

DIAL AND ELECTRONIC  
INDICATORS AND GAGES

## TEST INDICATOR SNUGS AND SPLIT BUSHINGS USAGE GUIDE

### DOVE TAIL STYLE SNUGS:

PT22428: 3/32-1/4" (2.4-6.3mm) inch hole on one side and standard female dove connection on the other. For use with 708, 709 and 811 Test Indicators. Allows connection to 657AA, 657A, 657T Magnetic Base and PT017762 Holding Rod for 252 Height Stand and PT11770A Tool Post Holder or 711-49 Height Gage Attachment.

### ROUND CONNECTION SNUGS:

657S: 1/4" hole on both ends

PT18718: 3/32-1/4" hole on one end 5/16" on the other

PT18724: 3/32-1/4" hole on one end 3/8" on the other

657H: 3/8" inch hole on both ends

665D: 3/8" inch hole on one end .465" (11.8mm) on the other. Includes 665L (.375" bushing)

PT16846 (not shown): 3/4" inch hole on both ends

### UNIVERSAL STYLE SNUGS:

58S: 3/32-1/4" hole allows connection to 1/4", 5/16", 3/8" (6.3, 8, 9.5mm)

### UNIVERSAL DRUM STYLE SNUGS:

57S: 5/16" and 3/8" (8, 9.5mm) on one end and 9/64", 5/32", 3/16", 1/4" (3.5, 4, 4.8, 6.3mm) on the opposite

**NOTE:** 3/8-1/4" bushings can be used with some of the snugs above to change 3/8"-1/4" where required (see PT00764)

### SPLIT BUSHINGS:

657R: outside .312" (7.9mm), inside .250" (6.3mm), length 1.000" (25.4mm)

PT00764: .375" (9.5mm) outside, inside .250" (6.3mm), length 1/2" (12.7mm)

80SB: outside .375" (9.5mm), inside .219" (5.5mm), length 1/2" (12.7mm). Used to increase the stem diameter on Starrett 80 miniature indicators to standard .375" diameter.

25MSB: outside .375" (9.5mm), inside .316" (8mm), length 1/2" (12.7mm), converts metric stemmed indicator to standard 3/8" diameter

665L: outside .465 (11.8mm), inside .375" (9.5mm), length 1-1/4" (31.5mm)

25SB: outside .500" (12.7mm), inside .375" (9.5mm), length 1/2" (12.7mm)



## BEST PRACTICES FOR TEST INDICATORS AND HOLDERS

Test indicators are primarily used for testing or checking parts and for machine setups. They are a tool that is indispensable for working as a machinist or toolmaker. They are available in two types – plunger style and the lever style. Both are versatile, but the lever style can be more adaptable to smaller, confined working areas.

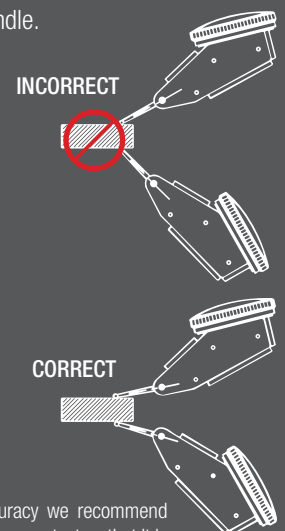
Unlike other indicators, the lever style's contact moves in an arc rather than in a straight line. This can cause a slight inaccuracy called "cosine error" if the angle of the lever to the workpiece is too steep. If, for example, a lever was set off an additional 20°, there could be an error of .0006" in a .010" range (0.012 mm in a 0.2mm range).

It is good practice, therefore, to keep your contact at or near 90° to the direction of movement.

Test indicators should always be "loaded" 1/10 to 1/4 of a turn before measuring.

Test indicators 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 allow 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.



For extreme accuracy we recommend positioning the lever contact so that it is approximately 15° (708/709) or 0° (all other lever styles) from being horizontal with the workpiece



# TEST INDICATORS

## 708, 708M, 709, 709M DIAL TEST INDICATORS WITH DOVETAIL MOUNTS

.020", .060"/0.2MM, 0.8MM

These precision test indicators offer an easy to read angled head and the flexibility of three dovetail mounts. Features include:

- Large 1-3/8" (35mm) dial diameter with angled head
- Precision gear-driven design with smooth, jeweled movement
- Replaceable contact point reverses automatically, always maintaining clockwise hand rotation
- Satin chrome finish for durability
- Contacts are frictionally adjustable and replaceable
- Revolution count hand on 708B and 709B models
- Meet or exceed ISO accuracy specification



INDICATORS AND GAGES

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

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

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



708, 709 Dial Test Indicators with Dovetail Mounts											
Cat. No.	EDP	With SLC**		Grad.	Range	Dial Reading	Carbide Contact Point		Dial Color	Description	
		Cat. No.	EDP				Length	Ball Dia.			
708AZ	64212	708AZ W/SLC	66866	.0001"	.010"	0-5-0	13/16" (20mm)	.078" (2mm)	White	Without attachments	
R708AZ	64603	R708AZ W/SLC	66867						Red		
B708AZ	64607	B708AZ W/SLC	66868						Black		
708ACZ	64217	708ACZ W/SLC	66869						White		With attachments*
R708ACZ	64604	R708ACZ W/SLC	66870						Red		
B708ACZ	64608	B708ACZ W/SLC	66871						Black		
708BZ	64213	708BZ W/SLC	66874	.0001"	.020"	0-5-0	13/16" (20mm)	.078" (2mm)	White	Without attachments	
708BCZ	64218	708BCZ W/SLC	66875						White	With attachments*	
709AZ	64214			.0005"	.030"	0-15-0	13/16" (20mm)	.078" (2mm)	White	Without attachments	
R709AZ	64605								Red		
B709AZ	64609								Black		
709ACZ	64219								White		With attachments*
R709ACZ	64606								Red		
B709ACZ	64610								Black		
709ALZ	65857			.0005"	.050"	0-25-0	1-23/64" (34.4mm)	.078" (2mm)	White	Without attachments	
709ALCZ	65858								White	With attachments*	
709BZ	64215			.0005"	.060"	0-15-0	13/16" (20mm)	.078" (2mm)	White	Without attachments	
709BCZ	64220								White	With attachments*	

708M, 709M Dial Test Indicators with Dovetail Mounts										
Cat. No.	EDP	With SLC**		Grad	Range	Dial Reading	Carbide Contact Point		Dial Color	Description
		Cat. No.	EDP				Length	Ball Dia.		
708MAZ	65864	708MAZ W/SLC	66872	0.002mm	0.2mm	0-100-0	5/8" (16mm)	.078" (2mm)	Yellow	Without attachments
708MACZ	65865	708MACZ W/SLC	66873						Yellow	With attachments*
709MAZ	64216			0.01mm	0.8mm	0-40-0	13/16" (20mm)	.078" (2mm)	Yellow	Without attachments
709MACZ	64221								Yellow	With attachments*
709MALZ	67092			0.01mm	1.0mm	0-50-0	1-5/64" (28.4mm)	.078" (2mm)	Yellow	Without attachments
709MALCZ	67093								Yellow	With attachments*

\*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).

\*\* Includes redemption card for Standard Letter of Certification



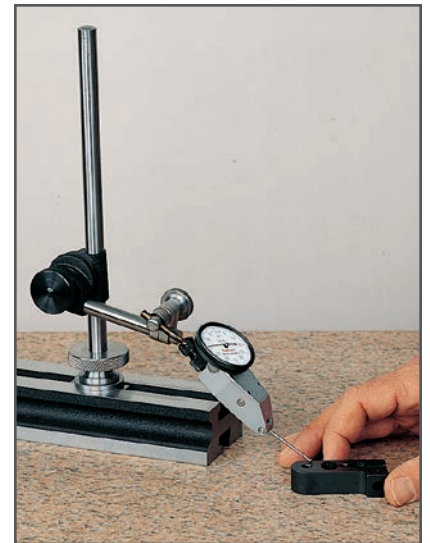
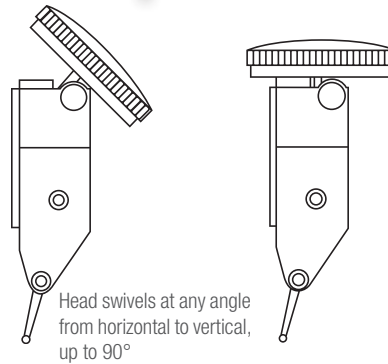
## TEST INDICATORS

### 811, 811M Dial Test Indicators WITH SWIVEL HEAD

.060", 0.8MM

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

- Two positioning mounts work with 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
- 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



#### Individual Contact Points for 811 and 811M Dial Test Indicators with Swivel Head

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

#### 811, Dial Test Indicators with Swivel Head

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

#### 811M Dial Test Indicators with swivel head

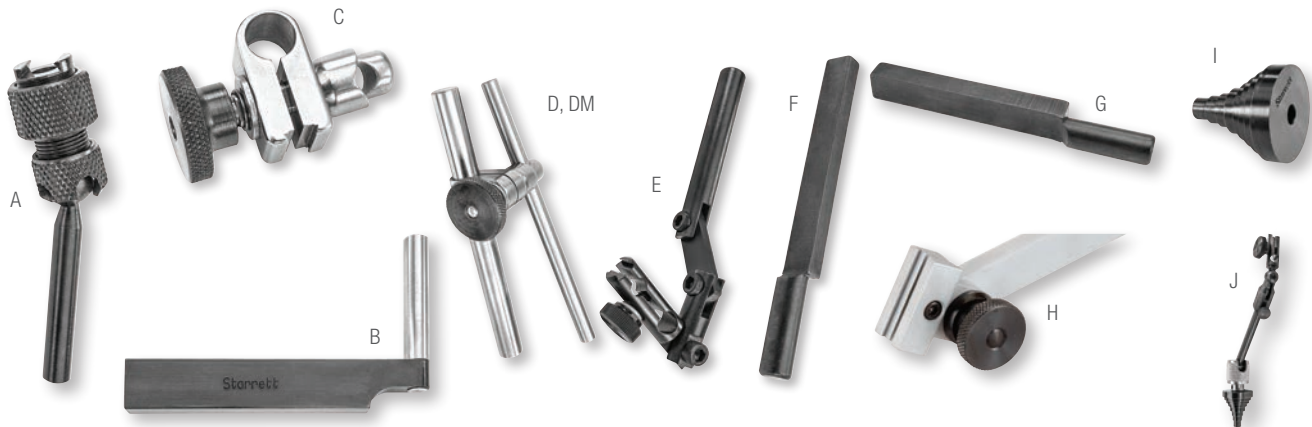
Cat. No.	EDP	Grad.	Range	Dial Reading	Steel Contact Points		Dial Color	Description
					Length	Ball Diameter		
811-MPZ	57084	0.01mm	0.8mm	0-40-0	5/8" (16mm)	.078" (2mm)	Yellow	In case without attachments
811-MCZ	57083							In case with attachments*

\*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).



# TEST INDICATORS

## ATTACHMENTS FOR 708, 709, AND 811 TEST INDICATORS



### A. DOVETAIL BODY CLAMP

PT22429. 3/16" (4.8mm) diameter rod. For use in chucks, collets or surface gage snugs.

### B. TOOL POST HOLDER

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

PT22428. Will fit over spindles and posts 3/32-1/4" (2.4-6.3mm). Can be used directly on our 252 Height Transfer Gage and our 657 Magnetic Base Holders. It is frequently used on the 1/4" (6.3mm) rod of the Snug and Rod Unit PT22430.

### D. SNUG AND ROD UNIT

PT22430. This unit consists of a snug (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 PT22428 Swivel Post Snug which slides onto the 1/4" (6.3mm) diameter rod.

The 3/8" (9.5mm) rod will fit into the 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

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

PT26007. This triple-hinged indicator holder is designed to mount dovetail indicators (such as our 708, 709, and 811 Indicators). By using a rod through the 3/16" (4.7mm) mounting hole, it will also accommodate test indicators such as our 711 Indicator. Overall length is approximately 5-1/4" (133mm), shank size is 3/8" (9.5mm).

### F. HEIGHT GAGE ATTACHMENT

711-49. 1/8" x 5/16" (3 x 8mm) shank. This is used for 250, 750, 751 Height Gages, and 995 Planer and Shaper Gage.

### G. HEIGHT GAGE ATTACHMENT

711-35. 3/16" x 3/8" (4.8 x 9.5mm) shank. This is used for 255 Height Gage.

### H. INDICATOR ATTACHMENT

PT99454 dovetail clamping style. 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. AND J. COLLET ADAPTERS

PT28315 (I.)– To be used with a 3/16" (4.7mm) diameter attachment for indicators such as PT22429 dovetail body clamp and PT07104F long and short arm attachments. PT28316 (J.)– Swivel Post Collet Adapter, for use on any dovetail test indicator.

Attachments for 708, 709, and 811 Test Indicators			
Photo Key	Part No.	EDP	Description
A*	PT22429	72441	Dovetail Body Clamp
B*	PT11770A	71361	Tool Post Holder
C*	PT22428	72440	Swivel Post Snug with Clamp
D*	PT22430	72442	Snug and Rod Unit
DM	PT27171	66457	Metric Snug and Rod Unit
E	PT26007	65101	Indicator Axial Support
F	711-49	52941	Height Gage Attachment
G	711-35	52942	
H	PT99454	68713	Indicator Attachment, dovetail style
I	PT28315	68847	Collet Adapter
J	PT28316	68848	

\* Furnished with all sets having "C" in the catalog number



# TEST INDICATORS

## 711, 711M LAST WORD® DIAL TEST INDICATORS

.030", 0.7MM

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.

### Individual Contact Points (Fit All 711 Models)

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

### 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 yellow for clarity
- Variety of attachments available to suit the application.
- 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, PT07087. Carbide points available as listed.

### 711 Last Word® Dial Test Indicators

Cat. No.	EDP	Grad.	Range	Dial Reading	Steel Contact Points		Description
					Length	Ball Diameter	
711FSAZ	52925	.001"	.030"	0-15-0	5/32" (4mm)	One: .120" (3mm)	Indicator with universal shank complete with long and short arm, body clamp
711FSBZ	52927						Indicator with gooseneck shank
711FSZ	52929						Indicator with body clamp only
711GPSZ	52944						Indicator with universal friction holder with shank
711GCSZ	52943	.001"	.030"	0-15-0	5/32" (4mm)	Three: .035" (0.9mm) .062" (1.6mm) .120" (3mm)	Indicator complete with all attachments*
711HSAZ	52951	.0005"	.030"	0-15-0	5/32" (4mm)	One: .120" (3mm)	Indicator with universal shank complete with long and short arm, body clamp
711HSZ	52953						Indicator with body clamp only
711LPSZ	52958						Indicator with universal friction holder with shank
711LCSZ	52957	.0005"	.030"	0-15-0	5/32" (4mm)	Three: .035" (0.9mm) .062" (1.6mm) .120" (3mm)	Indicator complete with all attachments*

### 711M Last Word® Dial Test Indicators

Cat. No.	EDP	Grad.	Range	Dial Reading	Steel Contact Points		Description
					Length	Ball Diameter	
711MFAZ	52926	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
711MFSZ	52930						Indicator with body clamp only
711MGPSZ	52946						Indicator with universal friction holder with shank
711MGCSZ	52945	0.01mm	0.7mm	0-35-0	5/32" (4mm)	Three: .035" (0.9mm) .062" (1.6mm) .120" (3mm)	Indicator complete with all attachments*

\*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" (4.8mm) hole.

711LPSZ Indicator with Universal Friction Holder and Shank



711FS-GS



# TEST INDICATORS

## ATTACHMENTS FOR 711 LAST WORD® DIAL TEST INDICATORS



### A. BODY CLAMP

PT07101F Permits the indicator to be held by its body and clamped to any diameter rod from 1/8-1/4" (3-6mm). It also attaches the universal shank to the indicator with the addition of PT07104F Long and Short Arm.

### B. UNIVERSAL FRICTION HOLDER

with shank 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 57 and 257 Surface Gages.

### C. UNIVERSAL SHANK

PT07103A. This shank includes 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 254 Height Gage.

### D. GOOSENECK SHANK

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 PT07103A Universal Shank. It is attached by unscrewing the body clamp and replacing it with the gooseneck shank.

### E. DOUBLE-JOINTED ATTACHMENT

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

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

PT05116. Coupling slips over the long and short arm PT07104F and the shank of 711EA Universal Friction Holder to permit offset.

### H. HEIGHT GAGE ATTACHMENT

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 255 12", 18" and 24" Height Gages.

### I. HEIGHT GAGE ATTACHMENT

711-49. 1/8" x 5/16" (3 x 8mm) shank. This is used for 250, 750, 751 Height Gages and 995 Planer and Shaper Gage.

### J. HEIGHT GAGE ATTACHMENT

711-35. 3/16" x 3/8" (4.8 x 9.5mm) shank. This is used for 255 Height Gage.

### K. INDICATOR AXIAL SUPPORT

PT26007. This triple-hinged indicator holder is designed to mount dovetail indicators (such as our 708, 709, and 811 indicators). By using a rod through the 3/16" (4.7mm) mounting hole, it will also accommodate test indicators such as our 711 indicators. Overall length is approximately 5 1/4" (133mm), shank size is 3/8" (9.5mm).

### L. SURFACE GAGE ATTACHMENT

PT05119. Fits in place of the ball shank of the 711EA Attachment. Allows 711G and L Indicators to be used on holders with smaller clamp hole.

### M. TOOL POST HOLDER

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

### N. RUBBER DUST GUARD

PT09764. Protects the indicators' working parts by sealing out dust, powder, and other foreign matter under adverse gaging conditions.

### O. COLLET ADAPTER

PT28315. To be used with a 3/16" (4.7mm) diameter attachment for indicators such as PT22429 dovetail body clamp and PT07104F long and short arm attachments.

### Attachments for 711 Last Word Dial Test Indicators

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

\*Furnished with all sets having "C" in the catalog number



## TEST INDICATORS

### 3808, 3809, 3908 AND 3909 DIAL TEST INDICATORS

These dial test indicators are offered with choices of dial size, range and include accessories.

All 3808 and 3809 models have 1-1/4" (32mm) dial faces while 3908 and 3909 models offer a larger 1-9/16" (40mm) dial face.

#### 3808, 3809, 3908 and 3909 Inch Reading Indicators

Cat. No.	EDP	Grad.	Range	Dial Reading	Dial Diameter	Description
3808A	12331	.0001"	.008"	0-4-0	1-1/4"	Indicator, two dovetail clamps, case*
3808AC	12303					Indicator with accessories, case**
3908A	12488	.0001"	.008"	0-4-0	1-9/16"	Indicator, two dovetail clamps, case*
3908AC	12636					Indicator with accessories, case**
3809A	12333	.0005"	.030"	0-15-0	1-1/4"	Indicator, two dovetail clamps, case*
3809AC	12305					Indicator with accessories, case**
3909A	12527	.0005"	.030"	0-15-0	1-9/16"	Indicator, two dovetail clamps, case*
3909AC	12669					Indicator with accessories, case**

\*Indicator, .078" contact point, 3/8" and 5/32" dovetail clamps and case

\*\*Indicator, .078" contact point, 3/8" and 5/32" dovetail clamps, .156" swivel post holder, tool post holder, contact wrench and case

#### 3808, 3809, 3908 and 3909 Metric Reading Indicators

Cat. No.	EDP	Grad.	Range	Dial Reading	Dial Diameter	Description
3808MA	12332	0.002mm	0.2mm	0-100-0	32mm	Indicator, two dovetail clamps, case*
3808MAC	12304					Indicator with accessories, case**
3908MA	12520	0.002mm	0.2mm	0-100-0	40mm	Indicator, two dovetail clamps, case*
3908MAC	12656					Indicator with accessories, case**
3809MA	12334	0.01mm	0.8mm	0-40-0	32mm	Indicator, two dovetail clamps, case*
3809MAC	12307					Indicator with accessories, case**
3909MA	12563	0.01mm	0.8mm	0-40-0	40mm	Indicator, two dovetail clamps, case*
3909MAC	12673					Indicator with accessories, case**

\*Indicator, 2mm contact point, 9.5mm and 4mm dovetail clamps and case

\*\*Indicator, 2mm and 4mm contact points, 9.5mm and 4mm dovetail clamps, 4mm swivel post holder, tool post holder, contact wrench and case

Each inch reading and metric reading 3808, 3809, 3908 and 3909 is offered with a choice of two Graduation/Range/Reading configurations. Features include:

- Precision gear-driven design with smooth, jeweled movement
- Frictionally adjustable contact point reverses automatically, always maintaining clockwise hand rotation
- Meets or exceeds ANSI/ASME accuracy specifications
- High contrast, easy-to-read dials with white background for inch and yellow for metric



3909A



3909MA





# BACK PLUNGER INDICATORS

## 650, 651 BACK-PLUNGER DIAL INDICATORS

.200"

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

- 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. When not needed, the attachment can be easily removed and the hole capped.
- 651 Indicators are identical to the 650 indicators except they cannot accept the deep hole attachment
- Both models have large 1-11/16" (43mm) diameter bezels with easy-to-read dial numbers and graduations
- 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
- With their .375" (9.5mm) AGD stem diameter, the 650 and 651 can be used with our 670 Hole Attachment and our 671 Universal Attachment
- 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



650B5



651B1

### 650, 651 Back Plunger Dial Indicators

With Deep Hole Attachment		Without Deep Hole Attachment		Grad.	Range	Dial Reading	Description
Cat. No.	EDP	Cat. No.	EDP				
650A1Z	64475	651A1Z	64483	.001"	.200"	0-100	Indicator with 3 contact points, 3 attachments*, in case
650B1	64477	651B1	64485				Indicator with 3 contact points only
650A5Z	64474	651A5Z	64484	.001"	.200"	0-50-0	Indicator with 3 contact points, 3 attachments*, in case
650B5	64476	651B5	64486				Indicator with 3 contact points only

### 650, 651 Back Plunger Dial Indicators

With Deep Hole Attachment		Without Deep Hole Attachment		Grad.	Range	Dial Reading	Description
Cat. No.	EDP	Cat. No.	EDP				
650MA1Z	65261	651MA1Z	65263	5mm	0.01mm	0-100	Indicator with 3 contact points, 3 attachments*, in case
650MB1	65262	651MB1	65264			Yellow Dial Face	Indicator with 3 contact points only

\* Attachments include clamp, tool post holder and snug (PT18718).

