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**TEST AND BACK-PLUNGER
INDICATORS AND HOLDERS**



Starrett®

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Test Indicators and Holders

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Test Indicators and Holders

Test indicators are primarily used for the testing or checking of parts and for machine setups, but they are also frequently used for general production purposes, either singly or “ganged” in multiples. They are an indispensable part of a toolmaker’s kit of tools.

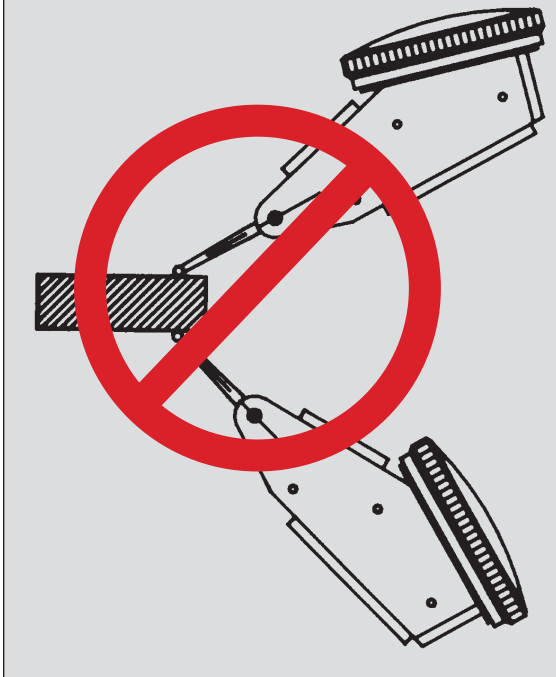
Test indicators come in two types – the plunger style and the lever style. The lever style is more adaptable to smaller, confined working areas, but both types are amazingly versatile.

The lever style differs in measuring because the lever contact moves in an arc rather than in a straight line, as in the plunger style. This can cause a slight inaccuracy called a “cosine error” if reasonable care is not used in setting the angle of the lever to the workpiece. If, for example, a lever was set off 20° more at the start of a reading than it should have been, there could be an error of .0006” in a .010” range (0.012 mm in a 0.2mm range). This is not important when zeroing-out, but only when looking for a measurement.

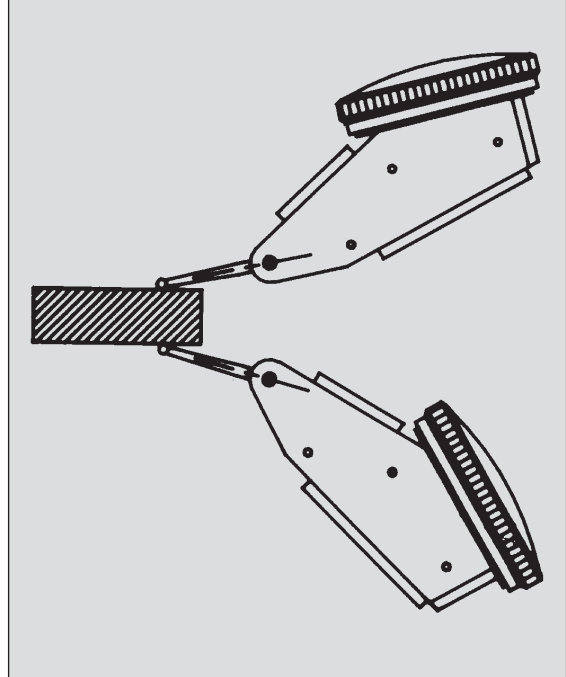
There are other test indicators on the market that have pear-shaped contacts to try to compensate for this error. We do not think this is effective. We think it is best to keep your contact at or near 90° to the direction of movement unless the manufacturer specifies another angle. (See Illustration.) Test indicators should always be “loaded” 1/10 to 1/4 of a turn before measuring.

Test indicators are not hand-held absolute measuring tools. They are comparative instruments that check and compare to known standards or that are used to zero-out setups. We have a broad selection of holders shown in this section that allows you to use these indicators to the fullest. We’ve never seen a job that one of these holders combined with one of our test indicators could not handle.

Incorrect



Correct





Dial Test Indicators with dovetail mounts

No. 708 Series .020"

No. 708M Series 0.2mm

No. 709 Series .060"

No. 709M Series 0.8mm

These precision test indicators were designed to be positioned for easy and accurate readability. The versatility of the angled head, combined with the three dovetail mounts eliminates the need for having both vertical and horizontal style test indicators. These are the features that make this series of test indicators superior to ordinary types:

Readability Features

- ◆ Angled head for better reading position
- ◆ Large 1-3/8" (35mm) dial diameter
- ◆ Revolution count hand on Nos. 708B and 709B models for easy reading

Accuracy Features

- ◆ Precision gear-driven design with smooth, jeweled movement
- ◆ Meet or exceed ISO accuracy specification
- ◆ For extreme accuracy we recommend positioning the lever contact so that it is approximately 15° from being horizontal with the workpiece



Left-to-right: Nos. 708BZ, 708AZ, 709AZ.

Versatility Features

- ◆ Three dovetail positioning mounts work with existing test indicator accessories
- ◆ Inch reading indicators are available with easy-to-read, shaded white, solid red, or solid black dials – millimeter reading indicators with solid yellow dials
- ◆ Contact point reverses automatically, always maintaining clockwise hand rotation
- ◆ Narrow body for inreach ability
- ◆ Satin chrome finish for durability
- ◆ Models with twice the range of ordinary types
- ◆ Long carbide contacts 13/16" (20mm) are furnished as standard on most indicators. Exceptions are the contacts for the Nos. 709ALZ and 709ALCZ which are 1-23/64" (34mm) long; and Nos. 709MALZ and 709MALCZ which are 1-5/64" (28mm)
- ◆ Contact points with other ball diameters also available individually, as listed
- ◆ Contacts are frictionally adjustable and replaceable



Angled head for easy reading.

Specifications on next page.



**Dial Test Indicators with dovetail mounts (continued)
Nos. 708, 708M and Nos. 709, 709M Series**

Inch Reading

Graduation	Range	Dial Reading	Carbide Contact Point		Description	Dial Color	Catalog No.	EDP No.	With Standard Letter of Certification**				
			Length In. (mm)	Ball Dia. In. (mm)					Catalog No.	EDP No.			
.0001"	.010"	0-5-0	13/16" (20mm)	.078" (2mm)	Without Attachments	White	708AZ	64212	708AZ W/SLC	66866			
						Red	R708AZ	64603	R708AZ W/SLC	66867			
						Black	B708AZ	64607	B708AZ W/SLC	66868			
	.020"				With Attachments*	White	708ACZ	64217	708ACZ W/SLC	66869			
						Red	R708ACZ	64604	R708ACZ W/SLC	66870			
						Black	B708ACZ	64608	B708ACZ W/SLC	66871			
.0005"	.030"	0-15-0	13/16" (20mm)	.078" (2mm)	Without Attachments	White	709AZ	64214					
						Red	R709AZ	64605					
						Black	B709AZ	64609					
	.050"				0-25-0	1-23/64" (34.4mm)	.078" (2mm)	With Attachments*	White	709ACZ	64219		
									Red	R709ACZ	64606		
									Black	B709ACZ	64610		
.060"	0-15-0	13/16" (20mm)	.078" (2mm)	Without Attachments	White	709ALZ	65857						
						709ALCZ	65858						
						709BZ	64215						
						709BCZ	64220						

Millimeter Reading

0.002mm	0.2mm	0-100-0	5/8" (16mm)	.078" (2mm)	Without Attachments	Yellow	708MAZ	65864	708MAZ W/SLC	66872
					With Attachments*		708MACZ	65865	708MACZ W/SLC	66873
0.01mm	0.8mm	0-40-0	13/16" (20mm)	.078" (2mm)	Without Attachments	Yellow	709MAZ	64216		
					With Attachments*		709MACZ	64221		
	1.0mm	0-50-0	1-5/64" (28.4mm)	.078" (2mm)	Without Attachments		709MALZ	67092		
					With Attachments*		709MALCZ	67093		

Individual Carbide Contact Points†

Fits Series	Length		Ball Diameter		Part No.	EDP No.
	Inch	mm	Inch	mm		
.0001", .0005", 0.01mm Reading Models	13/16"	20mm	.040"	1mm	PT23942	65255
			.078"	2mm	PT23914†	64222
			.120"	3mm	PT23943	65256
			.078"	2mm	PT27024†	66239
	1-23/64"	34.4mm	.078"	2mm	PT25577†	67294
	1-5/64"	28.4mm	.078"	2mm	PT25577†	67294
0.002mm Reading Models Only	5/8"	16mm	.078"	2mm	PT23953†	65868

*Attachments include **dovetail body clamp** (PT22429/EDP 72441), **tool post holder** (PT11770A/EDP 71361), **swivel post snug with dovetail indicator clamp** (PT22428/EDP 72440), and **snug and rod unit** (Inch: PT22430/EDP 72442 or Millimeter: PT27171/EDP 66457) (see detailed description on page 145 for complete information and/or individual ordering).

** Includes redemption card for Standard Letter of Certification (SLC).

†PT23914, PT27024, PT25577 and PT23953 furnished as standard.

‡Length of carbide contacts must be the same as contacts normally furnished.

Indicators furnished in fitted case.



Dial Test Indicators with swivel head

No. 811 Series .060"

No. 811M Series 0.8mm

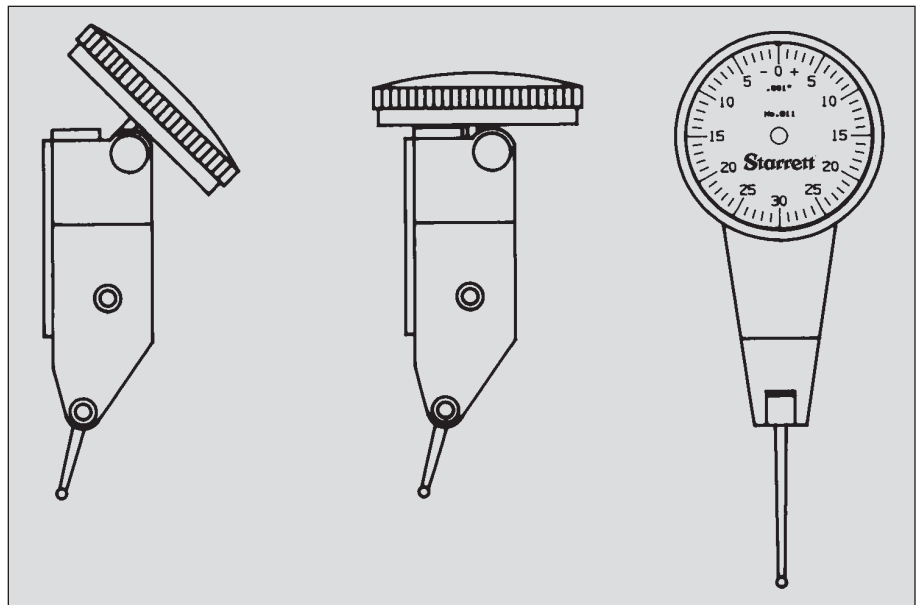
These are some of the most versatile and unique indicators available because the handy swivel head feature allows positioning to suit your line of sight from horizontal to vertical and at any angle in between 90°.

Additional features and benefits include:

- ◆ Two positioning mounts work with existing dovetail test indicator accessories
- ◆ Contacts are frictionally adjustable and replaceable
- ◆ Contact point reverses, always maintaining clockwise hand rotation
- ◆ Contacts also available individually in steel, carbide and different sizes as listed
- ◆ Smooth, jeweled movement
- ◆ Large, 1-3/8" (35mm) dial diameter for increased readability
- ◆ Inch reading indicators are available with white, red, or black dials – metric indicators with yellow dials



Left-to-right: Nos. 811-5CZ, R811-1CZ, B811-5CZ.



Head swivels at any angle from horizontal to vertical, up to 90°.



**Dial Test Indicators with swivel head (continued)
Nos. 811 and 811M Series**

Inch Reading

Graduation	Range	Dial Reading	Steel Contact Points		Description	Dial Color	Catalog No.	EDP No.
			Length Inch (mm)	Ball Dia. Inch (mm)				
.0005"	.030"	0-15-0	5/8" (16mm)	.078" (2mm)	In Case without Attachments	White	811-5PZ	57080
						Black	B811-5PZ	63262
						Red	R811-5PZ	63266
					In Case with Attachments*	White	811-5CZ	57079
						Black	B811-5CZ	63261
						Red	R811-5CZ	63265
.001"	.060"	0-30-0	1-5/16" (33mm)	.078" (2mm)	In Case without Attachments	White	811-1PZ	57082
						Black	B811-1PZ	63264
						Red	R811-1PZ	63268
					In Case with Attachments*	White	811-1CZ	57081
						Black	B811-1CZ	63263
						Red	R811-1CZ	63267

Millimeter Reading

0.01mm	0.8mm	0-40-0	5/8" (16mm)	.078" (2mm)	In Case without Attachments	Yellow	811-MPZ	57084
					In Case with Attachments*		811-MCZ	57083

*Attachments include **dovetail body clamp** (PT22429/EDP 72441), **tool post holder** (PT11770A/EDP 71361), **swivel post snug with dovetail indicator clamp** (PT22428/EDP 72440), and **snug and rod unit** (Inch: PT22430/EDP 72442 or Millimeter: PT27171/EDP 66457) (see detailed description on previous pages for complete information and/or individual ordering). All attachments are the same as for Nos. 708 and 709. Details and complete listings are shown on those pages.

Individual Contact Points

Fits No. 811 Models	Length		Ball Diameter		Material	Part No.	EDP No.
	Inch	mm	Inch	mm			
.0005" and 0.01mm Reading Only	5/8"	16mm	.032"	0.8mm	Steel	PT23062	72451
					Carbide	PT23062X	72452
			.078"	2mm	Steel	PT22315	72443
					Carbide	PT22315X	72453
.001" Reading Only	1-5/16"	33mm	.032"	0.8mm	Steel	PT23064	72454
					Carbide	PT23064X	72455
			.078"	2mm	Steel	PT23011	72444
					Carbide	PT23011X	72456

Indicators furnished in fitted case.



Attachments for Starrett Nos. 708, 709, and 811 Series Test Indicators

A. *Dovetail Body Clamp – No. PT22429
3/16" (4.8mm) diameter rod. For use in chucks, collets or surface gage snugs.



B. *Tool Post Holder – No. PT11770A
1/4" x 1 5/16" (6.3 x 33mm) post and 1/4" x 1/2" (6.3 x 12.7mm) shank. For use in tool posts or in height gages.



C. *Swivel Post Snug with Dovetail Indicator Clamp – No. PT22428
Will fit over spindles and posts 3/32-1/4" (2.4-6.3mm). Can be used directly on our No. 252 Height Transfer Gage and our No. 657 Series Magnetic Base Holders. It is frequently used on the 1/4" (6.3mm) rod of the Snug and Rod Unit No. PT22430.



D. *Snug and Rod Unit – No. PT22430
This unit consists of a snug (No. PT18724) with two 4" (100mm) long rods, one a 1/4" (6.3mm) diameter, the other a 3/8" (9.5mm) diameter. It is generally used with an indicator attached to No. PT22428 Swivel Post Snug which slides onto the 1/4" (6.3mm) diameter rod.

The 3/8" (9.5mm) rod will fit into the Nos. 252 and 657H Gage Holders. It also has the ability to be held in chucks and adjusted to a wide range of heights and diameters.

DM. Metric Snug and Rod Unit – No. PT27171. This unit consists of a snug with two 100mm (4") long rods, one having a 6mm (.236") diameter, the other an 8mm (.315") diameter.



E. Indicator Axial Support – No. PT26007
This triple-hinged indicator holder is designed to mount dovetail indicators (such as our Nos. 708, 709, and 811 Series). By using a rod through the 3/16" (4.7mm) mounting hole, it will also accommodate test indicators such as our No. 711 Series. Overall length is approximately 5 1/4" (133mm), shank size is 3/8" (9.5mm).



F. Height Gage Attachment – No. 711-49
1/8" x 5/16" (3 x 8mm) shank. This is used for Starrett Nos. 250, 454 10", 750, 751 Height Gages and No. 995 Planer and Shaper Gage.



G. Height Gage Attachment – No. 711-35
3/16" x 3/8" (4.8 x 9.5mm) shank. This is used for Starrett Nos. 255 and No. 454 12" and 24" Height Gages.



H. Indicator Attachment, dovetail clamping style – No. PT99454. Replaces standard scriber. Provides means to attach dovetail equipped test indicators or electronic probes to height gages. Allows indicator to be used to ensure that the down pressure on the part is the same as the original set zero position.



I. & J. Collet Adaptors – No. PT28315
To be used with a 3/16" (4.7mm) diameter attachment for indicators such as PT22429 dovetail body clamp and PT0710F long and short arm attachments.
No. PT28316 – Swivel Post Collet Adaptor, for use on any dovetail test indicator.



* Attachments marked with an asterisk (*) are furnished with all sets having "C" in the catalog number.

Photo Key	Description	Part No.	EDP No.
A*	Dovetail Body Clamp	PT22429	72441
B*	Tool Post Holder	PT11770A	71361
C*	Swivel Post Snug with Clamp	PT22428	72440
D*	Snug and Rod Unit	PT22430	72442
DM	Metric Snug and Rod Unit	PT27171	66457
E	Indicator Axial Support	PT26007	65101
F	Height Gage Attachment	711-49	52941
G	Height Gage Attachment	711-35	52942
H	Indicator Attachment, dovetail style	PT99454	68713
I	Collet Adaptor	PT28315	68847
J	Collet Adaptor	PT28316	68848



Last Word® Dial Test Indicators

No. 711 Series .030"

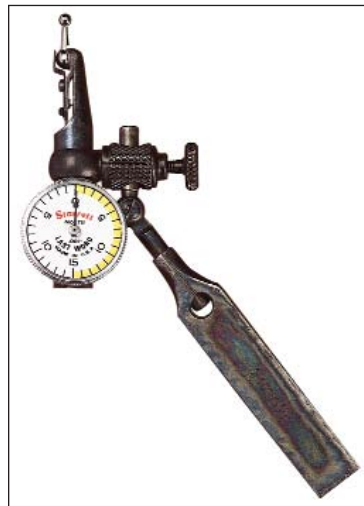
No. 711M Series 0.07mm

The venerable Last Word® Dial Test Indicator is among the most versatile available. Their small size and variety of attachments will handle all jobs with ease and accuracy. A very useful feature is the shaded dial – when used with a mirror, such as in a jig bore application, the operator will always know what the correct reading is.

Other features include:

- ◆ Ideal for precise measurements in all machining, layout, and inspection work
- ◆ Smooth, jeweled lever action
- ◆ Positive reversing switch
- ◆ Hard chrome-plated ratchet contact point
- ◆ Swiveling tubular body
- ◆ Easy reading dials, half-shaded yellow for clarity
- ◆ Variety of attachments available to suit the application, such as: universal or gooseneck shanks and universal friction holder with shank
- ◆ Indicators having "C" in the catalog number are furnished with 3 interchangeable steel contact points. All other indicators are furnished with one interchangeable steel contact point, No. PT07087. Carbide points available as listed

No. 711F Indicator only.



Right: No. 711LPSZ Indicator with Universal Friction Holder and shank.

Left: No. 711FSAZ Indicator with universal shank and body clamp attachment.




Last Word® Compact Dial Test Indicators Nos. 711 and 711M Series (continued)
Inch Reading

Graduation	Range	Dial Reading	Steel Contact Points		Description	Catalog No.	EDP No.
			Length Inch (mm)	Ball Diameter Inch (mm)			
.001"	.030"	0-15-0	5/32" (4mm)	One: .120" (3mm)	Indicator with Universal Shank Complete with Long and Short Arm, Body Clamp	711FSAZ	52925
					Indicator with Gooseneck Shank	711FSBZ	52927
					Indicator with Body Clamp Only	711FSZ	52929
					Indicator with Universal Friction Holder with Shank	711GPSZ	52944
					Indicator Complete with All Attachments*	711GCSZ	52943
.0005"	.030"	0-15-0	5/32" (4mm)	One: .120" (3mm)	Indicator with Universal Shank Complete with Long and Short Arm, Body Clamp	711HSAZ	52951
					Indicator with Body Clamp Only	711HSZ	52953
					Indicator with Universal Friction Holder with Shank	711LPSZ	52958
					Indicator Complete with All Attachments*	711LCSZ	52957
					Indicator Complete with All Attachments*	711LCSZ	52957

Millimeter Reading

0.01mm	0.7mm	0-35-0	5/32" (4mm)	One: .120" (3mm)	Indicator with Universal Shank Complete with Long and Short Arm, Body Clamp	711MFAZ	52926
					Indicator with Body Clamp Only	711MFSZ	52930
					Indicator with Universal Friction Holder with Shank	711MGPSZ	52946
					Indicator Complete with All Attachments*	711MGCSZ	52945
					Indicator Complete with All Attachments*	711MGCSZ	52945

*Attachments include 3 contact points – body clamp – universal friction holder with shank – universal shank complete with long and short arm – double-jointed attachment – height gage attachment – surface gage attachment – coupling with 3/16" (4.8 mm) hole.

Individual Contact Points (Fit All No. 711 Series)

Length		Ball Diameter		Material	Part No.	EDP No.
Inch	mm	Inch	mm			
5/32"	4mm	.035"	0.9mm	Steel	PT07137	70945
		.062"	1.6mm		PT07136	70944
		.120"	3mm		PT07087	70912
		.035"	0.9mm	Carbide	PT07137X	52964
		.062"	1.6mm		PT07136X	52965
		.120"	3mm		PT07087X	52966



Attachments for Starrett No. 711 Series Last Word® Dial Test Indicators

A. *Body Clamp – No. PT07101F
Permits the indicator to be held by its body and clamped to any diameter rod from 1/8-1/4" (3-6mm). It will attach directly to the rod on the Starrett No. 252 Height Transfer Gage, Nos. 57 and 257 Surface Gage Scribes and No. 657A and AA Holder. It also attaches the universal shank to the indicator with the addition of No. PT07104F Long and Short Arm.



B. *Universal Friction Holder with shank – No. 711EA – This inserts in place of the end plug at the top of the indicator body. The shank has a 3/16" (4.8mm) diameter which will fit into chucks and also into the snugs of our Nos. 57 and 257 Surface Gages.



C. *Universal Shank – No. PT07103A
This shank includes No. PT07104F (the long and short arm) to go into the body clamp. With its shank size of 1/4" x 1/2" (6.4 x 12.7mm) this can be used in a lathe tool post or for Starrett Height Gage Nos. 254 and 259.



D. Gooseneck Shank – No. PT07107A
1/4" x 1/2" (6.4 x 12.7mm) shank can be used on tool posts and on the same height gages as the No. PT07103A Universal Shank. It is attached by unscrewing the body clamp and replacing it with the gooseneck shank.



E. *Double-Jointed Attachment – No. PT13301 – This attachment has a 3/8" (9.5mm) diameter at one end and a 1/4" (6.3mm) diameter at the other end and will fit into chucks and collets, (such as in a jig borer) and hold the indicator by the body clamp, giving it greater depth and diameter range.



F. *Long and Short Arm – No. PT07104F
This is used with the universal shank to attach it to the body clamp. It has a 3/16" (4.8mm) diameter and arms with 13/16" and 1-3/16" (20mm and 30mm) lengths.



G. *Coupling with 3/16" (4.8mm) hole – No. PT05116 – Coupling slips over the long and short arm No. PT07104F and the shank of No. PT13175 Universal Friction Holder to permit offset.



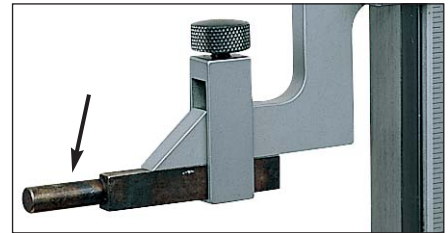
H. *Height Gage Attachment – No. PT24706 – This inserts in place of the end plug at the top of the indicator body. The 3/16" x 11/32" (4.8 x 8.7mm) shank fits Starrett No. 255 12", 18" and 24" Height Gages.



I. Height Gage Attachment – No. 711-49 – 1/8" x 5/16" (3 x 8mm). This goes into the body clamp and allows the indicator to be used on Starrett Nos. 250, 354, 454-10", 750, 751 Height Gages.



J. Height Gage Attachment – No. 711-35 – 3/16" x 3/8" (4.8 x 9.5mm). This goes into the body clamp and is used for Starrett No. 255 12", 18" and 24" Height Gages.



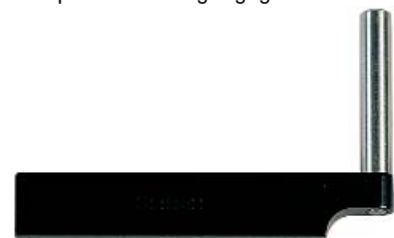
K. Indicator Axial Support – No. PT26007
This triple-hinged indicator holder will hold our No. 711 Series Indicators by putting a shank or rod through the 3/16" (4.7mm) mounting hole. Also designed to mount dovetail indicators. Overall length is approximately 5-1/4" (133mm) – shank size is 3/8" (9.5mm).



L. *Surface Gage Attachment – No. PT05119 – Fits in place of the ball shank of the No. 711EA Attachment. Allows Nos. 711G and L Indicators to be used on holders with smaller clamp holes.



M. Tool Post Holder – No. PT11770A
1/4" x 1-5/16" (6.3 x 33mm) post and 1/4" x 1/2" (6.3 x 12.7mm) shank. For use in tool posts or in height gages.



* Attachments marked with an asterisk (*) are furnished with all sets having "C" in the catalog number.



Attachments for Starrett No. 711 Series Last Word® Dial Test Indicators (continued)

N. Rubber Dust Guard – No. PT09764
Protects the indicators' working parts by sealing out dust, powder, and other foreign matter under adverse gaging conditions.



O. Collet Adaptor – No. PT28315
To be used with a 3/16" (4.7mm) diameter attachment for indicators such as PT22429 dovetail body clamp and PT0710F long and short arm attachments.



Photo Key	Description	Part No.	EDP No.
A*	Body Clamp	PT07101F	70924
B*	Universal Friction Holder with Shank	711EA	52924
C*	Universal Shank Complete with Long and Short Arm	PT07103A	52939
D	Gooseneck Shank	PT07107A	52937
E*	Double-Jointed Attachment	PT13301	71441
F*	Long and Short Arm	PT07104F	70929
G*	Coupling with 3/16" (4.8mm) Hole	PT05116	70556
H*	Height Gage Attachment	PT24706	65064
I		711-49	52941
J		711-35	52942
K	Indicator Axial Support	PT26007	65101
L*	Surface Gage Attachment	PT05119	70557
M	Tool Post Holder	PT11770A	71361
N	Rubber Dust Guard	PT09764	71290
O	Collet Adaptor	PT28315	68847

Attachments marked with an asterisk () are furnished with all sets having "C" in the catalog number.



Back-Plunger Dial Indicators

No. 650 Series with deep hole attachment .200"

No. 651 Series without deep hole attachment

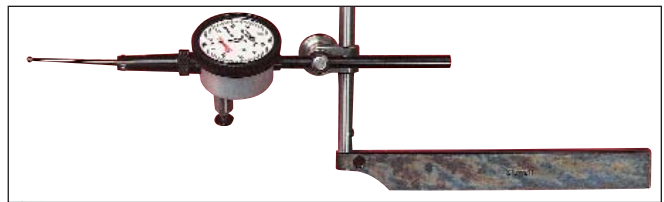
These workhorse back-plunger indicators feature AGD (American Gage Design) stem holding fixtures and the great variety of AGD contact points. This very versatile indicator series has the following features:

- ◆ Smooth and accurate operation due to their sturdy, basic design
- ◆ Hardened, stainless steel AGD stem .375" (9.5mm) diameter
- ◆ Shank dimension 1/4" (6.3mm) diameter, 3-3/16" (80mm) long
- ◆ No. 650 Indicators have a 3" (75mm) deep hole attachment that connects directly with the main spindle for positive action. Attachment is convenient to use when checking internal dimensions of a workpiece while in fixtures or machines. When not needed, the attachment can be easily removed and the hole capped
- ◆ No. 651 Indicators are identical to the No. 650 Series except they cannot accept the deep hole attachment



Left-to-right:
Nos. 650 and 651.

- ◆ Both models have large 1-11/16" (43mm) diameter bezels with easy-to-read dial numbers and graduations



Individual Contact Points Only

Photo	Part No.	EDP No.
	PT07215	70965
	PT06632-5	70793
	PT06632-6	70794

- ◆ With their .375" (9.5mm) AGD stem diameter, the 650 and 651 can be used with our No. 670 Hole Attachment and our No. 671 Universal Attachment the .375" (9.5mm) AGD stem diameter
- ◆ Adjustable dials to set zero at any point opposite the hand
- ◆ Inch reading dials have white faces and millimeter reading dials are yellow
- ◆ Three different styles of contact points are furnished with each indicator

Inch Reading

Range	Graduation	Dial Reading	Description	No. 650 Series		No. 651 Series	
				With Deep Hole Attachment	Without Deep Hole Attachment	Catalog No.	EDP No.
.200"	.001"	0-100	Indicator with 3 Contact Points, 3 Attachments*, in Case	650A1Z	64475	651A1Z	64483
			Indicator with 3 Contact Points Only	650B1	64477	651B1	64485
		0-50-0	Indicator with 3 Contact Points, 3 Attachments*, in Case	650A5Z	64474	651A5Z	64484
			Indicator with 3 Contact Points Only	650B5	64476	651B5	64486

Millimeter Reading

Range	Graduation	Dial Reading	Description	No. 650M Series		No. 651M Series	
				Catalog No.	EDP No.	Catalog No.	EDP No.
5 mm	0.01mm	0-100 Yellow Dial Face	Indicator with 3 Contact Points, 3 Attachments*, in Case	650MA1Z	65261	651MA1Z	65263
			Indicator with 3 Contact Points Only	650MB1	65262	651MB1	65264

*Attachments include clamp, tool post holder and snug (PT18718). For detailed information, see below and next page.

Attachments for Starrett No. 650 & No. 651 Series Back-Plunger Dial Indicators

A. *Clamp – No. PT99437
With a 1-5/16" (33mm) flat or round capacity – 5/16" (8mm) post used with No. PT18718 Snug. (See right)



B. *Tool Post Holder – No. PT99438
3/8" x 3/4" x 6" (9.5 x 19 x 150mm) with upright spindle 5/16" dia. x 4-1/2" length (8 x 114mm).



(Continued on the next page.)



Back-Plunger Dial Indicators

No. 641 .200"

No. 641M 5mm

These indicators have the same design as the 650 Series, but without the shank and deep hole attachments. They are useful for positioning in unconventional fixtures and mountings. The spindle is perpendicular to the dial face for optimum dial readability.

Attachments for Starrett No. 650 and No. 651 Series Back-Plunger Dial Indicators (continued)

C. *Snug Complete – No. PT18718
Post hole has a 5/16" diameter† and 3/32-1/4" holding capacity. Can be used on our No. 252 Height Transfer Gage, Nos. 57 and 257A and B Surface Gages, on No. 657A Magnetic Base and Swivel Post Assembly.



D. Snug Complete – No. PT18724
Post hole has a 3/8" diameter (9.5mm) and 3/32-1/4" (2.4-6.3mm) holding capacity. Can be used with our Nos. 57 and 257C and D Surface Gages or No. 657AA Magnetic Base with upright post.



* Attachments marked with an asterisk (*) are furnished with all sets having "A" in the catalog number.

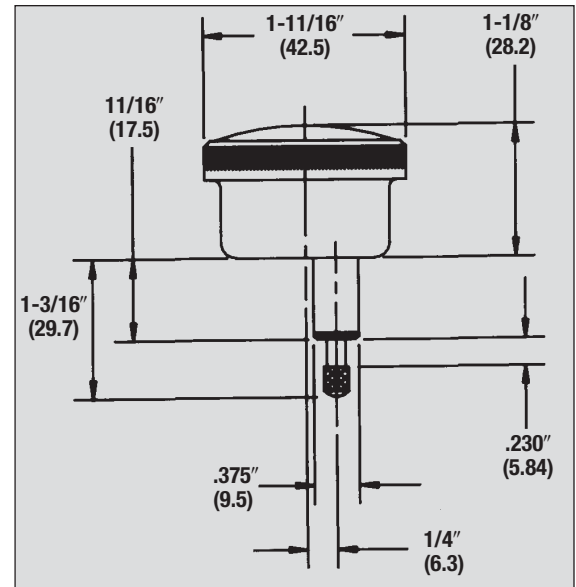
† For snug with 8mm post hole diameter and 2.4-6.3mm holding capacity, order PT27171, EDP 66457.



Above: No. 641;
Below: No. 641M.



- ◆ Continuous reading dials with revolution counters
- ◆ Uses standard AGD contacts



Inch Reading

Range	Graduation	Dial Reading	Catalog No.	EDP No.
.200"	.001"	0-100	641	65107

Millimeter Reading

5mm	0.01mm	0-100	641M	65108
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E. Universal Snug – No. 57S
With spindle hole diameters 5/16", 3/8" (8, 9.5mm) and gripping hole diameters 9/64", 5/32", 3/16", 1/4" (3.5, 4, 4.8, 6.3mm).



F. Universal Snug – No. 58S
With spindle hole diameters 1/4", 5/16", 3/8" (6.3, 8, 9.5mm). Gripping hole diameters range from 3/32-1/4"



Photo Key	Description	Catalog/Part No.	EDP No.
A*	Clamp (see previous page)	PT99437	64492
B*	Tool Post Holder (see previous page)	PT99438	64493
C*	Snug Complete	PT18718	50709
D	Snug Complete – 1/4" and 3/8" Holes	PT18724	50710
E	Universal Snug	57S	50296
F	Universal Snug	58S	56613

NOTE: For AGD attachments and contact points that can be used with No. 650 and No. 651 Indicators, see the attachments and accessories pages with the AGD Indicators, further on in the section.



Universal Back-Plunger Dial Indicators

No. 196 Series .001"

No. 196M Series 5mm

Our No. 196 Indicator is one of the most versatile indicators available ... and it is the "granddaddy" of them all. Over the years this tool has been improved by methods and materials but the basic design is unchanged. The design is older than most of you and has withstood the test of time and beaten all challengers because it is:

- ◆ Accurate and reliable
- ◆ Simple to operate
- ◆ Rugged, with few moving parts
- ◆ Smooth in operation
- ◆ Inexpensive – the best indicator value you can buy

While there is a need for indicators with finer graduations, such as our No.708 Series, this indicator with graduations to .001" and 0.02mm will handle by far the majority of jobs. Shank diameter is 1/4" (6.3mm). Antimagnetic models are also available – (inch reading) Nos. 196A6Z and 196B6.



Left, No. 196B1;
right, No. 196MB1.

For full use, the operator first chooses the proper contact from the three hardened contact points that come with each model. Then the contact should be brought against the work with enough pressure to give the hand

one full turn. Set the hand at zero by rotating the dial with the knurled bezel. This provides one full rotation of the hand both to the right and left of zero, showing a rise or drop in the work and the amount of that variation.

