

ELECTRONIC INDICATORS

WISDOM® REMOTE DISPLAYS AND PROBES

These displays with probes will make absolute, incremental and/or comparative measurements and implement all the features of Wisdom Indicators. System is suitable for any stand-alone gaging application.

- Remote display is a rugged enclosure with a 5/8" (16mm) high, easy-to-view LCD readout
- Box Dimensions: 6-1/4" across x 7" deep x 3-1/4" high
- Power sources include 110V 50/60hz, or battery operated (without backlight)
- Probe has 6' cable as standard
- Inch probes use #4/48 indicator contacts
- Probe and display can be separated by a distance of up to 18' (5.4m) with use of extension cable
- Cable is hard wired to the probe and has a jack for convenient connection to the remote display box
- Readout box can be elevated for desired viewing



R2760 with Wisdom Remote Display and probe.

INDICATORS AND GAGES

Remote Display Probes

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

Extension Cables

Description	Part No.	EDP
6' Extension Cable	PT05679	68752
SmartCable with USB 2.0 for 2700 Micrometer	2700SCKB	69891
USB style 6' cable to PC for programs already incorporating a terminal program with send button for the Wisdom IQ/AD	PT60644	72589
USB style to PC creates a virtual comm.; Port has no send button requires command from PC to acquire reading for Wisdom IQ/AD	PT60646	72592
6' long cable to remote reader for the Wisdom IQ/AD	PT60645	72591

Backs/Lever*

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

* 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.

Wisdom Remote Displays

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



Check out our website for interactive features at starrett.com



ELECTRONIC INDICATORS

3600 ELECTRONIC INDICATORS



AGD GROUP 2

RANGES UP TO .500" AND 12.7MM

The 3600 Electronic Indicators have simple, powerful, easy-to-use functions, all at an attractive price. Versions are available for inch/metric and metric only.

Inch/mm					
Range		Resolution		Cat. No.	EDP
Inch	mm	Inch	mm		
.500	12.7	.0005	0.01	3600-5	68813
Metric-Only					
	12.7		0.01	3600M-5	68918
Accessory					
Description				Cat. No.	EDP
SR44 Battery				PT61918	67169

FEATURES

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



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.

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

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

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.



Check out our website for interactive features at starrett.com



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.

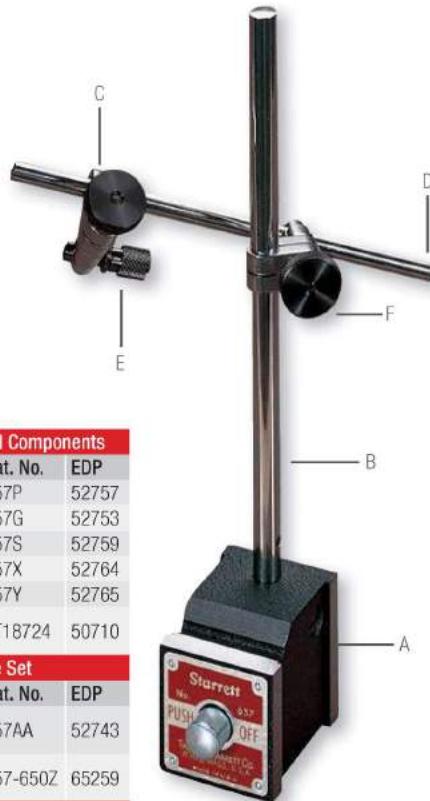
- A. 657P Magnetic Base. 1-15/16 x 1-5/8 x 1-7/8" (50 x 40 x 48mm). Push-button on/off switch for one-hand operation. Base has three precision ground magnetic contact points. Grips horizontally, vertically, and upside down. V-step holds base to arbors, shafts, etc. Base has extra 1/4-20 tapped hole on 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 with 196B1 Universal Dial Indicator



