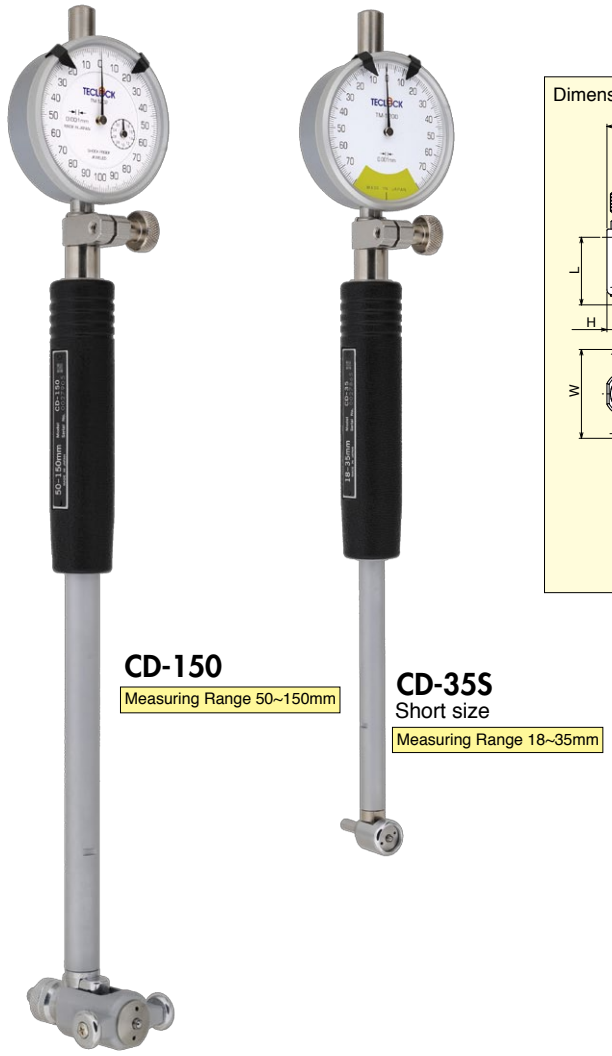
Bore Gauge

Bore Gauge is the comparative measuring instrument which measures internal diameter of a hole by comparing with master gauge (micrometer, ring gauge etc.). Center of prove and anvil are guided to diameter part of a hole by guide assembly and displacement of contact point is transferred to dial indicator (Automatic centripetal mechanism) by right angle change in the ratio of 1 : 1 with cam mechanism.
Measurement accuracy is changed according to graduation (resolution) of used dial indicator. Measuring range are available from minimum ϕ6mm to maximum ϕ450mm according to size of diameter.

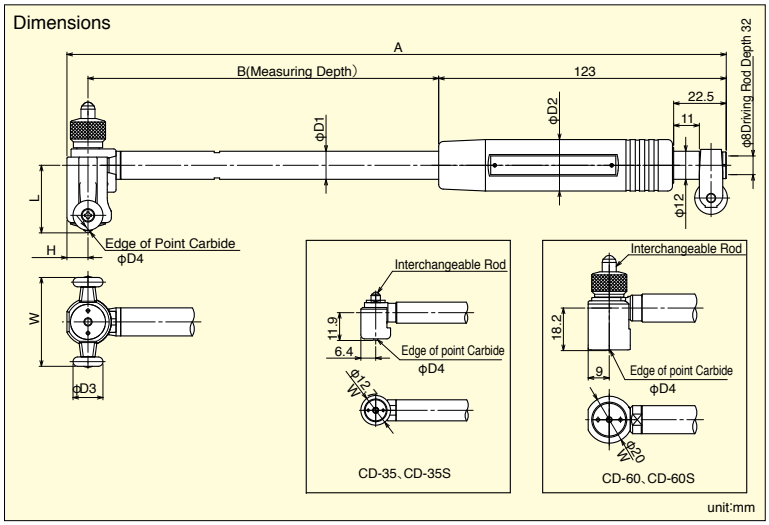
Bore Gauge (CD type)

- Compliance with JIS B 7515A.
- Anvil and Contact point are using the carbide ball.
- The measuring depth can be extend using the extension rod to measure a deep hole.



