

THE BENCHMARK OF INDICATING MEASURING INSTRUMENTS. **MARAMETER.**



The latest information on MARAMETER products can be found on our website:

www.mahr.com, WebCode 211

► | MaraMeter is the ideal measuring instrument for highly precise measurements of internal and external diameters on either an individual part or on serial components. Our indicating measuring instruments obtain the best results due to their constant measuring force, their exact transmission lever system as well as their high parallelism on the measuring faces. For special measuring tasks such as threads, teeth, grooves or precision mechanical parts MaraMeter offers the right solution. | ◀

► | MaraMeter. Indicating Measuring Instruments

Indicating Measuring Instruments for Outside Dimensions, Indicating Snap Gages

MaraMeter 840 F / 840 FC / 840 FH / 840 FG / 840 FM	9- 2
With fixed or interchangeable measuring faces	
MaraMeter 840 FS	9-12
For direct measurement on the machine tool	
MaraMeter 840 E	9-14
For extremely high precision	
MaraMeter 852 / 852 TS / 853	9-15
For threads, pitches, roots, serrations	

Portable Thickness Gages

MaraMeter 838 A / 838 B / 838 AB	9-20
With digital or analog display	

Caliper Gages

MaraMeter 838 TA / 838 EA / 838 TI / 838 EI	9-22
With digital or analog display	

Depth Gages

MaraMeter 837	9-27
----------------------	-------------

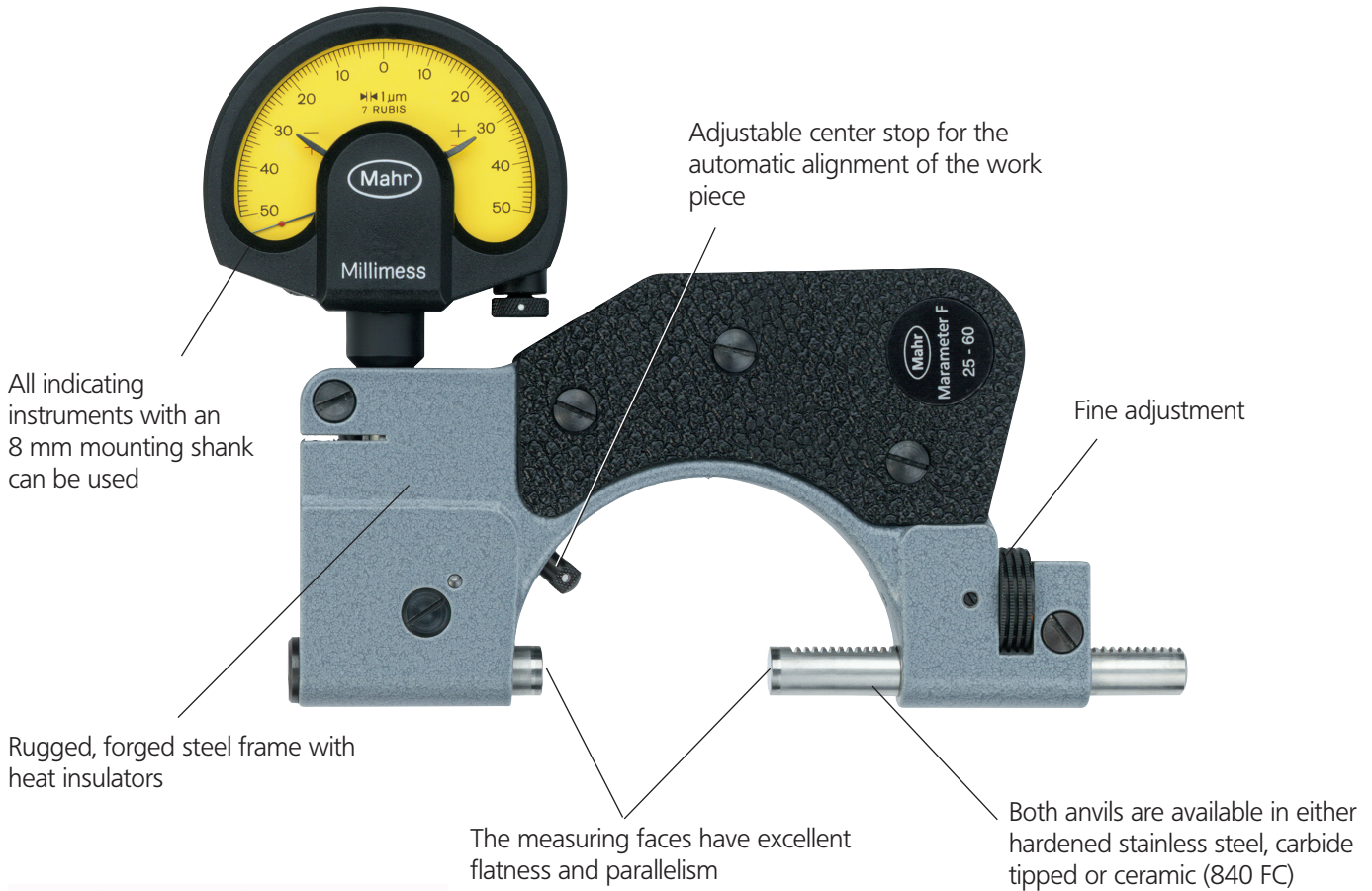
Indicating Measuring Instruments for Inside Dimensions

MaraMeter 844 D	9-28
Indicating Plug Gage for rapid testing of serial components	
MaraMeter 844 K / 844 N / 844 NH	9-35
Self-centering Dial Bore Gage	
MaraMeter 844 Z	9-44
Dial Bore Gage for internal serrations	

MaraMeter. Indicating Snap Gages 840 F / 840 FC

OVERVIEW

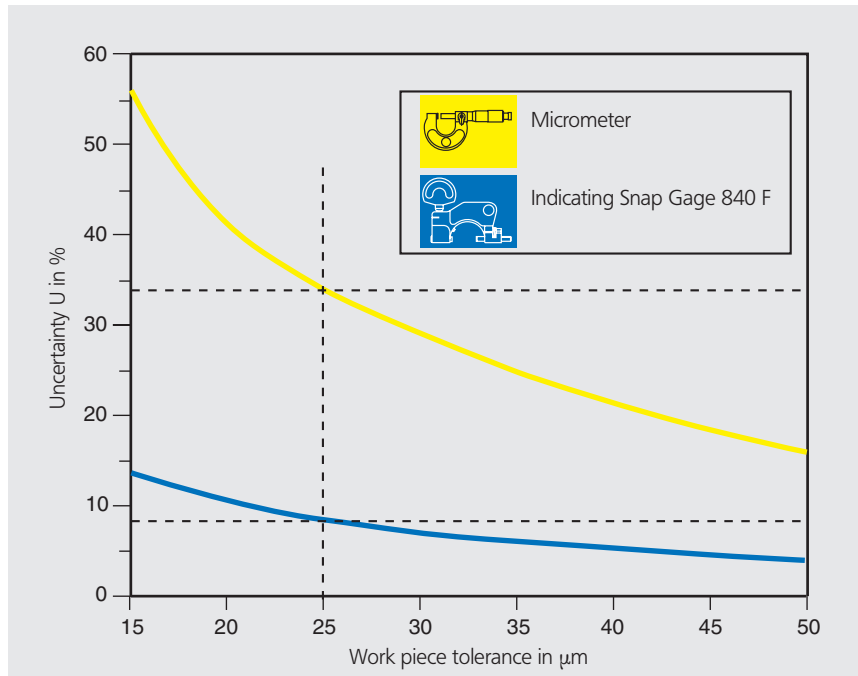
▶ | The Indicating Snap Gages **MaraMeter** 840 F / 840 FC are ideal for highly accurate and reliable results on cylindrical work pieces with a narrow tolerance. | ◀



Advantages of the Snap Gage 840 F compared to a Micrometer

• Reduced Measuring Uncertainty

The MaraMeter Indicating Snap Gages have a notably reduced measuring uncertainty in comparison to a Micrometer.



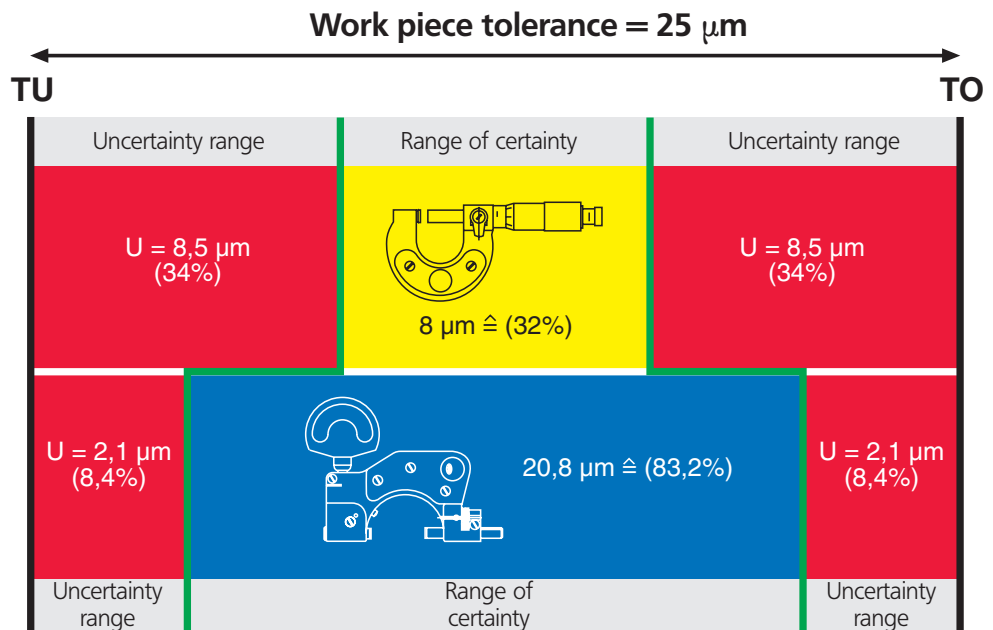
Measuring Uncertainty U is dependent upon the tolerance of the work piece

• Better utilization of the tolerance zone

Example:
Work piece tolerance 25 µm

The measured value in the uncertainty range can lie outside of the tolerance range, therefore the utilized tolerance of the micrometer is reduced to only 32% (8 µm).

With a MaraMeter Indicating Snap Gage 840 F, 83% (20.8 µm) of the work piece tolerance can be utilized.



Advantage:

With the Indicating Snap Gage the tolerance zone can be used to far greater extent, thus reducing the production costs.

Indicating Snap Gages 840 F / 840 FC MaraMeter F



Features

- For cylindrical parts such as shafts, bolts and spindles, for thickness and length measurements
- Rugged, forged steel frame with heat insulators
- Measuring spindle is mounted in long guide way with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Measuring spindle and anvil spindle are both made of hardened stainless steel, carbide-tipped or ceramic (840 FC) measuring faces
- Adjustable center stop for automatic alignment
- Maximum wear resistance due to non-contact positioning in conjunction with carbide tipped measuring faces
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable and extremely versatile. Each instrument spans a broad measuring range, within this range any dimension and fit can be very quickly and easily adjusted
- Supplied with: Wooden case, steel flat contact points 903

Technical Data

	Measuring range			Repeatability f_w μm	Distance of moveable anvil mm	Measuring** force N	Measuring face		Order no.*
	mm						Flatness μm	Parallelism μm	
840 F	0	-	25	≤ 0.5	2	7.5	≤ 0.2	≤ 1	4450000
	25	-	60	≤ 0.5	2	7.5	≤ 0.2	≤ 2	4450001
	50	-	100	≤ 1	2.5	7.5	≤ 0.2	≤ 2	4450002
	100	-	150	≤ 1	2.5	7.5	≤ 0.2	≤ 2	4450003
	150	-	200	≤ 1	2.5	7.5	≤ 0.2	≤ 2	4450004
840 FC	0	-	25	≤ 1	2	7.5	≤ 0.2	≤ 1	4450100
	25	-	60	≤ 1	2	7.5	≤ 0.2	≤ 2	4450101

* Excludes indicating instrument ** Further measuring forces are available on request

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Millimess 1003XL	2 μm	4334001
Supramess 1002	0.5 μm	4335000
Extramess 2000	0.2 μm , 0.5 μm , 1 μm	4346000
Extramess 2001	0.2 μm , 0.5 μm , 1 μm	4346100

Digital Indicators see Chapter 5

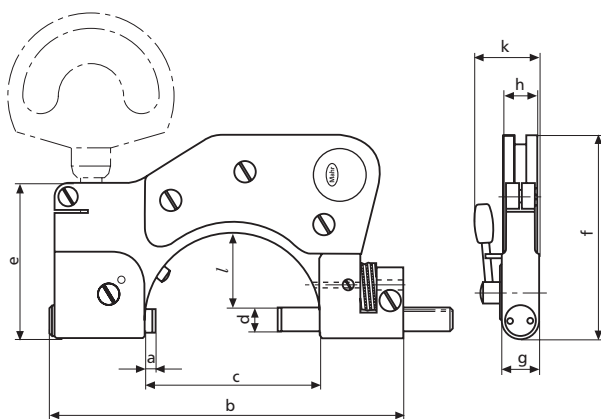
Electrical Indicating Instruments see Chapter 7



2000



1003



Meas. range	0 - 25	25 - 60	50 - 100	100 - 150	150 - 200
mm					
a*	5	5	6.5	6.5	6.5
b	97	140	193	258	316
c	34	68	110	162	212
d	8	9	10	12	12
e	54	60	60	70	75
f	65	77	103	141	171
g	12	13	14	16	16
h	13	13	13	12	12
k	23	25	28	31	31
l	14	30	54	81	106

* In initial position

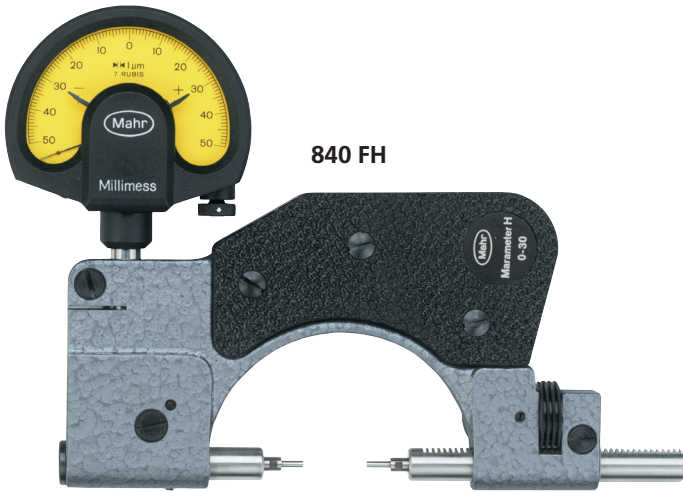
Accessories

Reference Discs 390 see Chapter 13

Gage Blocks see Chapter 13

Holder 840 Fk and Stand 840 Ff see Page 9-11

Indicating Snap Gage 840 FH with interchangeable anvils



Features

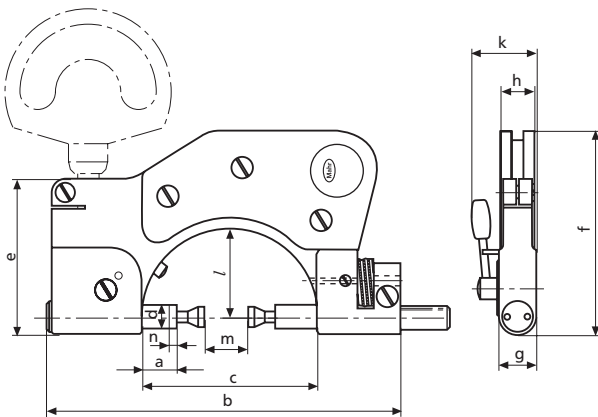
- Measuring spindle and anvil spindle have precision tapered bores for mounting interchangeable anvils 40 He
- For cylindrical parts such as shafts, bolts and spindles
- Rugged, forged steel frame with heat insulators
- Measuring spindle is mounted in long guide way with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Measuring spindle and anvil spindle and both made from hardened stainless steel
- Maximum wear resistance due to non-contact positioning
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable
- All kinds of measurement problems can be solved with the broad range of interchangeable anvils
- Supplied with: Wooden case, steel flat contact points 903, spanner DIN 902-3.5

Technical Data

	Measuring range* mm	Repeatability f_w μm	Distance of moveable anvil mm	Measuring force N	Order no.**
840 FH	0 - 30	≤ 1	2	7.5	4451000
	30 - 80	≤ 1	2.5	7.5	4451005

* Measuring is dependent upon the length of the anvils being used

** Excludes indicating instrument



Meas. range	840 FH	
m (mm)	0 - 30	30 - 80
a*	12.5	7.5
b	140	193
c	68	110
d	9	10
e	60	60
f	77	103
g	13	13
h	13	13
k	25	28
l	34	59
n**	2	2.5

* In initial position

** Distance of moveable anvil

Indicating Snap Gage 840 FH with interchangeable anvils

with tapered shank

Catalog no.	Features	Order no.
40 He 0H*	Flat faces	4152036
40 He 1	Stepped flat faces	4152011
40 He 1H*	Stepped flat faces	4152033
40 He 2	Stepped flat faces	4152012
40 He 2H*	Stepped flat faces	4152032
40 He 3	Discs	4152013
40 He 4	Discs with V-groove	4152014
40 He 5	Blades	4152015
40 He 6	Offset blades	4152016
40 He 7	Recessed blades	4152017
40 He 8	Recessed flat faces with V-grooves on sleeve	4152018
40 He 9	Recessed flat faces with slip on support	4152019
40 He 10	With clearance bores	4152020
40 He 11	Point	4152021