### Individual Contact Points Only

Photo	Part No.	EDP
	PT01761	75263
	PT06632-5	70793
	PT06632-6	70794



## BACK PLUNGER INDICATORS

### 196, 196M UNIVERSAL BACK PLUNGER DIAL INDICATORS

#### .200", 5MM

Our 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 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



196R, 196MR



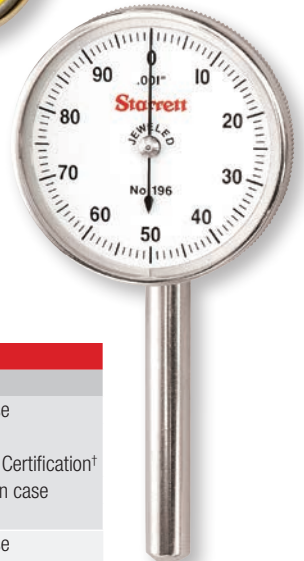
PT05471



PT05472



PT05473

Left: 196MB1  
Below: 196B1

#### Contact Points and Adapters Only for 196 and 196M Universal Back Plunger Dial Indicators

Catalog/Part No.	EDP	Description
196R	50711	Adapter**
196MR	67457	Adapter (metric threads)
PT05471	70617	Hardened steel contact point
PT05472	70618	
PT05473	70619	

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

#### 196 Universal Back Plunger Dial Indicators (1/4" Shank Diameter)

Cat. No.	EDP	Grad.	Range	Dial Reading	Description
196A1Z	50697				Indicator with 3 contact points, adapter, 4 attachments* in case
196B1	50699				Indicator with 3 contact points and adapter only
196B1 W/SLC	66865	.001"	.200"	0-100	Indicator with 3 contact points, adapter, and Standard Letter of Certification†
196A6Z	50701				Antimagnetic Indicator with 3 contact points, 4 attachments* in case
196B6	50702				Antimagnetic Indicator with 3 contact points only
196A5Z	50714	.001"	.200"	0-50-0	Indicator with 3 contact points, adapter, 4 attachments* in case
196B5	50717				Indicator with 3 contact points and adapter only

#### 196M Universal Back Plunger Dial Indicators (6.3mm Shank Diameter)

Cat. No.	EDP	Grad.	Range	Dial Reading	Description
196MA1Z	65251				Indicator with 3 contact points, adapter, 4 attachments* in case
196MB1	65252	0.02mm	5mm	0-100 Yellow Dial Face	Indicator with 3 contact points and adapter only
196MA5Z	65253	0.02mm	5mm	0-50-0 Yellow Dial Face	Indicator with 3 contact points, adapter 196R, 4 attachments* in case
196MB5	65254				Indicator with 3 contact points and adapter only

\* Attachments include clamp, tool post holder, snug and hole attachment.

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

While there is a need for indicators with finer graduations, such as our 708 Indicators, 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) 196A6Z and 196B6.

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.



# BACK PLUNGER INDICATORS

## ATTACHMENTS FOR 650, 651, 196 AND 196M BACK PLUNGER DIAL INDICATORS AND UNIVERSAL DIAL INDICATORS

### A. CLAMP

PT99437 With a 1-5/16" (33mm) flat or round capacity – 5/16" (8mm) post (PT03709-1/2) used with PT18718 Snug.

### B. TOOL POST HOLDER

PT99438 3/8" x 3/4" x 6" (9.5 x 19 x 150mm) with upright spindle (PT03820-0) 5/16" dia. x 4-1/2" length (8 x 114mm). Use with PT18718 Snug.

### C. SNUG COMPLETE

PT18718. Post hole has a 5/16" diameter† and 3/32-1/4" holding capacity. Can be used on our 252 Height Transfer Gage, 57 and 257A and B Surface Gages, on 657A Magnetic Base and Swivel Post Assembly.

### D. SNUG COMPLETE

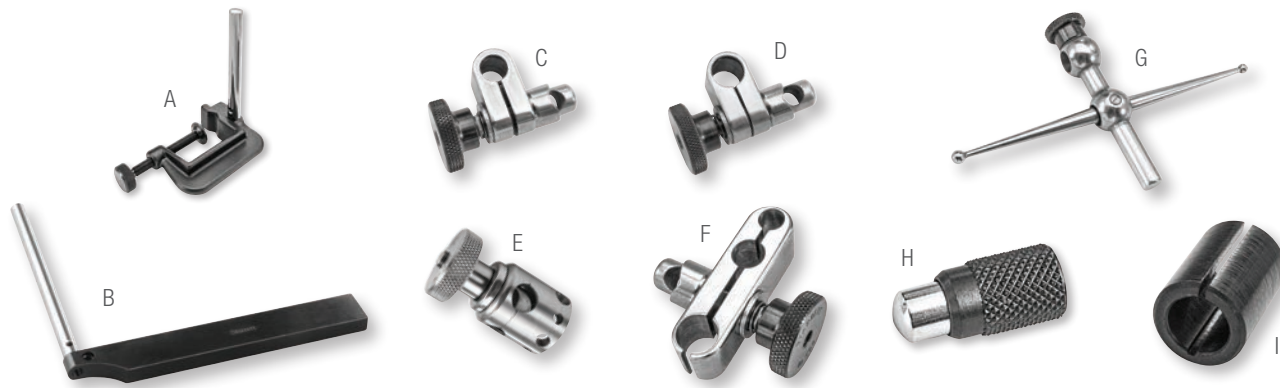
PT18724. Post hole has a 3/8" diameter (9.5mm) and 3/32-1/4" (2.4-6.3mm) holding capacity. Can be used with our 57 and 257C and D Surface Gages or 657AA Magnetic Base with upright post.

### E. UNIVERSAL SNUG

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

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" used on holders with smaller clamp hole.



Attachments for 650, 651, 196 and 196M Back Plunger Dial Indicators and Universal Dial Indicators			
Photo Key	Cat./Part No.	EDP	Description
A*	PT99437	64492	Clamp
B*	PT99438	64493	Tool Post Holder
C*	PT18718	50709	Snug Complete
D	PT18724	50710	Snug Complete - 1/4" and 3/8" Holes
E	57S	50296	Universal Snug
F	58S	56613	
G*	196F	50706	Hole Attachment for 196 and 196M Only
H	PT08726A	66052	Shock Absorbing Anvil for 196 and 196M Only
I	PT00764	68850	Split Bushing for 196 and 196M Only

\*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.

## ATTACHMENTS FOR 196 AND 196M ONLY

### G. HOLE ATTACHMENT

196F. allows indicator be used over obstructions and inside holes to a depth of approximately 1-5/8" (40mm).

### H. SHOCK ABSORBING ANVIL

PT08726A.

### I. SPLIT BUSHING

PT00764. Allows attachment of 196 Indicator to 660 Magnetic Base.



## DIAL INDICATORS

### MECHANICAL DIAL INDICATORS AND ATTACHMENTS

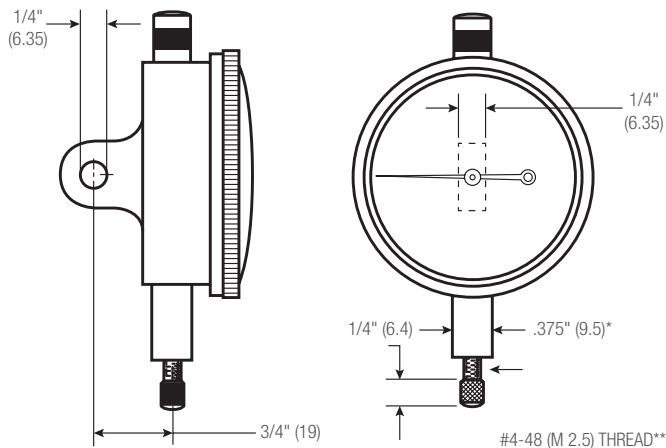
#### ELECTRONIC INDICATORS/INDICATOR HOLDERS

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.

### 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.

### APPLICATION SPECIFICATION FACTORS

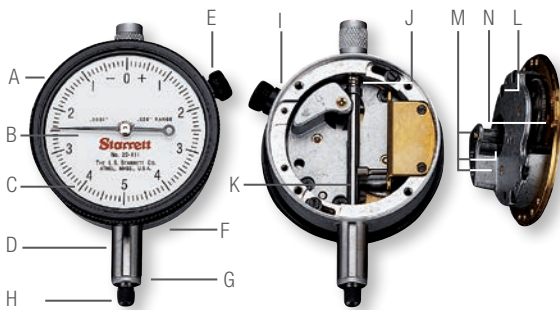
1. Regular analog styles with indicating hands are more readable than digital styles when the measurements are being visually monitored by an operator.
2. Select the dial size that gives you the readability you need. We offer five regular dial sizes which will fit most applications that have both space 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 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 INDICATORS

## DESIGN FEATURES

- Rugged and simple unit construction with a "universally fitting" design as shown
- One gear unit assembly fits AGD Group 2 (our 25 Indicators), AGD Group 3 (our 655 Indicators) and AGD Group 4 (our 656 Indicators)
- 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 non-shock 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. Non-reflecting 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

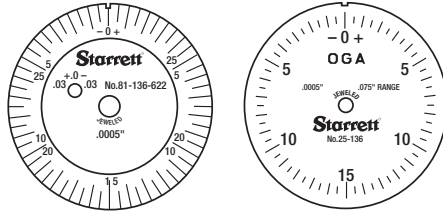
## DIALS, ACCESSORIES AND OPTIONS

Balanced or Continuous Dials – Starrett AGD indicators are furnished with a balanced dial (plus on right). A continuous dial (reading clockwise) may also be ordered.

**Plus and Minus Graduations** – Plus and minus readout – black figures read clockwise, red figures read counterclockwise, or colors reversed – are available on some 81 Dial Indicators.

**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



Far Left: Dial with Plus and Minus Graduations  
Left: Dial with Special Trademark Imprint

marked with your company name or trademark. 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 81, 25, 655, 656, 196B6 Dial Indicators. 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, including:

- Backs
- Contact Points
- Dust Guard
- Hole Attachments
- Special Non-shock mechanism
- Spindle Travel Controls
- Stem and Back Mounting Accessories
- Tolerance and Maximum Reading Hands



**Gear Unit**

+



**Case Assembly**

=



**Complete Indicator**



## DIAL INDICATORS

### 80 MINIATURE DIAL INDICATORS AND ACCESSORIES

ANSI GROUP 0

RANGES UP TO .100"

1-1/4" BEZEL, 7/32" STEM

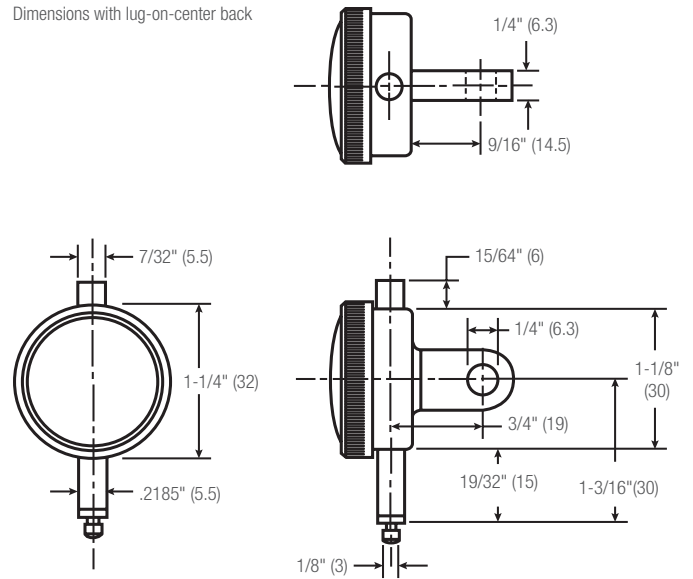
Similar in design to AGD dial indicators, these miniatures are built for gaging dimensions in tight places. Equipped with high precision, low friction movements, they are made in four models, all with frictionally adjustable bezels for quick, positive zero setting. No-glare, white eggshell finish dials.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

80SB split bushing available .219" to 3/8".

#### 80 Miniature Dial Indicators

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

Dimensions with lug-on-center back



Free drafting template available for this size.

Write The L. S. Starrett Co. at:  
121 Crescent Street  
Athol, MA 01331.



80-114J



80-134J

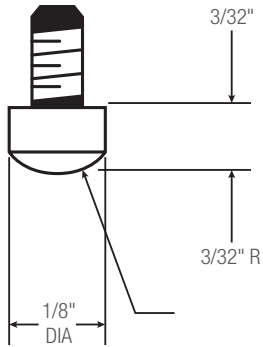


80-144J

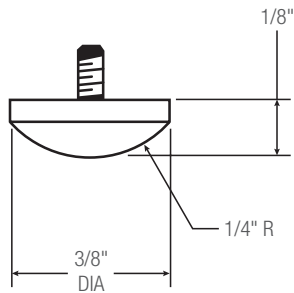


## CONTACT POINTS

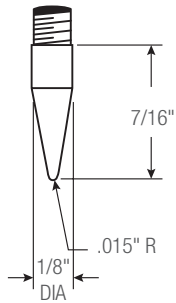
The regular contact point is furnished standard on all 80 Dial Indicators. Button, cone and flat contact points are available individually, as listed. All have #0-80 thread.



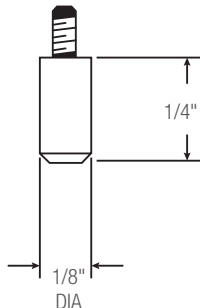
**PT25044 Regular Contact Point**  
(Standard on all 80 Dial Indicators)



**PT25159 Button Contact Point**



**PT25161 Cone Contact Point**



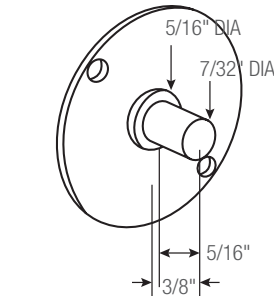
**PT25160 Flat Contact Point**



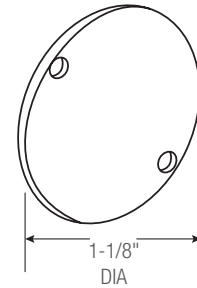
80-111J

## BACKS

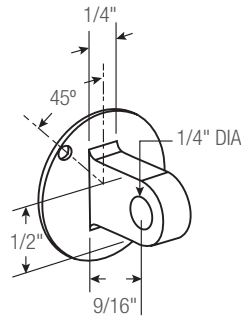
The lug-on-center back is furnished standard on all 80 Dial Indicators.



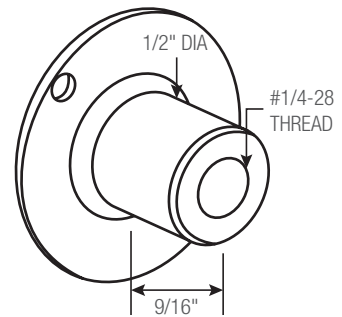
**PT25158 Post-Type Lug Back**



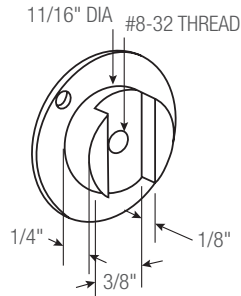
**PT25079 Flat Back**



**PT25053 Lug-on-Center Back**  
(Standard on all 80 Dial Indicators)



**PT25071 Screw-Type Lug Back**



**PT25157 Adjustable Bracket Back**

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

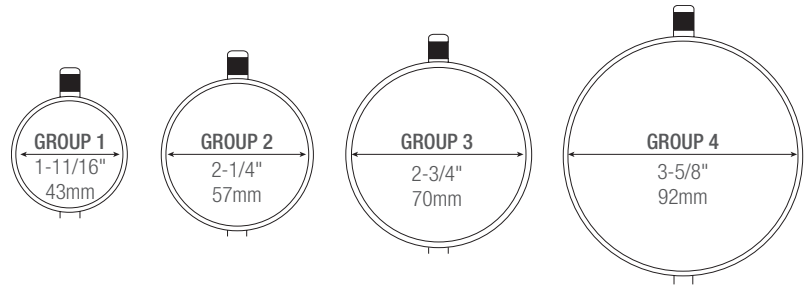
Part No.	EDP	Description
PT25044	72023	Regular Contact Point
PT25159	72024	Button Contact Point
PT25161	72025	Cone Contact Point
PT25160	72026	Flat Contact Point
PT25079	72028	Flat Back
PT25071	72030	Screw-Type Lug Back
PT25053	72027	Lug-on Center Back
PT25157	72029	Adjustable Bracket Back
PT25158	72031	Post-Type Lug Back



## DIAL INDICATORS

### 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.



81, 25, 655 and 656 AGD Dial Indicators (White Dials Furnished Standard)

Graduation	Range One Rev.	Total	Dial Reading	Group 1 81 Indicators	Group 2 25 Indicators	Group 3 655 Indicators	Group 4 656 Indicators
.00005"	.006"	.015"	0-3-0 0-6		25-109 25-209		656-109 656-209
.0001"	.006"	.015"	0-3-0		25-116		
.0001"	.008"	.020"	0-4-0 0-8		25-118 25-218	655-118	656-118
.0001"	.010"	.025"	0-5-0 0-10	81-111 81-211	25-111 25-211	655-111 655-211	656-111 656-211
.0001"	.010"	.025"	0.1 -0.10 -0.10 0.1	81-111-624* 81-111-630*			
.0001"	.010"	.200"	0-5-0 0-10		25-511* 25-611*	655-511* 655-611*	656-511* 656-611*
.0001"	.020"	.400"	0-10-0 0-20				656-517* 656-617*
.00025"	.010"	.025"	0-5-0 0-10	81-124 81-224	25-124 25-224	655-124 655-224	656-124 656-224
.00025"	.020"	.050"	0-10-0 0-20	81-128 81-228	25-128 25-228	655-128 655-228	656-128 656-228
.00025"	.030"	.075"	0-15-0 0-30			655-129 655-229	656-129 656-229
.0005"	.020"	.050"	0-10-0 0-20	81-134 81-234	25-134 25-234	655-134 655-234	656-134 656-234
.0005"	.030"	.075"	0-15-0 0-30	81-136 81-236	25-136 25-236	655-136 655-236	656-136 656-236
.0005"	.030"	.075"	0.3 -0.30 -0.30 0.3	81-136-622* 81-136-623*			
.0005"	.040"	.100"	0-20-0 0-40	81-138 81-238	25-138 25-238	655-138 655-238	656-138 656-238
.0005"	.050"	.125"	0-25-0 0-50	81-131 81-231	25-131 25-231	655-131 655-231	656-131 656-231
.0005"	.050"	.500"	0-50		25-431**		
.0005"	.050"	1.000"	0-50		25-631**		

\* With revolution counter on dial

† With top lift mechanism

AGD Design Specifications: Bezel Diameters

Design	Size Group	Minimum Diameter		Maximum Diameter	
		in	mm	in	mm
AGD	0	1"	25mm	1-3/8"	35mm
	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





**81, 25, 655 and 656 AGD Dial Indicators (White Dials Furnished Standard)**

Graduation	Range		Dial Reading	Group 1 81 Indicators	Group 2 25 Indicators	Group 3 655 Indicators	Group 4 656 Indicators
	One Rev.	Total					
.001"	.020"	.050"	0-10-0 0-20	81-142 81-242	25-142 25-242	655-142 655-242	656-142 656-242
.001"	.030"	.075"	0-15-0 0-30	81-143 81-243	25-143 25-243	655-143 655-243	656-143 656-243
.001"	.030"	.075"	+0.30, -0.30 -0.30, +0.30	81-143-628* 81-143-629*			
.001"	.040"	.100"	0-20-0 0-40	81-144 81-244	25-144 25-244	655-144 655-244	656-144 656-244
.001"	.050"	.125"	0-25-0 0-50	81-145 81-245	25-145 25-245	655-145 655-245	656-145 656-245
.001"	.100"	.250"	0-50-0 0-100	81-141 81-241	25-141 25-241	655-141 655-241	656-141 656-241
.001"	.100"	.500"	0-50-0 0-100		25-341/5*† 25-441/5*†	655-341/5* 655-441/5*	656-341/5* 656-441/5*
.001"	.100"	1.000"	0-50-0 0-100		25-341*† 25-441*†	655-341*† 655-441*†	656-341*† 656-441*†
.001"	.100"	2.000" 3.000" 4.000" 5.000" 6.000" 7.000" 8.000" 9.000" 10.000" 11.000" 12.000"	0-100		25-2041* 25-3041* 25-4041* 25-5041*	655-2041* 655-3041* 655-4041* 655-5041*	656-2041* 656-3041* 656-4041* 656-5041* 656-6041* 656-7041* 656-8041* 656-9041* 656-10041* 656-11041* 656-12041*

**81, 25, 655 and 656 AGD Dial Indicators (Yellow Dials Furnished Standard)**

Graduation	Range		Dial Reading	Group 1 81 Indicators	Group 2 25 Indicators	Group 3 655 Indicators	Group 4 656 Indicators
	One Rev.	Total					
0.001mm	0.1mm	0.25mm	0-50-0 0-100		25-151* 25-251*		
0.002mm	0.2mm	0.5mm	0-10-0 0-20	81-161 81-261	25-161 25-261	655-161 655-261	656-161 656-261
0.01mm	1mm	2.5mm	0-50-0 0-100	81-181 81-281	25-181 25-281	655-181 655-281	656-181 656-281
0.01mm	1mm	10mm	0-50-0 0-100		25-381*† 25-481*		
0.01mm	1mm	25mm	0-50-0 0-100		25-781*† 25-881*†	655-881*†	656-881*†
0.01mm	1mm	50mm	0-100		25-2081*	655-2081*	
0.01mm	1mm	75mm	0-100		25-3081*	655-3081*	
0.01mm	1mm	100mm	0-100		25-4081*	655-4081*	
0.01mm	1mm	125mm	0-100		25-5081*	655-5081*	

\* With revolution counter on dial

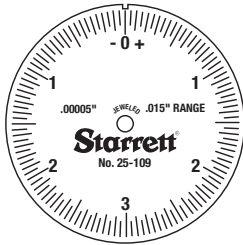
† With top lift mechanism



# DIAL INDICATORS

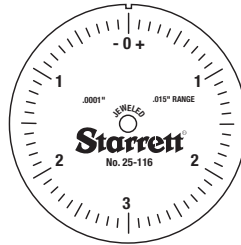
## STARRETT DIAL NUMBERING AND LINE STYLES FOR DIAL INDICATORS

These next three 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: 25-109) and number "2" signifies continuous dials (example: 25-209).