Inch Reading – Shank Diameter 1/4"

Graduation	Range	Dial Reading	Description	Catalog No.	EDP No.
.001"	.200"	0-100	Indicator with 3 Contact Points, Adaptor, 4 Attachments* in Case	196A1Z	50697
			Indicator with 3 Contact Points and Adaptor Only	196B1	50699
			Indicator with 3 Contact Points, Adaptor, and Standard Letter of Certification†	196B1 W/SLC	66865
		0-50-0	Antimagnetic Indicator with 3 Contact Points, 4 Attachments* in Case	196A6Z	50701
			Antimagnetic Indicator with 3 Contact Points Only	196B6	50702
			Indicator with 3 Contact Points, Adaptor, 4 Attachments* in Case	196A5Z	50714
			Indicator with 3 Contact Points and Adaptor Only	196B5	50717

Millimeter Reading – Shank Diameter 6.3mm

Graduation	Range	Dial Reading	Description	Catalog No.	EDP No.
0.02mm	5mm	0-100	Indicator with 3 Contact Points, Adaptor, 4 Attachments* in Case	196MA1Z	65251
			Indicator with 3 Contact Points and Adaptor Only	196MB1	65252
		0-50-0	Indicator with 3 Contact Points, Adaptor 196R, 4 Attachments* in Case	196MA5Z	65253
			Indicator with 3 Contact Points and Adaptor Only	196MB5	65254

*Attachments include **clamp, tool post holder, snug and hole attachment**. For detailed information, see next page.

†Includes redemption card for Standard Letter of Certification (SLC).

Contact Points and Adaptors Only

Description	Catalog/Part No.	EDP No.
Adaptor**	196R	50711
Adaptor (Metric Threads)	196MR	67457
Hardened Steel	PT05471	70617
	PT05472	70618
Contact Point	PT05473	70619



196R, 196MR



PT05472



PT05471



PT05473

**For Contact Points with #4-48 Thread, see AGD Contact Listings.



Attachments for Starrett Nos. 196, 196M Series Universal Dial Indicators

A. *Clamp – No. PT99437
With a 1-5/16" (33mm) flat or round capacity, 5/16" (8mm) post used with No. PT18718 Snug.



B. *Tool Post Holder – No. PT99438
3/8" x 3/4" x 6" (9.5 x 19 x 150mm) with upright spindle 5/16" dia. x 4-1/2" length (8 x 114mm). Use with No. PT18718 Snug.



C. *Snug Complete – No. PT18718
Post hole has a 5/16" diameter† and 3/32-1/4" holding capacity. Can be used on our No. 252 Height Transfer Gage, Nos. 57 and 257A and B Surface Gages, on No. 657A Magnetic Base and Swivel Post Assembly.

D. Snug Complete – No. PT18724
Post has a 3/8" diameter (9.5mm) and 3/32-1/4" (2.4-6.3mm) holding capacity. Can be used with our Nos. 57 and 257C and D Surface Gages and No. 657AA Magnetic Base with upright post.



E. *Hole Attachment – No. 196F
Lets indicator be used over obstructions and inside holes to a depth of approximately 1-5/8" (40mm).



F. Shock Absorbing Anvil – No. PT08726A



G. Universal Snug – No. 57S
With spindle hole diameters 5/16", 3/8" (8, 9.5mm) and gripping hole diameters 9/64", 5/32", 3/16", 1/4" (3.5, 4, 4.8, 6.3mm).



H. Universal Snug – No. 58S
With spindle hole diameters 1/4", 5/16", 3/8" (6.3, 8, 9.5mm). Gripping hole diameters range from 3/32-1/4" (2.4-6.3mm).



I. Split Bushing – No. PT00764
Allows attachment of No. 196 Indicator to No. 660 Magnetic Base.



* Attachments marked with an asterisk (*) are furnished with all sets having "A" in the catalog number.

† For snug with 8mm post hole diameter and 2.4-6.3 mm holding capacity, order PT27171, EDP 66457.

Photo Key	Description	Catalog/Part No.	EDP No.
A*	Clamp	PT99437	64492
B*	Tool Post Holder	PT99438	64493
C*	Snug Complete	PT18718	50709
D	Snug Complete – 1/4" and 3/8" Holes	PT18724	50710
E*	Hole Attachment	196F	50706
F	Shock Absorbing Anvil	PT08726A	66052
G	Universal Snug	57S	50296
H	Universal Snug	58S	56613
I	Split Bushing	PT00764	68850

NOTE: For AGD attachments and contact points that can be used with No. 196 Indicators, see the attachments and accessories pages with the AGD Indicators, further on in the section.



Test and Back-Plunger Indicator Holders

Test and back-plunger indicators cannot be used without proper holders. The following pages show the variety of Starrett holders available. This selection should handle virtually any job that needs to be done.

Magnetic Base Indicator Holder

No. 657AA

For use with all Starrett Test, Back-Plunger, AGD, Dial and Miniature-Dial Indicators. Also accommodates similar indicators of other manufacturers.

A. No. 657P Magnetic Base. 1-15/16 x 1-5/8 x 1-7/8" (50 x 40 x 48mm). Push-button on/off switch for one-hand operation. Base has three precision ground magnetic contact points. Grips horizontally, vertically, and upside down. V-step holds base to arbors, shafts, etc. Base has extra 1/4-20 tapped hole on one side for mounting post. Black wrinkle finish on non-working surfaces.

B. No. 657G Upright Base Post. 3/8" (9.5mm) diameter x 7-7/16" (190mm) length overall. Starrett No. 57S and No. 58S Universal Snugs may also be used.

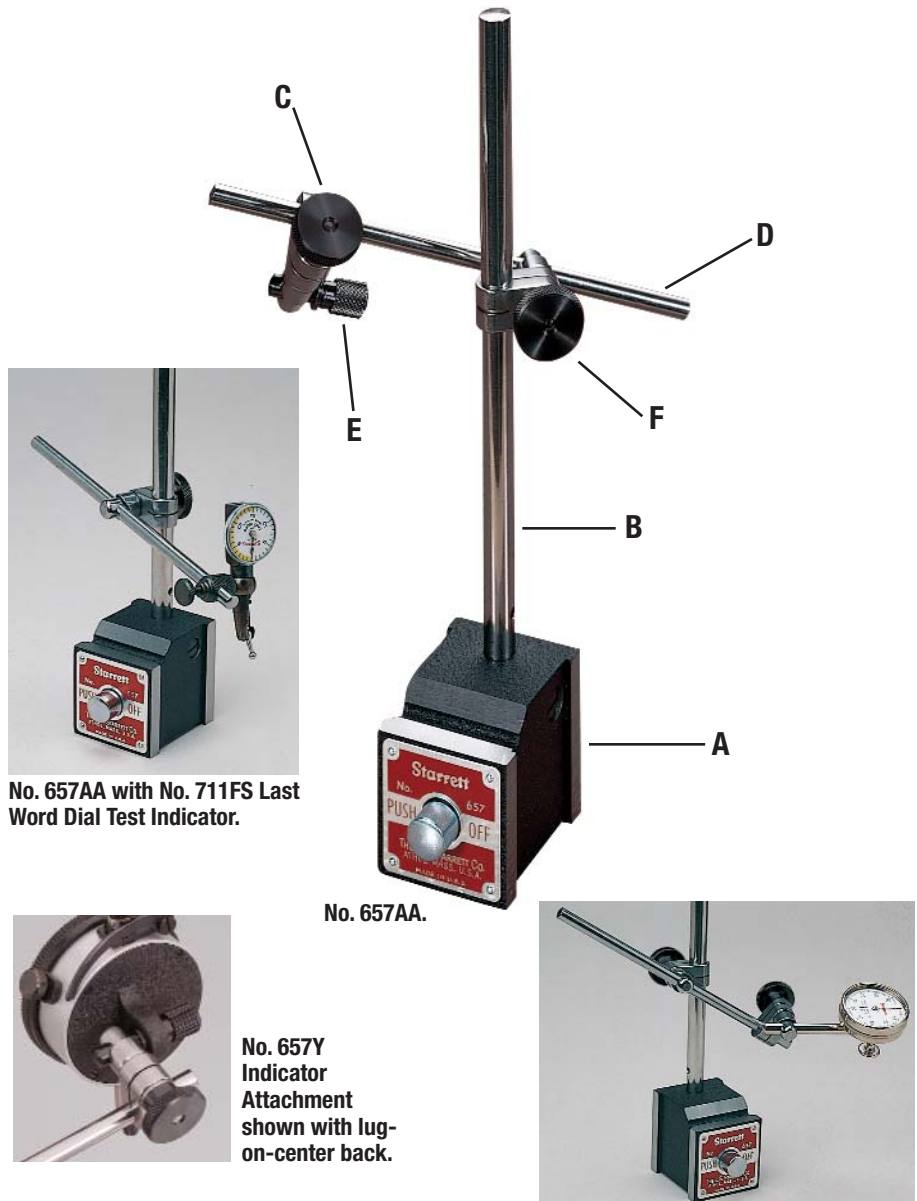
C. No. 657S Snug. Two 1/4" (6.3mm) diameter holes. Adapts Nos. 196, 650, and 651 Series Dial Indicators and No. 657Y Indicator Attachment to No. 657X Rod.

D. No. 657X Rod. 1/4" (6.3mm) diameter x 6" (150mm) long. Accommodates Starrett Nos. 708, 709, 811 and 711F Series Dial Test Indicators and No. 657S Sleeve.

E. No. 657Y Indicator Attachment. 1/4" (6.3mm) O.D. one end, other end threaded and fits lug backs of all AGD indicators (Starrett Series Nos. 81, 25, 655, 656) and Series No. 80 Miniature Indicators.

F. No. PT18724 Snug 3/8" (9.5mm) diameter post hole. 1/4" (6.3mm) diameter gripping hole accommodates No. 657X Rod.

Packed one in a box.



No. 657AA with No. 711FS Last Word Dial Test Indicator.

No. 657AA.

No. 657Y Indicator Attachment shown with lug-on-center back.

Shown with No. 196B1 Universal Dial Indicator.

Complete Set

Photo Key	Description	Catalog No.	EDP No.
	Magnetic Base with All Attachments – A, B, C, D, E, F	657AA	52743
	Base and Post Assembly with No. 650B1 Indicator, No. 657S Snug, and 3 Contact Points	657-650Z	65259

Individual Components

A	Magnetic Base Only	657P	52757
B	7 7/16" Upright Base Post Only	657G	52753
C	Snug with Two 1/4" (6.3 mm) Holes	657S	52759
D	Rod	657X	52764
E	Indicator Attachment	657Y	52765
F	Snug Complete – 1/4" and 3/8" Holes	PT18724	50710



Magnetic Base Indicator Holder with swivel post assembly

No. 657A

The swivel post assembly on these holders provides universal adjustment in both horizontal and vertical planes. Available with inch or millimeter Starrett Dial Test or Back-Plunger Indicators, they save time in shop set-up and other inspection jobs.

For use with all Starrett Test, Back-Plunger, AGD, Dial and Miniature-Dial Indicators. Also accommodates similar indicators of other manufacturers.

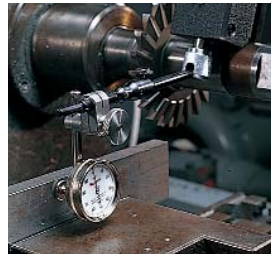
Powerful, permanent magnetic base holds firmly to steel or iron surfaces – horizontally, vertically, upside-down. Push-button turns magnetic force on or off for quick, one-hand set-up and take-down. V-step adapts base to horizontal or vertical arbors and chucks. There is an extra 1/4-20 NC tapped hole in side of base for indicator mounting post. Three precision ground magnetic contact surfaces (plus V-step). Black wrinkle finish on non-working surfaces.

Magnetic Base Assembly Features:

A. No. 657P Magnetic Base is 1-15/16" x 1-5/8" x 1-7/8" (50 x 40 x 48mm) deep.

B. Swivel Cap Slot permits 90° post travel to horizontal position.

Packed one in a box.



Left, No. 657A shown with No.196B1 Universal Dial Indicator setting up workpiece on milling machine.Center, No. 657A with No. 711LS Last Word Dial Test Indicator setting up workpiece on surface grinder. Right, No. 657A.

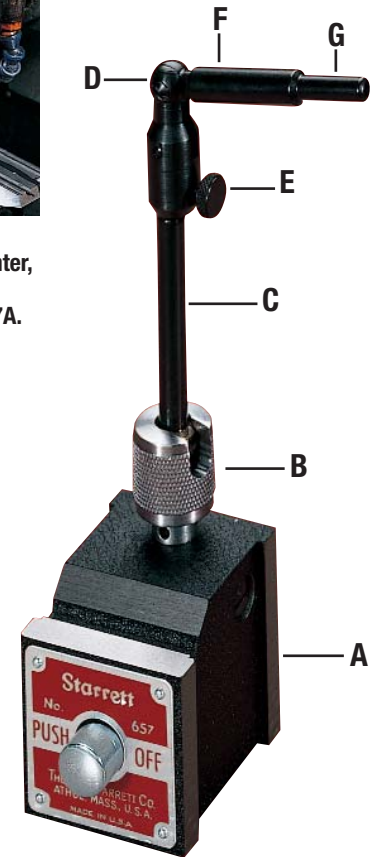
C. Post rotates 360°.

D. No. 657F Indicator Swivel Post Assembly is 6-1/2" (165mm) high (less threaded end). Assembly consists of items B, C, E, F, G.

E. Fine-Adjusting Screw. Turn to zero set indicator.

F. Upper arm is 2" (50mm) long with a 5/16" (8 mm) dia. and swings more than 180°; friction joint holds it in position.

G. 7/32" (5.5mm) dia. step, 1/2" (13 mm) long.



Individual Components

Description	Catalog No.	EDP No.
Magnetic Base with Swivel Post Assembly	657A	52744
Magnetic Base Only	657P	52757
Swivel Post Assembly Only	657F	52752

No. 657 Series Sets

These sets have been put together for your ordering convenience, but you can mix and match other Starrett test or back-plunger indicators and attachments with the No. 657A Magnetic Base and Swivel Post Assembly to suit your needs.

With No. 709A.



With No. 711FS.



With No. 196B1.



Inch Reading Sets

Description*	W/Finished Wood Case		Without Case	
	Cat. No.	EDP No.	Cat. No.	EDP No.
Base and Post Assembly with 711FSAZ Last Word® Indicator and PT07101F Body Clamp	657BZ	52746	657B	52745
Base and Post Assembly with 196B1 Indicator, PT18718 Snug, 3 Contact Points, and Contact Point Adaptor	657CZ	52748	657C	52747
Base and Post Assembly with 709AZ Indicator and PT22428 Swivel Post Snug	657-709Z	65257		
Base and Post Assembly with No. 811-1Z Indicator and PT22428 Swivel Post Snug	657-811Z	65258		

Millimeter Reading Sets

Base and Post Assembly with 711MFSZ Indicator with PT07101F Body Clamp	657MBZ	56354	657MB	56353
Base and Post Assembly with 196B1 Indicator, PT18718 Snug, 3 Contact Points, Contact Point Adaptor	657MCZ	56356	657MC	56355

* See previous pages for detailed indicator and attachment specifications.



Flex-O-Post Indicator Holders with magnetic base

No. 657T Series

For use with all Starrett Test, Back-Plunger, AGD, Dial, and Miniature Dial Indicators. Also accommodates similar indicators of other manufacturers. The flexible post is an assembly of short tubular steel sections and precision ball joints, linked by an internal steel cable. It can be adjusted to any position and locked by turning a lever near the magnetic base. This makes it possible to use indicators in awkward places that are hard to reach with conventional holding devices.

Assembled to the magnetic base, the post has a vertical reach of approximately 15" (380mm) and a horizontal reach of approximately 10" (250mm). The indicator snug on the end of the post can be rotated through 360° and locked in any position.

The base has three precision ground magnetic contact surfaces. Grips horizontally, vertically or upside down. V-step holds base to arbors, shafts, chucks.

The No. 657W Attachment allows fine adjustments to be made, operated by turning the fine-adjusting thumb screw (with post locked in rigid position) to zero, then set the indicator.

A. Gage Rod 3/8" x 3" (9.5mm x 75mm) has 5/16, 1/4 and 7/32" (8, 6.3, and 5.5mm) steps. Holds Nos. 708, 709, 711 and 811 Dial Test Indicators by body clamp. See attachment specifications for the appropriate indicator body clamp on previous pages.

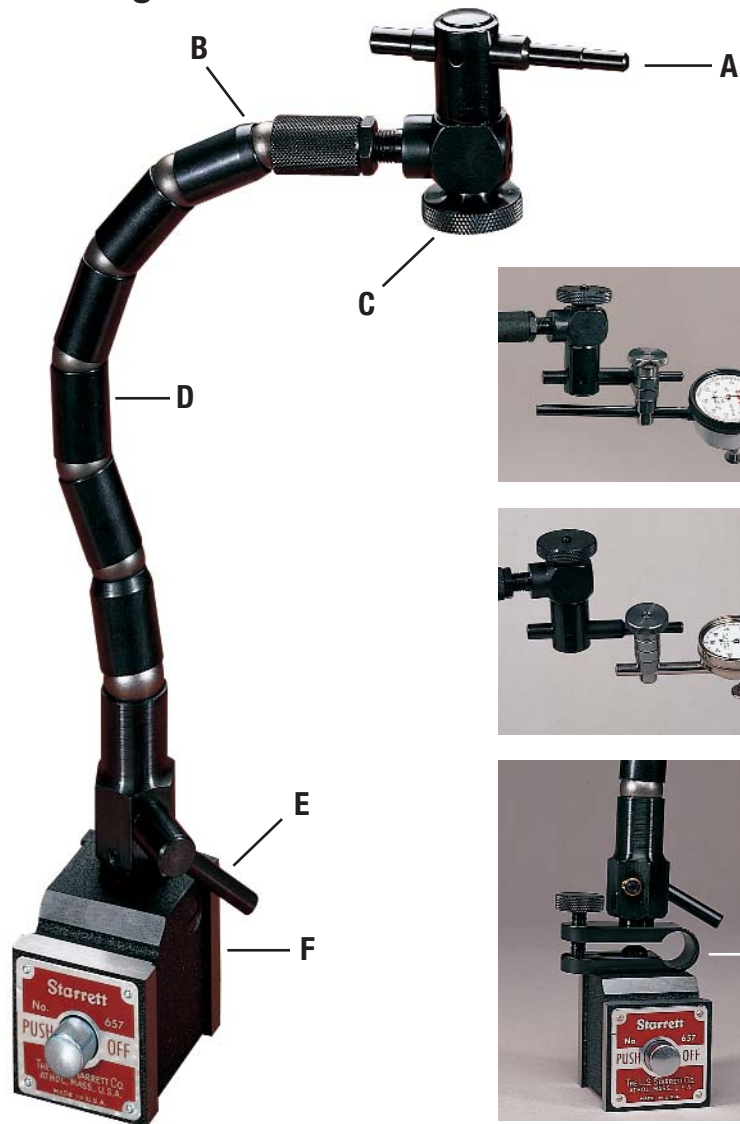
B. Adjusting Take-up Sleeve with locking nut for maintaining proper degree of post rigidity.

C. Post Snug has 3/8" (9.5mm) hole (which will also grip AGD dial indicators by the stem).

D. Flex-O-Post No. 657U.

E. Locking Lever tightens internal steel cable to make post rigid and lock it in position.

F. Magnetic Base No. 657P has push-button on/off switch.



Top inset, No. 651B1 Indicator gripped directly to its stem via the post snug; middle, holding a No. 196B1 Indicator via a No. 657S Snug attached to the indicator's 1/4" (6.3 mm) diameter rod; bottom, No. 657W Fine-Adjustment Attachment.

Complete Assemblies

Description	Catalog No.	EDP No.
Magnetic Base with Flex-O-Post Assembly	657T	52760
Magnetic Base with Flex-O-Post Assembly and Fine-Adjustment Attachment	657TW	52761

Individual Components

Photo Key	Description	Catalog No.	EDP No.
F	Magnetic Base Only	657P	52757
(A, B, C, D, E)	Flex-O-Post with Locking Lever and Snug Only	657U	52762
G	Fine-Adjustment Attachment	657W	52763
A	Indicator Holding Rod	PT17850	72400

Packed one in a box.



Magnetic Base Universal Indicator Holder with triple-jointed arm and fine-adjustment

Nos. 657-1 and -2 Series

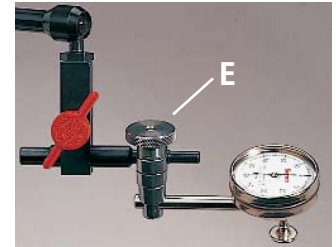
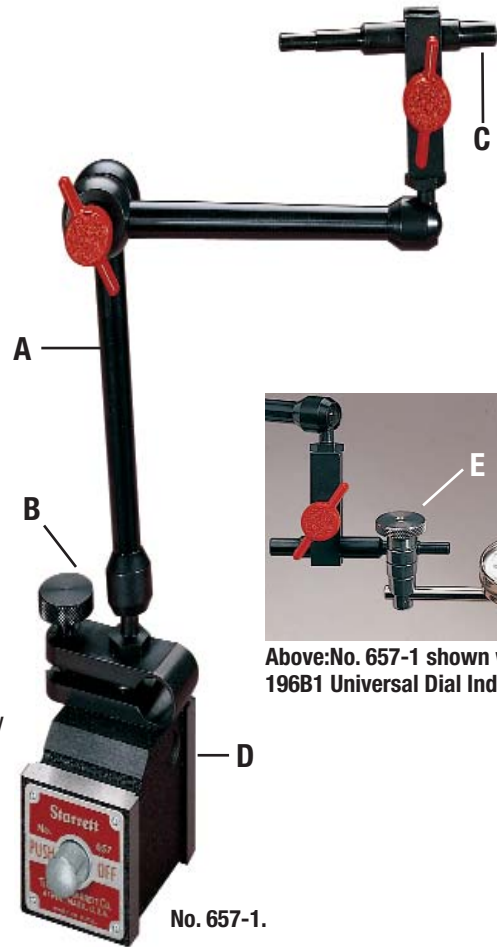
This versatile indicator holder has three pivots available for positioning the indicator where needed. All pivots are controlled by one tightening knob. It will hold:

- ◆ Any indicator with a 3/8" (9.5mm) stem (such as our No. 25 and Nos. 650 and 651 Series)
- ◆ Any indicator with a standard dovetail mount (such as our Nos. 708, 709, and 811 Series)
- ◆ Any indicator with a 1/4" (6.3mm) shank (such as our No. 196 Series)
- ◆ Any indicator with a 3/16" (4.7mm) shank (such as our Nos. 708, 709, 811 and 711 Series)
- ◆ Any indicator with a body clamp (such as our No. 711 Series)
- ◆ The working area is within a hemisphere having a radius of approximately 12" (300mm)



Above: No. 709A Dial Test Indicator with dovetail mount.

- ◆ The very sensitive fine-adjustment is located on the magnetic base to eliminate indicator deflection when it is being adjusted
- ◆ The No. 657-3 Universal Indicator Holder Arm Assembly can also be used on the No. 659P Base using the No. 659 Thread Adaptor, No. PT18318



Above: No. 657-1 shown with No. 196B1 Universal Dial Indicator.

Packed one in a box.

References for Other Test Indicator Holding Methods

In addition to the magnetic base indicator holders on the preceding pages, we also offer the following:

- A. For very precise measurements such as comparing a part to a gage block set, we have our No. 252 Height Transfer Gage with our Digi-Chek® Series of Height Gages

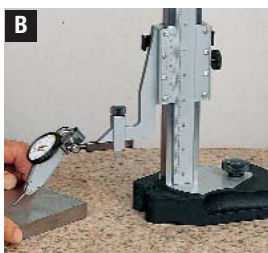


Complete Assemblies

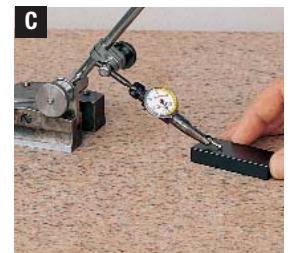
Description	Catalog No.	EDP No.
Universal Indicator Holder, No. 657W Fine-Adjustment, No. 657P Magnetic Base, No. PT17850 Indicator Holding Rod, and No. 657S Snug	657-1	64436
Universal Indicator Holder with No. 657 Magnetic Base	657-2	64437

Individual Components

Photo Key	Description	Catalog No.	EDP No.
A	Universal Indicator Holder Arm Assembly Only	657-3	64438
B	Fine-Adjustment Attachment	657W	52763
C	Indicator Holding Rod	PT17850	72400
D	Magnetic Base Only	657P	52757
E	Snug with Two 1/4" (6.3 mm) Holes	657S	52759



- B. Any of our great variety of height gages. Series Nos. 250, 254, 255, 259, and 3752. These can be used for comparing and for actual vertical measurements
- C. Our No. 57 or No. 257 Surface Gages. These are for comparison and the truing-up of surfaces





Magnetic Base Indicator Holder with Triple-Jointed Arm

No. 660

The compact and versatile 660 magnetic base indicator holder has three adjustable pivots controlled by a single knob for fast, easy indicator positioning.

- ◆ Small but powerful magnetic base, with 70 lbs. (320 N) holding force
- ◆ Positive On/Off switch
- ◆ Base Dimensions: 1-3/16" x 1-9/16" x 1-3/8" (30mm x 40mm x 35mm)
- ◆ Horizontal and vertical mounting positions
- ◆ Will hold any indicator with a 3/8" (9.5mm) stem or standard dovetail mount
- ◆ Articulating arm with powerful central locking knob, provides full 360° horizontal positioning and over 180° vertical positioning
- ◆ Maximum Horizontal Reach: 4.750" (120mm); Maximum Vertical Reach: 7.500" (190mm)
- ◆ Very sensitive fine-adjustment thumb screw



Left, No. 660. Inset, No. 660 shown with 81-131J Dial Indicator.

Description	Catalog No.	EDP No.
Base Indicator Holder	660	68621

Common Test and Back-Plunger Indicator Applications

- A. Models with tool post holders, generally used for lathe work.
- B. Indicators may be used on our No. 665 inspection holder.
- B, C. Some indicator holders have clamps for holding in different places.
- C, D. Indicators with straight stems or shanks can be held in snugs or in chucks and collets.





Mechanical Dial Indicators and Attachments

Electronic Indicators

Indicator Holders

Accurate, rugged, versatile, convenient to use and inexpensive —for these reasons and more, mechanical dial indicators with bottom plungers are the measurement workhorses of industrial production.

Electronic indicators have an unmatched ability for the accurate recording of a great amount of measurement data which is used in a variety of Statistical Process Control (SPC) operations.

The first part of this section shows our complete line of mechanical/analog dial indicators – over 180 models to give you the widest selection in the industry. Our comparison guide, following these introduction pages, has all the significant specifications to help you make your selection.

Application Specification Factors

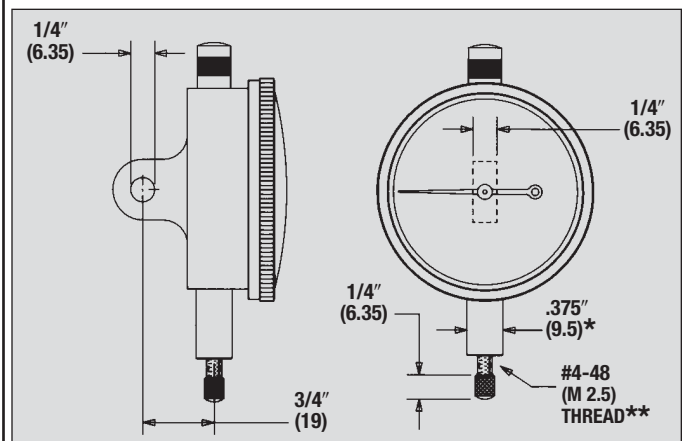
1. Regular analog styles with indicating hands are more readable than digital styles when the measurements are being visually monitored by an operator.
2. Select the dial size that gives you the readability you need. We offer five regular dial sizes which will fit most applications that have both space limitations and readability requirements.
3. Choose the accuracy and readout you need – don't select a .0001" (or 0.001mm) readout if .001" (or 0.01mm) will do your job.
4. Electronic styles are best when the measurement data needs to be collected, printed out or stored for future use.
5. Consider any special features you may need – inch or millimeter reading, special shockless movement, antimagnetic, long range, long stem, special backs, special contacts, special holders, etc. If you don't see what you need, please contact our Special Order Department. Even though we have a broad line of indicators to tackle most jobs, we also do a lot of special design, catering to the specific needs of our customers – challenge us!
6. Starrett indicators are made to American Gage Design Specifications (AGD). These specifications were developed in 1945 at the request of the U.S. Commerce Department through the National Bureau of Standards – now the National Institute of Standards and Technology (NIST). These specifications provide the dimensions to allow interchangeability between indicators of different manufacturers in fixturing. As you will see, these dimensions pertain to sizes for space consideration and for holding. Other countries have made their own design specifications which we can also furnish. However, the AGD design is probably more widely used, simply because it was the first standard created.
7. Basically, all dial indicators used worldwide fall into the following size ranges which relate to bezel diameters. Size 0 is a smaller dial indicator, having its own dimensions. Sizes 1 through 4 are AGD sizes. These sizes and the AGD dimensions

The AGD Design Specifications

Bezel Diameters

	Size Group	Minimum Diameter		Maximum Diameter	
		Inch	mm	Inch	mm
	0	1"	25mm	1-3/8"	35mm
AGD	1	1-3/8"	35mm	2"	50mm
	2	2"	50mm	2-3/8"	60mm
	3	2-3/8"	60mm	3"	75mm
	4	3"	76mm	3-3/4"	95mm

Comparing AGD Design Specifications with Others



*There are two major differences between American Gage Design and other specifications. The first is the stem diameter. AGD specifies .375" (9.5mm) and some other standards specify an 8mm (.315") diameter. International specifications allow for either one and we can furnish both diameters. The .375" (9.5mm) diameter provides a little more protection for the rack when clamped on the stem – 8mm stems are available on any model, please specify when ordering.

**The other difference is the contact thread. AGD specifies a #4-48 thread. Other standards specify a metric thread, #M2.5.

are essentially the same for all manufacturers, except as noted.

8. Accuracy – All indicators should be "loaded" 1/8-1/4 of a turn before testing or measuring. Starrett dial indicators meet or exceed all known performance specifications. Most accuracies are specified plus or minus one graduation over the full range. This basically means a 2-1/2 turn range. Longer ranges have slightly wider tolerances. Starrett indicators are at least that accurate, but we are better than that in the final critical measuring zone of "10 o'clock to 2 o'clock" from zero.

AGD specifies 2-1/3 turn indicators to cover any particular range. The reason for this is that in an effort to get the most out of the indicator, the operator "loads" it to about 1-1/3 turns and sets zero on his master. The indicator will now show the accurate deviation for a full revolution, plus or minus.