* Carbide version

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Millimess 1003XL	2 μm	4334001
Supramess 1002	0.5 μm	4335000
Extramess 2000	0.2 μm , 0.5 μm , 1 μm	4346000
Extramess 2001	0.2 μm , 0.5 μm , 1 μm	4346100

Digital Indicators see Chapter 5

Electrical Indicating Instruments see Chapter 7

Accessories

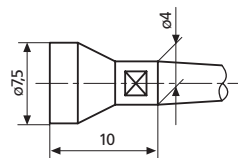
Spanner (Included in scope of supply)
for 840 FH, to loosen anvils

Order no. 4880210

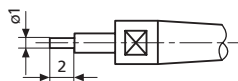
Reference Discs 390 see Chapter 13

Gage Blocks see Chapter 13

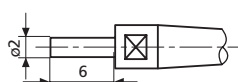
Holder 840 Fk and **Stand 840 Ff** see Page 9-11



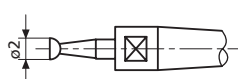
40 He 0H



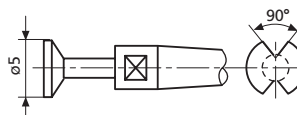
40 He 1



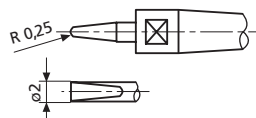
40 He 2



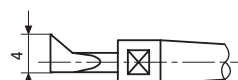
40 He 3



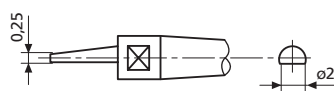
40 He 4



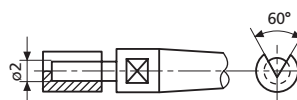
40 He 5



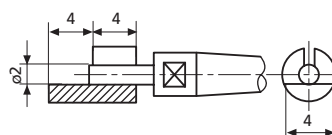
40 He 6



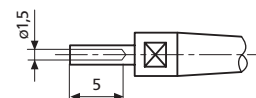
40 He 7



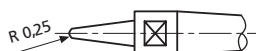
40 He 8



40 He 9



40 He 10



40 He 11

Indicating Snap Gages 840 FG with interchangeable anvils



Features

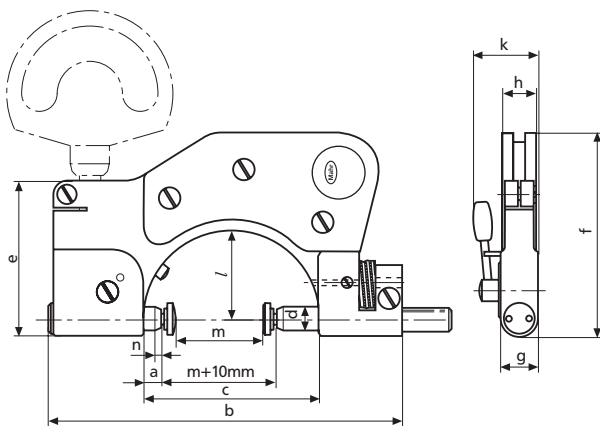
- Measuring spindle and anvil spindle have a M 2.5 connection thread, thus enabling the use of interchangeable anvils that are also used in dial indicators and dial comparators
- For cylindrical parts such as shafts, bolts and spindles
- Rugged, forged steel frame with heat insulators
- Measuring spindle is mounted in long guide way with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Measuring spindle and anvil spindle and both made from hardened stainless steel
- Maximum wear resistance due to non-contact positioning
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable
- All kinds of measurement problems can be solved with the broad range of interchangeable anvils
- Supplied with: Wooden case, steel flat contact points 903

Technische Daten

	Measuring range* mm	Repeatability f_w μm	Distance of moveable anvil mm	Measuring force N	Order no.**
840 FG	0 - 50*	≤ 0.5	2	7.5	4454000
	40 - 90*	≤ 0.5	2.5	7.5	4454001

* Measuring is dependent upon the length of the anvils being used

** Excludes indicating instrument



Meas. range	840 FG	
m (mm)	0 - 50	40 - 90
a*	5	6.5
b	140	193
c	68	110
d	9	10
e	60	60
f	77	103
g	13	14
h	13	13
k	25	28
l	34	59
n**	2	2.5

* In initial position

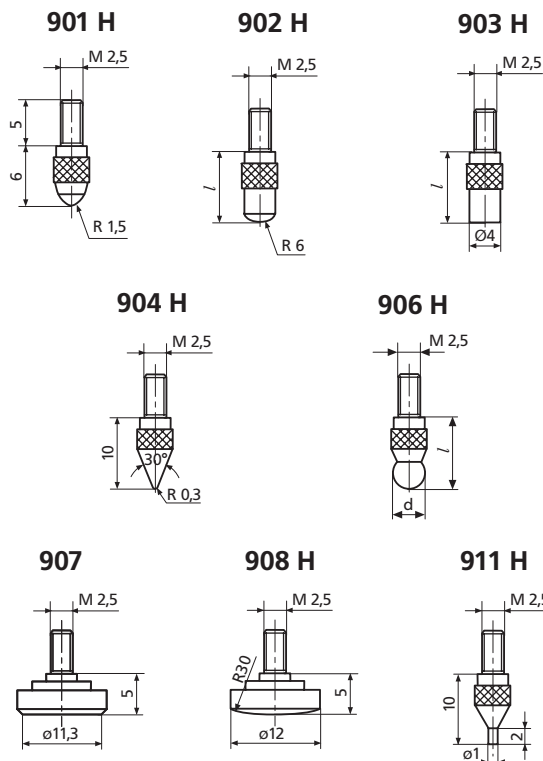
** Distance of moveable anvil

Interchangeable Anvils for Indicating Snap Gage 840 FG

Catalog no.	Features	Order no.
901 H	Standard contact point with carbide ball, ball dia. 3 mm	4360002
902 H	Spherical contact point, with carbide face, R = 6 mm	
	Length <i>l</i> in mm	
	10	4360041
	15	4360043
	20	4360044
903 H*	Flat contact point, carbide tipped	4360101
	Length <i>l</i> in mm	
	6	
	10	
	15	4360103
	20	4360105
		4360106
904 H	Conical contact point, carbide tipped	4360131

906 H Ball Contact Points
with carbide ball,
manufacturing tolerance ball dia. 0/-6 µm

Ball dia. d mm	<i>l</i> mm	Order no.	Ball dia. d mm	<i>l</i> mm	Order no.
1	8.5	4360150	5.5	9	4360161
1.25	8.5	4360151	6	9	4360162
1.5	8.5	4360152	6.35 (1/4")	9	4360163
1.75	8.5	4360153	6.5	10	4360164
2	8.5	4360154	7	10	4360165
2.5	8.5	4360155	7.5	11	4360166
3	8.5	4360156	8	11	4360167
3.5	8.5	4360157	8.5	12	4360168
4	8.5	4360158	9	12	4360169
4.5	8.5	4360159	10	13	4360170
5	9	4360160			



Catalog no.	Features	Order no.
907	Flat contact plates* steel, dia. 11.3 mm, A = 1 cm ²	4360200
907 H	Flat contact plates*, carbide tipped, dia. 7 mm	4360201
908	Spherical contact plates, steel	4360210
908 H	Spherical contact plates, carbide tipped	4360211
911 H	Pin contact point, carbide tipped, dia. 1 mm, plan	4360240

* When using a flat contact plate the opposite facing anvil must be a spherical contact plate.

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compramess 1004	5 µm	4333000
Millimess 1003	1 µm	4334000
Millimess 1003XL	2 µm	4334001
Supramess 1002	0.5 µm	4335000
Extramess 2000	0.2 µm, 0.5 µm, 1 µm	4346000
Extramess 2001	0.2 µm, 0.5 µm, 1 µm	4346100

Digital Indicators see Chapter 5

Electrical Indicating Instruments see Chapter 7

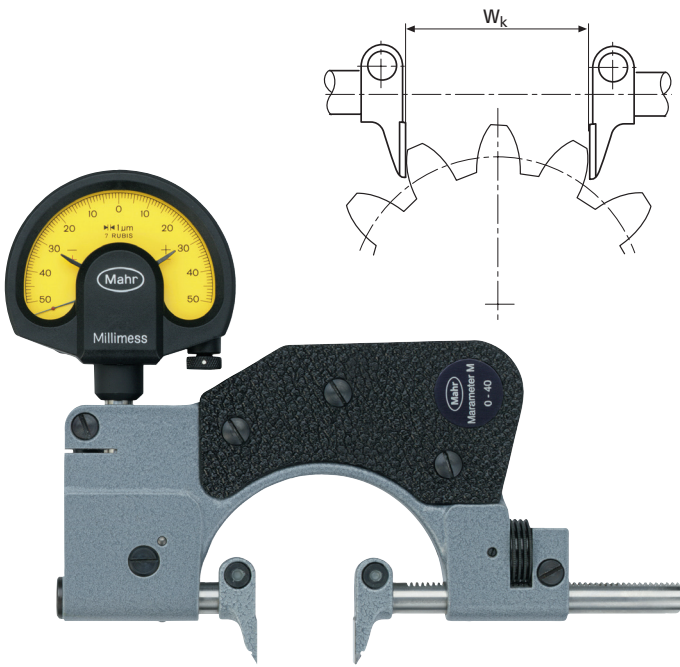
Accessories

Reference Discs 390 see Chapter 13

Gage Blocks see Chapter 13

Holder 840 Fk and **Stand 840 Ff** see Page 9-11

Indicating Snap Gages 840 FM MaraMeter M with measuring jaws



Features

- For diameters of small hubs, registers, shoulders on shafts and groove widths as well as for tooth span W_k as indirect, reference-free determination of tooth thickness on spur gears with straight and helical teeth
- Rugged, forged steel frame with heat insulators
- Measuring spindle is mounted in long guide way with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Maximum wear resistance due to non-contact positioning in conjunction with carbide-tipped measuring faces
- Measuring spindle and anvil spindle made of hardened stainless steel; with extending carbide-tipped measuring jaws
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable and extremely versatile, each instrument spans a broad measuring range, within this range any dimension and fit can be very quickly and easily adjusted
- Supplied with: Wooden case, steel flat contact points 903

Technical Data

	Measuring range mm	Repeatability f_w μm	Measuring force N	Measuring face			Tooth span measurements as per module m	Order no.*
				Area mm	Flatness μm	Parallelism μm		
840 FM	0 - 40	1	7.5	12 x 12	≤ 0.5	≤ 2	0.5	4452000
	40 - 80	1	7.5	12 x 12	≤ 0.5	≤ 3	0.5	4452001
	80 - 130	1	9	15 x 17	≤ 0.5	≤ 3	1.0	4452002
	130 - 180	1	9	15 x 17	≤ 0.5	≤ 3	1.0	4452003

* Excludes indicating instrument

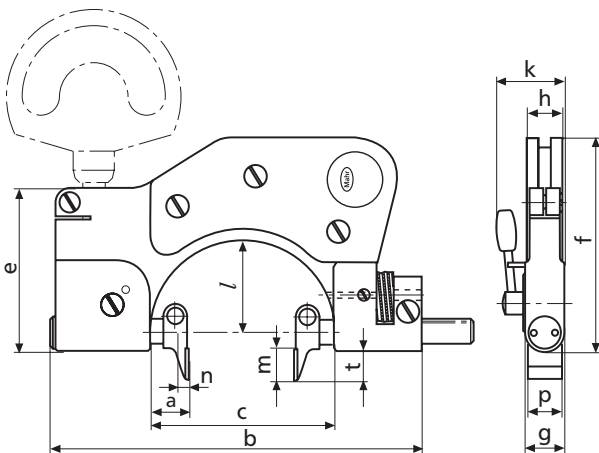
Dimensions

Meas. range (mm)	0 - 40	40 - 80	80 - 130	130 - 180
Dist mov. anvil (mm)	2	2.5	2.5	2.5
a*	14	14	19	15
b	140	193	258	316
c	68	110	162	212
e	60	60	70	75
f	77	103	141	171
g	13	14	16	16
h	13	13	12	12
k	25	28	31	31
l	34	59	87	112
m	12	12	17	17
p	12	12	15	15
t	11	11	17	17

* In initial position

Accessories

Indicating instruments, see Page 9-7
 Reference Discs 390 see Chapter 13
 Gage Blocks see Chapter 13
 Holder 840 Fk and Stand 840 Ff see Page 9-11



Accessories for Dial Indicators and Dial Comparators



Holder 840 Fk for Dial Indicators and Dial Comparators

- For attaching to the following measuring instruments **840 F/FC, 840 FH, 840 FG, 840 FM** and **852**
- Straight transfer of the spindle movement to the indicator
- Following the Abbe principle allows an even higher degree of accuracy than the already excellent level obtained with the standard set-up employing 90° transmission
- When the indicating instrument is in the shown position it is often easier to read
- For stationary application when in conjunction with the **Stand 840 Ff**

Catalog no.	Suitable for instruments with measuring ranges (mm)					Order no.
	840 F/FC	840 FH	840 FG	840 FM	852	
840 Fk/1	0 - 25					4450050
840 Fk/2	25 - 60	0 - 30	0 - 50	0 - 40	0 - 45	4450051
840 Fk/3	50 - 100	30 - 80	40 - 90	40 - 80	45 - 85	4450052
840 Fk/4	{ 100 - 150 150 - 200			{ 80 - 130 130 - 180	{ 85 - 140 140 - 190	4450053



Stand 840 Ff

- For stationary application in conjunction with the following measuring instruments **840 F/FC, 840 FH, 840 FG, 840 FM, 840 E** and **852**
- User has both hands free for insertion of work piece and retraction of moving spindle
- Indicating instrument is always in operator's field of vision
- Rugged, rigid cast-iron stand with clamp for locking the indicating snap gage
- Indicating snap gage is locked in mounting hole for dial comparator
- Only in conjunction with **Holder 840 Fk**

Catalog no.	Suitable for instruments with measuring ranges (mm)					Order no.	
	840 F/FC	840 FH	840 FG	840 FM	840 E		852
840 Ff	{ 0 - 25 25 - 60	0 - 30	0 - 50	0 - 40	0 - 25	0 - 45	4450020

Indicating Snap Gages 840 FS MaraMeter S



Merkmale

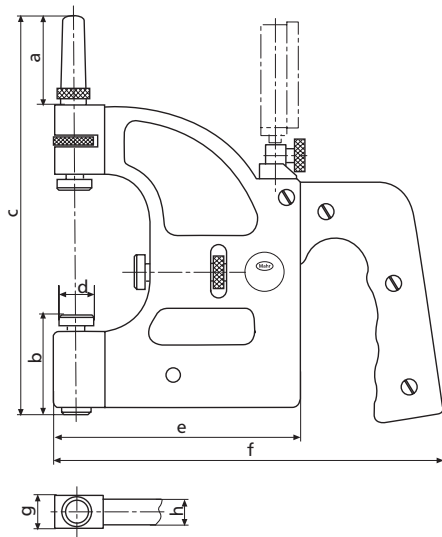
- For all kinds of cylindrical work pieces, whether directly on a machine tool or in the production control
- Rigid frame; convenient handle with heat insulators open on one end to eliminate heat transfer from user's hand
- Both spindles are made of hardened stainless steel and mounted in long guide ways
- Carbide-tipped measuring faces slightly chamfered at the front to facilitate positioning
- Projects over width of frame for measurement of narrow registers or when measuring directly at shoulders
- Maximum accuracy. Straight transfer of spindle movement to indicator. During the measurement, the weight of the gage rests on the anvil spindle
- Adjustable center stop for automatic alignment
- Indicating instrument is protected against possible impact during handling by a laterally projecting guard
- Direct indication and evaluation of measurement results
- Universally applicable and extremely versatile, each instrument spans a broad measuring range, within this range any dimension and fit can be very quickly and easily adjusted
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Supplied with:
Wooden case, Allen key

Technical Data

	Measuring range		Repeatability f_w μm	Measuring force N	Distance of moveable anvil mm	Measuring faces		Weight kg	Order no.*
	mm					Flatness μm	Parallelism μm		
840 FS	10	- 30	1	13.5	0.7	≤ 0.5	≤ 3	0.6	4455000
840 FS	30	- 60	1	13.5	0.7	≤ 0.5	≤ 3	0.9	4455001
840 FS	60	- 100	1	13.5	0.7	≤ 0.5	≤ 3	1.3	4455002
840 FS	100	- 150	1	15	0.7	≤ 0.5	≤ 3	1.7	4455003
840 FS	150	- 200	1	15	0.7	≤ 0.5	≤ 3	2.0	4455004
840 FS	200	- 250	1	15	0.7	≤ 0.5	≤ 3	2.2	4455005
840 FS	250	- 300	1	15	0.7	≤ 0.5	≤ 3	2.5	4455006
840 FS	300	- 350	1	15	0.7	≤ 0.5	≤ 4	3.3	4455007
840 FS	350	- 400	1	15	0.7	≤ 0.5	≤ 4	3.3	4455008
840 FS	400	- 450	1	15	0.7	≤ 0.5	≤ 4	4.3	4455009
840 FS	450	- 500	1	15	0.7	≤ 0.5	≤ 4	4.7	4455010

