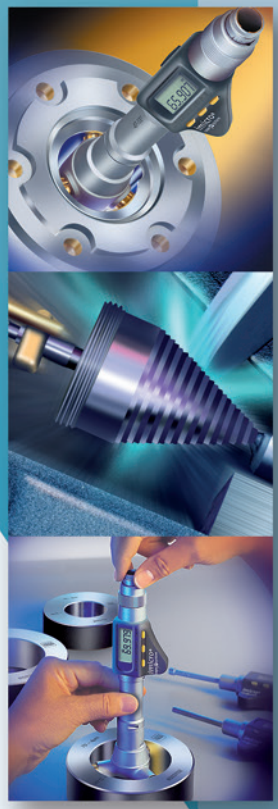


Internal Measurement

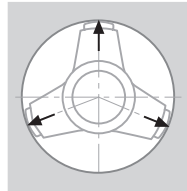


THE CHALLENGES OF INTERNAL MEASUREMENT

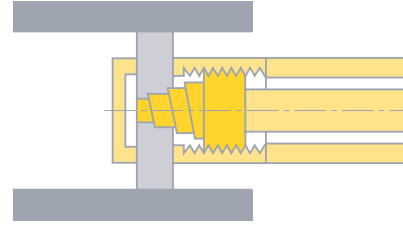
Bore measurement is more difficult than external measurement of components. Apart from the very tight tolerances specified, all measuring elements having a direct influence on the uncertainty of measurement must be designed in such a way that they can fit into the bore to be checked.

3-LINE CONTACT OFFERS A TRUE ADVANTAGE

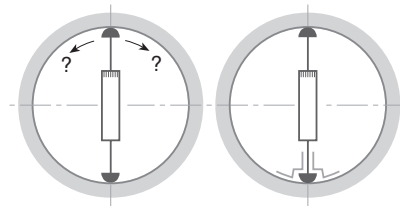
The near perfect auto-centering and auto alignment provided by TESA IMICRO, TESA TRI-O-BOR, ALESOMETER and ETALON INTALOMETER make bore measurement reliable, without the need for an operator to estimate.



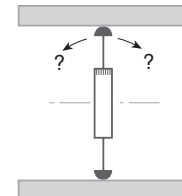
The three measuring bolts are spaced 120° apart, thus providing optimum self-centring.



The measuring bolts with 3-line contact allows the micro-meter to align itself parallel to the contact surfaces.



2-point contact measuring instruments are not self-centring. To enable bore measurements, the use of auxiliary means are required.



2-point contact does not permit the tool to align itself in relation to the bore axis.

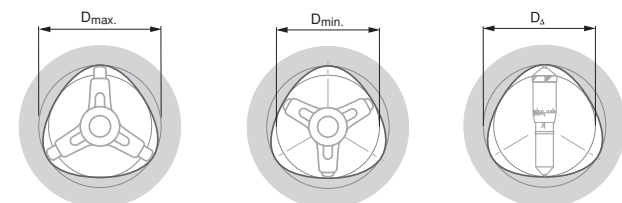
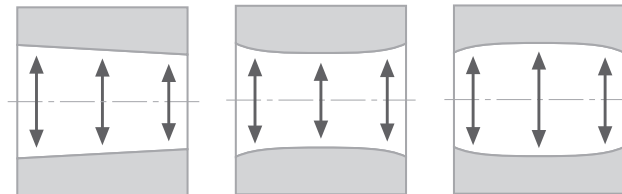
A SINGLE TOOL CAN REPLACE HUNDREDS OF PLUG GAUGES

Unlike plug gauges that check only one toleranced size, a single tool can measure many diameters. Depending on the model that is being used, through holes and blind bores along with short centring shoulders can be inspected reliably.



ESTABLISHING FORM ERRORS

Form errors are established through measurements taken at several points within a bore. Micrometers with 3-line contact determine run-out errors in a triangular way. Micrometers with 2-point contact measure medium-size diameters only. They do not allow users to see what makes diameters measured at various points different.