DIAL AND ELECTRONIC
INDICATORS AND HOLDERS



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181	AGD Dial Indicator Backs - Indicator Backs	
182	Backs with adjustable mounting bracket	Series No. 674
	Universal Backs	Series No. 672
	Magnetic Backs	Series No. 676

Continued next page

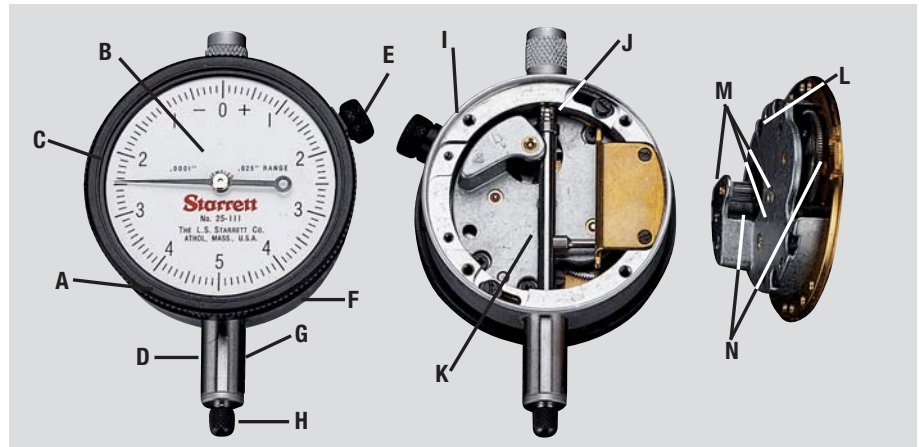
183	Indicator Hole Attachment	Series No. 670
	Universal Attachment	Series No. 671
184	AGD Indicator Contact Points and Accessories	Series No. 28
	AGD Indicator Contact Points and Accessories	Series No. Extra-Length Cont. Points
	AGD Indicator Contact Points and Accessories	Series No. Cont. Points
	Flat-End Steel Contact Points	Series No. Contact Points
185	AGD Indicator Special Contact Points and Accessories	Series No. 25R
	AGD Indicator Special Contact Points and Accessories	Series No. 25W
	AGD Indicator Special Contact Points and Accessories	Series No. Cont. Adaptor
	AGD Indicator Special Contact Points and Accessories	Series No. Special Form Cont. Points
	AGD Indicator Special Contact Points and Accessories	Series No. Contact Ext
	AGD Indicator Accessories	Series No. 25MSB, 25SB, 80SB
186	AGD Indicator Accessories	Series No. 25SC
187	AGD Indicator Accessories	Series No. 25LC
	AGD Indicator Accessories	Series No. Dust Guard
188	AGD Indicator Accessories -	Series No. LeverControl
189	Indicator Testers	Series No. 716, 716M
190	Electronic Indicators	Series No. 2600
191	Electronic Indicators	Series No. 2600
192	WISDOM Electronic Indicators	Series No. 2700
193	WISDOM Series Remote Displays and Probes	Series No. 2700
194	WISDOM Series Remote Displays and Probes	Series No. 2700
195	No. 3600 Series AGD Group 2	
196	Magnetic Base Indicator Holder and Indicators - Series No. 657	
197	Heavy-Duty Magnetic Base Indicator Holder	Series No. 659
198	Inspection Holder and Starrett AGD Dial Indicators	Series No. 665
199	Inspection Holder and Starrett AGD Dial Indicators	Series No. 665
200	Dial Comparators with granite base	Series No. 675
201	Dial Comparators	Series No. 653
202	Dial Bench Gages	Series No. 652



Starrett Dial Indicator Design Features

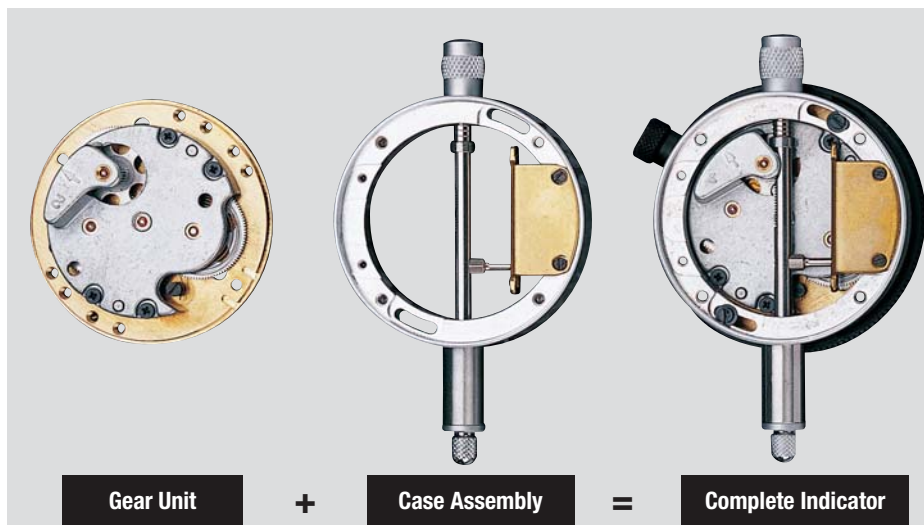
Unit construction is rugged and simple with a “universally fitting” design as shown in the photo below. (The same gear unit assembly fits the following:)

- ◆ AGD Group 2 (our No. 25 Series)
- ◆ AGD Group 3 (our No. 655 Series)
- ◆ AGD Group 4 (our No. 656 Series)
- ◆ The gear unit is constructed of a massive single bridge and plate assembly with a hardened stainless steel gear train
- ◆ All gear trains are fully jeweled for sensitivity, smoothness and life. (We do provide 1/2” and 1” range models with plain bronze bearings)
- ◆ The case is light but sturdy, with a hardened, precision stainless steel rack that rides in bronze bushings. Size Groups 0 and 1 indicators are of similar construction but smaller in size
- ◆ Hardened stainless steel bottom stems can be held in fixtures without cramping rack action
- ◆ Easy readability with the best, balanced style of graduation and number combination. (Too thick and accuracy suffers; too thin and readability suffers)
- ◆ Balanced and tapered hands are easy to follow
- ◆ Special nonshock mechanism (can be furnished on most styles) is ideal for when an indicator may be subjected to repeated and excessive shocks



- A. Sharp bezel serrations for positive grip
- B. Nonreflecting white eggshell finish on dial (millimeter models have yellow dials)
- C. Unbreakable crystal
- D. Hardened stainless steel stem
- E. Positive-acting clamp locks bezel in position
- F. No-glare satin finish on case
- G. .375” mounting diameter (all AGD models)
- H. Interchangeable contact point

- I. Four screw holes for 90° rotation of back
- J. Direct acting compression spring eliminates side friction
- K. Hardened stainless steel rack and spindle
- L. Massive bridge for rigid bearing support
- M. Replaceable low friction jewel bearings
- N. Hardened stainless steel gears and pinions





Dials, Accessories and Options

- ◆ **Balanced or Continuous Dials** – Starrett AGD indicators are available with a balanced dial (plus on right) or a continuous dial (reading clockwise). A balanced dial is sent unless otherwise ordered

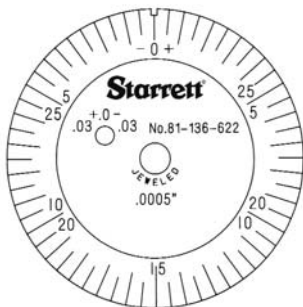


Balanced Dial



Continuous Dial

- ◆ **Plus and Minus Graduations** – Plus and minus readout – black figures read clockwise, red figures read counterclockwise, or colors reversed – are available on some No. 81 Series Dial Indicators



Dial with Plus and Minus Graduations



Dial with Special Trademark Imprint

- ◆ **Revolution Counters** – All AGD indicators with 2-1/2 revolutions can be furnished with double dial and count hand at a slight additional cost. Intermediate and long-range indicators have revolution counters
- ◆ **Special Dials** – Starrett dial indicators can be furnished with any standard dial marked with your company name or trademark. There is no charge when the indicators are purchased in lots of 25 or more. For quantities under 25, there is an additional charge. Prices are available on request
- ◆ **Antimagnetic Mechanism** – An antimagnetic mechanism can be furnished on most Series Nos. 81, 25, 655 and 656 Dial Indicators (and also on our No. 196B6 Universal Dial Indicator). This mechanism is desirable when the indicator is used near a magnetic chuck or a similar magnetic field which would disturb its operation. See individual listings for availability
- ◆ **Attachments and Accessories** – A variety of attachments and accessories are provided for mounting dial indicators on machine tools, inspection equipment and special fixtures

These include:

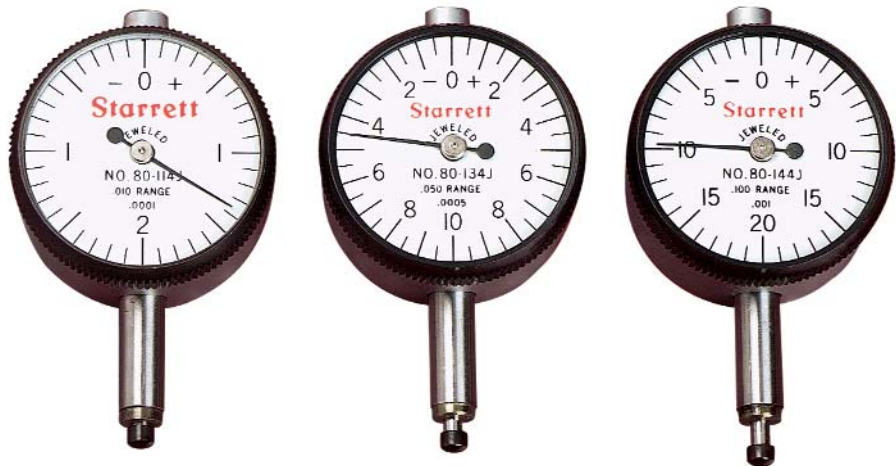
- ◆ Backs
- ◆ Contact Points
- ◆ Dust Guard
- ◆ Hole Attachments
- ◆ Special Nonshock Mechanism
- ◆ Spindle Travel Controls
- ◆ Stem and Back Mounting Accessories
- ◆ Tolerance and Maximum Reading Hands



Miniature Dial Indicators

**No. 80 Series
ANSI Group 0**
Ranges up to .100"
1-1/4" bezel, 7/32" stem

Similar in design to AGD dial indicators, these miniatures are built for gaging dimensions in tight places. Equipped with high precision, low friction movements, they are made in four models, all with frictionally adjustable bezels for quick, positive zero setting. No-glare, white eggshell finish dials. Black bezel, silver finish on case. Furnished with balanced dial, jeweled bearings and lug-on-center back.

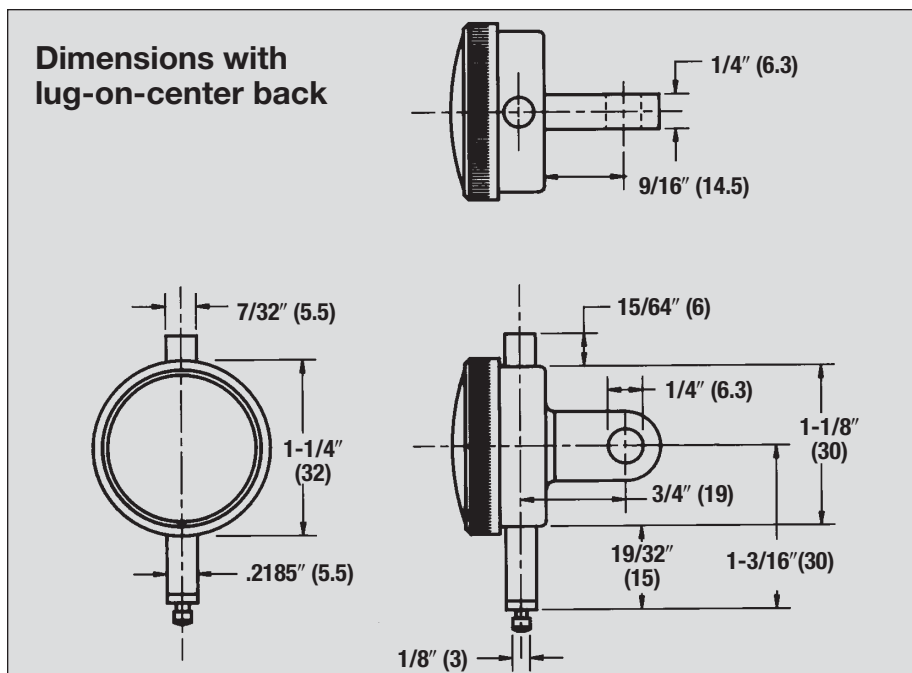


Left-to-right: No. 80-114J, No. 80-134J, No. 80-144J.



No. 80-111J.

**Dimensions with
lug-on-center back**



Free drafting template available for this size. Write The L. S. Starrett Co., Athol, MA 01331.

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.0001"	.004"	.010"	0-2-0	80-114J	55891
	.010"	.025"	0-5-0	80-111J	67714
.0005"	.020"	.050"	0-10-0	80-134J	55892
.001"	.040"	.100"	0-20-0	80-144J	55893

Packed one in a box.

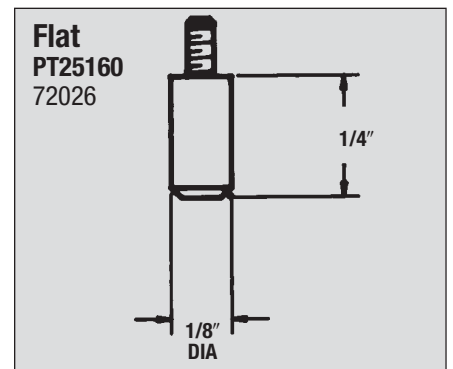
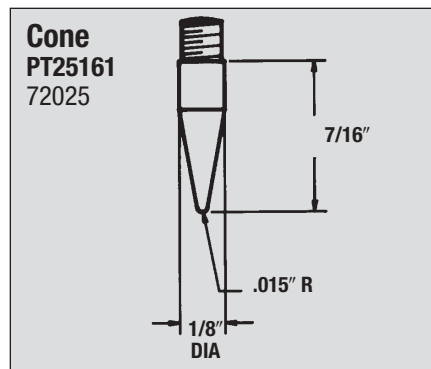
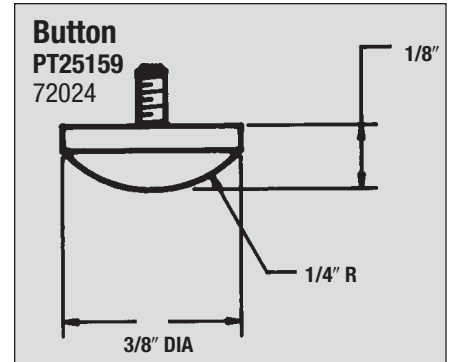
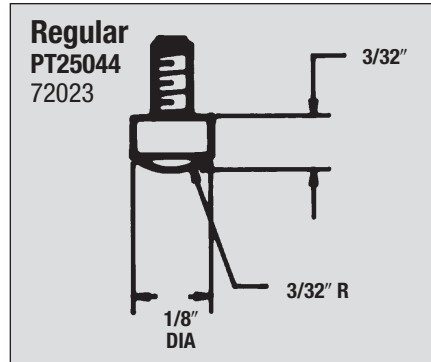
See following page for information on contact points and backs.



Miniature Dial Indicator Accessories – No. 80 Series

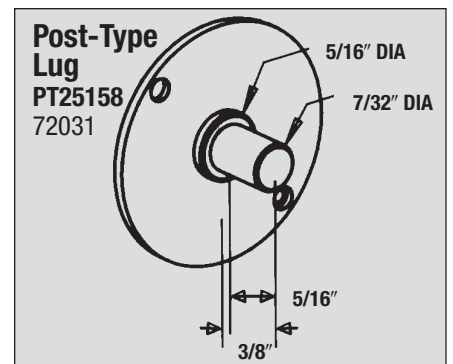
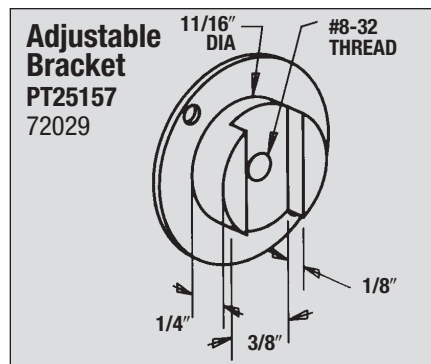
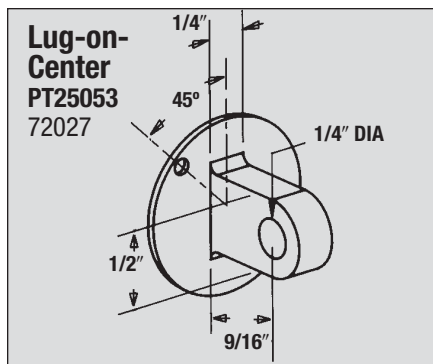
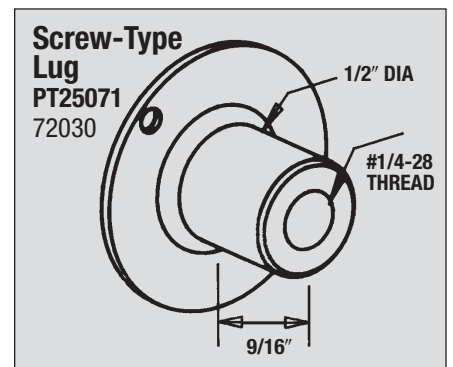
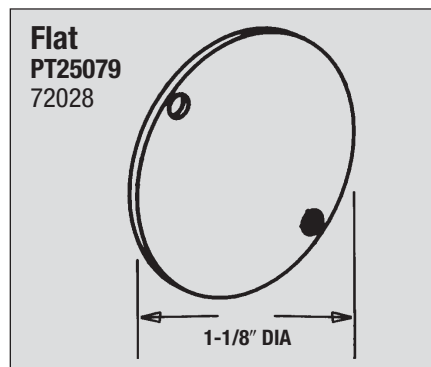
Contact Points

The regular contact point is furnished as standard on all No. 80 Series Dial Indicators. Button, cone and flat contact points are available individually, as listed. All have #0-80 thread.



Backs

The lug-on-center back is furnished standard on all No. 80 Series Dial Indicators.

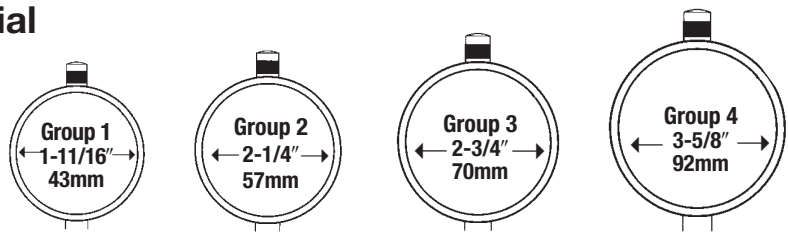


NOTE: Contact points and backs can be ordered individually. Order by part number/EDP number.



Series 81, 25, 655 and 656 AGD Dial Indicators

This comparison table is an aid to help you find the indicator with the specific graduations and ranges you are looking for. Refer to the following pages for the exact catalog number and EDP number.



Inch Reading (White Dials Furnished Standard)

Graduation	Range		Dial Reading	No. 81 Series	No. 25 Series	No. 655 Series	No. 656 Series
	One Rev.	Total					
.00005"	.006"	.015"	0-3-0		25-109		656-109
			0-6		25-209		656-209
.0001"	.006"	.015"	0-3-0		25-116		
			0-4-0		25-118	655-118	656-118
	.008"	.020"	0-8		25-218		
			0-5-0	81-111	25-111	655-111	656-111
	.010"	.025"	0-10	81-211	25-211	655-211	656-211
			+0.10 -0.10	81-111-624*			
	.010"	.025"	-0.10 +0.10	81-111-630*			
			0-5-0		25-511*	655-511*	656-511*
.010"	.200"	0-10		25-611*	655-611*	656-611*	
		0-10-0				656-517*	
.020"	.400"	0-20				656-617*	
.00025"	.010"	.025"	0-5-0	81-124	25-124	655-124	656-124
			0-10	81-224	25-224	655-224	656-224
	.020"	.050"	0-10-0	81-128	25-128	655-128	656-128
			0-20	81-228	25-228	655-228	656-228
	.030"	.075"	0-15-0			655-129	656-129
			0-30			655-229	656-229
.0005"	.020"	.050"	0-10-0	81-134	25-134	655-134	656-134
			0-20	81-234	25-234	655-234	656-234
	.030"	.075"	0-15-0	81-136	25-136	655-136	656-136
			0-30	81-236	25-236	655-236	656-236
	.030"	.075"	+0.30 -0.30	81-136-622*			
			-0.30 +0.30	81-136-623*			
	.040"	.100"	0-20-0	81-138	25-138	655-138	656-138
			0-40	81-238	25-238	655-238	656-238
	.050"	.125"	0-25-0	81-131	25-131	655-131	656-131
			0-50	81-231	25-231	655-231	656-231
	.050"	.500"	0-50		25-431*		
			0-50		25-631*		
.050"	1.000"	0-50					

* With revolution counter on dial.

(Continued on next page.)



Inch Reading (White Dials Furnished Standard) (continued)

Graduation	Range		Dial Reading	Group 1	Group 2	Group 3	Group 4
	One Rev.	Total		No. 81 Series	No. 25 Series	No. 655 Series	No. 656 Series
.001"	.020"	.050"	0-10-0	81-142	25-142	655-142	656-142
			0-20	81-242	25-242	655-242	656-242
	.030"	.075"	0-15-0	81-143	25-143	655-143	656-143
			0-30	81-243	25-243	655-243	656-243
	.030"	.075"	+0.30, -0.30	81-142-628*			
			-0.30, +0.30	81-143-629*			
	.040"	.100"	0-20-0	81-144	25-144	655-144	656-144
			0-40	81-244	25-244	655-244	656-244
	.050"	.125"	0-25-0	81-145	25-145	655-145	656-145
			0-50	81-245	25-245	655-245	656-245
	.100"	.250"	0-50-0	81-141	25-141	655-141	656-141
			0-100	81-241	25-241	655-241	656-241
	.100"	.500"	0-50-0		25-341/5*	655-341/5*	656-341/5*
			0-100		25-441/5*	655-441/5*	656-441/5*
	.100"	1.000"	0-50-0		25-341*	655-341*	656-341*
			0-100		25-441*	655-441*	656-441*
	.100"	2.000"	0-100		25-2041*	655-2041*	656-2041*
					25-3041*	655-3041*	656-3041*
					25-4041*	655-4041*	656-4041*
					25-5041*	655-5041*	656-5041*
						656-6041*	
						656-7041*	
						656-8041*	
						656-9041*	
						656-10041*	
						656-11041*	
	12.000"					656-12041*	

Millimeter Reading (Yellow Dials Furnished Standard)

0.001mm	0.1mm	0.25mm	0-50-0		25-151*		
			0-100		25-251*		
0.002mm	0.2mm	0.5mm	0-10-0	81-161	25-161	655-161	656-161
			0-20	81-261	25-261	655-261	656-261
0.01mm	1mm	2.5mm	0-50-0	81-181	25-181	655-181	656-181
			0-100	81-281	25-281	655-281	656-281
	1mm	10mm	0-50-0		25-381*		
			0-100		25-481*		
	1mm	25mm	0-50-0		25-781*		
			0-100		25-881*	655-881*	656-881*
	1mm	50mm	0-100		25-2081*	655-2081*	
	1mm	75mm	0-100		25-3081*	655-3081*	
1mm	100mm	0-100		25-4081*	655-4081*		
1mm	125mm	0-100		25-5081*	655-5081*		

* With revolution counter on dial.

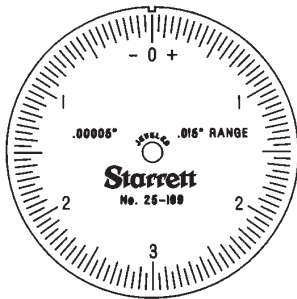


Starrett Dial Numbering and Line Styles for Dial Indicators

These next four pages include all Starrett dial styles. (Actual size not shown.) Refer to the graduation, then range, and catalog number below the dial and then see the following pages for the specific dial reading and other indicator information. Most of the dials shown have balanced styles. Continuous dials have the same

graduations, but have consecutive numbers instead. For most indicators, the first number after the base catalog number signifies dial style. The number "1" signifies balanced dials (example: No. 25-109) and number "2" signifies continuous dials (example: No. 25-209).

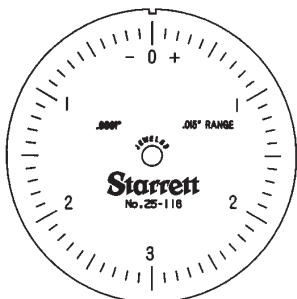
.00005" Graduation



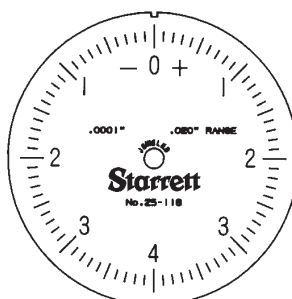
Total Range .015"

Catalog No.	No. 25-109 No. 656-109
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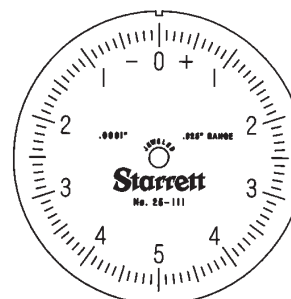
.0001" Graduation



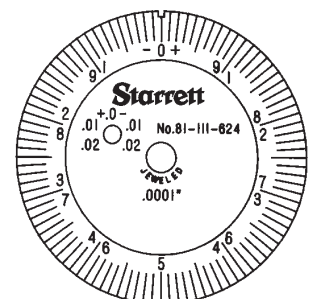
Total Range .015"



.020"

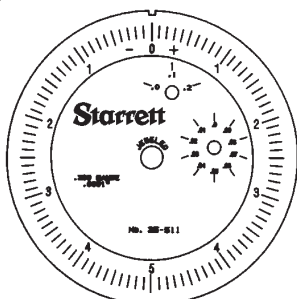


.025"

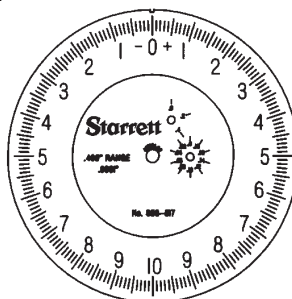


.025"

Catalog No.	No. 25-116	No. 25-118 No. 655-118 No. 656-118	No. 25-111 No. 80-111 No. 81-111 No. 655-111 No. 656-111	No. 81-111-624 (with double row figures)
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Total Range .200"



.400"

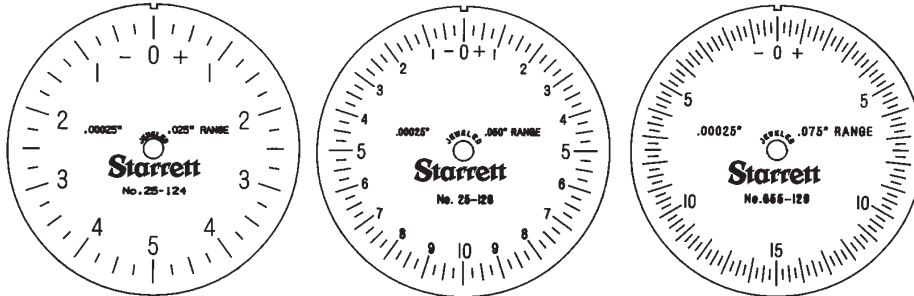
Catalog No.	No. 25-511 No. 655-511 No. 656-511	No. 656-517
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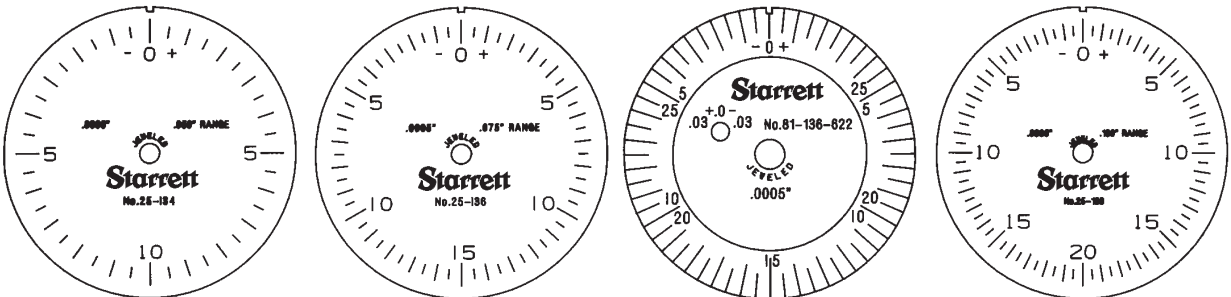
Starrett Dial Numbering and Line Styles for Dial Indicators (continued)

.00025" Graduation

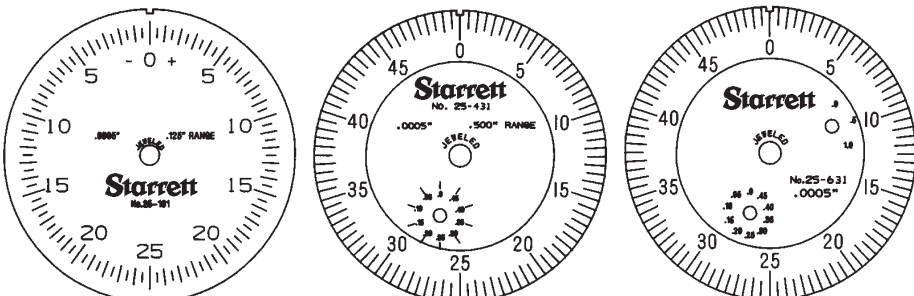


Total Range	.025"	.050"	.075"
Catalog No.	No. 81-124 No. 25-124 No. 655-124 No. 656-124	No. 81-128 No. 25-128 No. 655-128 No. 656-128	No. 655-129 No. 656-129

.0005" Graduation



Total Range	.050"	.075"	.075"	.100"
Catalog No.	No. 81-134 No. 25-134 No. 655-134 No. 656-134	No. 81-136 No. 25-136 No. 655-136 No. 656-136	No. 81-136-622 (with double row figures)	No. 81-138 No. 25-138 No. 655-138 No. 656-138



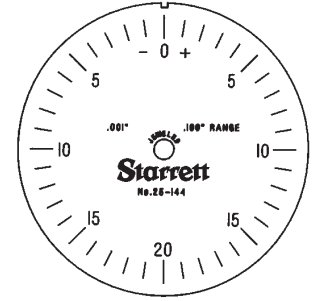
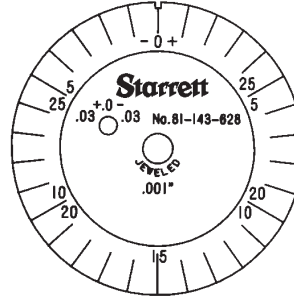
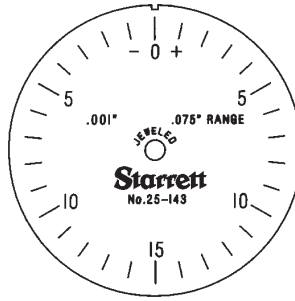
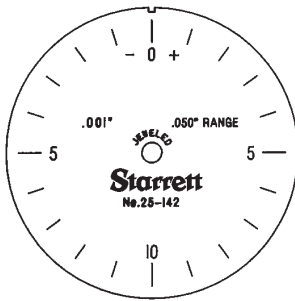
Total Range	.125"	.500"	1.000"
Catalog No.	No. 81-131 No. 25-131 No. 655-131 No. 656-131	No. 25-431	No. 25-631

(Continued on next page.)

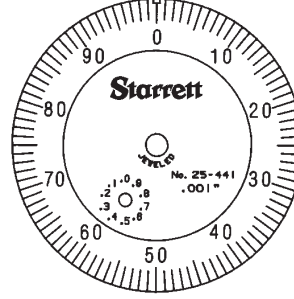
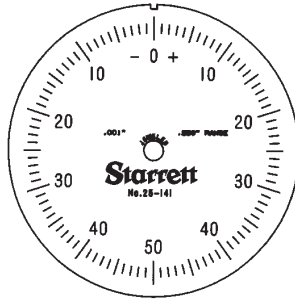
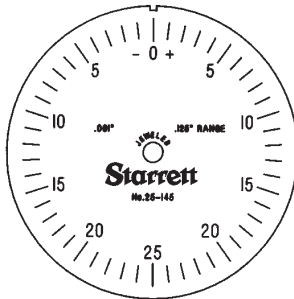


Starrett Dial Numbering and Line Styles for Dial Indicators (continued)

.001" Graduation



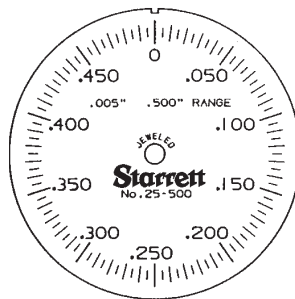
Total Range	.050"	.075"	.075"	.100"
Catalog No.	No. 81-142 *No. 25-142 *No. 655-142 *No. 656-142	No. 81-143 No. 25-143 No. 655-143 No. 656-143	No. 81-143-628 (with double row figures)	No. 81-144 *No. 25-144 *No. 655-144 *No. 656-144



Total Range	.125"	.250"	.500', 1.000"
Catalog No.	No. 81-145 *No. 25-145 *No. 655-145 *No. 656-145	No. 81-141 *No. 25-141 *No. 655-141 *No. 656-141	Nos. 25-441, 25-441/5 Nos. 655-441, 655-441/5 Nos. 656-441, 656-441/5

*Also on long range models.

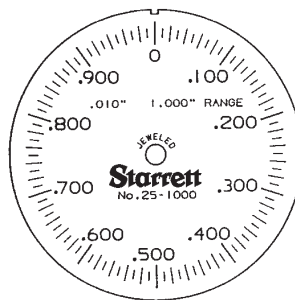
.005" Graduation



Total Range	.500"
Catalog No.	No. 25-500

Available from the Special Order Department.

.010" Graduation



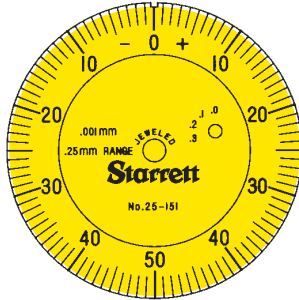
Total Range	1.000"
Catalog No.	No. 25-1000

(Continued on next page.)



Starrett Dial Numbering and Line Styles for Dial Indicators (continued)

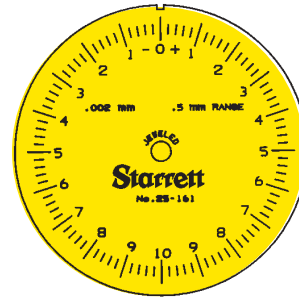
0.001mm Graduation



Total Range .25mm

Catalog No.	No. 25-151
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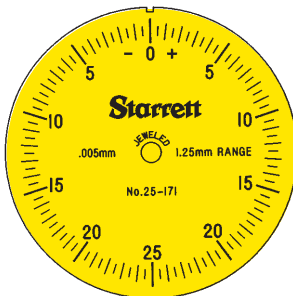
0.002mm Graduation



Total Range 0.5mm

Catalog No.	No. 81-161 No. 25-161 No. 655-161 No. 656-161
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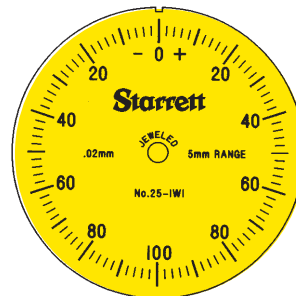
0.005mm Graduation



Total Range 1.25mm

Catalog No.	No. 25-171
-------------	------------

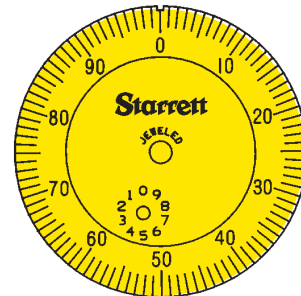
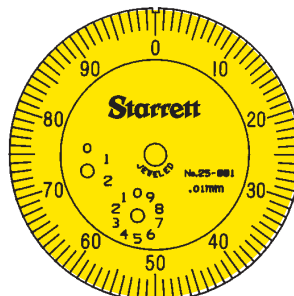
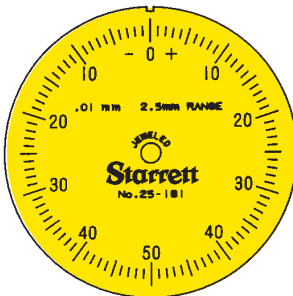
0.02mm Graduation



Total Range 5.0mm

Catalog No.	No. 25-1W1
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0.01mm Graduation



Total Range	2.5mm	25mm	10mm	50, 75, 100, 125mm
Catalog No.	No. 81-181 No. 25-181 No. 655-181 No. 656-181	No. 25-881 No. 655-881 No. 656-881	No. 25-381	No. 25-2081 No. 25-3081 No. 25-4081 No. 25-5081



Dial Indicators

No. 81 Series AGD Group 1

Ranges up to .250" and 2.5mm

These Indicators have a shockless, hardened steel gear train and jewel bearings. They are furnished with a lug-on-center back. Antimagnetic and special nonshock mechanisms are options available for all models. For more information on these and other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings. For dial styles, see previous pages. For dimensions, see next page.



No. 81-141J.



No. 81-161J.

Packed one in a box.

Inch Reading

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.0001"	.010"	.025"	0-5-0	81-111J	53378
			0-10	81-211J	53414
.00025"	.010"	.025"	0-5-0	81-124J	53384
			0-10	81-224J	53416
	.020"	.050"	0-10-0	81-128J	53386
			0-20	81-228J	53418
.0005"	.020"	.050"	0-10-0	81-134J	53390
			0-20	81-234J	53422
	.030"	.075"	0-15-0	81-136J	53392
			0-30	81-236J	53424
	.040"	.100"	0-20-0	81-138J	53398
			0-40	81-238J	53426
.050"	.125"	0-25-0	81-131J	53388	
.001"	.020"	.050"	0-10-0	81-142J	53402
			0-20	81-242J	53430
	.030"	.075"	0-15-0	81-143J	53404
			0-30	81-243J	53432
	.040"	.100"	0-20-0	81-144J	53408
			0-40	81-244J	53434
	.050"	.125"	0-25-0	81-145J	53410
			0-50	81-245J	53436
	.100"	.250"	0-50-0	81-141J	53400
			0-100	81-241J	53428

Millimeter Reading

Graduation	Range		Dial Reading	Stem Dia.	Catalog No.	EDP No.
	One Rev.	Total				
0.002mm	0.2mm	0.5mm	0-10-0	.375"	81-161J	56043
				8mm	81-161J-8	64643
			0-20	.375"	81-261J	56045
				8mm	81-261J-8	64644
0.01mm	1.0mm	2.5mm	0-50-0	.375"	81-181J	53412
				8mm	81-181J-8	64645
			0-100	.375"	81-281J	53438
				8mm	81-281J-8	64646



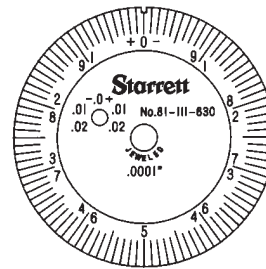
Dial Indicators

No. 81 Series with double row figures AGD Group 1 Ranges up to .075"

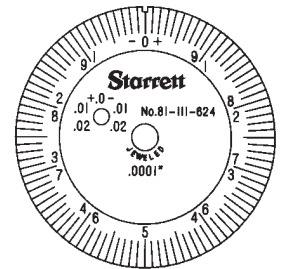
These indicators have the exact same features as our No. 81 Series on the previous page, except the dials have double-row figures, as illustrated on the right, and they cannot be specified with a special nonshock mechanism.



