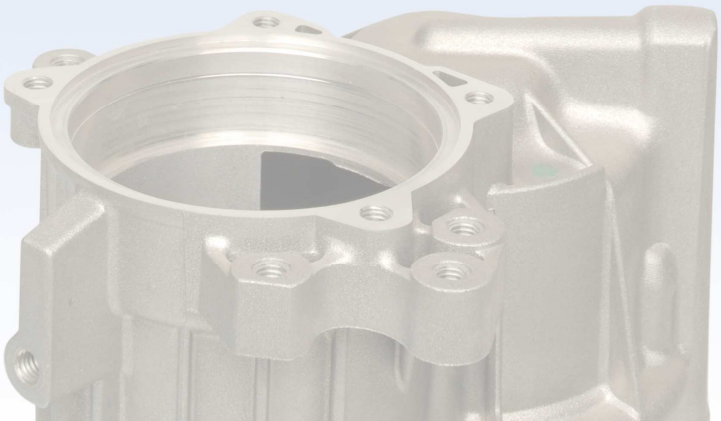
Instruction for use
Plunger Probes

M5678-78FB and
M78-Plus



TÜV PROFI CERT ® TÜV Hessen
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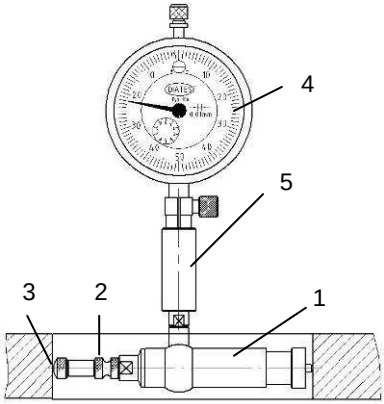
DIATEST Plunger Probe M5678 - 68FB

Self-centering interior measuring gauge for bore diameter from 19,5 to 330 mm

Design

A plunger probe consists of following components:
Plunger probe (1) with carbide measuring contact; carbide anvils HMT (3) extension (if necessary); ZS (2) indicator holder (5) with thread connection M6x0,75; display (4); setting master or setting device



Design

Standard Plunger Probes

Plunger probes for measuring range 19,5mm to 330mm are manufactured in 4 different sizes (MK5, MK6, MK7 and MK8). They are equipped with a centering bridge.

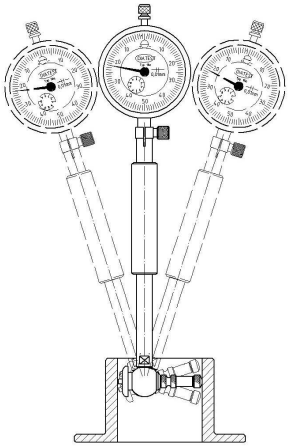
Blind bore style

These plunger probes correspond in their function and design to standard plunger probes. Measuring contact, carbide anvil and centering shoe are designed in a manner that enables measuring at a distance of 1,6mm from the bore base. Plunger probes for the range 38,5 – 348mm are supplied in 2 different designs (MK6-FB and MK8-FB).

Mode of Operation

Plunger probe with extension and anvil is selected according to the table (see pages 4-8) and is screwed into a holder with a display unit. During the gauging operation spring-loaded centering bridge centres the gauge in the bore. Bore diameter is determined by a pendulum movement of instrument in the bore. Reversal point of display of measured value indicates deviation to the setting master.

Minimum value is recorded by oscillating in the bore with the help of digital dial indicator MDU-M. Bore diameter can be displayed either absolute or relative (to setting master).

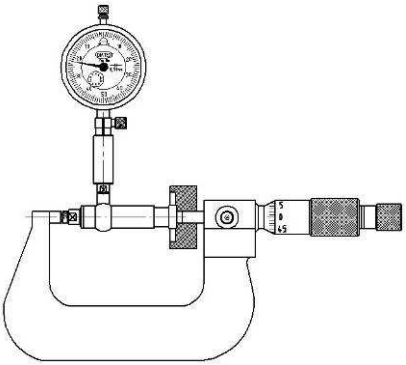


Calibration

Plunger probes are comparative measuring instruments. A reference standard is therefore necessary for calibration. Calibration (zero setting) of instrument can be done in various ways according to level of accuracy required:

