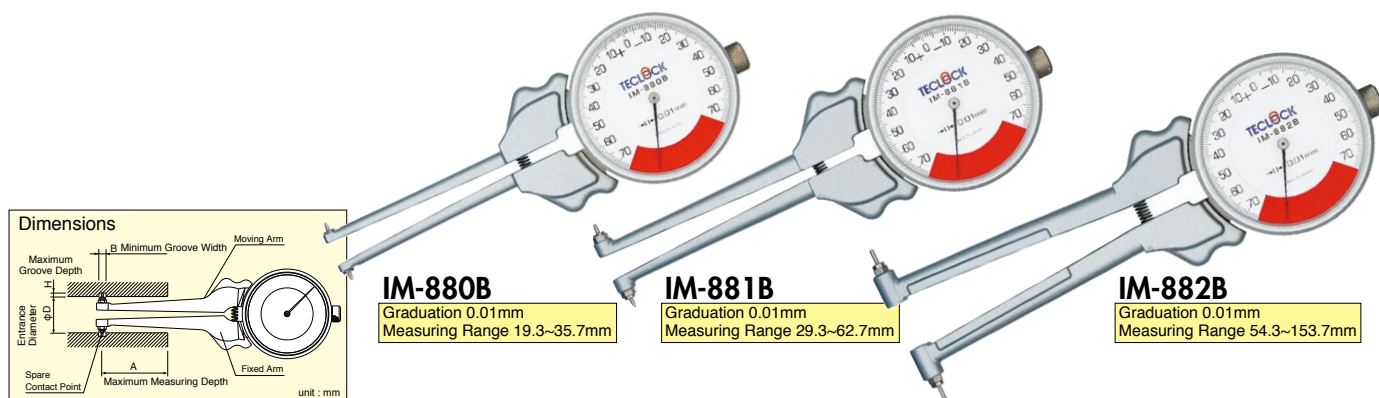
Specifications

Model	Graduation (mm)	Measuring Range (mm)	Indicating Range (mm)	Indication Error (μm)	Measuring Force (N)	Weight (g)	Spare Contact Point		Maximum Measuring Depth A (mm)	Entrance Diameter Φd (mm)*	Groove Depth H (mm)	Minimum Groove Width B (mm)
							Code No.	Measuring Range (mm)				
IM-880	0.01	20~35	2	± 20	3 or less	196	ZS-423	20-23	70	15-18	2.5	2.5
							ZS-424	22-25		15-18	3.5	
							ZS-425	24-27		16-19	4	
							ZS-426	26-29		18-21	4	
							ZS-427	28-31		20-23	4	
							ZS-428	30-33		22-25	4	
							ZS-429	32-35		24-27	4	
IM-881	0.01	30~62	2	± 20	3 or less	218	ZS-408	30-38	75	24-32	3	2.5
							ZS-409	36-44		27.4-35.4	4.3	
							ZS-410	42-50		33.4-41.4	4.3	
							ZS-411	48-56		39.4-47.4	4.3	
							ZS-412	54-62		45.4-53.4	4.3	
							ZS-413	55-73		45-63	5	
							ZS-414	71-89		54-72	8.5	
IM-882	0.01	55~153	2	± 20	3 or less	240	ZS-415	87~105	90	70-88	8.5	3.5
							ZS-416	103~121		86-104	8.5	
							ZS-417	119~137		102-120	8.5	
							ZS-418	135-153		118-136	8.5	

*ΦD=Measuring Range - 2H



One Revolution Internal Dial Caliper Gauge



Specifications

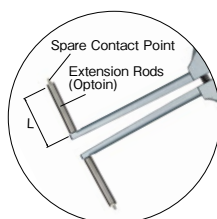
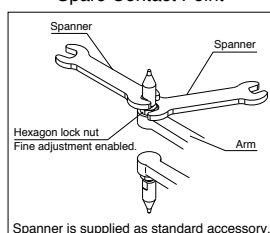
Model	Graduation (mm)	Measuring Range (mm)	Indicating range (mm)	Indication Error (μm)	Measuring Force (N)	Spare Contact Point			Maximum Measuring Depth A (mm)	Entrance Diameter ϕD (mm)*	Groove Depth H (mm)	Groove Width B (mm)	Weight (g)
						Code No.	Extension Rods	Measuring Range (mm)					
IM-880B	0.01	20~35	1.4	±20	3 or less	ZS-423	ZS-423	19.3~20.7	70	14.3	2.5	2.5	196
						ZS-423	ZS-424	20.3~21.7		15.3	2.5		
						ZS-424	ZS-424	21.3~22.7		14.3	3.5		
						ZS-424	ZS-425	22.3~23.7		15.3	3.5		
						ZS-425	ZS-425	23.3~24.7		15.3	4		
						ZS-425	ZS-426	24.3~25.7		16.3	4		
						ZS-426	ZS-426	25.3~26.7		17.3	4		
						ZS-426	ZS-427	26.3~27.7		18.3	4		
						ZS-427	ZS-427	27.3~28.7		19.3	4		
						ZS-427	ZS-428	28.3~29.7		20.3	4		
						ZS-428	ZS-428	29.3~30.7		21.3	4		
						ZS-428	ZS-429	30.3~31.7		22.3	4		
						ZS-429	ZS-429	31.3~32.7		23.3	4		
						ZS-426	ZS-426	ZS-646		24.3	4		
						ZS-426	ZS-427	ZS-646		25.3	4		
						ZS-427	ZS-427	ZS-646		26.3	4		
IM-881B	0.01	30~62	1.4	±20	3 or less	ZS-408	ZS-408	29.3~38.7	75	24	3	2.5	218
						ZS-409	ZS-409	35.3~44.7		27.4	4.3		
						ZS-410	ZS-410	41.3~50.7		33.4	4.3		
						ZS-411	ZS-411	47.3~56.7		39.4	4.3		
						ZS-412	ZS-412	53.3~62.7		45.4	4.3		
						ZS-413	ZS-413	54.3~73.7		45	5		
IM-882B	0.01	55~153	1.4	±20	3 or less	ZS-414	ZS-414	70.3~89.7	90	54	8.5	3.5	240
						ZS-415	ZS-415	86.3~105.7		70	8.5		
						ZS-416	ZS-416	102.3~121.7		86	8.5		
						ZS-417	ZS-417	118.3~137.7		102	8.5		
						ZS-418	ZS-418	134.3~153.7		118	8.5		

*Please combine with ZS-646 extension rod when measuring ϕ33 to ϕ35 by IM-880B.

Optional Extension Rods

- IM-880 series dialcaliper gauges can measure internal dimension up to measuring range in the right list by installing extension rods. Standard products of spare extension rods can be used as it is.

Mounting Method of Spare Contact Point



IM-880:

Measuring range with extension rods (mm)

Spare Contact Point	Extension Rods	Measuring Range
ZS-646 L=7	ZS-423	34~37
	ZS-424	36~39
	ZS-425	38~41
	ZS-426	40~43
	ZS-427	42~45
	ZS-428	44~47
	ZS-429	46~49
	ZS-423	48~51
ZS-647 L=14	ZS-424	50~53
	ZS-425	52~55
	ZS-426	54~57
	ZS-427	56~59
	ZS-428	58~61
	ZS-429	60~63
	ZS-423	62~65
	ZS-424	64~67
ZS-648 L=21	ZS-425	66~69
	ZS-426	68~71
	ZS-427	70~73
	ZS-428	72~75
	ZS-429	74~77
	ZS-423	76~79
	ZS-424	78~81
	ZS-425	80~83
ZS-649 L=28	ZS-426	82~85
	ZS-427	84~87
	ZS-428	86~89
	ZS-429	88~91

IM-881:

Measuring range with extension rods (mm)

Spare Contact Point	Extension Rods	Measuring Range
ZS-693 L=15	ZS-408	60~68
	ZS-409	66~74
	ZS-410	72~80
	ZS-411	78~86
	ZS-412	84~92
	ZS-408	90~98
	ZS-409	96~104
	ZS-410	102~110
ZS-694 L=30	ZS-411	108~116
	ZS-412	114~122
	ZS-408	120~128
	ZS-409	126~134
	ZS-410	132~140
	ZS-411	138~146
	ZS-412	144~152

IM-882:

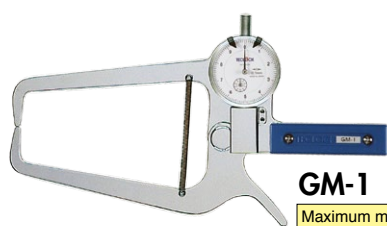
Measuring range with extension rods (mm)

Spare Contact Point	Extension Rods	Measuring Range
ZS-696 L=48	ZS-413	151~169
	ZS-414	167~185
	ZS-415	183~201
	ZS-416	199~217
	ZS-417	215~233
	ZS-418	231~249
	ZS-413	247~265
	ZS-414	263~281
ZS-697 L=96	ZS-415	279~297
	ZS-416	295~313
	ZS-417	311~329
	ZS-418	327~345



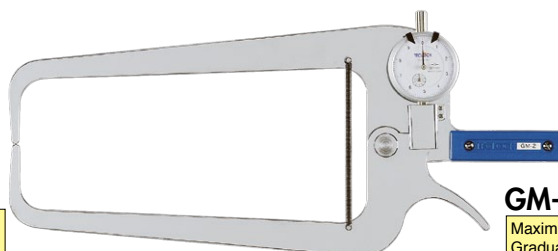
External Dial Caliper Gauge

- These gauges are designed for use in measuring external dimension of thick and large measuring work piece or special shape products which seem to be difficult to measure.
- Special order can be produced.