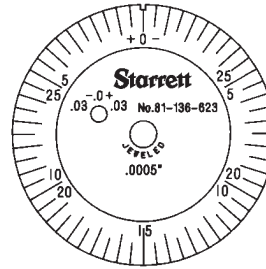
No. 81-111-624J.



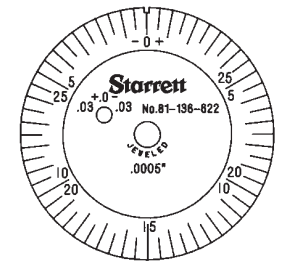
81-111-630J



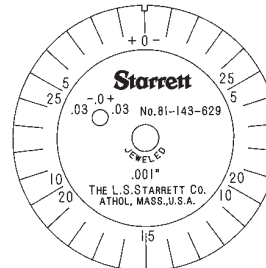
81-111-624J



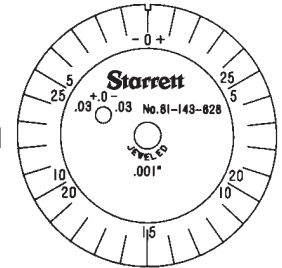
81-136-623J



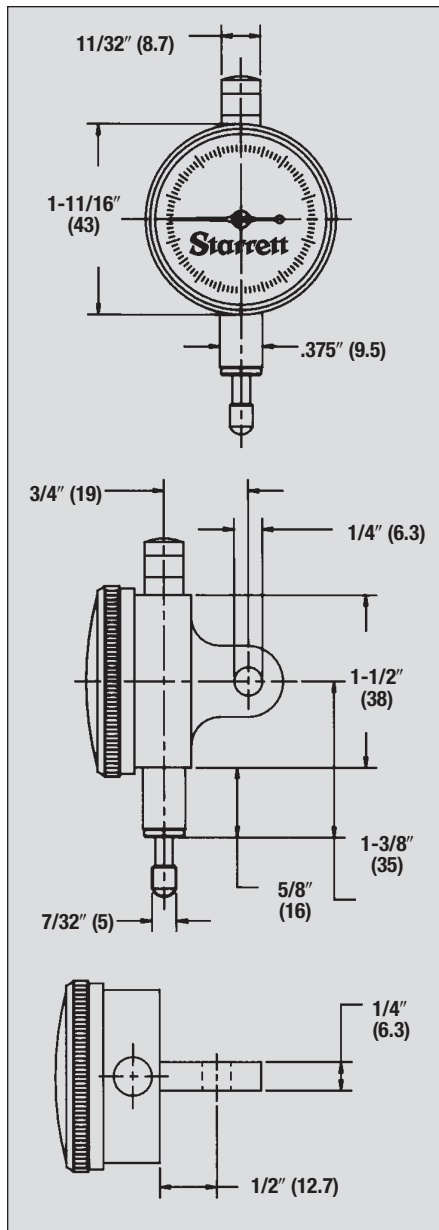
81-136-622J



81-143-629J



81-143-628J



Free drafting template available for this size. Write The L.S. Starrett Co., Athol, MA 01331.

Graduation	Dial Reading	Figures		Range		Catalog No.	EDP No.
		Direction	Color	One Rev.	Total		
.0001"	+0-10	Clockwise	Black	.010"	.025"	81-111-624J	53380
	-0-10	Counter-clockwise	Red				
	+0-10	Counter-clockwise	Black				
.0005"	-0-10	Clockwise	Red	.030"	.075"	81-111-630J	53382
	+0-30	Counter-clockwise	Red				
	+0-30	Counter-clockwise	Black				
.001"	-0-30	Clockwise	Red	.030"	.075"	81-136-622J	53394
	+0-30	Counter-clockwise	Black				
	-0-30	Clockwise	Red			81-136-623J	53396
	+0-30	Counter-clockwise	Black				
.001"	+0-30	Clockwise	Black	.030"	.075"	81-143-628J	53406
	-0-30	Counter-clockwise	Red				
	-0-30	Clockwise	Red				
.001"	+0-30	Counter-clockwise	Black	.030"	.075"	81-143-629J	66666
	-0-30	Counter-clockwise	Red				
	-0-30	Clockwise	Red				

Packed one in a box.

NOTE: Other models with double-row figures can be furnished by request.

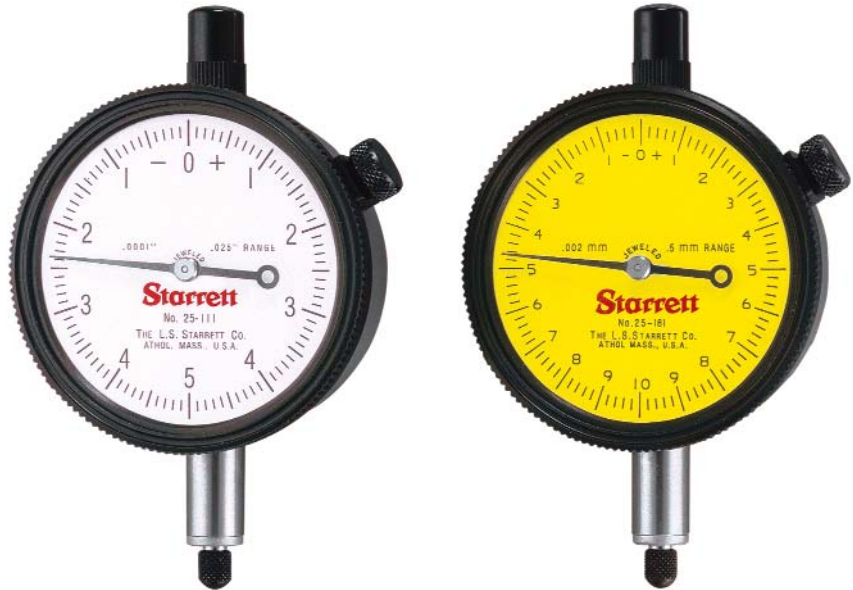


Dial Indicators

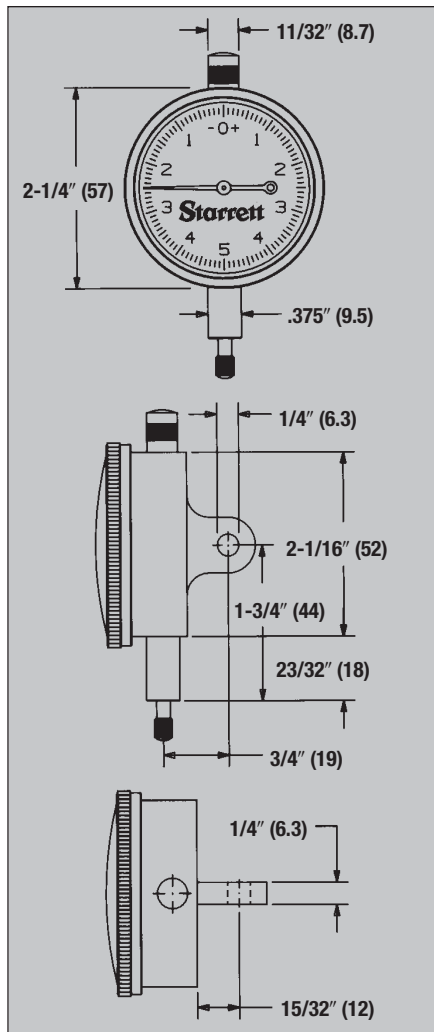
No. 25 Series AGD Group 2

Ranges up to 1" and 25mm

These indicators have a shockless, hardened steel gear train and jewel bearings, except where noted. They are furnished with a lug-on-center back. Anti-magnetic mechanism is optional for all models. Special nonshock mechanism is available for all models except Nos. 25-109, 25-209 and 25-116. For more information on these and other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings. For dial styles, see previous pages.



Left, No. 25-111J; right, No. 25-161J.



Free drafting template available for this size.
Write The L.S. Starrett Co., Athol, MA 01331.

Packed one in a box.

Inch Reading Models with Jewel Bearings

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.00005"	.006"	.015"	0-3-0	25-109J	53222
			0-6	25-209J	53254
.0001"	.006"	.015"	0-3-0	25-116J	53225
			0-4-0	25-118J	53226
			0-8	25-218J	53257
			0-5-0	25-111J	53223
			0-10	25-211J	53255
			0-5-0	25-511J	53299
.00025"	.010"	.025"	0-5-0	25-124J	53228
			0-10	25-224J	53259
			0-10-0	25-128J	53230
			0-20	25-228J	53261
.0005"	.020"	.050"	0-10-0	25-134J	53234
			0-20	25-234J	53265
			0-15-0	25-136J	53236
			0-30	25-236J	53267
			0-20-0	25-138J	53238
			0-40	25-238J	53269
			0-25-0	25-131J	53232
			0-50	25-231J	53263
.001"	.020"	.050"	0-50	25-431J	53292
			1.000"	25-631J	53304
.001"	.020"	.050"	0-10-0	25-142J	53242
			0-20	25-242J	53273



Inch Reading Models with Jewel Bearings (continued)

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.001"	.030"	.075"	0-15-0	25-143J	53244
			0-30	25-243J	53275
	.040"	.100"	0-20-0	25-144J	53246
			0-40	25-244J	53277
	.050"	.125"	0-25-0	25-145J	53248
			0-50	25-245J	53279
	.100"	.250"	0-50-0	25-141J	53240
			0-100	25-241J	53271
			0-50-0	25-341/5J	53285
				25-441/5J	53293
			0-100	25-441/5J W/SLC*	66864
				25-341J	53287
1.000"	.500"	0-50-0	25-341J	53287	
		0-100	25-441J	53295	
		1.000"	0-100	25-441/J W/SLC*	66863

Inch Reading Models with Plain Bearings

.001"	.100"	.500"	0-50-0	25-341/5P	53286
			0-100	25-441/5P	53294
		1.000"	0-50-0	25-341P	53288
			0-100	25-441P	53296

Millimeter Models with Jewel Bearings

Graduation	Range		Dial Reading	Stem Dia.	Catalog No.	EDP No.
	One Rev.	Total				
0.001mm	0.1mm	0.25mm	0-50-0	.375"	25-151J	67644
				8mm	25-151J-8	68646
			0-100	.375"	25-251J	68118
				8mm	25-251J-8	68647
0.002mm	0.2mm	0.5mm	0-10-0	.375"	25-161J	53250
				8mm	25-161J-8	64651
			0-20	.375"	25-261J	53281
				8mm	25-261J-8	64652
0.02mm	2.0mm	5.0mm	0-100-0	.375"	25-1W1J	68642
0.005mm	0.5mm	1.25mm	0-25-0	.375"	25-171J	68643
0.01mm	1.0mm	2.5mm	0-50-0	.375"	25-181J	53252
				8mm	25-181J-8	64653
			0-100	.375"	25-281J	53283
				8mm	25-281J-8	64654
		10mm	0-50-0	.375"	25-381J	53289
				8mm	25-381J-8	64655
			0-100	.375"	25-481J	53297
				8mm	25-481J-8	64656
		25mm	0-50-0	.375"	25-781J	53305
				8mm	25-781J-8	64657
			0-100	.375"	25-881J	53307
				8mm	25-881J-8	64658

Dial Indicator Sets

No. 253 Series Inch and Millimeter Reading

These sets provide in one handy, compact kit three No. 25 Series Dial Indicators to handle most gaging jobs at a minimum cost. Sets are ideal for tool and die shops, machine shops and toolrooms having occasional work where a heavy investment in dial indicators would not be practical. The indicators are furnished with jewel bearings.



No. S253Z.

Inch Set

Description	Catalog No.	EDP No.
Set of 3 Inch Reading Dial Indicators: Nos. 25-111J, 25-131J and 25-441J	S253Z	51218

Millimeter Set

Set of 3 Millimeter Reading Dial Indicators: Nos. 25-161J, 25-181J and 25-881J	S253MZ	56283
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* Includes redemption card for Standard Letter of Certification (SLC).

Sets furnished in attractive, protective case. Packed one in a box.



Dial Indicators

**No. 655 Series
AGD Group 3
Ranges up to 1" and 25mm**

These indicators have a shockless, hardened steel gear train and jewel bearings. They are furnished with a lug-on-center back. Antimagnetic and special nonshock mechanisms are options available for all models. For more information on these and other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings. For dial styles, see previous pages. For dimensions, see next page.



Left, No. 655-111J; right, No. 655-161J-8.

Inch Reading

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.0001"	.008"	.020"	0-4-0	655-118J	53507
		.025"	0-5-0	655-111J	53505
	.010"	.010"	0-10	655-211J	53537
		.200"	0-5-0	655-511J	53615
		.200"	0-10	655-611J	53617
.00025"	.010"	.025"	0-5-0	655-124J	53509
		.025"	0-10	655-224J	53539
	.020"	.050"	0-10-0	655-128J	53511
		.050"	0-20	655-228J	53541
		.075"	0-15-0	655-129J	53513
.030"	.075"	0-30	655-229J	53543	
.0005"	.020"	.050"	0-10-0	655-134J	53517
		.050"	0-20	655-234J	53587
	.030"	.075"	0-15-0	655-136J	53519
		.075"	0-30	655-236J	53589
	.040"	.100"	0-20-0	655-138J	53521
		.100"	0-40	655-238J	53591
		.125"	0-25-0	655-131J	53515
.050"	.125"	0-50	655-231J	53585	

Packed one in a box.

(Continued on next page.)



Dial Indicators

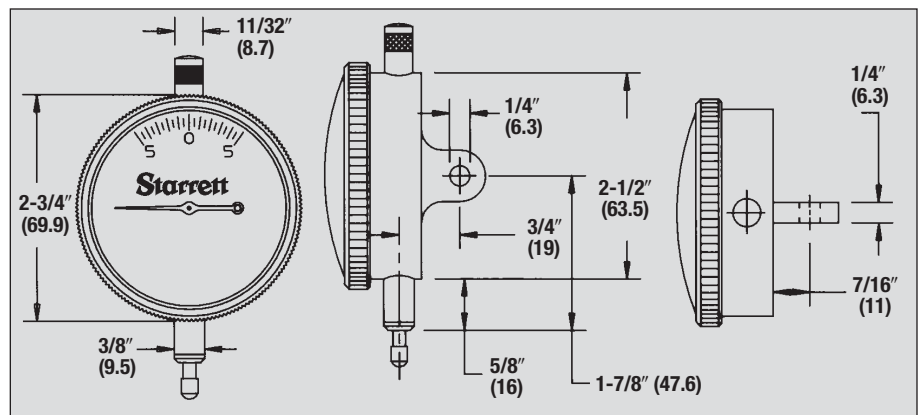
Series No. 655 (continued)

Inch Reading (continued)

Graduation	Range		Dial Reading	Catalog No.	EDP No.	
	One Rev.	Total				
.001"	.020"	.050"	0-10-0	655-142J	53525	
			0-20	655-242J	53595	
	.030"	.075"	0-15-0	655-143J	53527	
			0-30	655-243J	53597	
	.040"	.100"	0-20-0	655-144J	53529	
			0-40	655-244J	53599	
	.050"	.125"	0-25-0	655-145J	53531	
			0-50	655-245J	53601	
	.100"	.250"	0-50-0	655-141J	53523	
			0-100	655-241J	53593	
			.500"	0-50-0	655-341/5J	53607
				0-100	655-441/5J	53611
			1.000"	0-50-0	655-341J	53609
				0-100	655-441J	53613

Millimeter Reading

Graduation	Range		Dial Reading	Stem Dia.	Catalog No.	EDP No.
	One Rev.	Total				
0.002 mm	0.2 mm	0.5 mm	0-10-0	.375"	655-161J	53533
				8 mm	655-161J-8	64659
			0-20	.375"	655-261J	53603
				8 mm	655-261J-8	64660
0.01 mm	1.0 mm	2.5 mm	0-50-0	.375"	655-181J	53535
				8 mm	655-181J-8	64661
			0-100	.375"	655-281J	53605
				8 mm	655-281J-8	64868
		25 mm	0-100	.375"	655-881J	56229
				8 mm	655-881J-8	64869



Free drafting template available for this size. Write The L.S. Starrett Co., Athol, MA 01331.

Packed one in a box.



Dial Indicators

**No. 656 Series
AGD Group 4
Ranges up to 1" and 25mm**

These indicators have a shockless, hardened steel gear train and jewel bearings. They are furnished with a lug-on-center back. Antimagnetic mechanism is optional for all models. Special nonshock mechanism is available for all models except Nos. 656-109 and 656-209. For more information on these and other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings. For dial styles, see previous pages. For dimensions, see next page.



Left, No. 656-111J; right, No. 656-161J-8.

Inch Reading

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.00005"	.006"	.015"	0-3-0	656-109J	53661
			0-6	656-209J	53694
.0001"	.008"	.020"	0-4-0	656-118J	53664
			0-5-0	656-111J	53662
	.010"	.200"	0-10	656-211J	53695
			0-5-0	656-511J	53791
			0-10	656-611J	53795
			0-10-0	656-517J	53793
.020"	.400"	0-20	656-617J	53797	
.00025"	.010"	.025"	0-5-0	656-124J	53666
			0-10	656-224J	53697
	.020"	.050"	0-10-0	656-128J	53668
			0-20	656-228J	53699
			0-15-0	656-129J	53670
			0-30	656-229J	53701

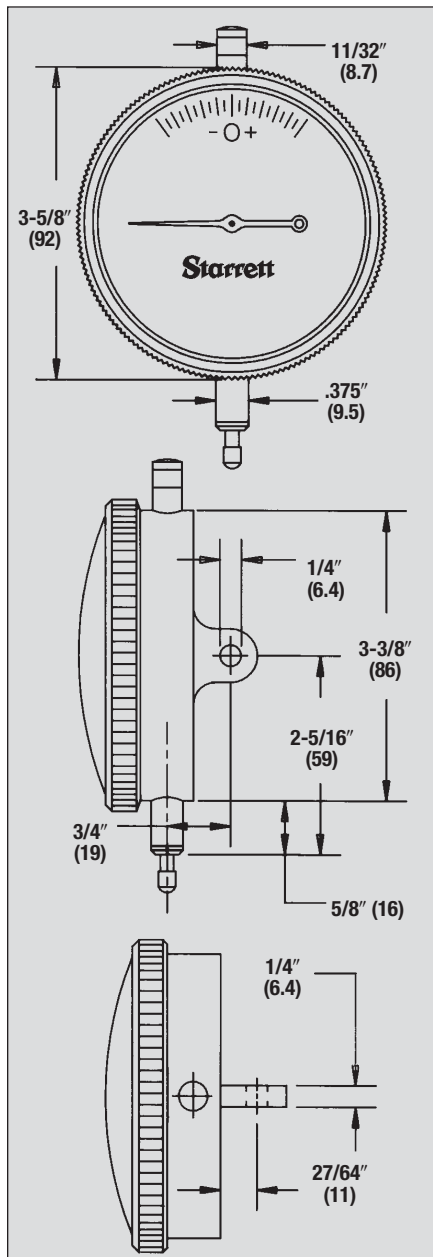
Packed one in a box.

(Continued on next page.)



Dial Indicators

No. 656 Series (continued)



Free drafting template available for this size.
Write The L.S. Starrett Co., Athol, MA 01331.

Inch Reading (continued)

Graduation	Range		Dial Reading	Catalog No.	EDP No.
	One Rev.	Total			
.0005"	.020"	.050"	0-10-0	656-134J	53674
			0-20	656-234J	53705
	.030"	.075"	0-15-0	656-136J	53676
			0-30	656-236J	53707
	.040"	.100"	0-20-0	656-138J	53678
			0-40	656-238J	53709
.050"	.125"	0-25-0	656-131J	53672	
.001"	.020"	.050"	0-10-0	656-142J	53682
			0-20	656-242J	53713
	.030"	.075"	0-15-0	656-143J	53684
			0-30	656-243J	53715
	.040"	.100"	0-20-0	656-144J	53686
			0-40	656-244J	53717
	.050"	.125"	0-25-0	656-145J	53688
			0-50	656-245J	53719
	.100"	.250"	0-50-0	656-141J	53680
			0-100	656-241J	53711
		.500"	0-50-0	656-341/5J	53783
			0-100	656-441/5J	53787
		1.000"	0-50-0	656-341J	53785
			0-100	656-441J	53789

Millimeter Reading

Graduation	Range		Dial Reading	Stem Dia.	Catalog No.	EDP No.
	One Rev.	Total				
0.002mm	0.2mm	0.5mm	0-10-0	.375"	656-161J	53690
				8mm	656-161J-8	64870
			0-20	.375"	656-261J	53779
				8mm	656-261J-8	64871
0.01mm	1.0mm	2.5mm	0-50-0	.375"	656-181J	53692
				8mm	656-181J-8	64872
			0-100	.375"	656-281J	53781
				8mm	656-281J-8	64873
		25mm	0-100	.375"	656-881J	56234
				8mm	656-881J-8	64874

Packed one in a box.



Dial Indicators with long range

Nos. 25, 655, 656 Series 2-5" ranges

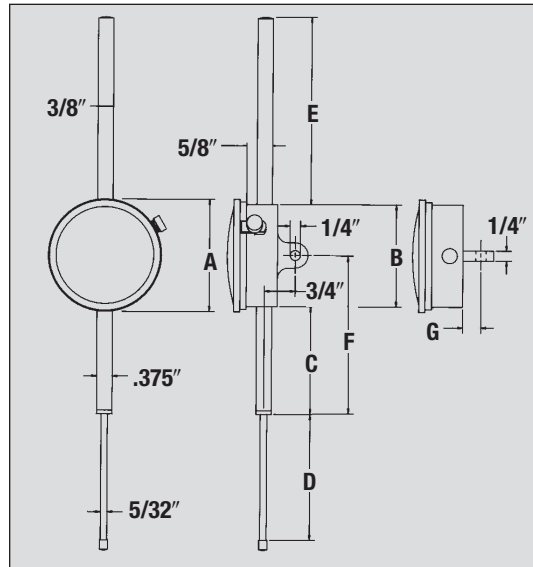
These indicators have a shockless, hardened steel gear train and are furnished with jewel bearings and lug-on-center backs unless otherwise ordered.

- ◆ Conforms to AGD specifications except for range
- ◆ Stem cap supplied as standard – top lift available when specified
- ◆ Furnished with continuous reading double dial with direct reading count hands



No. 25-2041J.

Packed one in a box.



NOTE: Not available with special nonshock mechanism. For other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings.

Approximate Dimensions

Catalog No.	A	B	C	D	E	F	G
25-2041J	2-1/4"	2-1/16"	1-13/16"	2-1/16"	3-3/32"	2-7/8"	15/32"
655-2041J	2-3/4"	2-1/2"	1-5/8"	2-1/16"	3-3/32"	2-7/8"	7/16"
656-2041J	3-5/8"	3-3/8"	1-1/4"	2-1/16"	3-3/32"	3"	27/64"
25-3041J	2-1/4"	2-1/16"	2-13/16"	3-1/16"	4-9/16"	3-7/8"	15/32"
655-3041J	2-3/4"	2-1/2"	2-5/8"	3-1/16"	4-9/16"	3-7/8"	7/16"
656-3041J	3-5/8"	3-3/8"	2-1/4"	3-1/16"	4-9/16"	4"	27/64"
25-4041J	2-1/4"	2-1/16"	3-13/16"	4-1/16"	6"	4-7/8"	15/32"
655-4041J	2-3/4"	2-1/2"	3-5/8"	4-1/16"	6"	4-7/8"	7/16"
656-4041J	3-5/8"	3-3/8"	3-1/4"	4-1/16"	6"	5"	27/64"
25-5041J	2-1/4"	2-1/16"	4-13/16"	5-1/16"	7-1/4"	5-7/8"	15/32"
655-5041J	2-3/4"	2-1/2"	4-5/8"	5-1/16"	7-1/4"	5-7/8"	7/16"
656-5041J	3-5/8"	3-3/8"	4-1/4"	5-1/16"	7-1/4"	6"	27/64"

Graduation	Range	Dial Reading	Revs. of Hand	AGD Group	Bezel Diameter	Catalog No.	EDP No.	
.001"	2.000"	0-100	20	2	2-1/4"	25-2041J	53309	
				3	2-3/4"	655-2041J	53619	
				4	3-5/8"	656-2041J	53799	
			30	2-1/4"	25-3041J	53310		
					3	2-3/4"	655-3041J	53620
					4	3-5/8"	656-3041J	53800
	40		2-1/4"	25-4041J	53311			
				3	2-3/4"	655-4041J	53621	
				4	3-5/8"	656-4041J	53801	
	50		2-1/4"	25-5041J	53312			
				3	2-3/4"	655-5041J	53622	
				4	3-5/8"	656-5041J	53802	



Metric Dial Indicators with long range

Nos. 25, 655 Series 50-125mm ranges

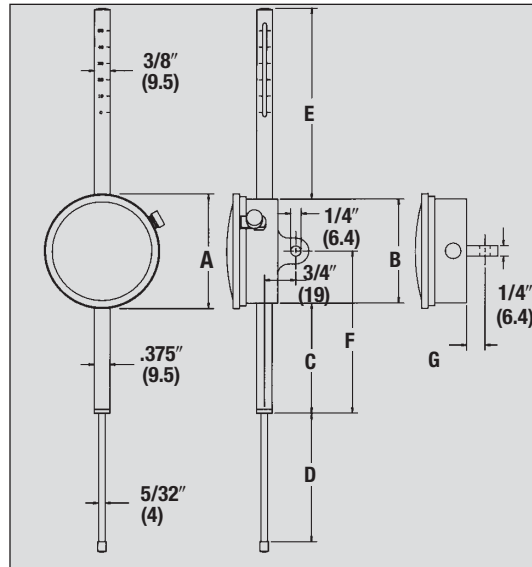
These indicators have a shockless, hardened steel gear train and are furnished with jewel bearings and lug-on-center backs unless otherwise ordered.

- ◆ Conforms to AGD specifications except for range
- ◆ Furnished with continuous reading double dial
- ◆ Direct readout accomplished by (1) graduated top tube which indicates each 10mm of spindle travel, (2) revolution counter which indicates each 1mm full turn of the indicator hand, and (3) indicator hand which shows each 0.01mm of spindle movement



No. 655-2081J.

Packed one in a box.



NOTE: Not available with special nonshock mechanism. For contact points, attachments and accessories, refer to the end of the AGD Dial Indicator listings.

Approximate Dimensions Inch and Millimeter

Catalog No.	A	B	C	D	E	F	G
25-2081J	2-1/4"	2-1/16"	1-13/16"	2-1/16"	3-3/32"	2-7/8"	15/32"
	57mm	52mm	46mm	52mm	79mm	73mm	12mm
655-2081J	2-3/4"	2-1/2"	1-5/8"	2-1/16"	3-3/32"	2-7/8"	7/16"
	70mm	63.5mm	41mm	52mm	79mm	73mm	11mm
25-3081J	2-1/4"	2-1/16"	2-13/16"	3-1/16"	4-9/16"	3-7/8"	15/32"
	57mm	52mm	71mm	78mm	116mm	98mm	12mm
655-3081J	2-3/4"	2-1/2"	2-5/8"	3-1/16"	4-9/16"	3-7/8"	7/16"
	70mm	63.5mm	67mm	78mm	116mm	98mm	11mm
25-4081J	2-1/4"	2-1/16"	3-13/16"	4-1/16"	5-61/64"	4-7/8"	15/32"
	57mm	52mm	81mm	103mm	151mm	124mm	12mm
655-4081J	2-3/4"	2-1/2"	3-5/8"	4-1/16"	5-61/64"	4-7/8"	7/16"
	70mm	63.5mm	92mm	103mm	151mm	124mm	11mm
25-5081J	2-1/4"	2-1/16"	4-13/16"	5-1/16"	7-1/4"	5-7/8"	15/32"
	57mm	52mm	122mm	129mm	184mm	149mm	12mm
655-5081J	2-3/4"	2-1/2"	4-5/8"	5-1/16"	7-1/4"	5-7/8"	7/16"
	70mm	63.5mm	117.5mm	129mm	184mm	149mm	11mm

Graduation	AGD Group	Stem Diameter	Range	Dial Reading	Revs. of Hand	Catalog No.	EDP No.				
0.01mm	2	.375" 9.5mm	50mm	0-100	50	25-2081J	56225				
	3					655-2081J	56230				
	2					75mm	75	25-3081J	56226		
	3							655-3081J	56231		
	2							100mm	100	25-4081J	56227
	3									655-4081J	56232
	2		125mm		125					25-5081J	56228
	3									655-5081J	56233



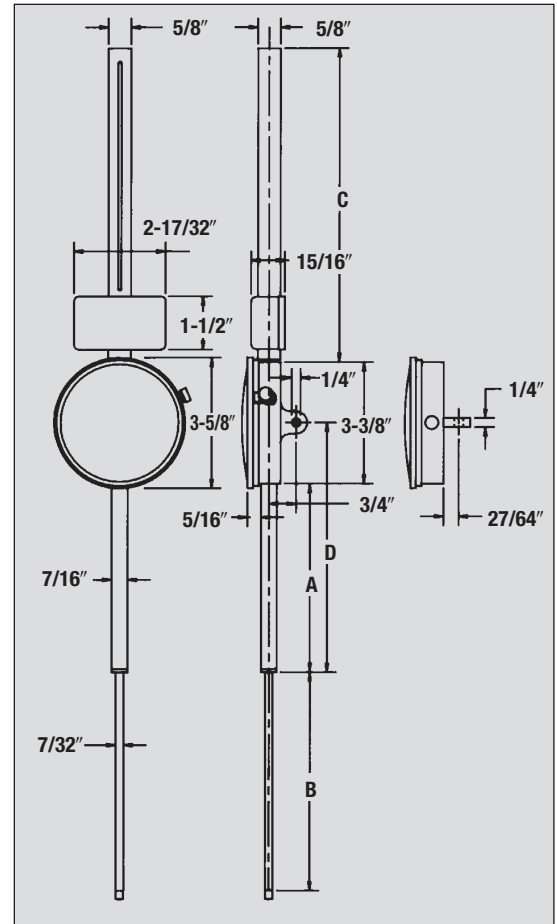
Dial Indicators with extra-long range

No. 656 Series AGD Group 4 6-12" ranges

These indicators have a shockless, hardened steel gear train and are furnished with jewel bearings and lug-on-center backs unless otherwise ordered.

- ◆ Use anywhere a long reach is needed – positioning of stops, measuring travel of slides and cam throws, and use in deep slots or holes
- ◆ Conforms to AGD specifications except for range, stems and contact point
- ◆ Top stem graduated in 1" increments, called out by red colored pointer
- ◆ Furnished with continuous reading double dial with direct reading count hand

NOTE: Not available with special nonshock mechanism. For contact points, attachments and accessories, refer to the end of the AGD Dial Indicator Section.



Dimensions

Catalog No.	A	B	C	D
656-6041J	5-1/4"	6-1/16"	8-3/4"	6-15/16"
656-7041J	6-1/4"	7-1/16"	9-3/4"	7-15/16"
656-8041J	7-1/4"	8-1/16"	10-3/4"	8-15/16"
656-9041J	8-1/4"	9-1/16"	11-3/4"	9-15/16"
656-10041J	9-1/4"	10-1/16"	12-3/4"	10-15/16"
656-11041J	10-1/4"	11-1/16"	13-3/4"	11-15/16"
656-12041J	11-1/4"	12-1/16"	14-3/4"	12-15/16"

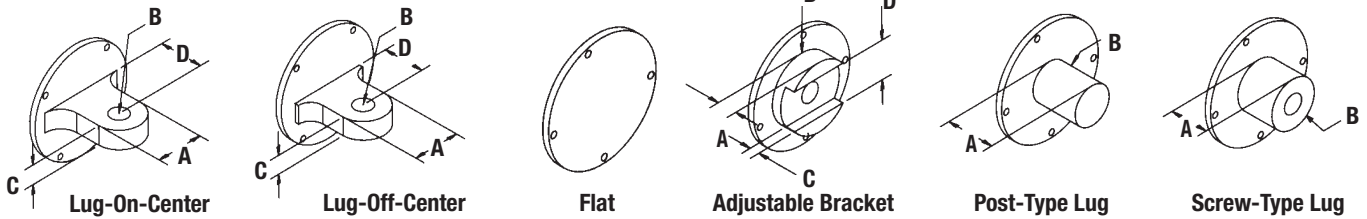
No. 656-6041J.

Graduation	AGD Group	Dial Diameter	Range	Dial Reading	Revs. of Hand	Catalog No.	EDP No.
.001"	4	3-5/8"	6.000"	0-100	60	656-6041J	53803
			7.000"		70	656-7041J	53804
			8.000"		80	656-8041J	53805
			9.000"		90	656-9041J	53806
			10.000"		100	656-10041J	53807
			11.000"		110	656-11041J	53808
			12.000"		120	656-12041J	53809

Packed one in a box.



AGD Dial Indicator Backs



Type	Fits Starrett Indicator Series No.	Part No.	EDP No.	Dimensions							
				A		B		C		D	
				Inch	mm	Inch	mm	Inch	mm	Inch	mm
*Lug-On-Center	81	PT06836-1	70856	5/8"	16mm	1/4"	6.3mm	1/4"	6.3mm	1/2"	12.7mm
	25, 2600	PT07206-1	70960							15/32"	12mm
	655	PT06966-1	70888							7/16"	11mm
	656	PT07317-1	70980							27/64"	10.7mm
**Lug-Off-Center	81	PT06836	70855	5/8"	16mm	1/4"	6.3mm	1/4"	6.3mm	1/2"	12.7mm
	25, 2600	PT06608-1	70770							15/32"	12mm
	655	PT06966A	71996							7/16"	11mm
	656	PT07317A	71997							27/64"	10.7mm
**Flat	81	PT06836J	70858								
	25, 2600	PT06608J	70774								
	655	PT06878J	70873								
	656	PT06903J	71995								
Flat (Plastic)	81	PT24921	67295								
	25, 2600	PT26160	67405								
†Screw-Type Lug (#1/4-20 Thread)	81	PT24074	72482	1/2"	12.7mm	5/8"	16mm				
	25, 2600	PT24076	72483								
	655	PT24078	72484								
	656	PT24080	72485								
†Screw-Type Lug (#3/8-24 Thread)	81	PT06836S	72223	1/2"	12.7mm	5/8"	16mm				
	25, 2600	PT06608E	70772								
	655	PT06878E	72224								
	656	PT06903E	72225								
†Screw-Type Lug (#1/4-28 Thread)	81	PT24073	72486	1/2"	12.7mm	5/8"	16mm				
	25, 2600	PT24075	72487								
	655	PT24077	72488								
	656	PT24079	72489								
†Post-Type Lug	81	PT06836F	70857	1-1/4"	32mm	1/2"	12.7mm				
	25, 2600	PT06608F	70773								
	655	PT06878F	71992								
	656	PT06903F	71994								
†Adjustable Bracket (#1/4-20 Thread)	81	PT06836M	70859	1/4"	6.3mm	7/8"	22mm	1/8"	3mm	1/2"	12.7mm
	25, 2600	PT06608M	70776			1-1/4"	32mm				
	655	PT06878M	70874								
	656	PT06903M	70882								

* Regularly furnished on all listed indicators at no extra charge.
 ** When specified, available on all listed indicators at no extra charge.