657AA Magnetic Base Indicator Holder - Individual Components

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

657AA Magnetic Base Indicator Holder - Complete Set

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



657AA with 711FS Last Word® Dial Test Indicator



INDICATOR HOLDERS

657A MAGNETIC BASE INDICATOR HOLDER WITH SWIVEL POST ASSEMBLY

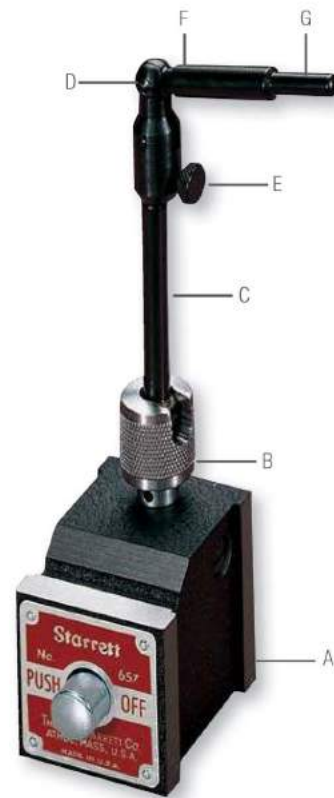
The swivel post assembly on these holders provides universal adjustment in both horizontal and vertical planes. Available with inch or millimeter Dial Test or Back-Plunger Indicators, they save time in shop set-up and other inspection jobs.

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

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

657 Magnetic Base Indicator Holder Sets				
Description	w/Finished Wood Case		Without Case	
	Cat.	EDP	Cat. No.	EDP
Base and Post Assembly with 711MFSZ Indicator with PT07101F Body Clamp	657MBZ	56354	657MB	56353
Base and Post Assembly with 196MB1 Indicator, PT18718 Snug, 3 Contact Points, Contact Point Adaptor	657MCZ	56356	657MC	56355

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.



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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.

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

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

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

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



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



196B1 Indicator via a 657S Snug.



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 Adaptor, PT18318

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

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

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

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

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



660 Magnetic Base Indicator Holder		
Description	Cat. No.	EDP
Base Indicator Holder	660	68621



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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

Description	Cat. No.	EDP
Indicator Holder	661	68620



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

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

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



INDICATOR HOLDERS

COMMON TEST AND BACK PLUNGER INDICATOR APPLICATIONS

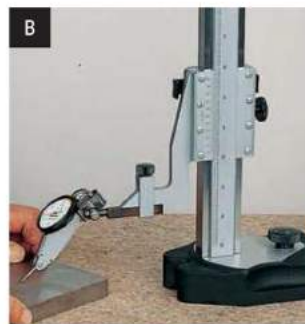
- A. Models with tool post holders, generally used for lathe work.
- B. Indicators may be used on our 665 Inspection Holder.
- B, C. Some indicator holders have flexible joints for holding in different places.
- C, D. Indicators with straight stems or shanks can be held in snugs or in chucks and collets.



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

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



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.



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						
Dial Indicator Specifications				With Granite Base		
Graduation	Dial Reading	Range	Indicator No.	Cat. No.	EDP	
.0005"	0-25-0	.125"	25-131J	675GJ	55964	
0.01mm	0-50-0	2.5mm	25-181J	675GMJ	56129	
Individual Components						
Description				Cat. No.	EDP	
Granite Base, Upright Base Post and Gage Holding Rod, Including Clamp Mechanism and Fine-Adjustment				675G	66051	
Gage Holding Rod Only, Including Clamp Mechanism and Fine-Adjustment				PT08903	72032	
Swivel Post Snug Only with Two 3/4" (19mm) Gripping Holes				PT16846	71597	

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.



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 dial 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							
Dial Indicator Specifications				With Cast Iron Base		With Granite Base	
Graduation	Dial Reading	Range	Indicator No.	Cat. No.	EDP	Cat. No.	EDP
.001"	0-50-0	.250"	655-141J	653J	52737	653GJ	55966
0.01mm	0-50-0	2.5mm	655-181J	653MJ	56146	653GMJ	56127
Individual Components							
Description						Cat. No.	EDP
Comparator with Cast Iron Base, without Indicator						653	55917
Comparator with Granite Base, without Indicator						653G	56646

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.



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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.