* Excludes indicating instrument

Technical Data



Dimensions

Meas. range mm	dia. d	a	b	c	e	f	g	h
10 - 30	18	37	46	154	87	161	17	15
30 - 60	18	45	51	199	122	196	17	15
60 - 100	22	56	62	260	154	228	20	18
100 - 150	22	71	62	335	189	263	20	18
150 - 200	22	71	62	385	214	288	20	18
200 - 250	22	71	62	436	248	322	20	18
250 - 300	22	71	62	487	280	354	20	18
300 - 350	22	71	62	537	310	384	20	18
350 - 400	22	71	62	587	350	424	20	18
400 - 450	22	71	62	637	380	454	20	18
450 - 500	22	71	62	687	410	484	20	18

Accessories

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Millimess 1003 XL	2 μm	4334001
Supramess 1002	0.5 μm	4335000
Extramess 2000	0.2 μm , 0.5 μm , 1 μm	4346000
Extramess 2001	0.2 μm , 0.5 μm , 1 μm	4346100

Digital Indicators see Chapter 5

Electrical Indicating Instruments see Chapter 7



2000



1003

Electronic Snap Gage 840 E MaraMeter E for extremely high accuracy



Features

- Inductive measuring system incorporated directly into frame
- Readings selectable down to 0.01 μm
- Rugged, forged steel frame with heat insulators
- Measuring spindle mounted in extra long guideway with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Measuring spindle and anvil spindle made of hardened stainless steel; measuring faces carbide-tipped
- Adjustable center stop for automatic alignment
- Extremely accurate due to the straight transfer of spindle movement to the inductive measuring system according to the Abbe principle
- Universally applicable and extremely versatile, each instrument spans a broad measuring range, within this range any dimension and fit can be very quickly and easily adjusted
- Maximum wear resistance due to non-contact positioning in conjunction with carbide-tipped measuring faces
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Supplied with:
Wooden case

Technical Data

	Measuring range	Readings / Resolution adjustable to*	Measuring force	Measuring faces dia.	Repeatability f_w	Measuring faces Parallelism	Order no.**
	mm	μm	N	mm	μm	μm	
840 E	0 - 25	0.01	4.5	7.5	≤ 0.1	≤ 0.3	4453000

* Depending upon which indicating instrument is being used

** Excludes indicating instrument

Accessories

Reference Discs 390 see Chapter 13

Gage Blocks see Chapter 13

Stand 840 Ff see Page 9-11

Recommended indicating instruments:

Electrical indicating instruments; recommended are C 1216M, C 1208M and 1240; please refer to Chapter 7



C 1208M



1240

Indicating Bench Snap Gage 852 TS



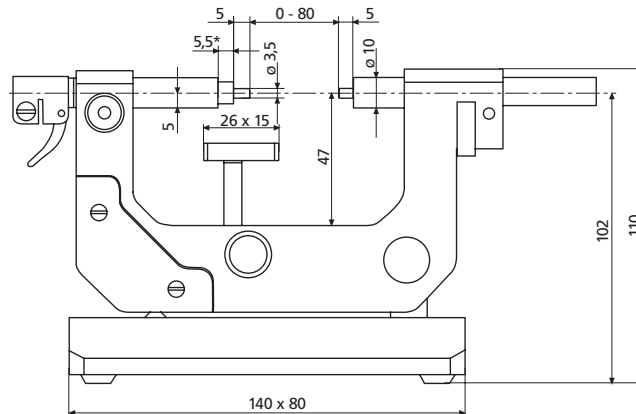
Applications

- For rapid measurements of diameters of cylindrical parts (shafts, bolts and shanks)
- For measuring pitch, root and outside diameters of all kinds of external threads as well as serrations
- For thickness and length measurement
- Particularly suited for batch produced parts

Features

- Rugged steel frame, can be inclined up to 45° from the sturdy base
- Measuring spindle and anvil spindle are both made of hardened stainless steel, with mounting bore for insertion of interchangeable anvils
- Anvil spindle can easily be fine adjusted
- Height adjustable stop
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable and extremely versatile, each instrument spans a broad measuring range
- Scope of supply: TC-tipped anvils dia. D= 3.5 mm, Dial Comparator 1003

Technical Data



Measuring range**	Repeatability	Retraction	Measuring force	Measuring face	Order no.
mm	f_w μm	mm	N	Parallelism μm	
0 - 80	1	1.2	6.5	≤ 2	4510030***

* In initial position

** Depending upon which anvils are being used

*** Delivery with a different indicating instrument is available upon request

Accessories

Order no.

Standard TC-tipped anvils,
Pair dia. D= 3.5 mm

4510840

Interchangeable Anvils please refer to Pages 9-18
Thread Setting Plug Gages see Page 13-17

Indicating Thread Snap Gage 852



Features

- For measuring pitch, root and outside diameters of all kinds of external threads as well as serrations
- Rugged, forged steel frame with heat insulators
- Measuring spindle is mounted in long guide way with lever-controlled retraction
- Anvil spindle can easily be fine adjusted
- Measuring spindle and anvil spindle are both made of hardened stainless steel, with mounting bore for insertion of interchangeable anvils
- Adjustable center stop for automatic alignment
- Maximum wear resistance due to non-contact positioning
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Universally applicable and extremely versatile. each instrument spans a broad measuring range
- Supplied with: Wooden case, steel flat contact points 903

Technical Data

	Measuring range*	Repeatability	Measuring force	Order no.**
	mm	f_w μm	N	
852	0 - 45	1	7.5	4510000
852	45 - 85	1	7.5	4510001
852	85 - 140	1	9	4510002
852	140 - 190	1	9	4510003

* Depending upon which anvils are being used, purchase separately

** Excludes indicating instrument and anvils

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compress 1004	5 μm	4333000
Millimes 1003	1 μm	4334000
Millimes 1003 XL	2 μm	4334001
Suprimes 1002	0.5 μm	4335000
Extrimes 2000	0.2 μm , 0.5 μm , 1 μm	4346000
Extrimes 2001	0.2 μm , 0.5 μm , 1 μm	4346100

Digital Indicators see Chapter 5

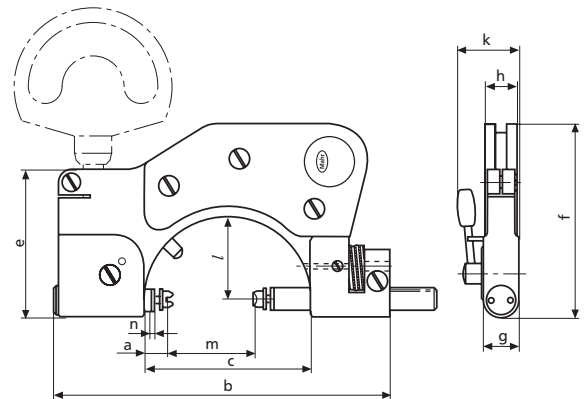
Electrical Indicating Instruments see Chapter 7

Accessories

Interchangeable Anvils please refer to Pages 9-18

Thread Setting Plug Gages see Page 13-17

Holder 840 Fk and Stand 840 Ff (for 0-45 mm) see Page 9-11



Meas. range m (mm)	0-45	45-85	85-140	140-190
Dist mov. anvil n (mm)	2	2.5	2.5	2.5

a*	13	8	10	6
b	140	193	258	316
c	68	110	162	212
e	60	60	70	75
f	77	103	141	171
g	13	14	16	16
h	13	13	12	12
k	25	28	31	31
l	34	59	87	112

a* = In initial position

Indicating Thread Snap Gage 853 for taps



Features

- For pitch, root and outside diameters on taps in conjunction with interchangeable anvils
- Measuring spindle mounted in long guideway, lever-controlled retraction with mounting bore for interchangeable anvils
- Anvil spindle adjustable with thumbscrew via worm and rack, for mounting interchangeable support yokes
- Measuring spindle and anvil spindle are made of hardened stainless steel
- Further features are similar to the model 852; for details please refer to Page 9-16
- Supplied with: Wooden case, steel flat contact points 903

Technische Daten

	Measuring range	Repeatability	Measuring force	Order no.*
	mm	f_w μm	N	
853	1.2 - 35	2	7.5	4511000
853	35 - 75	2	7.5	4511001

* Excludes indicating instrument and the support yokes 853 q

Interchangeable Support Yokes 853 q

Depending upon the number of flutes, allowance has to be made for a compensation factor when reading the result. See table below:

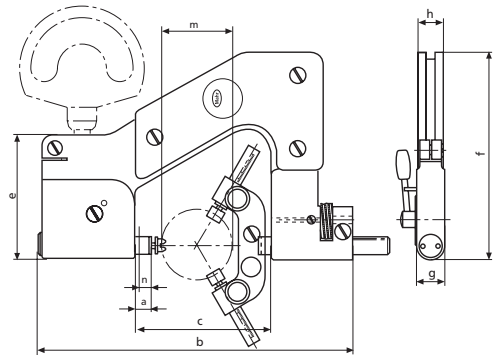
Cat. no.	No. of flutes of taps	For meas. range mm	Compens. factor**	Order no.
853 qk 3	3	1.2 - 35	x 1	4511024
853 qk 5	5	1.2 - 35	x 1.34	4511026
853 qk 7	7	1.2 - 35	x 1.42	4511028
853 qg 3	3	35 - 75	x 1	4511025
853 qg 5	5	35 - 75	x 1.34	4511027
853 qg 7	7	35 - 75	x 1.42	4511029

** Allowance is to be made for other compensation methods when using the Holder 840 Fk

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Indicator	Readings	Order no.
MarCator 810 S	0.001 mm	4311000
Compramess 1004	5 μm	4333000
Zentimes 1010	0.01 mm	4332000
MarCator 1087 R	1 μm	4337160



Meas. range m (mm)	1.2-35	35-75
Dist mov. anvil n (mm)	8	8
a*	12	11.5
b	152	192
c	66	110
e	60	65
f	98	125
g	14	14
h	11.5	14

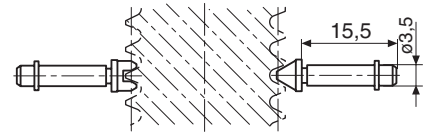
a* = In initial position

Accessories

Interchangeable Anvils see from Pages 9-18
Thread Setting Plug Gages see Page 13-17

Interchangeable Anvils for 852, 852 TS and 853

For pitch, root and outside diameters. Special wear-resistant hardened steel. With cylindrical mounting shank and retainer ring which ensures locking while permitting rotation in bore of indicating snap gages.



Sets consist of:

For pitch diameters

852 - 1 V-anvil and 1 blade
853 - 1 V-anvil and 2 radiused blades

For root diameters

852 - 1 V-anvil and 1 blade
853 - 1 V-anvil and 2 blades

For outside diameters

852 - 2 flat-face anvils
853 - 3 flat-face anvils

Anvils for pitch diameters for 852 and 852 TS

Metric thread (60°)			Whitworth thread (55°)			American UST thread (60°)		
Pitch	V-anvil	Blade	Pitch range	V-anvil	Blade	Pitch range	V-anvil	Blade
mm	Order no.	Order no.	tpi	Order no.	Order no.	tpi	Order no.	Order no.
0.2*	4173007	4173707	40 - 32	4173043	4173743	60 - 48	4173113	4173813
0.25*	4173008	4173708	32 - 24	4173044	4173744	48 - 40	4173114	4173814
0.3*	4173009	4173709	24 - 18	4173045	4173745	40 - 32	4173115	4173815
0.35*	4173010	4173710	18 - 14	4173046	4173746	32 - 24	4173116	4173816
0.4*	4173011	4173711	14 - 10	4173047	4173747	24 - 18	4173117	4173817
0.45*	4173012	4173712	10 - 7	4173048	4173748	18 - 14	4173118	4173818
0.5 - 0.7	4173000	4173700	7 - 4.5	4173049	4173749	14 - 10	4173119	4173819
0.7 - 1	4173001	4173701	4.5 - 3	4173050	4173750	10 - 7	4173120	4173820
1.25 - 2	4173002	4173702	3 - 2.5	4179408	4179410	7 - 4.5	4173121	4173821
2 - 3.5	4173003	4173703				4.5 - 3	4173122	4173822
3.5 - 5	4173004	4173704						
5 - 7	4173005	4173705						
7 - 9	4173006	4173706						

Anvils for pitch diameters for Indicating Thread Snap Gage 853

Metric thread (60°)			Whitworth thread (55°)			American UST thread (60°)		
Pitch	V-anvil	Blade	Pitch range	V-anvil	Blade	Pitch range	V-anvil	Blade
mm	Order no.	Order no.	tpi	Order no.	Order no.	tpi	Order no.	Order no.
0.2	4173051	4174007	40 - 32	4173043	4176043	60 - 48	4173124	4176113
0.25	4173052	4174008	32 - 24	4173044	4176044	48 - 40	4173125	4176114
0.3	4173053	4174009	24 - 18	4173045	4176045	40 - 32	4173115	4176115
0.35	4173054	4174010	18 - 14	4173046	4176046	32 - 24	4173116	4176116
0.4	4173055	4174011	14 - 10	4173047	4176047	24 - 18	4173117	4176117
0.45	4173056	4174012	10 - 7	4173048	4176048	18 - 14	4173118	4176118
0.5 - 0.7	4173000	4174000	7 - 4.5	4173049	4176049	14 - 10	4173119	4176119
0.7 - 1	4173001	4174001	4.5 - 3	4173050	4176050	10 - 7	4173120	4176120
1.25 - 2	4173002	4174002	3 - 2.5	4179408	4179411	7 - 4.5	4173121	4176121
2 - 3.5	4173003	4174003				4.5 - 3	4173122	4176122
3.5 - 5	4173004	4174004						
5 - 7	4173005	4174005						
7 - 9	4173006	4174006						

Carbide anvils for 852, 852TS and 853

1.25 - 2	4511105	4511104
2 - 3.5	4511108	4511107
3.5 - 5	4511140	4511139
5 - 7	4511142	4511141

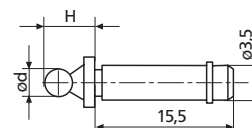
* V-anvil covers 3 pitches

Interchangeable Anvils for 852 and 852 TS

Ball Anvils

For measuring gears and for special applications. Carbide ball. With cylindrical mounting shank and retainer ring.
For mounting into mounting bores of thread micrometers 40 Z and 852.

Shank dia. 3.5 mm
Shank length 15.5 mm
Manufacturing tolerance
Ball dia. $\pm 2 \mu\text{m}$



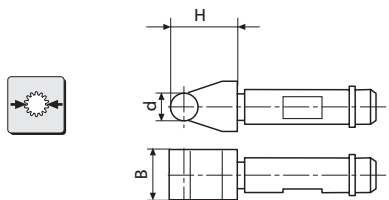
dia. d mm	H mm	Order no.	dia. d mm	H mm	Order no.	dia. d mm	H mm	Order no.
0.5	5.0	4179150	1.65	6.2	4179168	3.048	7.5	4179182
0.551	5.1	4179151	1.7	6.2	4179169	3.2	7.7	4170570
0.62	5.1	4179152	1.75	6.3	4170553	3.25	7.8	4170566
0.623	5.1	4179153	1.782	6.3	4179170	3.4	7.9	4179183
0.63	5.1	4179154	1.8	6.3	4179171	3.5	8.0	4170558
0.722	5.2	4179155	1.829	6.3	4179172	3.658	8.2	4179184
0.862	5.4	4179156	1.9	6.4	4179173	3.7	8.2	4170571
0.895	5.4	4179157	2	6.5	4170554	4	8.5	4170559
0.965	5.5	4179158	2.032	6.5	4170568	4.5	9.0	4170560
1	5.5	4170550	2.2	6.7	4170569	4.835	9.3	4179185
1.1	5.6	4179159	2.25	6.8	4170564	5	9.5	4170561
1.118	5.6	4179160	2.284	6.8	4179174	5.25	9.8	4179186
1.125	5.6	4179161	2.386	6.9	4179175	5.486	10.0	4179187
1.25	5.8	4170551	2.438	6.9	4179176	5.5	10.0	4170562
1.35	5.9	4179162	2.5	7.0	4170556	6	10.5	4170563
1.372	5.9	4179163	2.667	7.2	4179177	6.096	10.6	4179188
1.385	5.9	4179164	2.704	7.2	4179178	6.35	10.9	4179189
1.5	6.0	4170552	2.713	7.2	4179179	6.5	11.0	4170567
1.524	6.0	4179165	2.721	7.2	4179180	7	11.5	4170572
1.54	6.0	4179166	2.743	7.2	4179181	8	12.5	4170573
1.6	6.1	4179167	2.75	7.3	4170565	9	13.5	4170574
			3	7.5	4170557	10	14.5	4170575

Further sizes are available upon request (material: steel)

Roller Blades

For measuring gears and for special applications. The measuring roller is made of carbide.
To be mounted in the mounting bores of the 40 Z and 852.