† NOTE: When specified, available at extra charge on all listed indicators.
 Backs for special requirements are also available; priced on application.

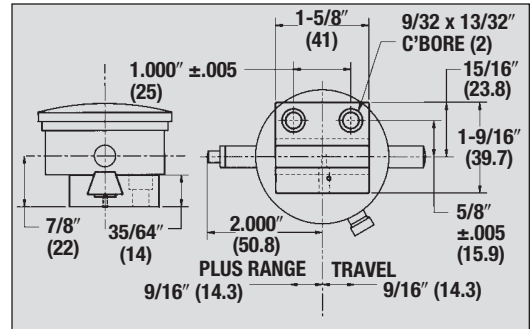
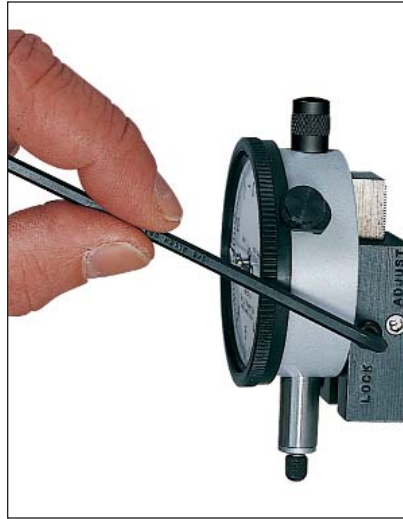


Special Indicator Backs

Backs with adjustable mounting bracket

No. 674 Series

For use with gages and gaging fixtures where an adjustable indicator mounting is required. A dovetail with rack and pinion adjustment provides 1-1/8" (28mm) indicator travel. A 1/8" hex wrench is used to adjust and lock the indicator in final position. The bracket has two counterbored mounting holes (for 1/4" socket head screws), and the back has four screw holes so the indicator back can be rotated.

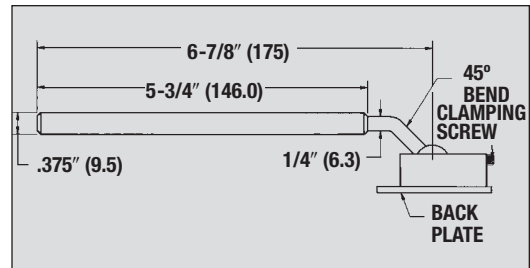


Fits Starrett Series	Catalog No.	EDP No.
No. 81	674-1	66374
Nos. 25, 2600	674-2	52892
No. 655	674-3	52893
No. 656	674-4	52894

Universal Backs

No. 672 Series

Featuring a universal ball joint attached to the end of a gooseneck shank, these attachments make it possible to position an AGD indicator at any desired setting. The indicator can be rotated 360° and angularly up to 90° and locked in the desired position by tightening a single knurled nut. Straight shank is 3/8" (9.5mm) in diameter.

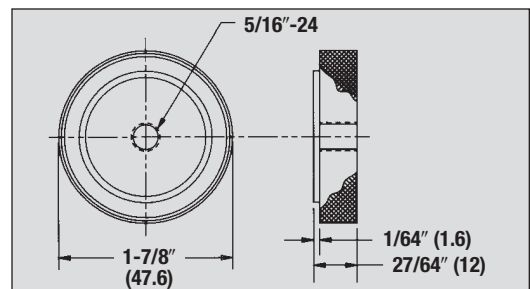


Fits Starrett Series	Catalog No.	EDP No.
Nos. 25, 2600	672-2	52887
No. 655	672-3	52888
No. 656	672-4	52889

Magnetic Backs

No. 676 Series

These magnetic backs provide a quick and easy means of attaching any Starrett AGD indicator to flat, ferrous metal surfaces. A real timesaver for machine, jig and fixture set up. Requires no clamps, rods or snugs. A special 5/16"-24 threaded stud back is provided to replace the standard lug back. The powerful, permanent magnet is then attached to the threaded stud. Anti-magnetic indicators are not required.



Fits Starrett Series	Catalog No.	EDP No.
No. 81	676-1	56647
Nos. 25, 2600	676-2	56648
No. 655	676-3	56649
No. 656	676-4	56650



AGD Indicator Attachments/Accessories

Indicator Hole Attachment

No. 670 Series

These hole attachments make it possible to measure the inside of holes and other surfaces that cannot be reached with the regular indicator spindle. Both attachments have a .375" (9.5mm) diameter hole to fit all indicators made to AGD standards and can be securely clamped to the indicator stem. The ball end on the swivel arm which contacts the work is 1/8" (3mm) in diameter.



Range (Approx.)		For Hole Depths to:		Catalog No.	EDP No.
Inch	mm	Inch	mm		
3/8"	9.5mm	13/16"	20mm	670A	52884
9/16"	14mm	1-11/16"	42mm	670B	52724

Universal Attachment

No. 671

This Universal Attachment is for use with indicators having standard AGD .375" (9.5mm) stem diameters. It clamps on the indicator stem and its movement is transmitted through the contact point to the indicator. Furnished with two interchangeable arms, one straight for measuring internal surfaces and one angular for measuring at right angles to the indicator spindle.



Range (Approx.)	Catalog No.	EDP No.
1/8" (3mm)	671	52886

Special Nonshock Mechanism

NONSHOCK

Starrett dial indicators have hardened, stainless steel gears, pinions and racks for maximum resistance to shock. Where the rack is subject to repeated, severe and/or excessive mechanical shocks, many Starrett AGD dial indicators may be ordered with a special nonshock mechanism. Based on a positive-loaded, split gear assembly, this simple device protects indicator accuracy, prolongs life, and reduces service costs.

When ordering, specify "N/S" after the dial indicator catalog number.

NOTE: Not available on the following indicators: Nos. 25-109, 25-209, 2600 and 2700 series; Nos. 656-109, 656-209 and all other indicators with 2" (50mm) range and above.

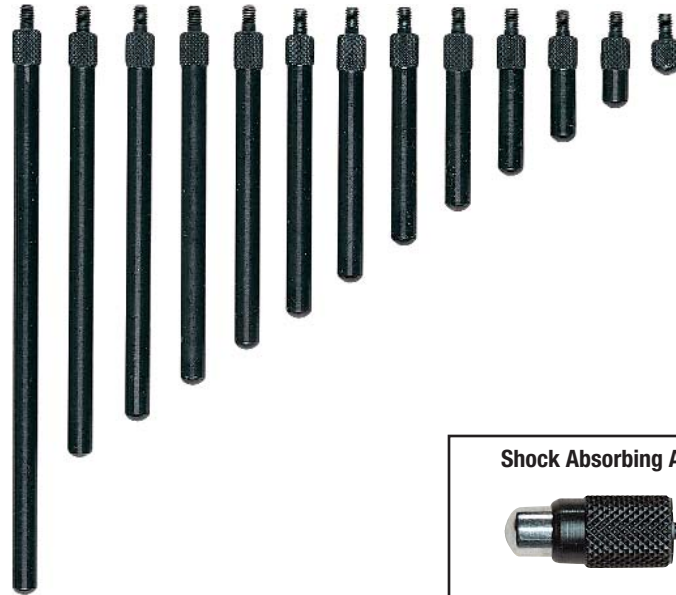


AGD Indicator Contact Points and Accessories

Any of the contact points listed here can also be used with the Nos. 650, 651 Series and with the 196 Series Indicators by using the No. 196R Adapter.

Extra-Length Regular-Style Contact Points with round or flat ends 1/4-4" (6-100mm)

All Starrett AGD indicators are regularly furnished with 1/4" (6.3mm) length interchangeable contact points. Available in standard lengths to 4" (100mm). Diameter is 13/64" (5mm), with a #4-48 screw thread. Made from high grade steel, hardened and ground. Other lengths are also available – priced on application. Available with round or flat ends as listed.



Regular-Style Carbide Contact Points with round or flat end

Two round points are available in standard lengths. 1/4" (6.3mm), PT08399-X (EDP 66053) – or – 1/2" (13mm), PT06677-X (EDP 66054). One flat point is available in standard length; 1/4" (6.3mm), PT10453-X (EDP 66068). Interchangeable points have a #4-48 screw thread. Longer lengths can be easily obtained by adding contact point extensions (see next page). Other sizes also available by request.

Shock Absorbing Anvil No. 28 / EDP No. 50199

Anvil replaces the regular contact point on any AGD indicator, protecting its movement against mechanical shock. Any sudden impact telescopes the anvil into the body of the unit against an internal spring. Acts as a solid contact point when the indicator is used normally. Furnished with #4-48 AGD standard screw thread.

Extra-Length Contact Points, Regular Style

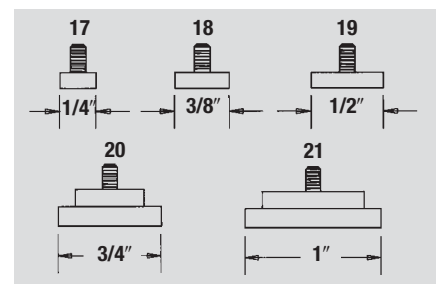
Length		Rounded End		Flat End	
Inch	mm	Part No.	EDP No.	Part No.	EDP No.
1/4"	6.3mm	PT07215	70965	PT10453	72048
1/2"	13mm	PT06677	70823	PT09560	71260
3/4"	19mm	PT06677A	70824	PT09560A	71261
1"	25mm	PT06677B	70825	PT09560B	71262
1-1/4"	32mm	PT06677C	70826	PT09560C	71263
1-1/2"	38mm	PT06677D	70827	PT09560D	71264
1-3/4"	44mm	PT06677E	70828	PT09560E	71265
2"	50mm	PT06677F	70829	PT09560F	71266
2-1/4"	57mm	PT06677G	70830	PT09560G	71267
2-1/2"	63mm	PT06677H	70831	PT09560H	71268
2-3/4"	70mm	PT06677J	70832	PT09560J	71269
3"	75mm	PT06677K	70833	PT09560K	71270
4"	100mm	PT10459	71327		

Flat-End Steel Points

The flat-end contact points have hardened steel contact surfaces, ground flat and lapped. They are furnished with a #4-48 screw thread for use on any AGD indicator.

Flat-End Steel Points

Diameter		Style No.	Part No.	EDP No.
Inch	mm			
1/4"	6.3	17	PT06632-17	70804
3/8"	9.5	18	PT06632-18	70805
1/2"	12.7	19	PT06632-19	70806
3/4"	19	20	PT06632-20	70808
1"	25	21	PT06632-21	70807





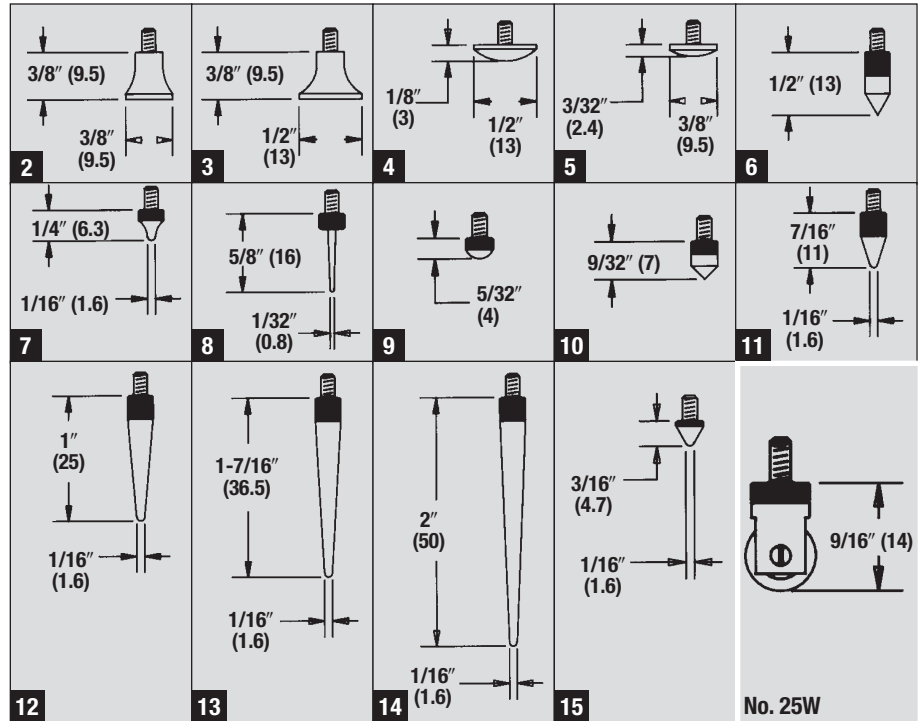
AGD Indicator Special Contact Points and Accessories

Special Form Contact Points

Starrett Special Contact Points are furnished in fourteen shapes. Knurled diameter is approximately 13/64" (5mm). All have #4-48 screw thread and can be used on any AGD indicator. Other special shapes are available on special order.

Carbide, sapphire, diamond or teflon-coated contact points are also available by request.

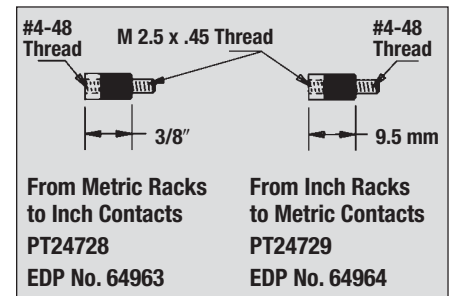
Style No.	Part No.	EDP No.
2	PT06632-2	70790
3	PT06632-3	70791
4	PT06632-4	70792
5	PT06632-5	70793
6	PT06632-6	70794
7	PT06632-7	70795
8	PT06632-8	70796
9	PT06632-9	70797
10	PT06632-10	70798
11	PT06632-11	70799
12	PT06632-12	70800
13	PT06632-13	70801
14	PT06632-14	70802
15	PT06632-15	70803



Roller Contact Point No. 25W/EDP No. 53916

This contact has a small, hardened roller 3/8" (9.5mm) in diameter for continuous gaging of moving material where the material movement is at a slow speed. Contact has #4-48 screw thread and substitutes for the regular contact point provided on Starrett and other AGD indicators. Furnished with a knurled check nut for positioning the contact on the indicator spindle. See inset drawing above.

AGD Contact Adaptors

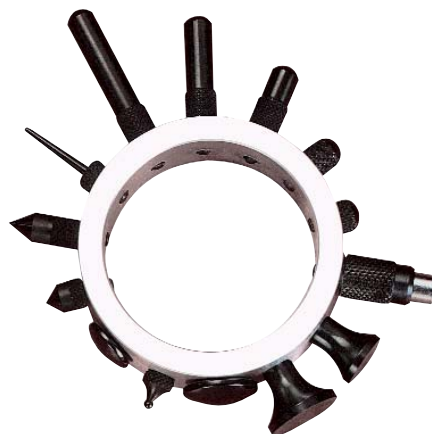


From Metric Racks to Inch Contacts
PT24728
EDP No. 64963

From Inch Racks to Metric Contacts
PT24729
EDP No. 64964

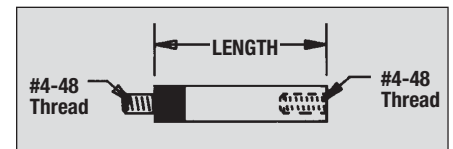
Contact Point Set No. 25R/EDP No. 50153

14 points with #4-48 screw thread to fit AGD indicators: a regular 1/4" (6.3mm) long point; 9 special form points; a No. 28 Shock Absorbing Anvil; and 3 extra long points 1/2", 3/4" and 1" (13, 19, 25mm) long. High grade steel, hardened and ground. All points are mounted on a convenient aluminum ring for safe keeping and easy selection.



No. 25R.

AGD Contact Point Extensions



Length	Part No.	EDP No.
1/2"	PT21697-1/2	64632
1"	PT21697-1	64633
2"	PT21697-2	64634
3"	PT21697-3	64635
4"	PT21697-4	64636



AGD Indicator Accessories Split Collets

No. 25 SC Series English and Metric Threads

For mounting AGD indicators with 3/8" (9.5 mm) or 8 mm stems in gaging and work location fixtures, these collets simplify fixture mounting. Screw the collet into the fixture or into our No. 648 Depth Gage Base, insert the indicator into the collet and tighten it in place with the hexagonal nut. Internal collet fingers grip the stem with equal pressure to eliminate spindle binding. Made of steel with black finish. Overall length of collet and threads is 1".



Left-to-right: Nos. 25SC14 and 25SC38.

English Thread

Thread Size	Thread Length	Hole for Indicator Stem	Catalog No.	EDP No.
3/8-24NF	9/32" (7mm)	.375" (9.5mm) Diameter to 1/2" (12.7mm) Depth; 1/4" (6.3mm) Diameter through Hole	25SC14	50155
1/2-20NF		.375" (9.5mm) dia. through Hole	25SC38	50156
1/2-32UN		.375" (9.5mm) dia. through Hole	25SC38B	55995

Metric Thread

M12 x 1.75	7mm	8mm Diameter through Hole	25SC8M	64885
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Depth Gage Bases with Stem Collet

No. 648 Series

Bases are for mounting AGD indicators to measure depths. Indicators with .375" (9. mm) stems will fit the stem collet furnished with the base (No. 25SC38). Indicators with 8 mm stems need the split bushing No. 25MSB to adapt to the stem collet. Longer contacts or extensions may be required.

Base Size	Catalog No.	EDP No.
4" (100mm)	648-4	65850
6" (150mm)	648-6	65851
8" (200mm)	648-8	65852



Split Bushings

Split bushings fit over the indicator stem to increase the overall diameter for mounting in fixtures.



Split Bushing.

Fit Starrett No. 80 Series Miniature Dial Indicators

Length	Diameter		Catalog No.	EDP No.
	Inside	Outside		
1/2"	.219"	.375"	80SB	56008

Fit Starrett AGD English Indicators

1/2"	.375"	.500"	25SB	50154
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Fit Starrett AGD Metric Indicators

12.7mm	8mm	9.5mm	25MSB	56007
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Threaded Stems

Threaded stems on Starrett indicators with a .375" (9.5mm) diameter stem up to 1" (25mm) range (except long stem models) are available at additional cost. A threaded stem is often desirable for attaching the indicator to machine tools or fixtures. A 3/8-24 thread is furnished unless otherwise specified.



Threaded Stem.



AGD Indicator Accessories

Long Stem Dial Indicators

Starrett Nos. 81, 25, 2600, 655 and 656 Indicators through the 1" (25mm) range can be furnished with long stems up to 12" (300mm). These are especially useful for gaging in deep holes or where obstructions prevent the use of regular indicators. Specify stem length from outside case diameter when ordering.

NOTE: Long stems not available on No. 80 Series Miniature Dial Indicators.

Range Limit Cap

No. 25LC
EDP No. 50152

The Range Limit Cap replaces the stem cap furnished on most Starrett Series Nos. 81, 25, 2600, 655 and 656 AGD Indicators, preventing the possible error of a complete revolution. It can be adjusted to limit an indicator's measuring range any amount up to 3/8" (9.5mm).

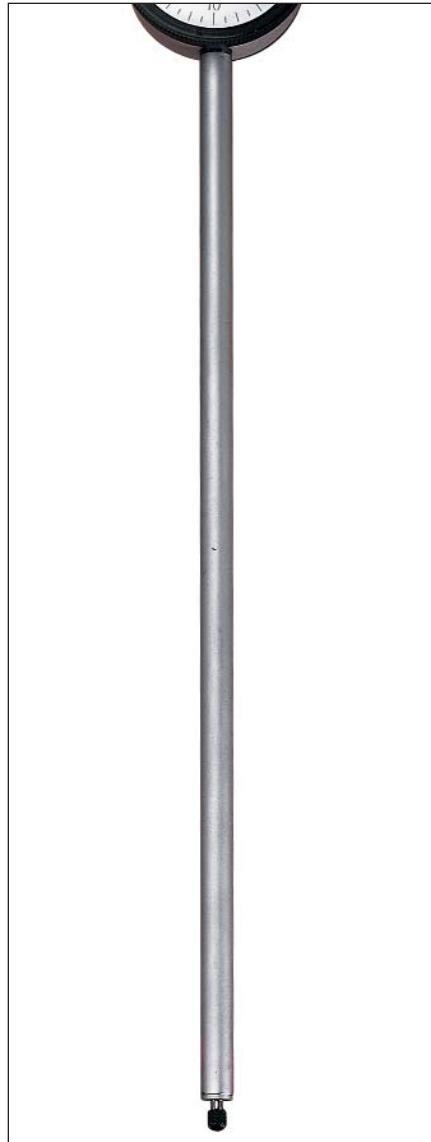
Lever Control

Fits only indicators with a case stem cap.

No. PT99356
EDP No. 72088

Handy attachment mounts in place of the stem cap and is interchangeable on most Starrett Series Nos. 81, 25, 2600, 655 and 656 AGD Indicators up to 1" or 25mm range. Pressing down the lever lifts the spindle; releasing it lets the spindle contact the work. Easy to install in the left or right hand position using a screwdriver and an open end wrench. If ordered on a new indicator, specify left or right hand position. (Furnished at left unless otherwise ordered.)

NOTE: .500", 1.000", 10mm or 25mm indicators must be originally ordered with case stem cap to be used with cam type lifting levers. No extra charge for case stem cap.



Long stem.

Top Lift

A knurled grip allows the spindle to be manually lifted and returned by spring action to contact the work. Furnished in place of the stem cap on .500", 1.000", 10mm and 25mm range indicators.

No extra charge on AGD indicators up to 1" (25mm) range; over 1" (25mm) range, priced on request. To order, specify "with Top Lift" after the indicator catalog number.

NOTE: Will not fit on No. 2700 Series Indicators.



Range cap.



Top lift.



Lever control.



Dust guard.

Rubber Dust Guard

Protects the rack of AGD Indicators from foreign matter under adverse gaging conditions. Made in lengths to fit Nos. 81, 25, 2600, 655 and 656 Indicators up to 1" (25mm) range.

Indicator Range	Part No.	EDP No.
.400", .500", 1.000" (10mm, 12.7mm, 25mm)	PT09545	71256
Ranges under .400" (10mm)	PT09763	71289



AGD Dial Indicator Tolerance Hands

Starrett dial indicators may be ordered with crystal-mounted or bezel-mounted tolerance hands for visually checking the limits of any given dimension.

Crystal-mounted hands, both colored red, are positioned under the crystal and are individually adjustable through 360° by turning concentric knurled knobs on the outside of the crystal. Available for all Series Nos. 81, 25, 655 and 656 AGD Dial Indicators.

Bezel-mounted hands, both colored red, rotate inside the bezel. They are mounted outside the crystal and are independently adjustable through 360°. Available for Nos. 81 and 25 Series AGD Indicators only.

New Snap-on bezel-mounted hands, two hands colored red, are easily mounted on the outside of the bezel and are adjustable through 360°. Available for Starrett No. 25 Series AGD Indicators only. Order No. PT99513 (EDP No. 66038).



Indicators with (left) Snap-on bezel-mounted hands; (middle) Crystal-mounted hands; and (right) with bezel-mounted hands.

Maximum Hand

This red-colored hand records the maximum position reached by the indicator hand within a single revolution. Mounted under the crystal, it has a small nib at its point. The indicator hand contacts the nib, advancing the maximum hand which remains in position when the indicator hand returns to its at-rest position. To reset the maximum hand, turn the knurled knob mounted outside the crystal.



Maximum Hand in at-rest position with indicator hand, left. In recording position, right.

To order Tolerance or Maximum Hands, specify the indicator catalog number followed by the name of the type of hand desired.



Indicator Testers

No. 716 0-1"

No. 716M 0-25mm

With direct reading capability to .0001" or 0.002mm, these gages provide a rapid means for calibrating both AGD and dial test indicators for linearity and repeatability through ranges up to 1" or 25mm. This tester design is unlike others because it can be swung to any position between vertical and horizontal by loosening a large hand knob which fastens the gage assembly to the base.

In addition, the micrometer head can be turned on its axis and its scale positioned to suit the operator's convenience by loosening a single set screw. Tensioned locking screws prevent tipping of both the gage assembly and the indicator holding clamp during set-up and adjustment.

The micrometer head is our No. 469 Series super-precision head with reverse reading capability. When testing a Series No. 2600 or No. 2700 Electronic Indicator, a .000050" graduated head is advisable, available on special order.

An indicator mounting attachment holds dovetail mount indicators, AGD indicators with 3/8" (9.5mm) stems and indicators with a holder that has a 3/16" (4.7mm) shank. Unit also has a fine adjustment to zero the indicator.



No. 716.



Dial test indicator is held in place by an offset attachment.



Checking AGD dial indicator.

0-1" Range

Micrometer Head Graduation	Description	Catalog No.	EDP No.
.0001"	Tester with carbide faced spindle, Indicator Mounting and Offset Attachment	716X	67228

0-25mm Range

0.002mm	Tester with carbide faced spindle, Indicator Mounting and Offset Attachment	716MX	67229
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NOTE: Also available on special order with resolution to .000050" or 0.001mm.

Packed one in a box.

Accessory

Description	Catalog No.	EDP No.
Indicator Mounting Attachment Only	PT26009	65102



Electronic Indicators

No. 2600 Series AGD Group 2

Ranges up to 1" and 25mm

This series of indicators is available in two versions; one with basic functions and one with full functions for complete SPC compatibility.

Features and Benefits Common to Both Versions:

- ◆ Conform to the dimensions of AGD size Group 2
- ◆ Available with either a .375" (9.5mm) stem or an 8mm (.315") stem. Furnished with .375" (9.5mm) stem unless otherwise ordered
- ◆ 1" (25mm) range
- ◆ Readout available to .0005" and 0.01mm
- ◆ A large, right-sized, easy-to-read LCD digital readout, surrounded by a rotating black bezel
- ◆ Furnished with lug-on-center back
- ◆ Starrett-designed electronics microprocessor
- ◆ Output to Starrett SPC Plus® system components on most models
- ◆ Utilizes standard indicator accessories and holding devices
- ◆ Battery powered and portable
- ◆ Rugged, sealed enclosure makes them F.F.F. (factory floor friendly)

No. 2600 Basic Indicator Action Features

- ◆ Instant inch/mm conversion
- ◆ Zero at any position
- ◆ Plus/minus control to indicate direction
- ◆ ON/OFF control with automatic off after one hour of nonuse. (Zero references will not be lost from memory)



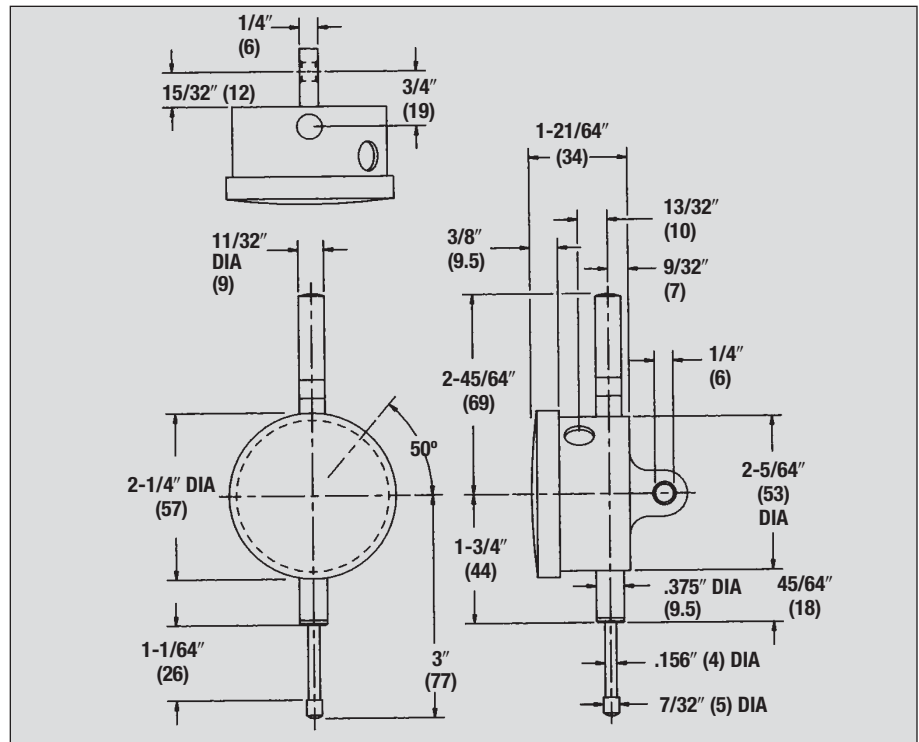
Left, No. 2600-0 basic model; right, No. 2600-8 Full-Function Indicator.

No. 2600 Full-Function Indicator Action Features

- ◆ Bezel rotates the reading for convenient positioning
- ◆ Instant inch/mm conversion
- ◆ Zero at any position
- ◆ Ability to retain and return reading to the original zero reference (zero absolute [ABS])
- ◆ Plus/minus control to indicate direction
- ◆ Min/Max/TIR – Min/max mode is used to retain the lowest and highest readings in a group, and TIR gives the difference between them
- ◆ Limits mode to enter low and high limits for tolerance control. This is easily done by the shift control to enter the proper function
- ◆ Preset is used to install any reading at any point in the display and is also done with the shift control
- ◆ ON/OFF control with automatic off after one hour of nonuse. (Zero references will not be lost from memory)
- ◆ Output jack allows data transmission to the following peripherals for SPC analysis, data collection and hard copy documentation
 - Starrett No. 772 Series Advanced Data Collection Systems
 - Starrett No. 761 Series Data Multiplexers
 - Works well with Starrett DataSure® Wireless Data Collection System
 - Other devices that support RS232C



**Electronic Indicators
No. 2600 Series
AGD Group 2 (continued)**



Basic Models

Resolution		Output	Catalog No.	EDP No.
Inch	mm			
.001"	0.01mm	No	2600-7	66041
.0005"	0.01mm	No	2600-0	65593
.0005"	0.01mm	Yes	2600-1	64886

Full Function Models

.001"	0.01mm	Yes	2600-8	66042
.0005"	0.01mm	Yes	2600-4	64889

Accessories and Cables

Description	Part No.	EDP No.
Adaptor from No. PT22938 Cable to PC (RS232C)	PT61768	66454
Shielded Cable to Starrett No. 761 Data Multiplexer and No. 772 Series Data Collector Modules and No. PT61768 Adaptor	PT22938	64059
Spindle Lifting Cable	PT26263	66043
One 3-Volt Battery No. CR2450	PT61120	65446

Specifications

Range		Resolution		Accuracy	
Inch	mm	Inch	mm	Inch	mm
1"	25mm	.001"	0.01mm	±.001"	±0.03mm
		.0005"			

Output Format

4,800 BAUD, seven data bits, even parity, one stop bit, ASCII data.
Transmission is exactly 16 characters followed by a carriage return and a line feed.



WISDOM® Electronic Indicators

No. 2700 Series AGD Groups 2, 3 and Rectangular Ranges up to 4" and 100mm

This is our most versatile line of electronic indicators, available in three styles, in addition to a remote display and accompanying probe series.

All indicators feature a glass scale design with an unsurpassed accuracy of \pm two resolutions when measuring from a known standard. All have rugged, sealed enclosures as well.

American designed and manufactured.

WISDOM Basic Series

◆ User Selectable Resolutions:

All available resolutions can be utilized in the same indicator, provided they are coarser than the resolution of the purchased model.

Example: selecting an indicator with the finest .00005"/0.00mm base resolution means you have all eight remaining resolutions "below" this which are usable in that model. If you select an indicator with a .001"/0.02mm base resolution, it will be your only available resolution for that model.

- ◆ 10 resolutions and 5 measuring ranges available (see specifications)
- ◆ Instant inch/mm conversion
- ◆ Plus or minus travel direction
- ◆ Maximum Reading Hold
- ◆ Zero the tool at any position of the spindle
- ◆ Rotating bezel
- ◆ Auto Off: After 10 minutes of nonuse. When Auto Off is engaged, an hourglass figure appears at the left side of the display
- ◆ Serial number: Indicators are furnished with individual serial number labels, coded with date for traceability
- ◆ Three power sources – operate by battery, A/C adaptor or through data port
- ◆ The output jack allows data transmission, either through a traditional wire or by connecting to a Starrett DataSure® Wireless Data Collection System end node



Left, No. F2730-0; right, No. 2720-4.