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

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



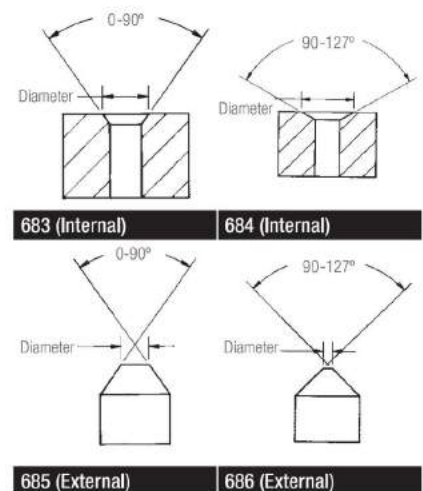
685-2Z Internal Chamfer Gage with 695 Check Stand with F2720-4IQ Electronic Indicator

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

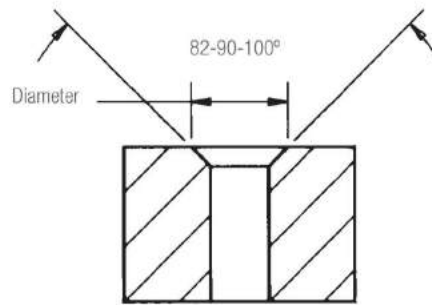
COUNTERSINK GAGES

- 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.



687, 688, 689

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

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

Check Gage Stand for Chamfer, Countersink and Hole Gages		
Description	Cat. No.	EDP
8-3/16" H x 6" W x 4" D (212 x 150 x 100mm) Hold Downs - 5" (125mm) on Center - 1/4" (6.3mm) Holes	695	63875

Also available with electronic indicators. Please specify.



687-3Z Countersink Gage with 695 Check Stand with F2720-4IQ Electronic Indicator



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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

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

Millimeter Reading Hole Gages with Yellow Dials

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

Check Gage Stand for Chamfer, Countersink and Hole Gages

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

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

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



SPECIAL FUNCTION INDICATORS

649 SPINDLE SQUARES™

The 649 Spindle Square offers accuracy, convenience and significant time saving with the common shop task of trammung 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 trammung 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

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

- 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



649-1



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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* Electronic Snap Gage

Range	Linear Accuracy	Resolution	Cat. No.	EDP
0-1/2" (0-12.7mm)	±.0010" (±0.02mm)	.0005" (0.01mm)	765A	67659
Two Replacement Batteries, CR2032			PT99492	65650

* 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

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

1010M Dial Indicator Pocket Gages, Millimeter Reading

9mm	0.01mm	0-100	Flat	1010MZ	53116
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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

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

1015M Portable Dial Thickness Gages, Millimeter Reading

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



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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.

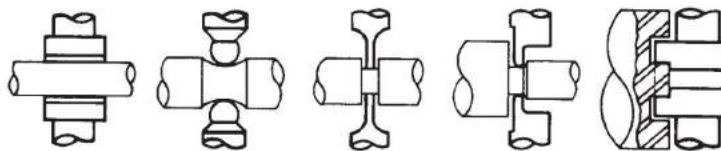
A bench stand is available to convert the gage to a bench comparator. T1150 Dial Indicator Snap Gages also available with indicators other than those listed, a 717 Gage Amplifier and gaging head in place of the indicator, carbide faces on the contacts, special contact and backstop shapes and sizes, variable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

1150 Dial Indicator Snap Gages, Inch Reading						
Range	Dial Indicator		Range	Model No.	Without Stand	
	Graduation	Dial Reading			Cat. No.	EDP
0-2"					1150Z-2	53168
2-4"					1150Z-4	53169
4-6"	.0001"	+ 10 - 10	.040"	81-111-1150	1150Z-6	53170
6-8"					1150Z-8	53171
Accessory for 1150 Dial Indicator Snap Gages						
Description					Cat. No.	EDP
Bench Stand Only					1150	53172

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 mounted
on 1150 Bench
Stand



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.