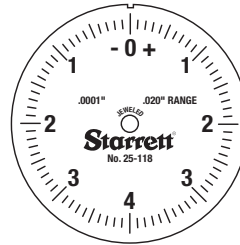
### .00005" Graduation

Total Range	.015"
Cat. No.	25-109 656-109



### .0001" Graduation

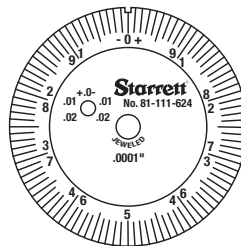
Total Range	.015"
Cat. No.	25-116



Total Range	.020"
Cat. No.	25-118 655-118 656-118

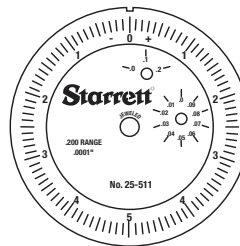


Total Range	.025"
Cat. No.	25-111 80-111 81-111 655-111 656-111

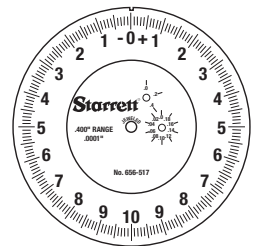


### .0001" Graduation

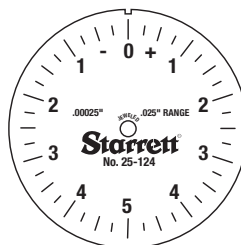
Total Range	.025"
Cat. No.	81-111-624 (with double row figures)



Total Range	.200"
Cat. No.	25-511 655-511 656-511

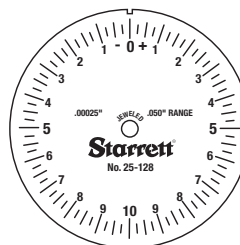


Total Range	.400"
Cat. No.	656-517

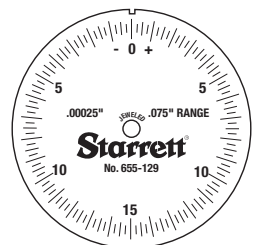


### .00025" Graduation

Total Range	.025"
Cat. No.	81-124 25-124 655-124 656-124

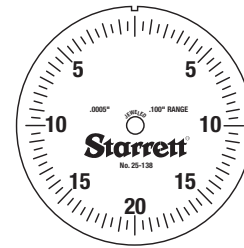
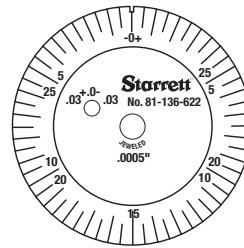
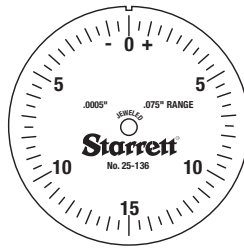
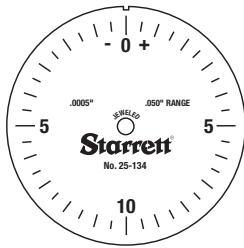


Total Range	.050"
Cat. No.	81-128 25-128 655-128 656-128

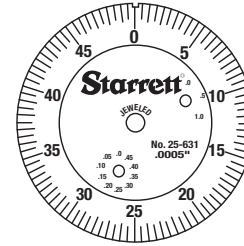
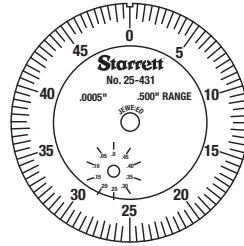
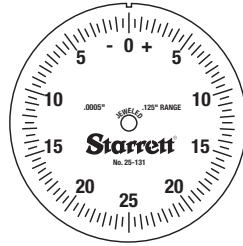


Total Range	.075"
Cat. No.	655-129 656-129

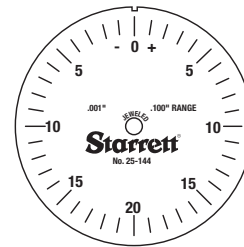
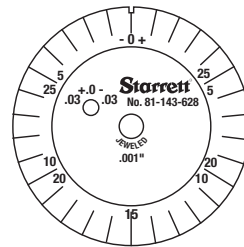
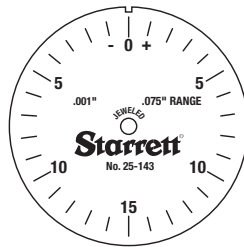
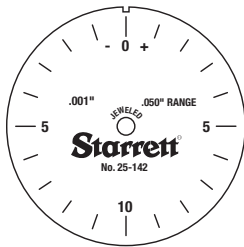




<b>.0005" Graduation</b>				
<b>Total Range</b>	.050"	.075"	.075"	.100"
<b>Cat. No.</b>	81-134 25-134 655-134 656-134	81-136 25-136 655-136 656-136	81-136-622 (with double row figures)	81-138 25-138 655-138 656-138

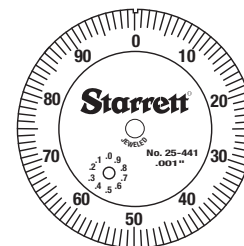
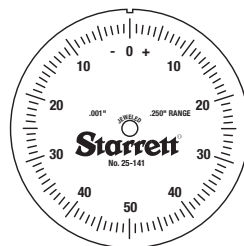
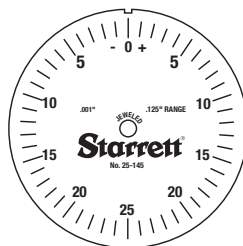


<b>.0005" Graduation</b>			
<b>Total Range</b>	.125"	.500"	1.000"
<b>Cat. No.</b>	81-131 25-131 655-131 656-131	25-431	25-631



<b>.001" Graduation</b>			
<b>Total Range</b>	.050"	.075"	.100"
<b>Cat. No.</b>	81-142 81-144 *25-142 *655-142 *656-142	81-143 25-143 655-143 656-143	81-143-628 (with double row figures) *25-144 *655-144 *656-144

\* Also on long range models.



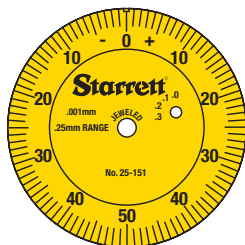
<b>.001" Graduation</b>			
<b>Total Range</b>	.125"	.250"	.500", 1.000"
<b>Cat. No.</b>	81-145 *25-145 *655-145 *656-145	81-141 *25-141 *655-141 *656-141	25-441, 25-441/5 655-441, 655-441/5 656-441, 656-441/5

\* Also on long range models.

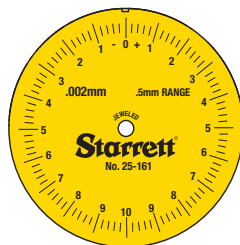


# DIAL INDICATORS

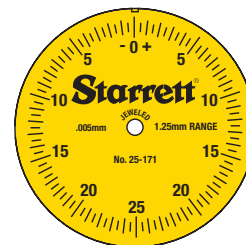
## STARRETT DIAL NUMBERING AND LINE STYLES FOR DIAL INDICATORS



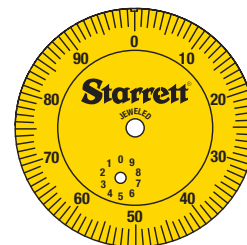
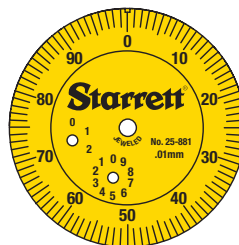
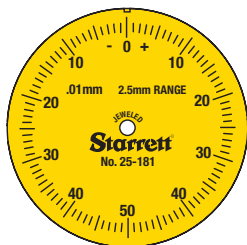
0.001mm Graduation	
Total Range	.25mm
Cat. No.	25-151



0.002mm Graduation	
Total Range	0.5mm
Cat. No.	No.81-161 25-161 655-161 656-161



0.005mm Graduation	
Total Range	1.25mm
Cat. No.	25-171



0.01mm Graduation				
Total Range	2.5mm	25mm	10mm	50, 75, 100, 125mm
Cat. No.	81-181 25-181 655-181 656-181	25-881 655-881 656-881	25-381	25-2081 25-3081 25-4081 25-5081



# DIAL INDICATORS

## 81 DIAL INDICATORS

### 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 non-shock 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.

If lift lever is desired, indicator must be ordered with case stem cap.

81 Dial Indicators					
Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading
81-111J	53378	.0001"	.010"	.025"	0-5-0
81-211J	53414				0-10
81-124J	53384	.00025"	.010"	.025"	0-5-0
81-224J	53416				0-10
81-128J	53386	.00025"	.020"	.050"	0-10-0
81-228J	53418				0-20
81-134J	53390	.0005"	.020"	.050"	0-10-0
81-234J	53422				0-20
81-136J	53392	.0005"	.030"	.075"	0-15-0
81-236J	53424				0-30
81-138J	53398	.0005"	.040"	.100"	0-20-0
81-238J	53426				0-40
81-131J	53388	.0005"	.050"	.125"	0-25-0
81-231J	53420				0-50
81-142J	53402	.001"	.020"	.050"	0-10-0
81-242J	53430				0-20
81-143J	53404	.001"	.030"	.075"	0-15-0
81-243J	53432				0-30
81-144J	53408	.001"	.040"	.100"	0-20-0
81-244J	53434				0-40
81-145J	53410	.001"	.050"	.125"	0-25-0
81-245J	53436				0-50
81-141J	53400	.001"	.100"	.250"	0-50-0
81-241J	53428				0-100

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



81-141J



81-161J



# DIAL INDICATORS

## 81 DIAL INDICATORS WITH DOUBLE ROW FIGURES

### AGD GROUP 1

#### RANGES UP TO .075"

These indicators have the exact same features as our 81 Dial Indicators on the previous page, except the dials have double-row figures, as illustrated, and they cannot be specified with a special non-shock mechanism.

If lift lever is desired, indicator must be ordered with case stem cap.

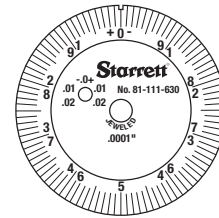
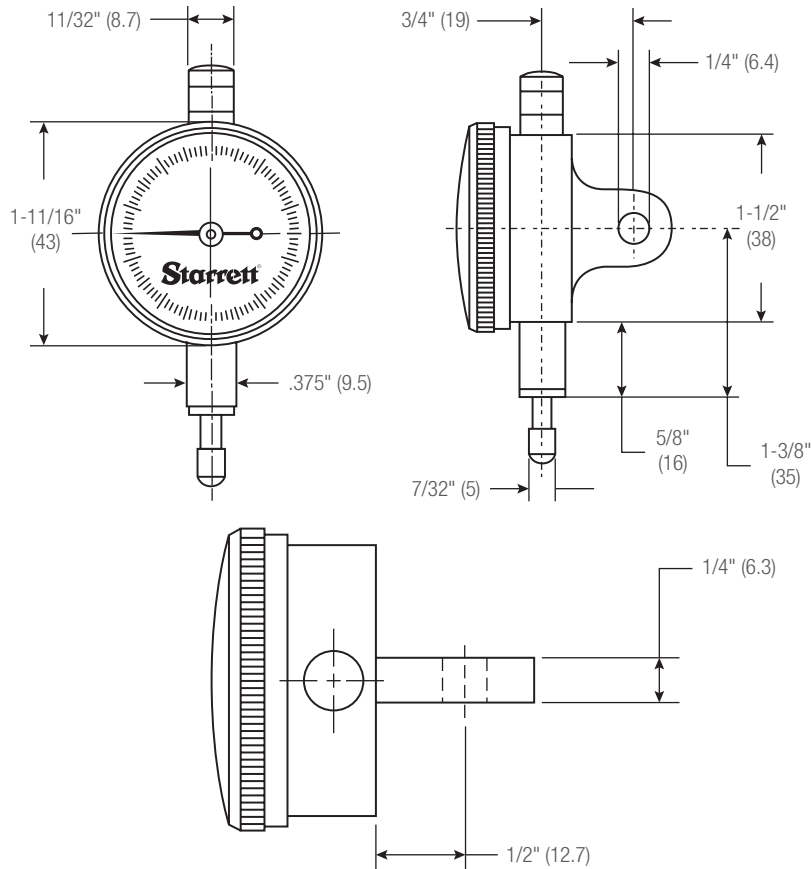
81 Dial Indicators with Double Row Figures

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

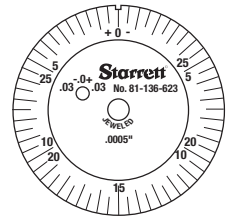
Other models with double-row figures can be furnished by request.



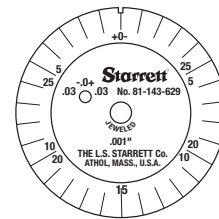
81-111-624J



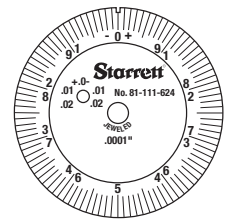
81-111-630J



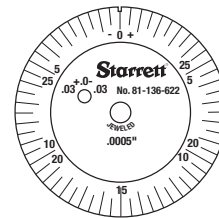
81-136-623J



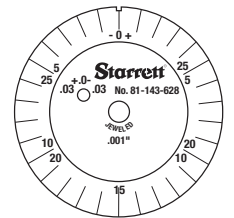
81-143-629J



81-111-624J



81-136-622J



81-143-628J

Free drafting template available for this size.

Write The L. S. Starrett Co. at:  
121 Crescent Street  
Athol, MA 01331



# DIAL INDICATORS

## 25 DIAL INDICATORS

### 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. Antimagnetic mechanism is optional for all models. Special non-shock mechanism is available for all models except 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.

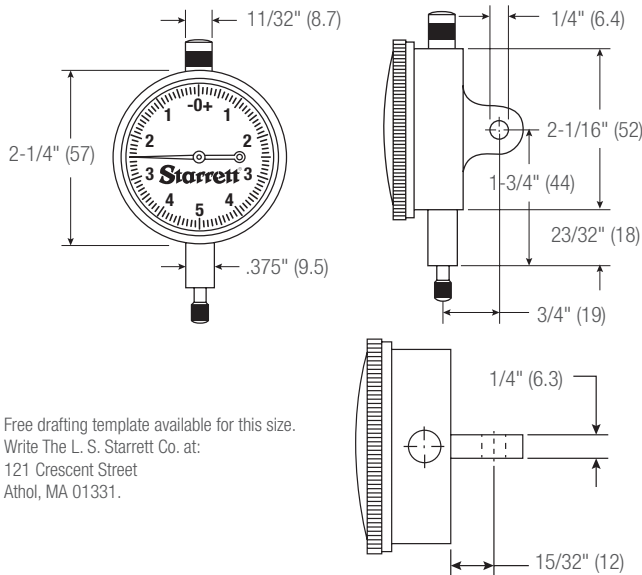
If lift lever is desired, indicator must be ordered with case stem cap.



25-111J



25-161J



Free drafting template available for this size. Write The L. S. Starrett Co. at: 121 Crescent Street Athol, MA 01331.

25-441J with top lift



656-129J case stem cap design required for use with lift lever See page 171



### 25 Dial Indicators with Jewel Bearings

Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading	Stem Dia.
25-151J	67644		0.1mm	0.25mm	0-50-0	.375" (9.5mm)
25-151J-8	68646	0.001mm	0.1mm	0.25mm	0-100	.375" (9.5mm)
25-251J	68118		0.1mm	0.25mm	0-10-0	.375" (9.5mm)
25-251J-8	68647	0.001mm	0.1mm	0.25mm	0-10-0	.375" (9.5mm)
25-161J	53250		0.2mm	0.5mm	0-10-0	.375" (9.5mm)
25-161J-8	64651	0.002mm	0.2mm	0.5mm	0-10-0	.375" (9.5mm)
25-261J	53281		0.2mm	0.5mm	0-20	.375" (9.5mm)
25-261J-8	64652	0.002mm	0.2mm	0.5mm	0-20	.375" (9.5mm)
25-171J	68643		0.5mm	1.25mm	0-25-0	.375"
25-181J	53252		1.0mm	2.5mm	0-50-0	.375" (9.5mm)
25-181J-8	64653	0.01mm	1.0mm	2.5mm	0-50-0	.375" (9.5mm)
25-281J	53283		1.0mm	2.5mm	0-100	.375" (9.5mm)
25-281J-8	64654	0.01mm	1.0mm	2.5mm	0-100	.375" (9.5mm)
25-381J	53289		1.0mm	10mm	0-50-0	.375" (9.5mm)
25-381J-8	64655	0.01mm	1.0mm	10mm	0-50-0	.375" (9.5mm)
25-481J	53297		1.0mm	10mm	0-100	.375" (9.5mm)
25-481J-8	64656	0.01mm	1.0mm	10mm	0-100	.375" (9.5mm)
25-781J	53305		1.0mm	25mm	0-50-0	.375" (9.5mm)
25-781J-8	64657	0.01mm	1.0mm	25mm	0-50-0	.375" (9.5mm)
25-881J	53307		1.0mm	25mm	0-100	.375" (9.5mm)
25-881J-8	64658	0.01mm	1.0mm	25mm	0-100	.375" (9.5mm)

### 25 Dial Indicators with Jewel Bearings

Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading
25-109J	53222	.00005"	.006"	.015"	0-3-0
25-209J	53254	.00005"	.006"	.015"	0-6
25-116J	53225	.0001"	.006"	.015"	0-3-0
25-118J	53226	.0001"	.008"	.020"	0-4-0
25-218J	53257	.0001"	.008"	.020"	0-8
25-111J	53223	.0001"	.010"	.025"	0-5-0
25-211J	53255	.0001"	.010"	.025"	0-10
25-511J	53299	.0001"	.010"	.200"	0-5-0
25-611J	53301	.0001"	.010"	.200"	0-10
25-124J	53228	.00025"	.010"	.025"	0-5-0
25-224J	53259	.00025"	.010"	.025"	0-10
25-128J	53230	.00025"	.020"	.050"	0-10-0
25-228J	53261	.00025"	.020"	.050"	0-20
25-134J	53234	.0005"	.020"	.050"	0-10-0
25-234J	53265	.0005"	.020"	.050"	0-20
25-136J	53236	.0005"	0.03	.075"	0-15-0
25-236J	53267	.0005"	0.03	.075"	0-30
25-138J	53238	.0005"	.040"	.100"	0-20-0
25-238J	53269	.0005"	.040"	.100"	0-40
25-131J	53232	.0005"	.050"	.125"	0-25-0
25-231J	53263	.0005"	.050"	.125"	
25-431J	53292	.0005"	.050"	.500"	0-50
25-631J	53304	.0005"	.050"	1.000"	
25-142J	53242	.001"	.020"	.050"	0-10-0
25-242J	53273	.001"	.020"	.050"	0-20
25-143J	53244	.001"	.030"	.075"	0-15-0
25-243J	53275	.001"	.030"	.075"	0-30
25-144J	53246	.001"	.040"	.100"	0-20-0
25-244J	53277	.001"	.040"	.100"	0-40
25-145J	53248	.001"	.050"	.125"	0-25-0
25-245J	53279	.001"	.050"	.125"	0-50
25-141J	53240	.001"	.100"	.250"	0-50-0
25-241J	53271	.001"	.100"	.250"	0-100
25-341/5J	53285	.001"	.100"	.500"	0-50-0
25-441/5J	53293	.001"	.100"	.500"	0-100
25-441/5J W/SLC*	66864	.001"	.100"	.500"	0-100
25-341J	53287	.001"	.100"	1.000"	0-50-0
25-441J	53295	.001"	.100"	1.000"	0-50-0
25-441J W/SLC*	66863	.001"	.100"	1.000"	0-100

### 25 Dial Indicators with Jewel Bearings

Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading
25-341/5P	53286	.001"	.100"	.500"	0-50-0
25-441/5P	53294	.001"	.100"	.500"	0-100
25-341P	53288	.001"	.100"	1.000"	0-50-0
25-441P	53296	.001"	.100"	1.000"	0-100

\* Includes redemption card for Standard Letter of Certification.



# DIAL INDICATORS

## 253 DIAL INDICATOR SETS

### INCH AND MILLIMETER READING

These sets provide in one handy, compact kit three 25 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.



#### 253 Dial Indicator Sets

Cat. No.	EDP	Description
S253Z	51218	Set of 3 Inch Reading Dial Indicators: 25-111J, 25-131J and 25-441J
S253MZ	56283	Set of 3 Millimeter Reading Dial Indicators: 25-161J, 25-181J and 25-881J

Sets furnished in attractive, protective case.

## 655 DIAL INDICATORS

### 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 non-shock 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.

If lift lever is desired, indicator must be ordered with case stem cap.

#### 655 Dial Indicators

Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading	Stem Dia.
655-161J	53533	0.002mm	0.2mm	0.5mm	0-10-0	.375" (9.5mm)
655-161J-8	64659					
655-261J	53603	0.002mm	0.2mm	0.5mm	0-20	.375" (9.5mm)
655-261J-8	64660					
655-181J	53535	0.01mm	1.0mm	2.5mm	0-50-0	.375" (9.5mm)
655-181J-8	64661					
655-281J	53605	0.01mm	1.0mm	2.5mm	0-100	.375" (9.5mm)
655-281J-8	64868					
655-881J	56229	0.01mm	1.0mm	25mm	0-100	.375" (9.5mm)
655-881J-8	64869					

#### 655 Dial Indicators

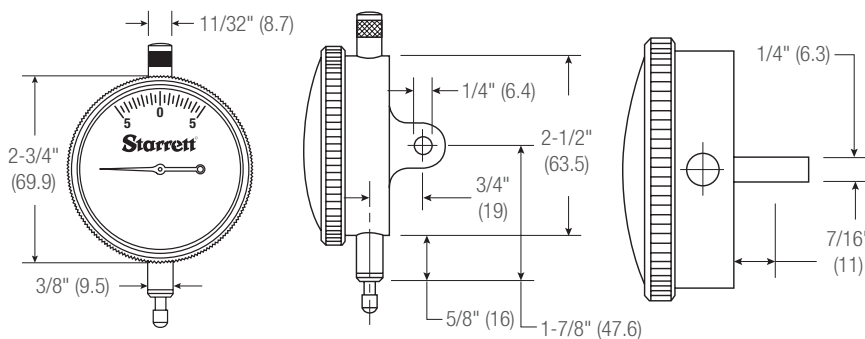
Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading
655-118J	53507	.0001"	.008"	.020"	0-4-0
655-111J	53505	.0001"	.010"	.025"	0-5-0
655-211J	53537				0-10
655-511J	53615	.0001"	.010"	.200"	0-5-0
655-611J	53617				0-10
655-124J	53509	.00025"	.010"	.025"	0-5-0
655-224J	53539				0-10
655-128J	53511	.00025"	.020"	.050"	0-10-0
655-228J	53541				0-20
655-129J	53513	.00025"	.030"	.075"	0-15-0
655-229J	53543				0-30
655-134J	53517	.0005"	.020"	.050"	0-10-0
655-234J	53587				0-20
655-136J	53519	.0005"	.030"	.075"	0-15-0
655-236J	53589				0-30
655-138J	53521	.0005"	.040"	.100"	0-20-0
655-238J	53591				0-40
655-131J	53515	.0005"	.050"	.125"	0-25-0
655-231J	53585				0-50
655-142J	53525	.001"	.020"	.050"	0-10-0
655-242J	53595				0-20
655-143J	53527	.001"	.030"	.075"	0-15-0
655-243J	53597				0-30
655-144J	53529	.001"	.040"	.100"	0-20-0
655-244J	53599				0-40
655-145J	53531	.001"	.050"	.125"	0-25-0
655-245J	53601				0-50
655-141J	53523	.001"	.100"	.250"	0-50-0
655-241J	53593				0-100
655-341/5J	53607	.001"	.100"	.500"	0-50-0
655-441/5J	53611				0-100
655-341J	53609	.001"	.100"	1.000"	0-50-0
655-441J	53613				0-100



655-111J



655-161J-8



655-131J with top lift

655-341J with stem cap





# DIAL INDICATORS

## 656 DIAL INDICATORS

### 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 non-shock mechanism is available for all models except 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.