Shank dia. 3.5 mm
Shank length 15.5 mm
Manufacturing tolerance
Ball dia. $\pm 2 \mu\text{m}$



Further sizes are available upon request (material: steel)

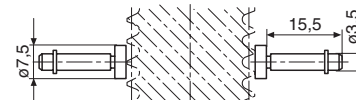
dia. d mm	Dimension H mm	Dimension B dia. mm	Order no.
1	5.5	5	4510200
1.25	5.8	5	4510201
1.5	6.0	5	4510202
1.75	6.3	5	4510203
2	6.5	5.5	4510204
2.5	7.0	5.5	4510206
3	7.5	5.5	4510207
3.5	8.0	5.5	4510208
4	8.5	5.5	4510209
4.5	9.0	5.5	4510210
5	9.5	6	4510211
5.5	10.0	6	4510212
6	10.5	6	4510213

For outside diameters

Anvil 40 Za, flat

Measuring face dia. 7.5 mm
with 853 smallest measurable O.D. dia. 5 mm

Hardened steel **Order no. 4173210**
Carbide tipped **Order no. 4511190**

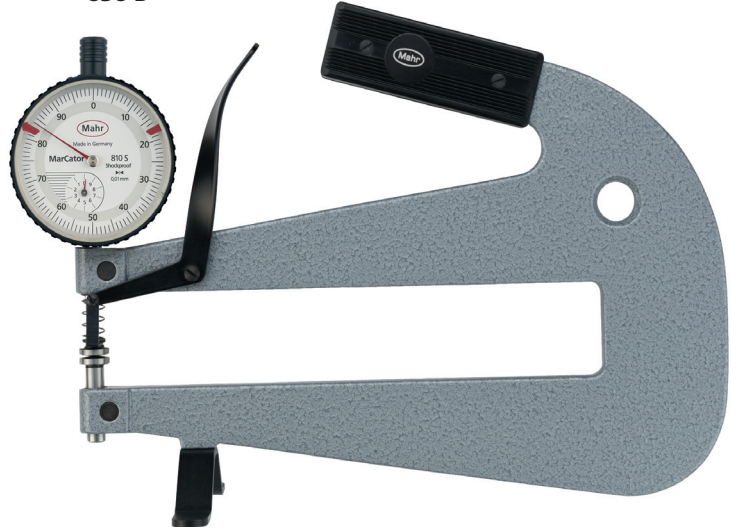


Portable Thickness Gages 838

838 A



838 B



Features

- Rugged sturdy frame made from hard aluminum
- Built-in Digital or Dial Indicator
- With a lifting lever for the moveable upper measuring spindle
- Convenient heat insulated handle, open at one end
- Versions with a throat depth of 200 mm have a removable stand

Thickness Gage 838 A

- With flat measuring faces
- For measuring soft materials for example; foil, felt, rubber, paper and cardboard

Thickness Gage 838 B

- With spherical measuring faces
- For measuring hard materials for example; sheet metal, hardboard, wooden panels and panes of glass

Technical Data

Catalog no.	Throat depth		Measuring range		Measuring face dia. mm	Measuring face radius mm	Order no. with Indicator 810	Order no. with Indicator 1075 R 5μm	Order no. Wooden case
	mm	(inch)	mm	(inch)					
838 A	50	(2")	0 - 20	(0 - .750")	11.3 = 1 cm ²	-	4495000	4495120	4495050
	100	(4")	0 - 20	(0 - .750")	11.3 = 1 cm ²	-	4495001	4495121	4495051
	200	(8")	0 - 20	(0 - .750")	11.3 = 1 cm ²	-	4495002	4495122	4495052
	50	(2")	0 - 20	(0 - .750")	20 = 3.14 cm ²	-	4495103	4495125	4495050
	100	(4")	0 - 20	(0 - .750")	20 = 3.14 cm ²	-	4495104	4495126	4495051
	200	(8")	0 - 20	(0 - .750")	20 = 3.14 cm ²	-	4495105	4495127	4495052
	50	(2")	0 - 20	(0 - .750")	30 = 7.06 cm ²	-	4495109	4495130	4495050
	100	(4")	0 - 20	(0 - .750")	30 = 7.06 cm ²	-	4495110	4495131	4495051
	200	(8")	0 - 20	(0 - .750")	30 = 7.06 cm ²	-	4495111	4495132	4495052
838 B	50	(2")	0 - 20	(0 - .750")	12	30	4495010	4495135	4495050
	100	(4")	0 - 20	(0 - .750")	12	30	4495011	4495136	4495051
	200	(8")	0 - 20	(0 - .750")	12	30	4495012	4495137	4495052

838 AB**Features**

- Rugged sturdy frame made from hard aluminum
- Built-in Digital or Dial Indicator or Dial Comparator
- With a lifting lever for the moveable upper measuring spindle
- Convenient heat insulated handle, open at one end

Thickness Gage 838 AB

- Lower measuring face is flat
- Upper measuring face is spherical
- For measuring hard materials for example; sheet metal and hardboard

Technical Data

Catalog no.	Throat depth		Measuring range		Measuring face dia. mm lower	Measuring face radius mm upper	Order no. with Indicator 810	Order no. with Indicator 1075 R 5μm	Order no. Wooden case
	mm	(inch)	mm	(inch)					
838 AB flat / spherical	50	(2")	0 - 20	(0 - .750")	11.3 = 1 cm ²	30	4495504	4495140	4495050
	100	(4")	0 - 20	(0 - .750")	11.3 = 1 cm ²	30			

Catalog no.	Throat depth		Measuring range		Measuring face dia. mm lower	Measuring face radius mm upper	Order no. with Indicator 1075 R 1μm	Order no. with Comparator 1003	Order no. Wooden case
	mm	(inch)	mm	(inch)					
838 AB flat / spherical	50	(2")	0 - 20	(0 - .750")	11.3 = 1 cm ²	30	4495145	4495519	4495050
	100	(4")	0 - 20	(0 - .750")	11.3 = 1 cm ²	30			

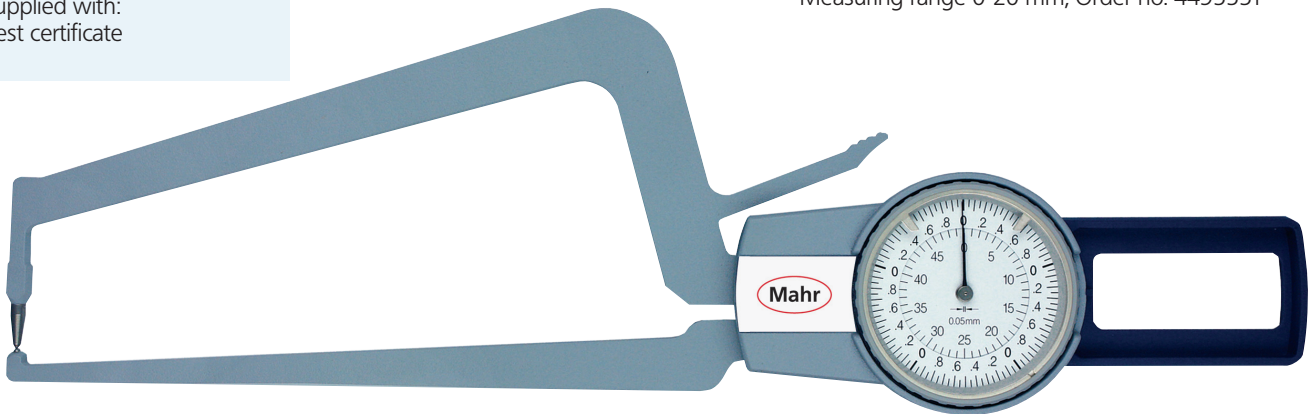
Gages for External Measurement 838 TA to measure thickness and wall thicknesses

Features

- For measuring thicknesses and wall thicknesses
- Easy to operate, very habile and portable
- Easy to read tolerance markers
- Dust and splash waterproof
- Contact points are made from carbide
- Absolute measuring instrument
- Supplied with: Test certificate



Type A
Measuring range 0-20 mm, Order no. 4495551

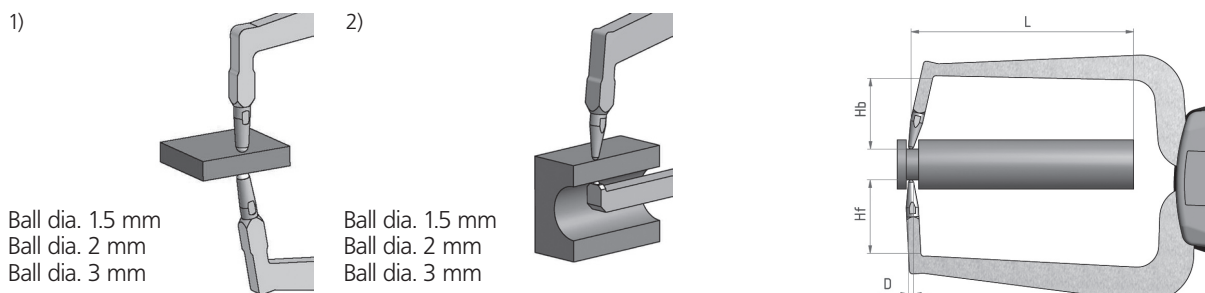


Type B with handle
Measuring range 0-50 mm, Order no. 4495554

Technical Data and Dimensions

			Type A			Type B	
Measuring range	Meb	mm	0 - 10	0 - 20	0 - 20	0 - 50	0 - 50
Readings	Skw	mm	0.005	0.01	0.01	0.05	0.05
Error limit	G	mm	0.015	0.03	0.03	0.05	0.05
Repeatability limit	r	mm	0.005	0.01	0.01	0.025	0.025
Measuring depth	L	mm	35	85	85	170	170
Contact point - length (move.)	Hb	mm	19.1	24.6	24.6	32	32
Contact point - length (fixed)	Hf	mm	18.6	24.6	2.5	32	1
Contact point - ball dia.	D	mm	1.5 ¹⁾	1.5 ¹⁾	1.5 ²⁾	2 ¹⁾	2 ²⁾
Measuring force	F	N	0.8 - 1.2	1.1 - 1.6	1.1 - 1.6	1.2 - 1.8	1.2 - 1.8
Protection class			IP65	IP65	IP65	-	-
Order no.			4495550	4495551	4495552	4495553	4495554

Applications



1)
Ball dia. 1.5 mm
Ball dia. 2 mm
Ball dia. 3 mm

2)
Ball dia. 1.5 mm
Ball dia. 2 mm
Ball dia. 3 mm

Electronic Gages for External Measurement 838 EA to measure thickness and wall thicknesses

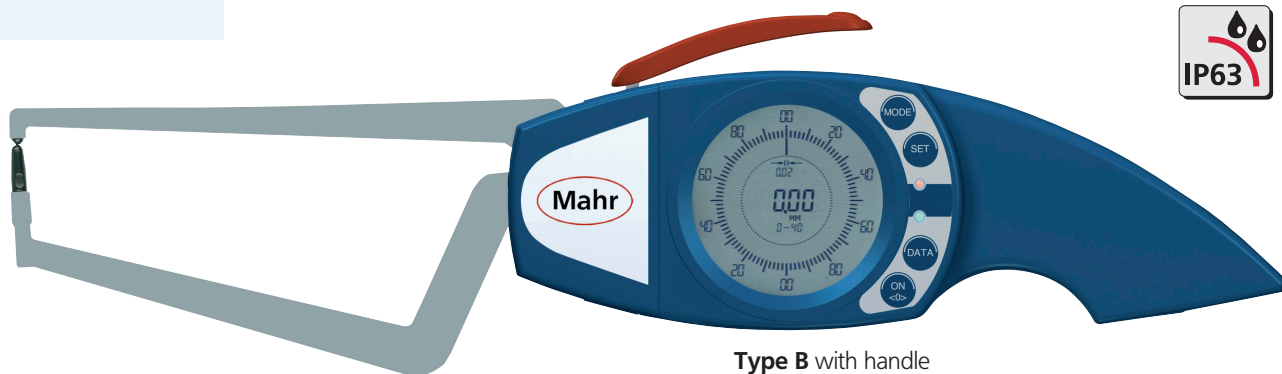
Features

- High contrast analog and digital LCD
- Specified measuring programs according to application
- Absolute/Relative measuring program
- Tolerance is displayed with 2 LEDs
- mm/inch switchable
- Protection class IP67 or IP63 according to EN 60529
- Supplied with:
Test certificate
Battery



Type A

Measuring range 0-20 mm, Order no. 4495561



Type B with handle

Measuring range 0-40 mm, Order no. 4495167

Technical Data and Dimensions

			Type A			Type B	
Measuring range	Meb	mm	0 - 10	0 - 20	0 - 20	0 - 40	0 - 40
Resolution	Skw	mm	0.005	0.01	0.01	0.02	0.02
Error limit	G	mm	0.015	0.03	0.03	0.04	0.04
Repeatability limit	r	mm	0.005	0.01	0.01	0.02	0.02
Measuring depth	L	mm	35	85	85	115	115
Contact point - length (move.)	Hb	mm	19.1	24.6	24.6	25	25
Contact point - length (fixed)	Hf	mm	18.6	24.6	2.5	25	1
Contact point - ball dia.	D	mm	1.5 ¹⁾	1.5 ¹⁾	1.5 ²⁾	3 ¹⁾	3 ²⁾
Measuring force	F	N	0.8 - 1.2	1.1 - 1.6	1.1 - 1.6	1 - 1.5	1 - 1.5
Protection class			IP67	IP67	IP67	IP63	IP63
Order no.			4495560	4495561	4495562	4495059	4495167

Accessories

	Order no.
Digimatic interface incl. data connection cable for Type A	838 di 4495083
Digimatic interface incl. data connection cable for Type B	838 di 4495084
USB data cable incl. Software for Type A	838 usb 4495079
Battery Alkaline AAA 1.5 V for Type A*	4243073
Battery Alkaline AA 1.5 V for Type B	4243072

* 2 batteries are required

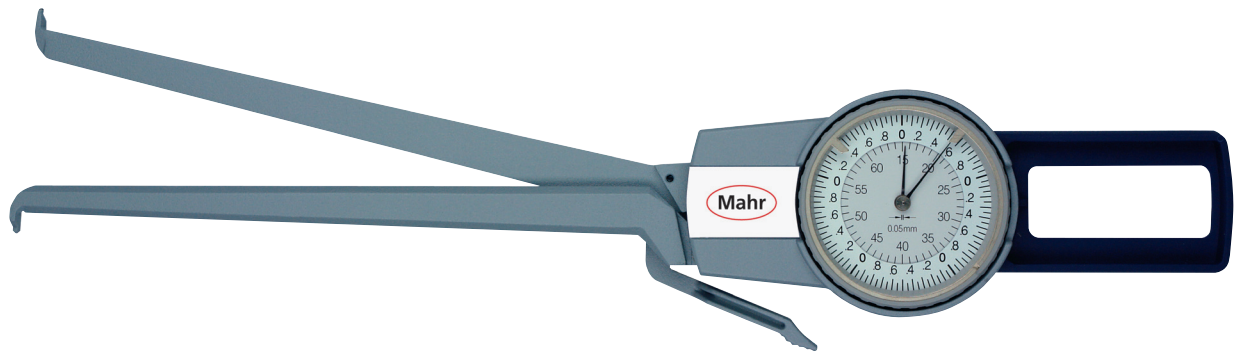
Gages for Internal Measurement 838 TI for measuring bores and internal grooves

Features

- For measuring bores and internal grooves
- Easy to operate, very habile and portable
- Easy to read tolerance markers
- Dust and splash waterproof
- Contact points are made from carbide
- Absolute measuring instrument
- Supplied with: Test certificate



Type A
Measuring range 10-30 mm, Order no. 4495581

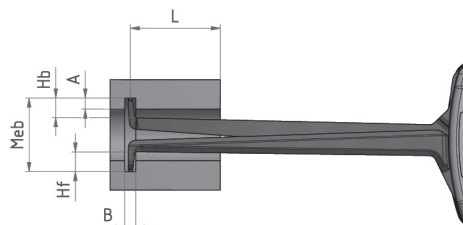


Type B with handle
Measuring range 15-65 mm, Order no. 4495076

Technical Data and Dimensions

			Type A						Type B	
			5 - 15	10 - 30	20 - 40	30 - 50	40 - 60	50 - 70	15 - 65	40 - 90
Measuring range	Meb	mm	5 - 15	10 - 30	20 - 40	30 - 50	40 - 60	50 - 70	15 - 65	40 - 90
Readings	Skw	mm	0.005	0.01	0.01	0.01	0.01	0.01	0.05	0.05
Error limit	G	mm	0.015	0.03	0.03	0.03	0.03	0.03	0.05	0.05
Repeatability limit	r	mm	0.005	0.01	0.01	0.01	0.01	0.01	0.025	0.025
Measuring depth	L	mm	35	85	85	85	85	85	175	175
Groove depth	A	mm	2.3	5.2	7.0	7.0	8.3	8.3	4.5	8
Groove width	B	mm	0.8	1.2	1.2	1.2	1.2	1.2	2.5	2.5
Contact point - length (move.)	Hb	mm	2.5	5.4	7.3	7.3	12.2	12.2	5.3	8.5
Contact point - length (fixed)	Hf	mm	2.5	5.4	7.3	7.3	12.2	12.2	5.3	8.5
Contact point - ball dia.	D	mm	0.6	1	1	1	1	1	1.5	2
Measuring force	F	N	0.8 - 1.2	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.2 - 2	1.2 - 2
Protection class			IP65	IP65	IP65	IP65	IP65	IP65	-	-
Order no.			4495580	4495581	4495582	4495583	4495584	4495585	4495076	4495077

Application



Electronic Gages for Internal Measurement 838 EI for measuring bores and internal grooves

Features

- High contrast analog and digital LCD
- Specified measuring programs according to application
- Absolute/Relative measuring program
- Tolerance is displayed with 2 LEDs
- mm/inch switchable
- Protection class IP67 or IP63 according to EN 60529
- Supplied with:
Test certificate
Battery



Type A
Measuring range 10-30 mm, Order no. 4495591



Type B with handle
Measuring range 15-55 mm, Order no. 4495596

Technical Data and Dimensions

			Type A						Type B	
			5 - 15	10 - 30	20 - 40	30 - 50	40 - 60	50 - 70	15 - 55	35 - 75
Measuring range	Meb	mm	5 - 15	10 - 30	20 - 40	30 - 50	40 - 60	50 - 70	15 - 55	35 - 75
Resolution	Skw	mm	0.005	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Error limit	G	mm	0.015	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Repeatability limit	r	mm	0.005	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Measuring depth	L	mm	35	85	85	85	85	85	114	114
Groove depth	A	mm	2.3	5.2	7.0	7.0	8.3	8.3	4.5	8
Groove width	B	mm	0.8	1.2	1.2	1.2	1.2	1.2	2.5	3
Contact point - length (move.)	Hb	mm	2.5	5.4	7.3	7.3	12.2	12.2	6	8.5
Contact point - length (fixed)	Hf	mm	2.5	5.4	7.3	7.3	12.2	12.2	6	8.5
Contact point - ball dia.	D	mm	0.6	1	1	1	1	1	1.5	2
Measuring force	F	N	0.8 - 1.2	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.1 - 1.6	1.2 - 1.7	1.3 - 1.8
Protection class			IP67	IP67	IP67	IP67	IP67	IP67	IP63	IP63
Order no.			4495590	4495591	4495592	4495593	4495594	4495595	4495596	4495597

Accessories

	Order no.	Order no.
Digimatic interface incl. data connection cable for Type A	838 di	4495083
Digimatic interface incl. data connection cable for Type B	838 di	4495084
USB data cable incl. Software for Type A	838 usb	4495079
Battery Alkaline AAA 1.5 V for Type A*		4243073
Battery Alkaline AA 1.5 V for Type B		4243072
* 2 batteries are required		

Definition of Terms Specifications for inspection and test acceptance procedure of mechanical and electronic caliper gages

1. Basics

The inspection only follows approximately the testing methods and procedures of the German standard DIN 878 for dial gages and the testing statements for caliper gages according to VDI/VDE/DGQ 2618 sheet 12.1 and 13.1. The gages are referred to without special reference as gages for 'absolute' measurements and adjustable zero point.