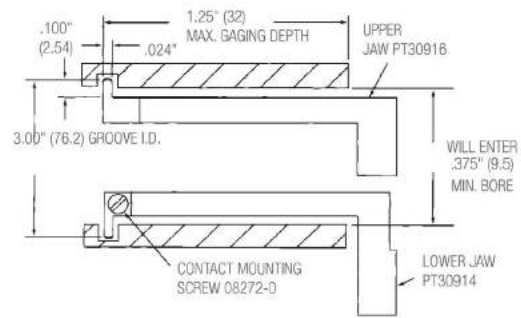
The movable, sensitive gaging contact has a 1/2" (12.7mm) retractable range and transfers the measurement through a linear, friction-free transfer mechanism to the dial indicator. The lower reference jaw is fixed and supports the entire weight of the gage and the operator's hands, thus preventing incorrect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

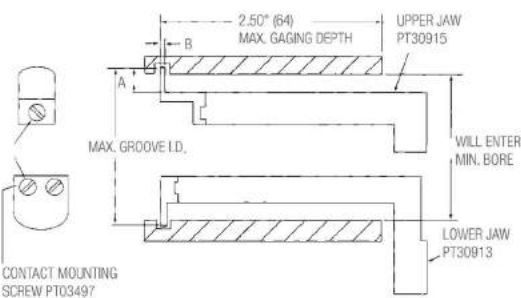
FEATURES:

- 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.



STYLE 1-10



STYLES 2-10, 2-20



1175 and 1175M Dial Indicator Groove Gages

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

1175 Dial Indicator Groove Gage Contact Sets

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

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 Outside Dial Caliper Gages

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



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SPECIAL FUNCTION INDICATORS

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 and 1019M Internal Dial Caliper Gages

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



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.

697 and 697M Inside Dial Gages

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



697Z



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.

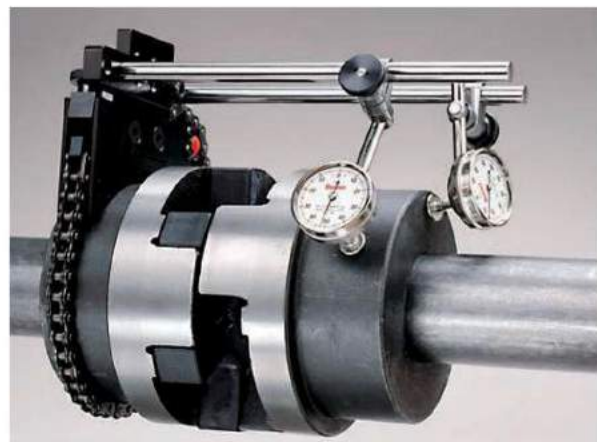
668 Shaft Alignment Clamp Sets		
Description	Cat. No.	EDP
1 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), without Case	S668A	67150
2 each: Chain Clamp, Extension Plate, Posts (5", 7-7/16", 9"), with Fitted Case	S668BZ	67151
2 each: Chain Clamp, 196B5 Indicator, PT18724 Snug, Extension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



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

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



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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

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

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.



696B Balancing Attachment

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.