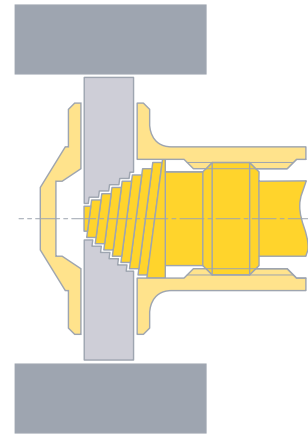
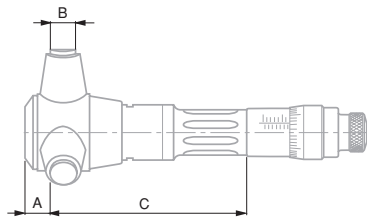
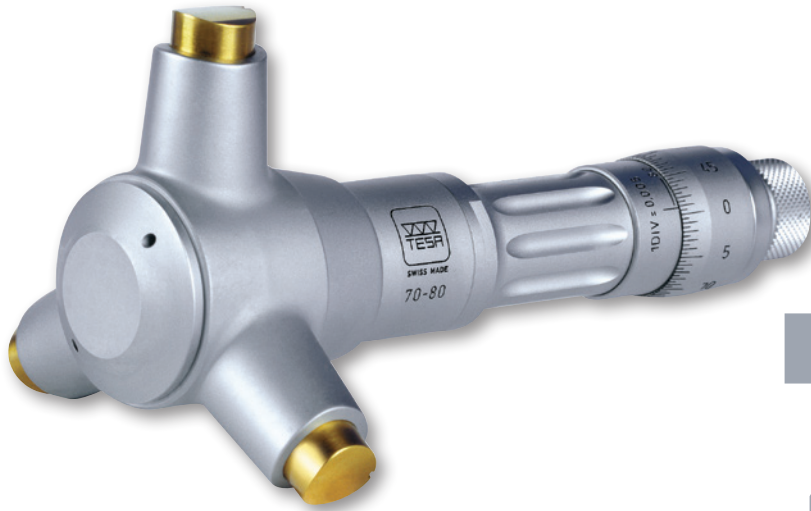
N DIN 863 T4
(Style C1)
NFE 11-099

Measuring faces for application ranges from 3,5 to 12 mm:
hardened steel (HV30 770)
11 to 100 mm: TiN hard-coating (HV5 2300)
100 to 300 mm: carbide tipped (HV5 1300)

Inspection report with a declaration of conformity

TESA IMICRO with Analogue Indication – Metric

Self-centring and self-aligning internal micrometers. The high-precision thread machined into the measuring cone, combined with the measuring bolts specially arranged to provide 3-line contact, make them the only micrometers in the world that respect the ABBE principle. Measure depth, reliably.






No							
	mm	mm	µm	µm	A mm	B mm	C mm
00813410	3,5 ÷ 4	0,001	4	4	2	1,5	20
00813411	4 ÷ 4,5	0,001	4	4	2	1,5	20
00813412	4,5 ÷ 5,5	0,001	4	4	2	1,5	25
00813413	5,5 ÷ 6,5	0,001	4	4	2	1,5	25
00810001	6 ÷ 8	0,001	4	4	2,5	2,5	52
00810002	8 ÷ 10	0,001	4	4	2,5	2,5	52
00810003	10 ÷ 12	0,001	4	4	2,5	2,5	52
00810801	11 ÷ 14	0,005	4	4	3,5	4	77
00810802	14 ÷ 17	0,005	4	4	3,5	4	77
00810803	17 ÷ 20	0,005	4	4	3,5	4	77
00811501	20 ÷ 25	0,005	4	4	7	7	78
00811502	25 ÷ 30	0,005	4	4	7	7	78
00811503	30 ÷ 35	0,005	4	4	7	7	78
00811504	35 ÷ 40	0,005	4	4	7	7	78
00812301	40 ÷ 50	0,005	4	4	11	12	84
00812302	50 ÷ 60	0,005	5	5	11	12	84
00812303	60 ÷ 70	0,005	5	5	11	12	84
00812304	70 ÷ 80	0,005	5	5	11	12	84
00812305	80 ÷ 90	0,005	5	5	11	12	84
00812306	90 ÷ 100	0,005	5	5	11	12	84
00812601	100 ÷ 125	0,01	6	6	26	18	81
00812602	125 ÷ 150	0,01	6	6	26	18	81
00812603	150 ÷ 175	0,01	7	7	26	18	81
00812604	175 ÷ 200	0,01	7	7	26	18	81
00813101	200 ÷ 225	0,01	8	8	26	18	81
00813102	225 ÷ 250	0,01	8	8	26	18	81
00813103	250 ÷ 275	0,01	8	8	26	18	81
00813104	275 ÷ 300	0,01	8	8	26	18	81