2. Definitions

Definitions of length checking techniques see DIN 2257 part 1 and part 2 (see Illustration).

2.1 Application range Awb

Application range Awb of a gage corresponds to the sum of adjusting and measuring range.

2.2 Measuring range Meb

The measuring range of an indicating gage represents the range of measuring values in which agreed error limits must not be exceeded.

2.3 Reading Zw

The reading Zw of a numerical interval of a numerical scale is the modification of the value of a measured variable that causes the modification of the indication by one interval. The numerical interval corresponds to the scale interval of a line scale and is indicated in the unity of the measured variable.

2.4 Scale interval Skw

The scale interval Skw is indicated on the scale, i.e. 0.01 mm. It corresponds to the measuring value between two scale graduation marks.

2.5 Deviation within the measuring range f_M

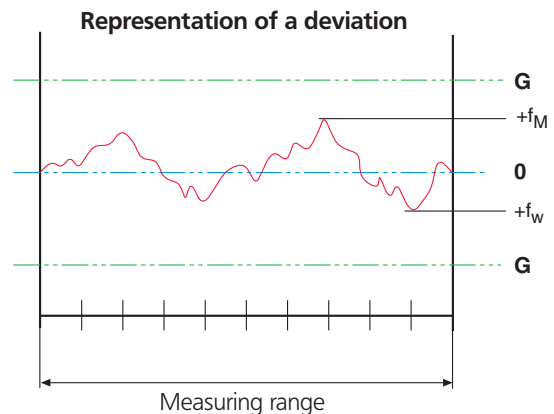
The deviation within the measuring range (range of deviation) f_M represents the distance of ordinates between the highest and the lowest position in the deviation diagram when the movable caliper arm closes. The **error limits G** for f_M is symmetrically positioned to the zero line and is indicated as ± f_{Mzul.}

The deviation in the partial measuring range f_w can only be determined by using electronic testing methods during the preparation of certificates of quality.

2.6 Repeatability f_w

Repeatability f_w is a characteristic value for deviations of the measured variable within the measuring range in the same motion direction of the movable caliper arm (usually n is 5).

The limits of error f_w are referred to with **repeatability limit r**.



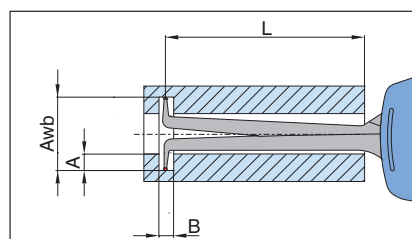
Measuring Capacity of Internal Measuring Instruments

Data listed in the table referring to groove depth A, groove width B and measuring depth L are only meant to be rough guidelines.

For each type of instrument there is dependence of these three values from each other and on the application range Awb. This is shown in the adjacent table of examples. For each inside measuring instrument this table is available upon request in connection with a detailed data sheet.

Groove depth A (mm)	Application range Awb (mm)										
	10	11	12	13	14	15	16	17	18	19	20
0	0/55	0/55	0/56	0/56	0/57	0/57	0/57	0/57	0/57	0/57	0/58
0.5		1.4/55	1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/57	1.4/57	1.4/57
1			1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/56	1.4/57
1.5				1.4/55	1.4/55	1.4/55	1.4/55	1.4/56	1.4/56	1.4/56	1.4/56
2					1.4/55	1.4/55	1.4/55	1.5/55	1.5/55	1.5/56	1.5/56
2.5						1.4/55	1.5/55	1.5/55	1.6/55	1.6/55	1.6/55
3							1.5/54	1.6/54	1.6/55	1.6/55	1.6/55
3.5								1.6/54	1.6/54	1.6/54	1.6/55
4									1.7/54	1.7/54	1.7/54
4.5										1.7/53	1.8/54

Relationship B/L



B = Min. groove depth (mm)
L = Max. usable caliper arm length (mm)

Example: Awb = 12 B = 1.4
 A = 0.5 L = 56

Indicating Depth Gage 837



Features

- Cross beam is hard chrome plated and hardened
- Measuring faces are finely lapped
- Supplied with:
Cross beam,
Anvil 902 12 mm

Technical Data

Length of cross beam mm	Width of cross beam mm	Flatness of the cross beam	Mounting hole mm	Order no.*
80	16	DIN 876/0	8H7	4494010
100	16	DIN 876/0	8H7	4494011
120	20	DIN 876/0	8H7	4494012

* Excludes indicating instrument

Accessories

Spherical Contact Points 902

Depth measuring range* mm	L mm	Order no.
10 - 20	25	4360015
20 - 30	35	4360017
30 - 40	45	4360026
40 - 50	55	4360031
50 - 60	65	4360035
60 - 70	75	4360020
70 - 80	85	4360036
80 - 90	95	4360029

* for Indicators with a 10 mm measuring range

Indicating Instruments

Recommended are:

Indicator	Readings / Resolution mm	Measuring range mm	Order no.
810 AT	0.01	10	4311060
1075 R	0.01	12.5	4336010
1086 R	0.01	25	4337130
1086 R	0.01	50	4337131

Indicating Plug Gages 844 D



Features

- For the rapid testing of diameter, roundness and conicity of bores
- Especially suitable for testing batches with tight tolerances
- No rocking in the bore is required to determine the reversal point
- Therefore ideal for use in conjunction with a digital indicating instrument and for subsequent processing of measured values
- Measuring head has a hardened chromium plated guide cylinder and carbide tipped anvils
- The carbide expanding pin transfers radial movement to indicating instrument
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Measuring head, holder, depth extension, right angle attachments and depth stops are part of an extensive modular system

Technical Data of the Measuring Heads

Nominal diameter of the bore	Measuring range starting from the minimum bore dimension to be measured			
	844 Dk/844Dkr		844 Dks (from 4 mm)	
2.98 - 8 mm	- 0.02	+ 0.1 mm	- 0.02	+ 0.1 mm
over 8 - 16 mm	- 0.02	+ 0.15 mm	- 0.02	+ 0.15 mm
over 16 - 32 mm	- 0.02	+ 0.2 mm	- 0.02	+ 0.15 mm
over 32 - 70 mm	- 0.03	+ 0.2 mm	- 0.03	+ 0.15 mm
over 70 - 200 mm	- 0.04	+ 0.2 mm	- 0.04	+ 0.15 mm

Accuracy

Hysteresis
 Repeatability
 Linearity
 Linearity 844 Dks >16 mm

$f_U \leq 0.4 \mu\text{m}$
 $f_W \leq 1 \mu\text{m}$
 $\leq 1 \%$
 $\leq 2 \%$

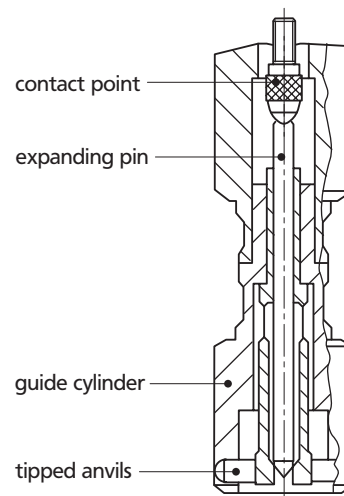
When placing an order please quote the nominal diameter and tolerances, for example:

Bore diameter	Tolerance	
	35 D7	+ 80
35 H7	+ 0	+25 μm
35 R7	- 50	-25 μm

The diameter of the guide cylinder is produced between 0.02 and 0.07 mm smaller than the minimum dimension of the bore to be checked.

Example:

Plug Gage 844 Dk for bore 35 D7
 Nominal diameter: 35 mm
 Minimum dimension: 35.080 mm
 Maximum dimension: 35.105 mm
 Meas. range: 35.050 - 35.280 mm



Plug Gages

Measuring Head 844 Dk, Standard version

	Nominal ^① diameter mm	Manufacturing ^② tolerance mm	Meas. range ^③ dia. d mm	Order no.	
over	2.98 - 3.99 3.99 - 8	-0.02/-0.04 -0.02/-0.04	0.1 0.1	4480184* 4478200*	
over	8 - 16	-0.02/-0.04	0.15	4478201	
over	16 - 25	-0.02/-0.05	0.2	4478202	
over	25 - 32	-0.02/-0.05	0.2	4478204	
over	32 - 44	-0.02/-0.06	0.2	4478205	
over	44 - 50	-0.03/-0.06	0.2	4478206	
over	50 - 60	-0.03/-0.06	0.2	4478207	
over	60 - 70	-0.03/-0.06	0.2	4478208	
over	70 - 80	-0.04/-0.07	0.2	4478209	
over	80 - 90	-0.04/-0.07	0.2	4478210	
over	90 - 100	-0.04/-0.07	0.2	4478211	
over	100 - 110	-0.04/-0.07	0.2	4478212	
over	110 - 120	-0.04/-0.07	0.2	4478213	
over	120 - 130	-0.04/-0.07	0.2	4478214	
over	130 - 140	-0.04/-0.07	0.2	4478215	
over	140 - 150	-0.04/-0.07	0.2	4478216	
over	150 - 160	-0.04/-0.07	0.2	4478217	
over	160 - 170	-0.04/-0.07	0.2	4478218	
over	170 - 180	-0.04/-0.07	0.2	4478219	
over	180 - 190	-0.04/-0.07	0.2	4478220	
over	190 - 200	-0.04/-0.07	0.2	4478221	

① Nominal diameter = smallest bore diameter

② dia. d in reference to the smallest bore diameter

③ Measuring range refers to the nominal diameter

* With Adaptor for connection to the holder

Plug Gages

Measuring Head 844 Dks, for blind holes, to measure almost to the base of a bore

	Nominal ^① diameter mm	Manufacturing ^② tolerance mm	Meas. range ^③ dia. d mm	Order no.	
	4 - 8	-0.02/-0.04	0.10	4478285*	
over	8 - 16	-0.02/-0.04	0.15	4478245	
over	16 - 25	-0.02/-0.05	0.15	4478230	
over	25 - 32	-0.02/-0.05	0.15	4478232	
over	32 - 44	-0.02/-0.06	0.15	4478233	
over	44 - 50	-0.03/-0.06	0.15	4478234	
over	50 - 60	-0.03/-0.06	0.15	4478235	
over	60 - 70	-0.03/-0.06	0.15	4478236	
over	70 - 80	-0.04/-0.07	0.15	4478237	
over	80 - 90	-0.04/-0.07	0.15	4478238	
over	90 - 100	-0.04/-0.07	0.15	4478239	
over	100 - 110	-0.04/-0.07	0.15	4478240	
over	110 - 120	-0.04/-0.07	0.15	4478241	
over	120 - 130	-0.04/-0.07	0.15	4478242	
over	130 - 140	-0.04/-0.07	0.15	4478243	
over	140 - 150	-0.04/-0.07	0.15	4478244	

① Nominal diameter = smallest bore diameter
 ② dia. d in reference to the smallest bore diameter

③ Measuring range refers to the nominal diameter
 * With adaptor for connection to the holder

Plug Gages

Measuring Head 844 Dkr, with an extended guide cylinder to measure through holes from the edge of a bore, ideal for narrow parts

	Nominal ^① diameter mm	Manufacturing ^② tolerance mm	Meas. range ^③ dia. d mm	Order no.	
over	2.98 - 3.99 3.99 - 8	-0.02/-0.04 -0.02/-0.04	0.1 0.1	4478272* 4478250*	
over	8 - 16	-0.02/-0.04	0.15	4478251	
over over over	16 - 25 25 - 32 32 - 44	-0.02/-0.05 -0.02/-0.05 -0.02/-0.06	0.2 0.2 0.2	4478252 4478254 4478255	
over over over	44 - 50 50 - 60 60 - 70	-0.03/-0.06 -0.03/-0.06 -0.03/-0.06	0.2 0.2 0.2	4478256 4478257 4478258	
over over	70 - 80 80 - 90 90 - 100 100 - 110 110 - 120 120 - 130 130 - 140 140 - 150 150 - 160 160 - 170 170 - 180 180 - 190 190 - 200	-0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07 -0.04/-0.07	0.2 0.2	4478259 4478260 4478261 4478262 4478263 4478264 4478265 4478266 4478267 4478268 4478269 4478270 4478271	

① Nominal diameter = smallest bore diameter
② dia. d in reference to the smallest bore diameter

③ Measuring range refers to the nominal diameter
* With adaptor for connection to the holder

Modular Unit System 844 D

Standard Holder 844 Kg/844 Dg - Standard version

With locking clamp for an indicating instrument and a connecting thread for a measuring head. Heat insulated handle. The model 844 Dg is made from Invar steel.

Cat. no.	Connecting thread g	Length L mm	Handle dia. D mm	Order no.
844 Kg	M6 x 0.75	50	14	4470851
844 Dg	M10 x 1	150	26	4478851

Short Holder 844 Dgk - Short version

With locking clamp for an indicating instrument and a connecting thread for a measuring head. Heat insulated handle.

Cat. no.	Connecting thread g	Length L mm	Handle dia. D mm	Order no.
844 Dgk	M10 x 1	61	26	4478050

Holder 844 Dge for Inductive Measuring Probes

With long sleeve for shock and waterproof mounting of inductive measuring probes. Strain relief clamp for probe cable. Threaded connection for measuring heads. Heat insulated handle.

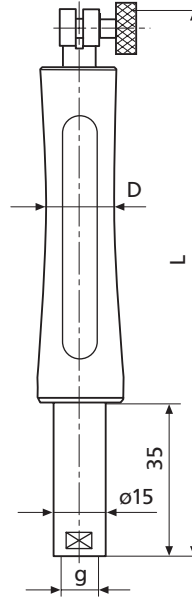
Cat. no.	Connecting thread g	Length L mm	Handle dia. D mm	Order no.
844 Dge	M6 x 0.75	195	33	4478020
	M10 x 1	195	33	4478021

Right Angle (Elbow) Attachment

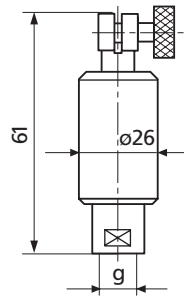
For measuring difficult to reach bores, e.g. in tight spaces, on a machine tool or when work piece bores are inconveniently located. For screwing in between holder and measuring head.

Cat. no.	Connecting thread g mm	Elbow		Order no.
		Length L mm	Height H mm	
844 Kw	M6 x 0.75	26.5	22.5	4470110
844 Dw	M10 x 1	36.7	17	4478110

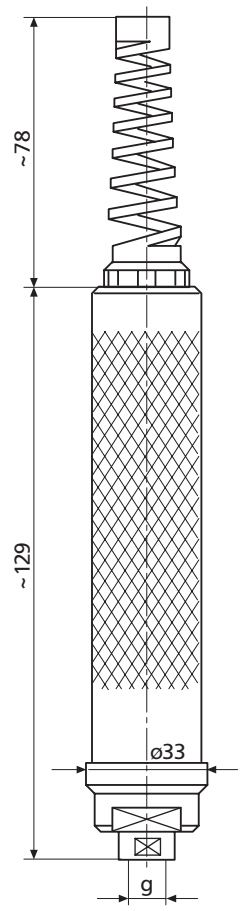
844 Kg / 844 Dg



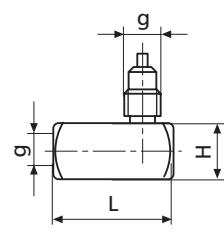
844 Dgk



844 Dge



844 Kw / 844 Dw



Extensions

For extra-deep bores. Screws in between holder and measuring heads. Several extensions can be screwed together as of 8 mm. Models 844 Dv and 844 Dvk made of **Invar steel**.