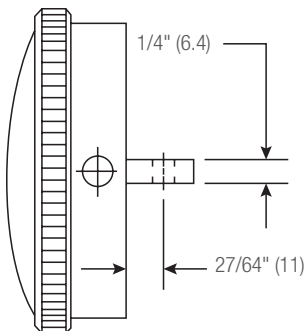
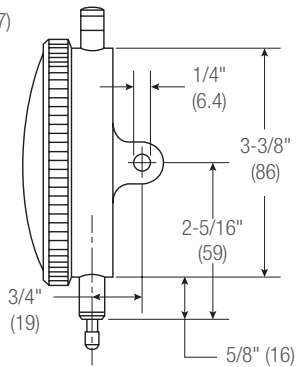
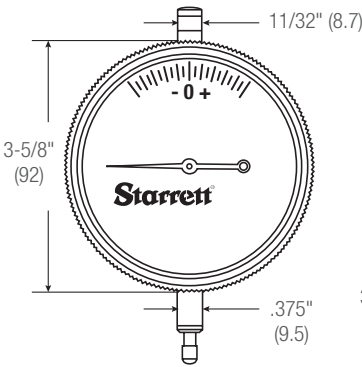
If lift lever is desired, indicator must be ordered with case stem cap.



656-111J



656-161J-8



Free drafting template available for this size.  
Write The L. S. Starrett Co. at:  
121 Crescent Street  
Athol, MA 01331.

656 Dial Indicators						
Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading	Stem Dia.
656-161J	53690	0.002mm	0.2mm	0.5mm	0-10-0	.375" (9.5mm)
656-161J-8	64870					
656-261J	53779	0.002mm	0.2mm	0.5mm	0-20	.375" (9.5mm)
656-261J-8	64871					
656-181J	53692	0.01mm	1.0mm	2.5mm	0-50-0	.375" (9.5mm)
656-181J-8	64872					
656-281J	53781	0.01mm	1.0mm	2.5mm	0-100	.375" (9.5mm)
656-281J-8	64873					
656-881J	56234	0.01mm	1.0mm	25mm	0-100	.375" (9.5mm)
656-881J-8	64874					

656 Dial Indicators					
Cat. No.	EDP	Graduation	Range One Rev.	Total	Dial Reading
656-109J	53661	.00005"	.006"	.015"	0-3-0
656-209J	53694				0-6
656-118J	53664	.0001"	.008"	.020"	0-4-0
656-111J	53662	.0001"	.010"	.025"	0-5-0
656-211J	53695				0-10
656-511J	53791	.0001"	.010"	.200"	0-5-0
656-611J	53795				0-10
656-517J	53793	.0001"	.020"	.400"	0-10-0
656-617J	53797				0-20
656-124J	53666	.00025"	.010"	.025"	0-5-0
656-224J	53697				0-10
656-128J	53668	.00025"	.020"	.050"	0-10-0
656-228J	53699				0-20
656-129J	53670	.00025"	.030"	.075"	0-15-0
656-229J	53701				0-30
656-134J	53674	.0005"	.020"	.050"	0-10-0
656-234J	53705				0-20
656-136J	53676	.0005"	.030"	.075"	0-15-0
656-236J	53707				0-30
656-138J	53678	.0005"	.040"	.100"	0-20-0
656-238J	53709				0-40
656-131J	53672	.0005"	.050"	.125"	0-25-0
656-231J	53703				0-50
656-142J	53682	.001"	.020"	.050"	0-10-0
656-242J	53713				0-20
656-143J	53684	.001"	.030"	.075"	0-15-0
656-243J	53715				0-30
656-144J	53686	.001"	.040"	.100"	0-20-0
656-244J	53717				0-40
656-145J	53688	.001"	.050"	.125"	0-25-0
656-245J	53719				0-50
656-141J	53680	.001"	.100"	.250"	0-50-0
656-241J	53711				0-100
656-341/5J	53783	.001"	.100"	.500"	0-50-0
656-441/5J	53787				0-100
656-341J	53785	.001"	.100"	1.000"	0-50-0
656-441J	53789				0-100

656-441J with top lift



656-129J stem cap required for use with lift lever

See page 170



## DIAL INDICATORS

### 25, 655, 656 DIAL INDICATORS WITH LONG RANGE

#### 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

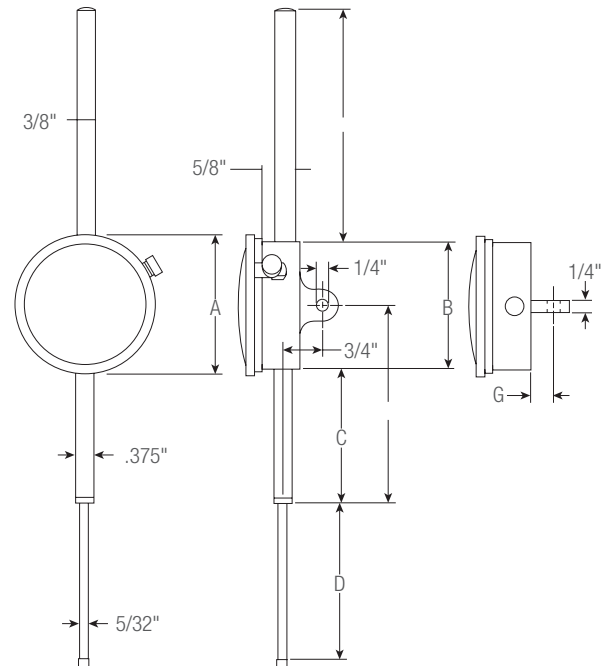
#### 25, 655, 656 Dial Indicators with Long Range

Cat. No.	EDP	Graduation	Range	Dial Reading	Revs. of Hand	AGD Group	Bezel Diameter
25-2041J	53309					2	2-1/4"
655-2041J	53619	.001"	2.000"	0-100	20	3	2-3/4"
656-2041J	53799					4	3-5/8"
25-3041J	53310					2	2-1/4"
655-3041J	53620	.001"	3.000"	0-100	30	3	2-3/4"
656-3041J	53800					4	3-5/8"
25-4041J	53311					2	2-1/4"
655-4041J	53621	.001"	4.000"	0-100	40	3	2-3/4"
656-4041J	53801					4	3-5/8"
25-5041J	53312					2	2-1/4"
655-5041J	53622	.001"	5.000"	0-100	50	3	2-3/4"
656-5041J	53802					4	3-5/8"

Not available with special non-shock mechanism. For other attachments, accessories and contact points, refer to the end of the AGD Dial Indicator listings.

#### Approximate Dimensions

Cat. 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"



25-2041J



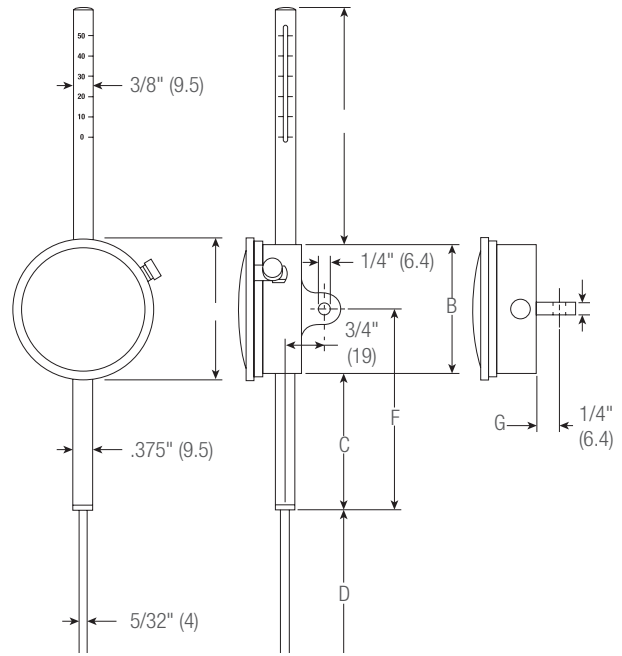
# DIAL INDICATORS

## 25, 655 METRIC DIAL INDICATORS WITH LONG RANGE

### 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



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

Not available with special non-shock mechanism. For contact points, attachments and accessories, refer to the end of the AGD Dial Indicator listings.

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



## DIAL INDICATORS

### 656 DIAL INDICATORS WITH EXTRA LONG RANGE

#### 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

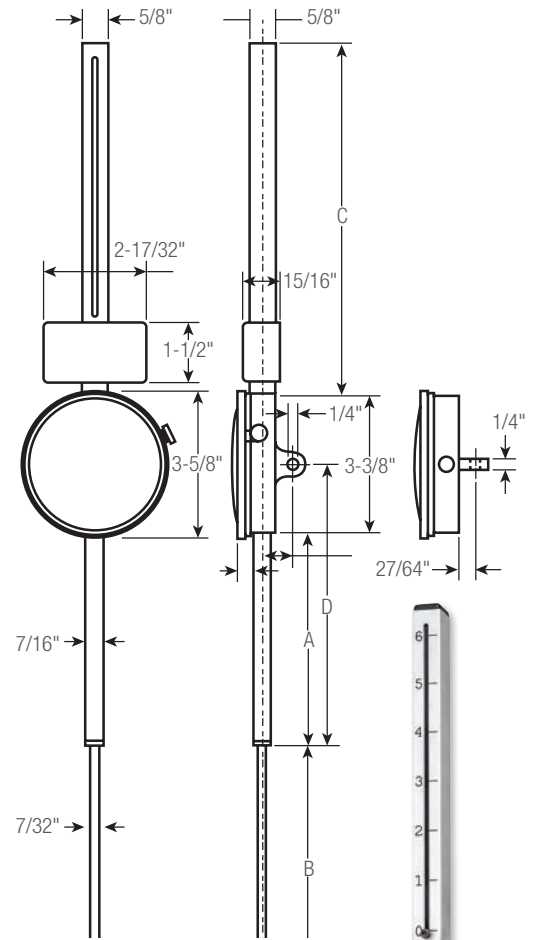
#### 656 Dial Indicators with Extra-Long Range

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

Not available with special non-shock mechanism. For contact points, attachments and accessories, refer to the end of the AGD Dial Indicator Section

#### Dimensions

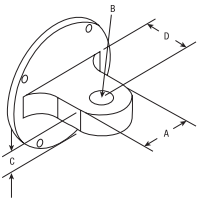
Cat. No.	A	B	C	D
656-6041J	5-1/4"	6-1/16"	8-3/4"	6-15/16"
656-7041J	6-1/4"	7-1/16"	9-3/4"	7-15/16"
656-8041J	7-1/4"	8-1/16"	10-3/4"	8-15/16"
656-9041J	8-1/4"	9-1/16"	11-3/4"	9-15/16"
656-10041J	9-1/4"	10-1/16"	12-3/4"	10-15/16"
656-11041J	10-1/4"	11-1/16"	13-3/4"	11-15/16"
656-12041J	11-1/4"	12-1/16"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



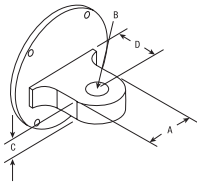
656-6041J



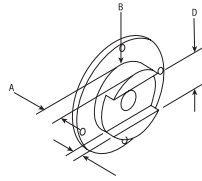
# INDICATOR BACKS



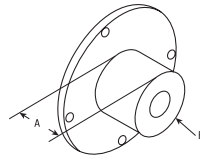
Lug-On-Center



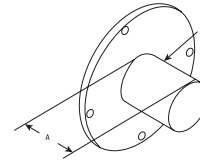
Lug-Off-Center



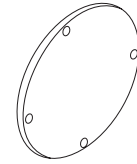
Adjustable Bracket



Screw-Type Lug



Post-Type Lug



Flat

## AGD Dial Indicator Backs

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

\* Regularly furnished on all listed indicators at no extra charge.

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

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



## DIAL INDICATORS

### 647 DIAL COMPARATOR INDICATORS

The 647 Dial Comparator Indicators offer a high degree of security and precision. They are based on a solid and well thought-out construction taking into account the latest technology. They are manufactured by the most up-to-date methods.

#### 647 and 647M Dial Comparator Indicators

Cat. No.	EDP	Range	Graduation	Dial Reading
647	00001	.004"	.00005"	20-0-20
647M	00002	0.1mm	0.001mm	50-0-50

#### 647 and 647M Dial Comparator Indicator Accessories

Part No.	EDP	Description
PT15052	00537	Lug-on-center back
PT15053	00538	Lift cable

#### FEATURES AND SPECIFICATIONS

- Effective non-shock mechanism
- Pinions and shafts of the movement are jeweled
- After removal of the safety cap and adjustment screw on top of the case allows simple and safe zero setting of the instrument over the total measuring range
- A safety cap prevents unintentional turning of the fine adjustment screws
- Stem and spindle are made of hardened stainless steel
- The measuring spindles are very sensitive on account of their accurate guides
- Additional overtravel assists with the insertion of work pieces into the measuring device
- The clear scale is shadow free
- The red tolerance markers are easy to recognize and to set
- Furnish with flat back



647



647M

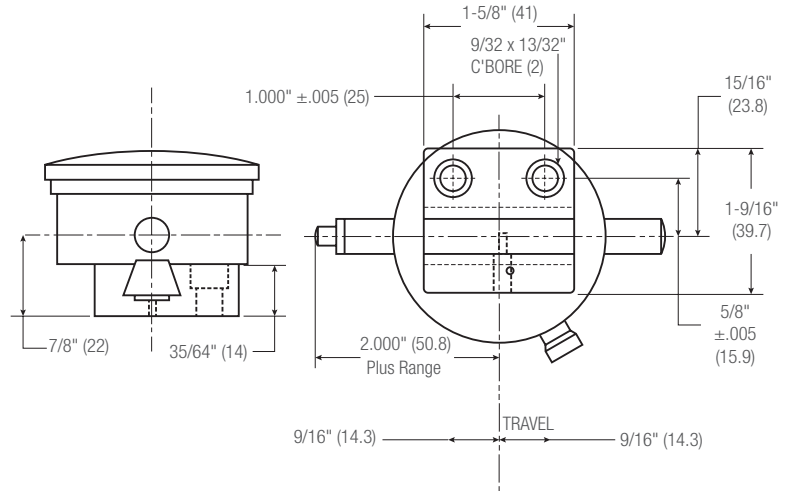


# INDICATOR BACKS

## SPECIAL INDICATOR BACKS

### 674 BACKS WITH ADJUSTABLE MOUNTING BRACKET

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 counter-bored mounting holes (for 1/4" socket head screws), and the back has four screw holes so the indicator back can be rotated.



#### 674 Backs with Adjustable Mounting Bracket

Cat. No.	EDP	Fits Starrett Models
674-1	66374	81
674-2	52892	25, 2600, 2900
674-3	52893	655
674-4	52894	656

674-2

### 676 MAGNETIC BACKS

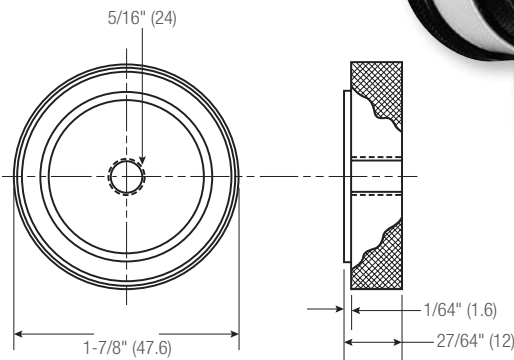
These magnetic backs provide a quick and easy means of attaching any Starrett AGD indicator to flat, ferrous metal surfaces. A real time-saver for machine, jig and fixture set up. Requires no clamps, rods or snugs. A special 5/16"-24 threaded stud back is provided to replace the standard lug back. The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

#### 676 Magnetic Backs

Cat. No.	EDP	Fits Starrett Models
676-1	56647	81
676-2	56648	25, 2600, 2900
676-3	56649	655
676-4	56650	656



676-2



### 672 UNIVERSAL BACKS

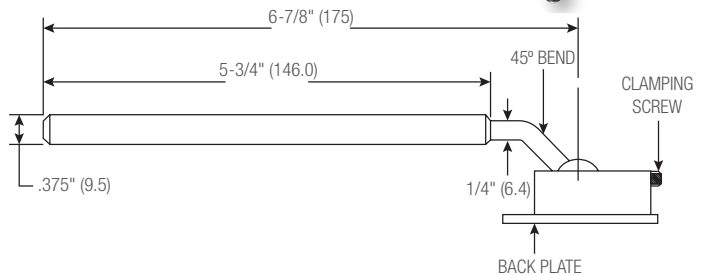
Featuring a universal ball joint attached to the end of a gooseneck shank, these attachments make it possible to position an AGD indicator at any desired setting. The indicator can be rotated 360° and angularly up to 90° and locked in the desired position by tightening a single knurled nut. Straight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

#### 672 Universal Backs

Cat. No.	EDP	Fits Starrett Models
672-2	52887	25, 2600, 2900
672-3	52888	655
672-4	52889	656



672-2



## INDICATOR ACCESSORIES

### AGD INDICATOR ATTACHMENTS AND ACCESSORIES

#### 670 INDICATOR HOLE ATTACHMENT

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.

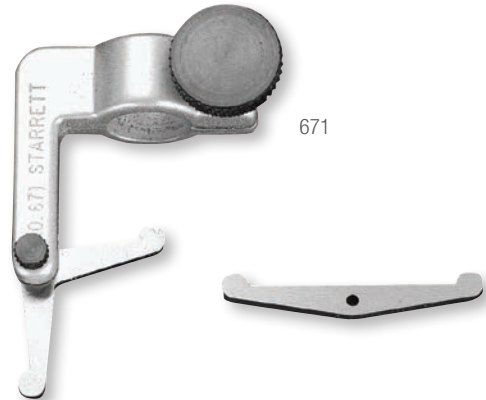
670 Indicator Hole Attachment					
Cat. No.	EDP	Range (Approx.)		For Hole Depths to:	
		in	mm	in	mm
670A	52884	3/8	9.5	13/16	20
670B	52724	9/16	14.3	1-11/16	42



#### 671 UNIVERSAL ATTACHMENT

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.

671 Universal Attachment				
Cat. No.	EDP	Range (Approx.)		
		in	mm	
671	52886	1/8	3	



#### SPECIAL NON-SHOCK MECHANISM

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 non-shock 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.

The following indicators are not available with non-shock mechanism: 25-109, 25-209, 2600 and 2700 Indicators; 656-109, 656-209 and all other indicators with 2" (50mm) range and above.



25-111JNS with Special Non-Shock Mechanism





# INDICATOR ACCESSORIES

## AGD INDICATOR CONTACT POINTS AND ACCESSORIES

Any of the contact points listed here can also be used with the 650 and 651 Indicators and with the 196 Indicators by using the 196R Adapter.

### EXTRA-LENGTH REGULAR-STYLE CONTACT POINTS WITH ROUND OR FLAT ENDS

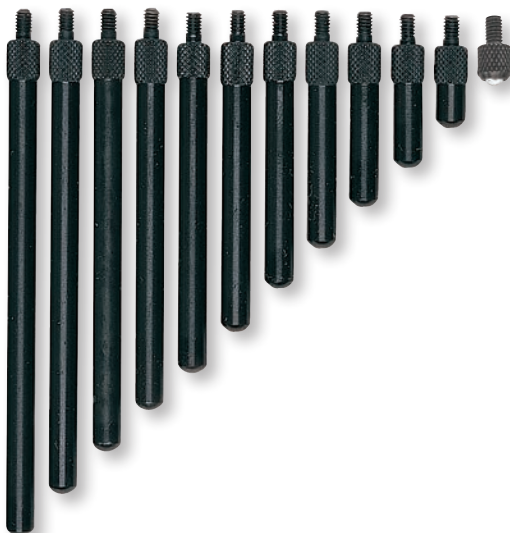
#### 1/4-4"/6-100MM

All Starrett AGD indicators are regularly furnished with 1/4" (6.4mm) 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.

Extra-Length Contact Points, Regular Style					
Rounded End Part No.	EDP	Flat End Part No.	EDP	Length in	mm
PT07215	70965				
PT01761	75263	PT10453	72048	1/4	6.4
PT06677	70823	PT09560	71260	1/2	13
PT06677A	70824	PT09560A	71261	3/4	19
PT06677B	70825	PT09560B	71262	1	25
PT06677C	70826	PT09560C	71263	1-1/4	32
PT06677D	70827	PT09560D	71264	1-1/2	38
PT06677E	70828	PT09560E	71265	1-3/4	44
PT06677F	70829	PT09560F	71266	2	50
PT06677G	70830	PT09560G	71267	2-1/4	57
PT06677H	70831	PT09560H	71268	2-1/2	63
PT06677J	70832	PT09560J	71269	2-3/4	70
PT06677K	70833	PT09560K	71270	3	75
PT10459	71327			4	100



## 28 SHOCK ABSORBING ANVIL

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.