TESA IMICRO with Analogue Indication – Full Metric Sets



-  DIN 863 T4 (Style C1) NFE 11-099
-  Measuring faces on models from 3,5 to 12 mm: hardened steel, HV30 770; 11 to 100 mm: titanium nitride (TiN) hard-coating to HV5 2300. 100 to 200 mm: tungsten carbide tipped to HV5 1300.
-  Inspection report with a declaration of conformity



									
		mm	Isolated instruments	mm	Setting rings	mm	Extensions	A mm	
COMPOSITION OF THE SETS:									
00813409	BAE	3,5 ÷ 6,5	00813410	3,5 ÷ 4	00843200	4			
			00813411	4 ÷ 4,5	00843201	5,5			
			00813412	4,5 ÷ 5,5					
			00813413	5,5 ÷ 6,5					
00810000	BAF	6 ÷ 12	00810001	6 ÷ 8	00840101	8	00840001	100	
			00810002	8 ÷ 10	00840102	10			
			00810003	10 ÷ 12					
00810800	BAG	11 ÷ 20	00810801	11 ÷ 14	00840103	11	00840301	150	
			00810802	14 ÷ 17	00840105	17			
			00810803	17 ÷ 20					
00811500	BAH	20 ÷ 40	00811501	20 ÷ 25	00840106	25	00841100	150	
			00811502	25 ÷ 30	00840107	35			
			00811503	30 ÷ 35					
			00811504	35 ÷ 40					
00812300	BAJ	40 ÷ 100	00812301	40 ÷ 50	00840108	50	00841800	150	
			00812302	50 ÷ 60	00840109	70			
			00812303	60 ÷ 70	00840110	90			
			00812304	70 ÷ 80					
			00812305	80 ÷ 90					
			00812306	90 ÷ 100					
00812600	BAK	100 ÷ 200	00812601	100 ÷ 125	00840112	125	00842600	150	
			00812602	125 ÷ 150	00840113	175			
			00812603	150 ÷ 175					
			00812604	175 ÷ 200					



DIN 863 T4
(Style C1)



0,001 mm
0,00005 in




LCD, 7 mm
digit height




Floating zero



Metric/inch
Conversion




Measuring faces
for application
ranges 3,5 to 12 mm:
hardened steel
(770 HV 30)
11 to 100 mm:
TiN hard-coating
(2300 HV 5)
100 to 300 mm:
carbide tipped
(1300 HV 5)




3 V Lithium battery



1 to 2 a
(≈ 2000 h/a)



Automatic shut
down after 10 min.
Display setting is
retained as long as
power supply
remains stable.




Measuring
element IP54
(IEC 60529) or
IP40 with active
data output



TESA's
calibration
certificate



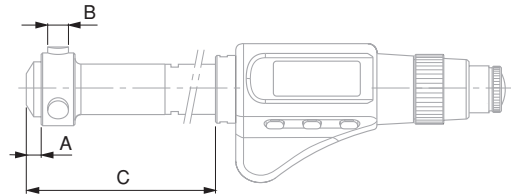
Display lock










RS232
opto-coupled,
bidirectional

TESA IMICRO CAPA μ SYSTEM with Digital Display

A successful combination of the patented TESA capacitive system with the IMICRO unique cone.