GM-1

Maximum measuring depth 125mm
Graduation 0.1mm
Measuring Range 0~90mm



GM-2

Maximum measuring depth 250mm
Graduation 0.1mm
Measuring Range 0~90mm

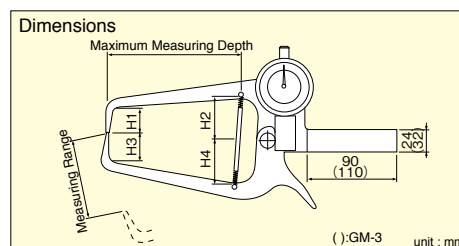


GM-3

Maximum measuring depth 400mm
Graduation 0.1mm
Measuring Range 0~90mm



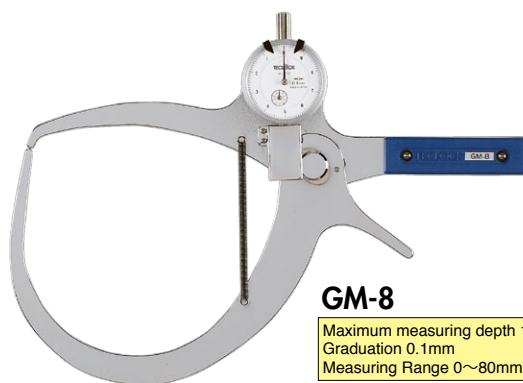
Overall length of GM-3 is large as 635mm.



Dimension Table

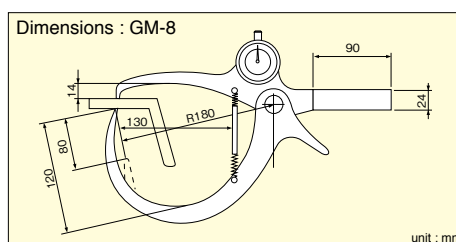
Model	H ₁	H ₂	H ₃	H ₄
GM-1	25	40	25	40
GM-2	50	60	50	60
GM-3	60	70	60	80

unit : mm



GM-8

Maximum measuring depth 130mm
Graduation 0.1mm
Measuring Range 0~80mm



Specifications

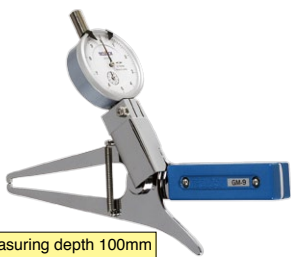
Model	Graduation (mm)	Measuring Range (mm)	Indication Error (mm)	Maximum measuring depth (mm)	Measuring Force (N)	Weight (g)
GM-1	0.1	0~90	±0.1	125	5 or less	500
GM-2	0.1	0~90	±0.1	250	5 or less	800
GM-3	0.1	0~90	±0.2	400	10 or less	1,400
GM-8	0.1	0~80	±0.1	130	5 or less	630



Caliper Gauge

GM-9

Maximum measuring depth 100mm
Graduation 0.1mm
Measuring Range 0~30mm



GM-11

Maximum measuring depth 125mm
Graduation 0.1mm
Measuring Range 0~50mm



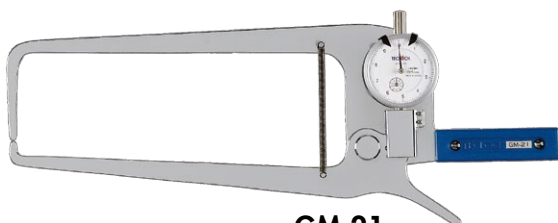
GM-20

Maximum measuring depth 125mm
Graduation 0.1mm
Measuring Range 0~80mm



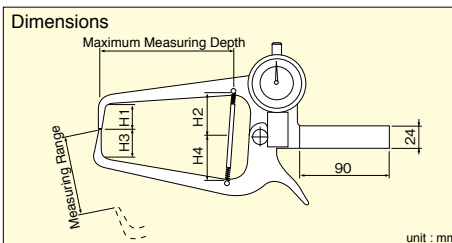
GM-21

Maximum measuring depth 220mm
Graduation 0.1mm
Measuring Range 0~90mm



GM-22

Maximum measuring depth 250mm
Graduation 0.1mm
Measuring Range 0~90mm



Dimension Table

Model	H ₁	H ₂	H ₃	H ₄
GM-9	2	12	2	12
GM-11	2	6	2	6
GM-20	17	11	17	11
GM-21	65	70	10	15
GM-22	20	25	65	70

unit: mm

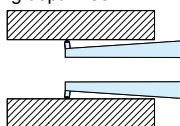
Specifications

Model	Graduation (mm)	Measuring Range (mm)	Indication Error (mm)	Maximum Measuring Depth (mm)	Measuring Force (N)	Weight (g)
GM-9	0.1	0~30	±0.1	100	5 or less	460
GM-11	0.1	0~50	±0.1	125	5 or less	430
GM-20	0.1	0~80	±0.1	125	5 or less	405
GM-21	0.1	0~90	±0.1	220	5 or less	660
GM-22	0.1	0~90	±0.1	250	5 or less	720

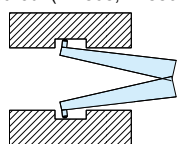
Usage Example

Internal Caliper Gauge

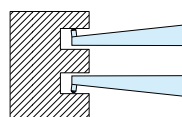
Internal dimension of deep position can be easily measured. (maximum measuring depth 180mm=IM-2)



Groove diameter of groove for "O" ring can be easily measured. (IM-808, IM-880 etc)

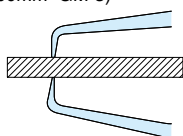


Measurement evading from screw, nuts etc. can be made.

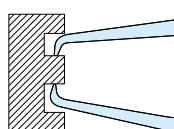


External Caliper Gauge

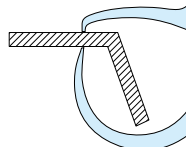
Thickness of long distance position of board shape workpiece can be measured. (maximum measuring depth 400mm=GM-3)



Thickness measurement in narrow area. (GM-9, GM-11)



It can measure evading obstacles in front of measuring point. (GM-8, GMD-8J)





External Digital Caliper Gauge

- External dimension measuring instrument of which digital gauge is built into frame. This can treat statistics data and print out it by connecting it to the optional exclusive printer SD-765P (Please refer to page 52).
- It is possible to equip print out switch (Option).



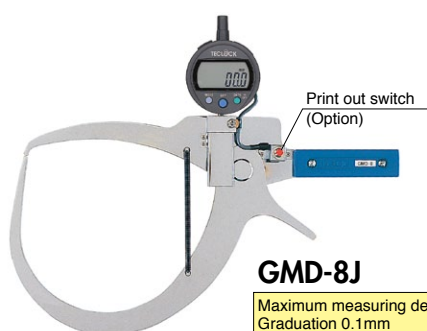
GMD-1J

Maximum measuring depth 125mm
Graduation 0.1mm
Measuring Range 0~90mm



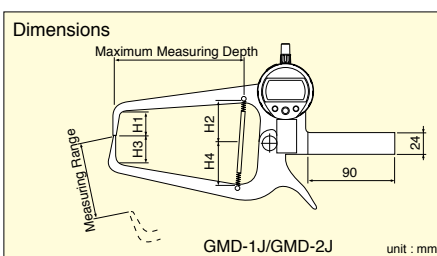
GMD-2J

Maximum measuring depth 250mm
Graduation 0.1mm
Measuring Range 0~90mm



GMD-8J

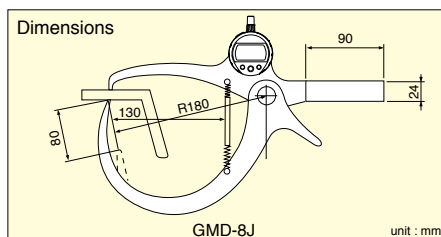
Maximum measuring depth 130mm
Graduation 0.1mm
Measuring Range 0~80mm



Dimension Table

Model	H ₁	H ₂	H ₃	H ₄
GMD-1J	25	40	25	40
GMD-2J	50	60	50	60

unit : mm



Printer (Option)

Mini Printer for
Digital Caliper Gauges SD-763P
Connect cable ZE-018



Specifications

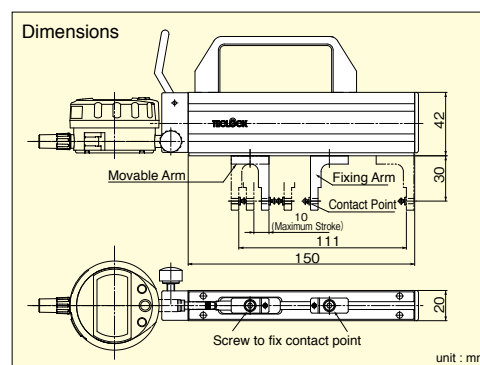
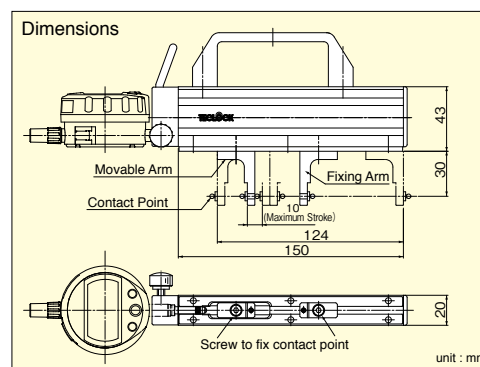
Model	Graduation (mm)	Measuring Range (mm)	Indication Error* (mm)	Maximum Measuring Depth (mm)	Measuring Force (N)	Weight (g)
GMD-1J	0.1	0~90	±0.1	125	5 or less	560
GMD-2J	0.1	0~90	±0.1	250	5 or less	830
GMD-8J	0.1	0~80	±0.1	130	5 or less	580

*The quantizing error function is not included.



Arm Slide Type Caliper Gauge

- Stable and accurate measuring dimension (comparative measurement) is possible for internal and external dimension, as this can well stick to workpiece with measurement method by sliding movable arm.
- Boxy type, easily to hold, lightweight and solid, this is suitable to inspect large volume at work site.
- This can be used for various objectives to measure internal gears, internal diameter female screw, plain gear, spline shaft of special key, over pin diameter of separation shaft and pitch gear thickness.
- Contact point is separately produced on demand such as ball type, flat type, knife edge type. Please advise dimension and shape.
- As Digital indicator is an option, please select it according to an objective. Because dial indicator can be installed.
- This can print out data by connected to Digital mini printer SD-763P (option).



