

CITIZEN

CITIZEN FINEDEVICE CO., LTD.

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PRECISIO



Precision Specialists

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Precision Measuring Instruments General Catalog

CITIZEN

INSTRUMENTS

CITIZEN FINEDEVICE CO., LTD.

^{*}The information contained in this catalog is subject to change without prior notice

This product may fall under the category of strategic goods or other export-regulated items under the Foreign Exchange and Foreign Trade Law

Before exporting such products, contact our sales repre



Grind, Measure and Assemble

Our mastery of the basics of craftsmanship is the proof of reliability



Through manufacturing watches that require absolute precision,

CITIZEN has continued to refine its technologies to "grind,"

"measure" and "assemble."

These three technologies are the basics of craftsmanship.

It is no exaggeration to say that CITIZEN is the only manufacturer of

measuring instruments that possesses all three of these technologies.

Our technical abilities, which have been proving their worth in

measurements of watch components requiring high precision in

micron units, have become the proof of reliability,

and they now contribute to measurements in various fields

including bearings, auto components and electronic components.



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Displacement Sensor	
Digital Gauge SA series	13
Electric Micrometer	25
Signal Indicator & Micro Indicator TRI-METRON Mu-METRON	33

Measuring Stand

Options & Accessories

Precision Measuring Instruments Product Overview

Displacement Sensors

page 13 Digital Gauges

SA Series

Robust

The W-bearing structure enables the product to withstand 200 million sliding operations under a durability test in which load is applied in the vertical, horizontal, and oblique directions

Accurate

Adoption of the absolute method significantly reduces counting errors compared to conventional digital gauges

Wide product lineup

- Air purge specification
 - Usable under environments in which the product is exposed to cutting fluid.
- Pneumatic drive specification
- Abundant lineup of long-stroke products

Models with 10-mm, 32-mm, 50-mm sensor heads are available

Controllers adapted to applications

One-channel type for desktop placement Connectable type to accommodate up to 16 units Multi-channel type focused on data output

PRECISION MEASURING **INSTRUMENTS**



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Electric Micrometers

ELEMETRON

Can measure in units of 0.1 µm

The best choice for high-precision measurement.

Low-measuring-force type available

Can measure soft and fragile objects.

Long-selling products that use differential transformers





Measuring Stands page 37

This lineup of horizontal stands facilitates measurement of product outer and inner diameters.

Measure with minimal error by attaching the SA series or Mu-METRON.

Measure unusually shaped workpieces or grooves by using special contact points.



TRI-METRON page 33

Micro indicators

Mu-METRON

Simple structure, no amplifier needed

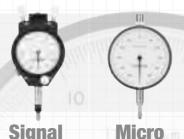
The most cost-efficient option for simple pass/fail measurement.

High-precision micro indicators

Achieves high precision by adopting the mechanical structure of a watch

Two types:

Mu-METRON high-precision micro indicators, and TRI-METRON incorporating electric contacts in Mu-METRON

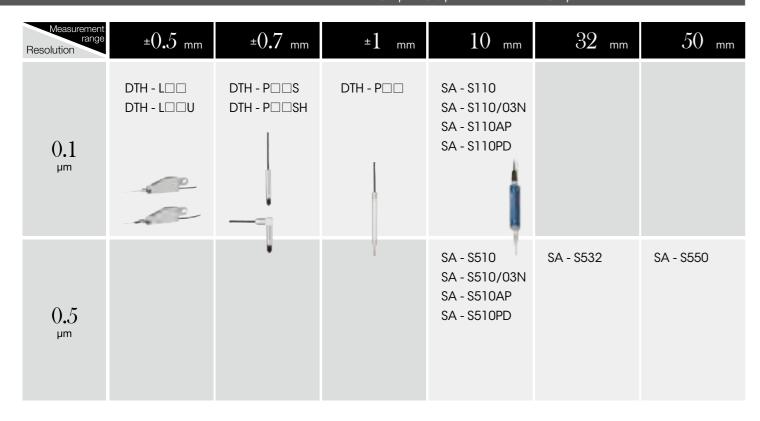


Signal Indicator



indicator

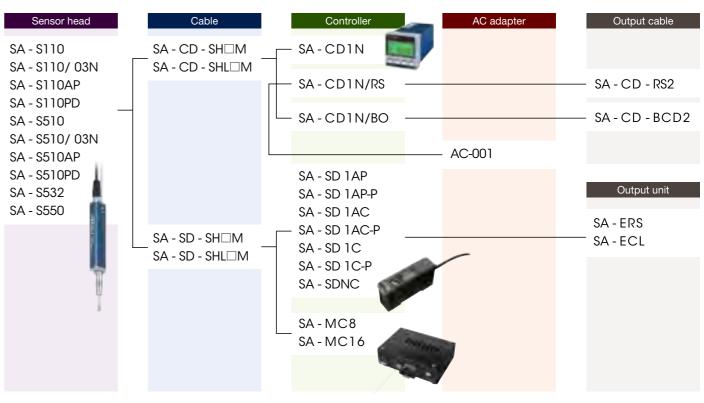
SA series ELEMETRON 10 mm - 50 mm Resolution 1.1 µm · 0.5 µm ELEMETRON ±0.5 mm - ±1 mm 0.1 µm

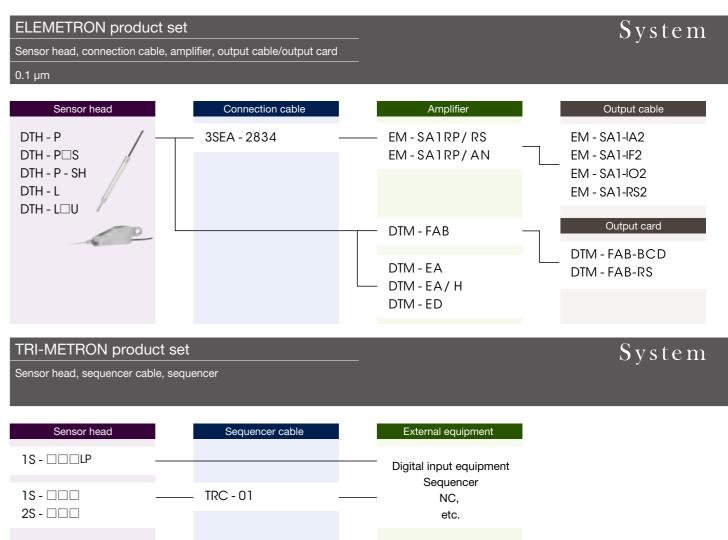


Lineup	TRI-METRON	Mu-METRON
	Measurement range ±0.05 mm − ±0.6 mm	±0.05 mm
	Resolution 1 µm — 20 µm	 0.5 μm — 1 μm

Measurement range Resolution	±0.05 mm	±0.1 mm	±0.5 mm	±0.6 mm
0.5 µm	4M - 100P			
1 µm	1S - 100LP 1S - 100 2S - 100 2M - 100 3M - 100	Ø · ①		
$\underset{\mu m}{2}$	1	2S - 200		
10 µm			1S - 010LP 1S - 010	2S - 010
20 µm			1S - 010FIS 2S - 010FIIS	

SA series product set Sensor head, cable, controller, output cable Sensor head, cable, controller, output cable Sensor head, cable, controller, output cable





Automobile

pplication



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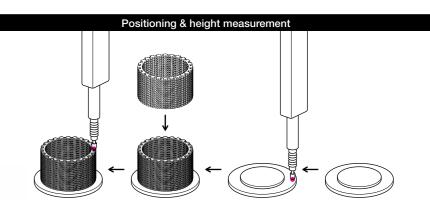
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With our precision measuring instruments, all kinds of automobile components can be measured. Our instruments greatly contribute to

the modern automotive industry.

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Automobile



• Attachment positions are accurately determined by simultaneous multi-point measurement using multiple contact points.

Positioning

· Eccentricity of motor shafts used for windshield wipers or doors is measured while rotating the shafts at high

Eccentricity measurement

• Pass/fail judgments are made in each component assembly process based on height measurement.

Doors

Motors

Steering

Brake discs

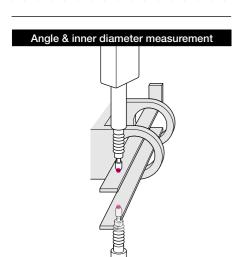
Crankshafts

Valves

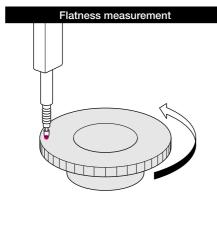
Engine piston rings

(Aluminum diecast products)

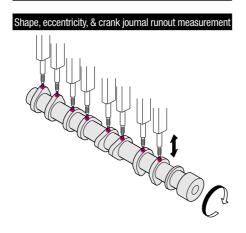
Height & flatness measurement



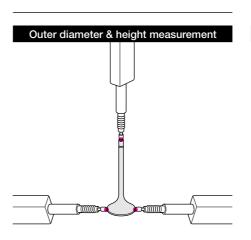
 Shaft inner and outer diameters are measured by two contact points.