Cat. no.	Connecting thread g	Length L mm	dia. D mm	Order no.
844 Dvk	M6x0.75/M3,5x0.35	64	3.8	4478080
844 Kv	M6 x 0.75	64	8	4470070
844 Dv	M10 x 1	64	15	4478070
844 Dv	M10 x 1	80	15	4478071
844 Dv	M10 x 1	100	15	4478072
844 Dv	M10 x 1	125	15	4478073
844 Dv	M10 x 1	250	15	4478074
844 Dv	M10 x 1	500	15	4478075

Depth Stops

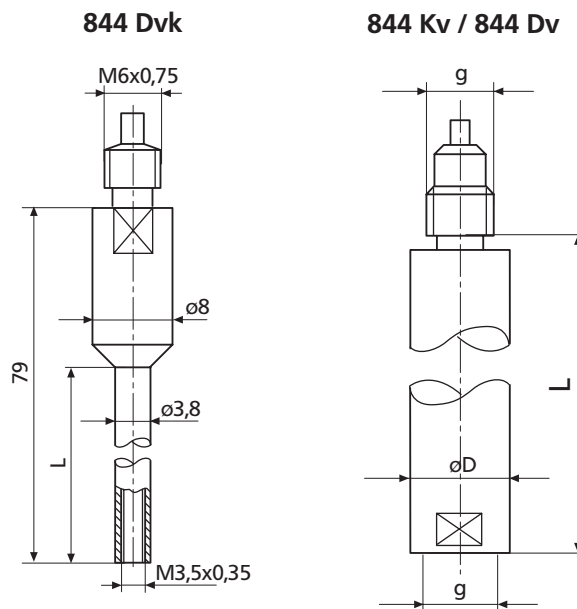
For limiting depth of insertion of measuring head in bore. Can be attached to Extensions 844 Kv or 844 Dv. With clamping screw.

Cat. no.	Mounting hole dia. d mm	Stop surface dia. A mm	Height h mm	Order no.
844 Kt	8	25	60	4470115
844 Dt	15	45	30	4478115
844 Dt	15	75	30	4478116
844 Dt	15	110	30	4478117
844 Dt	15	160	30	4478118
844 Dt	15	220	30	4478119

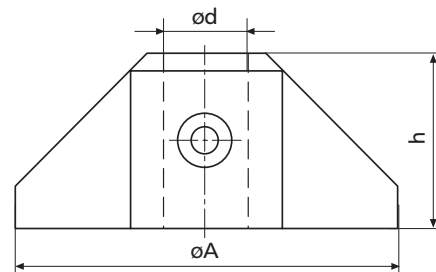
Depth Stop Rings

For limiting depth of insertion of measuring head in bore. Clamped onto the measuring head.

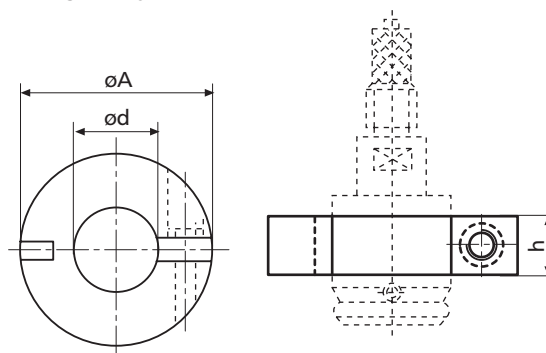
Cat. no.	Mounting hole dia. d mm	Stop surface dia. A mm	Height h mm	Order no.
844 Dtr	3 - 5	27	10	4478130
	> 5 - 8	30	10	4478130
	> 8 - 11	33	10	4478130
	> 11 - 15	37	10	4478130
	> 15 - 20	42	10	4478130
	> 20 - 25	50	12	4478131
	> 25 - 30	55	12	4478131
	> 30 - 35	60	12	4478131
	> 35 - 40	65	12	4478131
	> 40 - 45	70	12	4478131
	> 45 - 50	75	12	4478132
	> 50 - 60	85	12	4478132
	> 60 - 70	95	12	4478132
	> 70 - 80	105	12	4478132
	> 80 - 90	115	12	4478133
	> 90 - 100	125	12	4478133



844 Kt / 844 Dt



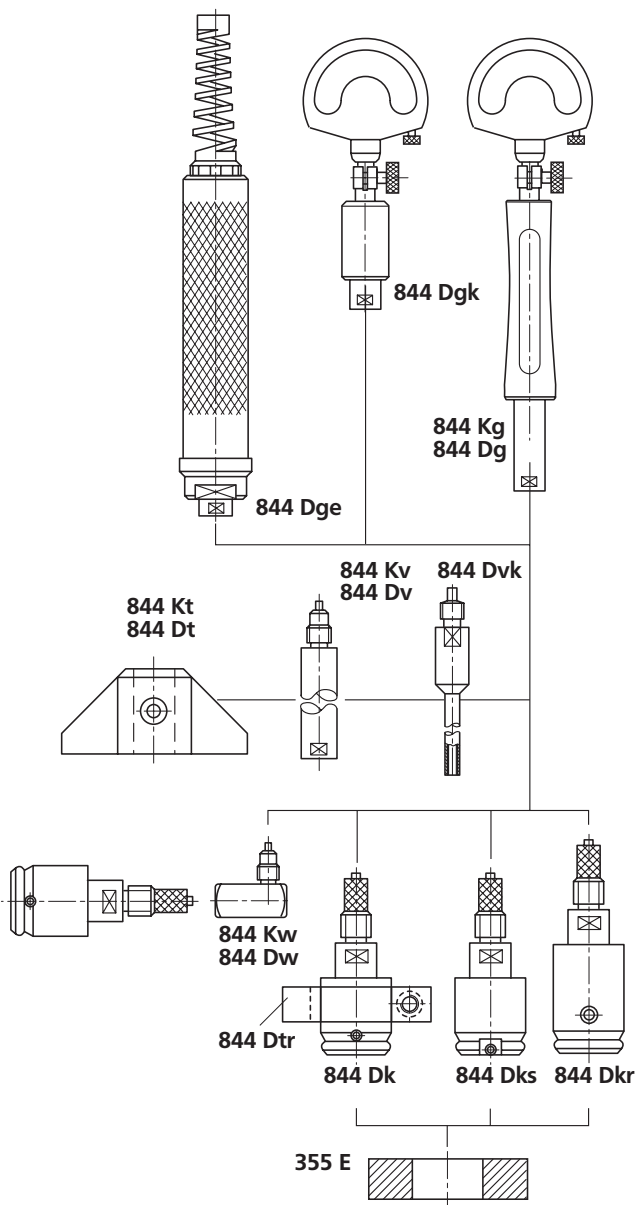
844 Dtr



Modular Unit System 844 D

Modular units	Diameter of Measuring Heads		
	2.98 - 8 mm	8 - 16 mm	over 16 mm
844 Kg	4470851		
844 Dg			4478851
844 Dgk			4478050
844 Dge	4478020		4478021
844 Dvk 844 Kv 844 Dv	4478080	4470070	4478070 to 4478076
844 Kt 844 Dt	4470115		4478115 to 4478119
844 Kw 844 Dw	4470110		4478110
844 Dk 844 Dks 844 Dkr			
355 E	see page 9-42		

Modular unit	Diameter of Measuring Heads			
	2.98 - 20 mm	20 - 44 mm	44 - 80 mm	80 - 100 mm
844 Dtr	4478130	4478131	4478132	4478133



Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Indicator	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Supramess 1002	0.5 μm	4335000
Extramess 2000	0.2 μm , 0.5 μm , 1 μm	4346000
Extramess 2001	0.2 μm , 0.5 μm , 1 μm	4346100
Millimar C 1208	± 3 , 10, 30, 100, 300, 1000 μm 3000 μm , 10000 μm	5312080
Millimar P 2004 M		5323010
Millimar S 1840	± 10 , 30, 100, 300, 1000 μm 3000 μm , 10000 μm	5318400
Millimar P 2004 M		5323010

Digital Indicators see Chapter 5
Electrical Indicating Instruments see Chapter 7

Adjustment of Plug Gages 844 D

Ring Gage 355 E:

Special wear-resistant gage steel. Hardened and lapped. With actual deviation engraved.

Dimensions: DIN 2250, type C
Manufacturing tolerance: DIN 2250
Available diameters: 0.5-200 mm

Self-Centering Dial Bore Gages 844 K Intramess



Features

- Measuring the diameter, roundness and conicity of bores
- Spring-loaded halves of measuring probe are split via expanding pin with precision lapped taper. This movement is transferred to indicating instrument
- Maximum wear-resistance due to hard chrome plating. From 4 mm alternatively with carbide tipped available on request
- Constant measuring force as a result of built-in spring thus eliminating user influence
- Highly versatile, each gage covers a large range. Within the respective limits, quickly and easily adjustable to any size and any type of measuring application
- Measuring probe, holder, depth extensions, right-angle attachments and depth stops are part of an extensive modular system
- Supplied with: Holder, probe, expanding pin and a wooden case, excludes an indicating instrument

Technical Data

Complete Instrument

- 844 K** Measuring heads hard chrome plated, expanding pin made of stainless steel
- 844 KH** Measuring heads carbide tipped on both sides, carbide expanding pin
- 844 KS** Blind hole measuring heads hard chrome plated, expanding pin made of stainless steel

Catalog no.	Measuring range mm	Number of measuring probes	Order no.*
844 K	0.47 - 0.97	6	4470000
	0.95 - 1.55	5	4470001
	1.5 - 4.2	10	4470002
	3.7 - 7.3	7	4470003**
	6.7 - 10.3	7	4470004**
844 KH	9.4 - 18.6	9	4470005**
	1.5 - 4.2	10	4471002
	3.7 - 7.3	7	4471003**
	6.7 - 10.3	7	4471004**
844 KS	9.4 - 18.6	9	4471005**
	1.5 - 4.2	10	4482163
	3.7 - 7.3	7	4482164**
	6.7 - 10.3	7	4482165**
	9.4 - 18.6	9	4482166**

* Excludes an indicating instrument

**Additionally includes measuring force spring 4470828 and disk 4470821

Accuracy

Deviation of linearity

- ≤ 2 % measuring ranges 0.47-1.55 mm
- ≤ 1 % measuring ranges 1.5-18.6 mm

Repeatability

- 1 μm manual measurement
- ≤ 0.5 μm measurement with Stand 844 Kst and Floating Holder 844 Ksts

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Indicators	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Millimess 1003 XL	2 μm	4334001
Supramess 1002	0.5 μm	4335000
Extramess 2000	0.2 μm, 0.5 μm, 1 μm	4346000
Extramess 2001	0.2 μm, 0.5 μm, 1 μm	4346100
MarCator 1087 BR	1 μm, 2 μm, 4 μm, 10 μm	4337162

Digital Indicators see Chapter 5

Electrical Indicating Instruments see Chapter 7

Modular Unit System for 844 K Standard Measuring Probes

In addition complete Dial Bore Gages 844 K, modular units area available for assembly as required to suit an individual measuring task and or application.

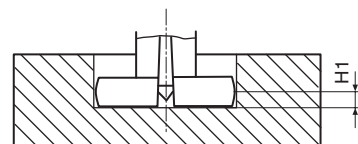
Measuring Probe 844 Kk, Expander Pin, individual Ring Gage for 844 Ke

Nominal dimension mm	Measuring range mm	Measuring depth mm	Measuring probe hard chrome plated	Expanding pin steel	Measuring probe carbide tipped	Expander pin carbide	Ring gage
0.50	0.47 - 0.53	1.25	4470586	4470801			4482300
0.55	0.52 - 0.58	1.5	4470587				4482301
0.60	0.57 - 0.67	1.7	4470588	4470802			4482302
0.70	0.65 - 0.77	2.2	4470589				4482303
0.80	0.75 - 0.87	2.55	4470590	4470803			4482304
0.90	0.85 - 0.97	2.65	4470591				4482305
1.00	0.95 - 1.15	10.5	4470592	4470803			4482306
1.10	1.07 - 1.25	10.5	4470593				4482307
1.20	1.17 - 1.35	10.5	4470594	4470804			4482308
1.30	1.27 - 1.45	10.5	4470595				4482309
1.40	1.37 - 1.55	10.5	4470596	4470804	4471234	4471207	4482310
1.75	1.50 - 1.90	16	4470597				4482311
2.00	1.80 - 2.20	16	4470598	4470805	4471206	4471819	4482312
2.25	2.05 - 2.45	16	4470599				4482313
2.50	2.30 - 2.70	21	4470600	4470805	4471812	4471819	4482314
2.75	2.55 - 2.95	21	4470601				4482315
3.00	2.80 - 3.20	21	4470602	4470806	4471208	4471200	4482316
3.25	3.05 - 3.45	21	4470603				4482317
3.50	3.30 - 3.70	21	4470604	4470806	4471815	4471200	4482318
3.75	3.55 - 3.95	21	4470605				4482319
4.00	3.80 - 4.20	21	4470606	4470806	4471816	4471200	4482320
4.00	3.70 - 4.30	38	4470607				4482320
4.50	4.20 - 4.80	38	4470608	4470806	4471607	4471200	4482321
5.00	4.70 - 5.30	38	4470609				4482321
5.50	5.20 - 5.80	38	4470610	4470806	4471608	4471200	4482322
6.00	5.70 - 6.30	38	4470611				4482322
6.50	6.20 - 6.80	38	4470612	4470806	4471609	4471200	4482323
7.00	6.70 - 7.30	38	4470613				4482323
7.50	7.20 - 7.80	38	4470614	4470806	4471610	4471200	4482324
8.00	7.70 - 8.30	38	4470615				4482324
8.50	8.20 - 8.80	45	4470616	4470806	4471611	4471200	4482325
9.00	8.70 - 9.30	45	4470617				4482325
9.50	9.20 - 9.80	45	4470618	4470806	4471612	4471200	4482326
10.00	9.70 - 10.30	45	4470619				4482326
10.00	9.40 - 10.60	45	4470620	4470808	4471613	4471202	4482327
11.00	10.40 - 11.60	45	4470621				4482327
12.00	11.40 - 12.60	45	4470622	4470808	4471614	4471202	4482328
13.00	12.40 - 13.60	45	4470623				4482328
14.00	13.40 - 14.60	45	4470624	4470808	4471615	4471202	4482329
15.00	14.40 - 15.60	45	4470625				4482329
16.00	15.40 - 16.60	80	4470626	4470808	4471616	4471202	4482330
17.00	16.40 - 17.60	80	4470627				4482330
18.00	17.40 - 18.60	80	4470628	4470808	4471617	4471202	4482331
			4470629				4482331
				4470808	4471618	4471202	4482332
							4482332
				4470808	4471619	4471202	4482333
							4482333
				4470808	4471620	4471202	4482334
							4482334
				4470808	4471621	4471202	4482335
							4482335
				4470808	4471622	4471202	4482336
							4482336
				4470808	4471623	4471202	4482337
							4482337
				4470808	4471624	4471202	4482338
							4482338
				4470808	4471625	4471202	4482339
							4482339
				4470808	4471626	4471202	4482340
							4482340
				4470808	4471627	4471202	4482341
							4482341
				4470808	4471628	4471202	4482342
							4482342
				4470808	4471629	4471202	4482343
							4482343

i for further technical data (e.g. nominal dimensions up to 40 mm) see **WebCode 11070**

Nominal dimension mm	L mm	H 1 mm
0.50	19.50	0.25
0.55	19.50	0.27
0.60	19.50	0.29
0.70	19.50	0.31
0.80	19.50	0.33
0.90	19.50	0.35
1.00	19.50	0.60
1.75	25.30	0.90
2.50	30.60	1.20
4.00	47.30	2.00
10.00	48.50	3.30

Minimum measurement height



Modular Unit System for 844 KS Blind Hole Measuring Probes

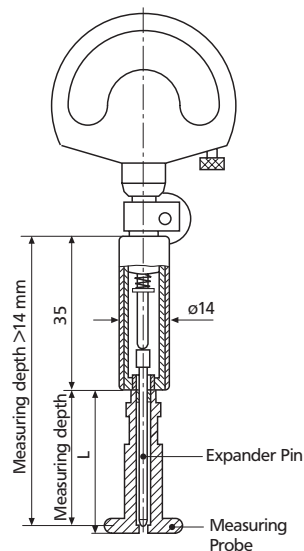
In addition to complete Dial Bore Gages 844 KS, modular units are available for assembly as required to suit a individual measuring task and or application.