CD-150
Measuring Range 50~150mm

CD-35S
Short size
Measuring Range 18~35mm



Dimension Table ： Standard

Model	A	B	L	H	W	ϕD1	ϕD2	ϕD3	ϕD4
CD-35	229.4	100	11.9	6.4	ϕ12.7	9	22	———	1.5
CD-60	282	150	18.2	9	ϕ20	12	22	———	1.5
CD-150	282	150	28.9	9	38	12	22	12.8	2
CD-160	282	150	28.9	9	50	12	22	12.8	2
CD-250	385	250	100.9	12	90	15	25	19.8	3
CD-400	385	250	100.9	12	90	15	25	19.8	3

unit:mm

Dimension Table ： Short size

Model	A	B	L	H	W	ϕD1	ϕD2	ϕD3	ϕD4
CD-35S	179.4	50	11.9	3.4	ϕ12.7	9	22	———	1.5
CD-60S	182	50	18.2	9	ϕ20	12	22	———	1.5
CD-150S	182	50	28.9	9	38	12	22	12.8	2
CD-160S	182	50	28.9	9	50	12	22	12.8	2
CD-250S	285	150	100.9	12	90	15	25	19.8	3
CD-400S	285	150	100.9	12	90	15	25	19.8	3

unit:mm

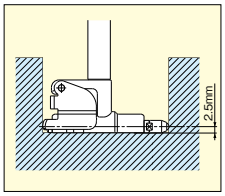
Specification

	Model	Measuring Range (mm)	Probe Depth (mm)	Effective Measuring Range(mm)	Total Range Error (μm)	Adjacent Error (μm)	Repeatability (μm)	Measuring Force	Guide Support Force	Number of Anvils	Number of Washers	Sub Anvil	Weight (g)
Standard type	CD-35	18-35	100	1.2	2	1	0.5	4N or less	6N or less	Incream 9pcs./2mm	2	—	160
	CD-60	35-60	150							Incream 6pcs./5mm	4	—	230
	CD-150	50-150	150	1.6				5N or less	10N or less	Incream 11pcs./5mm	4	50	250
	CD-160	100-160	150							Incream 13pcs./5mm	4	—	310
	CD-250	160-250	250					6N or less	15N or less	Incream 6pcs./15mm	7	—	680
	CD-400	250-400	250							Incream 5pcs./15mm	7	75	775
Short type	CD-35S	18-35	50	1.2				4N or less	6N or less	Incream 9pcs./2mm	2	—	150
	CD-60S	35-60	50							Incream 6pcs./5mm	4	—	210
	CD-150S	50-150	50	1.6				5N or less	10N or less	Incream 11pcs./5mm	4	50	230
	CD-160S	100-160	50							Incream 13pcs./5mm	4	—	290
	CD-250S	160-250	150					6N or less	15N or less	Incream 6pcs./15mm	7	—	630
	CD-400S	250-400	150							Incream 5pcs./15mm	7	75	720

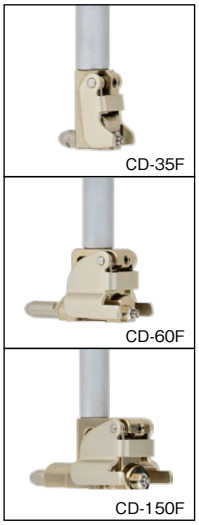
Bore Gauge (CD type) for shallow hole

CD-35F

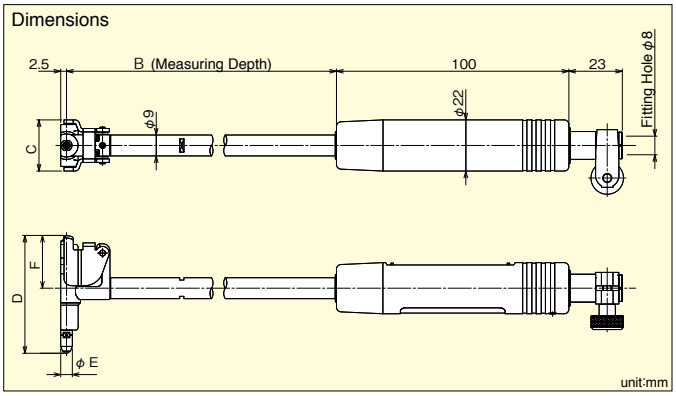
Measuring Range 15~35mm



Internal measurement is possible at the position from shallow hole bottom by 2.5mm.