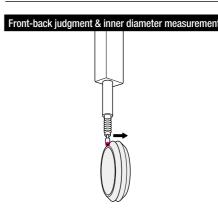
 Disc surface flatness is measured by one contact point while rotating the disc.



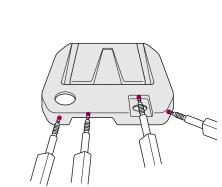
All measurements required for shafts can be performed.



• Measurement is instantaneously performed by simultaneous multi-point measurements using multiple contact points.



• Run the sensor over stacked piston rings to judge the front or back.



• Height and flatness are measured by simultaneous multi-point measurement using multiple contact points.

Transmissions

Cylinder head covers

Bearings are used in many industrial products.

We have handled bearing measurement

since our establishment, and we are

the leaders in terms of experience

and performance in Japan.

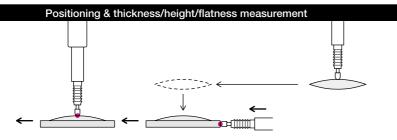
Mobile Phone

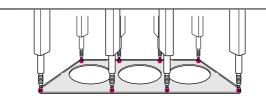
Application

Bearing

The technologies we cultivated through measurement for watches, which are precision instruments, are used to measure the components







 Pass/fail judgments for the lens based on thickness, height, and flatness measurement. Accurate positioning during assembly and pass/fail judgment based on height measurement. OK WING WING

 Judgments are made based on height measurement in the final line after processing.

Completed products

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Ball bearing rings

Balls

Height measurement

Batteries

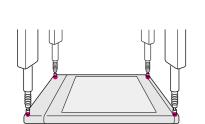
Tablet surfaces

Mobile Phone

Chassis & covers

Camera lens cases

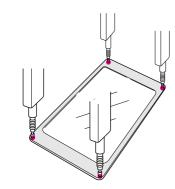
Height measurement



• Pass/fail judgments are made by comparison to the

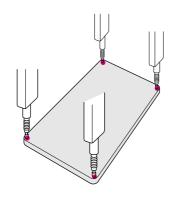
master gauge with one contact point.

Thickness & flatness measurement



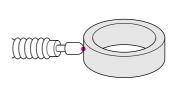
 Instantaneous judgment by multi-point measurement using multiple contact points.

Thickness & flatness measurement



 Instantaneous judgment by multi-point measurement using multiple contact points.

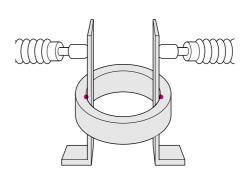
Height measurement



 Pass/fail judgments are made by comparison to the master gauge with one contact point.

Outer & inner diameter measurement

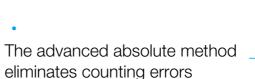
Bearing



 Measurement is made with two contact points. Outer and inner diameters are measured in separate processes.

 Pass/fail judgments are made by comparison to the master gauge with one contact point.

SA Series



SA series displacement sensors adopt the optical absolute encoder method.

With this method, the absolute position is read instantaneously when the power is turned on, thereby eliminating the need for master adjustment, which has conventionally been required each time.

This method reduces the setup time for each use and improves your work efficiency.

Slim and tough W-bearing structure

Metal bearings are provided both above and below the measuring part, and they are housed inside a robust diecast body to achieve extreme durability.

Their incredible robustness to vibrations, shocks, and lateral loads have earned customers' trust.



Detectors

Absolute method detectors

SA-S110, SA-S110/03N SA-S510, SA-S510/03N SA-S532 SA-S550 SA-S110AP / SA-S510AP Air purge specification SA-S110PD / SA-S510PD Pneumatic drive specification



Controllers

Controllers for SA series detectors

SA-CD SA-SD SA-MC8 / SA-MC16 SA-ERS SA-ECL



Displacement Sensors

Digital Gauge

The SA series of digital gauges adopt the absolute method and W-bearing structure to achieve superior precision and durability. The high-precision contact displacement sensor optically detects the spindle's absolute position and outputs data with a high resolution. The air purge specification type prevents the invasion of foreign objects from the outside by raising the inner pressure. This enables precise measurement in environments with liquids such as permeable oil, coolant liquids, and cutting fluids.



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Accessories

Controllers for SA series detectors

SA connector cables Contact points F-001, 101, 201, 301 SA-CD SA-SD F-171 Output cables F-106 SA-CD-RS2 SA-CD-BCD2 F-504 AC Adapter AC-001 F-507 For SA-CD1N For SA-CD1N/BO For SA-CD1N/RS

Rubber bellows M-137 For SA-S510, 110 M-142 For SA-S532 M-143 For SA-S550

Finger lever

Indicator bush M-150

Lug holder SMA-0417

Digital Gauges SA Series Detectors



Detectors











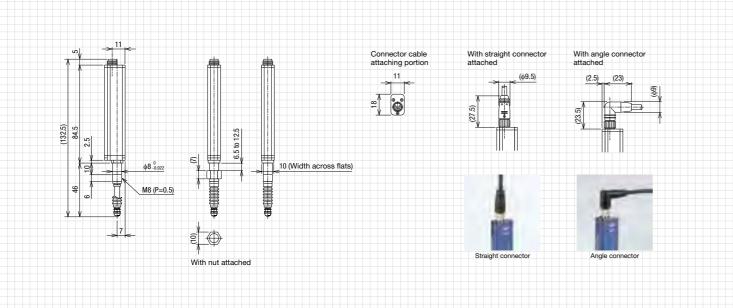






This series of sensors achieves high durability owing to the W-bearing structure and die-cast body. The series also eliminates counting errors by adopting the absolute method.

In addition to a minimum resolution of 0.5 μm (SA-S510, SA-S510/03N), high resolution products with a resolution of 0.1 μm are also available (SA-S110, SA-S110/03N). The series demonstrates superb capabilities in various measuring situations.





Model	SA-S110, SA-S110/03N	SA-S510, SA-S510/03N	
Measurement method	Optical absolute linear encoder method		
Measurement range	10	mm	
Resolution	0.1 µm	0.5 µm	
Indication accuracy (P-P) *1	1.0 µm	2.0 µm	
Measuring force *2	1.65 N or less (SA-S□10) / 0.35 N or less (SA-S□10/03N)		
Ingress protection rating *3	Equivalent to IP67		
Weight	Approx. 80 g		
Cable	Sold separately as an option		
Measuring probe	Ceramic sphere (diameter: 3.175 mm)		
Rubber bellows*4	Material: NBR		

^{*1} At an ambient temperature of 20°C

^{*3} Only when the rubber bellows is attached properly and is not damaged *4 For SA-S 10/03N, no rubber bellows are attached.

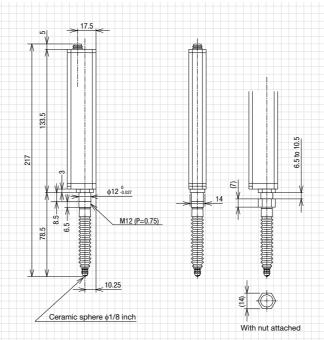








A long stroke of 32 mm extends the measurement range while maintaining high durability.



Connector cable	With straight connector	With angle connector
attaching portion	attached (\$\phi 9.5)	attached (23)
→ 17.5 ← 4-R3	→ 	(0) > (20) > 9
▼ ● ●		
52	(27.5)	(23.5)
V	<u> </u>	<u> </u>
	1	
		9

Model	SA-S532	
Measurement method	Optical absolute encoder method	
Measurement range	32 mm	
Resolution	0.5 μm	
Indication accuracy (P-P) *1	3 μm or less	
Measuring force *2	2.97 N or less	
Ingress protection rating *3	Equivalent to IP67	
Weight	Approx. 150 g	
Cable	Sold separately as an option	
Measuring probe	Ceramic sphere (diameter: 3.175 mm)	
Rubber bellows	Material: NBR	

^{*1} At an ambient temperature of 20°C

^{*2} When the measuring probe is pushed vertically down by 32 mm
*3 Only when the rubber bellows is attached properly and is not damaged





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² When the measuring probe is pushed vertically down by 10 mm (For SA-S 10/03N, this indicates the value when no rubber bellows have been installed.)

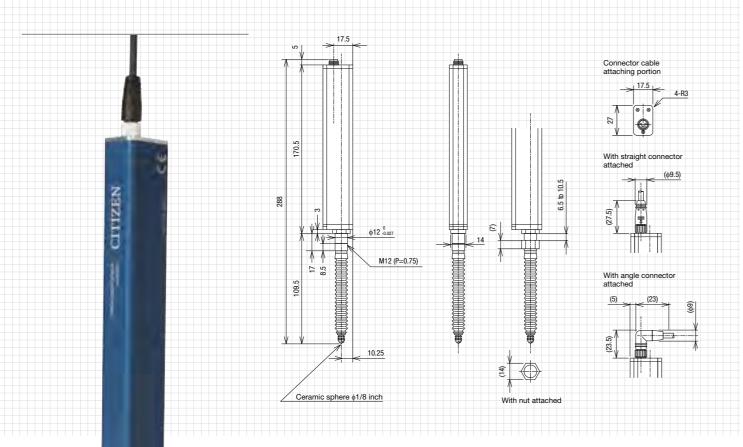
Digital Gauges







An ultra-long stroke of 50 mm easily accommodates measurements of large components.