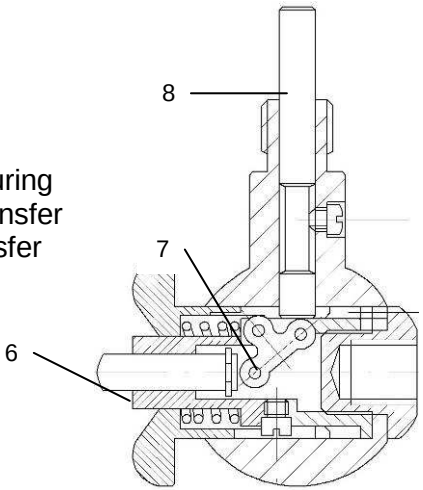
In the setting ring (highest accuracy). With a micrometer (not suitable for FB style). For the FB application, DIATEST developed a setting guide which is clamped on to the micrometer spindle. The centering disk (MZT) prevents plunger probe from slipping out during calibration.

With setting devices, slip gauges etc.



Transmission of measured displacement

Measured displacement of measuring contact (6) is transmitted via a transfer lever (7) at the rate of 1:1 to transfer pin (8) and display.



Technical Data

- Operative range ∅19,5 – 330 mm (∅ 38,5 – 348 mm with FB design)
- Measuring range 3mm (MK-5; 2,5mm)
- Accuracy of standard design:
  Repeatability <= 0,001mm
  Linearity: max: 0,006mm in measuring range
- Connection thread M6x0,75
- Measuring depth: easily up to 3m
- Carbide contact points
- Measuring contact radii R8,0
- Required measuring pressure of dial indicator: 1,5-2,0N

Maintenance

Due to the closed design DIATEST plunger probes are largely protected against dirt. If probe gets dirty it can be dismantled easily by unscrewing the parts. A suitable cleaning agent is sufficient for cleaning. After cleaning all parts must be lubricated with a thin, non-resin oil.

MK5

MK6

MK7

MK8

MK6-FB

MK8-FB

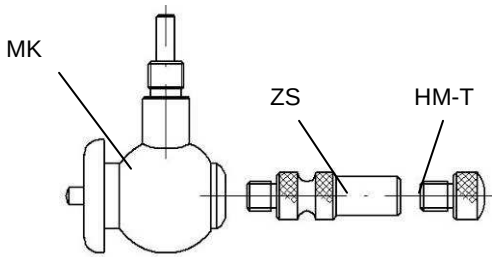
Measuring range tables

M5X mm	E5X inch	Extension	Carbide Anvil No.				
19,5-22,0	0,768-0,866		1				
22,0-24,5	0,866-0,965			2			
24,5-27,0	0,965-1,063				3		
27,0-29,5	1,063-1,161					4	
29,5-32,0	1,161-1,260	A	1				
32,0-34,5	1,260-1,358	A		2			

M6 mm	E6 mm	Extension			Carbide Anvil No.				
26,3-29,5	1,035-1,161				1				
29,0-31,5	1,142-1,240					2			
31,5-34,0	1,240-1,339						3		
34,0-36,5	1,339-1,437							4	
36,5-39,0	1,437-1,535	A			1				
39,0-41,0	1,535-1,614	A				2			
41,0-43,5	1,614-1,713	A					3		
43,5-46,0	1,713-1,811	A						4	
46,0-48,5	1,811-1,909		B		1				
48,5-51,0	1,909-2,008		B			2			
51,0-53,5	2,008-2,106		B				3		
53,5-55,0	2,106-2,165		B					4	
47,0-60,0	1,850-2,362		B						0
57,0-70,0	2,244-2,756	A							0
67,0-80,0	2,638-3,150		B						0
77,0-90,0	3,031-3,543	A	B						0
87,0-100,0	3,425-3,937			C					0
97,0-110,0	3,819-4,331	A		C					0

Example MK-6

Bore ∅: 45,0 +0,03
From table: plunger probe MK-6
For ∅43,5 – 46,0:
Extension ZS-A
Carbide anvil No. 4: HMT-4