No	 mm	 in	 μ m	 μ m	 A mm	 B mm	 C mm
06130101	3,5 ÷ 4	0.1377 ÷ 0.1574	4	4	2	1,5	20
06130102	4 ÷ 4,5	0.1574 ÷ 0.1771	4	4	2	1,5	20
06130103	4,5 ÷ 5,5	0.1771 ÷ 0.2165	4	4	2	1,5	25
06130104	5,5 ÷ 6,5	0.2165 ÷ 0.2559	4	4	2	1,5	25
06130105	6 ÷ 8	0.2362 ÷ 0.3150	4	4	2,5	2,5	79
06130106	8 ÷ 10	0.3150 ÷ 0.3970	4	4	2,5	2,5	79
06130107	10 ÷ 12	0.3970 ÷ 0.4724	4	4	2,5	2,5	79
06130108	11 ÷ 14	0.4330 ÷ 0.5512	4	4	3,5	4	93
06130109	14 ÷ 17	0.5512 ÷ 0.6693	4	4	3,5	4	93
06130110	17 ÷ 20	0.6693 ÷ 0.7874	4	4	3,5	4	93
06130111	20 ÷ 25	0.7874 ÷ 0.9843	4	4	7	7	91
06130112	25 ÷ 30	0.9843 ÷ 1.1811	4	4	7	7	91
06130113	30 ÷ 35	1.1811 ÷ 1.3780	4	4	7	7	91
06130114	35 ÷ 40	1.3780 ÷ 1.5748	4	4	7	7	91
06130115	40 ÷ 50	1.5748 ÷ 1.9685	4	4	11	12	104
06130116	50 ÷ 60	1.9685 ÷ 2.3622	5	5	11	12	104
06130117	60 ÷ 70	2.3622 ÷ 2.7560	5	5	11	12	104
06130118	70 ÷ 80	2.7560 ÷ 3.1496	5	5	11	12	104
06130119	80 ÷ 90	3.1496 ÷ 3.5433	5	5	11	12	104
06130120	90 ÷ 100	3.5433 ÷ 3.9370	5	5	11	12	104
06130121	100 ÷ 125	3.9370 ÷ 4.9212	6	6	26	18	100
06130122	125 ÷ 150	4.9212 ÷ 5.9055	6	6	26	18	100
06130123	150 ÷ 175	5.9055 ÷ 6.8897	7	7	26	18	100
06130124	175 ÷ 200	6.8897 ÷ 7.8740	7	7	26	18	100
06130125	200 ÷ 225	7.8740 ÷ 8.8582	8	8	26	18	100
06130126	225 ÷ 250	8.8582 ÷ 9.8425	8	8	26	18	100
06130127	250 ÷ 275	9.8425 ÷ 10.8267	8	8	26	18	100
06130128	275 ÷ 300	10.8267 ÷ 11.8110	8	8	26	18	100

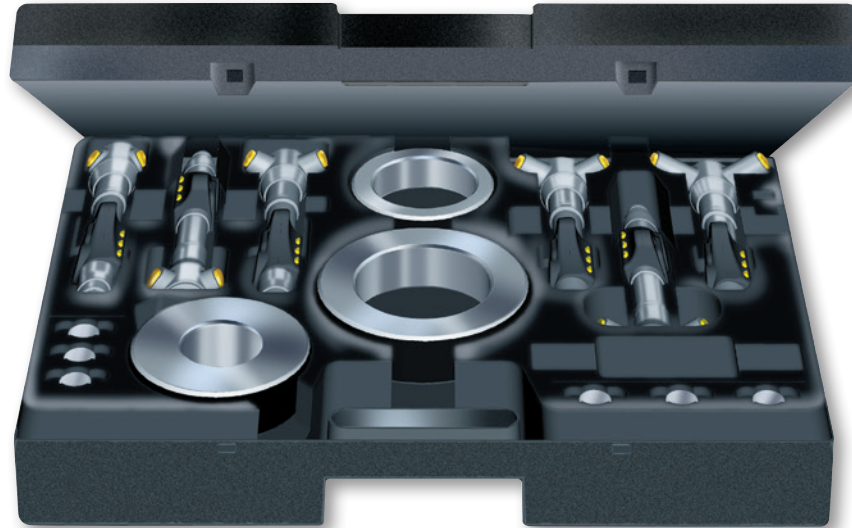
OPTIONAL ACCESSORY

01961000 1 Lithium battery 3V, CR2032



TESA IMICRO CAPA μ SYSTEM with Digital Display – Full Sets

A successful combination of the TESA patented capacitive measuring system with the IMICRO unique cone.