Model	SA-S550	
Measurement method	Optical absolute linear encoder method	
Measurement range	50 mm	
Display resolution	0.5 µm	
Indication accuracy (P-P) *1	3.5 µm or less	
Measuring force *2	3.5 N or less	
Ingress protection rating *3	Equivalent to IP67	
Weight	Approx. 250 g	
Cable	Sold separately as an option	
Measuring probe	Ceramic sphere (diameter: 3.175 mm)	
Rubber bellows	Material: NBR	

^{*1} At an ambient temperature of 20°C

^{*2} When the measuring probe is pushed vertically down by 50 mm
*3 Only when the rubber bellows is attached properly and is not damaged





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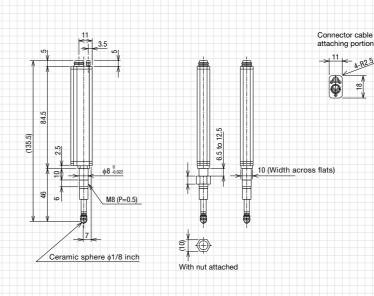


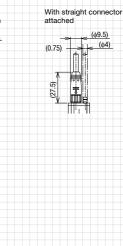


SA-S110AP / SA-S510AP (Air Purge Specification)

Air purge technology provides the ultimate environmental performance.

The body's inner pressure is raised by air-purging, which prevents foreign objects from invading. These sensors exhibit strong performance in severe environments where they are exposed to liquids such as permeable oil, coolant liquids, and cutting fluids.





Model	SA-S110AP	SA-S510AP	
Position detection method	Optical absolute encoder method		
Measurement range	10 ו	mm	
Used fluid	Α	ir	
Operating pressure range	0.05 to 0).10 MPa	
Air tube specification	Outer diameter: 4 mm / Inner diameter: 2.5 mm		
Withstand pressure	0.2 MPa		
Measuring force	1.5 to 3 N *2		
Resolution	0.1 μm 0.5 μm		
Indication accuracy (P-P) *1	1.0 µm or less	2.0 µm or less	
Weight	Approx. 80 g		
Ingress protection rating *3	Equivalent to IP67		
Cable *4	Sold separately as an option		
Measuring probe	Ceramic sphere (diameter: 3.175 mm)		

^{*1} At an ambient temperature of 20°C





^{*2} This value depends on the supplied air pressure as well as the assembling accuracy of the product and wear of the sealing material (O-ring).

^{*3} This applies only when the air tube is connected and the sealing part is not degraded or damaged.

*4 Angle-type connector cables cannot be used.

ONo rubber bellows are attached.



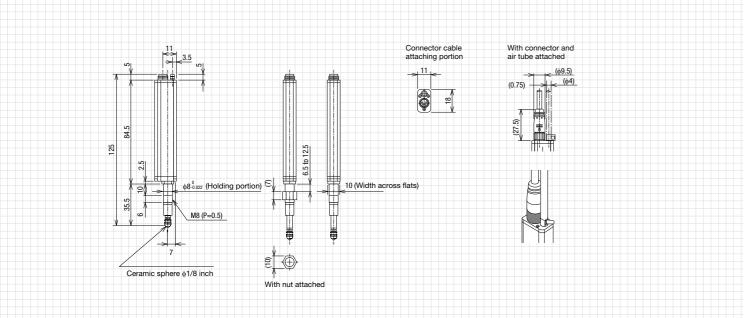






/ SA-S510PD (Pneumatic Drive Specification)

The pneumatic drive structure, which moves the spindle up and down with air, significantly simplifies the system design process while increasing measurement speed.





Model	SA-S110PD	SA-S510PD	
Position detection method	Optical absolute encoder method		
Measurement range	10	mm	
Resolution	0.1 µm	0.5 µm	
Indication accuracy (P-P) *1	1 µm or less	2 µm or less	
Measuring force	*2		
Fluid used	Dry air		
Operating pressure range	0.14 to 0.16 MPa *3		
Air tube specification	Outer diameter: 4 mm / Inner diameter: 2.5 mm		
Withstand pressure	0.2	MPa	
Ingress protection rating *4	Equivalent to IP67		
Weight	Approx. 80 g		
Cable *5	Sold separately as an option		
Measuring probe	Ceramic sphere (diameter: 3.175 mm)		

^{*1} At an ambient temperature of 20°C

^{*5} Angle-type connector cables cannot be used.





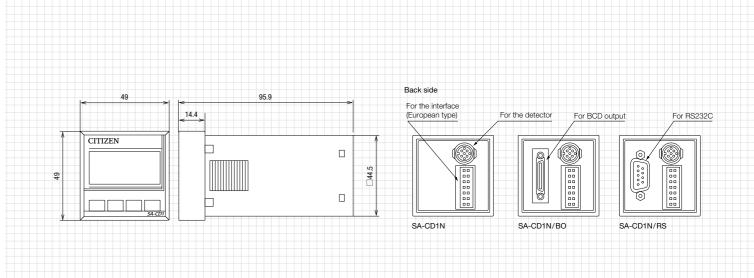
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SA-CD

A one-channel type compact controller. The backlight changes between red and green, making it easy to recognize judgment results.



Мо	odel	SA-CD1N SA-CD1N/BO SA-CD1N/RS		
Display		LCD with green/red backlight that displays polarity, 6-digit value, and mode		1 , 1 ,
Display resol	ution *1	0.	1 μm / 1 μm / 10 μ	ım
Display rang	е	- 99	9.9999 to 99.9999	mm
	I/O	O (-	NG/OK/+NG/E	Error)
Input/ Output	BCD	_	0	_
Output	RS	_	_	0
No. of detec	tor inputs	1 ch		
Data hold me	ethod	Data hold with external signals		
Sorting funct	tion	7-level display (Up to 7 types can be registered.)		
Peak measu	rement	Maximum, minimum, maximum-minimum, maxi- mum-minimum/2		,
Power suppl	y voltage		12-24 V DC (±10%	b)
Consumption	n current	200 mA or less (when the sensor head is connected)		
Accessories		Panel mount frame		
Specialty options			Cable for BCD output	RS232C cable *2
(Sold separa	tely)		SA-CD- B02M	SA-CD- RS2M
AC adapter		AC-001		

^{*1} Depends on the resolution of the sensor head used.
*2 If EXT RS IN (trigger) is not needed, a commercially available interlink cable can be used.



See tolerance judgment results at a glance

Depending on the setting value, the backlight changes to green (OK/pass) or red (NG/fail), making it easy to recognize judgment results even from a distance.





High usability with a 7-level sorting function

Three types of output terminals

In addition to the standard type, the BCD type and RS-232C output model are available. Choose the model that best suits your facilities.







Digital Gauges

SA Series

Controllers

BCD type

RS232C type

^{*2} The measuring force depends on the air pressure used.

Remove the seal cap to use this sensor as a low measurement force type.

^{*3} This value depends on the supplied air pressure as well as the assembling accuracy of the product and wear of the sealing material (O-ring).

^{*4} This applies only when the air tube is connected and the sealing part is not degraded or damaged.

An ultra-compact body equipped with

Supports connection of up to 16 units Up to 15 slave units can be connected to one master unit,

and all the controllers can be centrally controlled. Multi-

point calculation can also be easily performed. In addition, the ultra-compact body has guide tabs for DIN rails, allowing for easy connection with other controllers in lines.

* Up to 14 slave units can be connected when using the

Dual digital display for a wide range of uses

Link-up installation on a DIN rail

Easy-to-read VA high contrast LCD

various functions

communication unit.



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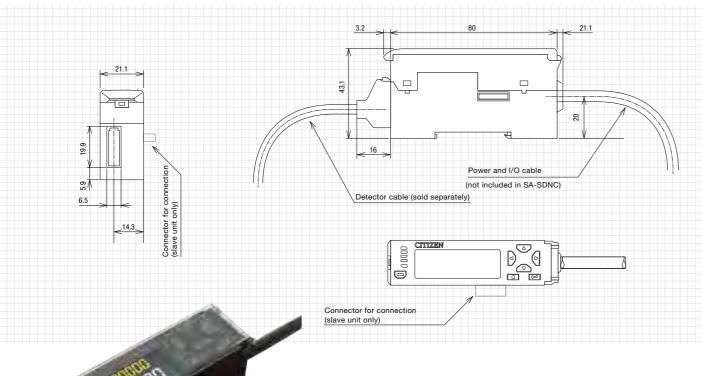
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SA-SD1AP / SD1AC / SD1C

Compact controllers for connecting up to 16 units. Use a DIN rail to connect.