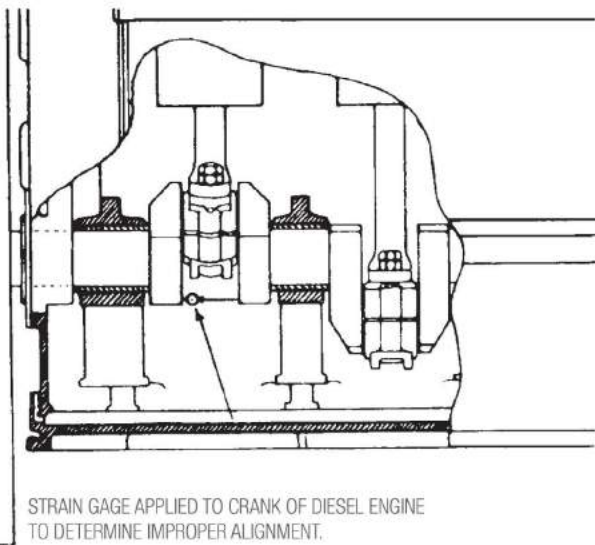


Fig. 1

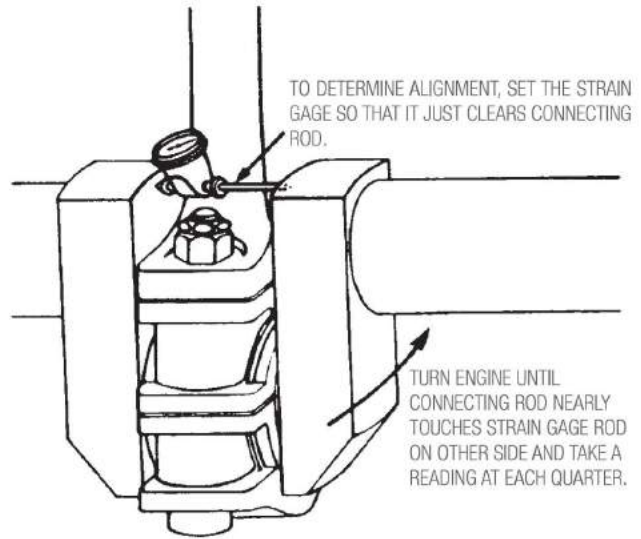
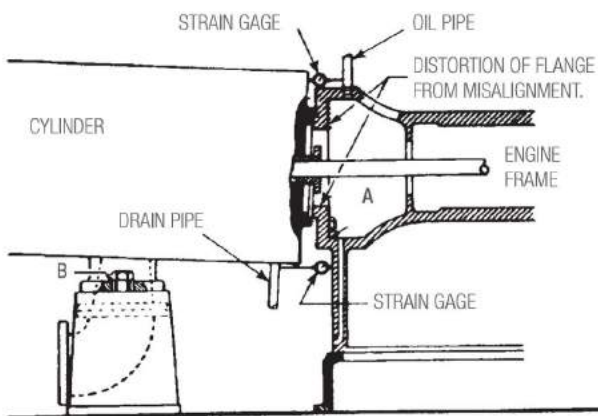
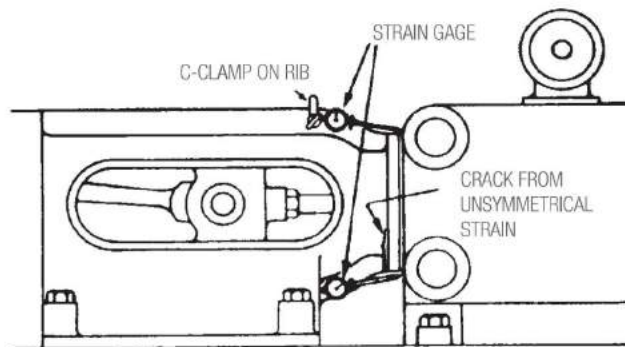


Fig. 2



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

Fig. 3



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

Fig. 4

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

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

Accessories

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

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



SPECIAL FUNCTION INDICATORS



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



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INDICATOR DIAMETER GAGES



1102, 1102M DIAL INDICATOR DIAMETER GAGES

1-12"/25-300MM

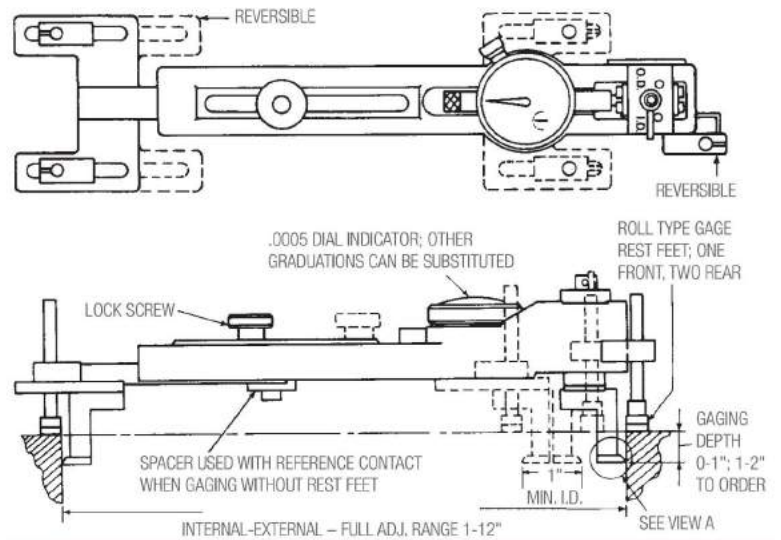
This is a light, easy-to-handle gage that is a workhorse in its range. Approximate weight is 11lb, 12oz. (0.8kg). The gaging depth can be set within a range of 0-1" (0-25mm) by adjusting the rest foot. Dial indicators are the 81-136-623 Inch Reading (.0005") or 81-181-623 Millimeter Reading (0.01mm) 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.