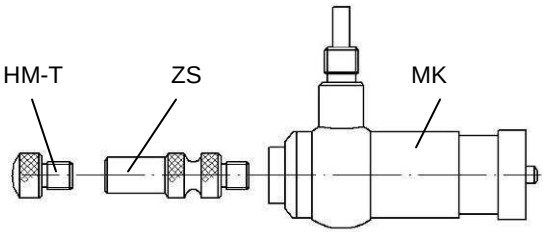


Measuring range tables

M7 mm	E7 Inch	Extension				Carbide Anvil No.				
49,5-52,5	1,949-2,067					1				
52,5-54,6	2,067-2,150						2			
54,5-56,6	2,146-2,228							3		
56,5-59,1	2,224-2,327								4	
59,0-61,6	2,323-2,425	A				1				
61,5-64,1	2,421-2,524	A					2			
64,0-66,6	2,520-2,622	A						3		
66,5-69,1	2,618-2,720	A							4	
69,0-71,6	2,717-2,819		B			1				
71,5-74,1	2,815-2,917		B				2			
69,0-81,0	2,717-3,189									0
79,0-91,0	3,110-3,583	A								0
89,0-101,0	3,504-3,976		B							0
99,0-111,0	3,898-4,370	A	B							0
109,0-121,0	4,291-4,764			C						0
119,0-131,0	4,685-5,157	A		C						0
129,0-141,0	5,079-5,551		B	C						0
139,0-151,0	5,472-5,945	A	B	C						0
149,0-161,0	5,866-6,339				D					0
159,0-171,0	6,260-6,732	A			D					0
169,0-181,0	6,654-7,126		B		D					0
179,0-191,0	7,047-7,520	A	B		D					0
189,0-201,0	7,441-7,913			C	D					0
199,0-211,0	7,835-8,307	A		C	D					0
209,0-221,0	8,228-8,701		B	C	D					0
219,0-231,0	8,622-9,094	A	B	C	D					0

Example MK-8

Bore ∅: 265,0 +0,08
From table: plunger probe MK-8
For ∅258 - 270:
Extension ZS-B, ZS-C, ZS-E
Adjustable carbide anvil No. 0: HMT-0



Measuring range tables

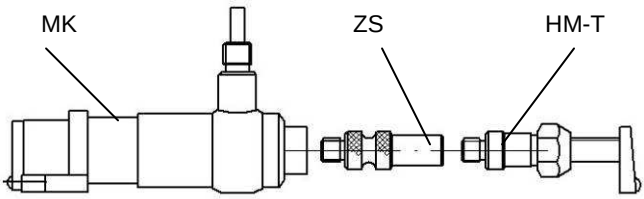
M8 **mm**	**E8** **Inch**	Extension					Carbide Anvil				
73,5 - 75,6	2,8937 - 2,9764						1				
75,5 - 77,6	2,9724 - 3,0551							2			
77,5 - 79,6	3,0512 - 3,1339								3		
79,5 - 82,1	3,1299 - 3,2323									4	
82,0 - 84,6	3,2283 - 3,3307	A					1				
84,5 - 87,1	3,3268 - 3,4291	A						2			
87,0 - 89,6	3,4252 - 3,5276	A							3		
89,5 - 92,1	3,5236 - 3,626	A								4	
92,0 - 94,6	3,622 - 3,7244		B				1				
94,5 - 97,1	3,7205 - 3,8228		B					2			
93 - 105	3,6614 - 4,1339										0
103 - 115	4,0551 - 4,5276	A									0
113 - 125	4,4488 - 4,9213		B								0
123 - 135	4,8425 - 5,315	A	B								0
133 - 145	5,2362 - 5,7087			C							0
143 - 155	5,6299 - 6,1024	A		C							0
153 - 165	6,0236 - 6,4961		B	C							0
163 - 175	6,4173 - 6,8898	A	B	C							0
173 - 185	6,811 - 7,2835				D						0
183 - 195	7,2047 - 7,6772	A			D						0
193 - 205	7,5984 - 8,0709					E					0
203 - 215	7,9921 - 8,4646	A				E					0
213 - 225	8,3858 - 8,8583		B			E					0
223 - 235	8,7795 - 9,252	A	B			E					0
233 - 245	9,1732 - 9,6457			C		E					0
243 - 255	9,5669 - 10,0394	A		C		E					0
253 - 265	9,9606 - 10,4331		B	C		E					0
263 - 275	10,3543 -10,8268	A	B	C		E					0
273 - 285	10,748 - 11,2205				D	E					0
283 - 295	11,1417 -11,6142	A			D	E					0
293 - 305	11,5354 -12,0079		B		D	E					0
303 - 315	11,9291 -12,4016	A	B		D	E					0
313 - 325	12,3228 -12,7953			C	D	E					0