- DIN 863 T4 (Style C1)
- 0,001 mm / 0.00005 in
- LCD, 7 mm digit height
- Floating zero
- Metric/inch Conversion
- Measuring faces for application ranges 3,5 to 12 mm: hardened steel (770 HV 30)
11 to 100 mm: TiN hard-coating (2300 HV 5)
100 to 300 mm: carbide tipped (1300 HV 5)
- 3 V lithium battery
- 1 to 2 a (\approx 2000 h/a)
- Automatic shut down after 10 min. Display setting is retained as long as power supply remains stable.
- Measuring element IP54 (IEC 60529) or IP40 with active data output
- TESA's calibration certificate
- Display lock
- RS 232 opto-coupled, bidirectional

	mm	Singel micrometers	mm		Setting rings mm		Extensions	mm
COMPOSITION OF THE SETS:								
06130220	3,5 ÷ 6,5	06130101	3,5 ÷ 4		00843200	4		
		06130102	4 ÷ 4,5		00843201	5,5		
		06130103	4,5 ÷ 5,5					
		06130104	5,5 ÷ 6,5					
06130221	6 ÷ 12	06130105	6 ÷ 8		00840101	8	00840001	100
		06130106	8 ÷ 10		00840102	10		
		06130107	10 ÷ 12					
06130222	11 ÷ 20	06130108	11 ÷ 14		00840103	11	00840301	150
		06130109	14 ÷ 17		00840104	17		
		06130110	17 ÷ 20					
06130223	20 ÷ 40	06130111	20 ÷ 25		00840106	25	00841100	150
		06130112	25 ÷ 30		00840107	35		
		06130113	30 ÷ 35					
		06130114	35 ÷ 40					
06130224	40 ÷ 100	06130115	40 ÷ 50		00840108	50	00841800	150
		06130116	50 ÷ 60		00840109	70		
		06130117	60 ÷ 70		00840110	90		
		06130118	70 ÷ 80					
		06130119	80 ÷ 90					
		06130120	90 ÷ 100					
06130225	100 ÷ 300	06130121	100 ÷ 125		00840112	125	00842600	150
		06130122	125 ÷ 150		00840113	175		
		06130123	150 ÷ 175					
		06130124	175 ÷ 200					



DIN 863 T4
(Style C1)



0,001 mm /
0.00005 in




LCD, 7 mm
digit height



Floating zero



Metric/inch
Conversion




Measuring faces
for application
ranges
3,5 to 12 mm:
hardened steel
(HV30 770)
11 to 100 mm:
TiN hard-coating
(HV5 2300)
100 to 300 mm:
carbide tipped
(HV5 1300)




3V lithium battery



1 to 2 a
(≈ 2000 h/a)



Automatic shut
down after 10 min.
Display setting is
retained as long as
power supply
remains stable.