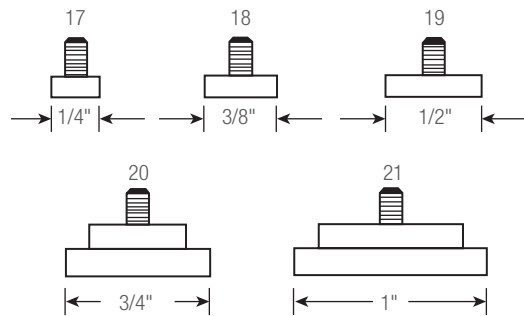
Shock Absorbing Anvil	
Cat. No.	EDP
28	50199



## 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				
Part No.	EDP	Diameter		Style No.
		in	mm	
PT06632-17	70804	1/4	6.4	17
PT06632-18	70805	3/8	9.5	18
PT06632-19	70806	1/2	12.7	19
PT06632-20	70808	3/4	19	20
PT06632-21	70807	1	25	21



# INDICATOR ACCESSORIES

## AGD INDICATOR SPECIAL CONTACT POINTS AND ACCESSORIES

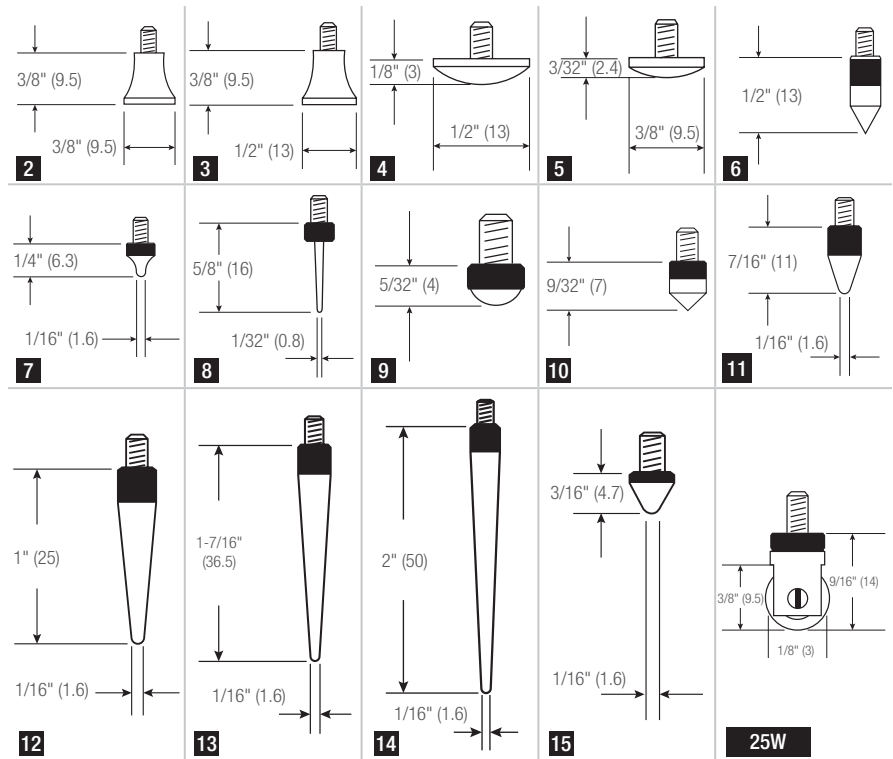
### SPECIAL FORM CONTACT POINTS

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.

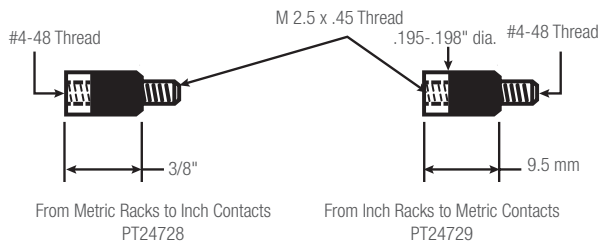
Carbide, sapphire, diamond or teflon-coated contact points are also available by request.

### 25W ROLLER CONTACT POINT

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 drawing (right).



### AGD CONTACT ADAPTERS



From Metric Racks to Inch Contacts  
PT24728

From Inch Racks to Metric Contacts  
PT24729

### AGD CONTACT POINT EXTENSIONS



#### AGD Contact Point Extensions

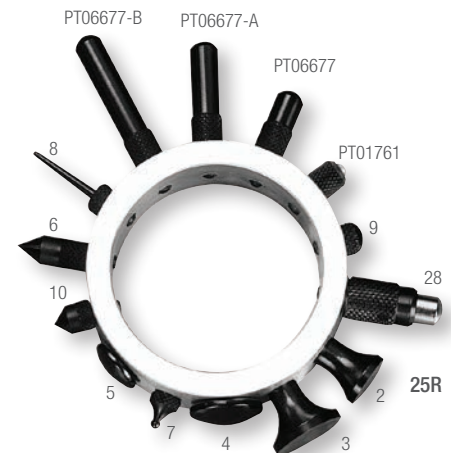
Part No.	EDP	Length
PT21697-1/2	64632	1/2"
PT21697-1	64633	1"
PT21697-2	64634	2"
PT21697-3	64635	3"
PT21697-4	64636	4"

### 25R CONTACT POINT SET

14 points with #4-48 screw thread to fit AGD indicators: a regular 1/4" (6.3mm) long point; 9 special form points; a 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.

#### Contact Points

Style No.	Part No.	EDP
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
	25W	53916
	25R	50153
	PT24728	64963
	PT24729	64964



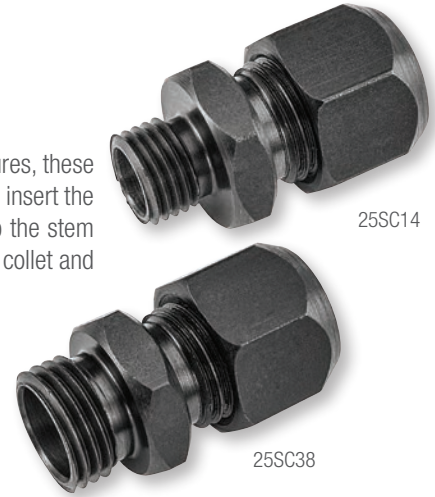
# INDICATOR ACCESSORIES

## AGD INDICATOR ACCESSORIES

### 25SC SPLIT COLLETS

#### 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 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".



25SC Split Collets English Thread				
Cat. No.	EDP	Thread Size	Thread Length	Hole for Indicator Stem
25SC14	50155	3/8-24NF	9/32" (7mm)	.375" (9.5mm) Diameter to 1/2" (12.7mm) depth; 1/4" (6.3mm) Diameter through hole
25SC38	50156	1/2-20NF		.375" (9.5mm) Diameter through hole
25SC38B	55995	1/2-32UN		.375" (9.5mm) Diameter through hole
25SC Split Collets Metric Thread				
Cat. No.	EDP	Thread Size	Thread Length	Hole for Indicator Stem
25SC8M	64885	M12 x 1.75	7mm	8mm Diameter through hole

#### SPLIT BUSHINGS

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

Split Bushings for 80 Miniature Dial Indicators				
Cat. No.	EDP	Length	Diameter	
			Inside	Outside
80SB	56008	1/2"	.219"	.375"
Split Bushings for AGD English Indicators				
Cat. No.	EDP	Length	Diameter	
			Inside	Outside
25SB	50154	1/2"	.375"	.500"
Split Bushings for AGD Metric Indicators				
Cat. No.	EDP	Length	Diameter	
			Inside	Outside
25MSB	56007	12.7mm	8mm	9.5mm

#### 648 DEPTH GAGE BASES WITH STEM COLLET

Depth gage base with 25SC38 Stem Collet to fit 3/8" (9.5mm) stem dia. (as per AGD). Split bushings for adapting stem diameter are available but not included.

648 Depth Gage Bases with Stem Collet			
Cat. No.	EDP	Base Size	
		in	mm
648-4	65850	4	100
648-6	65851	6	150
648-8	65852	8	200

#### LONG STEM DIAL INDICATORS

Starrett 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.

Long stems not available on 80 Miniature Dial Indicators.



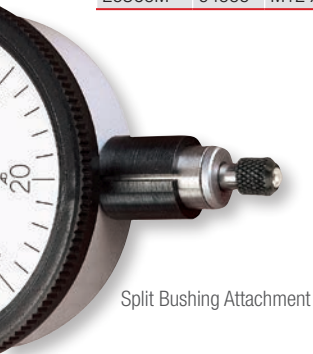
#### THREADED STEMS

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.

#### 25LC RANGE LIMIT CAP

The Range Limit Cap replaces the stem cap furnished on most 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).

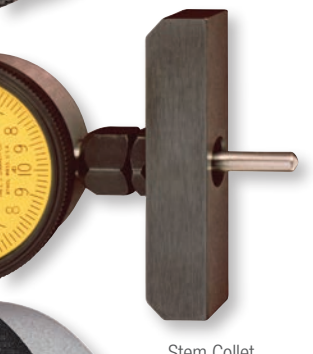
25LC Range Limit Cap	
Part No.	EDP
25LC	50152



Split Bushing Attachment



Threaded Stem Attachment



Stem Collet



Range Limit Cap



## INDICATOR ACCESSORIES

### AGD INDICATOR ACCESSORIES

#### 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 2700 Indicators.

#### RUBBER DUST GUARD

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

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

#### AGD DIAL INDICATOR TOLERANCE HANDS

Starrett dial indicators may be ordered with crystal-mounted or bezel-mounted tolerance hands for visually checking limits of a 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 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 81 and 25 AGD Indicators only.

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 25 AGD Indicators only. Order PT99513 (EDP 66038).

#### 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.

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

#### LEVER CONTROL

Handy attachment mounts in place of stem cap and is interchangeable on most Starrett 81, 25, 2600, 655 and 656 AGD Indicators up to 1" or 25mm range. Pressing down lever lifts spindle; releasing it lets 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:** Fits only indicators with a case stem cap.

Lever Control	
Part No.	EDP
PT99356	72088



Top Lift

Dust Guard



Indicators with snap-on bezel-mounted hands (left), crystal-mounted hands (above), and bezel-mounted hands (right).



Maximum Hand in at-rest position with indicator hand (left), and in recording position (right).



# INDICATOR TESTERS

## 716, 716M INDICATOR TESTERS

### 0-1"/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 469 super-precision head with reverse reading capability. When testing a 2700 or 2900 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.



716 Indicator Tester (0-1" Range)			
Cat. No.	EDP	Micrometer Head Graduation*	Description
716X	67228	.0001"	Tester with carbide faced spindle, indicator mounting and offset attachment
716M Indicator Tester (0-25mm Range)			
Cat. No.	EDP	Micrometer Head Graduation*	Description
716MX	67229	0.002mm	Tester with carbide faced spindle, indicator mounting and offset attachment
Accessory for 716, 716M Indicator Testers			
Cat. No.	EDP	Description	
PT26009	65102	Indicator mounting attachment only	

\*Available on special order with resolution to .000050" or 0.001mm.



Dial test indicator held in place by an offset attachment



Checking AGD dial indicator



**NEW!**

# ELECTRONIC INDICATORS

## 2900 ELECTRONIC INDICATORS

RANGES FROM .5" (12MM) TO 2" (50MM)  
AGD GROUP 2

The 2900 Electronic Indicators are available in a choice of configurations to meet a range of requirements. Innovative True Absolute Sensor Technology minimizes the chance of data loss for exceptional reliability. Built with IP67 protection and renowned Starrett quality, they maintain their reliability in hostile shop environments.

### FEATURES

- Intuitive design and layout – easy to learn and use
- Positive, tactile-feel button activation
- Long battery life
- CE compliant
- Data output to SPC on all models
- Choice of Basic, Standard and Advanced feature levels
- Fixed ratio measurement systems available
- Compatible with 25 Indicator backs
- Origin set, zero set
- All compatible with 2900 SCM, SCU and SCKB cables
- Counting direction switching (±)



INDICATORS AND GAGES



Inch/Metric -.375" Stem - #4-48 UNF Thread																	
Cat. No.	EDP	Range		Resolution		Accuracy		Additional Features					Ftr. Lock	Max/Min/Runout Value Holding	True Abs. Sensor Tech.	Lug On Ctr. Bck.	CR2032 Btry. (2)
		in	mm	in	mm	in	mm	in/mm Cnv.	Limit Set	Value Preset	Reading Hold	Selectable Res.					
2900-1	09980	.5	12	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-2	09981	.5	12	.0001	0.002	±.00012	±0.003	x							x		
2900-4	09983	.5	12	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-6	09985	.5	12	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-1-1	09960	1	25	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-2-1	09962	1	25	.0001	0.01	±.00012	±0.003	x							x		
2900-3-1	09963	1	25	.0005	0.01	±0.001	±0.03	x								x	x
2900-4-1	09965	1	25	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-5-1	09967	1	25	.0005	0.01	±0.001	±0.03	x	x	x						x	x
2900-6-1	09969	1	25	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-1-2	72676	2	50	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-4-2	72677	2	50	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-6-2	72678	2	50	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x	x	x	x	x

Inch/Metric - 8mm Stem - M2.5 x 0.45 Thread																	
Cat. No.	EDP	Range		Resolution		Accuracy		Additional Features					Ftr. Lock	Max/Min/Runout Value Holding	True Abs. Sensor Tech.	Lug On Ctr. Bck.	CR2032 Btry. (2)
		in	mm	in	mm	in	mm	in/mm Cnv.	Limit Set	Value Preset	Reading Hold	Selectable Res.					
2900-1ME	09971	.5	12	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-4ME	09976	.5	12	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-6ME	09979	.5	12	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-1ME-25	09972	1	25	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-3ME-25	09975	1	25	.0005	0.01	±0.001	±0.03	x								x	x
2900-4ME-25	09977	1	25	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-5ME-25	09978	1	25	.0005	0.01	±0.001	±0.03	x	x	x	x				x	x	x
2900-6ME-25	09991	1	25	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-1ME-50	72679	2	50	.0005	0.001	±.00012	±0.003	x							x	x	x
2900-4ME-50	72681	2	50	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x		x	x	x
2900-6ME-50	72683	2	50	.0005/.0001/.00005	0.01/0.001	±.00012	±0.003	x	x	x	x	x	x	x	x	x	x

Metric Only - 8mm Stem - M2.5 x 0.45 Thread																	
Cat. No.	EDP	Range		Resolution		Accuracy		Additional Features					Ftr. Lock	Max/Min/Runout Value Holding	True Abs. Sensor Tech.	Lug On Ctr. Bck.	CR2032 Btry. (2)
		in	mm	in	mm	in	mm	in/mm Cnv.	Limit Set	Value Preset	Reading Hold	Selectable Res.					
2900-1M	09986	.5	12		0.001		±0.003								x	x	x
2900-4M	09988	.5	12		0.01/0.001		±0.003		x	x	x	x	x		x	x	x
2900-6M	09990	.5	12		0.01/0.001		±0.003		x	x	x	x	x		x	x	x
2900-1M-25	09961	1	25		0.001		±0.003								x	x	x
2900-3M-25	09964	1	25		0.01		±0.03									x	x
2900-4M-25	09966	1	25		0.01/0.001		±0.003		x	x	x	x	x		x	x	x
2900-5M-25	09968	1	25		0.01		±0.03		x	x	x				x	x	x
2900-6M-25	09970	1	25		0.01/0.001		±0.003		x	x	x	x	x		x	x	x
2900-1M-50	72680	2	50		0.001		±0.003								x	x	x
2900-4M-50	72682	2	50		0.01/0.001		±0.003		x	x	x	x	x		x	x	x
2900-6M-50	72684	2	50		0.01/0.001		±0.003		x	x	x	x	x	x	x	x	x

\*Fixed ratios available with special order. (exception of 2900-5M-25)



# ELECTRONIC INDICATORS

NEW!

## 2700 BACKLIGHT ELECTRONIC INDICATORS

The 2700 Backlight Electronic Indicators are offered in 1", 2" and 4" ranges. The deep backlight color indicates tolerances to read the indicator at far distances, in poor lighting, and with limited operator experience. A CD drive is required to use the software.

Cat. No.	EDP	Range	SPC Output	Accuracy	Resolution
2700-800	72758	1"	x	(±) 2. Res.	.0001"
2700-801	72759	1"	x	(±) 2. Res.	.000050"
2700-802	72760	2"	x	(±) 2. Res.	.0005"
2700-803	72761	2"	x	(±) 2. Res.	.0001"
2700-804	72762	4"	x	(±) 2. Res.	.0005"
2700-805	72763	4"	x	(±) 2. Res.	.0001"

### Accessories, Power Source, Cables

Part No.	EDP	Description
PT60646	72592	Cable to SPC computer, not foot switch
2700SCKB	69891	USB cable to PC (In focused window), all 2700 Series
2700SCU	23956	USB Cable, all 2700 Series
2700SCM	69896	SmartCable Gage MUX - all 2700 Series

### Backs/Lever\*

Part No.	EDP	Description
PT26406	65886	Flat back
PT26407	65887	Offset lug back
PT26411	65891	Adjustable lug back
PT26408	65888	Adjustable back
PT26409	65889	Post-type back
PT26410	65890	Screw bracket back
PT26848	66293	Adjustable mounting bracket back
PT26405	65885	Lifting lever

\*Other backs, styles and accessories also available by request.

### FEATURES

- Backlight relates a reading to tolerance values
- SPC Cables USB, MTI, RS232
- Inch/metric display
- Analog visual display
- Travel reverse
- Maximum reading hold
- Display/freeze hold
- Single gage simple data collection included
- Floating zero
- Minimum reading hold
- Abs./preset measuring mode
- T.I.R. with low and high storage recall
- Lock combination
- USB/AC power cable included
- Software included
- AC power source

INDICATORS AND GAGES



## ELECTRONIC INDICATORS

### 2700 WISDOM ELECTRONIC INDICATORS

The 2700 Wisdom Electronic Indicator is one of the most versatile of the electronic indicators. 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.

#### FEATURES

- 8 resolutions and 4 measuring ranges available
- Plus or minus travel direction
- Zero the tool at any position of the spindle
- Rotating bezel
- Auto Off after 10 minutes of non-use
- Three power sources - operate by battery, A/C adapter or through data port
- Output jack allows data transmission



#### Inch/Metric - .375" Stem - #4-48 UNF Thread

Cat. No.	EDP	Range		Resolution		Accuracy	
		in	mm	in	mm	in	mm
F2720IQ	49508	0.6	15	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2720AD	49500	0.6	15	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2720-1AD	00043	0.6	15	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0001	$\pm$ 0.002
F2730IQ	49509	1	25	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2730-1IQ	49516	1	25	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2730AD	49501	1	25	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2730-1AD	00045	1	25	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2740IQ	49510	2	50	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2740AD	49502	2	50	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2750IQ	49511	4	100	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2750AD	49503	4	100	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004

#### Inch/Metric - 8mm Stem - M2.5 x 0.45 Thread

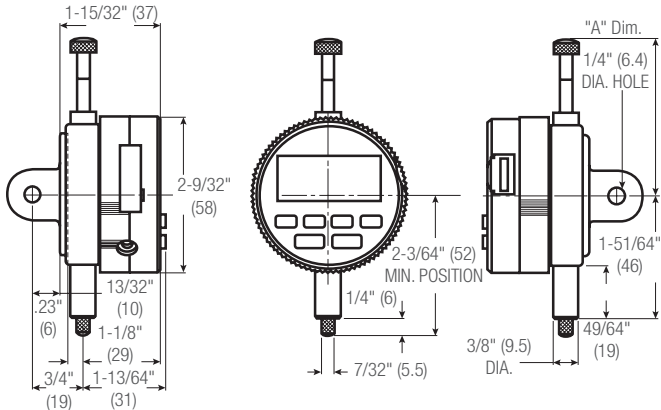
Cat. No.	EDP	Range		Resolution		Accuracy	
		in	mm	in	mm	in	mm
F2720IQM	49512	0.6	15	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2720ADM	49504	0.6	15	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2720-1ADM	09993	0.6	15	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2730IQM	49513	1	25	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2730-1IQM	09992	1	25	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2730ADM	49505	1	25	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	$\pm$ .0001	$\pm$ 0.002
F2730-1ADM	09994	1	25	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2740IQM	49514	2	50	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2740ADM	49506	2	50	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2750IQM	49515	4	100	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004
F2750ADM	49507	4	100	.001/.0005/.0001	0.02/0.01/0.002	$\pm$ .0002	$\pm$ 0.004





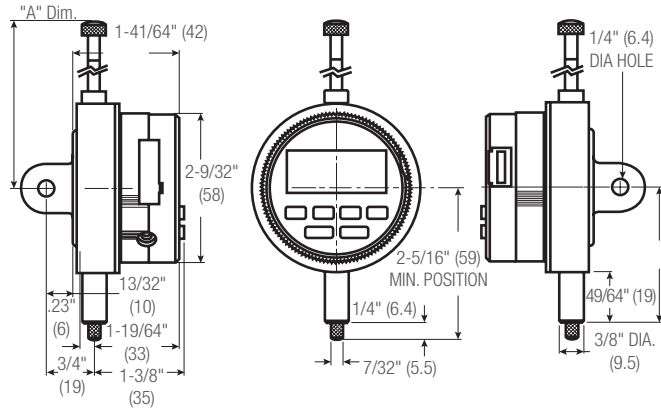
# ELECTRONIC INDICATORS

## .250"/6MM AND .600"/15MM MODELS



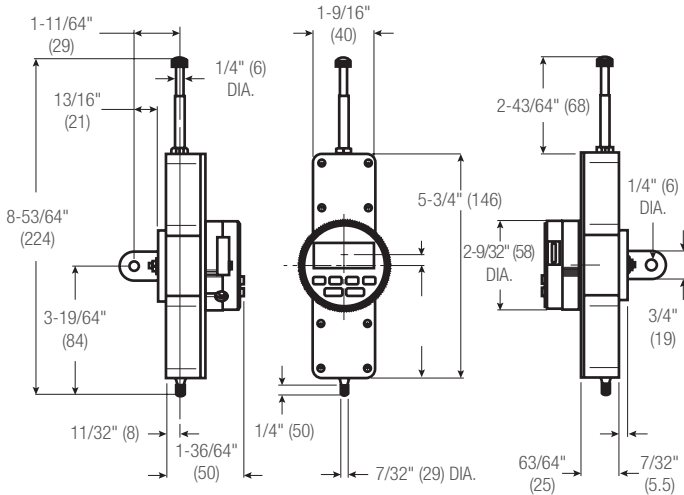
Travel		A Dimension	
in	mm	in	mm
.600	15	2-13/32	61
.250	6.4	2-1/16	52

## 1"/25MM MODELS

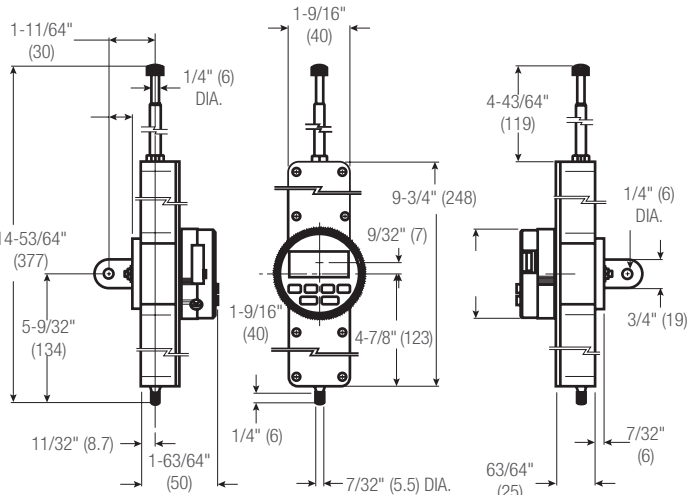


Travel		A Dimension	
in	mm	in	mm
1	25.4	2-7/8	73

## 2"/50 MM MODELS



## 4"/100MM MODELS



### Accessories, Power Source, Cables

Part No.	EDP	Description
PT26413	65880	A/C Adapter, 110-Volt
PT26404	65884	Replacement Zinc Air Batteries, 4-Pack
PT61120	65446	Replacement Battery, 1-Pack (req. 2)
PT61489	65904	Cable to Module PT61490, to Connect to 772 Data Collectors and 761 Multiplexers
PT26415	65882	Cable for Wisdom Indicator to Wisdom Remote Display
PT26441	65893	USB Cable to RS232 (PC/Compatible)
2700SCM	69896	7612 Data Multiplexer Gage Interface

### Backs/Lever\*

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

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

### Extension Cables

Part No.	EDP	Description
PT05679	68752	6' Extension Cable
2700SCKB	69891	USB cable to PC (In focused window)

### Backs/Lever\*

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

\*Other backs, styles and accessories also available by request. To order contact points individually, see previous pages.  
NOTE: Probe and display resolutions must be the same for accurate readings.