	Type	Master unit		Slave unit	
Model	NPN	SA-SD1AP	SA-SD1AC	SA-SD1C	CA CDNC
	PNP	SA-SD1AP-P	SA-SD1AC-P	SA-SD1C-P	SA-SDNC
D: -			Omnidirection	onal VA LCD	
Display		Polarity, measur	ement value (2-line	e display), and cir	cle meter display
Display resolu	ution *1		0.1 μm / 1 μm /	10 μm / 100 μm	
Display range)		- 199.9999 to	199.9999 mm	
Analog outpu	t	○ (4 to	20 mA)	-	_
Input/output		0 -			_
No. of detect	or inputs	1 ch			
Connection fu	unction	Up to 15 slave units can be connected to one master unit.		master unit.	
Calculation fu	ınction	Maximum value, minimum value, flatness, average value, deviation, distortion, warpage, thickness			
Hold function	1	Sample hold, maximum, minimum, maximum - minimum, maximum - minimum/2, etc.			
Power supply	/ voltage	24 V DC (±10%)			
Consumption	current *2	70 mA or less (when the sensor head is connected)		nnected)	
Cable		2-m composite cable for power supply, analog output, and I/O	2-m composite cable for analog output and I/O	2-m cable for I/O	_

*2 The consumption current does not include analog current output. ♦ When using the communication unit (SA-ERS), up to 14 slave units can be connected.

(€

Self-diagnosis and notification of disconnections & abnormalities

The controller detects when a sensor head failure occurs, or when a cable is not connected or becomes disconnected, and immediately notifies you by displaying an error.





SA-ERS

This communication unit supports MODBUS RS485. It enables speedy data communication.

Model	SA-ERS
Supported controller	SA-SD□
No. of connectable controllers	Up to 15 controllers (1 master unit, 14 slave units) can be connected to a single SA-ERS.
Electrical characteristics	EIA RS-485 compliant
Communication method Two-wire half-duplex communication	
Communication protocol	MODBUS (RTU/ASCII) / MEWTOCOL-COM*1
Power supply voltage *2	24 V DC (±10%)
Consumption current	40 mA or less

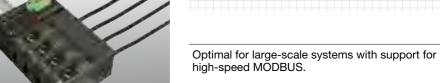
^{*1} MEWTOCOL is a registered trademark of Panasonic Industrial Devices SUNX Co., Ltd.

Specifically for SA-SD controllers to integrate measurement and monitoring systems

SA-ERS can be easily connected to controllers using the integrated communication connector specifically for SA-SD controllers, which can also easily be removed. Up to 15 controllers (1 master unit + 14 slave units) can be connected to a single SA-ERS unit.



Installed on a 35-mm DIN rail



Receives power from the SA-SD controller main unit.

Also, supports MEWTOCOL*communication.

* MEWTOCOL is a registered trademark of Panasonic Industrial Devices SUNX Co., Ltd.

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This communication unit supports CC-Link. It enables high speed communication up to 10 Mbps.

Model	SA-ECL				
Supported controller			SA-SD□		
Number of connectable controllers	Up to 15 c	,	master unit to a single S		,
Power supply voltage *1	24	V DC ±10 %	, including ().5 V ripple (P-P)
Consumption current		3	30 mA or les	S	
Communication method	CC-Link ver. 1.10/ver. 2.00 (switchable) *2				
Remote station classification	Remote device station				
No. of occupied stations	CC-Ling ver. 1.10: 4 stations, ver. 2.00: 2 stations (switchable)				
Station No. setting	1 to 6	64 (0 or 65 a	and above w	ill cause an	error.)
Communication speed	156 Kbps	625 Kbps	2.5 Mbps	5 Mbps	10 Mbps
Max. transmission distance	1,200 m	900 m	400 m	160 m	100 m
Operating ambient temperature	-10 to 45°C (no dew condensation or freezing allowed) In storage: -20 to +60°C				
Operating ambient humidity	35 to 85% RH, in storage: 35 to 85% RH				
Material	Main body case: PC				
Weight			Approx. 80	g	

^{*1} Power is supplied from the connected controller master unit.



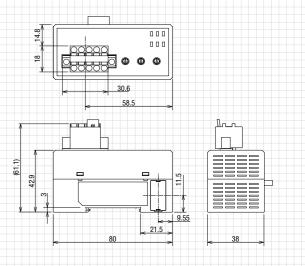
9.55

Digital Gauges

LAURS CITIZEN

SA Series

Controllers



21

^{*2} Power is supplied from the connected controller master unit.

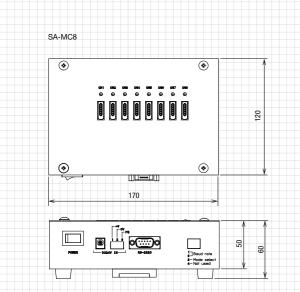
^{*2} CC-Link is a registered trademark of Mitsubishi Electric Corporation that is managed by the CC-Link Partner Association (CLPA).

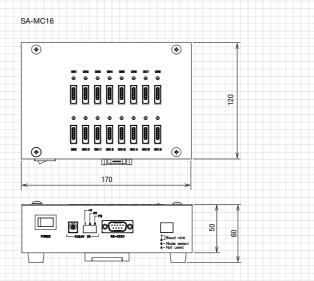
Digital Gauges SA Series Controllers



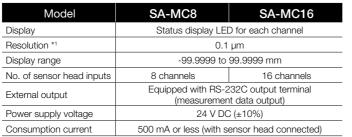
SA-MC8 / SA-MC16

These multi-channel type controllers are specifically for RS-232C data output. 8-channel and 16-channel types are available.















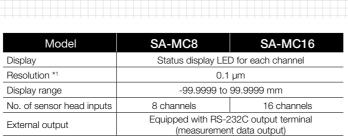
Supports the SA series. Enables easy, convenient multi-point measurement.

handled and enable you to build a



Easy-to-see status LED lamp with a simple display

8-channel and 16-channel types available







These controllers are sized to be easily

safe, reliable multi-point measurement system. They can easily realize a multi-channel system while meeting the constraints for general-purpose communication via RS-232C. Measurement data can be output from up to 16 channels.



DIN rail guide

Both SA-MC8 and SA-MC16 can be installed on DIN rails.



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ELEMETRON

Plunger

Plunger type

This is the standard sensor head.

A contact point is attached to the tip of the plunger held

by the ball retainer and spring.

Thanks to its durable body, this type can accurately measure various targets even in environments with extreme temperature fluctuations.

Detectors

Electric Micrometers ELEMETRON

DTH-P DTH-P□S DTH-P-SH DTH-L DTH-L□U



Universal

Universal type (lever type)

The strong lever bearing mechanism is resistant to breakage caused by large loads or fluctuations. In addition, since the measuring direction can be changed freely, this type can be used in any location, freeing you of concern about damaging or deforming measurement targets.

This type is suitable for measuring bearing runout, etc.



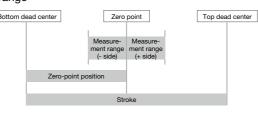
Amplifiers

Electric Micrometers ELEMETRON

EM-SA1R DTM-FAB DTM-EA DTA-EA / H DTM-ED



Measurement range



Accessories
Electric Micrometers
ELEMETRON

Contact point F-001, 101, 201, 301 F-002 F-171 F-105 F-106 F-501 Rubber bellows M-131 Finger lever

M-150 Lug holder SMA-0417

Indicator bush

Conversion cable 3SEA-2834

Output cable

EM-SA1-IF2

EM-SA1-IO2

EM-SA1-RS2

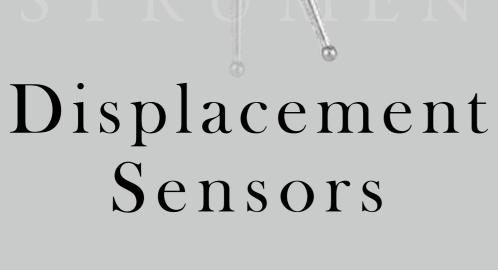
F-502 F-503 F-504 F-505 F-507 F-508

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Electric

Micrometer

The ELEMETRON electric micrometers are long-selling products that employ differential transformers to accommodate any measuring conditions with a variety of specifications. These products are optimal for high-precision measurement that requires readings in 0.1-µm units or measurement that requires low measuring force (0.1 g). Besides the standard plunger type, we offer a universal type (lever type) that can freely change the measurement direction and is suitable for measuring objects susceptible to damage or deformation as well as a small-size type that is useful for making measurements

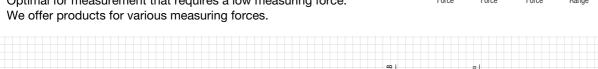
in small spaces.

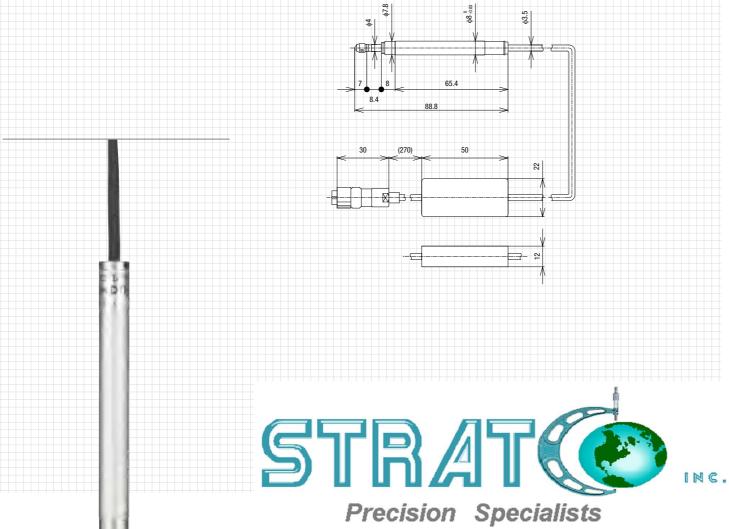
ELEMETRON

Detectors

Electric Micrometers ELEMETRON Detectors

Optimal for measurement that requires a low measuring force.