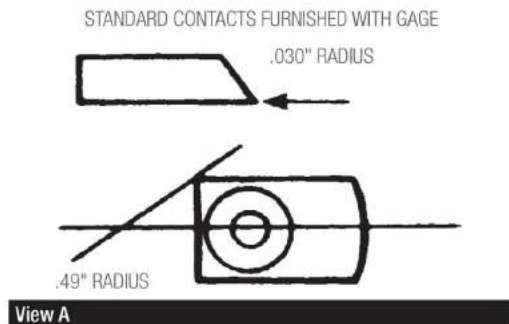
1102 and 1102M Dial Indicator Diameter Gages			
Length Range	Height Adjustment	Cat. No.	EDP
1-12" (.0005" Indicator)	0-1"	1102	56134
1-12" (.0001" Indicator)	0-1"	1102-1	69004
25-300mm	0-25mm	1102M	65020

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

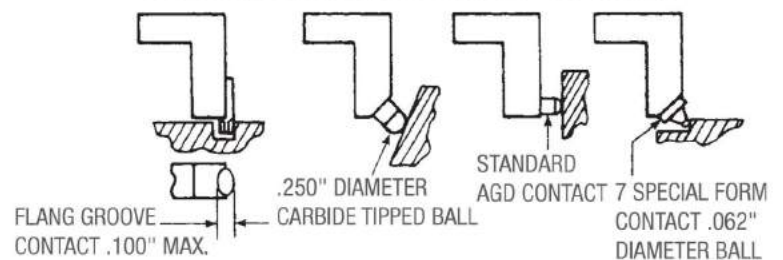
1102 and 1102M Dial Indicator Diameter Gages	
Photo Key	Description
A	Range Lock Screw
B	I.D. -O.D. Preload Reversing Mechanism Lever
C	Rest Foot
D	Reference Contact
E	Sensitive Contact



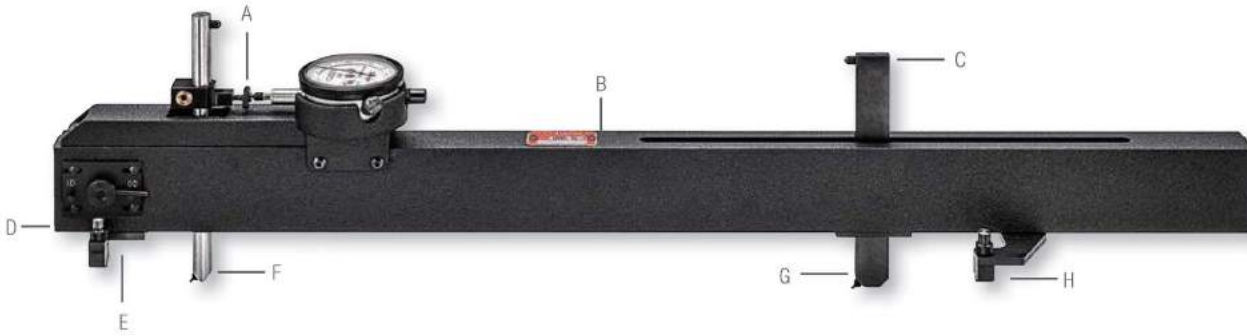
1102



SPECIAL CONTACTS DESIGNED TO ORDER



INDICATOR DIAMETER GAGES



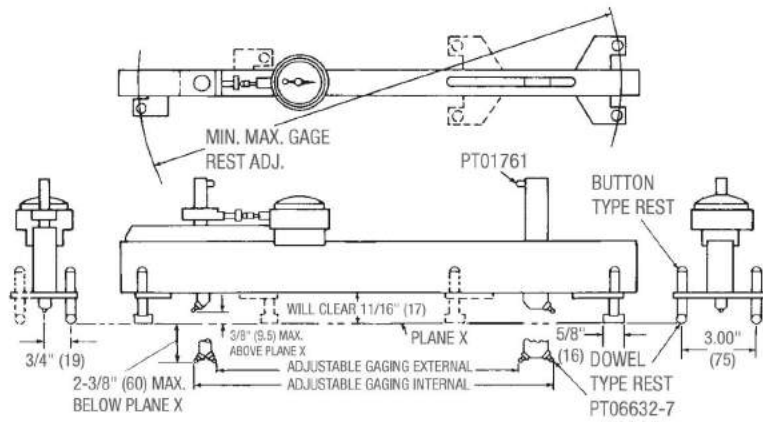
1101, 1101M Dial Indicator Diameter Gages