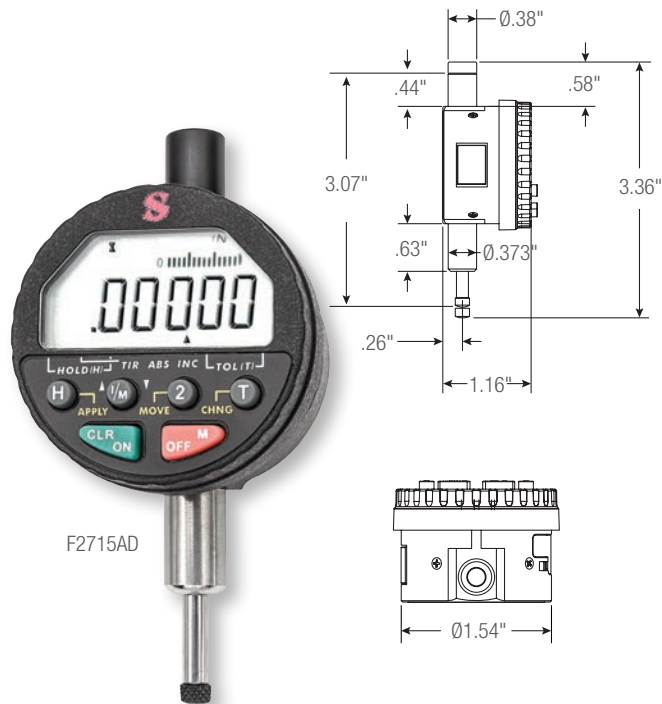
# ELECTRONIC INDICATORS

## 2700 GROUP 1 DIGITAL INDICATORS

### AGD GROUP 1

#### FEATURES

- 270 degree Rotating Bezel - Allows viewing at different attitudes
- Smaller Diameter - A dimensional match to AGD Group one mechanical indicators (1.700"/43mm)
- Two Available Displays - Single LCD Numeric IQ model (largest of its class) with low battery warning and programmable ratios or Numeric/Analog AD model showing its two displays simultaneously
- .400 travel
- Allows storage of 200 readings internally and viewed, stored readings can be downloaded with included software and USB style cable
- Easy wired communication with cables or using Starrett DataSure® wireless (contact Starrett)
- Long battery life (with one CR232 cell) 3,000 hours under typical use also can be powered by plugging into your computer



F2715AD

Inch/Metric - 8mm Stem - M2.5 x 0.45 Thread							
Cat. No.	EDP	Range		Resolution		Accuracy	
		in	mm	in	mm	in	mm
F2715IQ	72970	0.4	10	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	±.0001	±0.002
F2715AD	72971	0.4	10	.001/.0005/.0001/.00005	0.02/0.01/0.002/0.001	±.0001	±0.002
F2714IQ	73273	0.4	10	.001/.0005/.0001	0.02/0.01/0.002	±.0001	±0.002
F2714AD	73274	0.4	10	.001/.0005/.0001	0.02/0.01/0.002	±.0001	±0.002

## 3900 ELECTRONIC INDICATORS

### AGD GROUP 2

#### RANGES UP TO .500" AND 12.7MM

The 3900 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
- 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 with additional flat back
- Dust cap
- Plastic storage case with clear cover



3900-5

Cat. No.	EDP	Range		Resolution		Accuracy	
		in	mm	in	mm	in	mm
3900-5	72538	.5	12.7	.0005	0.01	±0.001	±0.03
3900M-5	72537		12.7		0.01		±0.03

Accessory		
Cat. No.	EDP	Description
PT61918	67169	SR44 battery



# INDICATOR HOLDERS

## 3670 DIAL INDICATOR STANDS

The 3670 Dial Gage Stands are versatile and easily adapted to thickness gages for comparator work.

A perfect companion for the 647 Comparator Indicator.

### FEATURES

- Designed for comparison measurements using a dial indicator or digital indicator
- Vertical fine adjustment is standard on all models
- Rugged bracket holds indicator firmly in place
- Can be used with any A.G.D. dial or digital indicator
- Furnished with a serrated or flat anvil which is ground and lapped and removable



3671 with 647M  
Comparator Indicator

3670 Dial Gage Stands (3/8" stem hole; 8mm bushing)		
Cat. No.	EDP	Description
3671	69901	Indicator stand with round flat anvil
3672	69902	Indicator stand with round serrated anvil
3673	69903	Indicator stand with square serrated anvil



3671



3672



3673

NEW!

INDICATORS AND GAGES



## INDICATOR HOLDERS

### 657 INDICATOR HOLDERS

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 25-131J (graduation .0005", dial reading 0-25-0, range .125") or millimeter reading 25-181J (graduation 0.01mm, dial reading 0-50-0, range 2.5mm). Other indicators can be furnished on request.

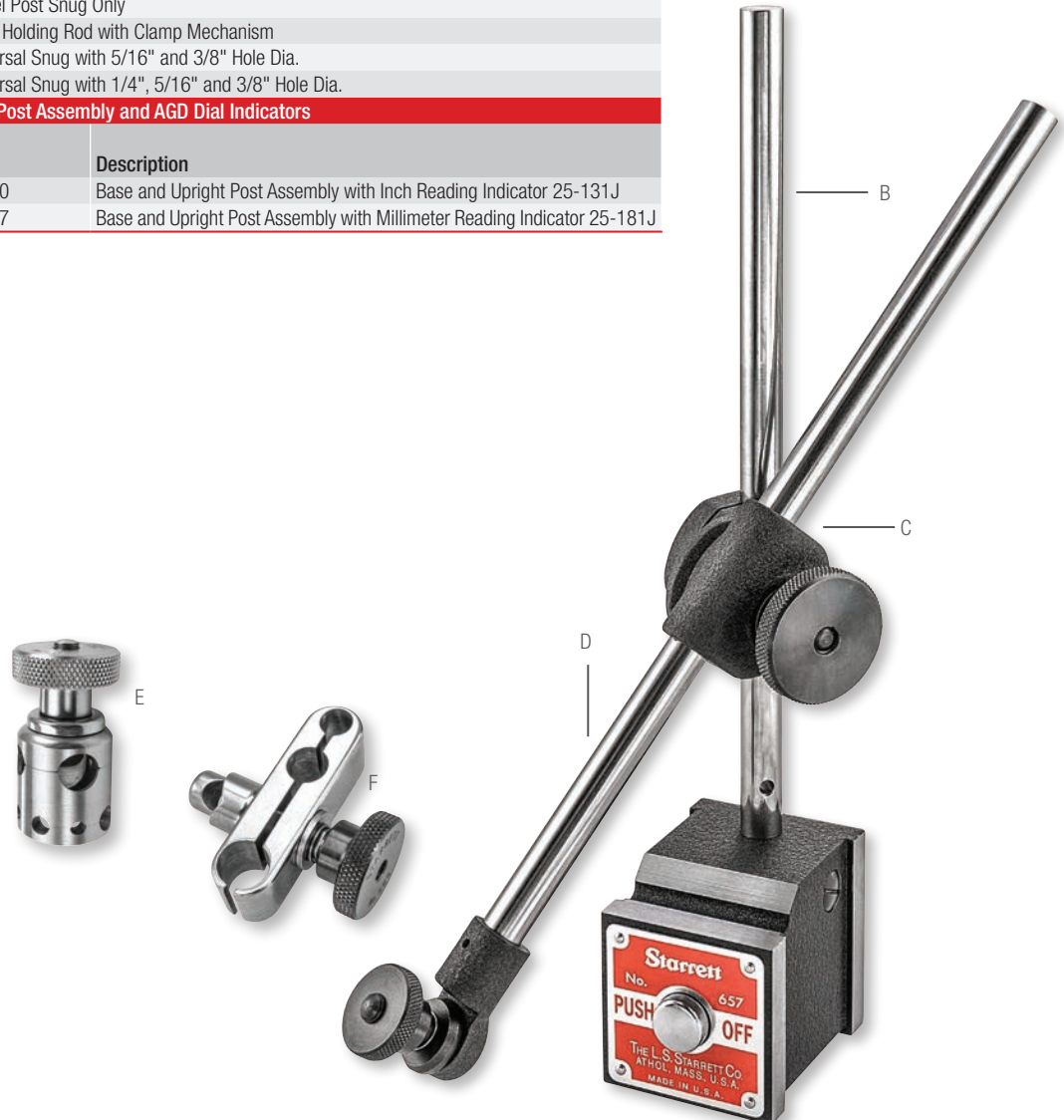
- A. 657P Magnetic Base. 1-15/16" x 1-5/8" x 1-7/8" (50 x 40 x 48mm) deep. Push button on/off switch for one-hand operation.
- B. 657G Upright Base Post. 3/8" (9.5mm) diameter x 7-7/16" (190mm) length overall.
- C. 657H Swivel Post Snug. Allows universal indicator adjustment – up-and-down, any vertical angle, for a complete 360°. Two 3/8" (9.5mm) holes.
- D. 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. F. 57S and 58S Universal Snugs. Adapt various scribes and indicator shanks to rods and posts.

#### 657 Base Holder Assembly and Individual Components

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

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

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



# INDICATOR HOLDERS

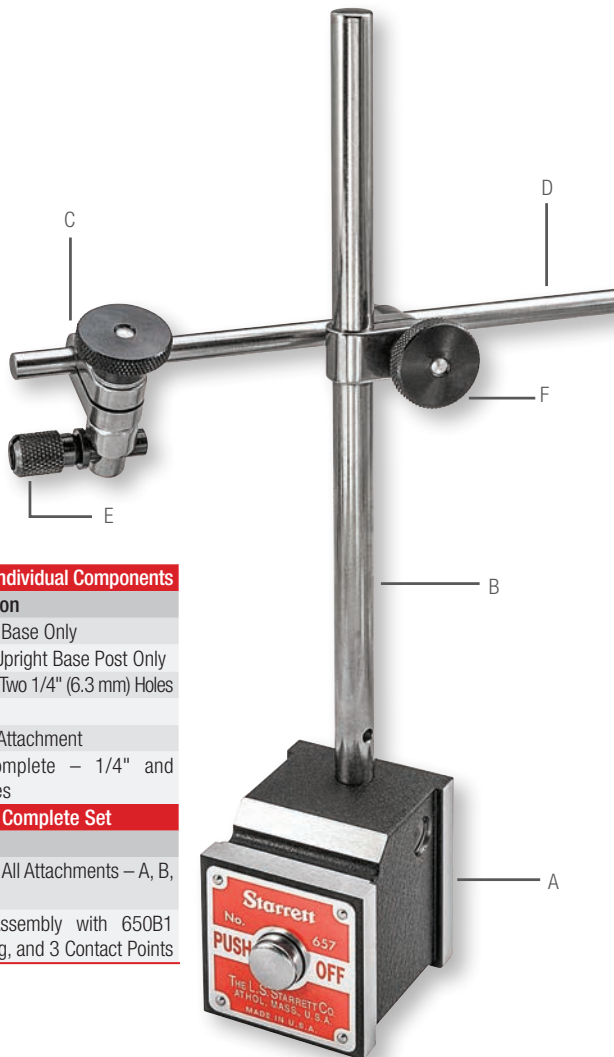
## 657AA MAGNETIC BASE INDICATOR HOLDER

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

- A. 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. 657G Upright Base Post. 3/8" (9.5mm) diameter x 7-7/16" (190mm) length overall. 57S and 58S Universal Snugs may also be used.
- C. 657S Snug. Two 1/4" (6.3mm) diameter holes. Adapts 196, 650, and 651 Dial Indicators and 657Y Indicator Attachment to 657X Rod.
- D. 657X Rod. 1/4" (6.3mm) diameter x 6" (150mm) long. Accommodates Starrett 708, 709, 811 and 711F Dial Test Indicators and 657S Sleeve.
- E. 657Y Indicator Attachment. 1/4" (6.3mm) O.D. one end, other end threaded and fits lug backs of all AGD indicators (81, 25, 655, 656) and 80 Miniature Indicators.
- F. PT18724 Snug. 3/8" (9.5mm) diameter post hole. 1/4" (6.3mm) diameter gripping hole accommodates 657X Rod.



657Y with lug-on-center back



### 657AA Magnetic Base Indicator Holder - Individual Components

Photo Key	Cat. No.	EDP	Description
A	657P	52757	Magnetic Base Only
B	657G	52753	7-7/16" Upright Base Post Only
C	657S	52759	Snug with Two 1/4" (6.3 mm) Holes
D	657X	52764	Rod
E	657Y	52765	Indicator Attachment
F	PT18724	50710	Snug Complete - 1/4" and 3/8" Holes

### 657AA Magnetic Base Indicator Holder - Complete Set

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



657AA with 196B1 Universal Dial Indicator



657AA with 711FS Last Word® Dial Test Indicator



## INDICATOR HOLDERS

### 657A MAGNETIC BASE INDICATOR HOLDER WITH SWIVEL POST ASSEMBLY

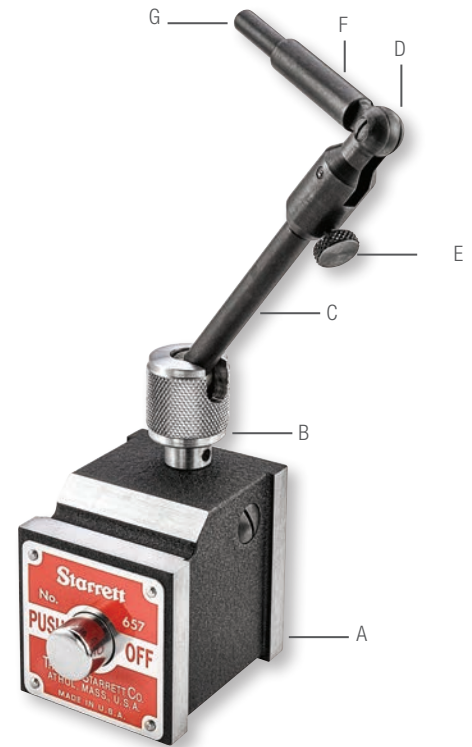
The swivel post assembly on these holders provides universal adjustment in both horizontal and vertical planes. Available with inch or millimeter Dial Test or Back-Plunger Indicators, they save time in shop set-up and other inspection jobs.

For use with all 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. 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.
- C. Post rotates 360°.
- D. 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" (8mm) diameter and swings more than 180°; friction joint holds it in position.
- G. 7/32" (5.5mm) diameter step, 1/2" (13mm) long.



657A with 196B1 Universal Dial Indicator setting up workpiece on milling machine.



657A with 711LS Last Word Dial Test Indicator setting up workpiece on surface grinder.

#### 657A Magnetic Base Indicator Holder - Individual Components

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

### 657 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 657A Magnetic Base and Swivel Post Assembly to suit your needs.

#### 657T Flex-O-Post Indicator Holders with magnetic base - Individual Components

Photo Key	Cat. No.	EDP	Description
F	657P	52757	Magnetic Base Only
(A, B, C, D, E)	3657U	12695	Flex-O-Post with Locking Lever and Snug Only
G	657W	52763	Fine-Adjustment Attachment
A	PT17850	72400	Indicator Holding Rod

#### 657T Flex-O-Post Indicator Holders with magnetic base - Complete Assemblies

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



# INDICATOR HOLDERS

## 657T Flex-O-Post Indicator Holders with Magnetic Base

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 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 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 3657U.
- E. Locking Lever tightens internal steel cable to make post rigid and lock it in position.
- F. Magnetic Base 657P has push-button on/off switch.



651B1 Indicator gripped directly to its stem via the post snug.



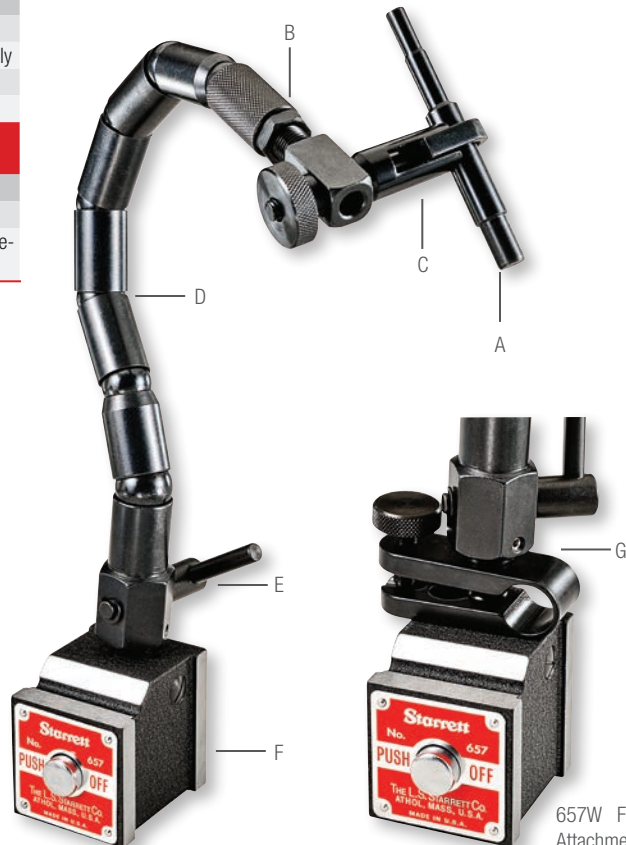
196B1 Indicator via a 657S Snug.

### 657T Flex-O-Post Indicator Holders with magnetic base - Individual Components

Photo Key	Cat. No.	EDP	Description
F	657P	52757	Magnetic Base Only
(A, B, C, D, E)	3657U	12695	Flex-O-Post with Locking Lever and Snug Only
G	657W	52763	Fine-Adjustment Attachment
A	PT17850	72400	Indicator Holding Rod

### 657T Flex-O-Post Indicator Holders with magnetic base - Complete Assemblies

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



657W Fine-Adjustment Attachment



## INDICATOR HOLDERS

### 657-1, 657-2 MAGNETIC BASE UNIVERSAL INDICATOR HOLDER

#### WITH TRIPLE JOINTED ARM AND FINE ADJUSTMENT

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 25, 650 and 651 Indicators)
- Any indicator with a standard dovetail mount (such as our 708, 709, and 811 Indicators)
- Any indicator with a 1/4" (6.3mm) shank (such as our 196 Indicator)
- Any indicator with a 3/16" (4.7mm) shank (such as our 708, 709, 811 and 711 Indicators)
- Any indicator with a body clamp (such as our 711 Indicators)
- The working area is within a hemisphere having a radius of approximately 12" (300mm)
- The very sensitive fine-adjustment is located on the magnetic base to eliminate indicator deflection when it is being adjusted
- The 657-3 Universal Indicator Holder Arm Assembly can also be used on the 659P Base using the 659 Thread Adapter, PT18318

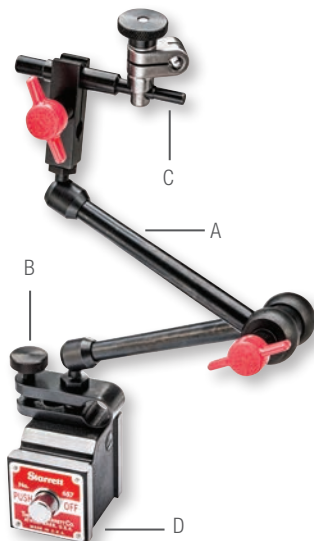
#### 657-1 and 657-2 Magnetic Base Universal Indicator Holders - Individual Components

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

#### 657-1 and 657-2 Magnetic Base Universal Indicator Holders - Complete Assemblies

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

\* Not included with the 657-2



657-1 with 196B1 Universal Dial Indicator



709A Dial Test Indicator with dovetail mount

### 660 MAGNETIC BASE INDICATOR HOLDER

#### WITH TRIPLE JOINTED ARM

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 70lb (320N) 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

#### 660 Magnetic Base Indicator Holder

Cat. No.	EDP	Description
660	68621	Base Indicator Holder



660 shown with Dial Indicator





# INDICATOR HOLDERS

## 661 MINI MAGNETIC INDICATOR HOLDER

The Mini Magnetic Tool Holder is a simple, versatile, effective and economical tool for a variety of indicator holding tasks. It has no levers or switches – simply place the holder on the measuring surface, attach the indicator and position as required.

### FEATURES AND SPECIFICATIONS

- 30 lb (133 N) of holding force
- Base Diameter: 1.180" (30mm)
- Base Height: 1" (25.4mm)
- Overall Height 4.173" (106mm)
- Holds indicators with 3/8" stems or standard dovetail mounts
- Fits over spindles and posts with diameter of 1/4" (6.3mm), such as the 196 Dial Indicator
- Includes an 8mm adapter for indicators with metric (8mm) stems

661 Mini Magnetic Indicator Holder		
Cat. No.	EDP	Description
661	68620	Indicator Holder



## 659 HEAVY-DUTY MAGNETIC BASE INDICATOR HOLDER

### WITH ROTARY ON/OFF SWITCH. FURNISHED WITH OR WITHOUT STARRETT AGD DIAL INDICATORS

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 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 adapter, making it possible to use the 657 Magnetic Base post and attachments. Base and snug have a black wrinkle finish with precision ground contact surfaces.

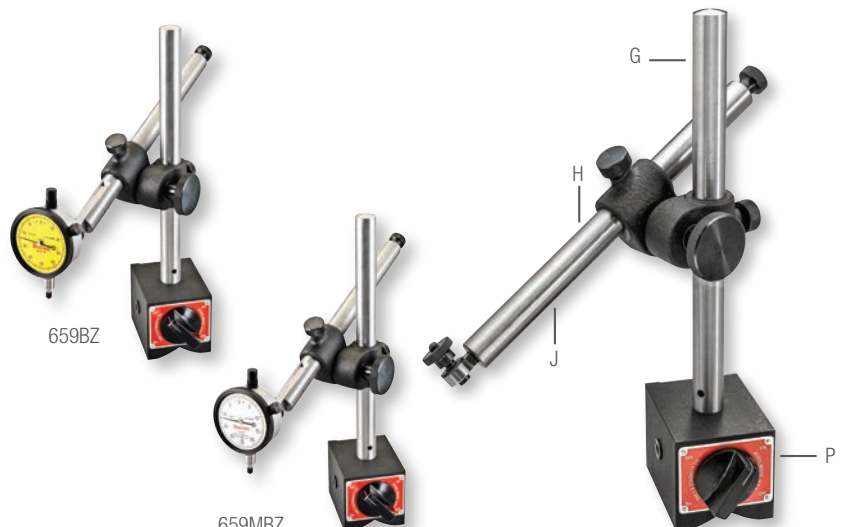
Available with or without Starrett AGD Dial Indicators: inch reading 25-131J (.0005" graduation) or millimeter reading 25-181J (0.01mm graduation). Other mechanical AGD indicators are available on request. Electronic indicators, 2600 and 2700, are also available on request.