Dimensions



Dimension Table

Model	A	B	C	D	E	F
CD-35F	275.5	150	10.6	15.7	5	10
CD-60F	275.5	150	18	35.7	5	14.3
CD-150F	275.5	150	22	50.7	5	22.7
CD-35FS	175.5	50	10.6	15.7	5	10
CD-60FS	175.5	50	18	35.7	5	14.3
CD-150FS	175.5	50	22	50.7	5	22.7

unit:mm

Specification

Model	Measuring Range (mm)	Effective Measuring Range (mm)	Total Range Error (μm)	Adjacent Error (μm)	Repeatability (μm)	Anvil (pcs.)	Weight (g)
CD-35F	15~35	1.2	4	1	1	11	180
CD-60F	35~60	1.2	4	1	1	6	200
CD-150F	50~150	1.2	4	1	1	11	210
CD-35FS	15~35	1.2	4	1	1	11	140
CD-60FS	35~60	1.2	4	1	1	6	160
CD-150FS	50~150	1.2	4	1	1	11	170

Bore Gauge (CN type) for small hole

• These are bore gauges for small holes of which internal diameter is 18.5mm and high accuracy measuring is possible as well as standard type bore gauges.

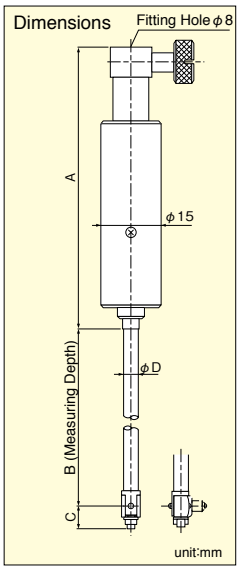
CN-10

Measuring Range 6~10mm

CN-18

Measuring Range 10~18.5mm

Dimensions



Dimension Table

Model	A	B	C	D
CN-10	80	49	5.4	4
CN-18	80	100	8.5	6

unit:mm

Specification

Model	Measuring Range (mm)	Effective Measuring Range (mm)	Total Range Error (μm)	Adjacent Error (μm)	Repeatability (μm)	Weight (g)
CN-10	6~10	0.5	5	2	2	70
CN-18	10~18.5	0.6	5	2	2	80

Parts

Interchangeable Rods (Anvils), Washers and Extension Rods

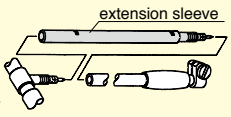
Model		Extension rods	Interchangeable rods (anvils)													Washers						
			No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13	0.5mm	1mm	2mm	3mm	4mm	5mm	6mm
CN-10	NML		6	6.5	7	7.5	8	8.5	9	9.5	10											
	Code No.		ZJ-300	ZJ-301	ZJ-302	ZJ-303	ZJ-304	ZJ-305	ZJ-306	ZJ-307	ZJ-308											
CN-18	NML		10	11	12	13	14	15	16	17	18					ZJ-343						
	Code No.		ZJ-310	ZJ-311	ZJ-312	ZJ-313	ZJ-314	ZJ-315	ZJ-316	ZJ-317	ZJ-318											
CD-35	NML		18	20	22	24	26	28	30	32	34					ZJ-382	ZJ-383					
CD-35S	Code No.		ZJ-350	ZJ-351	ZJ-352	ZJ-353	ZJ-354	ZJ-355	ZJ-356	ZJ-357	ZJ-358											
CD-60	NML		35	40	45	50	55	60								ZJ-384	ZJ-385	ZJ-386	ZJ-387			
CD-60S	Code No.		ZJ-360	ZJ-361	ZJ-362	ZJ-363	ZJ-364	ZJ-365														
	NML		50	55	60	65	70	75	80	85	90	95	100									
CD-150	Code No.		ZJ-360	ZJ-361	ZJ-362	ZJ-363	ZJ-364	ZJ-365	ZJ-366	ZJ-367	ZJ-368	ZJ-369	ZJ-370									
CD-150S	NML	50	100	105	110	115	120	125	130	135	140	145	150									
	Code No.	ZJ-379	ZJ-360	ZJ-361	ZJ-362	ZJ-363	ZJ-364	ZJ-365	ZJ-366	ZJ-367	ZJ-368	ZJ-369	ZJ-370									
CD-160	NML		100	105	110	115	120	125	130	135	140	145	150	155	160							
CD-160S	Code No.		ZJ-360	ZJ-361	ZJ-362	ZJ-363	ZJ-364	ZJ-365	ZJ-366	ZJ-367	ZJ-368	ZJ-369	ZJ-370	ZJ-371	ZJ-372							
CD-250	NML		160	175	190	205	220	235								ZJ-388	ZJ-389	ZJ-390	ZJ-391	ZJ-392	ZJ-393	ZJ-394
CD-250S	Code No.		ZJ-373	ZJ-374	ZJ-375	ZJ-376	ZJ-377	ZJ-378														
	NML		250	265	280	295	310															
CD-400	Code No.		ZJ-373	ZJ-374	ZJ-375	ZJ-376	ZJ-377															
CD-400S	NML	75	325	340	355	370	385															
	Code No.	ZJ-380	ZJ-373	ZJ-374	ZJ-375	ZJ-376	ZJ-377															
	NML		15	16	17	18	19	20	21	22	23	24	25			ZJ-344						
CD-35F	Code No.		ZJ-319	ZJ-320	ZJ-321	ZJ-322	ZJ-323	ZJ-324	ZJ-325	ZJ-326	ZJ-327	ZJ-328	ZJ-329									
CD-35FS	NML	10mm	(25)	26	27	28	29	30	31	32	33	34	35									
	Code No.	ZJ-341	(ZJ-319)	ZJ-320	ZJ-321	ZJ-322	ZJ-323	ZJ-324	ZJ-325	ZJ-326	ZJ-327	ZJ-328	ZJ-329									
CD-60F	NML		35	40	45	50	55	60								ZJ-344	ZJ-345	ZJ-346	ZJ-347			
CD-60FS	Code No.		ZJ-330	ZJ-331	ZJ-332	ZJ-333	ZJ-334	ZJ-335														
	NML		50	55	60	65	70	75	80	85	90	95	100									
CD-150F	Code No.		ZJ-330	ZJ-331	ZJ-332	ZJ-333	ZJ-334	ZJ-335	ZJ-336	ZJ-337	ZJ-338	ZJ-339	ZJ-340									
CD-150FS	NML	50	(100)	105	110	115	120	125	130	135	140	145	150									
	Code No.	ZJ-342	(ZJ-330)	ZJ-331	ZJ-332	ZJ-333	ZJ-334	ZJ-335	ZJ-336	ZJ-337	ZJ-338	ZJ-339	ZJ-340									