Groove internal diameter is comparatively measured by using Digital indicator with 0.001mm resolution

Specifications

Model	Application	Measuring Range (mm)	Arm Length (mm)	Measuring Force (N)	Fitting Holes (mm)	Weight (g)
FM-20	Internal	20~130	30	7~9	Screw to fix contact point	380
FM-25	External	0~100	30	7~9	φ3.5	380

Contact point and digital indicator are not included.

12 Durometer & IRHD Hardness Tester

Abundant Lineups of Hardness Testers for ISO and JIS standard.

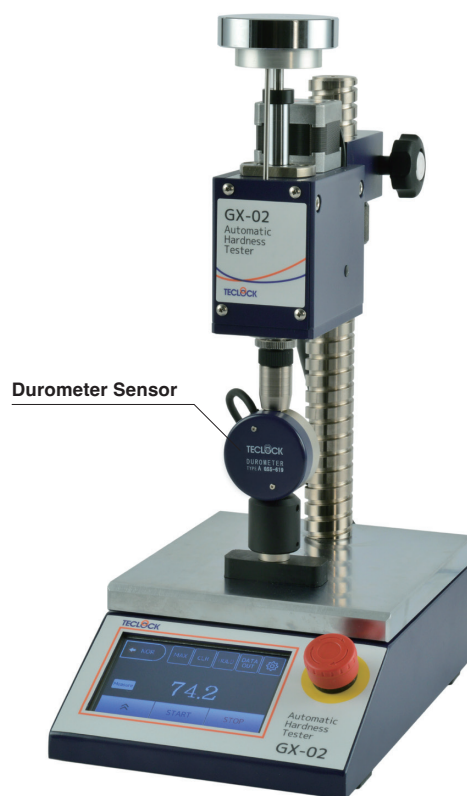
Durometers show the degree of hardness by value whether a non-rigid material like rubber is soft or hard (hardness gauge for rubber or plastic). Recently, JIS standard and ISO standard have been drastically revised and details of hardness tester of rubber and method of measuring hardness are changed. As an all embracing manufacturer of non-rigid material hardness tester, Teclock proposes lots of measuring methods of measuring hardness of not only rubber and plastic but many non-rigid materials and elastic materials.



IRHD(M-method) Hardness Tester for standard can measure hardness of O-ring, small rubber parts and thin rubber sheet.



Pocket type and Digital Durometer with peak hold type.



In order to solve individual difference of measured value, it is clearly mentioned in the standard to measure hardness by mounting durometer to special stand.

Features, Measuring hardness, Durometer standard	---- 136
JIS K 6253 compliance	----- 137
GX-02series Automatic Hardness Tester	----- 138
GX-700II Totally Automatic type IRHD M-method	----- 139
Model selection of Durometer, Comparison of Measured Value	---- 140,141
JIS K 6253 Compliance	----- 142
Deep Hole, Long Leg Type, Pocket Type	----- 143
JIS K 7215 Compliance, JIS K 7312 Compliance	----- 144

ASTM D 2240 Compliance, TECLOCK Original standard	---- 145
Thin sheet hardness Tester, JIS K 6301 Compliance	----- 146
Durometer Standard Table	----- 147
GX- 610II Automatic type Motor Driving Durometer Stand	----- 148
Measuring Stand for Durometer	----- 149
Durometer Periodical Inspection and Calibration	----- 150
Precautions on use of Durometer	----- 151
"Duro" of Durometer means "hardness"	----- 152

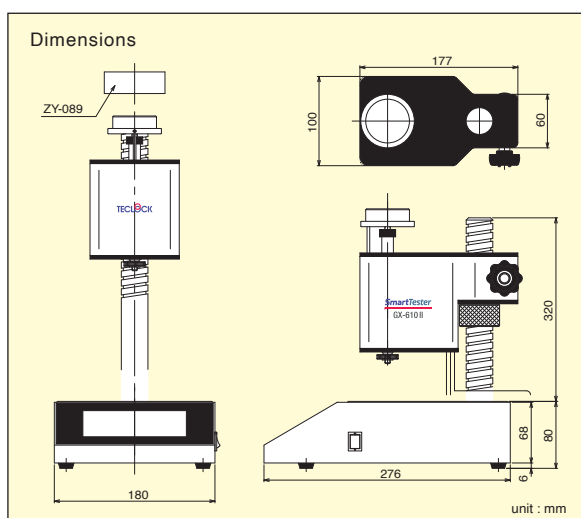
SmartTester GX-610 II

Durometer stand mounted VFD with touch panel

New JIS
complianceISO
compliance

Features

- Large and easy-to-see display.
- Easy-to-understand operation with touch panel.
- Accurate and repeatable descent speed controlled by stepping motors.
- High adhesion between pressurized face and test piece by Alignment Unit.
- Measurement of TypeA, TypeD or TypeE by exchange the sensor and weight.
- Calibration certificate can be issued.



Specifications

Moving-down speed	1.0~20.0mm/sec (Every 0.1mm/sec setting possible)
Pressing mass	Unit mass 346g(With spring load) Standard weight(ZY-089) 487.5g
Display brightness	Following 1.0(A)
Current consumption	W180xL276xH400(mm)
Dimensions	Input AC100-240(V)Output DC 24(V)
Weight	Body 11.4(kg)/AC Adapter 0.2(kg)
Operating temperature	10 - 30(°C)
Storage temperature	-10 - 50(°C)
AC Adapter	8-step setting possible
Touch sound	Hi/Lo setting possible
Touch sensitivity	Yes/No setting possible
Suggested List price	363,000 JPY



* The durometer is option.



Weight ZY-128
(Option)



Weight ZY-089
(Accessory)

Adaptive Durometer

Stand	Durometer			Weight for Load	
	Type	Durometer ex.	Load	Weight Code No.	
GX-610II	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-089(Accessory)	
	Digital	GSD-719K-R etc.		ZY-090(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-089(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-090(Optional)+ ZY-128(Optional)	
GS-612	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-089(Accessory)	
	Digital	GSD-719K-R etc.		ZY-090(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-089(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-090(Optional)+ ZY-128(Optional)	
GS-615	Analog	"A,B,E, AskerC,O,Old A"	for 1kg	ZY-078(Accessory)	
	Digital	GSD-719K-R etc.		ZY-079(Optional)	
	Analog	"D,ASTM C, DO, Old JIS C"	for 5kg	ZY-078(Accessory)+ ZY-128(Optional)	
	Digital	GSD-720K-R etc.		ZY-079(Optional)+ ZY-128(Optional)	

Measuring Stand for Durometer

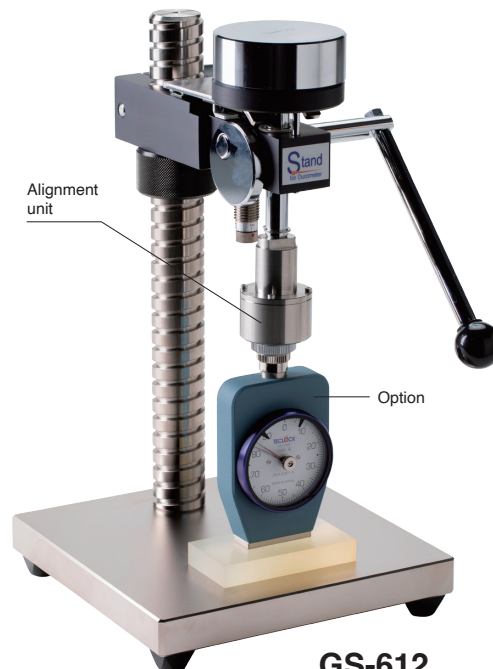
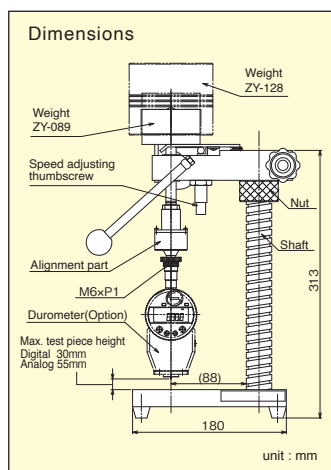


In case of measuring with durometer by pushing by hand, measuring values vary in some degree due to individual difference. Therefore, Measuring stand is materialized as measuring method for high reproducibility, which is prescribed in JIS and ISO.

New JIS compliance

GS-612 Manual Operation type Durometer Stand with Speed Controller

- Speed controller with high reliability is adopted for moving down speed adjustment unit.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 65mm for analog and 40mm for digital are obtained for possible measuring range.
- Shaft with square thread is adopted that can prevent holder falling down and moving up and down.
- 1kg can be measured by type A and type E durometer as they are.
- Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-090 for measuring 1kg..
- Calibration certificate of mass (with durometer) can be issued, which are prescribed in ISO / JIS.



GS-612

Mass	8.5kg
------	-------

Model	Suggested List Price
GS-612	203,280 JPY
ZY-128	45,980 JPY
ZY-090	14,770 JPY



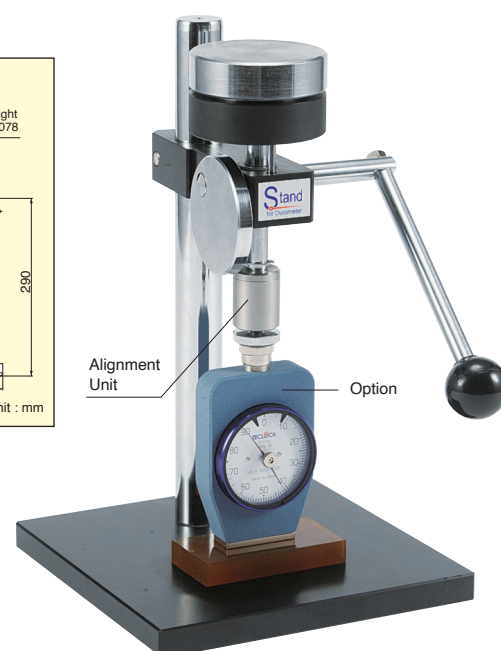
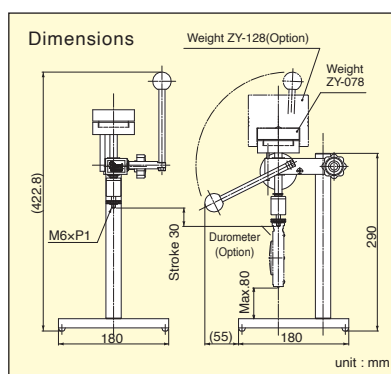
Weight ZY-128 (Option)



Weight ZY-089 (Accessory)

GS-615 Manual Operation type Durometer Stand

- Hardness can be measured by durometer with load prescribed by JIS by mounting durometer and manual operation.
- Adopting cam has realized easy operation and cost performance.
- Alignment unit which realizes high contact between indenter (contact point) of durometer and test piece is mounted.
- 1kg can be measured by type A and type E durometer as they are.
- Measuring by type D needs optional weight ZY-128 for measuring 5kg.. Digital durometer GSD series needs optional weight ZY-079 for measuring 1kg..
- Calibration certificate can be issued (Operation speed certificate can not be issued.).