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

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

Sets, Including Magnetic Base, Upright Post Assembly and AGD Dial Indicators		
Cat. No.	EDP	Description
659BZ	55948	Base and Upright Post Assembly with Inch Reading Indicator 25-131J in Case
659MBZ	64892	Base and Upright Post Assembly with Millimeter Reading Indicator 25-181J in Case



## INDICATOR HOLDERS

### COMMON TEST AND BACK PLUNGER INDICATOR APPLICATIONS

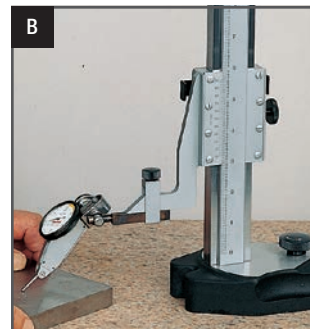
- A. Models with tool post holders, generally used for lathe work.
- B. Indicators may be used on our 665 Inspection Holder.
- B, C. Some indicator holders have flexible joints for holding in different places.
- C, D. Indicators with straight stems or shanks can be held in snugs or in chucks and collets.



### 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 252 Height Transfer Gage with our DIGI-CHEK® Height Gages
- B. Any of our great variety of height gages - 250, 254, 255, and 3752 - can be used for comparing and for actual vertical measurements
- C. Our 57 or 257 Surface Gages. These are for comparison and the truing-up of surfaces



# INDICATOR HOLDERS

## 665 INSPECTION HOLDER AND DIAL INDICATORS

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.

### D. Swivel Post Snug 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 665L Reducing Bushing (J) that can reduce the .465" (11.8mm) hole to 3/8" (9.5mm).

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

Inspection Sets with AGD Dial Indicators		
Cat. No.	EDP	Description
665JZ	56275	Complete with Components and 25-131J Inch Reading Indicator in Case
665MJZ	56276	Complete with Components and 25-181J Millimeter Reading Indicator in Case

Three very useful inspection combinations can be made by removing the complete swivel post snug and gage holding rod as follows:

### G. Clamp 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 665D.

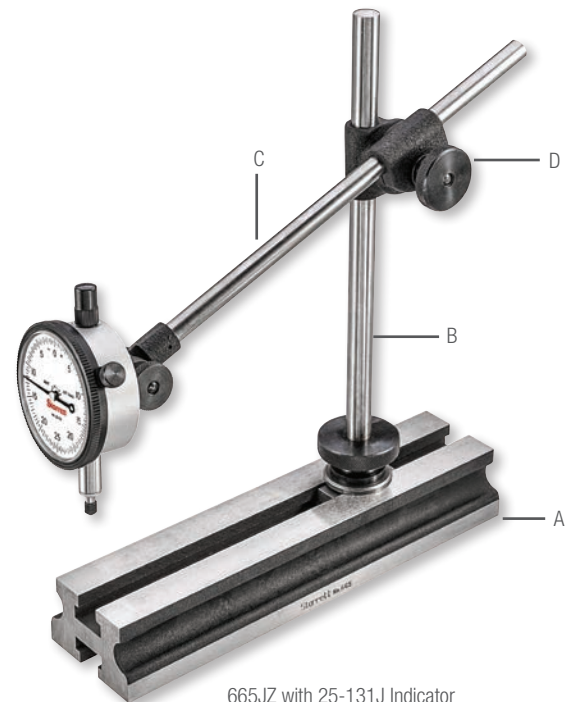
Three other clamp post diameter options available – 665G-3/8 is a 3/8" (9.5mm) diameter clamp post that can be used in the regular swivel post snug 665D with the addition of the 665L reducing bushing. The 665G-5/16 (7.9mm) and 665G-1/4 (6.3mm) can be used with other snugs to hold an indicator.

### H. Tool Post Holder 665H

Put one end of the offset arm into the swivel post snug 665D (with the 665L reducing bushing in it). Then put this rectangular tool post holder 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 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.



665JZ with 25-131J Indicator



## INDICATOR HOLDERS

### 675 DIAL COMPARATORS WITH GRANITE BASE

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).

**NOTE:** Not recommended for electronic indicators 2" and above.

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

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

Available with special non-shock mechanism or without indicator. Any Starrett AGD Dial or Electronic Indicator can be interchanged with indicators listed. Please specify when ordering.



675G

### 653 DIAL COMPARATORS

#### WITH CAST IRON BASE, INCH AND MM READING

### 653G DIAL COMPARATORS

#### 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. Left hand lever furnished unless otherwise specified.

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".

**653 Dial Comparator** has a precision ground cast iron base measuring approximately 8" x 9" (200 x 225mm).

**653G Dial Comparator** has 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).

**NOTE:** Recommended for electronic indicators 2" and above.

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

Individual Components		
Cat. No.	EDP	Description
653J	55917	Comparator with Cast Iron Base, without Indicator
653G	56646	Comparator with Granite Base, without Indicator

Available with special non-shock mechanism or without indicator. Any Starrett AGD Dial or Electronic Indicator can be interchanged with indicators listed. Please specify accordingly.



653J

653GJ



## 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 Gage 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.

## SPECIAL FUNCTION INDICATORS

### CHAMFER GAGES

FOR INTERNAL CHAMFERS:

683 CHAMFER GAGE 0-90°

684 CHAMFER GAGE 90-127°

FOR EXTERNAL CHAMFERS:

685 CHAMFER GAGE 0-90°

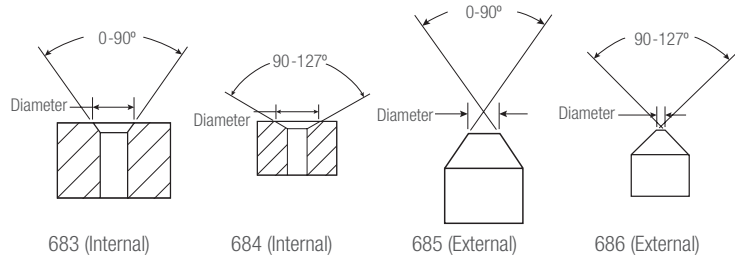
686 CHAMFER GAGE 90-127°

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.



685-2Z Internal Chamfer Gage with 695 Check Stand with F2720-4IQ Electronic Indicator



683 Inch Reading Internal Gages					684 Millimeter Reading Internal Gages with Yellow Dials				
0-90° Angle		90-127° Angle		Range	0-90° Angle		90-127° Angle		Range
Cat. No.	EDP	Cat. No.	EDP		Cat. No.	EDP	Cat. No.	EDP	
683-1Z	63684	684-1Z	63688	0-3/8"	683M-1Z	64989	684M-1Z	64993	0-9.5mm
683-2Z	63685	684-2Z	63689	0-1/2"	683M-2Z	64990	684M-2Z	64994	0-12.7mm
683-3Z	63686	684-3Z	63690	0-1"	683M-3Z	64991	684M-3Z	64995	0-25mm
683-4Z	63687	684-4Z	63691	1-2"	683M-4Z	64992	684M-4Z	64996	25-50mm
685 Inch Reading External Gages					686 Millimeter Reading External Gages with Yellow Dials				
0-90° Angle		90-127° Angle		Range	0-90° Angle		90-127° Angle		Range
Cat. No.	EDP	Cat. No.	EDP		Cat. No.	EDP	Cat. No.	EDP	
685-1Z	63692	686-1Z	63695	1/8-1/2"	685M-1Z	64997	686M-1Z	65000	3.2-12.7mm
685-2Z	63693	686-2Z	63696	3/16-1"	685M-2Z	64998	686M-2Z	65001	4.7-25mm
685-3Z	63694	686-3Z	63697	1-2"	685M-3Z	64999	686M-3Z	65002	25-50mm

Also available with electronic indicators. Please specify.  
Gages furnished in deluxe padded case.



## SPECIAL FUNCTION INDICATORS

### COUNTERSINK GAGES

687 COUNTERSINK GAGE 82°

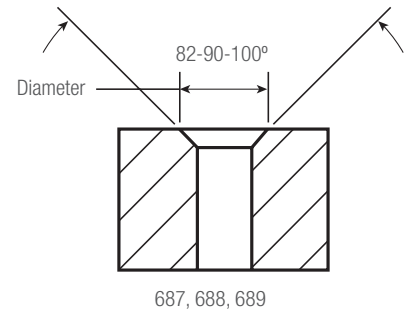
688 COUNTERSINK GAGE 90°

689 COUNTERSINK GAGE 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.



#### Inch Reading Countersink Gages

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

#### Millimeter Reading Countersink Gages with Yellow Dials

82° Angle		90° Angle		100° Angle		Range
Cat. No.	EDP	Cat. No.	EDP	Cat. No.	EDP	
687M-1Z	65003	688M-1Z	65007	689M-1Z	65011	0.5-4.3mm
687M-2Z	65004	688M-2Z	65008	689M-2Z	65012	4-9mm
687M-3Z	65005	688M-3Z	65009	689M-3Z	65013	9-14.2mm
687M-4Z	65006	688M-4Z	65010	689M-4Z	65014	14.2-19.8mm

#### Check Gage Stand for Chamfer, Countersink and Hole Gages

Cat. No.	EDP	Description
695	63875	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

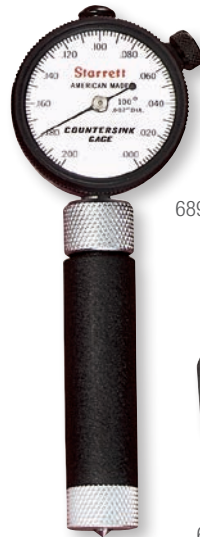
Also available with electronic indicators. Please specify.



687



688



689



687-3Z Countersink Gage with 695 Check Stand with F2720-41Q Electronic Indicator



# SPECIAL FUNCTION INDICATORS

## HOLE GAGES

### 690 HOLE GAGE

.010-.330"

### 690M HOLE GAGE

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.



### Inch Reading Hole Gages

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

### Millimeter Reading Hole Gages with Yellow Dials

Gages		Set Masters (Optional)		
Cat. No.	EDP	Part No.	EDP	Range
690M-1Z	63714	PT23710-5	63883	.25-1.00mm
690M-2Z	63715	PT23710-6	63884	.75-3.30mm
690M-3Z	63716	PT23710-7	63885	3.30-5.85mm
690M-4Z	63717	PT23710-8	63886	5.85-8.35mm

### Check Gage Stand for Chamfer, Countersink and Hole Gages

Cat. No.	EDP	Description
695	63875	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

Also available with electronic indicators. Please specify.

## 170 DIAL SHEET GAGES

.150"

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. Thickness is registered on the dial. By turning the knurled bezel, the dial may be moved to bring the hand to zero.

- Contact edges are radiused to prevent work from being marred or deflected
- The flat contact area measures 5/16" in diameter
- Black finish
- 1-1/8" throat depth
- Furnished in deluxe padded case



### 170 Dial Sheet Gages, Inch Reading

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



## SPECIAL FUNCTION INDICATORS

### 649 SPINDLE SQUARES™

The 649 Spindle Square™ offers accuracy, convenience and significant time saving with the common shop task of tramping the head of a vertical milling machine. This must be done regularly to ensure squareness and perpendicularity between the spindle and work surface.

The spindle square is easier to use and more precise than the traditional method of tramping with a dial test indicator.

#### USING THE SPINDLE SQUARE

After setting the spindle square indicators to "0" on a surface plate, place the Spindle Square™ into the collet of the milling machine and bring the head down to the table until both indicator needles have rotated approximately one full rotation.

The needles do not need to point in the same direction. Identical numerical readings, not the needle positions, indicate squareness.

To tram the milling machine, adjust the machine per normal procedures until both indicators read the same numerical value. After setting the X-axis, repeat the same procedure with the Y-axis.

#### FEATURES AND SPECIFICATIONS

- Fully assembled with two AGD Group 2 dial indicators
- Patented design
- Solid steel body construction with durable black oxide finish
- Ground gaging surface
- Approximately 4lbs with custom case
- 3/8" inch shank diameter
- 4" (100mm) between contact points
- Approximately 6-3/4" (172mm) wide and 5" (140mm) from the top of shank to the end of the contact points

649 Spindle Square				
Cat. No.	EDP	Range	Graduation	Dial Reading
649-1	52080	.250"	.001"	0-50-0
649-5	52081	.125"	.0005"	0-25-0
649-1M	52082	2.5mm	0.01mm	0-50-0





## SPECIAL FUNCTION INDICATORS

### 765A ELECTRONIC SNAP GAGE

0-1/2"/0-12.7MM

High quality, economical gage that is ideal for inspectors, purchasing agents, sales people and other who need to quickly measure materials up to 1/2" or 12.7mm thick.

- Balanced, compact design
- Simple, logical control buttons
- Easy-to-read LCD
- Single, long-life battery with easy access
- Light-weight aluminum frame
- Inch/millimeter conversion
- Zero at any position
- Manual ON/OFF, AUTO OFF
- Furnished in fitted plastic case



765A

#### 765A\* Electronic Snap Gage

Cat. No.	EDP	Range		Linear Accuracy		Resolution	
		in	mm	in	mm	in	mm
765A	67659	0-1/2	0-12.7	±.0010	±0.02	.0005	0.01

#### Accessories

Part No.	EDP	Description
PT99492	65650	Two Replacement Batteries, CR2032

\* No output available on the 765A.

### 1010, 1010M DIAL INDICATOR POCKET GAGES

.375"/9MM

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

- 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)
- Gage has a small count hand for recording each revolution of large hand
- Chrome plated case, unbreakable crystal dial cover
- Furnished in attractive, protective case

#### 1010 Dial Indicator Pocket Gages, Inch Reading

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

#### 1010M Dial Indicator Pocket Gages, Millimeter Reading

Cat. No.	EDP	Range	Graduation	Dial Reading	Contacts
1010MZ	53116	9mm	0.01mm	0-100	Flat



1010Z



INDICATORS AND GAGES



## SPECIAL FUNCTION INDICATORS

### 1015, 1015M PORTABLE DIAL THICKNESS GAGES

0-1" / 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.



#### 1015 Portable Dial Thickness Gages, Inch Reading

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

#### 1015M Portable Dial Thickness Gages, Millimeter Reading

Without Case		Case Only		Throat Depth	Range	Graduation	Dial Reading	Dial Indicator Model No.
Cat. No.	EDP	Cat. No.	EDP					
1015MA	56131	1015AZZ	55407	63mm	10mm	0.01mm	0-100	1015MA-481J
1015MB	56133	1015BZZ	55408		25mm			1015MB-881J
1015MA-100	67647			100mm	10mm	0.01mm	0-100	1015MA-481J
1015MB-100	67650				25mm			1015MB-881J
1015MA-150	67653			150mm	10mm	0.01mm	0-100	1015MA-481J
1015MB-150	67656				25mm			1015MB-881J



# SPECIAL FUNCTION INDICATORS

## 1150 DIAL INDICATOR SNAP GAGES

### 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. T1150 Dial Indicator Snap Gages also available with indicators other than those listed, a 717 Gage Amplifier and gaging head in place of the indicator, carbide faces on the contacts, special contact and backstop shapes and sizes, variable gaging pressure control, disc setting and other special masters, and larger ranges.

1150Z-2 mounted on 1150 Bench Stand



INDICATORS AND GAGES

### 1150 Dial Indicator Snap Gages, Inch Reading

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

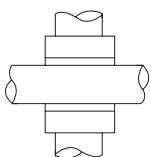
### Accessory for 1150 Dial Indicator Snap Gages

Cat. No.	EDP	Description
1150	53172	Bench Stand Only

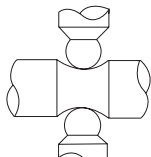
Gages furnished in case.

### SPECIAL CONTACTS

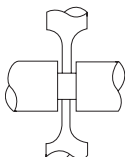
Some of the many interchangeable anvil configurations designed to suit special applications.



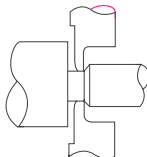
Wide Face up to 9/16" Square



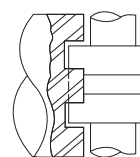
Ball or Roll



Blade Type



Offset



Offset for Face Groove



1150Z-2 with F2720AD Electronic Indicator



## SPECIAL FUNCTION INDICATORS

### 1175, 1175M DIAL INDICATOR GROOVE GAGES

#### .375-6"/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.

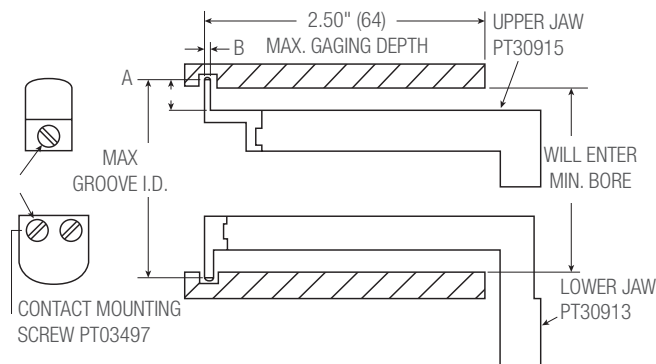
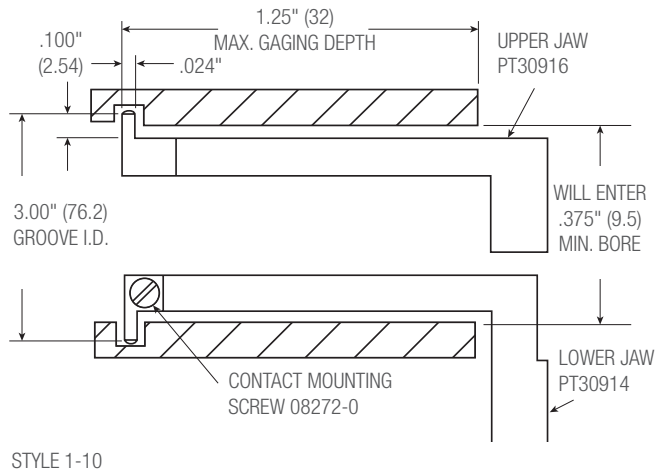
The reference jaw can be mounted in two positions on the range adjusting bar. The bar itself is also adjustable for greater or lesser range. A fine adjustment screw and a lock are also provided.

#### 1175 and 1175M Dial Indicator Groove Gages

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

#### 1175 Dial Indicator Groove Gage Contact Sets

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



#### 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
- Furnished with storage case

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.



# SPECIAL FUNCTION INDICATORS

## 1017 OUTSIDE DIAL CALIPER GAGES

### 0-2"/0-50MM

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.



1017-4

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

## 1019, 1019M INTERNAL DIAL CALIPER GAGES

### .400-1.4"/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



1019

1019M

1019 and 1019M Internal Dial Caliper Gages			
Cat. No.	EDP	Range	Description
1019-1	66559	.400-1.4"	.001" with Revolution Counter
1019M-25	67120	10-35mm	0.025mm with Revolution Counter

## 697, 697M INSIDE DIAL GAGES

### 2-3/8-18"/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 and one extension 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.



697Z

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



## SPECIAL FUNCTION INDICATORS

### 668 SHAFT ALIGNMENT CLAMP SETS

The 668 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.

#### 668 Shaft Alignment Clamp Sets

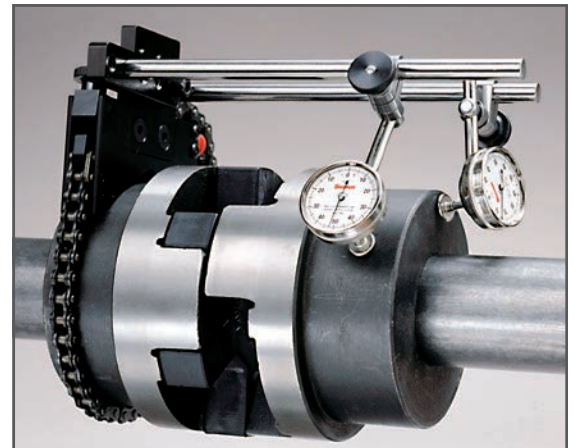
Cat. No.	EDP	Description
S668A	67150	1 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), without Case
S668BZ	67151	2 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case
S668CZ	67152	2 each: Chain Clamp, 196B5 Indicator, PT18724 Snug, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case
S668DZ	67153	2 each: Chain Clamp, 81-141J Indicator, 657Y Indicator Attachment, PT18724 Snug, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case
27984-0	-	Extra Length Chain: 24" #35 ANSI Chain with Link

#### 668 Shaft Alignment Clamp

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

#### 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 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



# SPECIAL FUNCTION INDICATORS

## 696, 696M CRANKSHAFT DISTORTION DIAL/STRAIN GAGE

2-3/8-18"/61-458MM

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 and bears a direct relation to existing misalignment or excessive bearing wear. Used on all diesel engine shafts and center crankshafts on any type of engine or compressor, the gage can also be applied as a strain gage on engine frames 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, leaving the operator's hands free. Hardened and ground to a sharp point, conical contact points have an approximate 60° included angle, and will stay in place on 45° surfaces.