◆ Output data can be used by a variety of peripherals for analysis, data collection and hard copy documentation, including:

- ◆ Starrett No. 772 Series Advanced Data Collection Systems
- ◆ Starrett No. 761 Series Data Multiplexers
- ◆ Other devices that support RS232C

WISDOM Plus Series

These models have all the features and functions of the Basic Series, plus the following:

- ◆ Preset mode to install any reading at any point in the display. Reading is retained even if the indicator is turned off
- ◆ T.I.R.: Displays the difference between the highest and lowest values reached
- ◆ Tolerancing: Permits the entering of high and low tolerances. When tolerances are exceeded, the display will flash. Numbers are retained even if the indicator is turned off
- ◆ Minimum reading hold
- ◆ Hold button to freeze display: Displays and holds the reading after the measurement has been taken
- ◆ Feature lock: Unique feature locks user selections so that a wrong button push will not change your settings



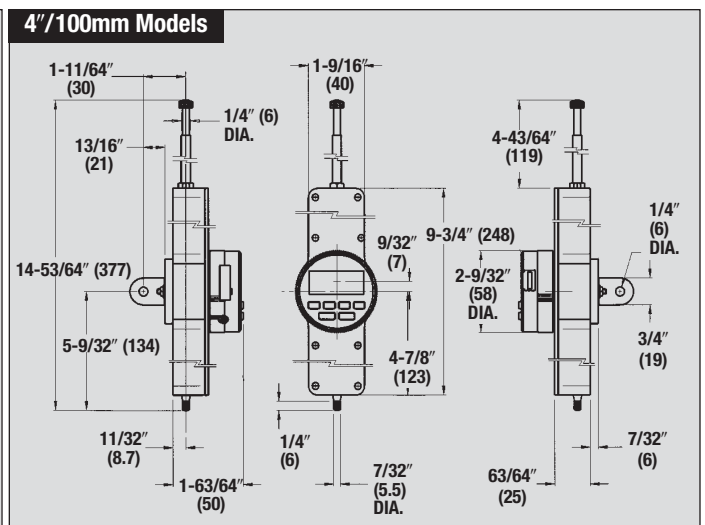
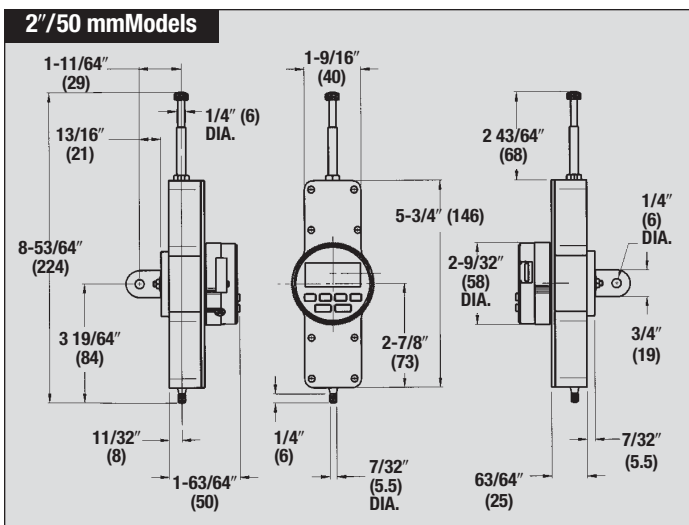
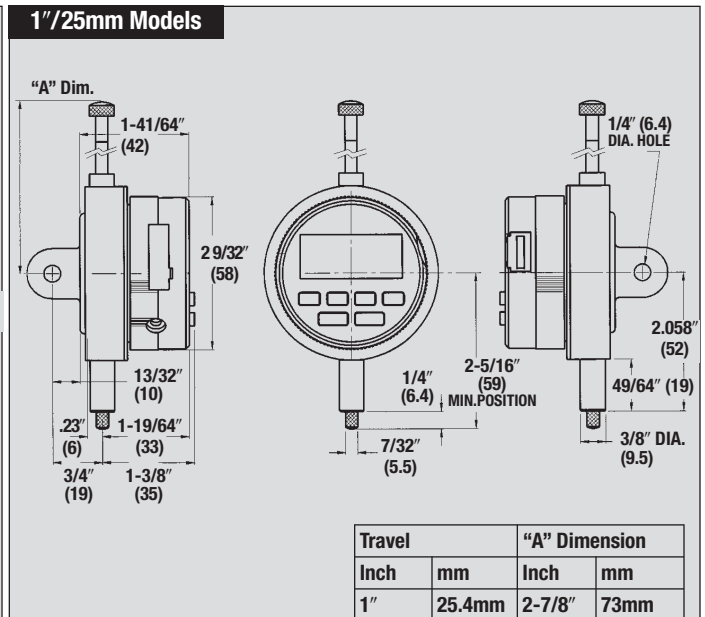
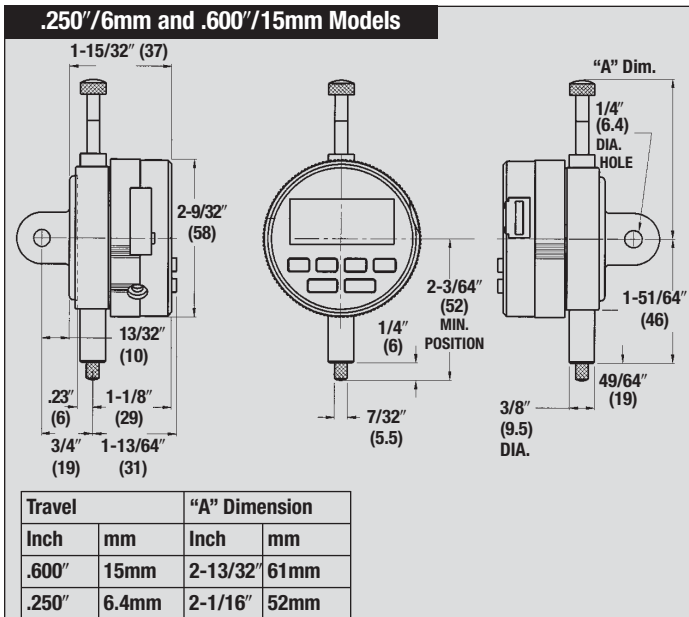
Above: regular and oversized models.

WISDOM-OEM Indicators:

Starrett can customize WISDOM models to meet your needs. Any combination of features found in WISDOM Basic or Plus Series can be furnished. In addition, units can be designed with features such as:

- ◆ Special measuring ratios like 2:1, 4:1, etc.
- ◆ Other units of measurement (cm, lb., etc.)
- ◆ Custom LCDs, graphics
- ◆ Varying the auto-off after nonuse time (Example: 45 minutes vs. 10 minutes)

See specifications, next two pages.



WISDOM® Series Remote Displays and Probes

These displays with probes will make absolute, incremental and/or comparative measurements and implement all the features of WISDOM Plus Indicators. System is ideal where viewing and operation ease are required. It is also suitable for any stand-alone gaging application.

- ◆ Remote display is a rugged enclosure with a 5/8" (16mm) high, easy-to-view LCD readout
- ◆ Power sources include 110V 50/60hz, or battery operated (without backlight)
- ◆ Probe and display can be separated by a distance of up to 6' (1.8 meters)
- ◆ Cable is hard wired to the probe and has a jack for convenient connection to the remote display box
- ◆ Readout box can be elevated for desired viewing



No. R2760-1.

See specifications on next page.



WISDOM No. 2700 Series Indicators** (continued)

Range		Resolution		No. of Resolutions Avail.	AGD/Case	Basic Series In/mm		Plus Series In/mm		Basic Series mm Only		Plus Series mm Only	
Inch	mm	Inch	mm			Cat. No.	EDP No.	Cat. No.	EDP No.	Cat. No.	EDP No.	Cat. No.	EDP No.
.250"	6	.00005"	0.001	10	AGD-2	2710-0	65810	F2710-0	65830			F2710-0M	66515
		.0001"	0.002	8		2710-1	65811	F2710-1	65831				
		.00025"	0.005	6		2710-2	65812	F2710-2	65832				
		.0005"	0.01	4		2710-3	65813	F2710-3	65833				
		.001"	0.02	2		2710-4	65814	F2710-4	65834				
.600"	15	.00005"	0.001	8	AGD-2	2720-0	65815	F2720-0	65835	2720-0M	67140		
		.0001"	0.002	6		2720-1	65816	F2720-1	65836			F2720-1M	66516
		.0005"	0.01	4		2720-3	65817	F2720-3	65837	2720-3M	66508	F2720-3M	66517
		.001"	0.02	2		2720-4	65818	F2720-4	65838			F2720-4M	66518
1.0"	25	.00005"	0.001	8	AGD-3	2730-0	65819	F2730-0	65839	2730-0M	67106	F2730-0M	66519
		.0001"	0.002	6		2730-1	65820	F2730-1	65840	2730-1M	67107	F2730-1M	66520
		.0005"	0.01	4		2730-3	65821	F2730-3	65841				
		.001"	0.02	2		2730-4	65822	F2730-4	65842				
2.0"	50	.0001"	0.002	6	Rectangular	2740-1	65824	F2740-1	65844	2740-1M	67141	F2740-1M	66522
		.0005"	0.01	4		2740-3	65825	F2740-3	65845	2740-3M	66509		
		.001"	0.02	2		2740-4	65826	F2740-4	65846			F2740-4M	66521
4.0"	100	.0001"	0.002	6		2750-1	65827	F2750-1	65847	2750-1M	67142	F2750-1M	66523
		.0005"	0.01	4		2750-3	65828	F2750-3	65848	2750-3M	66510		
		.001"	0.02	2		2750-4	65829	F2750-4	65849			F2750-4M	66524

WISDOM Series Remote Displays

Resolution		Power	In/mm		mm Only	
Inch	mm		Cat. No.	EDP No.	Cat. No.	EDP No.
.00005"	0.001	110 Volt	R2762-0	65878	R2762-0M	66514
		Battery	R2763-0	65879	R2763-0M	67149
.0001"	0.002	110 Volt	R2760-1	65876	R2760-1M	67147
		Battery	R2761-1	65877	R2761-1M	67148

Remote Display Probes

Range		Resolution		In/mm		mm Only	
Inch	mm	Inch	mm	Cat. No.	EDP No.	Cat. No.	EDP No.
.250"	6	.00005"	0.001	P2711-0	65870	P2711-0M	66511
		.0001"	0.002	P2711-1	65871		
.600"	15	.00005"	0.001	P2721-0	65872	P2721-0M	66512
		.0001"	0.002	P2721-1	65873	P2721-1M	67146
1.0"	25	.00005"	0.001	P2731-0	65874	P2731-0M	67144
		.0001"	0.002	P2731-1	65875	P2731-1M	67145
2.0"	50	.0001"	0.002	P2741-1	65978	P2741-1M	67143
4.0"	100	.0001"	0.002	P2751-1	65979		

*Other backs, styles and accessories also available by request. To order contact points individually, see previous pages.

**Other ranges and resolutions available on request.

Accessories, Power Source, Cables

Description	Part No.	EDP No.
A/C Adaptor, 110-Volt	PT26413	65880
Replacement Zinc Air Batteries, 4-Pack	PT26404	65884
Replacement Battery, 1-Pack (req. 2)	PT61120	65446
Cable to Module PT61490, to Connect to Starrett 772 Data Collectors and 761 Multiplexers	PT61489	65904
Cable for WISDOM Indicator to WISDOM Remote Display	PT26415	65882
Cable to RS232 (PC/Compatible)	PT26441	65893
Cable to M.T.I. Collectors and Processors	PT26546	66048
6' Extension Cable	PT05679	68752

Backs/Lever*

Back/Lever	Part No.	EDP No.
Flat Back	PT26406	65886
Offset Lug Back	PT26407	65887
Adjustable Lug Back	PT26411	65891
Adjustable Back	PT26408	65888
Post-Type Back	PT26409	65889
Screw Bracket Back	PT26410	65890
Adjustable Mounting Bracket Back	PT26848	66293
Lifting Lever	PT26405	65885



Electronic Indicators

No. 3600 Series

AGD Group 2

Ranges up to .500" and 12.7mm

No. 3600 Series Electronic Indicators have simple, powerful, easy-to-use functions, all at an attractive price. Versions are available for inch/metric and metric only.

Features

- ◆ Large, easy-to-read LCD
- ◆ AGD group 2 size
- ◆ Range: .500" or 12.7mm
- ◆ Resolution: .0005" or .01mm
- ◆ Power On / Off button
- ◆ Reverse travel (\pm control indicates direction)
- ◆ Zero setting at any position
- ◆ Long battery life
- ◆ 3/8" diameter stem for inch/mm model (8mm on metric-only model)
- ◆ 4-48 spindle thread on inch/mm model (M2.5 X .45 thread on metric-only model)
- ◆ Lug-on-center back + additional flat back
- ◆ Dust cap
- ◆ Plastic storage case with clear cover



Inch/mm

Range		Resolution		Catalog No.	EDP No.
Inch	mm	Inch	mm		
.500	12.7	.0005	0.01	3600-5	68813

Metric-Only

	12.7		0.01	3600M-5	68918
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Accessory

Description	Catalog No.	EDP No.
SR44 Battery	PT61918	67169



Magnetic Base Indicator Holders

Starrett offers a full line of indicator holders and stands to meet the requirements of a wide variety of applications.

Four of these are applicable to Dial and Electronic Indicator applications, and are also used with Test Indicators.

These models are detailed in the Test Indicator Section. Please refer to the appropriate page number for information about these models.



No. 657 Series

Base has three precision ground, magnetic contact surfaces. Grips horizontally, vertically or upside down. V-step holds base to round surfaces. Extra #1/4-20 tapped hole in one side of base (not shown) for mounting post.

Available with or without Starrett AGD Dial Indicators: inch reading No. 25-131J (graduation .0005", dial reading 0-25-0, range .125") or millimeter reading No. 25-181J (graduation 0.01 mm, dial reading 0-50-0, range 2.5mm). Other indicators can be furnished on request.

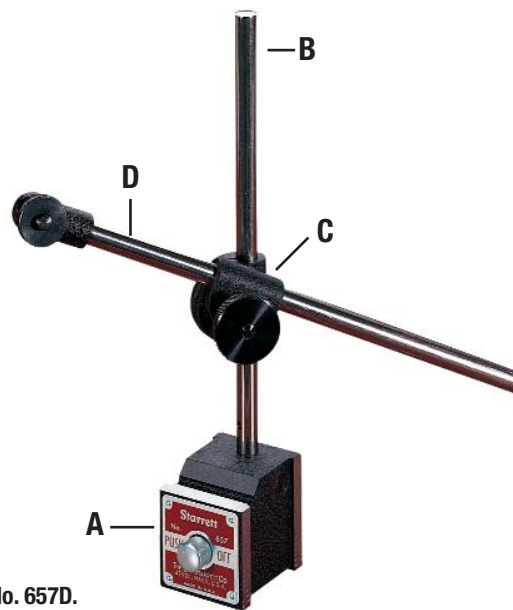
A. No. 657P Magnetic Base – 1-15/16" x 1-5/8" x 1-7/8" (50 x 40 x 48mm) deep. Push button on/off switch for one-hand operation.

B. No. 657G Upright Base Post – 3/8" (9.5mm) diameter x 7-7/16" (190mm) length overall.

C. No. 657H Swivel Post Snug – Allows universal indicator adjustment – up-and-down, any vertical angle, for a complete 360°. Two 3/8" (9.5mm) holes.

D. No. PT06784-A Gage Holding Rod – 3/8" x 9-1/2" (9.5 x 240mm) with clamping mechanism for gripping the indicator lug back (see photo below).

E. and F. Nos. 57S and 58S Universal Snugs – Adapt various scribers and indicator shanks to rods and posts.



No. 657D.



Base Holder Assembly and Individual Components

Photo Key	Description	Catalog No.	EDP No.
	Magnetic Base, Upright Post Assembly Including Post, Swivel Post Snug and Gage Holding Rod	657D	52749
A	Magnetic Base Only	657P	52757
B	Upright Base Post Only	657G	52753
C	Swivel Post Snug Only	657H	52785
D	Gage Holding Rod with Clamp Mechanism	PT06784-A	52755
E	Universal Snug with 5/16" and 3/8" Hole Dia.	57S	50296
F	Universal Snug with 1/4", 5/16" and 3/8" Hole Dia.	58S	56613

Sets Including Magnetic Base, Upright Post Assembly and AGD Dial Indicators

Description	w/Finished Wood Case		Without Case	
	Catalog No.	EDP No.	Catalog No.	EDP No.
Base and Upright Post Assembly with Inch Reading Indicator No. 25-131J	657EZ	52751	657E	52750
Base and Upright Post Assembly with Millimeter Reading Indicator No. 25-181J	657MEZ	56358	657ME	56357



Clamp mechanism grips indicator lug back.



Heavy-Duty Magnetic Base Indicator Holder with rotary on/off switch.

Furnished with or without Starrett AGD Dial Indicators

No. 659 Series

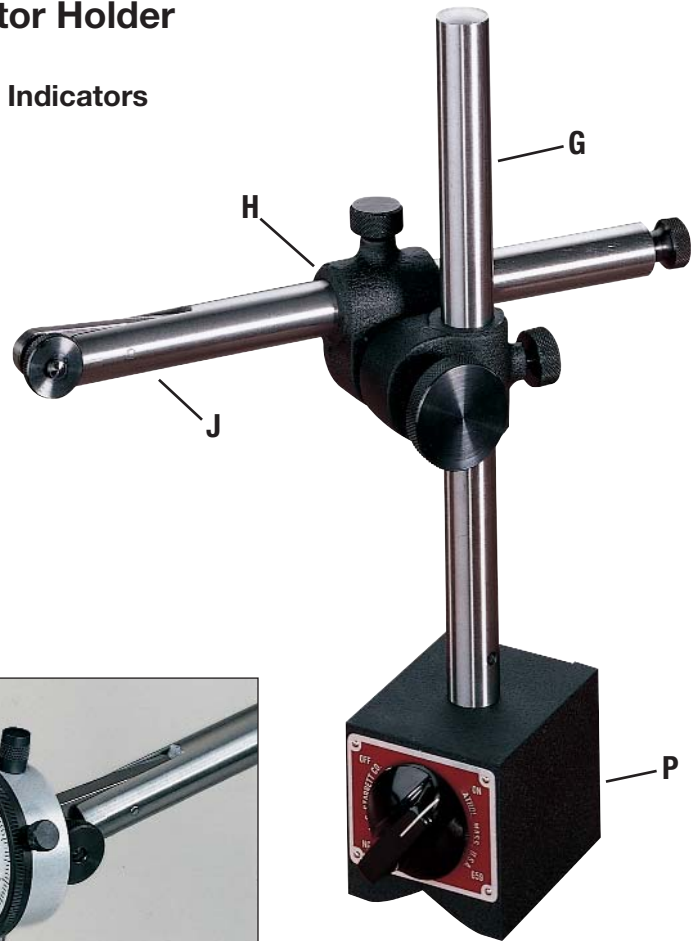
This holder has a powerful magnetic base that attaches to flat surfaces or on round work up to 5" (125mm) in diameter by a form-ground involute vee for accurate seating. It has approximately twice the holding power of our No. 657 Magnetic Base and has a rotary on/off switch.

A post snug with two 3/4" (19mm) gripping holes positions the dial indicator at any height and at any vertical angle and allows for 360° rotation of the gage rod. After locking the gage in place, the final indicator setting is made by an independent fine adjustment at the back end of the gage rod.

A second tapped hole (3/8"-24) in one side of the base is for mounting the post horizontally or adding another post for multiple inspection work. The base is furnished with a threaded adaptor, making it possible to use the No. 659 Series Magnetic Base post and attachments. Base and snug have a black wrinkle finish with precision ground contact surfaces.

Available with or without Starrett AGD Dial Indicators: inch reading No. 25-131J (.0005" graduation) or millimeter reading No. 25-181J (0.01mm graduation). Other mechanical AGD indicators are available on request. Electronic indicators, Nos. 2600 and 2700 Series, are also available on request.

Both the upright post and the gage rod are approximately 9 3/8" (238mm) long and 3/4" (19mm) in diameter.



No. 659A. Inset, No. 659A with No. 25-111J.

Base Holder Assembly and Individual Components

Photo Key	Description	Catalog No.	EDP No.
	Magnetic Base, Upright Post Assembly Including Post, Snug, Gage Rod with Clamp and Fine Adjust, and Thread Adaptor, without Case	659A	56687
	Complete Assembly (Above) in Case	659AZ	55947
P	Magnetic Base, Including Thread Adaptor	659P	55949
G	Upright Base Post Only	659G	56688
H	Swivel Post Snug Only with Two 3/4" (19mm) Gripping Holes	PT16846	71597
J	Gage Holding Rod Only, Including Clamp Mechanism and Fine-Adjustment	PT08903	72032
	Thread Adaptor Only	PT18318	72040

Sets, Including Magnetic Base, Upright Post Assembly and AGD Dial Indicators

Description	Catalog No.	EDP No.
Base and Upright Post Assembly with Inch Reading Indicator No. 25-131J in Case	659BZ	55948
Base and Upright Post Assembly with Millimeter Reading Indicator No. 25-181J in Case	659MBZ	64892

Packed one in a box.



Inspection Holder and Starrett AGD Dial Indicators

No. 665 Series

This is the most versatile dial indicator holder with an extremely stable base (A) that is 8-1/2" (215mm) long x 2-1/4" (57mm) wide at the bottom. It can inspect workpieces on the top surface of the ground base or within a working area defined by the 8" (200mm) upright base post (B) and the 9-1/2" (238mm) long gage-holding rod (C). The base post can be conveniently located anywhere along the 8-1/2" (215mm) T-slot in the base.

This tool can be held in a vise or by a bolt in a machine T-slot coming up through one of the two 3/8" (9.5mm) holes in the base and fastening down on the top surface.

A great variety of mechanical AGD indicators and electronic indicators, Nos. 2600 and 2700 Series, are available on request.

D. Swivel Post Snug No. 665D

Snug has a .375" (9.5mm) hole for the gage holding rod and a .465" (11.8mm) hole for the upright post. Also comes with the No. 665L Reducing Bushing that can reduce the .465" (11.8mm) hole to 3/8" (9.5mm).

E. Base Reference Guide No. 665E

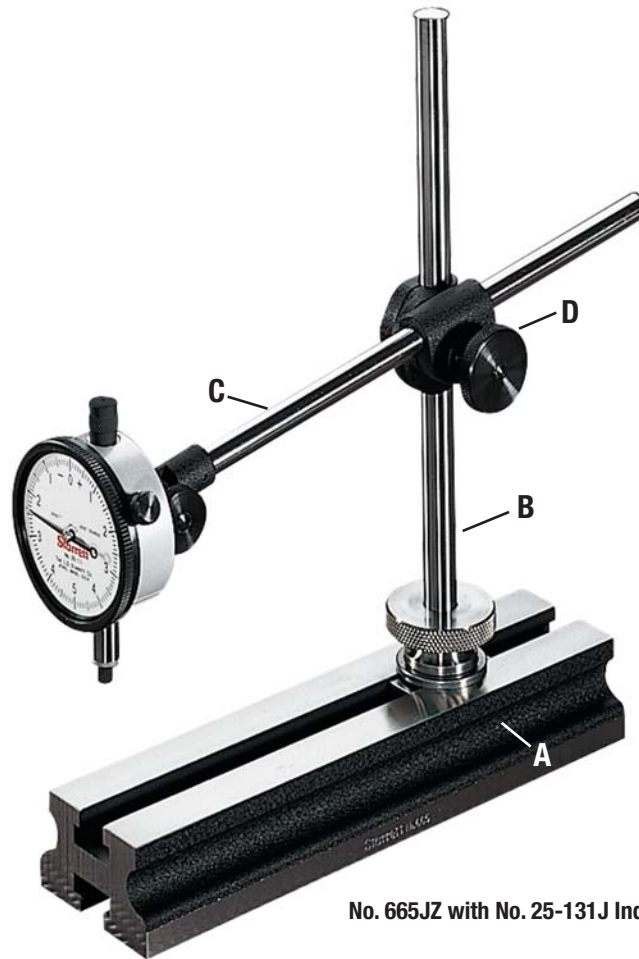
(Optional) – Guide is used to check parts or surfaces from straight or angular surfaces by use of the radiused guide stop. This fits into the T-slot in the bottom of the base and is fastened at right angles to the length.

Push up to a radius surface or slide along a radius surface.

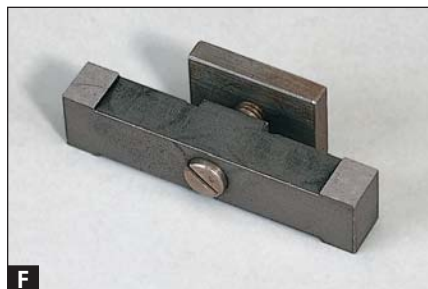
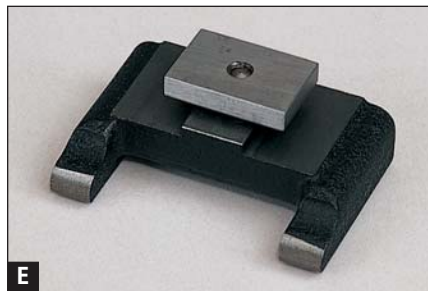
F. Square Keyway Guide No. 665F

(Optional) – This guide can also be referenced from a square edge, a T-slot or a keyway with at least a 1/2" (12.7mm) width. Has square edges and is fastened at right angles to the length.

Push up to a square edge or slide along a square edge.



No. 665JZ with No. 25-131J Indicator.



(Continued on next page.)



No. 665 Series (continued)

There are three very useful inspection combinations that can be made by removing the complete swivel post snug and gage holding rod and using them as follows:

G. Clamp No. 665G

Take the clamp and put the clamp post into the snug and lock it. Now this combination can be used to clamp the gage holding rod and the indicator into hard-to-reach places for inspecting jigs, fixtures, lining up work on centers and machine tables.

The clamp has a 3" (75mm) capacity and a post with an approximately 5-3/4" (145mm) length. The clamp post is .464" (11.8mm) diameter that fits into the regular swivel post snug No. 665D.

There are three other clamp post diameter options available – No. 665G-3/8 is a 3/8" (9.5mm) diameter clamp post that can be used in the regular swivel post snug No. 665D with the addition of the No. 665L reducing bushing. The Nos. 665G-5/16 (7.9mm) and 665G-1/4 (6.3mm) can be used with other snugs to hold an indicator.

H. Tool Post Holder No. 665H

Put one end of the offset arm into the swivel post snug No. 665D (with the No. 665L reducing bushing in it). Then put this rectangular tool post holder No. 665H onto the other arm. This combination now allows for a good, tight setup in lathe tool posts and other machine setups.

I. Offset Arm No. 665G-1

Another very popular measuring combination is to put the reducing bushing (which is furnished) into the snug and then put one leg of the offset arm into it. Now the tool can be used in a 3/8" (9.5mm) chuck or collet to sweep a large area.

J. Reducing Bushing No. 665L

Bushing has a .465" (11.8mm) O.D. and a .375" (9.5mm) I.D.



Individual Components

Key	Description	Catalog No.	EDP No.
A*	Base Only	665A	52783
B*	Upright Base Post .464" x 8" (11.8 x 200mm) with Clamp Mechanism	665B	52784
C*	Gage Holding Rod 3/8" x 9-1/2" (9.5 x 240mm) with Clamp Mechanism	PT06784-A	52755
D*	Swivel Post Snug with .465" and 3/8" (11.8 and 9.5mm) holes with No. 665L Reducing Bushing	665D	52754
E	Base Reference Guide	665E	52787
F	Square Keyway Guide	665F	52788
G*	Clamp with .464" x 5-3/4" (11.8 x 146mm) Post	665G	52792
	Clamp with 1/4" (6.3mm) Diameter Post	665G-1/4	52793
	Clamp with 5/16" (7.9mm) Diameter Post	665G-5/16	52794
	Clamp with 3/8" (9.5mm) Diameter Post	665G-3/8	52795
H*	Tool Post Holder Approximately 1" x 7/16" (25 x 11mm)	665H	52790
I*	Offset Arm 3/8" (9.5mm) Diameter 3" and 5 1/2" (75 and 140mm) Arms	665G-1	52789
J*	Reducing Bushing Only (for Swivel Post Snug) .465" (11.8mm) O.D. .375" (9.5mm) I.D.	665L	52756

Inspection Sets with AGD Dial Indicators

Description	Catalog No.	EDP No.
Complete with Components * and No. 25-131J Inch Reading Indicator in Case	665JZ	56275
Complete with Components * and No. 25-181J Millimeter Reading Indicator in Case	665MJZ	56276

Packed one in a box.



Dial Comparators with granite base

No. 675GJ

No. 675GMJ

Extremely rugged and universally adjustable to any position, these gages are well suited for inspection, layout, checking and lineup operations anywhere in the shop. All settings are individually made without disturbing others.

These versatile stands allow the indicator to be positioned at any height within the capacity of the upright base post – 360° both horizontally and vertically.

The indicator can also be moved lengthwise within the capacity of the 3/4" x 9-7/8" (19 x 250mm) horizontal gage-holding rod.

A special feature of this tool is the sensitive, fine-adjustment at the end of the gage rod. The fine-adjustment range is approximately 1/4" (6.3mm).

A 1/4" (6.3mm) steel indicator contact point is provided, but contact points in other lengths and materials are also available – see previous accessory pages.

This holder has a Starrett Grade-A Crystal Pink Granite base that is 8" x 12" x 2" (200 x 300 x 50mm), and is finished to an overall tolerance of .0001" (0.0025mm).



Complete Units

Dial Indicator Specifications*				With Granite Base	
Graduation	Dial Reading	Range	Indicator No.	Catalog No.	EDP No.
.0005"	0-25-0	.125"	25-131J	675GJ	55964
0.01mm	0-50-0	2.5mm	25-181J	675GMJ	56129

*For complete specifications see previous pages.

Individual Components

Description	Catalog No.	EDP No.
Granite Base, Upright Base Post and Gage Holding Rod, Including Clamp Mechanism and Fine-Adjustment	675G	66051
Gage Holding Rod Only, Including Clamp Mechanism and Fine-Adjustment	PT08903	72032
Swivel Post Snug Only with Two 3/4" (19mm) Gripping Holes	PT16846	71597

NOTE: Available with special nonshock mechanism or without indicator. Any Starrett AGD Dial or Electronic Indicator can be interchanged with indicators listed. Please specify when ordering.



No. 675G with No. F2710-1 Electronic Indicator.



No. 653J.



No. 653GJ.

Dial Comparators

No. 653 Series with cast iron base, inch and mm reading

No. 653G Series with granite base, inch and mm reading

These bench-type comparator gages are ruggedly built for in-process and final inspection work.

The dial indicator can be adjusted vertically and locked in any position. A sliding ring with locking screw below the beam permits swinging the indicator to either side. The ring also acts as a safety device, preventing the beam from accidentally dropping. There is a fine adjustment on the beam for final indicator setting.

The hand lifting lever on the indicator raises the spindle and releases it to contact the work. A left hand lever is furnished unless specified otherwise.

Both gages have a maximum vertical capacity of 9-1/4" (235mm) and a throat depth of 5" (125mm) and a vertical indicator fine adjustment of up to 1/2" (12.7mm). Post diameter is 1-1/2".

No. 653 Series have a ribbed, precision ground cast iron base measuring approximately 8" x 9" (200 x 225mm).

No. 653G Series have a Starrett Grade A, Crystal Pink Granite base, measuring 8" x 12" x 2" (200 x 300 x 50mm). Base is finished to an overall tolerance of .0001" (0.0025mm).

Complete Units

Dial Indicator Specifications*				With Cast Iron Base		With Granite Base	
Graduation	Dial Reading	Range	Indicator No.	Catalog No.	EDP No.	Catalog No.	EDP No.
.001"	0-50-0	.250"	655-141J	653J	52737	653GJ	55966
0.01mm		2.5mm	655-181J	653MJ	56146	653GMJ	56127

*For complete specifications see previous pages.

Individual Components

Description	Catalog No.	EDP No.
Comparator with Cast Iron Base, without Indicator	653	55917
Comparator with Granite Base, without Indicator	653G	56646

NOTE: Available with special nonshock mechanism or without indicator.

Any Starrett AGD Dial or Electronic Indicator can be interchanged with indicators listed. Please specify accordingly.



Dial Bench Gages

No. 652 Series with sliding table and fine-adjustment

These compact gages are used for bench or beside-the-machine inspection of small parts and materials. The hand lever is pressed down to lift the spindle and released to contact the work under uniform pressure. Gages are furnished with left hand lever unless specified otherwise. The dial can be rotated for zero setting and located in place with the bezel clamp.

The 652 has a ground and lapped table that can be adjusted vertically and locked in position. A sliding ring below a table bracket can also be locked in position permitting the table to swing to either side. Final setting of the table is made by a fine-adjusting screw.



No. 652JZ.

Size Specifications	Inch	mm
Maximum Vertical Capacity	1-3/4"	44mm
Maximum Throat Depth	1-5/8"	40mm
Table Diameter	2"	50mm
Table Fine-Adjustment	1/8"	3mm
Base Diameter	5"	125mm

Dial Indicator Specifications*					
Graduation	Dial Reading	Range	Indicator No.	Catalog No.	EDP No.
.0005"	0-25-0	.125"	25-131J	652JZ	52733
0.01mm	0-50-0	2.5mm	25-181J	652MJZ	52734

*For complete specifications see previous pages.

NOTE: All gages can be furnished with tolerance hands; special nonshock mechanism; special sizes and shapes of contact points and tables. Available by request.

Furnished in case. Packed one in a box.



**SPECIAL FUNCTION
INDICATOR GAGES**



J.W. DONCHIN CO. 4841-43 W. Chicago Ave. • Chicago, IL 60651-3224
Ph: 773-261-2182 • Fax: 773-261-2867 • Sales@jwdonchin.com • www.jwdonchin.com

Special Function Indicator Gages

203	Chamfer Gages	Series Nos. 683, 684, 685, 686
204	Chamfer Gages	Series Nos. 683, 684, 685, 686
205	Countersink Gages	Series No. 687, 688, 689
206	Hole Gages	Series No. 690, 690M
207	Dial Sheet Gages	Series No. 170, 170M
	Dial Indicator Pocket Gages	Series No. 1010, 1010M
208	Portable Dial Thickness Gages	Series No. 1015, 1015M
209	Dial Indicator Snap Gages	Series No. 1150
210	Dial Indicator Groove Gages	Series No. 1175, 1175M
211	Dial Caliper Gages	Series No. 1017, 1018
	Internal Dial Caliper Gages	Series No. 1019, 1019M
212	Dial Out-Of-Roundness Gages	Series No. 681, 681M
213	Shaft Alignment Clamp Sets	Series No. 668
214	Crankshaft Distortion Dial/Strain Gage	Series No. 696, 696M
215	Crankshaft Distortion Dial/Strain Gage	Series No. 696, 696M
216	Automotive Disc Brake Indicating Gages	Series No. 1016, 1016M
217	Cylinder Gages	Series No. 452, 452M
218	Dial Indicator Diameter Gages	Series No. 1102, 1102M
219	Dial Indicator Diameter Gages	Series No. 1102, 1102M
220	Dial Indicator Diameter Gages	Series No. 1101, 1101M
221	Heavy-Duty Dial Indicator Diameter Gages	Series No. 1100, 1100M
222	Internal-External Adjustable Setting Master for Starrett No. 1102 Diameter Gages	Series No. 1102, 1127
223	Internal-External Adjustable Setting Masters for Starrett Nos. 1100 and 1101 Series Diameter Gages	Series No. 1126
224	Dial Depth Gages	Series No. 640, 643, 644
	Top Reading Dial Depth Gages	Series No. 642, 642M



Special Function Dial Gages

This section includes special function dial gages that we list as regular items. Gages are also available with electronic indicators on request, where noted.

- ◆ Chamfer Gages
- ◆ Countersink Gages
- ◆ Hole Gages
- ◆ Bore Gages – See Bore Gages Section
- ◆ Direct-Reading Thickness Gages
- ◆ Snap Gages
- ◆ Groove Gages
- ◆ Caliper Gages
- ◆ Depth Gages
- ◆ Out-of-roundness Gages
- ◆ Inside Dial Gages
- ◆ Automotive Gages
- ◆ Crankshaft Distortion Gages
- ◆ Cylinder Gages
- ◆ Disc Brake Gages
- ◆ Large Diameter Gages

In addition, we have made many other special function gages to suit a wide variety of our customers' specific requirements. If you have a special application, we invite you to submit your drawings and specifications to our Special Order Department at 121 Crescent Street, Athol, MA 01331, USA. We will be happy to provide a prompt quotation.

Chamfer Gages

For Internal Chamfers:
No. 683 Series 0-90°
No. 684 Series 90-127°

For External Chamfers:
No. 685 Series 0-90°
No. 686 Series 90-127°

These gages directly measure the diameter of chamfered holes. No setting master is necessary. When the three-blade plunger is pressed against a flat surface, the gage should read the set number stamped on the back of the indicator. In case of wear, the gage may be adjusted to read the proper number.

All ground surfaces are of hardened tool steel. Indicators are AGD design.

Internal gages will measure the largest diameter of any chamfer that has an included angle within the range of angles printed on the dial face of the gage.

External gages will measure the smallest diameter of any chamfer within the range of angles printed on the dial face of the gage.



Left, No. 683-1Z;
 Right, No. 685-3Z.

Right: No. 684-2Z Chamfer Gage with No. F2710-3 Electronic Indicator on the No. 695 Check Stand.

See specifications on next page.