GS-615

Mass	3.9kg
------	-------

Model	Suggested List Price
GS-615	90,530 JPY
ZY-128	45,980 JPY
ZY-079	14,770 JPY



Weight ZY-128 (Option)



Weight ZY-078 (Accessory)

Durometer Periodical Inspection / Calibration

Durometer is a testing machine. In case that it corresponds to "Monitoring Machine" and "Measuring Machine" of ISO 9001 (JIS G 9001), controlling machines along with it is needed. Teclock is one of a few manufacturers of durometer which has obtained the authentication of ISO9001 and can originally issue 3 kinds of traceability system diagram, calibration certificate and inspection report that are needed for calibration documents. In addition, Teclock can issue 3 kinds of documents for durometer tester and indenter height gauge, that are needed for internal inspection. Use these for control based on internal calibration standard.

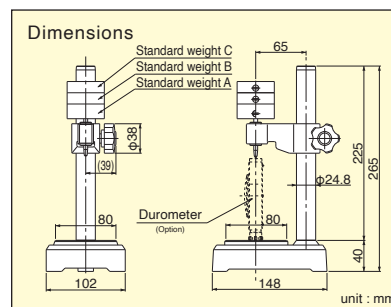
Durometer Tester



GS-607

Durometer is optional.

This is inspection machine which simply checks spring load value of analog type durometer. Putting defined load with 3 pieces of standard weight to the inverted durometer and inspecting whether graduation of 25, 50 and 75 correctly point out. Calibration certificate can be issued. (Digital type durometer and other makes products can not be calibrated.) In addition, in the standard of overseas and also domestic, inspection method by using mechanism of even balance and with normal position of durometer is introduced.

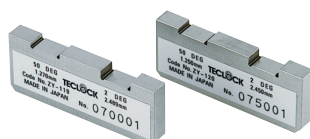


Specifications

Code.No.	Applicable Durometer	Weight(kg)	Suggested List Price
GS-607	GS-701N/GS-701G/GS-706N/GS-706G	3.7	78,650 JPY
GS-607A	GS-709N/GS-709G	3.7	94,820 JPY
GS-607B	GS-719N/GS-719G/GS-721N/ GS-721G/GS-750G/GS-753G	3.7	94,820 JPY
GS-607C	GS-743G	3.7	94,820 JPY

Type D durometer for tester does not manufacture. Calibration certificate is Available.

Indenter Extension Gauge



ZY-119

ZY-120

Height of indenter (contact point) of durometer is simply checked. ZY-119 is for JIS K 6301 and ZY-120 is for JIS K 6253. Products of other makers can be checked.

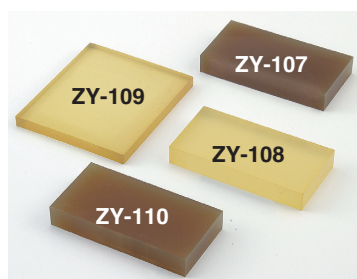
Specifications

Code No.	Indenter Height (mm)	50DEG	2DEG	Applicable Durometer	Suggested List Price
ZY-119	2.54 type	1.27mm	2.489mm	GS-701N/G, 706N/G	19,360 JPY
ZY-120	2.5 type	1.25mm	2.45mm	GS-GSD-719, 720 Series	19,360 JPY

Calibration certificate is possible.

Rubber Piece for Durometer Measuring

This is not rubber test piece. It is used for easy checking to find out failure of durometer. Measuring hardness when it is purchased and use it for daily control of durometer.



for Durometer



for IRHD Tester

Specifications for Durometer

Code No.	Type	Dimension(mm)	Applicable Durometer	Suggested List Price
ZY-107	nearly A50	40x80x12 Thickness	TypeA (GS,GSD-719J Series)	6,660 JPY
ZY-108	nearly A80	40x80x12 Thickness		6,660 JPY
ZY-109	nearly D40	70x80x7 Thickness	TypeD (GS,GSD-720J Series)	6,660 JPY
ZY-110	nearly E70	40x80x12 Thickness	TypeE (GS,GSD-721J Series)	6,660 JPY

Specifications for IRHD Tester

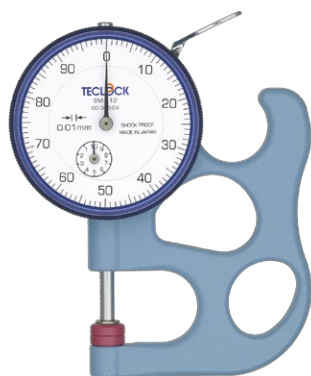
Code No.	Hardness IRHD	Dimension (mm)	Color	Material	Suggested List Price
ZY-917	Set of 6 pcs. (ZY-080~ZY-085)				50,600 JPY
ZY-080	40±5	25x25x2	Blue	Silicon	8,800 JPY
ZY-081	50±5		Black	Silicon	8,800 JPY
ZY-082	60±5		Yellow	Silicon	8,800 JPY
ZY-083	70±5		Bengara	Silicon	8,800 JPY
ZY-084	80±5		Gray	Silicon	8,800 JPY
ZY-085	90±5		Transparent	Urethane	9,900 JPY

Thickness Gauge

Dial Indicator is used by being fitted to jig etc., while thickness gauge is held with our hand. Holding work piece between stylus and anvil, read the value directly. Contact point moves to upward when lifting lever is pressed down, and contact point returns to “zero” when it is released. As operation is easy, it can measure for a short period compared with micrometer. There are 2 kinds of Dial 0.01mm , 0.001mm for both analog and digital. The stroke depends on size of work piece and a model is available to measure maximum thickness up to 50mm. This can be used for various thickness measurement such as paper, hair, rubber plate metal tube small molded components.

Dial Thickness Gauge

- Suitable for measuring thickness and diameter of metal, lens, rubber, plastic, paper, felt, hair, pearl etc. in actual dimension.
- Ceramic contact point and anvil feature are superior for anti-abrasion and rust. In addition, there are steel FE type and AT type which rarely adheres with adhesion tape.
- As to shape of contact point and anvil, there are standard type and other various kinds.
- Measuring force of standard type is not more than 2.5N as final pressure, low measuring force type of which final pressure is about 0.4N (about 40gf) is also available.



SM-112
Standard type
Graduation 0.01mm
Measuring Range 10mm

All SM series equips ceramic contact point and anvils.

SM-112P
(Direct Reading Graduation)

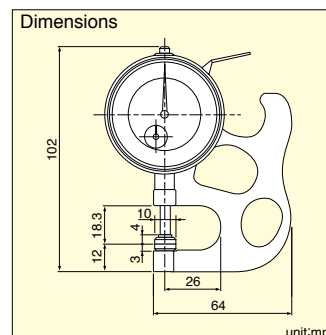


1.17mm reading example

SM-112D
(Coaxial Revolution Pointer)



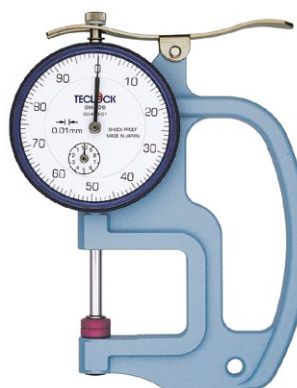
Measuring metal work piece.
The photo shows 5.98mm.



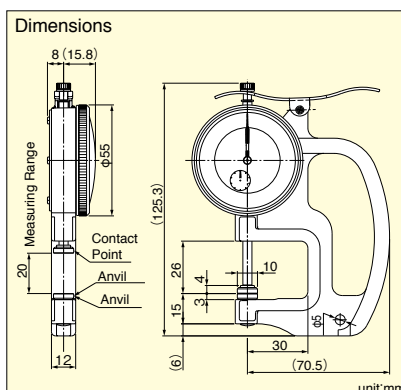
Specifications **SM-112 Series**

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-112	0.01	10	±15	5	0-50-100	2.5 or less	φ 10 Flat	φ 10 Flat	150
SM-112LS	0.01	10	±15	—	0-50-100	2.5 or less	φ 3.2 Ball	φ 10 Flat	150
SM-112LW	0.01	10	±15	—	0-50-100	2.5 or less	φ 3.2 Ball	φ 3.2 Ball	150
SM-112-3A	0.01	10	±15	5	0-50-100	2.5 or less	φ 5 Flat	φ 5 Flat	150
SM-112-80g	0.01	10	±15	5	0-50-100	Stop Point Measuring Forced 0.8±0.05	φ 10 Flat	φ 10 Flat	150
SM-112P	0.01	10	±15	5	0-0.5-1	2.5 or less	φ 10 Flat	φ 10 Flat	150
SM-112FE	0.01	10	±15	5	0-50-100	2.5 or less	φ 10 Flat	φ 10 Flat	150
SM-112AT	0.01	10	±15	8	0-50-100	0.8 or less	φ 10 Flat	φ 10 Flat	150
SM-112D	0.01	10	±15	5	0-50-100	2.5 or less	φ 10 Flat	φ 10 Flat	155

LS, LW, 3A For more information please refer to P26.