Extension Sleeves

Length (mm)	CD-35 CD-35F~CD-150F	CD-60~ CD-160	CD-250~ CD-400
125	ZJ-400	ZJ-403	ZJ-408
250	ZJ-401	ZJ-404	ZJ-409
500	ZJ-402	ZJ-405	ZJ-410
750	–	ZJ-406	ZJ-411
1000	–	ZJ-407	ZJ-412
Extension sleeve dia. (mm)	ϕ8.7	ϕ12	ϕ15
Spanner	ZZ-018	ZZ-019	

Can not be used for CN-10, 18, 35F, 60F, 150F.

In case that deep holes are measured which can not be measured with standard bore gauges, measuring depth is to be extended by extension rod outer cylinder.

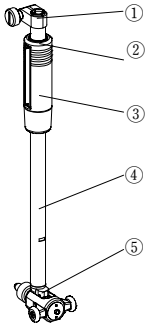


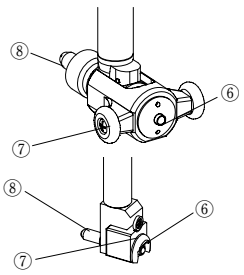
As error may occur due to deflection, only 1 extension rod should be adopted.

Dial Gauge Protection Cover (ZY-094)

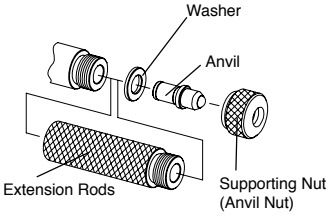
Dial indicator protection cover (ZY-094).
Protection cover for bore gauge.
It can not be used for CC type.

Parts Names





①Dial Clamp
②Dial Holder
③Grip
④Sleeve
⑤Head
⑥Contact Point (Movable Side)
⑦Guide
⑧Anvil



Extension Rods and Washer Set

Code No.	Model
ZJ-918	CN-10
ZJ-919	CN-18
ZJ-920	CN-35F
ZJ-921	CN-60F
ZJ-922	CN-150F
ZJ-923	CD-35
ZJ-924	CD-60
ZJ-925	CD-150
ZJ-926	CD-160
ZJ-927	CD-250
ZJ-928	CD-400

Can also be used to CN type of old poducts.

Micro-Hole test

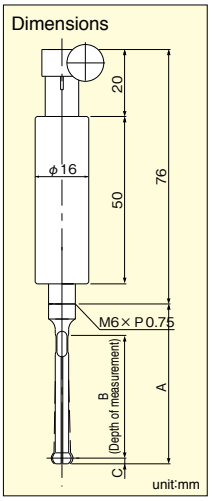
This is designed for measuring diameter of small holes exclusively and can measure diameters from minimum ϕ1.7mm to maximum ϕ10mm. When the edge of probe is inserted to a small hole, the edge is closed to inside and presses inner driving rod upward. The principle is that movement is transferred to the extension rod and instructs to dial indicator. Swing width of dial graduation is read as well as bore gauge. It is marked characteristic that stability accuracy indicating performance is high as 2μm.