Measuring element
IP54 (IEC 60529) or
IP40 with active
data output



TESA's
calibration
certificate



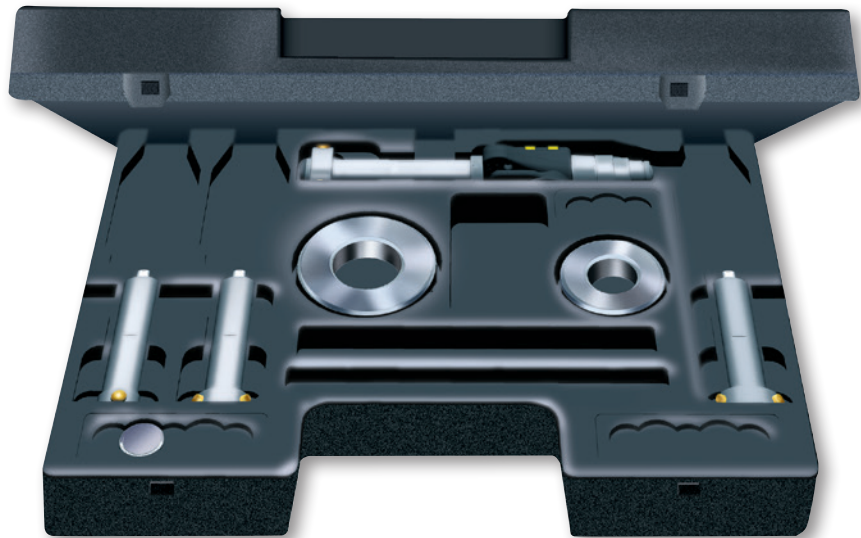
Display lock











RS232
opto-coupled,
bidirectional

TESA IMICRO CAPA μ SYSTEM with Digital Display – Partial Sets

A successful combination of the TESA patented capacitive measuring system with the IMICRO unique cone.



	 mm	 Elements	 Measuring heads	 mm	 Setting rings	 mm	 Extensions	 mm
COMPOSITION OF THE SETS:								
06130230	3,5 ÷ 6,5	06130010	06140020 06140021 06140022 06140023	3,5 ÷ 4 4 ÷ 4,5 4,5 ÷ 5,5 5,5 ÷ 6,5	00843200 00843201	4 5,5		
06130231	6 ÷ 12	06130011	06140024 06140025 06140026	6 ÷ 8 8 ÷ 10 10 ÷ 12	00840101 00840102	8 10	00840001	100
06130232	11 ÷ 20	06130011	06140027 06140028 06140029	11 ÷ 14 14 ÷ 17 17 ÷ 20	00840103 00840104	11 15	00840301	150
06130233	20 ÷ 40	06130011	06140030 06140031 06140032 06140033	20 ÷ 25 25 ÷ 30 30 ÷ 35 35 ÷ 40	00840106 00840107	25 35	00841100	150
06130234	40 ÷ 100	06130011	06140034 06140035 06140036 06140037 06140038 06140039	40 ÷ 50 50 ÷ 60 60 ÷ 70 70 ÷ 80 80 ÷ 90 90 ÷ 100	00840108 00840109 00840110	50 70 90	00841800	150
06130235	100 ÷ 300	06130012	06140040 06140041 06140042 06140043	100 ÷ 125 125 ÷ 150 150 ÷ 175 175 ÷ 200	00840112 00840113	125 175	00842600	150

Set available on request for extending the application range from 200 to 300 mm.

Cases for Sets of IMICRO Analogue

No	mm
00863035	3,5 ÷ 6,5
00863005	6 ÷ 12
00860008	11 ÷ 20
00860012	20 ÷ 40
00860017	40 ÷ 100
00863017	100 ÷ 200



Cases for Single IMICRO Digital Instruments

No	mm
06160002	3,5 ÷ 40
06160003	40 ÷ 100



Cases for Sets of IMICRO Digital

No	mm
06160005	3,5 ÷ 20
06160006	20 ÷ 40
06160007	40 ÷ 100
00863017	100 ÷ 200



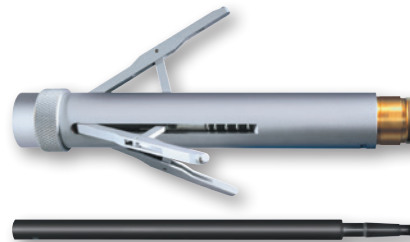
Accessories for Both TESA IMICRO and TESA IMICRO CAPA μ SYSTEM – Extensions for Deep Hole Measurement

No	mm	A mm
00840001	6 ÷ 12	100
00840301	11 ÷ 20	150
00840302	11 ÷ 20	500
00841100	20 ÷ 40	150
00841101	20 ÷ 40	500
00841102	20 ÷ 40	1000
00841800	40 ÷ 100	150
00841801	40 ÷ 100	500
00841802	40 ÷ 100	1000
00842600	100 ÷ 300	150
00842601	100 ÷ 300	500
00842602	100 ÷ 300	1000



Centring Devices for TESA IMICRO

No	mm	A mm
00860001	40 ÷ 100	150
00862601	100 ÷ 200	200



Cases for Single IMICRO Analogue Instruments

No	mm
00860007	11 ÷ 20
00860011	20 ÷ 40
00860015	40 ÷ 70
00860016	70 ÷ 100
00863016	100 ÷ 300