Chamfer Gages (continued)

Internal Gages

Inch Reading

Range	0-90° Angle		90-127° Angle	
	Catalog No.	EDP No.	Catalog No.	EDP No.
0-3/8"	683-1Z	63684	684-1Z	63688
0-1/2"	683-2Z	63685	684-2Z	63689
0-1"	683-3Z	63686	684-3Z	63690
1-2"	683-4Z	63687	684-4Z	63691

Millimeter Reading with Yellow Dials

0-9.5mm	683M-1Z	64989	684M-1Z	64993
0-12.7mm	683M-2Z	64990	684M-2Z	64994
0-25mm	683M-3Z	64991	684M-3Z	64995
25-50mm	683M-4Z	64992	684M-4Z	64996

External Gages

Inch Reading

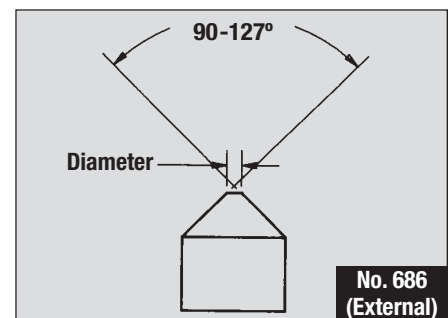
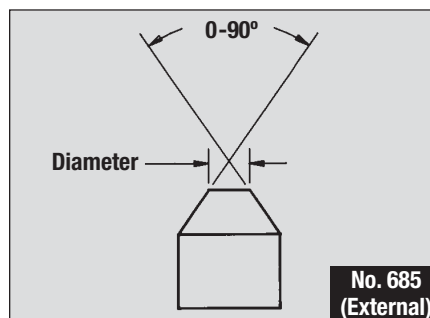
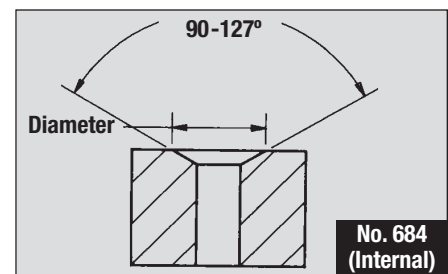
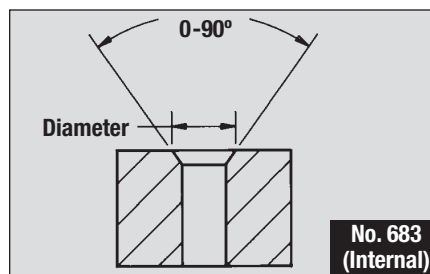
1/8-1/2"	685-1Z	63692	686-1Z	63695
3/16-1"	685-2Z	63693	686-2Z	63696
1-2"	685-3Z	63694	686-3Z	63697

Millimeter Reading with Yellow Dials

3.2-12.7mm	685M-1Z	64997	686M-1Z	65000
4.7-25mm	685M-2Z	64998	686M-2Z	65001
25-50mm	685M-3Z	64999	686M-3Z	65002

Check Gage Stand for Chamfer, Countersink and Hole Gages

Description	Catalog No.	EDP No.
8-3/16" H x 6" W x 4" D (212 x 150 x 100mm) Hold Downs – 5" (125mm) on Center – 1/4" (6.3mm) Holes	695	63875



NOTE: Also available with electronic indicators.
Please specify.

Gages furnished in deluxe padded case.



Countersink Gages

- No. 687 Series** 82°
- No. 688 Series** 90°
- No. 689 Series** 100°

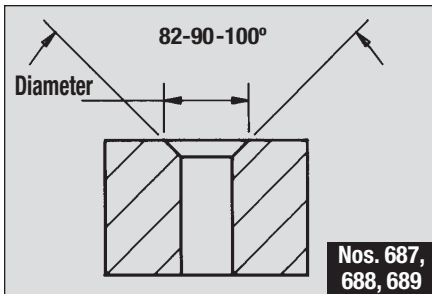
Starrett Countersink Gages are offered in three different angles so that the gage sets on the angular side of the countersink, as opposed to a chamfer gage which sets on the top edge of the chamfer.

This gage directly reads the large diameter of the countersink in .002" or 0.05 mm increments. A set master ring is furnished with each gage for calibration and setting. Press the button on top of the indicator to firmly depress the gage head into the countersink. When the gage is removed, the indicator reading is held in place until the reset button is activated.

All ground surfaces are of hardened tool steel. Indicators are AGD design.



Left-to-right: Nos. 687-4Z, No. 688-3Z, No. 689-1Z.



Inch Reading

Range	82° Angle		90° Angle		100° Angle	
	Catalog No.	EDP No.	Catalog No.	EDP No.	Catalog No.	EDP No.
.020-.170"	687-1Z	63698	688-1Z	63702	689-1Z	63706
.160-.360"	687-2Z	63699	688-2Z	63703	689-2Z	63707
.360-.560"	687-3Z	63700	688-3Z	63704	689-3Z	63708
.560-.780"	687-4Z	63701	688-4Z	63705	689-4Z	63709

Millimeter Reading with Yellow Dials

0.5-4.3mm	687M-1Z	65003	688M-1Z	65007	689M-1Z	65011
4-9mm	687M-2Z	65004	688M-2Z	65008	689M-2Z	65012
9-14.2mm	687M-3Z	65005	688M-3Z	65009	689M-3Z	65013
14.2-19.8mm	687M-4Z	65006	688M-4Z	65010	689M-4Z	65014

Check Gage Stand for Chamfer, Countersink and Hole Gages

Description	Catalog No.	EDP No.
8-3/16" H x 6" W x 4" D (212 x 150 x 100mm) Hold Downs – 5" (125mm) on Center – 1/4" (6.3mm) Holes	695	63875

NOTE: Also available with electronic indicators. Please specify.

Gages furnished in deluxe padded case.



Hole Gages

No. 690 Series
.010-.330"

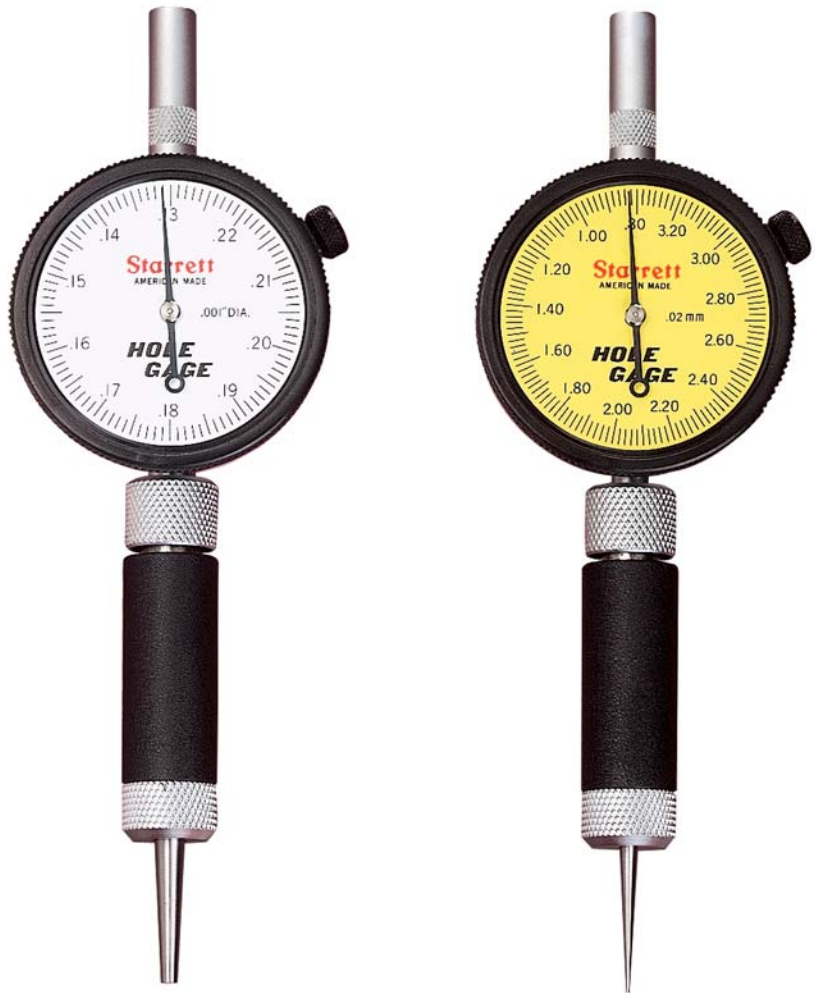
No. 690M Series
0.25-8.35mm

These hole gages will check hole diameters to .001" and 0.02mm. They are fast, accurate, easy to read and have a balanced design for easy one-hand operation.

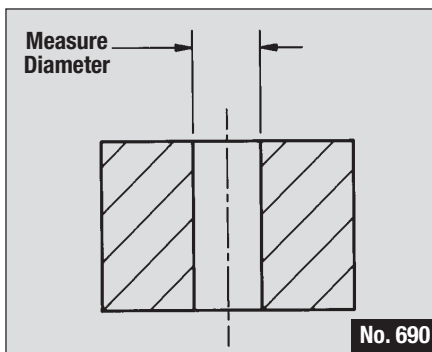
The gage can be pressed down on a flat surface and checked so the size should read the same as the set number stamped on the back of the indicator. It can also be checked and set with an optional "setting master".

All ground surfaces are of hardened tool steel. Indicators are AGD design.

Holes that need to be accurately checked must have no chamfers or countersinks.



Left, No. 690-3Z; right, No. 690M-2Z.



Inch Reading

Range	Gages		Set Masters (Optional)	
	Catalog No.	EDP No.	Part No.	EDP No.
.010-.040"	690-1Z	63710	PT23710-1	63879
.030-.130"	690-2Z	63711	PT23710-2	63880
.130-.230"	690-3Z	63712	PT23710-3	63881
.230-.330"	690-4Z	63713	PT23710-4	63882

Millimeter Reading with Yellow Dials

.25-1.00mm	690M-1Z	63714	PT23710-5	63883
.75-3.30mm	690M-2Z	63715	PT23710-6	63884
3.30-5.85mm	690M-3Z	63716	PT23710-7	63885
5.85-8.35mm	690M-4Z	63717	PT23710-8	63886

Check Gage Stand for Chamfer, Countersink and Hole Gages

Description	Catalog No.	EDP No.
8-3/16" H x 6" W x 4" D (212 x 150 x 100mm) Hold Downs - 5" (125mm) on Center - 1/4" (6.3mm) Holes	695	63875

NOTE: Also available with electronic indicators.
Please specify.

Gages furnished in deluxe padded case.



Thickness Gages

Three handy, specialized, direct-reading gages, as shown on these two pages.

Dial Sheet Gages

No. 170 .150"

No. 170M 2.5mm

Measures the thickness of sheet materials like paper, cardboard, leather, plastics and metals. Raise the movable contact, insert the work, remove thumb, and spring pressure holds the work parallel with the contacts. The thickness is registered on the dial. By turning the knurled bezel, the dial may be moved to bring the hand to zero. The contact edges are radiused to prevent the work from being marred or deflected. The flat contact area measures 5/16" (8mm) in diameter. Black finish.

- ◆ Throat depth is 1-1/8" (28.5mm)
- ◆ Furnished in deluxe padded case



No. 170Z.

Inch Reading

Range	Graduation	Dial Reading	Catalog No.	EDP No.
.150"	.001"	0-100	170Z	50647

Millimeter Reading

2.5mm	0.2mm	0-100	170MZ	66036
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Dial Indicator Pocket Gages

No. 1010 Series .375"

No. 1010M 9mm

Handy pocket gage is approximately the size of a thin pocket watch. Ideal for inspectors, purchasing agents and salespeople to check the size of materials up to 3/8" or 9mm thick. The gage fits naturally into the curve between the thumb and index finger. A slight pull on the serrated top plate raises the spindle.

- ◆ The throat depth ranges from 1/2" (12.7mm) down to 5/16" (8mm)
- ◆ Models are available with flat or rounded contacts as listed
- ◆ The diameter of both the flat or round contacts are 1/4" (6.3mm)
- ◆ The gage has a small count hand for recording each revolution of the large hand
- ◆ The case is chrome plated, and the dial is covered with an unbreakable crystal
- ◆ Furnished in attractive, protective case



No. 1010RZ.

Inch Reading

Range	Graduation	Dial Reading	Contacts	Catalog No.	EDP No.
.375"	.001"	0-100	Flat	1010Z	53114
	.0005"	0-50		1010EZ	53115
.275"	.001"	0-100	Round	1010RZ	56067

Millimeter Reading

9mm	0.01mm	0-100	Flat	1010MZ	53116
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**Portable Dial
Thickness Gages**

No. 1015 Series 0-1"

No. 1015M Series 0-25mm

After inserting work between the measuring contacts, releasing the lever will cause the spindle to contact the work, giving an accurate size reading because measuring pressure is independent of the user. Indicators have jewel bearings and continuous dials. (Models with balanced dials, other graduations and ranges are also available on special order. Electronic indicators can also be furnished.) Throat depths include 2-1/2", 4", and 6". The contact edges are radiused to prevent the work from being marred or deflected. The flat contact area measures 1/4" (6.3mm) in diameter and is 1/8" (0.125mm) thick. Special contact sizes and shapes are available by request.



No. 1015A.



No. 1015A-6.

Inch Reading

Throat Depth	Range	Graduation	Dial Reading	Dial Indicator Model No.	Without Case		Case Only	
					Catalog No.	EDP No.	Catalog No.	EDP No.
2-1/2"	1/2"	.0005"	0-50	1015A-431J	1015A	53119	1015AZZ	55407
	1"	.001"	0-100	1015B-441J	1015B	53121	1015BZZ	55408
4"	1/2"	.0005"	0-50	1015A-431J	1015A-4	67646		
	1"	.001"	0-100	1015B-441J	1015B-4	67649		
6"	1/2"	.0005"	0-50	1015A-431J	1015A-6	67652		
	1"	.001"	0-100	1015B-441J	1015B-6	67655		

Millimeter Reading

63mm	10mm	0.01mm	0-100	1015MA-481J	1015MA	56131	1015AZZ	55407
	25mm			1015MB-881J	1015MB	56133	1015BZZ	55408
100mm	10mm			1015MA-481J	1015MA-100	67647		
	25mm			1015MB-881J	1015MB-100	67650		
150mm	10mm			1015MA-481J	1015MA-150	67653		
	25mm			1015MB-881J	1015MB-150	67656		

Packed one in a box.



Dial Indicator Snap Gages

No. 1150 Series 0-8"

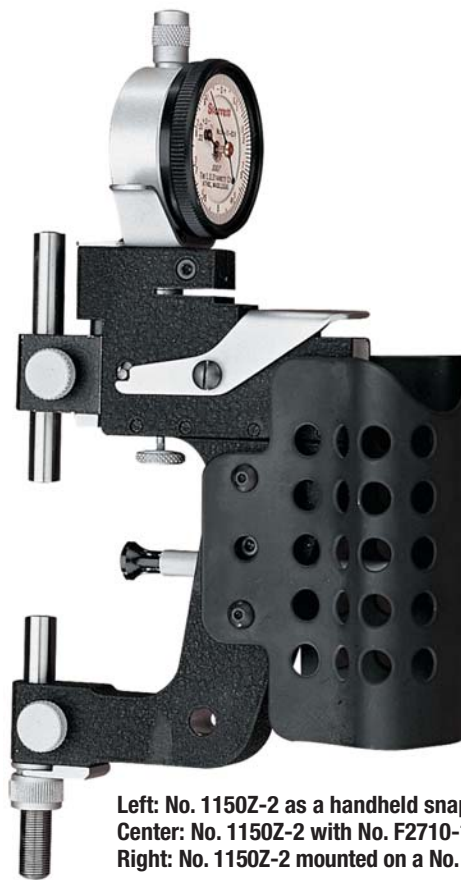
These compact gages have rigid aluminum alloy frames protected from hand heat by insulating handles. They are used to gage outside diameters to an accuracy of .0001".

Dimensional variations are transmitted to the dial indicator through a linear friction-free transfer mechanism totally enclosed for protection against side thrust, foreign matter and coolants. Flat gaging contacts simplify measurement close to shoulders. The top sensitive contact may be reversed to present a spherical face to the work. An adjustable backstop simplifies centering the work.

The contacts and backstop are 5/16" diameter hardened tool steel, precision ground and lapped flat. The contacts are individually adjustable to a maximum 2" range and are locked in position by tightening parallel-lock clamps to maintain parallelism of faces. Both contacts are also keyed to maintain orientation of faces regardless of adjustment.

Plus or minus tolerances are read directly from the indicator since the dial face has a double row of graduations reading in opposite directions from zero, with "minus" graduations in red and "plus" in black. The indicator can be rotated 360° and locked in position to read from any angle, and a fine-adjusting screw provides for zero setting the hand. A guard protects the dial indicator when the gage is laid down.

A bench stand is available to convert the gage to a bench comparator. The series is also available with indicators other than those listed, a No. 717 Gage Amplifier and gaging head in place of the indicator, carbide faces on the contacts, special



Left: No. 1150Z-2 as a handheld snap gage.
Center: No. 1150Z-2 with No. F2710-1 Electronic Indicator.
Right: No. 1150Z-2 mounted on a No. 1150 Bench Stand.



contact and backstop shapes and sizes, variable gaging pressure control, disc

setting and other special masters, and larger ranges.

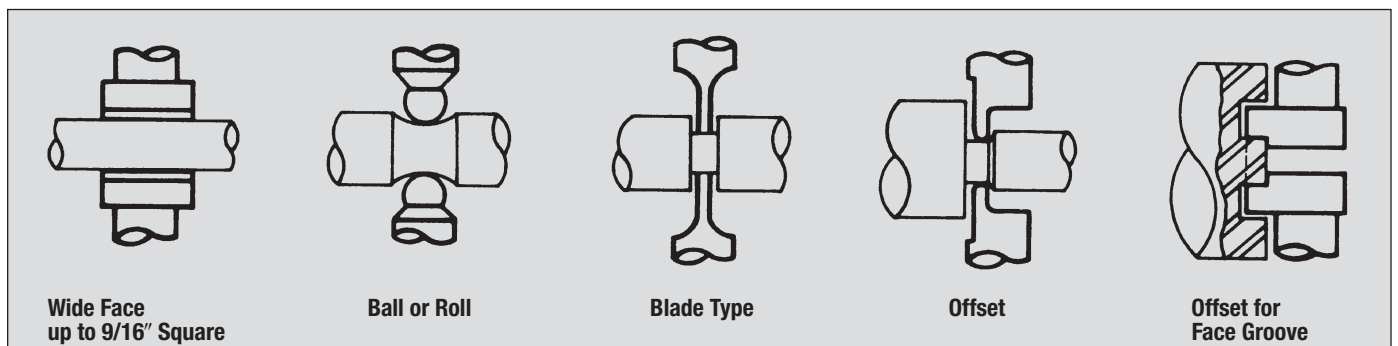
Inch Reading

Range	Dial Indicator				Without Stand	
	Graduation	Dial Reading	Range	Model No.	Catalog No.	EDP No.
0-2"	.0001"	+ 10 - 10	.040"	81-111-1150	1150Z-2	53168
2-4"					1150Z-4	53169
4-6"					1150Z-6	53170
6-8"					1150Z-8	53171

Accessory

Bench Stand Only	1150	53172
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Special Contacts



Some of the many interchangeable anvil configurations designed to suit special applications.

Gages furnished in case. Packed one in a box.



Dial Indicator Groove Gages

No. 1175 .375-6"

No. 1175M 9.5-150mm

This lightweight gage is used for in-process or bench inspection of oil grooves, snap ring retainer grooves, "O" ring seat retainer grooves and similar internal recesses. It is also useful for checking bore dimensions and testing for taper, bell-mouth and out-of-roundness.

The movable, sensitive gaging contact has a 1/2" (12.7mm) retractable range and transfers the measurement through a linear, friction-free transfer mechanism to the dial indicator. The lower reference jaw is fixed and supports the entire weight of the gage and the operator's hands, thus preventing incorrect gaging pressure and false readings.

The reference jaw can be mounted in two positions on the range adjusting bar. The bar itself is also adjustable for greater or lesser range. A fine adjustment screw and a lock are also provided.

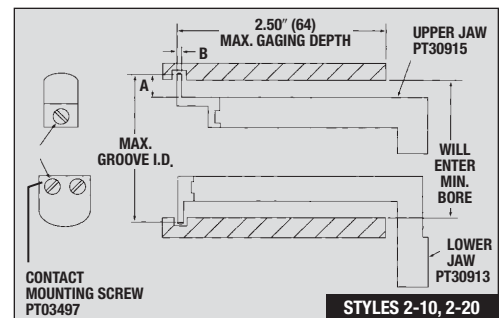
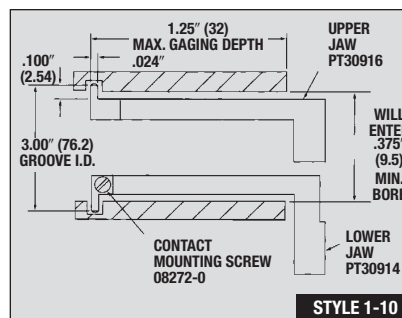
This gage has the following features:

- ◆ Supplied with two sets of jaws, both readily interchangeable
- ◆ Three sets of contacts are furnished (Styles 1-10, 2-10, 2-20) that can be attached to the ends of the jaws without replacing the entire jaw. Contacts have flush ends so that grooves at the bottom of blind holes can be gaged. The contacts are hardened steel with a hard chrome finish for long life
- ◆ Gage can be set with gage blocks or other methods such as micrometers, vernier calipers and ring gages.

Special jaws for 4" and 6" (100mm and 150mm) gaging depths, a diameter range extension bar from 6-12" (150-300mm), dial indicators graduated in .001", or any special modification of gaging contacts and jaws, are also available by request through our Special Order Department



No. 1175Z.



Contact Set Specifications:

Style 1-10 is for the smaller jaws and can enter a .375" (9.5mm) bore. Styles 2-10 and 2-20 are used on the larger jaws to get the range up to 6" (150mm).

Contact Set	Part No.		Will Enter Minimum Bore		Maximum Groove I.D.		A		B	
	Upper	Lower	Inch	mm	Inch	mm	Inch	mm	Inch	mm
Style 1-10	PT30917	PT30917	.375"	9.5	3.00"	75	.100"	2.5	.024"	0.6
Style 2-10	PT30918	PT30919	.690"	17.5	5.00"	125	.140"	3.6	.034"	0.8
Style 2-20	PT30920	PT30921	1.00"	25	6.00"	150	.265"	6.7	.051"	1.3

Range	Dial Indicator				Catalog No.	EDP No.
	Model No.	Graduation	Reading	Range		
.375-6"	81-136-1175	.0005"	±30	.060"	1175Z	53173
9.5-150mm	81-181-1175	0.01mm	±100	2.5mm	1175MZ	65032

Furnished with storage case. Packed one in a box.



Dial Caliper Gages

No. 1017 Series Outside

No. 1018 Series Inside

No. 1017 Series – Outside

These gages are designed for use in measuring castings, forgings and sheet metal work. Large clearances have been provided to reach over part configurations for easy measurement of small sections. The convenient retraction lever allows for one-hand operation and good gage control.

The dial indicator has a direct reading count hand. The contacts are cylindrical carbide for long wear life.

No. 1018 Series – Inside

These gages are designed for use in measuring bores of castings and for inside reading in fabrications. Clearance has been provided for use in recessed bores. The convenient retraction lever allows one-hand operation.

The dial indicator has a direct reading count hand. The gage contacts are carbide balls for long wear life.



Top, No. 1017-4 Outside Model;
Bottom/Right, No. 1018A Inside Model.

No. 1017 Series – Outside

Range	Graduation	Throat Depth	Catalog No.	EDP No.
0-2"	.001"	4"	1017-4	65091
		8"	1017-8	64959
0-50mm	0.02mm	100mm	1017M-100	64179
		200mm	1017M-200	64180

No. 1018 Series – Inside

Range	Gaging Depth	Indicator Graduation	Catalog No.	EDP No.
1-3"	3"	.001"	1018A	65092
		.010"	1018B	65093
25-75mm	75mm	0.02mm	1018MA	64181
		0.10mm	1018MB	64182

Internal Dial Caliper Gages

No. 1019 .400-1.4"

No. 1019M 10-35mm

These indicating gages are ideal for obtaining fast, comparative I.D. measurements, especially in hard-to-reach locations. The user depresses the button on the indicator housing and releases, allowing the arms to make contact with the work.

- ◆ Makes convenient, accurate I.D. measurements
- ◆ Spring loaded design provides constant pressure and positive contact for reliable measurements
- ◆ Can be set with a micrometer or ring gage
- ◆ 3-1/4" arm length for ample reach
- ◆ Rotatable bezel for zero setting and bezel lock
- ◆ Jewel bearings
- ◆ .040" (1.016mm) dia. carbide ball measuring contacts



Left-to-right: Nos.
1019-1, 1019M-25.

Inch Reading

Range	Description	Catalog No.	EDP No.
.400-1.4"	.001" with Revolution Counter	1019-1	66559

Millimeter Reading

10-35mm	0.025mm with Revolution Counter	1019M-25	67120
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Packed one in a box.



Dial Out-Of-Roundness Gages

No. 681 1-1/4-5"

No. 681M 30-125mm

A compact, easy-to-apply gage for checking the out-of-roundness of connecting rod bearings and holes of shallow depth. Also for inspecting parallelism and for alignment of slots and assembled parts in jig and fixture work. A dial indicator is mounted on top of the base, and on the bottom a positive adjustable slide which is readily set to the approximate hole size or slot width. This slide holds the stationary contact plus two centralizing contacts under spring tension, insuring constant alignment. Bearing surfaces and contact points are of hardened steel. The contact points are inserted to a depth of approximately 3/8" (9.5mm).



Range	Dial Indicator			Model No.	Catalog No.	EDP No.
	Graduation	Dial Reading	Range			
1-1/4-5"	.001"	0-25-0	.125"	81-145	681	52899
30-125mm	0.01mm	0-50-0	2.5mm	81-181	681M	52900

Packed one in a box.

Inside Dial Gages

No. 697 2-3/8-18"

No. 697M 61-458mm

These gages are used between two walls to check parallelism and also to take comparative measurements of internal diameters. There are ten rods furnished. The rods are marked to designate the approximate overall length of the gage. All measuring contacts are rounded. Tool can be set with a micrometer.

The indicator bezel is rotated to adjust the dial in relation to the hand and has a non-breakable crystal. The movement of the dial indicator is approximately 5/32" (4mm). Rods of different lengths can also be furnished on request.



Range	Graduation	Dial Reading	One Revolution	Catalog No.	EDP No.
2-3/8-18"	.001"	0-20-0	.040"	697Z	52907
61-458mm	0.02mm	0-50-0	1.0mm	697MZ	52908

Furnished in attractive, protective case. Packed one in a box.



Dial Out-Of-Roundness Gages

No. 681 1-1/4-5"

No. 681M 30-125mm

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Range	Dial Indicator			Model No.	Catalog No.	EDP No.
	Graduation	Dial Reading	Range			
1-1/4-5"	.001"	0-25-0	.125"	81-145	681	52899
30-125mm	0.01mm	0-50-0	2.5mm	81-181	681M	52900

Packed one in a box.

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Range	Graduation	Dial Reading	One Revolution	Catalog No.	EDP No.
2-3/8-18"	.001"	0-20-0	.040"	697Z	52907
61-458mm	0.02mm	0-50-0	1.0mm	697MZ	52908

Furnished in attractive, protective case. Packed one in a box.



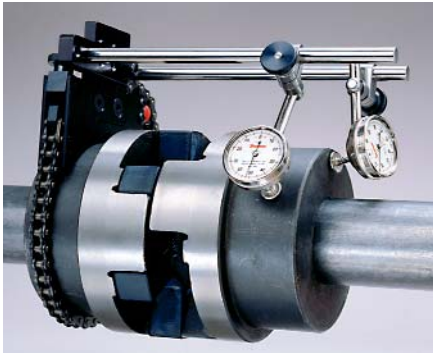
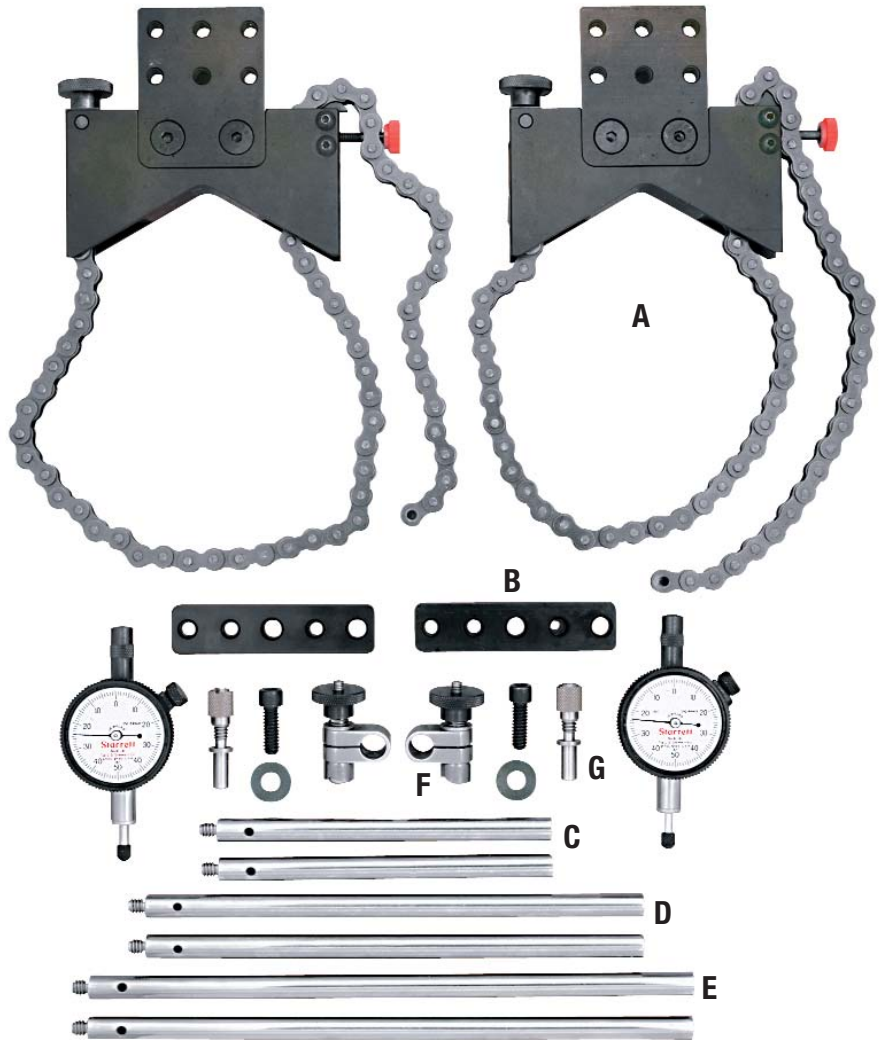
Shaft Alignment Clamp Sets

No. 668 Series

The Starrett Shaft Alignment Clamp is designed for fast, precise alignment of motors, pumps, compressors, etc. This system is capable of addressing radial and angular misalignment problems and can be set up within minutes.

Features

- ◆ Lightweight clamp design made of black anodized aluminum
- ◆ Rigid 3/8" diameter stainless steel indicator posts provided in three lengths (5", 7-7/16", and 9")
- ◆ Extension plate allows for added radial clearance
- ◆ Heavy-duty roller chain can accommodate up to a 7-1/2" diameter shaft
- ◆ Sets are available with either two Starrett Nos. 196B5 or 81-141J Indicators
- ◆ Excess roller chain can be secured to the side of the chain clamp
- ◆ A second shaft alignment clamp can be mounted across from the first clamp to act as a vertical "target" for face alignment



No. S668CZ mounted on coupling.

No. S668DZ.

Photo Key	Individual Components	Catalog No.	EDP No.
A	Chain Clamp Only	668	67155
B	Extension Plate Screw, Washer	PT99529	67454
C	5" Post	PT27981	67302
D	7-7/16" Post	657G	52753
E	9" Post	PT27982	67303
F	Snug Complete	PT18724	50710
G	Indicator Attachment	657Y	52765

Description	Catalog No.	EDP No.
1 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), without Case	S668A	67150
2 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case	S668BZ	67151
2 each: Chain Clamp, No. 196B5 Indicator, PT18724 Snug, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case	S668CZ	67152
2 each: Chain Clamp, No. 81-141J Indicator, No. 657Y Indicator Attachment, No. PT18724 Snug, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case	S668DZ	67153



Crankshaft Distortion Dial/Strain Gage

No. 696 2-3/8-18"

No. 696M 61-458mm

An ideal gage for checking bearing alignment or shaft deflection without dismantling the engine. Also useful as a strain gage on engine frames. This inside measuring gage checks the distortion of crankshaft webs (Fig. 1 and Fig. 2 next page). This distortion bears a direct relation to existing misalignment or excessive bearing wear. The gage makes it possible to check bearing alignment or undue shaft deflection without dismantling the engine. Used on all diesel engine shafts and the center crankshafts on any type of engine or compressor, the gage can also be applied as a strain gage on engine frames (Fig. 3 and Fig. 4 next page) while the engine is operating. A comparison of readings taken at top and bottom positions indicates any misalignment of cylinder and frame which results in local over-stress and eventual cracking of the frame neck.

With a special spring tension in the dial indicator, the gage is self-sustaining in any position without sacrificing necessary rigidity, thus leaving the operator's hands free. The contact points are conical, with an approximate 60° included angle, hardened and ground to a sharp point, and will stay in place on 45° surfaces.

No. 696B Balancing Attachment is furnished with the gage. For certain applications, like turning the crank under test with the gage in place, the attachment can be adjusted to maintain the face of the indicator upward or in desired position. To install it on a strain gage in use, remove the knurled clamping nut, then the doweled plate or end strap at either end by the screw. The unit is then positioned over the hubs on two sides of the indicator head. A spring plunger provides the friction that holds the balance in proper relation to position. The parts are nickel plated.

The dial indicator movement is approximately 5/32" (4mm) and with rods and extension, provides a range from 2 3/8-18" or 61-458mm. There are 10 rods and one extension furnished. The rods are marked to designate the approximate overall length of the gage. The indicator has a movable bezel to adjust the dial in relation to the hand and a non-breakable crystal.

This gage was designed in collaboration with the Hartford Steam Boiler Inspection and Insurance Company. It was known as the Hartford Steam Boiler Engine Strain Gage and is used by their inspectors to check the distortion of engine shafts and frames as shown.



No. 696B Balancing Attachment.

See specifications on next page.