Micro-Hole test

- It can comply with measuring internal diameter from minimum ϕ1.7mm to maximum ϕ10mm.
- It has realized stability accuracy 2μm, even though it is applied for small internal diameter which is difficult to measure.
- It realizes smooth operation with hard chrome plating. It can be naturally inserted to small internal diameter and obtain stable indication value.

MT-10N

Measuring Range 6~10mm



[Full Choice] Micro-Hole Test

Series to select only the measuring range is needed.

Model	Ordering Method	Measuring Range (mm)	Probe	Driving Rod
MT-3N	MT-3N 1.7	1.7~2.1	012	1
	MT-3N 2.1	2.1~2.4	013	1
	MT-3N 2.3	2.3~2.7	014	2
	MT-3N 2.7	2.7~3.2	015	2
MT-4N	MT-4N 2.7	2.7~3.2	015	2
	MT-4N 3.1	3.1~3.5	016	2
	MT-4N 3.4	3.4~3.8	017	2
	MT-4N 3.8	3.8~4.3	018	2
MT-6N	MT-6N 3.8	3.8~4.3	018	2
	MT-6N 4.2	4.2~5.0	021	3
	MT-6N 4.7	4.7~5.5	022	3
	MT-6N 5.3	5.3~6.2	023	3
MT-10N	MT-10N 6.0	6.0~6.8	024	3
	MT-10N 6.6	6.6~7.5	025	3
	MT-10N 7.3	7.3~8.1	026	3
	MT-10N 8.0	8.0~8.8	027	3
	MT-10N 8.5	8.5~9.4	028	3
	MT-10N 9.2	9.2~10.0	029	3

Product configuration=Probe+Diving rod + Holder + Extension rods + Spanner (Dialgauge options)

Specification

Model	Measuring Range (mm)	Probe						Accessories			Indication Error (μm)	Repeatability (μm)	Weight (g)
		Number of Probe	No.	Measuring Range (mm)	Probe Dimensions (mm) A	B	C	Driving Rod	Extension Rods	Spanner			
MT-3N	1.7~3.2	4	012	1.70~2.10	25.3	17	0.9	Driving Rod1	1	1	8	2	100
			013	2.10~2.40									
			014	2.30~2.70	30.6	22	1.2	Driving Rod2					
			015	2.70~3.20									
MT-4N	2.7~4.3	4	015	2.70~3.20	30.6	22	1.2		1	1	8	2	100
			016	3.10~3.50									
			017	3.40~3.80									
			018	3.80~4.30	30.6	22	2.0						
MT-6N	3.8~6.2	4	018	3.80~4.30	30.6	22	2.0		1	1	8	2	100
			021	4.20~5.00	47.3	40		Driving Rod3					
			022	4.70~5.50									
			023	5.30~6.20									
MT-10N	6.0~10.0	6	024	6.00~6.80	47.3	40	2.0		1	1	8	2	100
			025	6.60~7.50									
			026	7.30~8.10									
			027	8.00~8.80									
			028	8.50~9.40		50							
			029	9.20~10.00									

Technical Data

- Dial indicator can be installed to bore gauges and Micro-hole Test. It is selectable for easier reading in compliance with objective and dimension range.

Measuring purpose
Graduation 0.001mm
Applicable Models
TM-1201f
(Measuring Range 1mm)
TM-1202f
(Measuring Range 2mm)

Measuring purpose
Graduation 0.001mm
Continuous Dial
Applicable Models
TM-1251f
(Measuring Range 1mm)

Measuring purpose
Graduation 0.001mm
One Revolution Dial Indicator
Applicable Models
TM-1200f
(Measuring Range 0.16mm)

Measuring purpose
Graduation 0.01mm
Applicable Models
TM-105
(Measuring Range 5mm)

Measuring purpose
Graduation 0.01mm
One Revolution Dial Indicator
Applicable Models
TM-102f
(Measuring Range 1mm)

Measuring purpose
Small Dial Indicators
Applicable Models
TM-36f
(Graduation 0.005mm
Measuring Range 3.5mm)
TM-37C
(Graduation 0.01mm
Measuring Range 3.5mm)

As to dial indicator installed to bore gauge, dial indicator with flat back is recommended. Lug back is standard for ordinary dial indicators but it will be with flat back by adding suffix "f" to the end of model name. TM-105 and TM-37C dial indicator is supplied with Flat back as standard.