Measuring range tables

M6-FB mm	E6-FB Inch	Extension			Carbide Anvil No.		
38,5-43,5	1,516-1,713				5		
43,0-49,0	1,693-1,929					6	
48,5-53,5	1,909-2,106	A			5		
53,0-59,0	2,087-2,323	A				6	
58,5-63,5	2,303-2,500		B		5		
63,0-69,0	2,480-2,717		B			6	
53,0-65,0	2,087-2,559						7
63,0-75,0	2,480-2,953	A					7
73,0-85,0	2,874-3,346		B				7
83,0-95,0	3,268-3,740	A	B				7
93,0-105,0	3,661-4,134			C			7
103,0-115,0	4,055-4,528	A		C			7

Example MK8-FB

Bore ∅: 145,0 +0,05
From table: plunger probe MK8-FB
For ∅138,0 – 148,0:
Extension ZS-A, ZS-C
Adjustable carbide anvil No. 7: HMT-7

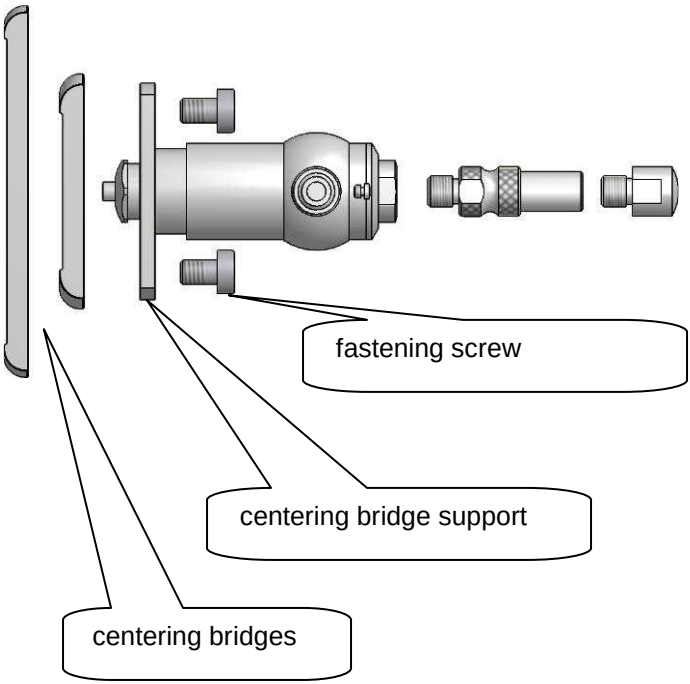


Measuring range tables

M8-FB mm	**E8-FB Inch**	Extension					Carbide Anvil No.		
70,5-74	2,7756-2,9134						5		
73,5-79	2,8937-3,1102							6	
78,5-83,5	3,0906-3,2874	A					5		
83-93	3,2677-3,6614								7
93-103	3,6614-4,0551	A							7
103-113	4,0551-4,4488		B						7
113-123	4,4488-4,8425	A	B						7
123-133	4,8425-5,2362			C					7
133-143	5,2362-5,6299	A		C					7
143-153	5,6299-6,0236		B	C					7
153-163	6,0236-6,4173	A	B	C					7
163-173	6,4173-6,811				D				7
173-183	6,811-7,2047	A			D				7
183-193	7,2047-7,5984					E			7
193-203	7,5984-7,9921	A				E			7
203-213	7,9921-8,3858		B			E			7
213-223	8,3858-8,7795	A	B			E			7
223-233	8,7795-9,1732			C		E			7
233-243	9,1732-9,5669	A		C		E			7
243-253	9,5669-9,9606		B	C		E			7
253-263	9,9606-10,3543	A	B	C		E			7
263-273	10,3543-10,748				D	E			7
273-283	10,748-11,1417	A			D	E			7
283-293	11,1417-11,5354		B		D	E			7
293-303	11,5354-11,9291	A	B		D	E			7
303-313	11,9291-12,3228			C	D	E			7
313-323	12,3228-12,7165	A		C	D	E			7
323-333	12,7165-13,1102		B	C	D	E			7
333-343	13,1102-13,5039	A	B	C	D	E			7