SM-528
Measurement of up to 20mm thick
Graduation 0.01mm
Measuring Range 20mm



Specifications **SM-528 Series**

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-528	0.01	20	±20	5	0-50-100	3.5 or less	φ 10 Flat	φ 10 Flat	180
SM-528LS	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 10 Flat	180
SM-528LW	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 3.2 Ball	180
SM-528-3A	0.01	20	±20	5	0-50-100	3.5 or less	φ 5 Flat	φ 5 Flat	180
SM-528-80g	0.01	20	±20	5	0-50-100	Stop Point Measuring Forced 0.8±0.05	φ 10 Flat	φ 10 Flat	180
SM-528FE	0.01	20	±20	5	0-50-100	3.5 or less	φ 10 Flat	φ 10 Flat	180

LS, LW, 3A For more information please refer to P26.

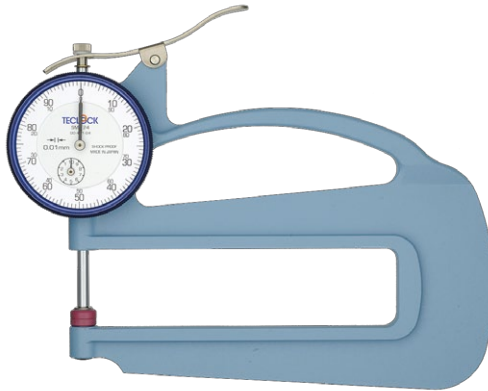
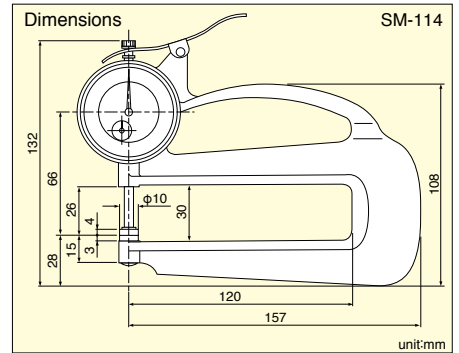
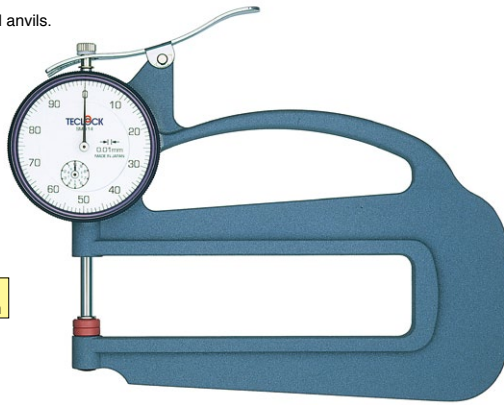


All SM series equips ceramic contact point and anvils.

SM-114

Insertion Depth
120mm

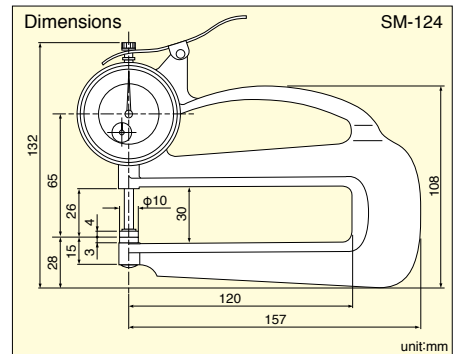
Graduation 0.01mm
Measuring Range 10mm



SM-124

Medium size
Thickness Gauge

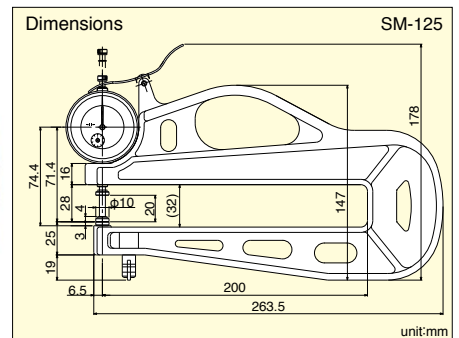
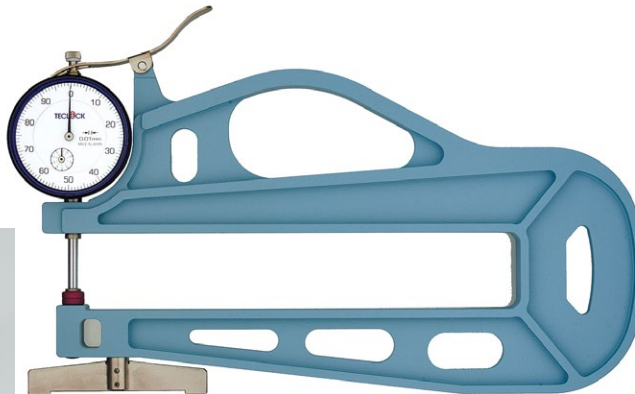
Graduation 0.01mm
Measuring Range 20mm



SM-125

Large size Thickness
Gauge

Graduation 0.01mm
Measuring Range 20mm



This stand is standard accessories.

Specifications

SM-114 Series

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-114	0.01	10	±15	5	0-50-100	2.5 or less	φ 10 Flat	φ 10 Flat	250
SM-114LS	0.01	10	±15	—	0-50-100	2.5 or less	φ 3.2 Ball	φ 10 Flat	250
SM-114LW	0.01	10	±15	—	0-50-100	2.5 or less	φ 3.2 Ball	φ 3.2 Ball	250
SM-114P	0.01	10	±15	5	0-0.5-1	2.5 or less	φ 10 Flat	φ 10 Flat	250

LS, LW, 3A For more information please refer to P26.

SM-124 Series

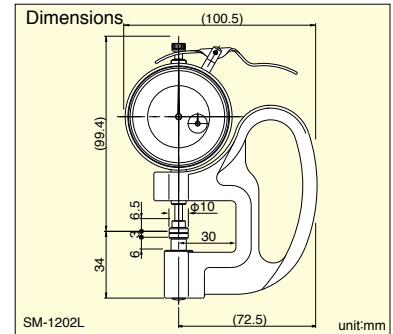
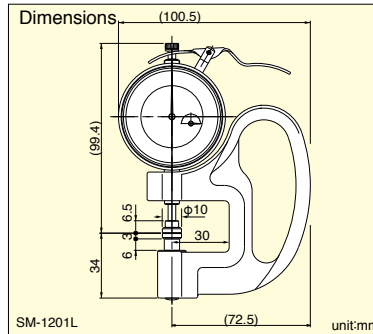
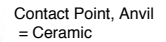
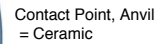
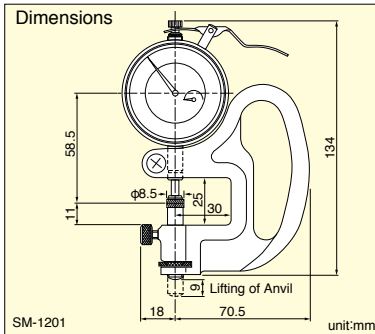
Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-124	0.01	20	±20	5	0-50-100	3.5 or less	φ 10 Flat	φ 10 Flat	250
SM-124LS	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 10 Flat	250
SM-124LW	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 3.2 Ball	250

LS, LW, 3A For more information please refer to P26.

SM-125 Series

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-125	0.01	20	±20	5	0-50-100	3.5 or less	φ 10 Flat	φ 10 Flat	625
SM-125LS	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 10 Flat	625
SM-125LW	0.01	20	±20	—	0-50-100	3.5 or less	φ 3.2 Ball	φ 3.2 Ball	625

LS, LW, 3A For more information please refer to P26.

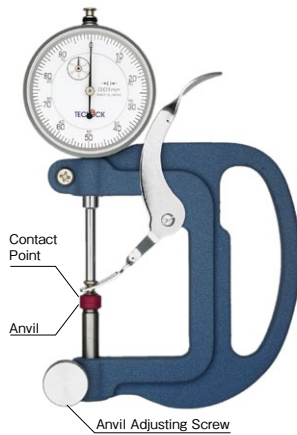


Specifications SM-1201 Series

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μ m)	Parallelism (μ m)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-1201	0.001	10	± 3	3	0-100-0	1.5 or less	φ 8.5 Flat (Carbide)	φ 8.5 Flat (Carbide)	440
SM-1201LS	0.001	10	± 3	—	0-100-0	1.5 or less	φ 3 Ball (Carbide)	φ 8.5 Flat (Carbide)	440
SM-1201LW	0.001	10	± 3	—	0-100-0	1.5 or less	φ 3 Ball (Carbide)	φ 3 Ball (Carbide)	440
SM-1201L	0.001	1 (3) *	± 3	3	0-100-200	1.5 or less	φ 10 Flat (Ceramic)	φ 10 Flat (Ceramic)	420
SM-1202L	0.001	2 (2) *	± 5	3	0-100-200	1.5 or less	φ 10 Flat (Ceramic)	φ 10 Flat (Ceramic)	420

* () is a free-stroke.

LS, LW, 3A For more information please refer to P26.

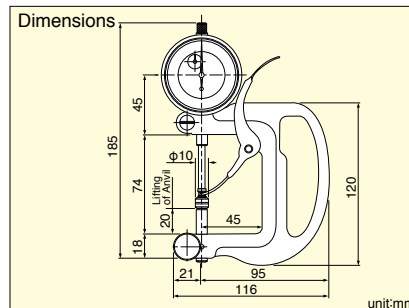
**SM-130**

By the lifting of the anvil, can
be measured 0~50mm

Graduation 0.01mm
Measuring Range 50mm
Indication Range 30mm
(Lifting Anvil)

Upward Shockproof
Contact Point, Anvil = Ceramic

*Setting up standard point with block gauge is necessary to measure thickness 30mm and over.