Blind Hole Measuring Probe 844 Kk, Blind Hole Expander Pin

Nominal dimension mm	Measuring range mm	Measuring depth mm	Blind hole measuring probe hard chrome plated	Blind hole expander pin steel	
1.75	1.50 - 1.90	16	4482228	4482176	
2.00	1.80 - 2.20	16	4482229		
2.25	2.05 - 2.45	16	4482230		
2.50	2.30 - 2.70	21	4470301		
2.75	2.55 - 2.95	21	4482227	4482177	
3.00	2.80 - 3.20	21	4482178		
3.25	3.05 - 3.45	21	4482179		
3.50	3.30 - 3.70	21	4470300		
3.75	3.55 - 3.95	21	4482188		
4.00	3.80 - 4.20	21	4482180		
4.00	3.70 - 4.30	38	4482057		4482028
4.50	4.20 - 4.80	38	4482162		
5.00	4.70 - 5.30	38	4482056		
5.50	5.20 - 5.80	38	4470953		
6.00	5.70 - 6.30	38	4482140		
6.50	6.20 - 6.80	38	4482055		
7.00	6.70 - 7.30	38	4482108		
7.50	7.20 - 7.80	38	4482204	4482192	
8.00	7.70 - 8.30	38	4482054		
8.50	8.20 - 8.80	45	4482206		
9.00	8.70 - 9.30	45	4482170		
9.50	9.20 - 9.80	45	4482182		
10.00	9.70 - 10.30	45	4470375		
10.00	9.40 - 10.60	45	4482205		
11.00	10.40 - 11.60	45	4482042		
12.00	11.40 - 12.60	45	4482112		
13.00	12.40 - 13.60	45	4482102		
14.00	13.40 - 14.60	45	4482181		
15.00	14.40 - 15.60	45	4482202		
16.00	15.40 - 16.60	80	4482021		
17.00	16.40 - 17.60	80	4482203		
18.00	17.40 - 18.60	80	4482113		

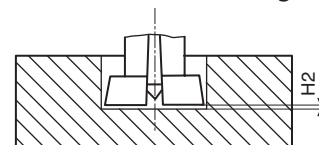


for further technical data (e.g. nominal dimensions up to 40 mm) see **WebCode 11070**



844 Kk

Minimum measurement height



Nominal dimension mm	L mm	H 2 mm
1.75 - 2.25	25.30	0.30
2.50 - 4.00	30.60	0.30
4.00 - 10.00	47.30	0.50
10.00 - 18.00	48.50	1.00

Ring Gage Sets 844 Ke

For setting Dial Bore Gages 844 K, 844 KH and 844 KS. Supplied in sets to match the measuring ranges of these instruments. Can be stored in the wooden case of the bore gages.

Diameter tolerance $\pm 1 \mu\text{m}$

Ring Gages 844 Ke are only available with the diameters shown in the table.

For all other dimensions, Ring Gages 355 E with dimensions as per DIN 2250 and with actual deviation engraved are available.

For Meas. range mm	Diameter mm	Order no.
0.47 - 0.97	0.5 / 0.55 / 0.6 / 0.7 / 0.8 / 0.9	4470160
0.95 - 1.55	1 / 1.1 / 1.2 / 1.3 / 1.4	4470161
1.5 - 4.2	1.75 / 2 / 2.25 / 2.5 / 2.75 / 3 / 3.25 / 3.5 / 3.75 / 4	4470162
3.7 - 7.3	4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7	4470163
6.7 - 10.3	7 / 7.5 / 8 / 8.5 / 9 / 9.5 / 10	4470164
9.4 - 18.6	10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18	4470165

Modular Unit System for 844 K

Holder 844 Kg

With locking clamp for an indicating instrument and a connecting thread for a **Measuring Head 844 Kk**. Heat insulated handle

Order no. 4470851

Extensions 844 Kv

For extra-deep bores. Screws in between Holder 844 Kg and Measuring Head 844 Kk for measuring range 10-18 mm. Length 64 mm, dia. 8 mm,

Order no. 4470070

Right Angle Attachment 844 Kw

For measuring bores which are difficult to reach, e.g. in tight spaces, on machine tools or when work piece bores are inconveniently located. For screwing in between Holder 844 Kg and Measuring Head 844 Kk

Order no. 4470110

Lifter 954

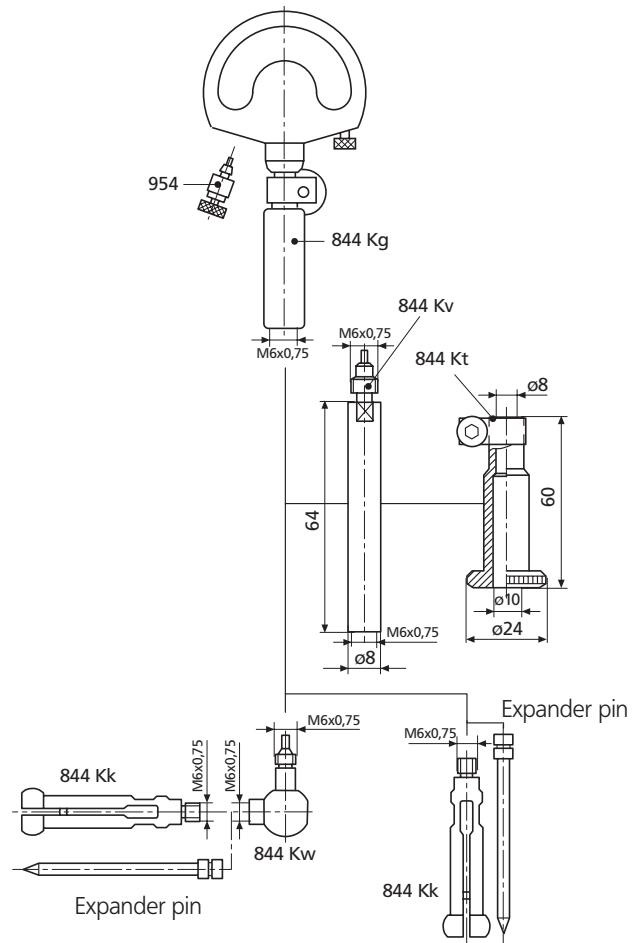
Facilitates insertion of measuring probe in bore by lifting measuring spindle of Dial Comparator.

Order no. 4372030

Depth Stop 844 Kt

For checking diameter of bores at prescribed depth. Only to be used with Extension 844 Kv.

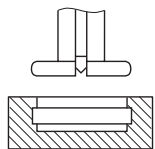
Order no. 4470115



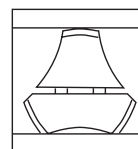
Measuring Probes for Special Applications

For measurement of blind holes, diameters of recesses, distances between plane-parallel surfaces, etc. special models of measuring probes are available on request.

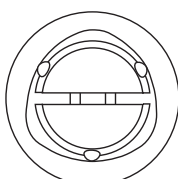
1. Measurement of the diameter of recesses



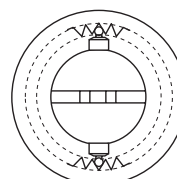
2. Measurement of plane-parallel surfaces



3. Measurement of polygon bores



4. Measurement of inside serrations, see 844 Z Page 9-44



Accessories

Stand 844 Kst



Features

For quick checks of bores in small work pieces. Hardened table plate can be raised with lever, thus moving test piece into position. Plate can be clamped at any height for checking eccentricity. Particularly suited to use with digital indicators, where appropriate in conjunction with data printers or computer equipment, in cases where the determination of the reversal point is inappropriate.

Table dia.	58 mm
Throat depth of arm	45 mm
Table stroke	30 mm
Max. work piece height	ca. 100 mm

Order no. 4470100

Angle Stop 844 Ka

Facilitates positioning of cylindrical work pieces under measuring instrument. For clamping to Stand 844 Kst.

Order no. 4470120

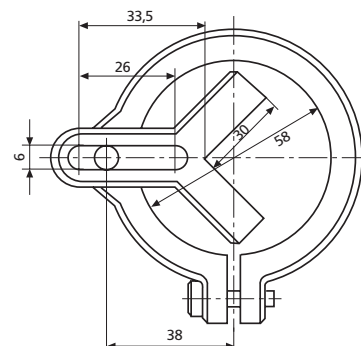
Floating Holder 844 Ksts



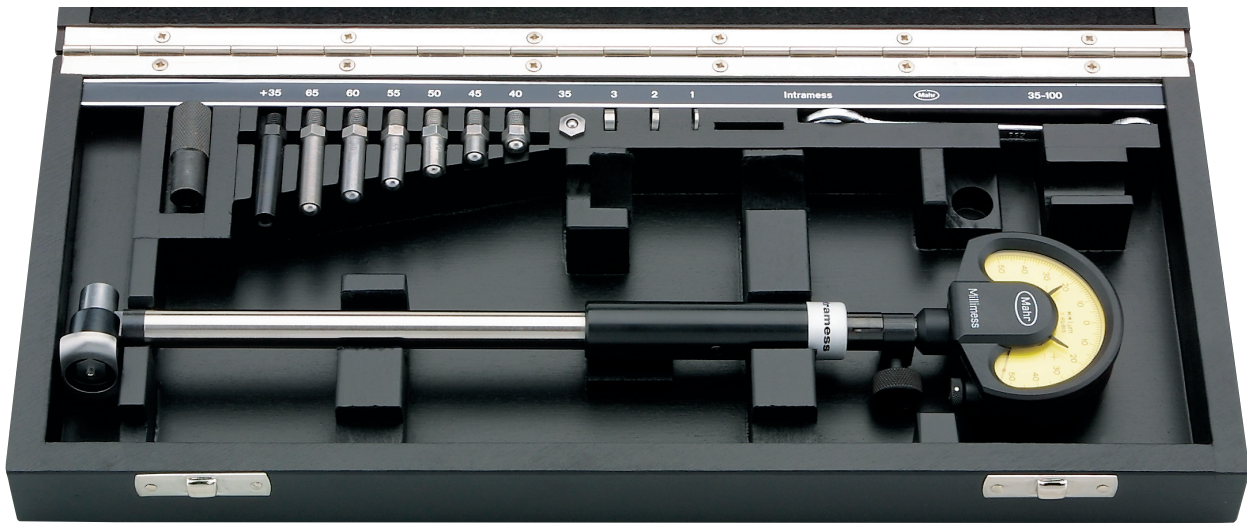
Features

For use in conjunction with Stand 844 Kst. Enables measuring probe to find common axis of bore and measuring instrument quickly and easily on insertion into hole, thus providing optimum measuring speed and high accuracy. Particularly suitable for small diameters, as measuring confidence is considerably enhanced.

Order no. 4470105



Self-Centering Dial Bore Gages 844 N / 844 NH Intramess



Features

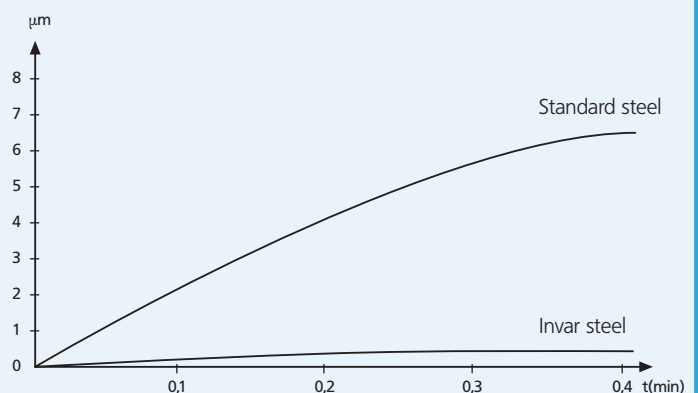
- Measuring the diameter, roundness and conical form of a bore as well as the distances of plane-parallel surfaces
- Measuring head consists of a carbide-tipped moving anvil and an interchangeable stationary anvil which has a hardened steel ball; alternatively a carbide ball is available
- Transmission lever system transfers movement of the movable anvil to indicating instrument
- The broad centering bridge ensures automatic centering in the bore
- Insensitive to temperature due to both the shank and transfer rod being made from heat resistant **Invar steel**
- Highly resistant to wear and tear due to the carbide tipped moving anvil
- Constant measuring force due to built-in spring thus eliminating user influence
- Universally applicable and extremely versatile as every instrument spans a broad measuring range, within this range it is quick and easy to adjust to any size
- Measuring head, holder, extensions, right-angle attachments and depth stops are all part of this extensive modular system
- Supplied with: Holder, measuring head, stationary anvil, wooden case, excludes an indicating instrument

The comparison between Invar and Standard steel

Invar steel has a particularly low expansion coefficient and thus makes the instrument totally insensitive to any kind of heat. Body heat from the user, increases in ambient temperature have no influence on the measuring results.

The graph on the right compares the Invar steel version to a standard type. Both gages were hand-held and thus influenced by body heat. The deviation when using Invar steel is negligible.

Change in length due to heat



Technical Dat

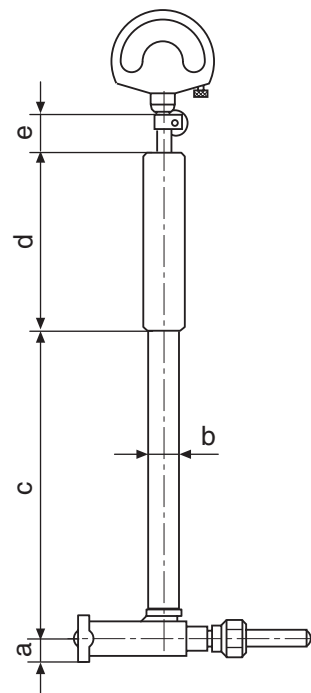
Measuring range	Error limit	Repeatability	Hysteresis	Order no*	Order no*
mm	G_e μm	f_w μm	f_u μm	844 N	844 NH
18 - 50	2	0.5	2.5	4474000	4475000
35 - 100	2	0.5	2.5	4474001	4475001
100 - 250	2	0.5	2.5	4474002	4475002
250 - 400	3	1.5	3.5	4474003	4475003
400 - 800	3	1.5	3.5	4474004	4475004
250 - 800	3	1.5	3.5	4474005	4475005

* Excludes indicating instrument

Complete Instrument

844 N Carbide-tipped moving anvil;
stationary anvil with steel ball

844 NH Moving anvil **and** stationary anvil are carbide-tipped



Measuring range mm	a	b	c	d	e
18 - 50	5.35	8	115	63	22
35 - 100	8.5	12	148	80	22
100 - 250	11.5	18	230	100	25
250 - 400	16	24	366	110	28
400 - 800	17.5	24	366	110	28

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Indicator	Readings	Order no.
Compramess 1004	5 μm	4333000
Millimess 1003	1 μm	4334000
Supramess 1002	0.5 μm	4335000
Extramess 2001	0.2 μm , 0.5 μm , 1 μm	4346100
MarCator 1087 BR	1 μm , 2 μm , 4 μm , 10 μm	4337162



Digital Indicators see Chapter 5
Electrical Indicating Instruments see Chapter 7

Accessories to set and adjust Dial Bore Gages

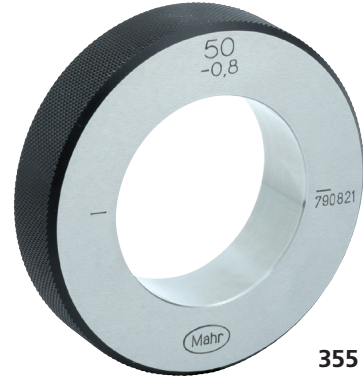
1. Setting Device

Uses standard gage blocks for setting any bore diameter and any tolerance. Replaces ring gages and is universally applicable.

2. Ring Gage 355 E

Special wear-resistant gage steel. Hardened and lapped. With actual deviation engraved

Dimensions: DIN 2250, type C
 Manufacturing tolerance: DIN 2250
 Available diameters: 0.5 - 200 mm



355 E

Components

Measuring Jaw 844 em

Measuring range	Dimensions	Order no.
18 - 800 mm	60 x 9.5 x 9 mm	4470095

Setting Bridge 844 Neb

Measuring range	Width	Height	Order no.
18 - 250 mm	70 mm	12 mm	4474080
18 - 400 mm	165 mm	17 mm	4474081
18 - 800 mm	320 mm	20 mm	4474082

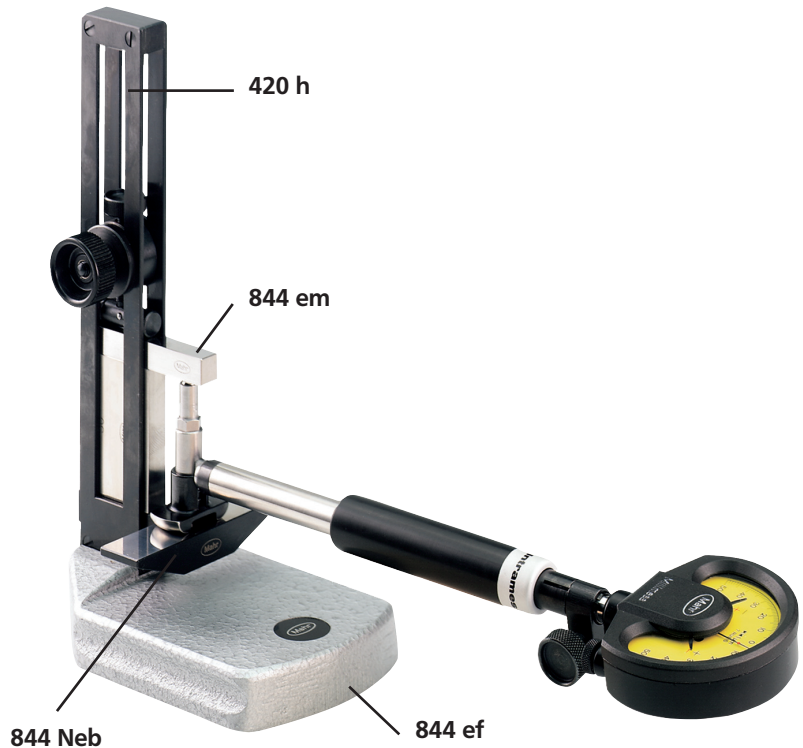
Gage Block Holder 420 h

Clamping range	Order no.
0 - 70 mm	4800120
0 - 120 mm	4800121
100 - 220 mm	4800122
100 - 420 mm	4800123
400 - 820 mm	4800124

Stand 844 ef

For mounting setting device up to 420 mm

Order no. 4470098



Modular Unit System 844 N

In addition to complete Dial Bore Gages 844 N, modular units can also be compiled as required to suit a individual measuring task and or application.