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Model		DTH-P20	DTH-P40	DTH-P70	DTH-P16AL	
Measuring force		0.196N	0.392N	0.686N	0.157N	
Measurement ra	inge	±1 mm (-0.4 to +1 mm for type A)				
Stroke			4 mm (3.5 mm for type A)			
Zero-point positi	ion	Approx. 2 mm (0.5 mm for type A)				
Repeatability		0.3 µm				
Accuracy guarar range	nteed temperature	24°C±5°C				
Operating temper	erature range	0 to 50°C				
Weight (main bo	dy only)	Approx. 25 g				
Standard speci-	Cable length	3 m				
fications	Contact point	F-001				
lications	Rubber bellows		M-	131		

♦ All measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

Small in size and optimal for installation in a machine

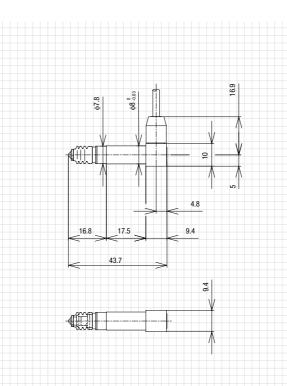


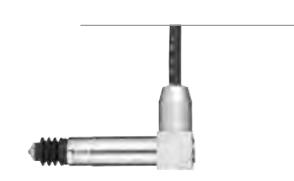
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16.8	34.9 >	

Model		DTH-P20S	DTH-P40S	DTH-P70S		
Measuring force		0.196N	0.392N	0.686N		
Measurement rai	nge		±0.7 mm			
Stroke			2 mm			
Zero-point position	on	Approx. 1 mm				
Repeatability		0.3 µm				
Accuracy guaranteed tempera- ture range		24°C±5°C				
Operating tempe	rature range	0 to 50°C				
Weight (main body only)		Approx. 20 g				
Cable length		3 m				
Standard speci-	Contact point	F-171				
fications	Rubber bellows		M-131			

[♦] All measuring force are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

Small in size with a laterally connected cord



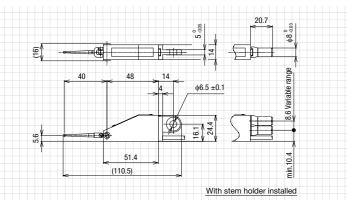


Model		DTH-P20SH	DTH-P40SH	DTH-P70SH		
Measuring force	•	0.196N	0.392N	0.686N		
Measurement ra	ange		±0.7mm			
Stroke			2 mm			
Zero-point position		Approx. 1 mm				
Repeatability		0.3 μm				
Accuracy guaranteed tempera-		24°C±5°C				
Operating temp	erature range	0 to 50°C				
Weight (main body only)		Approx. 20 g				
Standard	Cable length	3 m				
	Contact point	F-171				
specifications	Rubber bellows		M-131			

[♦] All measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

Measuring Force

The lever-type sensor is optimal for measuring flatness and roundness.





Model		DTH-L02	DTH-L08	DTH-L15		
Measuring force		0.0196N	0.0785N	0.147N		
Measurement ran	nge		±0.5 mm			
Stroke			1.5 mm			
Zero-point position		Approx. 0.5 mm				
Repeatability		0.3 μm				
Accuracy guaran range	teed temperature	24°C±5°C				
Operating temperature range		0 to 50°C				
Weight (main boo	dy only)	Approx. 115 g		Approx. 115 g		
Standard	Cable length	3 m				
specifications	Contact point		F-138			



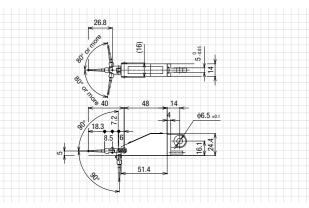








The universal lever-type sensor enables the measurement direction to be changed up to 80° to the right and to the left.





Model		DTH-L02U	DTH-L08U	DTH-L15U
Measuring force	Э	0.0196N	0.0785N	0.147N
Measurement r	ange		±0.5 mm	
Stroke		1.5 mm		
Zero-point position		Approx. 0.5 mm		
Repeatability		0.3 µm		
Accuracy guara range	inteed temperature	24°C±5°C		
Operating temperature range		0 to 50°C		
Weight (main body only)		Approx. 115 g		
Standard	Cable length		3 m	<u> </u>
specifications	Contact point		F-118	

Precision Specialists

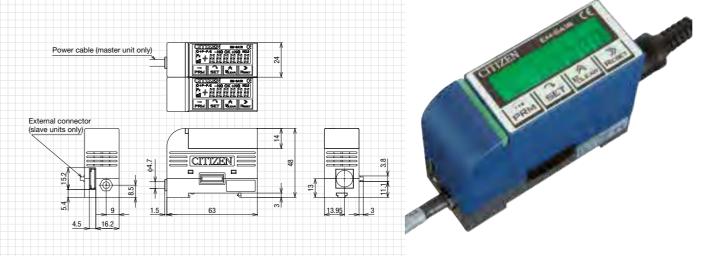
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EM-SA1R



Output Output

This small-size amplifier enables up to eight units to be linked.



Model	FM-SA1RP/RS (Master unit)	EM-SA1RP/AN (Master unit)	FM-SA1RC (Slave unit)	
		6 digits/polarity, mode of		
Display	2-color backlight (red/green)			
Display resolution	0.1 / 1	/ 10 µm (selectable by	setting)	
Display range	-9	99.9999 to +99.9999 m	m	
Indication error		±1% ±1 digit		
	Reset /	Peak clear / Hold: Max	c 20 ms	
Response speed	RS-232C comr	munication: Approx. 2 >	n units + 3 ms	
Fault detection	-NG /	OK / +NG / 6-rank judg	gement	
RS-232C *1	Available	None	None	
Analog output *1	None	Available	Available	
No. of detector inputs		1 ch		
Zero set function	Can be reset by the switch on the front face or at any position by an external signal or the RS command.			
Data hold method	Hold of the display and data by an external signal			
Measuring direction	+/- (Can be switched by a setting)			
Preset function	6 digits & polarity			
Peak measurement	+P, -P, P-P, (P-P)/2 (+P: Maximum, -P: Minimum)			
Error functionality		Available		
Measurement condition registration	Seven items (key, RS command)			
Accuracy guaran- teed temperature range	24°C ±5°C			
Operating ambient temperature	0 to +40°C (no dew condensation or freezing allowed), in storage: -10 to +60°C			
Power supply	12 V DC ± 10% or 24 V DC ± 10%			
Consumption current		100 mA or less		
Weight	Approx	c. 110 g	Approx. 60 g	
Dimensions	63	3 (W) × 24 (H) × 48 (D) n	nm	
	EMC Directive (EN61326-1:2006)			

^{*1} An optional dedicated cable is required. Note that analog output supports absolute value display.

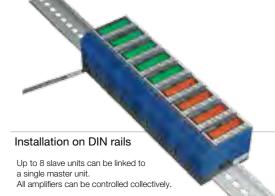


Register up to 7 types of measuring conditions

Using the switches on the front face or by input via the interface, you can easily register up to seven output judgment values for measuring conditions in order to categorize and sort. For example, this allows you to broaden the range of control for the peak measurement function.

Supports RS-232C and analog output

Using an optional cable with each dedicated amplifier makes it simple to introduce the product in your current environment. This is also ideal for delicate lines that require visibility.



Confirm Pass or Fail at a glance with the 2-color (red/green) display



The backlight switches between green (Pass) and red (Fail) in accordance with the set value. This makes it easy to confirm judgment results even from a distance. You are also notified immediately if an error occurs by a red backlight and error

Innovative, compact form enables various kinds of link-up installations

Because the display unit is detachable, it can be removed from the amplifier's body and mounted on a panel. Arranging the elements close together helps save space in the system.

* For panel mounting, the optional display mounting unit (EM-SA1-DPM)

While maintaining high sensitivity and high accuracy with a resolution of 0.1 $\mu m,$ the Elemetron EM-SA1R has an ultra-compact form with a volume just one-fiftieth that of previous models. Additionally, new functions that enable multiple point measurement have been added (such as link-up installation and batch control by combining base and client devices). Thus, space savings are achieved while expanding upon the range of functions offered previously.

OTTVCTSIOTT CUDIC		
Model	Dimensions	Product No.
	15 cm	3SEA-2834

♦ The conversion cable (3SEA-2834) is required to connect to conventional detectors.