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	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"	300-450mm	1101-18	53144	1101M-450	65015	1101-18-1	69005	1101M-450-2	69021
18-24"	450-600mm	1101-24	53146	1101M-600	65016	1101-24-1	69006	1101M-600-2	69022
24-30"	600-750mm	1101-30	53148	1101M-750	65017	1101-30-1	69007	1101M-750-2	69023
30-36"	750-900mm	1101-36	53150	1101M-900	65018	1101-36-1	69008	1101M-900-2	69024
36-42"	900-1050mm	1101-42	53152	1101M-1050	65019	1101-42-1	69009	1101M-1050-2	69025
42-48"	1050-1200mm	1101-48	53154	1101M-1200	65021	1101-48-1	69010	1101M-1200-2	69026
48-54"	1200-1350mm	1101-54	53156	1101M-1350	65022	1101-54-1	69011	1101M-1350-2	69027
54-60"	1350-1500mm	1101-60	53158	1101M-1500	65023	1101-60-1	69012	1101M-1500-2	69028
Gaging Contact Range:		±.050"		±1.3mm		±.050"		±1.3mm	

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



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INDICATOR DIAMETER GAGES

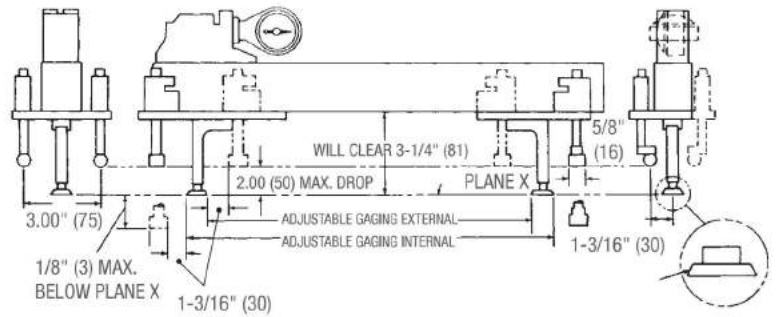


1100, 1100M HEAVY-DUTY DIAL INDICATOR DIAMETER GAGES 12-60"/300-1500MM

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

1100 and 1100M Heavy-Duty Dial Indicator Diameter Gages

Length	Inch Reading .0005" Graduations		Millimeter Reading .01mm Graduations		Inch Reading .0001" Graduations		Millimeter Reading .002mm Graduations		
	Inch	mm	Cat. No.	EDP	Cat. No.	EDP	Cat. No.	EDP	
12-18"	300-450mm	1100-18	53128	1100M-450	65024	1100-18-1	69013	1100M-450-2	69029
18-24"	450-600mm	1100-24	53130	1100M-600	65025	1100-24-1	69014	1100M-600-2	69030
24-30"	600-750mm	1100-30	53132	1100M-750	65026	1100-30-1	69015	1100M-750-2	69031
30-36"	750-900mm	1100-36	53134	1100M-900	65027	1100-36-1	69016	1100M-900-2	69032
36-42"	900-1050mm	1100-42	53136	1100M-1050	65028	1100-42-1	69017	1100M-1050-2	69033
42-48"	1050-1200mm	1100-48	53138	1100M-1200	65029	1100-48-1	69018	1100M-1200-2	69034
48-54"	1200-1350mm	1100-54	53140	1100M-1350	65030	1100-54-1	69019	1100M-1350-2	69035
54-60"	1350-1500mm	1100-60	53142	1100M-1500	65031	1100-60-1	69020	1100M-1500-2	69036
Gaging Contact Range:		±.050"		±1.3mm		±.050"		±1.3mm	

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



INDICATOR DIAMETER GAGES

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.