Measuring Head 844 Nk, steel

Measuring Head 844 NHk, carbide

With built-in lever transmission system, carbide-tipped anvil and extra-wide centering bridge. With interchangeable stationary anvil. Threaded connection for Holders 844 Ng and 844 Ngk.

Measuring range mm	Order no. 844 Nk	Order no. 844 NHk
18 - 50	4474151	4474156
35 - 100	4474152	4474157
100 - 250	4474153	4474158
250 - 400	4474154	4474159
400 - 800	4474155	4474160

Extension Set 844 Nes

For extending range of Measuring Head 844 Nk/NHk from 250-400 mm to 800 mm. Consists of additional centering bridge and two extensions.

Order no.: 4474010

Holder 844 Ng

Shank and transfer rod made of heat-resistant Invar steel. With a locking clamp for indicator.

For meas. range mm	L (mm)	d1 (mm)	d2 (mm)	Order no.
18 - 50	200	14	8	4474040
35 - 100	250	18	12	4474041
100 - 250	350	26	18	4474042
250 - 800	500	30	24	4474043

Short Holder 844 Ngk

Shank and transfer rod made of heat-resistant Invar steel. With a locking clamp for indicator.

For meas. range mm	L (mm)	d1 (mm)	d2 (mm)	Order no.
18 - 50	120	14	8	4474050
35 - 100	120	18	12	4474051
100 - 250	150	26	18	4474052
250 - 800	250	30	24	4474053

Right Angle Attachment 844 Nw

For measuring difficult to reach bores, e.g. in tight spaces, inconveniently located or on machine tools. For screwing in between 844 Ng or 844 Ngk and 844 Nk/NHk.

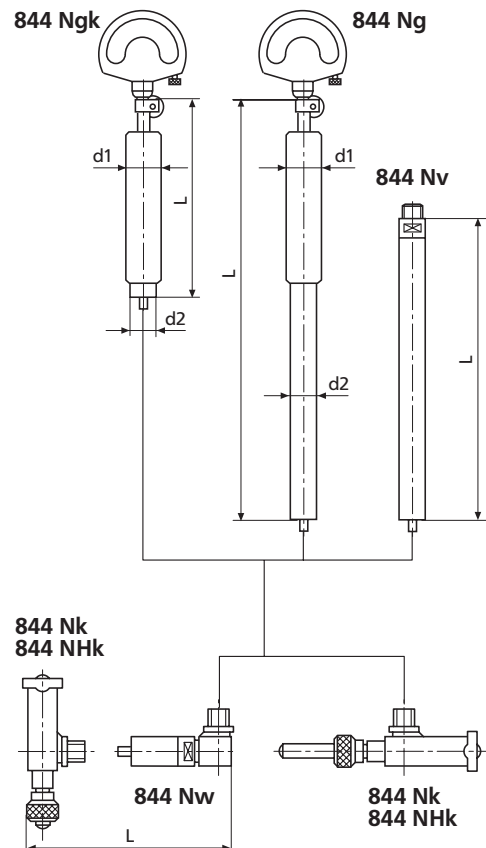
For meas. ranges mm	Length* L (mm)	Bore depth mm	Order no.
18 - 50	66	45	4474070
35 - 100	80	55	4474071
100 - 250	105	70	4474072

* With measuring heads 844 Nk/NHk

Extension 844 Nv

For extra deep bores. For screwing in between 844 Ng and 844 Nk/NHk. Shank and transfer rod made of Invar steel.

For instruments mm	Length L (mm)	Order no.
18 - 50	250	4474066
35 - 100	250	4474060
100 - 250	250	4474061
	500	4474062
250 - 800	250	4474063
	500	4474064



Dial Bore Gage for Internal Serrations 844 Z



Dial Bore Gage 844 Z
 Diametrical two ball measurement "Mdk" from **3.5 - 333 mm**

Modular Unit Parts 844 Kk
 "Mdk" from **3.5 - 26.1 mm**
 (see table below)

Modular Unit Parts 844 Z
 "Mdk" **26 - 333 mm** (see table on opposite page)

Modular Unit Parts:

Diametrical two ball measurement „M_{dk}“ from **3.5 - 26.1 mm**

Ball dimen. M _{dk} (mm)	Order no. ball dia. 1-5 graduation 0.5	Ball dia. according to table	Order no. ball dia. 7.5-10 graduation 0.5	Expander pin Steel
3.5 - 4.1	4482450	4482550		4470806
4.0 - 4.6	4482451	4482551		
4.5 - 5.1	4482452	4482552		
5.0 - 5.6	4482453	4482553		
5.5 - 6.1	4482454	4482554		
6.0 - 6.6	4482455	4482555		
6.5 - 7.1	4482456	4482556		
7.0 - 7.6	4482457	4482557		
7.5 - 8.1	4482458	4482558		
8.0 - 8.6	4482459	4482559		
8.5 - 9.1	4482460	4482560		
9.0 - 9.6	4482461	4482561		
9.3 - 10.6	4482462	4482562	4482662	
10.3 - 11.6	4482463	4482563	4482663	
11.3 - 12.6	4482464	4482564	4482664	
12.3 - 13.6	4482465	4482565	4482665	
13.3 - 14.6	4482466	4482566	4482666	
14.5 - 16.1	4482467	4482567	4482667	
15.5 - 17.1	4482468	4482568	4482668	
16.5 - 18.1	4482469	4482569	4482669	
17.5 - 19.1	4482470	4482570	4482670	
18.5 - 20.1	4482471	4482571	4482671	
19.5 - 21.1	4482472	4482572	4482672	
20.5 - 22.1	4482473	4482573	4482673	
21.5 - 23.1	4482474	4482574	4482674	
22.5 - 24.1	4482475	4482575	4482675	
23.5 - 25.1	4482476	4482576	4482676	
24.5 - 26.1	4482477	4482577	4482677	

Table (Sizes in mm)

0.500 - 0.551 - 0.620 - 0.623 - 0.630 - 0.722 - 0.862 - 0.895 - 0.965 - 1.100 - 1.118 - 1.125 - 1.250
 1.350 - 1.372 - 1.385 - 1.524 - 1.540 - 1.600 - 1.650 - 1.700 - 1.750 - 1.782 - 1.800 - 1.829 - 1.900
 2.032 - 2.250 - 2.284 - 2.386 - 2.438 - 2.667 - 2.704 - 2.713 - 2.721 - 2.743 - 2.750 - 3.048 - 3.250
 3.400 - 3.658 - 4.835 - 5.250 - 5.486 - 5.500 - 6.000 - 6.096 - 6.350 - 6.500 - 7.000

Merkmale

- For diametrical two ball measurement Mdk, to obtain the pitch diameter and conical form of internal gears in any position and at any depth
- For ball dimensions from 3.5 to 26.1 mm use the 844 Kk with carbide ball anvils and in conjunction with an expander pin
- For ball dimensions >26 mm the measuring heads 844 z1 or 844 z2 with the appropriate modular units are to be employed
- Maximum wear resistance due to carbide ball anvils
- Constant measuring force due to built-in spring thus eliminating user influence
- Anvils, measuring heads, holder, spacer (intermediate piece) and depth extensions form a very comprehensive modular system which can rapidly be converted to measure further gear sizes

Lifting Knob 954

enables the dial bore gage to gently guided into the serration. The measuring spindle of the indicating instrument can also be lifted.

Order no. 4372030

Holder 844 Kg

with a clamping device for the indicating instrument. The mounting bore diameter 8 mm

Order no. 4470851

Extension 844 Kv

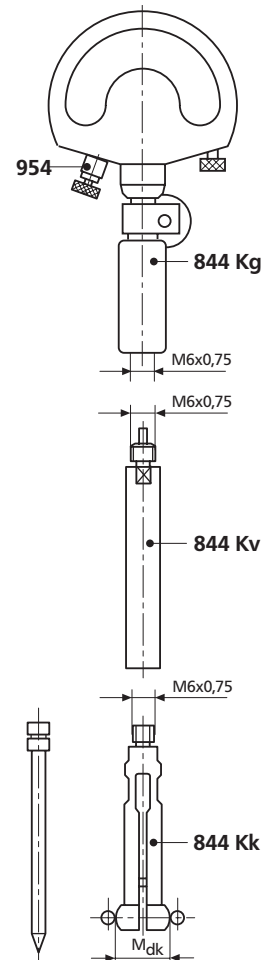
for measuring in depth bores; length 64 mm

Order no. 4470070

844 Kk Anvil

for internal serrations. ball dimension „M_{dk}“ from

3.5 - 26.1 mm



Modular Unit Parts

Diametrical two ball measurement from M_{dk} 26-333 mm

Measuring Heads

844 z1, for M_{dk} 26 - 130,5 mm

844 z2, for M_{dk} 48.5 - 333 mm

Order no.

4485000

4485001

Floating Ball Anvils with carbide ball

	Grad. (mm)	Ball dia. mm	
844 z3 Meas. range 3 mm, for Meas. Head 844 z1	0.5	1.0 - 5.0	4488300
		acc. to table	4488301
	0.5	7.5 - 10	4488302
844 z4 Meas. range 3 mm, for Meas. Head 844 z2	0.5	1.0 - 5.0	4488310
		acc. to table	4488311
	0.5	7.5 - 10	4488312

Ball Anvils with carbide ball

844 z5 , Length 2.5 mm	0.5	1.0 - 5.0	4488320
		acc. to table	4488321
	0.5	7.5 - 10	4488322
844 z6 , Length 5.0 mm	0.5	1.0 - 5.0	4488330
		acc. to table	4488331
	0.5	7.5 - 10	4488332
844 z7 , Length 7.5 mm	0.5	1.0 - 5.0	4488340
		acc. to table	4488341
	0.5	7.5 - 10	4488342
844 z8 , Length 10.0 mm	0.5	1.0 - 5.0	4488350
		acc. to table	4488351
	0.5	7.5 - 10	4488352
844 z15 , Length adjustable from 24-34 mm	0.5	1.0 - 5.0	4488360
		acc. to table	4488361
	0.5	7.5 - 10	4488362

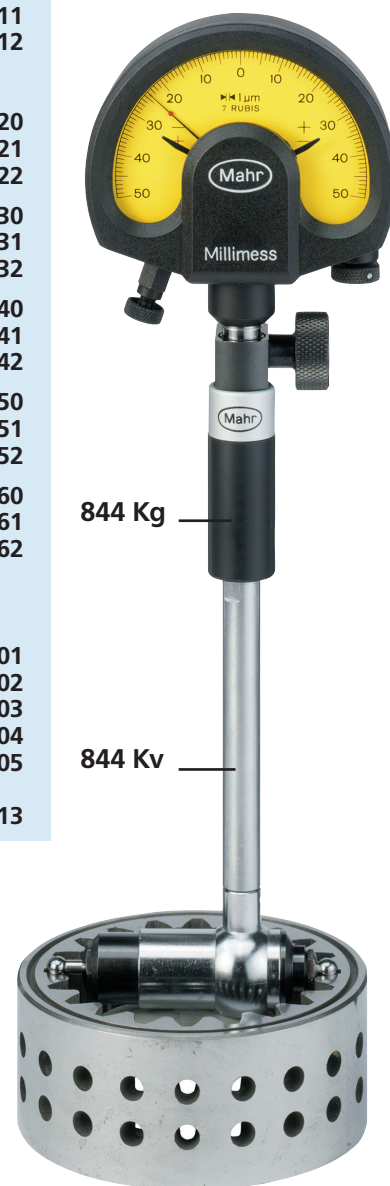
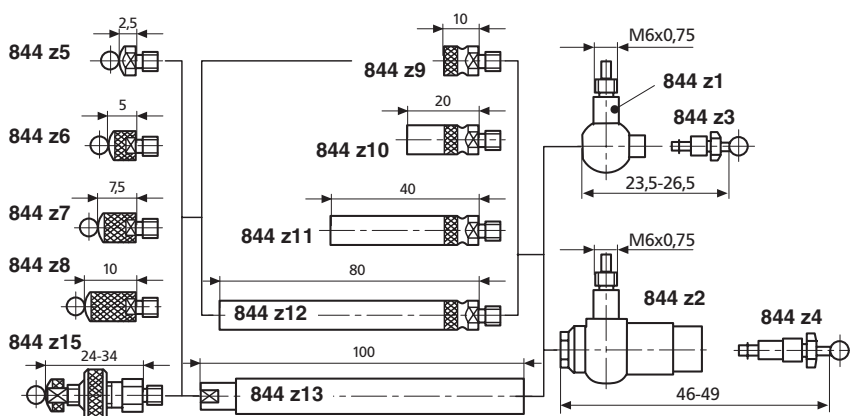
Spacer (intermediate piece)

	Length (mm)	
844 z9	10	4486501
844 z10	20	4486502
844 z11	40	4486503
844 z12	80	4486504
844 z13	100 *	4486505

Wooden case

4485013

* Only for 844 z2



Dial Bore Gage for Internal Serrations 844 Z

Selecting Modular Unit Parts Measuring Head 844 z1 and Floating Ball Anvil 844 z3

M _{dk} in mm	844 z5	844 z6	844 z7	844 z8	844 z15	844 z9	844 z10	844 z11	844 z12	844 z13
26.0 - 29.0	x									
28.5 - 31.5		x								
31.0 - 34.0			x							
33.5 - 36.5				x						
36.0 - 39.0	x					x				
38.5 - 41.5		x				x				
41.0 - 44.0			x			x				
43.5 - 46.5				x		x				
46.0 - 49.0	x						x			
47.5 - 60.5					x					
48.5 - 51.5		x					x			
51.0 - 54.0			x				x			
53.5 - 56.5				x			x			
56.0 - 59.0	x					x	x			
57.5 - 70.5					x	x				
58.5 - 61.5		x				x	x			
61.0 - 64.0			x			x	x			
63.5 - 66.5				x		x	x			
66.0 - 69.0	x							x		
67.5 - 80.5					x		x			
68.5 - 71.5		x						x		
71.0 - 74.0			x					x		
73.5 - 76.5				x				x		
76.0 - 79.0	x					x		x		
77.5 - 90.5					x	x	x			
78.5 - 81.5		x				x		x		
81.0 - 84.0			x			x		x		
83.5 - 86.5				x		x		x		
86.0 - 89.0	x						x	x		
87.5 - 100.5					x			x		
88.5 - 91.5		x					x	x		
91.0 - 94.0			x				x	x		
93.5 - 96.5				x			x	x		
96.0 - 99.0	x					x	x	x		
97.5 - 110.5					x		x	x		
98.5 - 101.5		x				x	x	x		
101.0 - 104.0			x			x	x	x		
103.5 - 106.5				x		x	x	x		
107.5 - 120.5					x		x	x		
117.5 - 130.5					x		x	x		

Example:

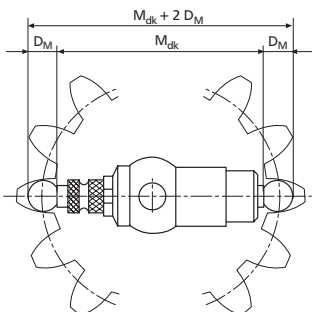
Diametrical two ball meas. M _{dk}	73.0 mm
Ball dia.	5.486 mm

When placing an order please quote the ball diameter of the modular unit system for 844 z3 - 844 z8, as well as 844 z15. On the basis of the above specified example above result several combinations that are possible to choice from is dependent upon the work piece. For further details please refer to the illustration on Page 9-43.

The measuring application can be solved with either one of the following 4 versions:

Type	Description	Ball dia. mm	Length mm	Order no.
Version 1				
844 z1	Measuring Head		23.5-26.5	4485000
844 z3	Floating Ball Anvil	5.486		4488301
844 z7	Ball Anvil	5.486	7.5	4488341
844 z11	Spacer		40.0	4486503
Meas. range			71.0-74.0	
Version 2				
844 z1	Measuring Head		23.5-26.5	4485000
844 z3	Floating Ball Anvil	5.486		4488301
844 z15	Ball Anvil	5.486	24.0-34.0	4488361
844 z10	Spacer		20.0	4486502
Meas. range			67.5-80.5	
Version 3				
844 z2	Measuring Head		46.0-49.0	4485001
844 z4	Floating Ball Anvil	5.486		4488311
844 z6	Ball Anvil	5.486	5.0	4488331
844 z10	Spacer		20.0	4486502
Meas. range			71.0-74.0	
Version 4				
844 z2	Measuring Head		46.0-49.0	4485001
844 z4	Floating Ball Anvil	5.486		4488311
844 z15	Ball Anvil	5.486	24.0-34.0	4488361
Meas. range			70.0-83.0	

Determination of setting values



D_M = Ball diameter of the ball anvil

M_{dk} = Diametrical two ball measurement

$M_{dk} + 2 D_M$ = Setting value (length of the gage block required for setting)

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	Readings	Order no.
Compramess 1004	5 μ m	4333000
Millimess 1003	1 μ m	4334000

Digital Indicators see Chapter 5
Electrical Indicating Instruments see Chapter 7