Amplifiers

Amplifiers

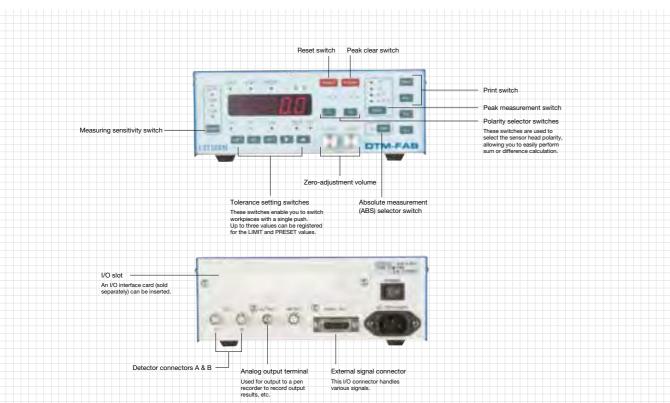
ELEMETRON

Electric Micrometers

Output

Output

These flexible amplifiers can be used in a wide range of applications. All the modes are arranged on the front panel, enabling easy operation.





30

Model		DTM-FAB	
	HIGH	±999.9 μm, resolution: 0.1 μm	
Sensitivity selection	LOW	±1999 μm, resolution: 1 μm *1	
SCICCION	AUTO	Automatic selection of HIGH or LOW	
Indication e	error	±1% rdg ±1 digit	
Zero-point range	adjustment	±20 μm or more	
Display		4-digit LED display & polarity (-)	
	I/O connector	○ (-NG/OK/+NG, error) *2	
Input/	RS-232C	DTM-FAB-RS (optional interface card) *3	
Output	BCD	DTM-FAB-BCD (optional interface card) *3	
	Analog output	○ (DC±1 V/full scale) *4	
No. of sens	or head inputs	2 channels	
I/O slot		One I/O interface card can be inserted.	
Simple mea	asurement	+A, -A, +B, -B	
Sum or difference		+A+B, +A-B, -A+B, -A-B	
Reset meth	nod	Can be reset by the front switch or at any point by an external signal.	
Data hold r	nethod	Hold of the display and data by an external signal	
Preset fund	ction	4 digits & polarity	
Measureme registration	ent condition	3 types	
Peak meas	urement	+P, -P, P-P, (P-P)/2 (+P: Maximum, -P: Minimum)	
Accuracy guaranteed temperature range		24°C±5°C	
Operating temperature range		0°C to 40°C	
Power sup	supply 100 V to 240 V AC ±10% 50/60 Hz 10 VA *5		
Dimensions	3	204 (W) × 240 (D) × 82 (H) mm	
Weight		Approx. 2.2 kg	

^{*1} The performance assurance range is ±999 µm when LOW is selected.
*2 Applicable connector: RDAD-15SE1/M2.6 (55) (Hirose) or equivalent
*3 An optional I/O interface card is required. (See p. 00.)

DTM-EA DTM-EA / H

Output

This analog indication type is equipped with a sensitivity selection function (three ranks).

Model		DTM-EA	DTM-EA/H		
	HIGH	±5 µm (Graduation: 0.2 µm)	±2.5 μm (Graduation: 0.1 μm)		
Sensitivity selection	LOW	±25 μm (Graduation: 1 μm)	±25 μm (Graduation: 1 μm)		
	AUTO	±125 μm (Graduation: 5 μm)	±125 μm (Graduation: 5 μm)		
Indication error			HIGH: Within ±1 graduation MED/LOW: Within ±1/2 graduation		
Zero-point adjustment range		±50 µm or more			
Display		_			
Response speed		(Pointer) Approx. 0.5 sec/full scale			
Analog output	t	DC±1 V/full scale*			
Accuracy guaranteed temperature range		24°C ±5°C			
Operating temperature range		0°C to 50°C			
Power supply		100 to 240 V AC ± 10% 50/60 Hz Approx. 4 VA *1			
Dimensions		110 (W) × 175 (D) × 185 (H) mm			
Weight		Approx. 1.1 kg			

^{*} The power cable attached to the unit has a rating of 125 V/10 A. If using the unit with a higher voltage, procure and use a high-voltage cable with a suitable rating.



DTM-ED

This digital indication type is equipped with a sensitivity selection function (two ranks).

Model		DTM-ED	
	HIGH	±199.9 μm, resolution: 0.1 μm	
Sensitivity selection	LOW	_	
Selection	AUTO	±1999 μm, resolution: 1 μm	
Indication error		±1% rdg ±1 digit *1	
Zero-point adjustment range		±50 μm or more	
Display		3-digit LED display & polarity (-)	
Response speed		Approx. 400 ms (max)	
Analog output		DC±1 V/full scale *2	
Accuracy guaranteed tempera- ture range		24°C ±5°C	
Operating temp	erature range	0°C to 50°C	
Power supply		100 to 240 V AC ± 10% 50/60 Hz Approx. 5 VA *3	
Dimensions		110 (W) × 175 (D) × 185 (H) mm	
Weight		Approx. 1.0 kg	

^{*1} Performance assurance range: ±99.9 µm when HIGH is selected and ±999 µm when LOW is selected. Note that the assurance differs depending on the display range and indication error. *2 DC±1 V is the output at ±100.0 µm when HIGH is selected and ±1000 µm when LOW is selected.

^{*3} The power cable attached to the unit has a rating of 125 V/10 A. If using the unit with a higher voltage, procure and use a high-voltage cable with a suitable rating.



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^{*4} DC±1 V is the output at ±100.0 µm when HIGH is selected and ±100 µm when LOW is selected.
*5 The power cable attached to the unit has a rating of 125 V/10 A. If using the unit with a higher voltage, procure and

use a high-voltage cable with a suitable rating.

CITIZEN (-) limit setting knob Set the limit freely and easily just he mechanism has strong esistance against dust and drips

Signal Indicators TRI-METRON

Micro Indicators Mu-METRON

Signal Indicators Micro Indicators

These analog models of signal indicators and micro indicators have simple structures that do not require amplifiers. They are the most cost-efficient options for simple pass/fail measurement. We offer Mu-METRON high-precision mechanical micro indicators, and TRI-METRON with electrical contacts incorporated into Mu-METRON. The LP type enables you to confirm pass or fail judgment results even from a distance via lamp lighting.

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Signal Indicators & Micro Indicators

TRI-METRON Mu-METRON

How to use TRI-METRON



1 Checking

Move the spindle up and down to confirm that the indicator moves over the entire scale range.



4 Minus tolerance

gauge. Turn the left limit setting dial to the right until the



5 Plus tolerance

Press the spindle fully and turn the right limit setting dial to the right until the needle points to the plus tolerance for

Signal Indicators TRI-METRON

1S series 1S-□□□LP 1S-

2S series 2S-



Micro Indicators Mu-METRON 2M-100

3M-100 4M-100P



If the needle does not the detector up and down, turn the scale plate to adjust it to zero. Once the zero-point po-



sition has been adjusted, move the spindle up and down two or three times Ensure that the needle



6 Tolerance check

After setting the minus and plus tolerances, move the spindle up and down two or three times. Ensure that the needle can move between the minus limit and the plus limit (within the product's tolerance

Accessories Signal Indicators/Micro Indicators TRI-METRON Mu-METRON

Indicator bush

Precision Specialists

262 Woolbright Circle

F-002 F-171 F-105 F-106 F-501 F-502 F-503 F-504 F-505 F-507 F-508

Rubber bellows

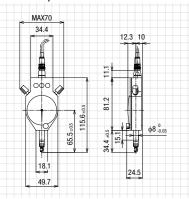
Contact points

F-001, 101, 201, 301 F-M100 M-150 F-M101 F-M103-1 Lua holder C-M100 SMA-0417 C-M101 C-M103-1 Release M-140 Finger lever

Back mounts

Signal Indicator & Micro Indicator

These signal indicators can be directly connected to a controller, such as a sequencer. The green and red judgment indication lamps enable you to visually confirm pass/fail results.









		1S-100	0LP	18	-010LP	
iring ce	Measuring Force	Measurement M Range	Measurement Range	Output	Cable Length	

Model		1S-100LP	1S-010LP	
Graduation		1 µm	10 µm	
Range		±0.05 mm	±0.5 mm	
Precision		±1 µm	±5 μm	
Measuring for	ce	0.98 N		
Spindle stroke		2.5 mm		
Contact rating	J	24 V DC 4 mA (resistance load)		
	Contact point	F-001		
Standard	Back	Flat back (F-M103-1)		
attachments	Cable	1 m		
	Rubber bellows	M-131		
Option	Release	-		

[♦] In the 1S series, the contacts are insulated from the body.







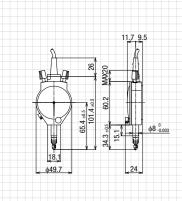




Measuring Measurement Measurement Output Force Range Range

Cable Length

These are small-size signal indicators.





Model		1S-100	1S-100 1S-010			
Graduation		1 µm	10 µm	20 μm		
Range		±0.05 mm	±0.5 mm	±0.5 mm		
Precision		±1 μm	±5 μm	±15 μm		
Measuring force		0.98 N 0.78 N				
Spindle stroke		2.5 mm				
Contact rating	ı	24 V DC 4 mA (resistance load)				
	Contact point	F-001				
Standard	Back	Flat back (F-M103-1)				
attachments	Cable	3SMA-0061-1.5 (1.5 m)				
	Rubber bellows	M-131				
Option Release		M-140				
♦ In the 2S series th	e contacts are connecte	ed to the body				













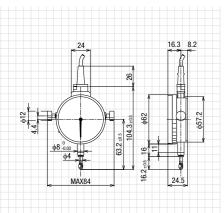
Measurement Measurement Measurement Force Range Range Range





Cable Length

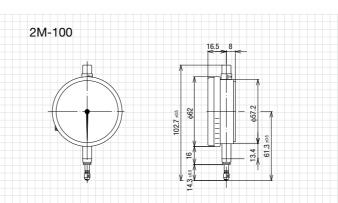
This low-priced version features a large display.