Plunger Probe M78-Plus

Plunger Probe M78-Plus differs from other plunger probes by exchangeable centering bridge. This bridge is fixed by 2 screws on centering bridge support.



Measuring range tables

M7-Plus mm	M7-Plus Inch	Extension					Carbide anvil No.				
50,5 - 52,7	1,9882 - 2,0748						1				
52,3 - 55,0	2,0591 - 2,1654							2			
54,6 - 57,5	2,1496 - 2,2638								3		
57,0 - 60,0	2,2441 - 2,3622									4	
59,5 - 62,5	2,3425 - 2,4606	A					1				
62,0 - 65,0	2,4409 - 2,5591	A						2			
64,5 - 67,5	2,5394 - 2,6575	A							3		
67,0 - 70,5	2,6378 - 2,7756	A								4	
69,5 - 72,5	2,7362 - 2,8543		B				1				
71,5 - 75,0	2,815 - 2,9528		B					2			
71,0 - 83,0	2,7953 - 3,2677										0
81,0 - 93,0	3,189 - 3,6614	A									0
91,0 - 103,0	3,5827 - 4,0551		B								0
101,0 - 113,0	3,9764 - 4,4488	A	B								0
111,0 - 123,0	4,3701 - 4,8425			C							0
121,0 - 133,0	4,7638 - 5,2362	A		C							0
131,0 - 143,0	5,1575 - 5,6299		B	C							0
141,0 - 153,0	5,5512 - 6,0236	A	B	C							0
151,0 - 163,0	5,9449 - 6,4173				D						0
161,0 - 173,0	6,3386 - 6,811	A			D						0
171,0 - 183,0	6,7323 - 7,2047		B		D						0
181,0 - 193,0	7,126 - 7,5984	A	B		D						0
191,0 - 203,0	7,5197 - 7,9921			C	D						0
201,0 - 213,0	7,9134 - 8,3858	A		C	D						0
211,0 - 223,0	8,3071 - 8,7795		B	C	D						0
221,0 - 233,0	8,7008 - 9,1732	A	B	C	D						0

Measuring range tables

M8-Plus mm	M8-Plus Inch	Extensions					Carbide anvil No.				
130,0 - 142,0	5,1181 - 5,5906		B	C							0
140,0 - 152,0	5,5118 - 5,9843	A	B	C							0
150,0 - 162,0	5,9055 - 6,378				D						0
160,0 - 172,0	6,2992 - 6,7717	A			D						0
170,0 - 182,0	6,6929 - 7,1654					E					0
180,0 - 192,0	7,0866 - 7,5591	A				E					0
190,0 - 202,0	7,4803 - 7,9528		B			E					0
200,0 - 212,0	7,874 - 8,3465	A	B			E					0
210,0 - 222,0	8,2677 - 8,7402			C		E					0
220,0 - 232,0	8,6614 - 9,1339	A		C		E					0
230,0 - 242,0	9,0551 - 9,5276		B	C		E					0
240,0 - 252,0	9,4488 - 9,9213	A	B	C		E					0
250,0 - 262,0	9,8425 - 10,315				D	E					0
260,0 - 272,0	10,2362 - 10,7087	A			D	E					0
270,0 - 282,0	10,6299 - 11,1024		B		D	E					0
280,0 - 292,0	11,0236 - 11,4961	A	B		D	E					0
290,0 - 302,0	11,4173 - 11,8898			C	D	E					0
300,0 - 312,0	11,811 - 12,2835	A		C	D	E					0
310,0 - 322,0	12,2047 - 12,6772		B	C	D	E					0
320,0 - 332,0		A	B	C	D	E					0

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