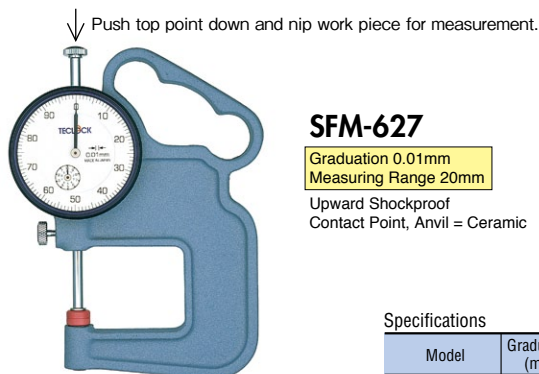


Specifications SM-130 Series

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SM-130	0.01	50	±25	5	±0-50-100	2.2 or less	φ 10 Flat	φ 10 Flat	620
SM-130LS	0.01	50	±25	—	±0-50-100	2.2 or less	φ 3.2 Ball	φ 10 Flat	620
SM-130LW	0.01	50	±25	—	±0-50-100	2.2 or less	φ 3.2 Ball	φ 3.2 Ball	620

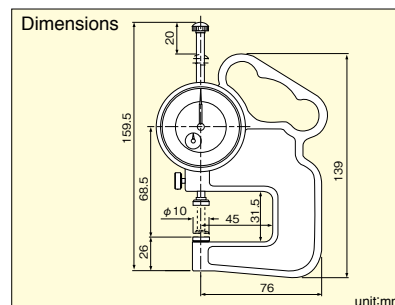
LS, LW, 3A For more information please refer to P26.

Dial Swift Gauge

**SFM-627**

Graduation 0.01mm
Measuring Range 20mm

Upward Shockproof
Contact Point, Anvil = Ceramic



Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μm)	Parallelism (μm)	Dial Reading	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SFM-627	0.01	20	+20	5	0-50-100	φ 10 Flat	φ 10 Flat	240



Dial Pipe Gauge



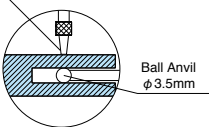
TPM-116

*Suitable for measuring thickness of pipe and curved plate etc.
Radial thickness can be measured up to minimum diameter ϕ 3.5mm.

Graduation 0.01mm
Measuring Range 10mm

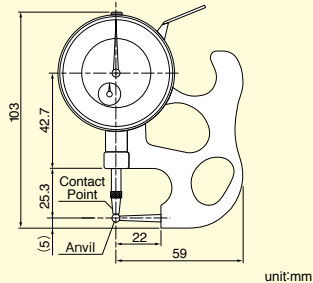
Upward Shockproof
Anvil fixed type

Edge of point
 ϕ 2.5mm Flat



Ball Anvil
 ϕ 3.5mm

Dimensions:TPM-116



unit:mm

The special order if the following hole diameter ϕ 3.5mm.

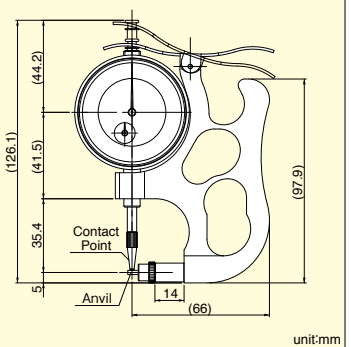


TPM-617

Graduation 0.01mm
Measuring Range 10mm

Anvil replaceable type (ϕ 0.5, ϕ 1.0, ϕ 2.0mm)

Dimensions:TPM-617/618



unit:mm



TPM-618

Graduation 0.01mm
Measuring Range 10mm

Anvil replaceable type
(option)

Anvil ϕ 5mm

Relation between Anvil diameter and Work inserting depth

Anvil dia.	Depth	Anvil dia.	Depth
ϕ 0.5	2mm	ϕ 5.0	8mm
ϕ 1.0	3mm	ϕ 7.0	8mm
ϕ 2.0	3mm	ϕ 10.0	8mm

unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μ m)	Parallelism (μ m)	Dial Reading	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
TPM-116	0.01	10	± 15	—	0-50-100	2.3 or less	ϕ 2.5 Flat	ϕ 3.5 Ball	145
TPM-617	0.01	10	± 15	—	0-50-100	1.5 or less	ϕ 1.6 Ball	ϕ 0.5, 1.0, 2.0 replaceable	190
TPM-618	0.01	10	± 15	—	0-50-100	1.5 or less	ϕ 1.6 Ball	ϕ 5.0 (ϕ 7.0, 10.0 replaceable)*	195

*Anvils of ϕ 7 and ϕ 10.0 are optional.

Digital Pipe Gauge



TPD-617J

Graduation 0.01mm
Measuring Range 12mm

Anvil replaceable type



TPD-618J

Graduation 0.01mm
Measuring Range 12mm

Anvil replaceable type
(option)

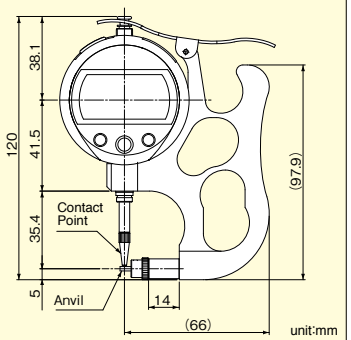
Relation between Anvil diameter and Work inserting depth

Anvil dia.	Depth	Anvil dia.	Depth
ϕ 0.5	2mm	ϕ 5.0	8mm
ϕ 1.0	3mm	ϕ 7.0	8mm
ϕ 2.0	3mm	ϕ 10.0	8mm

unit:mm

All SM series equips ceramic contact point and anvils.

Dimensions:TPD-617J/618J



unit:mm

Specifications

Model	Graduation (mm)	Measuring Range (mm)	Accuracy (μ m)	Parallelism (μ m)	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
TPD-617J	0.01	12	± 20	—	1.5 or less	ϕ 1.6 Ball	ϕ 0.5, 1.0, 2.0 replaceable	255
TPD-618J	0.01	12	± 20	—	1.5 or less	ϕ 1.6 Ball	ϕ 5.0 (ϕ 7.0, 10.0 replaceable)*	260

*Anvils of ϕ 7 and ϕ 10.0 are optional.



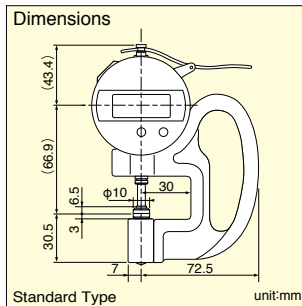
Conventional Digital Thickness Gauge

- Digital display for error-free reading



SMD-540S2

Resolution 0.01mm
Measuring Range 12mm



- Measurement force cannot be changed.
Low measurement force is required, check a standard type.

Specifications

Model	Resolution (mm)	Measuring Range (mm)	Accuracy* (μm)	Parallelism (μm)	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SMD-540S2	0.01	12	±20	5	2.0 or less	φ 10 Flat	φ 10 Flat	250
SMD-540S2-LS	0.01	12	±20	—	2.0 or less	φ 3.2 Ball	φ 10 Flat	250
SMD-540S2-LW	0.01	12	±20	—	2.0 or less	φ 3.2 Ball	φ 3.2 Ball	250
SMD-540S2-3A	0.01	12	±20	5	2.0 or less	φ 5 Flat	φ 5 Flat	250

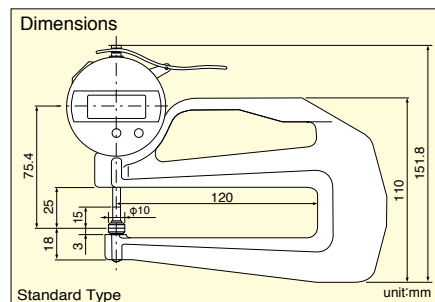
LS, LW, 3A For more information please refer to P26.

* The quantizing error is not included.



SMD-550S2

Resolution 0.01mm
Measuring Range 12mm



Specifications

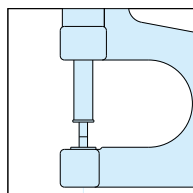
Model	Resolution (mm)	Measuring Range (mm)	Accuracy* (μm)	Parallelism (μm)	Measuring Force (N)	Contact Point Form (mm)	Anvil Form (mm)	Weight (g)
SMD-550S2	0.01	12	±20	5	2.0 or less	φ 10 Flat	φ 10 Flat	400
SMD-550S2-LS	0.01	12	±20	—	2.0 or less	φ 3.2 Ball	φ 10 Flat	400
SMD-550S2-LW	0.01	12	±20	—	2.0 or less	φ 3.2 Ball	φ 3.2 Ball	400
SMD-550S2-3A	0.01	12	±20	5	2.0 or less	φ 5 Flat	φ 5 Flat	400

LS, LW, 3A For more information please refer to P26.

* The quantizing error is not included.

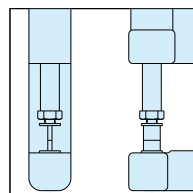
Special order product of Dial Thickness Gauge / Digital Thickness Gauge

1. Instruct dimension and shape of anvil and contact point by referring to the figure in the right and P26.
2. Instruct necessary measuring range.
3. In case that there is direction like blade type, instruct "parallel" or "right angle" based on graduation face as front face standard.
4. In case of requesting shape of anvil and contact point rather than figure in the right or change of measuring force, please contact our nearest branch for you.



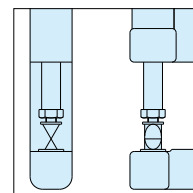
NE (needle) type

This is top and bottom needle type(cylinder).
Instruct diameter



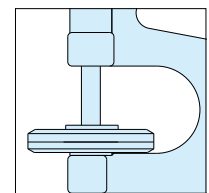
BL (blade) type

This is top and bottom blade type(blade). Instruct width and thickness.



KN (knife edge) type

This is top and bottom knife edge type. Instruct width and angle.



LD (large diameter flat) type

This is top and bottom disc type(cylinder).
Instruct diameter.