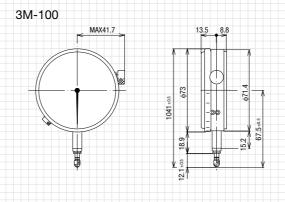


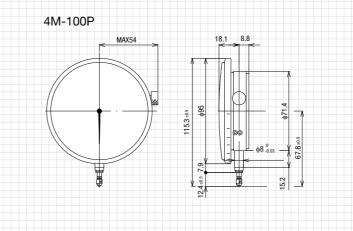


Model		2S-100	2S-200	2S-010	2S-010FIIS		
Graduation		1 µm	2 µm	10 µm	20 µm		
Range		±0.05 mm	±0.1 mm	±0.6 mm	±0.5 mm		
Precision		±1 μm	±1.5 µm	±5 μm	±15 µm		
Measuring force		1.18 N 0.78 N					
Spindle stroke		2.8 mm					
Contact rating	9	24 V DC 4 mA (resistance load)					
	Contact point*1	F-001					
Standard	Back	Flat back (F-M101)					
attachments	Cable	3SMA-0061-1.5 (1.5 m)					
	Rubber bellows	*2					
Option Release		M-140					
on the 2S series the contacts are connected to the hody							

•		
Ontional cable	Model	3SMA-0061-3
Optional cable	Length	3 m







Madal		ON 100	204 100	484 400		
Model		2M-100	3M-100	4M-100		
Graduation		1 µm	1 µm	0.5 µm		
Range		±0.05 mm	±0.05 mm	±0.05 mm		
Precision	Precision		±1 µm	±0.5 µm		
Measuring for	ce	0.784 N 0.588 N				
Spindle stroke	Э	2.8 mm				
	Contact point *1	F-001				
Standard attachments	Back	F-M101 F-M100				
allacriments	Release	M-140				
Option Rubber bellows		M-131				

^{*1} Various other contact points are available.

2M-100 • 3M-100 • 4M-100











The low-priced version has a graduation of 1 μm .



The standard type has a graduation of 1 µm.



The high-precision type has a graduation of 0.5 µm.





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[♦] All measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

[♦] All measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g

[♦] All measuring forces are for the state in which no rubber bellows is attached. (The measuring force is about 5 to 15 g higher if a rubber bellows is attached.)

^{*1} Various other contact points are available.

Horizontal Stands

Measuring Stands

Our lineup of horizontal stands can be used to measure inner and outer diameters. By attaching SA series displacement sensors or Mu-METRON to these stands, you can obtain measurement values with minimal measurement error. In addition, you can measure abnormally shaped workpieces or grooves by using special contact points. Use the H-2 series to measure outer diameters and the BST series to measure inner diameters.

Horizontal Stands

Internal gear spline measurement BST-2B, BST-1B (3LB)

You can measure the over-pin diameter, large diameter, and small diameter using the BST-2B or BST-1B (3LB) inner diameter measuring instruments and a special-order contact point. Although different measurement methods are used for odd and even numbers of teeth, the following gives some measurement examples.

* Since these measurements are comparative measurements against a master (reference work), a master workpiece is

requirea.		
Even No. of teeth	Odd No. of teeth	Contact point selection condition
Over-pin diameter	Over-pin diameter	For both even and odd numbers of teeth, measurement can be performed using a two-point-type ball contact point. However, to ensure that the contact point does not touch the large diameter surface, you must consider the ball diameter at the tip or whether the ball has been cut into a D-shape.
Large diameter	Large diameter	To enable the contact point to come into contact with the large diameter surface, it is necessary to select the ball diameter so that it does not interfere with the gear surface. Our standard contact point has a diameter of 1 mm.
Small diameter	Small diameter	For an even number of teeth, two R-shaped contact points are used. For an odd number of teeth, two ball contact points and an R-shaped contact point are used.

Horizontal Stands

Outer diameter measurement H-2LB

Inner diameter measurement BST-1B BST-2B BST-3LB





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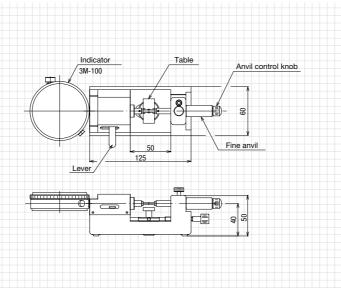
Horizontal Stands Outer Diam. Meas./Inner Diam. Meas.

H-2B • H-2LB



These stands support measurement of outer diameters within the range of 0 to 25 mm.

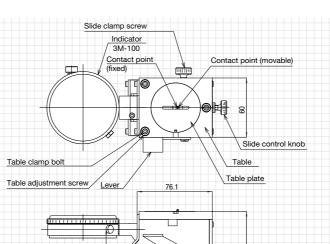




Model	H-2B		H-2LB		
Model	Without indicator	With indicator 3M-100	Without indicator	With indicator 3M-100	
Measurement range	0 to 25 mm		18 to 45 mm		
Precision	_		_		
Measuring force	As per the indicator's measuring force		As per the indicator's measuring force		
Standard contact point *1	F-150		F-150		

^{*1} Various other contact points are available.

BST-2B



This stand supports measurement of inner diameters within the range of 2 to 23 mm.



Madal	BST	Г-2В	
Model	Without indicator	With indicator 3M-100	
Measurement range	φ2~23 mm		
Measurement depth adjustment	3 mm		
Measuring force	1.47N		
Contact point stroke 1 mm		nm	
Standard contact point	F-060		

[♦]Because this inner diameter measuring instrument is a comparative measuring instrument, a reference gauge is $required. \ Error \ will \ result \ if \ the \ dimensional \ difference \ between \ this \ gauge \ and \ the \ target \ workpiece \ is \ large.$

BST-1B



BST-3LB

Lift clamp screw

303 Fixed contact point Table Fixed contact point

point clamp screw

This stand supports measurement of inner diameters within the range of 10 to 260 mm.



Madal	BST-3LB			
Model	Without indicator	With indicator 3M-100		
Measurement range	φ10 to 260 mm			
Measurement depth adjustment	nt 15 mm			
Measuring force	0.98 to	4.90 N		
Contact point stroke	5 1	mm		
Standard contact point	F-070, F-071	. F-072, F-073		

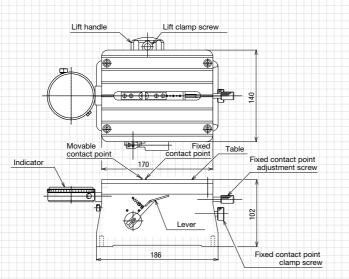
 $[\]diamondsuit \\ \text{Because this inner diameter measuring instrument is a comparative measuring instrument, a reference gauge is}$ required. Error will result if the dimensional difference between this gauge and the target workpiece is large.

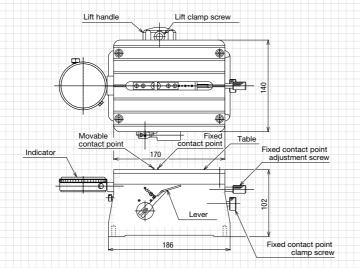
This stand supports measurement of inner diameters within the range of 4 to 67 mm.



	BST	Г-1В	
Model	Without indicator	With indicator 3M-100	
Measurement range	φ4 to 67 mm		
Measurement depth adjustment	ment 15 mm		
Measuring force	0.98 to 2.94 N		
Contact point stroke	3 mm		
Standard contact point	F-050		

required. Error will result if the dimensional difference between this gauge and the target workpiece is large.







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SA Series

Connector Cables / Output Cables / AC Adapters

ELEMETRON
Output Cables / Conversion Cables

Connector Cables						
	S	A-CD-SH□	lM	S	A-SD-SH□	lM
Product No.	2M	5M	10M	2M	5M	10M
	2 m	5 m	10 m	2 m	5 m	10 m
Shape (Straight)		.8 (sheath outer	diameter)	(27.3)	8 (sheath outer	diameter <u>)</u>

	SA-CD-SHL□M		SA	A-SD-SHL□	□M	
Product No.	2M	5M	10M	2M	5M	10M
	2 m	5 m	10 m	2 m	5 m	10 m
Shape (L-shaped)	(42)	ф3.8 (sheath ou	uter diameter)			uter diameterj

Output Cables			
Shape	Straight	Output	Product No.
Counter side D-sub 9-pin female D-sub 9-pin female D-sub 9-pin female D-sub 9-pin female 1 If you do not need "EXT RS IN" (trigger input), you can use a commercially available interlink cable.	2 m	RS-232C	SA-CD-RS2
Counter side 2000 '2000 50 50	2 m	BCD	SA-CD-BCD2

SA-CD1N (RS, BO) Adapter			
Shape	Output	Product No.	
	100 V	AC-001	

EM-SA1R Output Cables				
Shape	Straight	Output	Product No.	
2000 1400 18	2 m	Analog +IO	EM-SA1-IA2	
2000 1400	2 m	RS232C+ IO	EM-SA1-IF2	
2000	2 m	10	EM-SA1-I02	
2000	2 m	RS232C	EM-SA1-RS2	

EM-SA1R Conversion Cable			
Shape	Dimensions	Product No.	
The state of the s	15 cm	3SEA-2834	

^{*} Required when connecting a detector to EM-SA1R.