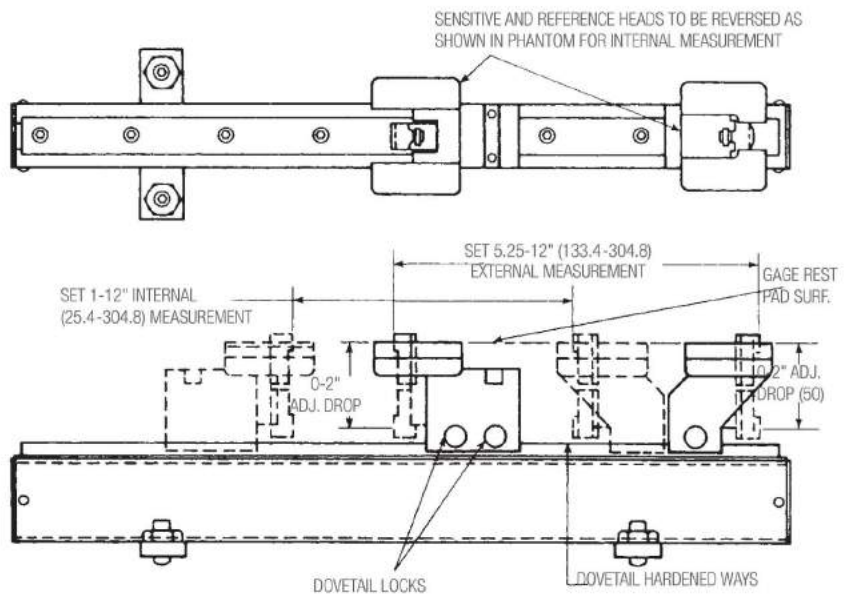
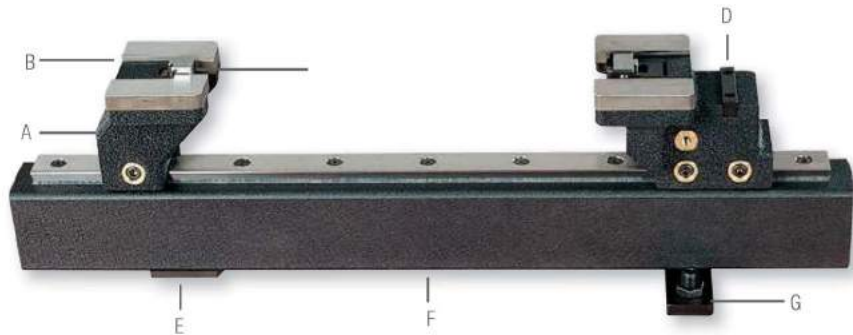
Both heads can be reversed for I.D. or O.D. settings. Each master has a fixed single point rest and two leveling screws which provide a three-point suspension. All contact and working surfaces are hardened and ground.

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.

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)



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INDICATOR DIAMETER GAGES



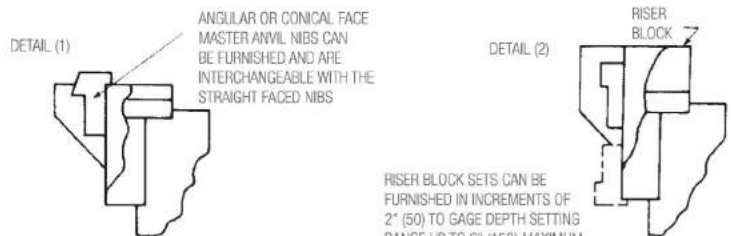
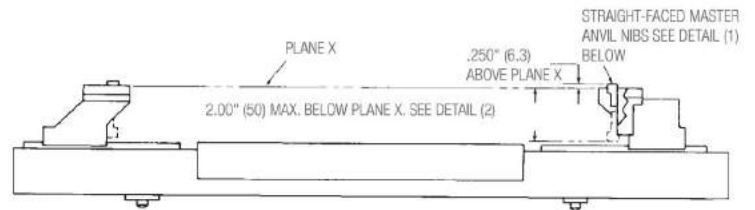
1126 INTERNAL-EXTERNAL ADJUSTABLE SETTING MASTERS FOR STARRETT 1100 AND 1101 DIAMETER GAGES

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



ANGULAR OR CONICAL NIBS AND RISER BLOCKS QUOTED UPON REQUEST

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

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

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.