Crankshaft Distortion Dial/Strain Gage (continued) No. 696

FIG. 1

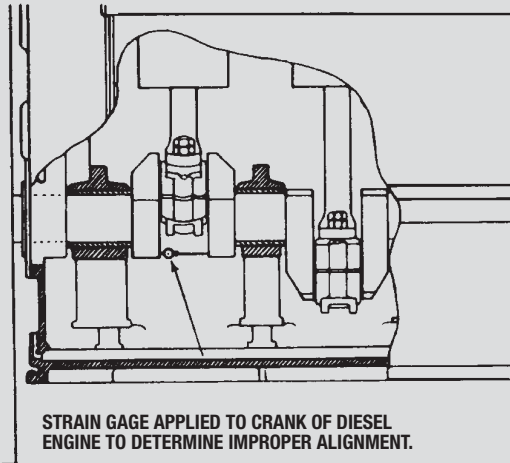
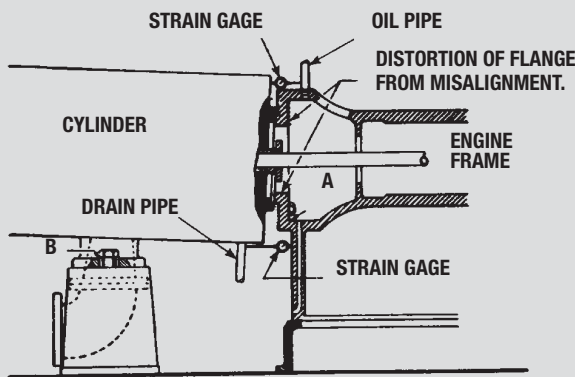
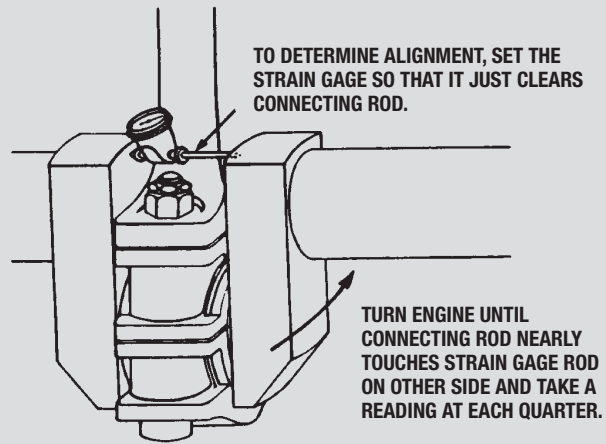
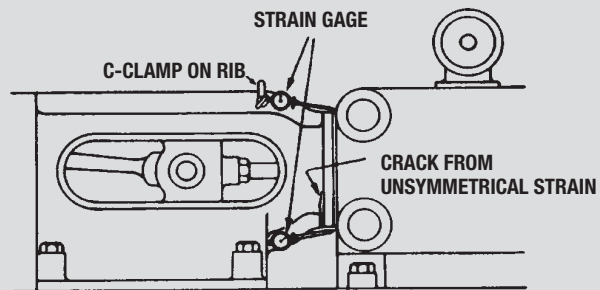


FIG. 2



MISALIGNMENT OF CYLINDER AND ENGINE FRAME (SHOWN EXAGGERATED FOR PURPOSES OF ILLUSTRATION).



STRAIN GAGE APPLIED TO ENGINE FRAME (WHILE OPERATING), DIFFERENCE BETWEEN TOP AND BOTTOM READINGS OF THE STRAIN GAGE INDICATES IMPROPER ALIGNMENT, CAUSING CRACKS.

FIG. 3

FIG. 4

Range	Dial Indicator			Description	Catalog No.	EDP No.
	Graduation	Dial Reading	Range One Rev.			
2-3/8-18"	.001"	0-20-0	.040"	Strain Gage with Balancing Attachment	696Z	52901
61-458mm	0.02mm	0-50-0	1mm	Millimeter Strain Gage with Balancing Attachment	696MZ	52902

Description	Catalog No.	EDP No.
Balancing Attachment Only	696B	52903

Gage furnished with 10 rods, sharp points and balancing attachment in attractive, protective case.



Automotive Disc Brake Indicating Gages

No. 1016 .300-2"

No. 1016M 8-50mm

This gage is a companion gage to the No. 458 Series Micrometer. It is an indicator gage used to measure the thickness of disc brake rotors and to determine the depth of grooves worn in the rotor.

This gage consists of a 1" (25mm) range, .001" (0.01mm) indicator reverse loaded, mounted on a frame with a 60° pointed anvil and a flat indicator contact. This gage is adjustable to allow reading dimensions from .300" (8mm) to 2" (50mm) in one gage, eliminating the need for two separate gages. The frame has a 3-3/8" (85mm) depth.

Readability Features

- ◆ Clear, easily read large numbers and sharp graduations on both regular and counter dials

Ease-of-Handling Features

- ◆ Balanced frame design for comfortable and accurate measuring
- ◆ Gracefully designed tapered frame for use in tight places
- ◆ Lightweight
- ◆ Easy plunger action to set the reading
- ◆ Adjustable to read through .300" (8mm) to 2" (50mm) range

Accuracy and Long-Life Features

- ◆ Stable steel frame
- ◆ Hardened indicator gear action
- ◆ Extremely hard and finely finished measuring surfaces
- ◆ Furnished with a 1" or 25mm gage block standard



No. 1016.



Measuring the groove depth of a disc brake rotor with the No. 1016.

.300-2" range

Catalog No.	EDP No.	Graduation	Description
1016	63795	.001"	Adjustable Dial Indicator and No. 2G Gage Block Standard

8-50mm range

1016M	63796	0.01mm	Adjustable Dial Indicator and No. 2MG Gage Block Standard
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NOTE: Also see No. 458 Disc Brake Micrometer in the Micrometer section.

Packed one per box.



Cylinder Gages

No. 452 Series 2-1/10–9"

No. 452M Series 54–150mm

These convenient, easy-to-use gages are used to determine taper and out-of-roundness of bores, offering a quick and accurate way to show your customer whether new rings or reconditioning is necessary.

The ranges are achieved by the use of two measuring contact rods. The gage is easily and accurately set to a micrometer.

Gages also include the following features:

- ◆ Dial is graduated to show plus or minus
- ◆ Bezel may be rotated for zero setting
- ◆ Sled is hardened and ground for long, accurate life and has two long-line contacts in constant alignment with the cylinder wall. These reference points are spring loaded, making the gage self-centering and non-collapsible
- ◆ The locking screw (stem protruding above the dial) clamps the contact points in position for measurement with a micrometer
- ◆ The handle can be locked in any perpendicular or angular position and may also be transformed by a slight turn into a toggle joint with a wide sweep
- ◆ Extra handles may be ordered to make a long extension



No. 452B.

Inch Reading

Range	Graduation	Dial Reading	One Rev.	Catalog No.	EDP No.
2-1/2–6"	.001"	0-100	.100"	452B	52339
2-1/2–9"				452B-9	52341
2-1/10–6"				452E	52342
2-1/10–9"				452E-9	52344

Millimeter Reading

63-150mm	0.02mm	0-100	1.0mm	452MB	52340
54-150mm				452ME	52343

Accessories

Extra Handle for Nos. 452B-9, 452MB	PT05805-1/2	72175
Extra Handle for Nos. 452E-9, 452ME	PT06722	72275

Packed one in a box.

NOTE: Height from contact points to top of handle is 10" (250mm).



Dial Indicator Diameter Gages

These gages measure both outside and inside diameters by comparing dimensions to gage blocks or an adjustable setting master. Each gage consists of a strong rectangular box beam with a sensitive gaging contact at one end and a reference gaging contact at the other.

All of the diameter gages have these features:

- ◆ The sensitive contact transfers dimensions to the dial indicator through a linear friction-free mechanism
- ◆ There are two gage feet at the reference end of the gage and one foot at the sensitive end of the gage to set the gage on the work and align the contacts
- ◆ Gage depth is set by adjusting the gage feet up or down
- ◆ A lever-actuated reverse mechanism loads the gage for either inside or outside diameter measurements

- ◆ The gage contacts are easily changed to I.D. or O.D. gaging by turning them end for end
- ◆ Unless otherwise specified, the dial indicator sent with the gage reads in .0005" increments with a total range of ± 0.030 ". The dial has a double row of graduations reading in opposite directions – minus in red and plus in black
- ◆ On the following pages we list our standard line but to suit other needs we also can furnish the following:

1. Any length that is required
2. Any dial indicator with inch or millimeter reading
3. No. 717 Electronic Gage Amplifier and Gaging Head in place of the indicator
4. Electronic indicators can also be furnished on any of these gages except the No. 1102
5. Special contact shapes
6. Gaging contacts with more depth



Dial Indicator Diameter Gages

No. 1102 1-12"

No. 1102M 25-300mm

This is a light, easy-to-handle gage that is a workhorse in its range. Approximate weight is 1 lb., 12 oz. (0.8kg). The gaging depth can be set within a range of 0-1" (0-25mm) by adjusting the rest foot.

Dial indicators are the No. 81-136-623 Inch Reading (.0005") or No. 81-181-623 Millimeter Reading (0.01mm) models.

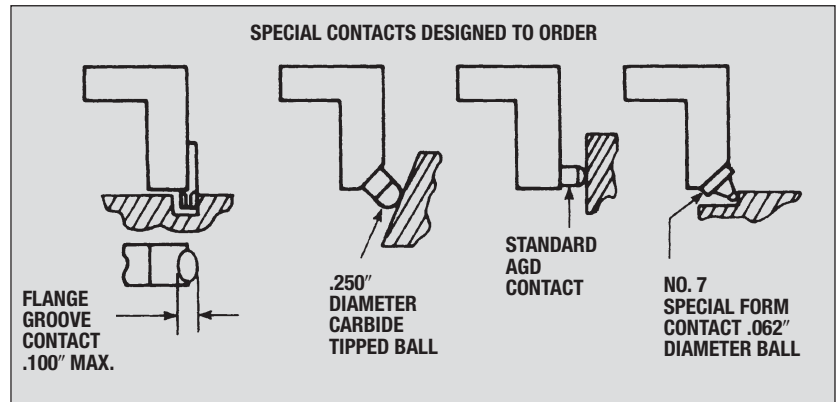
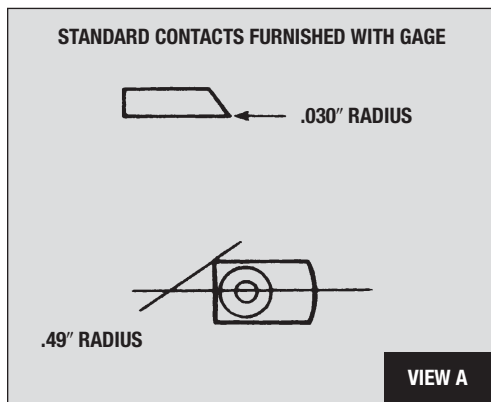
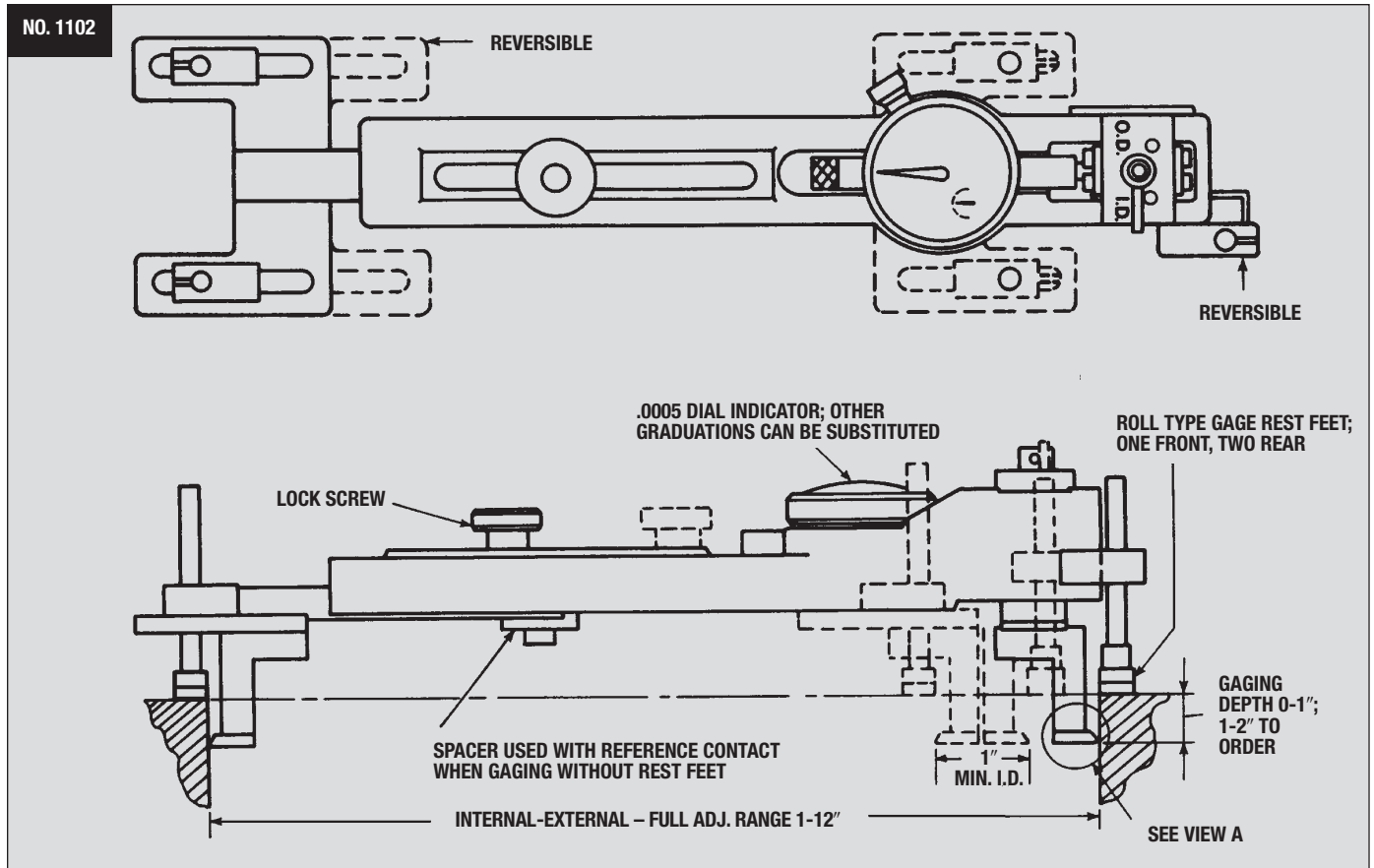
The gage should be checked against our No. 1127 Master for a precise reference standard during production gaging. (See the following pages.) Also available on request with .0001" or 0.002mm graduations.

Photo Key	Description
A	Range Lock Screw
B	I.D.-O.D. Preload Reversing Mechanism Lever
C	Rest Foot
D	Reference Contact
E	Sensitive Contact

See specifications on next page.



Dial Indicator Diameter Gages (continued)
Nos. 1102, 1102M Series

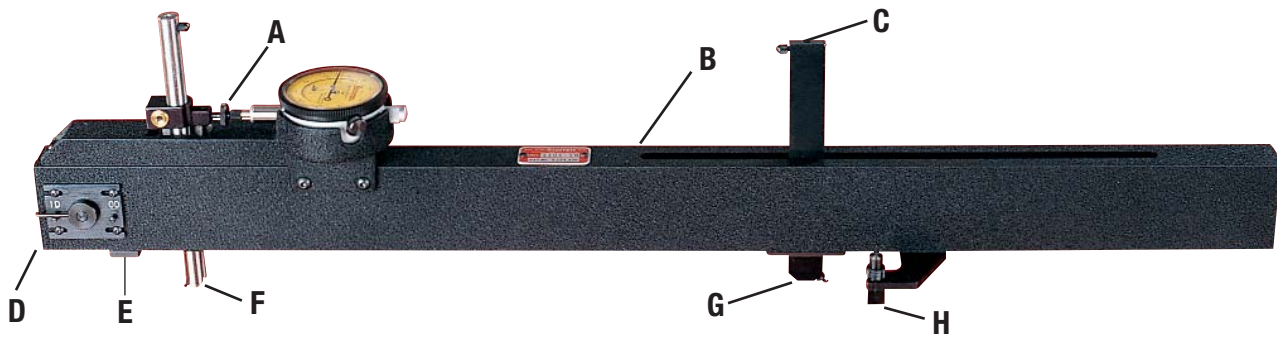


Length Range	Height Adjustment	Catalog No.	EDP No.
1-12"	0-1"	1102	56134
1-12"	0-1"	1102-1	69004
25-300mm	0-25mm	1102M	65020

Case

Storage Case to Hold Both Gage and No. 1127 Master	1102ZZ	56136
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Sent without case unless otherwise ordered.



Dial Indicator Diameter Gages

No. 1101 Series 12-60"

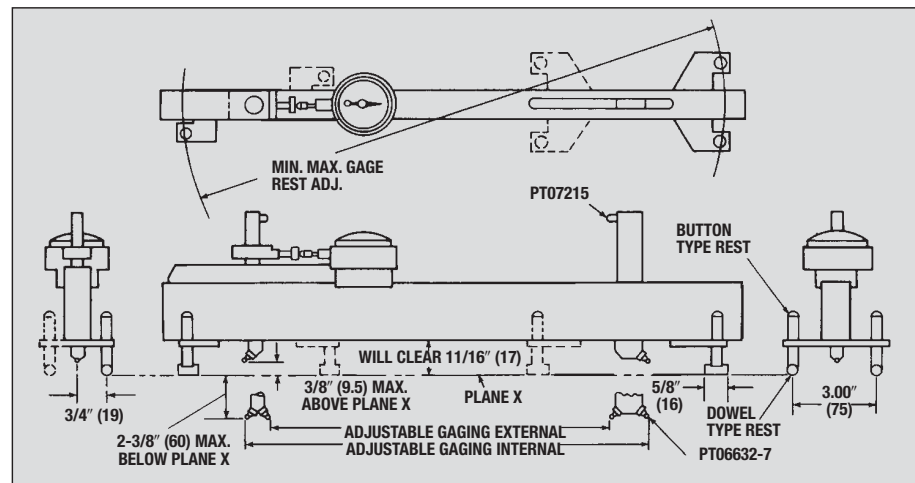
**No. 1101M Series
300-1500mm**

These gages allow for measurement beyond the size range of our No. 1102 models. Each gage adjusts a full 6" or 150mm. The contact carriers are vertically adjustable to handle various work depth. Special contacts are available.

This tool has dowel (line) contacts at one end of the gage feet, and a button (point) contact gage at the other end of the feet. These can be reversed as needed and the gaging depth can be set within a range of 2-3/4" or 70mm.

This gage should be checked against our No. 1126 Master for a precise reference standard during production gaging. (See the following pages.)

Photo Key	Description
A	Dial Indicator Fine-Adjusting Screw
B	Beam – Rectangular Box Section
C	Contact for Added Applications
D	I.D.-O.D. Preload Reversing Mechanism Lever
E	Combination Dowel/Button Rest Feet
F	Sensitive Contact
G	Reference Contact
H	Mounting Plate with Combination Dowel and Button Rest Feet



Length		Inch Reading .0005" Graduations		Millimeter Reading .01mm Graduations		Inch Reading .0001" Graduations		Millimeter Reading .002mm Graduations	
Inch	mm	Catalog No.	EDP No.	Catalog No.	EDP No.	Catalog No.	EDP No.	Catalog No.	EDP No.
12-18"	300-450mm	1101-18	53144	1101M-450	65015	1101-18-1	69005	1101M-450-2	69021
18-24"	450-600mm	1101-24	53146	1101M-600	65016	1101-24-1	69006	1101M-600-2	69022
24-30"	600-750mm	1101-30	53148	1101M-750	65017	1101-30-1	69007	1101M-750-2	69023
30-36"	750-900mm	1101-36	53150	1101M-900	65018	1101-36-1	69008	1101M-900-2	69024
36-42"	900-1050mm	1101-42	53152	1101M-1050	65019	1101-42-1	69009	1101M-1050-2	69025
42-48"	1050-1200mm	1101-48	53154	1101M-1200	65021	1101-48-1	69010	1101M-1200-2	69026
48-54"	1200-1350mm	1101-54	53156	1101M-1350	65022	1101-54-1	69011	1101M-1350-2	69027
54-60"	1350-1500mm	1101-60	53158	1101M-1500	65023	1101-60-1	69012	1101M-1500-2	69028
Gaging Contact Range:		±.050"		±1.3mm		±.050"		±1.3mm	

NOTE: Sent without case unless otherwise ordered. To order case, specify the Catalog No. and "ZZ" (For example: No. 1101ZZ-18).



Heavy-Duty Dial Indicator Diameter Gages

No. 1100 Series 12-60"

**No. 1100M Series
300-1500mm**

These gages combine heavy-duty construction features with adaptability for a wide range of internal and external measurements. The adjustable dowel rest legs ride on slotted mounting plates for horizontal adjustment. Each of the legs are vertically adjustable to obtain the proper rest position on the work and correct alignment on the gaging contacts. 2" or 50 mm range is the vertical adjustment.

The gaging contacts are radiused but may be modified by request to suit special gaging conditions.

The indicator and its housing can be rotated through to 360° so that the indicator may be read at the most convenient angle. The gage should be checked against our No. 1126 Master for a precise reference standard during production gaging. (See the following pages.)

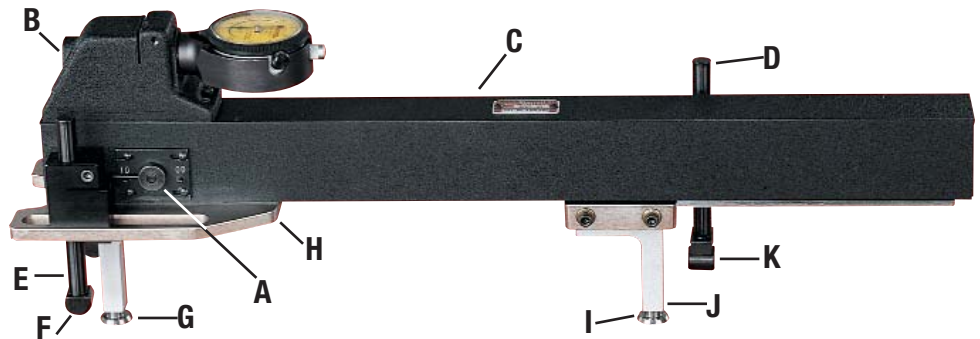
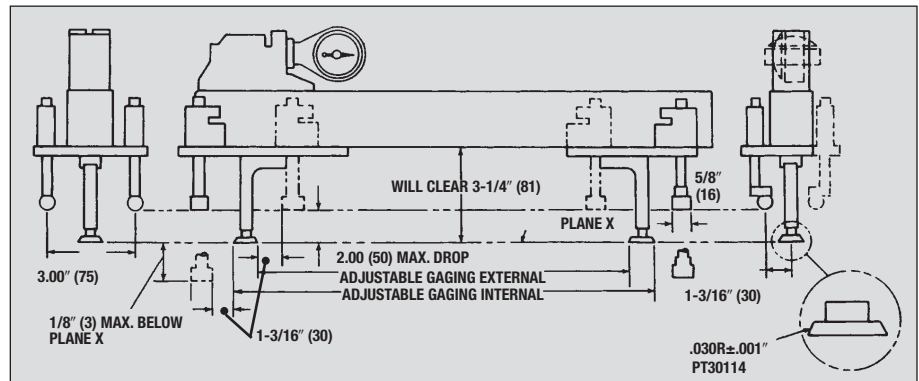


Photo Key	Description
A	I.D.-O.D. Preload Reversing Mechanism Lever
B	Tamper Proof Dial Indicator Fine-Adjust Screw
C	Beam – Rectangular Box Section
D, E	Adjustable Dowel Rest Leg
F, K	Dowel Rest
G	Sensitive Contact
H	Slotted Rest Leg Mounting Plate
I	Reference Contact
J	Reference Contact Carrier



Length		Inch Reading .0005" Graduations		Millimeter Reading .01mm Graduations		Inch Reading .0001" Graduations		Millimeter Reading .002mm Graduations	
Inch	mm	Catalog No.	EDP No.	Catalog No.	EDP No.	Catalog No.	EDP No.	Catalog No.	EDP No.
12-18"	300-450mm	1100-18	53128	1100M-450	65024	1100-18-1	69013	1100M-450-2	69029
18-24"	450-600mm	1100-24	53130	1100M-600	65025	1100-24-1	69014	1100M-600-2	69030
24-30"	600-750mm	1100-30	53132	1100M-750	65026	1100-30-1	69015	1100M-750-2	69031
30-36"	750-900mm	1100-36	53134	1100M-900	65027	1100-36-1	69016	1100M-900-2	69032
36-42"	900-1050mm	1100-42	53136	1100M-1050	65028	1100-42-1	69017	1100M-1050-2	69033
42-48"	1050-1200mm	1100-48	53138	1100M-1200	65029	1100-48-1	69013	1100M-1200-2	69034
48-54"	1200-1350mm	1100-54	53140	1100M-1350	65030	1100-54-1	69013	1100M-1350-2	69035
54-60"	1350-1500mm	1100-60	53142	1100M-1500	65031	1100-60-1	69020	1100M-1500-2	69036
Gaging Contact Range:		±.050"		±1.3mm		±.050"		±1.3mm	

NOTE: Sent without case unless otherwise ordered. To order case, specify the Catalog No. and "ZZ" (For example: No. 1101ZZ-18).



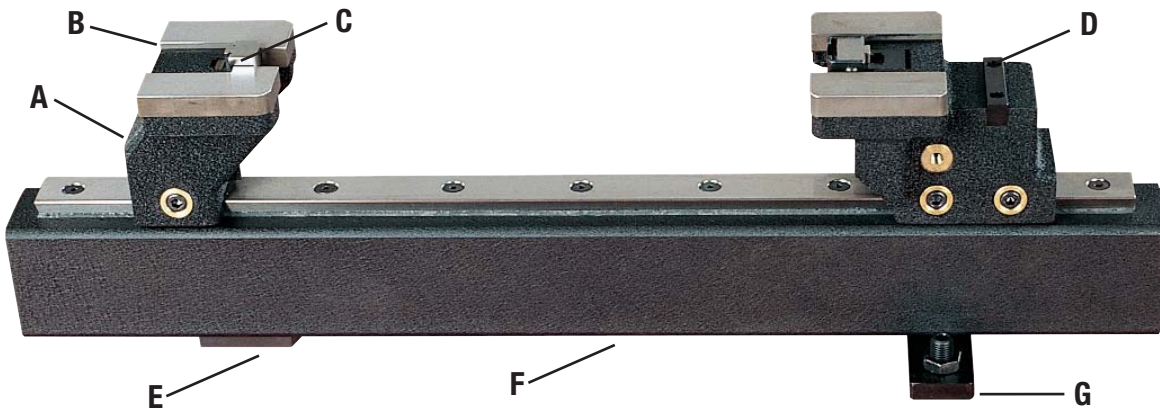
Setting Masters For Dial Indicator Diameter Gages

These setting masters are used to check and reset diameter gages under production gaging conditions. Each master consists of a rigid box beam with reference and sensitive heads which are individually adjustable along dovetail ways.

A platen on each head locates the diameter gage from its feet. The position of the gage contacts is matched by the anvils on the masters which are vertically adjustable. The reference head anvil has a fine adjustment for final settings, plus a restrictor to help position the gage in the master.

Both heads can be reversed for I.D. or O.D. settings. Each master has a fixed single point rest and two leveling screws which provide a three-point suspension. All contact and working surfaces are hardened and ground.

The setting procedure is as follows: set the diameter gage precisely to gage blocks or height gages. Then, using the diameter gage, set the master which can then be used as a precise reference standard for the diameter gage during production gaging.

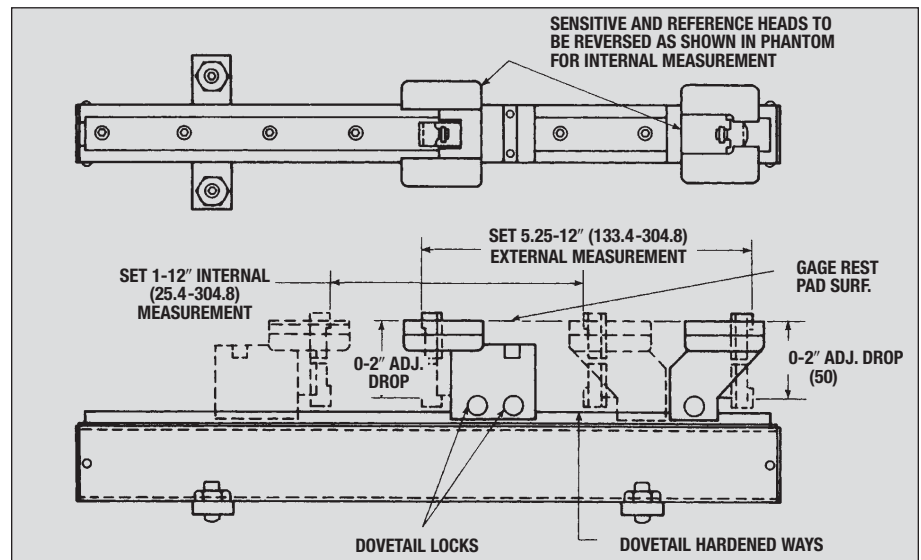


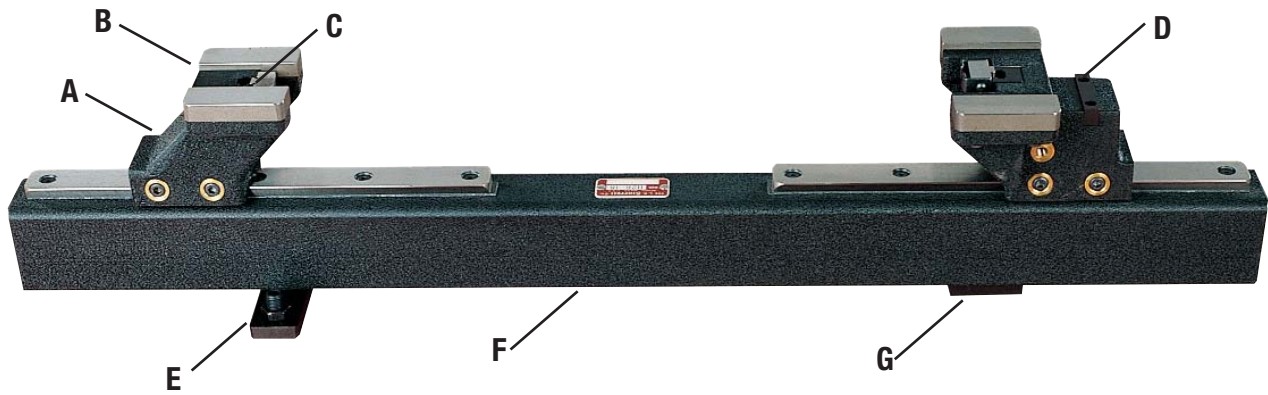
Internal-External Adjustable Setting Master for Starrett No. 1102 Diameter Gages Catalog No. 1127 EDP 56135

This set master is used with our No. 1102 Diameter Gages. The internal adjustment range is 1-12" (25-300mm) and external adjustment is 5-1/4-12" (133-300mm). Storage case is available to hold both the gage and master (Catalog No. 1102ZZ, EDP 56136).

Photo Key	Description
A	Sensitive Head
B	Hardened Rest Platen
C	Anvil
D	Reference Head

Photo Key	Description
E	Fixed Single Point Button Rest
F	Beam – Rectangular Box Section
G	Leveling Screws (2)



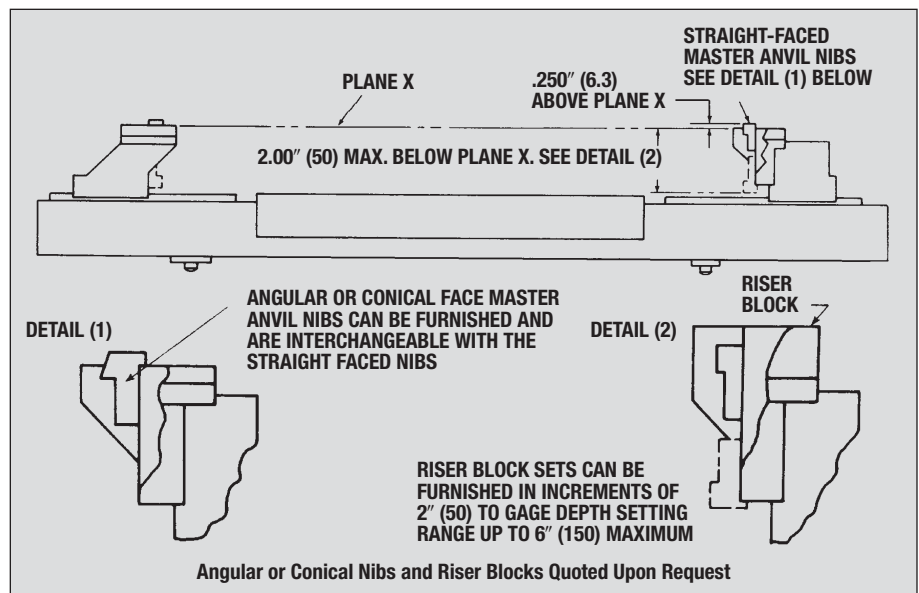


**Internal-External
Adjustable Setting
Masters for Starrett
Nos. 1100 and 1101
Series Diameter Gages**

**No. 1126 Series
12-60" (300-1500mm)**

These set masters are used to check and reset Starrett Nos. 1100 and 1101 Diameter Gages under production gaging conditions. The range is from 12-60" or 300-1500mm.

Photo Key	Description
A	Sensitive Head
B	Hardened Rest Platen
C	Anvil
D	Reference Head
E	Leveling Screws (2)
F	Beam – Rectangular Box Section
G	Fixed Single Point Button Rest



Length Range		For Use With Diameter Gage Nos.				Catalog No.	EDP No.
Inch	mm	Inch	mm	Inch	mm		
12-18"	300-450mm	1100-18	1100M-450	1101-18	1101M-450	1126-18	53160
18-24"	450-600mm	1100-24	1100M-600	1101-24	1101M-600	1126-24	53161
24-30"	600-750mm	1100-30	1100M-750	1101-30	1101M-750	1126-30	53162
30-36"	750-900mm	1100-36	1100M-900	1101-36	1101M-900	1126-36	53163
36-42"	900-1050mm	1100-42	1100M-1050	1101-42	1101M-1050	1126-42	53164
42-48"	1050-1200mm	1100-48	1100M-1200	1101-48	1101M-1200	1126-48	53165
48-54"	1200-1350mm	1100-54	1100M-1350	1101-54	1101M-1350	1126-54	53166
54-60"	1350-1500mm	1100-60	1100M-1500	1101-60	1101M-1500	1126-60	53167

NOTE: Setting masters for larger diameters are also available by request – priced on the application.

Sent without case. Cases are available to hold gage and master. To order case, specify the Catalog No. and "ZZ" (For example: 1126ZZ-18).



SPECIAL FUNCTION INDICATOR GAGES



Dial Depth Gages

No. 640 Series 0-1/2"

No. 640M Series 0-10mm

No. 643 0-.125"

No. 644 0-3"

No. 644M 0-75mm

See Page 137 for complete details.



Left-to-right: Nos. 640JZ, 643JZ, 644JZ.

Top Reading Dial Depth Gages

No. 642 Series 0-8.6"

No. 642M Series 0-215mm

See Page 138 for complete details.



Left, No. 642AZ side view; right, top view.

Special Function Dial Gages – A Final Note

In addition to the products detailed in this section, we have made many other special function gages to suit a wide variety of our customers' specific requirements.

If you have a special application, we invite you to submit your drawings and specifications to our Special Order Department at 121 Crescent Street, Athol, MA 01331, USA . We will be happy to provide a prompt quotation.

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