TRI-METRON
Optional cable

Optional Cable		
Shape	Straight	Product No.
	3 m	3SMA-0061-3

ontact Points					
Shape	Dimensions	Steel	Produ Carbide	ct No.	Nylon
N.S.	L=7	F-001	F-101	F-201	F-301
∠ ^L >	L=9	F-002			
5.6	L=5.6		F-171		
	R=0.4		F-105		
9 > 4.5	R=0.6		F-106		
M2.5×P0.45 S S S S S S S S S	L1=5 L2=12.3 φD=5	F-501			
M2.5×P0.45 Diamond knurling 2.8 14.5 17.3 22.3	L1=2.8 L2=14.5 φD=φ1.0	F-502			
M2.5×P0.45 Diamond knurling (*2) (*2) (*3) (*4) (*4) (*4) (*4) (*4) (*4) (*4) (*4	L1=2.8 L2=14.5 φD=φ1.5	F-503			
M2.5×P0.45 Diamond knurling S 2.8 14.5 17.3 22.3	L1=2.8 L2=14.5 φD=φ2	F-504			
23.3 5 18.3 12.3 Ş	L1=6 L2=12.3 φD=φ0.5		F-505		
Diamond knurling Carbide	L1=6 L2=12.3 φD=φ1.0		F-507		
23.3 18.3 12.3 Diamond knurling Carbide	L1=6 L2=12.3 φD=φ2.0		F-508		

^{*} The fixing screw is M2.5P0.45. It can be used commonly for the SA series, ELEMETRON, TRI-METRON, Mu-METRON, etc.

For ELEMETRON

Lever Type

Options & Accessories SA Series / TRI-METRON / Mu-METRON

Indicator Bush / Lug Holder / Rubber Bellows

For ELEMETRON Lever Type Product No. Shape Dimensions Applicable model Carbide L =28 DTH-L F-138 $\phi D = \phi 2$ DTH-L F-139 L =28 $\phi D = \phi 1$ $DTH-L\square\square U$ $\phi D = \phi 2$ L = 18.3F-118 (Universal type)

TRI-METRON / Mu-METRON

Backs

Backs	
Shape Flat back F	Shape Center back C







Model	Dimensions (mm)	No. of holes	Product No.
3M-□□□ 4M-100P	фD=ф68	4	F-M100
2S-□□□ 2M-100	φD=φ53.2	4	F-M101
1S-□□□ 1S-100LP 1S-010LP	φD=φ47.1	3	F-M103-1

Model	Dimensions (mm)	No. of holes	Product No.
3M-□□□ 4M-100P	фD=ф68	4	C-M100
2S-□□□ 2M-100	φD=φ53.2	4	C-M101
1S-□□□	φD=φ47.1	3	C-M103-1

TRI-METRON / Mu-METRON

Release / Finger Lever

Release		
Shape	Applicable models	Product No.
	1S, 2S, 2M, 3M, 4M	M-140

Finger lever		
Shape	Applicable models	Product No.
	Can be installed in any model with M2.5 contact points.	M-129

Indicator bush			
Shape	Applicable models	Product No.	
01 15 15,5	All models with an 8-mm diameter stem can be fixed with this indicator bush.	M-150	

Lug holder		
Shape	Product No.	
\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SMA-0417	

Rubber bellows			
Shape	Applicable models	Product No.	
8.8 %	1S	M-131	
19.8	SA - S110, SA - S110 / 03N SA - S510, SA - S510 / 03N	M-137	
56 97 01	SA - S532	M-142	
84.7	SA - S550	M-143	

Horizontal stands

Table plates (hardened lap)

Table plates (hardened lap)				
Shape	Applicable stand	Dimensions (mm)	Product No. Hardened lap	
20 27 3.5	BST-1B (Auxiliary table)	()	TP-106*1	
21 21 2		A=3	TP-107	
	BST-2B	A=5.6	TP-108	

^{*1} Make-to-order manufacturing



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List of Discontinued Products

Horizontal Stands

Contact Points (Contact points come in sets of two: one for the movable side and the other for the fixed side.)

Contact points (BST-1B)				
Product No.	F-050	F-051	F-052	F-053
Shape	63.8	912 912 910 910	\$1.4 \$1.4 \$1.5 \$1.0 \$1.0	1
Measurement range (mm)	φ4 to 59	φ12 to 67	φ1.5 to 56	φ87 to 126
Measurement depth (mm)	0 to 7	0 to 12	0 to 2.5	0 to 12

♦ Made of SK carbon hardened steel. ♦ F-050 is provided as standard.

Contact point (BST-2B)				
Product No.	F-060	F-061	F-062	
Shape	\$2 \$3 \$4 \$4 \$5 \$6 \$5 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6	\$5 \\ \frac{60}{33} \\	\$5	
Measurement range (mm)	φ2 to 20	φ5 to 23	φ5 to 23	
Measurement depth (mm)	0 to 2	2 to 5	2 to 5	

♦ Made of SK carbon hardened steel. ♦ F-060 is provided as standard. Note that a table plate (TP-108) is required when using F-061 or F-062.

Contact point (BST-3LB)				
Product No.	F-070*	F-071*	F-072*	F-073*
Shape	13 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		23 99 010	L3 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
Dimensions (mm)	L =43.5 L1=30.5 L2=42	L=30.5 L1=17.5 L2=29	L =44.5 L1=10 L2=42 L3=34.5	L =31.5 L1=10 L2=29 L3=21.5
Measurement range (mm)	φ10 to 180	φ10 to 180	φ25 to 203 (φ105 to 260)	φ25 to 203 (φ105 to 260)
Measurement depth (mm)	13 to 28	0 to 15	13 to 28	0 to 15

♦ Made of SK carbon hardened steel. ♦ Can be used with BST-1B. * Make-to-order manufacturing

Contact point (H-2B, H-2LB)		
Product No.	F-150	F-152
Shape	9	\$\epsilon \chi \chi \chi \chi \chi \chi \chi \chi
Measurement range (mm)	φ4 to 59	φ12 to 67
Measurement depth (mm)	0 to 7	0 to 12

♦ Made of carbide.



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Product	Model
[Amplifier] ELEMETRON	DTM-FA
	RK-R
	RK-P
	RK-O
	BCD-T
I/O interface card (For DTM-FA, DGM-FC)	BCD-0
(1 of briving, baiving)	RS232C
	RS232C-9F
	CN-N
	CN-C
	DTM-CD
	DTM-CA
	DTM-CA/H
[Amplifiers] ELEMETRON	DTM-CB/1V
	DTM-CB/5V
	DTM-CB/10V
	DTM-MD4
Light boxes for signal indicators	TLB-1 TLB-7 TLB-3L TLB-3B TLB-5I
g.n. boxee for eignal indicatore	DGM-0501B
	DGM-0505B
	DGM-1001B
	DGM-1005B
[Detectors] DIGIMETRON DGM series	DGM-2501B
	DGM-2505B
	DGM-0201BT
	DGM-0205BT
Markinia a count level data store	GPH-2N
Machining sound level detectors	
TRI-METRON	1S-010BF
[Counter] DIGIMETRON	DGM-FC
	C-105E
	C105EP
	C-105B
All dial gauge models (including the lever type)	C-106N
	C-107N
	C-107S
	C-107B
	C-108
	2A-104
	2A-104R

2A-254

Product	Model
	2A-254R
	2B-104
	2B-104P
	2B-254
	0B-054
	OB-054P
All dial gauge models (including the lever type)	T-201
lever type)	T-202
	T-203
	TC-100
	TC-101
	TC-102
	TC-103
[Checker] TRI-METRON	CHK-001
	2BF-3
Signal limit	CLS-1L
	4B-5
[Amplifier] ELEMETRON	DTM-AM
	DTH-P50L
[Detectors] ELEMETRON	DTH-P70W
Paper thickness measuring instrument	MEI-10B
Cable for sequencers	TRC-200
	1S-010BT
TRI-METRON	1S-100BT
	1T-100
Mini-METRON	1T-100D
	1T-200D
	MEI-6D
Small bore measuring instruments	MEI-6E
(Bore Check)	MEI-6F
	2M-250S
[Detector] DIGIMETRON	IPD-C1003
	DGB-FCB1
[Counter] DIGIMETRON	DGB-FCB1/BO
	DGB-FCB1/RS
	IPD-FCC1
	IPD-FCC1/RS
	IPD-FCC1/BO
Rubber hardness tester / soft	CH-R01/V
material hardness tester	CH-R01/IRHD
	1