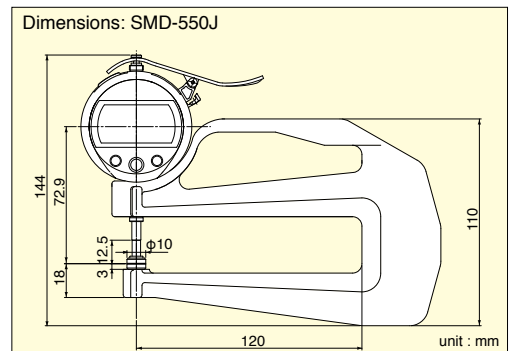
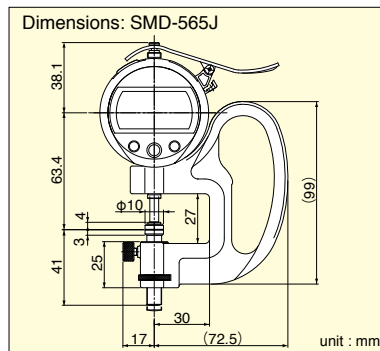
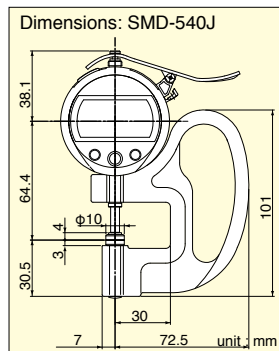


Standard Digital Thickness Gauge

- 0.01mm and 0.001mm graduation are available.
- 0.001mm model which can measure up to 15mm thickness as maximum by lifting anvil.



PRINTER (Option)
Printer for Digital Thickness Gauges
Digital Mini-Printer SD-763P and
connecting cable ZE-018.
Refer to the details on page 52.



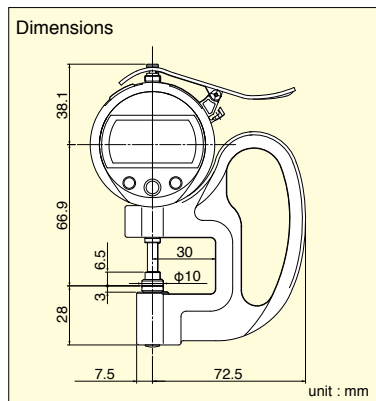
Specifications

Model	Resolution (mm)	Measuring Range (mm) () : Indicating Range*1	Accuracy*2 (μm)	Parallelism (μm)	Measuring Force (N)	Contact Point Form / Anvil Form (mm)	Weight (g)
SMD-540J	0.01	12	±20	5	1.0 or less	φ 10 Flat	290
SMD-550J	0.01	12	±20	5	1.0 or less	φ 10 Flat	440
SMD-565J	0.001	15 (12)	±3	3	1.5 or less	φ 10 Flat	470

*1 Indicating value in () is a measuring range of digital sensor. *2 The quantizing error is not included.

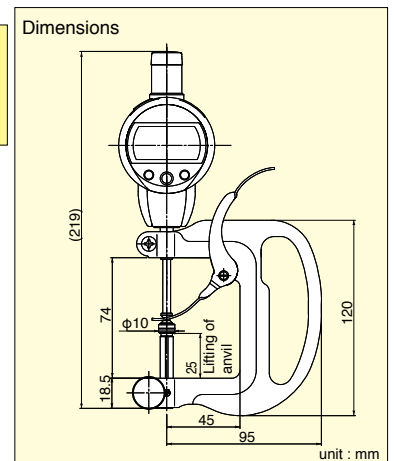
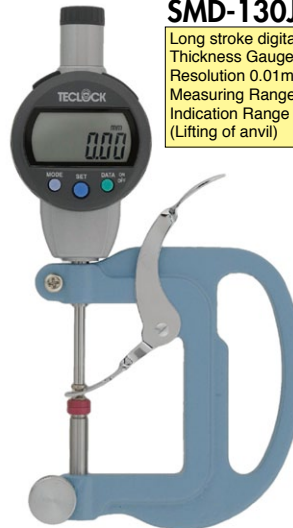
SMD-565J-L

Conventional type of Model : SMD-565J but without Anvil Adjustment.
Resolution 0.001mm
Measuring Range 12mm



SMD-130J

Long stroke digital Thickness Gauge.
Resolution 0.01mm
Measuring Range 50mm
Indication Range 25mm (Lifting of anvil)



Specifications

Model	Resolution (mm)	Measuring Range (mm) () : Indicating Range*1	Accuracy*2 (μm)	Parallelism (μm)	Measuring Force (N)	Contact Point Form	Anvil Form (mm)	Weight (g)
SMD-565J-L	0.001	12	±3	3	1.5 or less	φ 10 Flat	φ 10 Flat	415
SMD-130J	0.01	50 (25)	±20	5	2.0 or less	φ 10 Flat	φ 10 Flat	610

*1 Indicating value in () is a measuring range of digital sensor. *2 The quantizing error is not included.



Constant Pressured Thickness Measuring Instrument

Thickness measuring method for tested piece for physical test such as rubber, heat plasticity Elastomer, plastic film, cloth, textile, leathers are ruled in detail by JIS or ISO. PG/PF series are digital type thickness measuring instrument in compliance with these major standard.

Stand type (fixed type) and frame type (handy type) are widely used for test & research dept., quality control dept. and manufacturing dept.

Features

- Wide range of line-up complying with various standard of the field are available.
- High accuracy digital type with weight type for all the versions realizing stable static load, which is not got by analog type utilizing gears or springs.
- PG series uses micro-granite which is superior for abrasion resistance, chemical resistance, impact resistance in addition to high unstriated for measurable table. It can avoid scratches and stains for metal.
- Stainless steel is used for contact point and anvil (excluding partial model). Acid resistance, alkali proof, water resistance are improved.

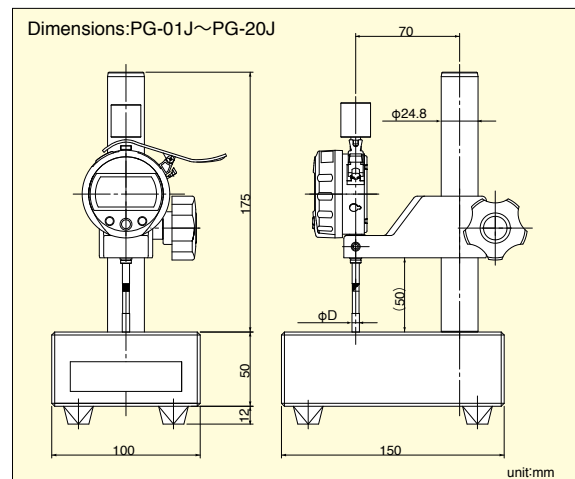
- Power source is silver oxide batteries (SR-44) which is convenient to carry.
- This makes treating statistics of measured data possible with connected to optional printer SD-763P.
- Contact point and measuring pressure can be changed. (However, it is not equivalent to standard)
- Please refer to page 25 for specifications of each model.

PG Series stand type

PG-20J

JIS K 6250 Method A

PG-20 is the thickness measuring instrument compliant with A Law for measuring thickness which is standardized in JIS K 6250 (ruled in physical test method general rule of rubber for vulcanized rubber and thermoplastic rubber.) This is sheet block compatible type which can measure both thickness of test piece hardness IRHD below 35 and over 35 by this one unit. Contact point is diameter 5mm and pressure can be changed by only attaching and detaching weights.

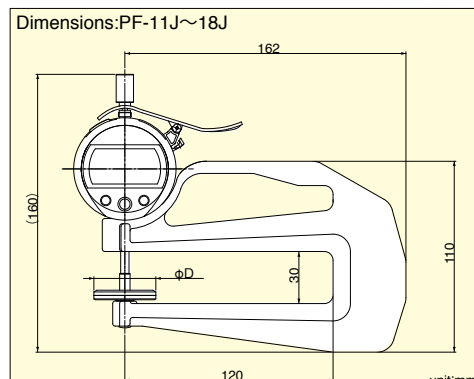
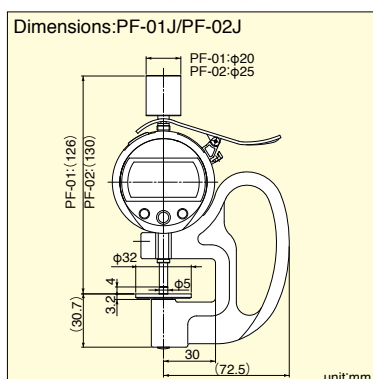


PF Series frame type

PF-02J



PF-11J





Specifications

Model		Reference Standard		Resolution (Mm)	Measuring Range (Mm)	Load (Measuring Force)	Contact Point Φd (Mm)	Measured Pressure
Stand-type	Frame-type	JIS	Measured Item					
PG-01J	PF-01J	K6732-1996	Poly Vinyl Chloride Films For Agriculture	0.001	12	0.8N (80gf) or less	$\phi 5$	
PG-02J	PF-02J	K6783-1994	Ethylene / Vinyl Acetate Copolymer Films For Agriculture	0.001	12	1.22 $\pm$ 0.14mN (125gf $\pm$ 15gf)	$\phi 5$	
		Z1702-1994	Polyethylene Films For Packaging			1226 $\pm$ 143mN (125gf $\pm$ 15gf)		
		Z1709-1995	Heat Shrinkable Plastic Films For Packaging					
PG-11J	PF-11J	K6400-1997	Flexible Polyurethane Foam	0.01	12	0.363N (37gf)	$\phi 35.7$	0.363kPa (3.7gf/cm 2)
PG-12J	PF-12J	K6301-1995	Vulcanized Rubber	0.01	12	0.785N (80gf)	$\phi 5$	
PG-13J	PF-13J	K6328-1999	Rubber Coated Fabrics	0.01	12	0.785N (80gf)	$\phi 10$	
		K6250-2006	Rubber / For A Method (Less Than IRhd 35)					
PG-14J	PF-14J	L1086-2007	Fusible Interlining Fabrics (Non Woven Textile)	0.01	12	0.394N (40gf)	$\phi 16$	2kPa (20gf/cm 2)
PG-15J	PF-15J	L1086-1999	Fusible Interlining Fabrics (Ordinary Textile)	0.01	12	2.35N (240gf)	$\phi 11.3$	23.5kPa (240gf/cm 2)
		L1096-2007	Woven Fabrics (Ordinary Textile)					
		L1018-1999	Knitted Fabrics (Ordinary Knit)					
PG-16J	PF-16J	L1086-2007	Fusible Interlining Fabrics (Ordinary Knitting Fabric)	0.01	12	0.343N (35gf)	$\phi 25.2$	0.7kPa (7gf/cm 2)
		L1096-1999	Woven Fabrics (Crinose Textile)					
PG-17J	PF-17J	K6505-1995	Man-made Upper Material Of Shoes	0.01	12	3.85 $\pm$ 0.1N (390gf $\pm$ 10gf)	$\phi 10$	49.03 $\pm$ 1.177kPa (500 $\pm$ 12gf/cm 2)
		K6550-1994	Leathers					
PG-18J	PF-18J	K6250-2006	Rubber A Method (35 IRhd And Over)	0.01	13	0.431N (44 $\pm$ 10gf)	$\phi 5$	(35 IRHD and over) 22 $\pm$ 5kPa (2.24 $\pm$ 0.51gf/mm 2)
PG-20J	—	K6250-2006	Rubber A Method For Both (Less Than 35 IRhd, 35 IRhd And Over)	0.01	13	0.196 $\pm$ 0.038N (20 $\pm$ 3.9gf)	$\phi 5$	(Less than 35 IRHD) 10 $\pm$ 2kPa (1.02 $\pm$ 0.20gf/mm 2)
						0.431 $\pm$ 0.098N (44 $\pm$ 10gf)		(35 IRHD and over) 22 $\pm$ 5kPa (2.24 $\pm$ 0.51gf/mm 2)