### 696 and 696M Crankshaft Distortion Dial/Strain Gages

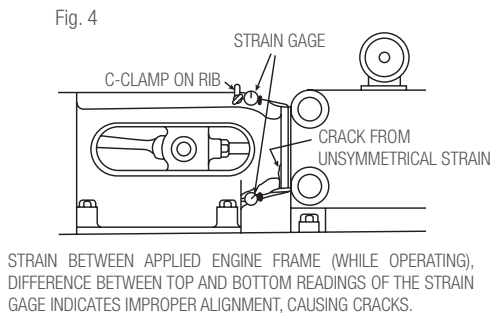
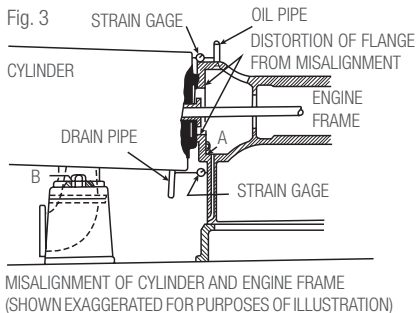
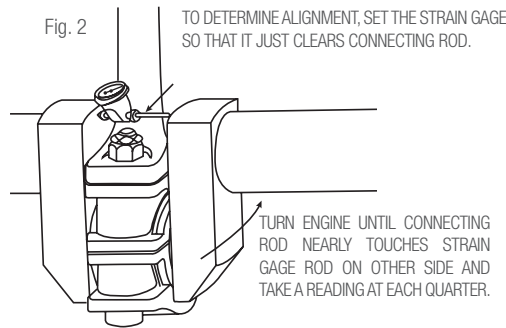
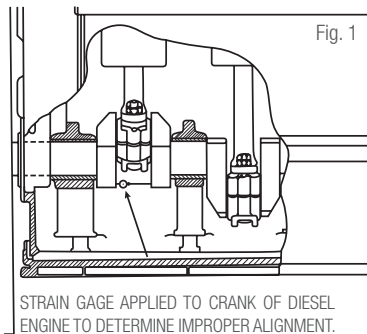
Cat. No.	EDP	Range	Dial Indicator			Description
			Graduation	Dial Reading	Range One Rev.	
696Z	52901	2-3/8-18"	.001"	0-20-0	.040"	Strain Gage with Balancing Attachment
696MZ	52902	61-458mm	0.02mm	0-50-0	1mm	Millimeter Strain Gage with Balancing Attachment
696B	52903	Balancing Attachment Only				

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

**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 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. Rods are marked to designate the approximate overall length of the gage. Indicator has a movable bezel to adjust the dial in relation to the hand and a non-breakable crystal.

Designed in collaboration with 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.



696B Balancing Attachment



## SPECIAL FUNCTION INDICATORS

### 452 CYLINDER GAGES

#### 2-1/2–9"

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.

#### 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

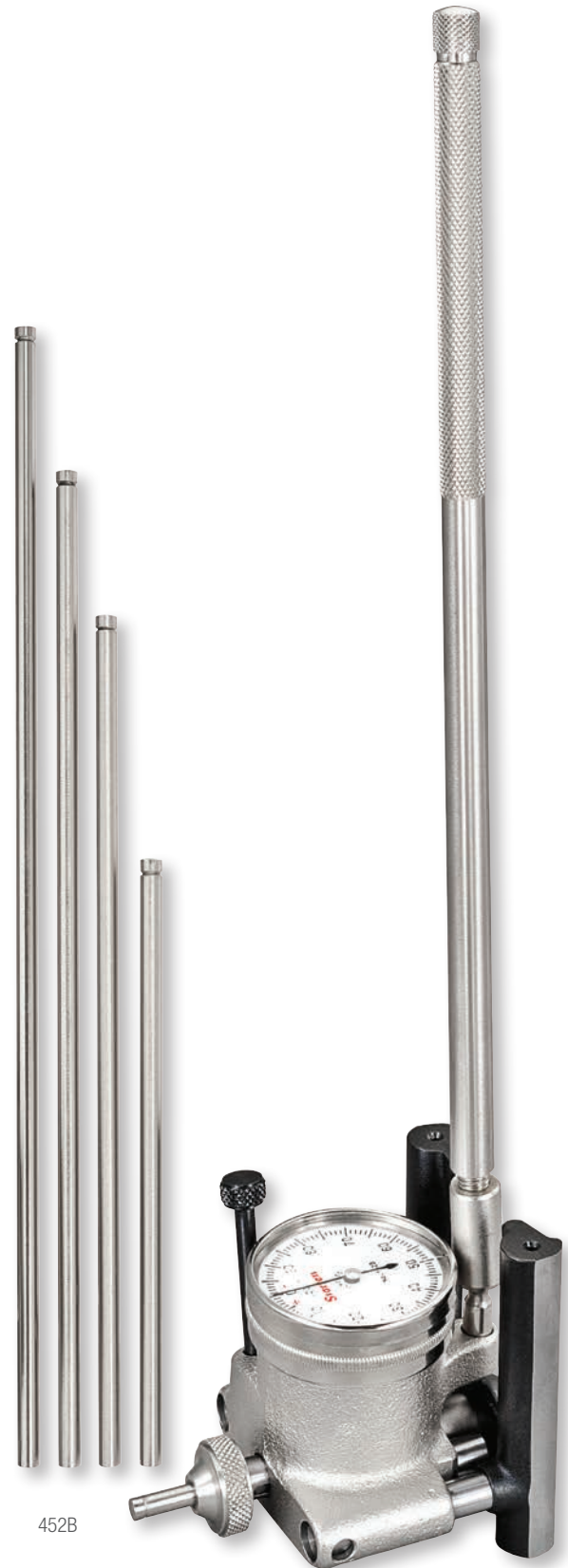
#### 452 Cylinder Gages

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

#### Accessories

Cat. No.	EDP	Length	Description
PT06722	72275	8-5/8"	Handle Extension for 452B and 452B-9

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







1102

## 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  $\pm .030$ ". 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. 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 1102
5. Special contact shapes
6. Gaging contacts with more depth



## INDICATOR DIAMETER GAGES



## 1102, 1102M Dial Indicator Diameter Gages

1-12"/25-300MM

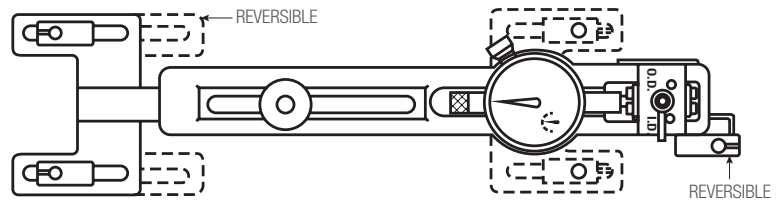
This is a light, easy-to-handle gage that is a workhorse in its range. Approximate weight is 1lb, 12oz. (0.8kg). The gaging depth can be set within a range of 0-1" (0-25mm) by adjusting the rest foot. Dial indicators are the 81-136-623 Inch Reading (.0005") or 81-181-623 Millimeter Reading (0.01mm) models.

The gage should be checked against our 1127 Master for a precise reference standard during production gaging (See the following pages). Also available on request with .0001" or 0.002mm graduations.

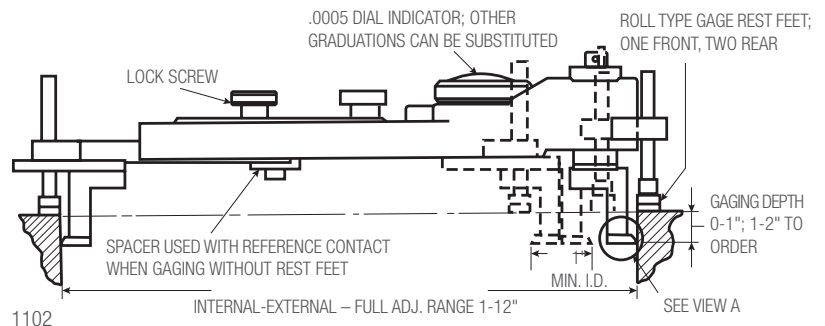
1102 and 1102M Dial Indicator Diameter Gages			
Cat. No.	EDP	Length Range	Height Adjustment
1102	56134	1-12" (.0005" Indicator)	0-1"
1102-1	69004	1-12" (.0001" Indicator)	0-1"
1102M	65020	25-300mm	0-25mm

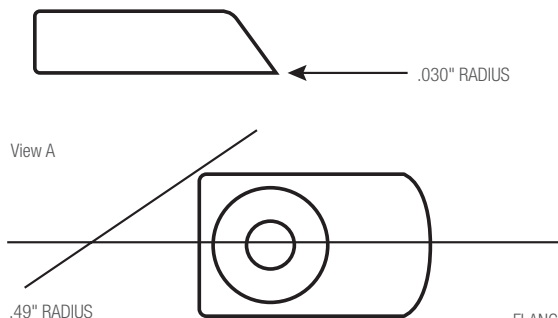
Case for 1102 and 1102M Dial Indicator Diameter Gages		
Cat. No.	EDP	Description
1102ZZ	56136	Storage Case to Hold Both Gage and 1127 Master



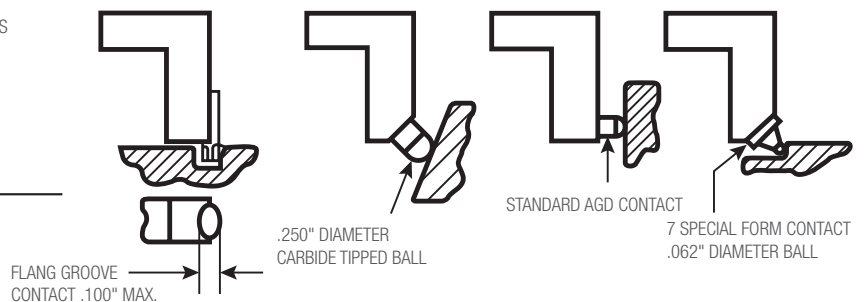
1102 and 1102M Dial Indicator Diameter Gages	
Photo Key	Description
A	Range Lock Screw
B	I.D.-O.D. Preload Reversing Mechanism Lever
C	Rest Foot
D	Reference Contact
E	Sensitive Contact



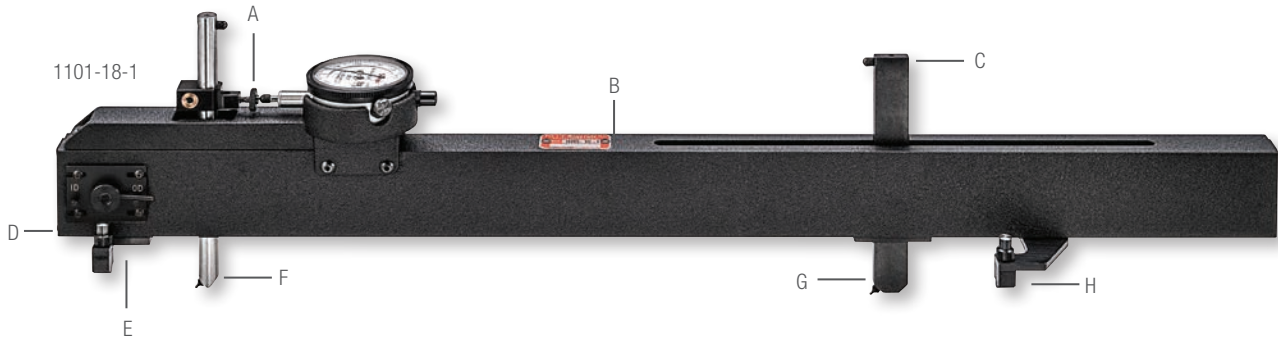
## STANDARD CONTACTS FURNISHED WITH GAGE



## SPECIAL CONTACTS DESIGNED TO ORDER



# INDICATOR DIAMETER GAGES



## 1101, 1101M DIAL INDICATOR DIAMETER GAGES

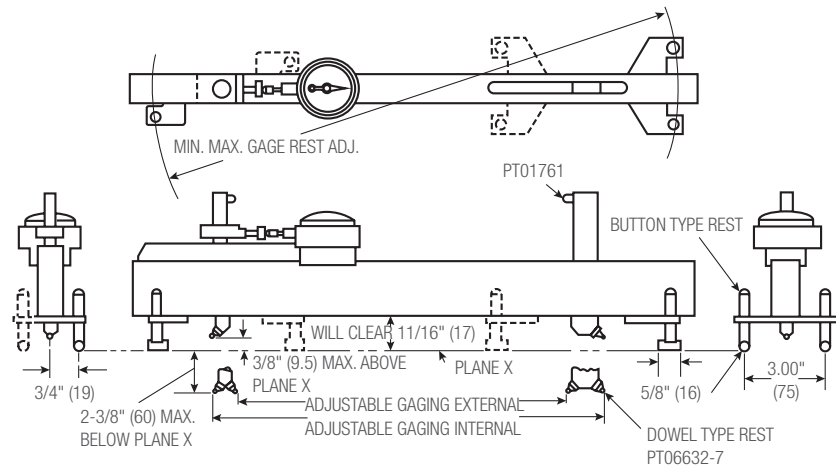
12-60"/300-1500MM

These gages allow for measurement beyond the size range of our 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 1126 Master for a precise reference standard during production gaging (See the following pages).

1101 and 1101M Dial Indicator Diameter Gages	
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

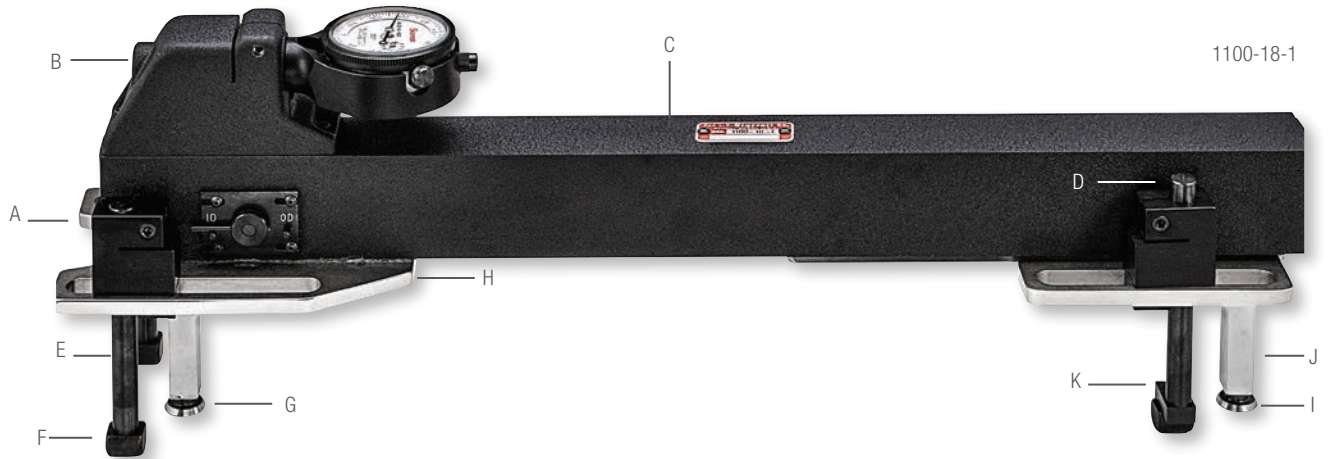


1101 and 1101M Dial Indicator Diameter Gages									
Length		Inch Reading - .0005" Graduations		Millimeter Reading - .01mm Graduations		Inch Reading - .0001" Graduations		Millimeter Reading - .002mm Graduations	
in	mm	Cat. No.	EDP	Cat. No.	EDP	Cat. No.	EDP	Cat. No.	EDP
12-18	300-450	1101-18	53144	1101M-450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

Sent without case unless otherwise ordered. To order case, specify the Catalog and "ZZ" (For example: 1101ZZ-18).



## INDICATOR DIAMETER GAGES



## 1100, 1100M Heavy-Duty Dial Indicator Diameter Gages

12-60"/300-1500MM

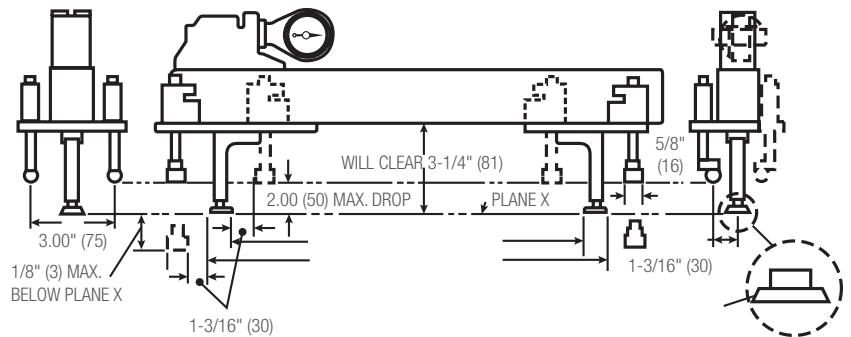
These gages combine heavy-duty construction features with adaptability for a wide range of internal and external measurements. The adjustable dowel rest legs ride on slotted mounting plates for horizontal adjustment. Each of the legs are vertically adjustable to obtain the proper rest position on the 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 1126 Master for a precise reference standard during production gaging (See the following pages).

## 1100 and 1100M Heavy-Duty Dial Indicator Diameter Gages

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



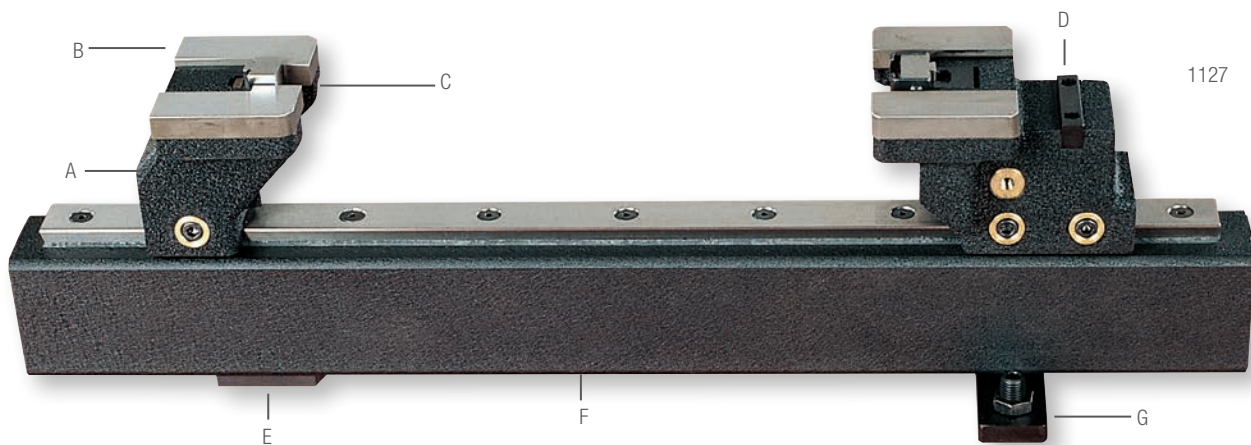
## 1101 and 1101M Dial Indicator Diameter Gages

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

Sent without case unless otherwise ordered. To order case, specify the Catalog and "ZZ" (For example: 1101ZZ-18).



# INDICATOR DIAMETER GAGES



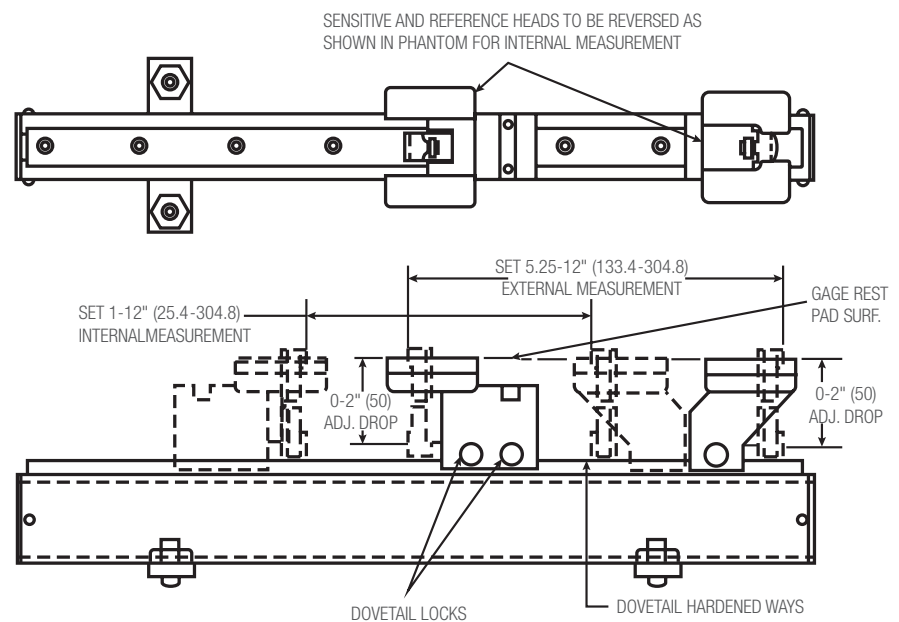
## 1127 INTERNAL-EXTERNAL ADJUSTABLE SETTING MASTER FOR STARRETT 1102 DIAMETER GAGES

EDP 56135

This set master is used with our 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 1102ZZ, EDP 56136).

### 1127 Internal-External Adjustable Setting Master for Starrett 1102 Diameter Gages

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



## 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.



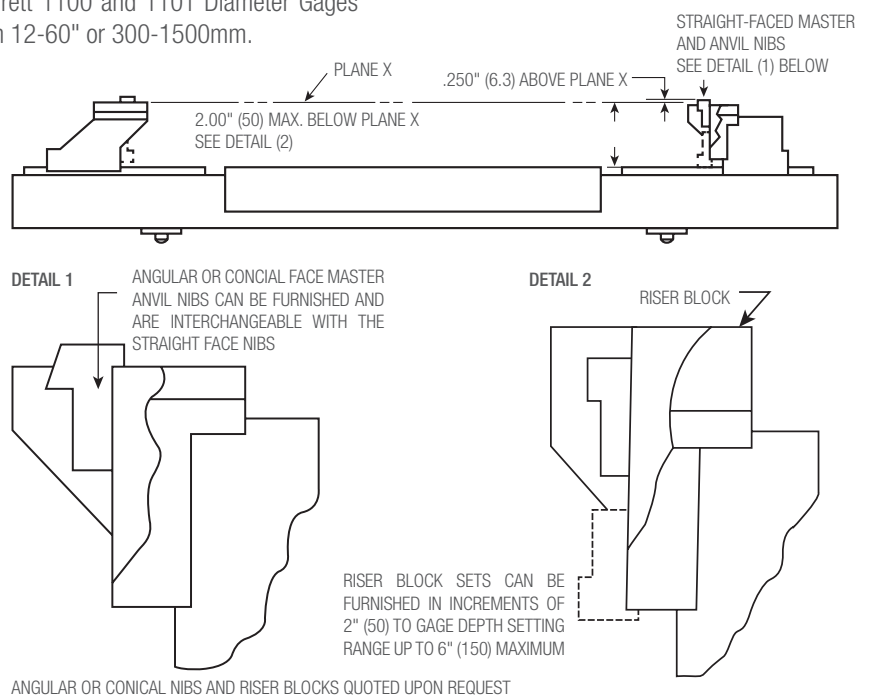
## INDICATOR DIAMETER GAGES



### 1126 INTERNAL-EXTERNAL ADJUSTABLE SETTING MASTERS FOR STARRETT 1100 AND 1101 DIAMETER GAGES

12-60"/300-1500MM

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



#### 1126 Internal-External Adjustable Setting Masters for Starrett 1100 and 1101 Diameter Gages

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

#### 1126 Internal-External Adjustable Setting Masters for Starrett 1100 and 1101 Diameter Gages

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

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

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.