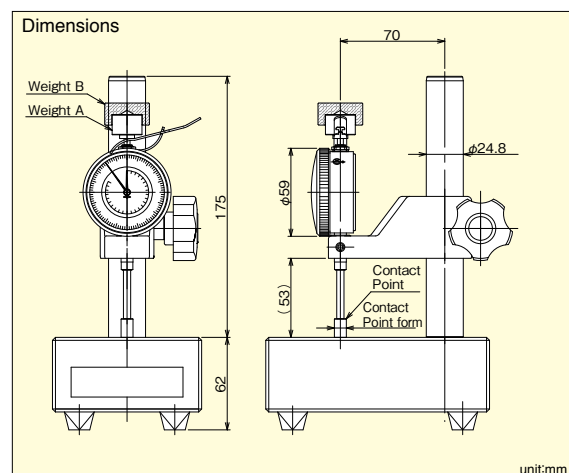
Aluminium alloy is used for material of contact point (including anvil) of PG-11J and PF-11J. Contact point for other model are all stainless steel.
PG-13 and PF-13 can be also used for IRHD below 35 of JIS K 6250 A law.

- PF series can be used by being fixed to stand (Option).



Constant pressured thickness measuring instrument of the plate-cylindrical shape test piece (JIS K 6250 method A)

Hardness 35 for IRHD below-or more of vulcanized rubber.

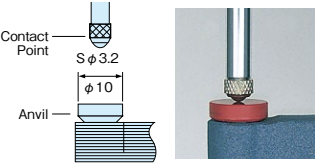
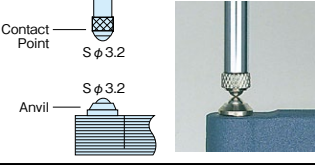
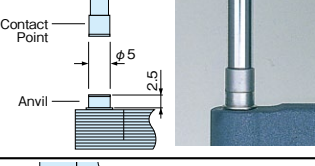
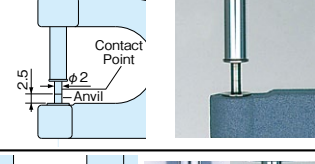
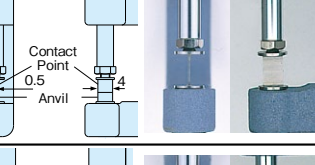
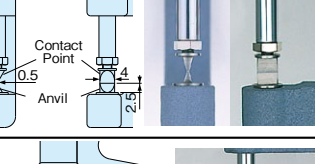
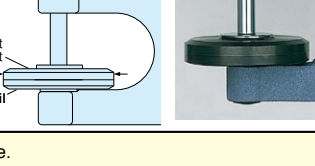


Specifications

Model	Less than 35 IRHD	35 IRHD and over	Graduatoun	Measuring Range	Contact Point Form
PGM-20-5	10 $\pm$ 2kPa (20gf)	22 $\pm$ 5kPa (44gf)	0.01mm	25mm	$\phi 5$ mm
PGM-20-8	10 $\pm$ 2kPa (51gf)	22 $\pm$ 5kPa (113gf)	0.01mm	25mm	$\phi 8$ mm



Thickness Gauge Special Product List

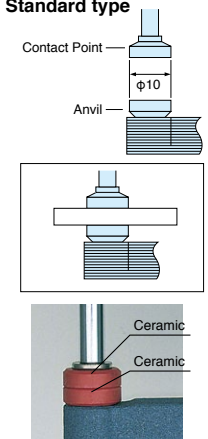
Type	Adaptation models	Graduation (mm)	Measuring Range (mm)	Contact Point (mm)	Anvil Form (mm)
LS type Contact point is spherical, the anvil is flat. 	SM-112LS	0.01	10	φ3.2 Ball	φ10 Flat
	SM-528LS	0.01	20	φ3.2 Ball	φ10 Flat
	SM-114LS	0.01	10	φ3.2 Ball	φ10 Flat
	SM-124LS	0.01	20	φ3.2 Ball	φ10 Flat
	SM-130LS	0.01	50	φ3.2 Ball	φ10 Flat
	SM-1201LS	0.001	10	φ3.2 Ball	φ10 Flat
	SMD-540S2-LS	0.01	12	φ3.2 Ball	φ10 Flat
	SMD-550S2-LS	0.01	12	φ3.2 Ball	φ10 Flat
LW type Contact point: anvil with spherical. 	SM-112LW	0.01	10	φ3.2 Ball	φ3.2 Ball
	SM-528LW	0.01	20	φ3.2 Ball	φ3.2 Ball
	SM-114LW	0.01	10	φ3.2 Ball	φ3.2 Ball
	SM-124LW	0.01	20	φ3.2 Ball	φ3.2 Ball
	SM-130LW	0.01	50	φ3.2 Ball	φ3.2 Ball
	SM-1201LW	0.001	10	φ3 Ball (Carbide)	φ3 Ball (Carbide)
	SMD-540S2-LW	0.01	12	φ3.2 Ball	φ3.2 Ball
	SMD-550S2-LW	0.01	12	φ3.2 Ball	φ3.2 Ball
3A type Upper and lower both φ5 flat. 	SM-112-3A	0.01	10	φ5 Flat	φ5 Flat
	SM-528-3A	0.01	20	φ5 Flat	φ5 Flat
	SMD-540S2-3A	0.01	12	φ5 Flat	φ5 Flat
	SMD-550S2-3A	0.01	12	φ5 Flat	φ5 Flat
NE (needle) type Upper and lower with needle type. 	SM-112NE	0.01	10	φ2 Flat	φ2 Flat
	SM-528NE	0.01	20	φ2 Flat	φ2 Flat
	SM-114NE	0.01	10	φ2 Flat	φ2 Flat
	SMD-540S2-NE	0.01	12	φ2 Flat	φ2 Flat
	SMD-550S2-NE	0.01	12	φ2 Flat	φ2 Flat
BL (blade) type Upper and lower with blade type. 	SM-112BL	0.01	7	t0.5/w4	t0.5/w4
	SM-528BL	0.01	17	t0.5/w4	t0.5/w4
	SM-114BL	0.01	7	t0.5/w4	t0.5/w4
	SMD-540S2-BL	0.01	10	t0.5/w4	t0.5/w4
	SMD-550S2-BL	0.01	10	t0.5/w4	t0.5/w4
KN (blade) type Upper and lower with blade type. 	SM-112KN	0.01	7	t0.5/w4/30°	t0.5/w4/30°
	SM-528KN	0.01	17	t0.5/w4/30°	t0.5/w4/30°
	SM-114KN	0.01	7	t0.5/w4/30°	t0.5/w4/30°
	SMD-540S2-KN	0.01	10	t0.5/w4/30°	t0.5/w4/30°
	SMD-550S2-KN	0.01	10	t0.5/w4/30°	t0.5/w4/30°
LD (flat disk) type Upper and lower with a flat disk type. 	SM-112LD	0.01	10	φ30	φ30
	SM-528LD	0.01	20	φ30	φ30
	SM-114LD	0.01	10	φ30	φ30
	SMD-540S2-LD	0.01	12	φ30	φ30
	SMD-550S2-LD	0.01	12	φ30	φ30

●SM is Analog Type, SMD is Digital type.

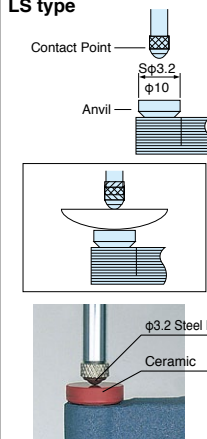
Parts & Accessories

Contact Point, Anvil of Symbol and Shapes

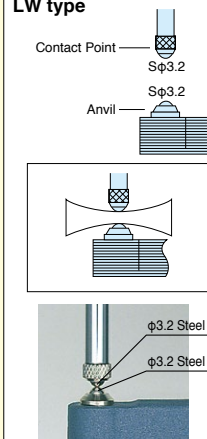
Standard type



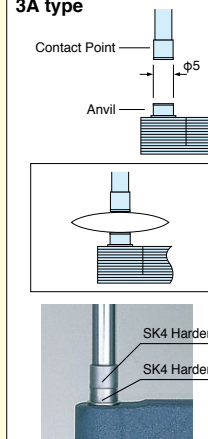
LS type



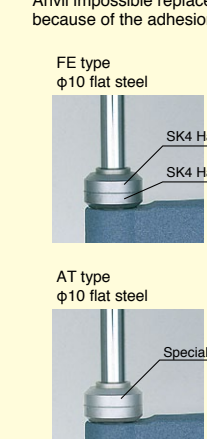
LW type



3A type



FE type
φ10 flat steel



AT type
φ10 flat steel

