

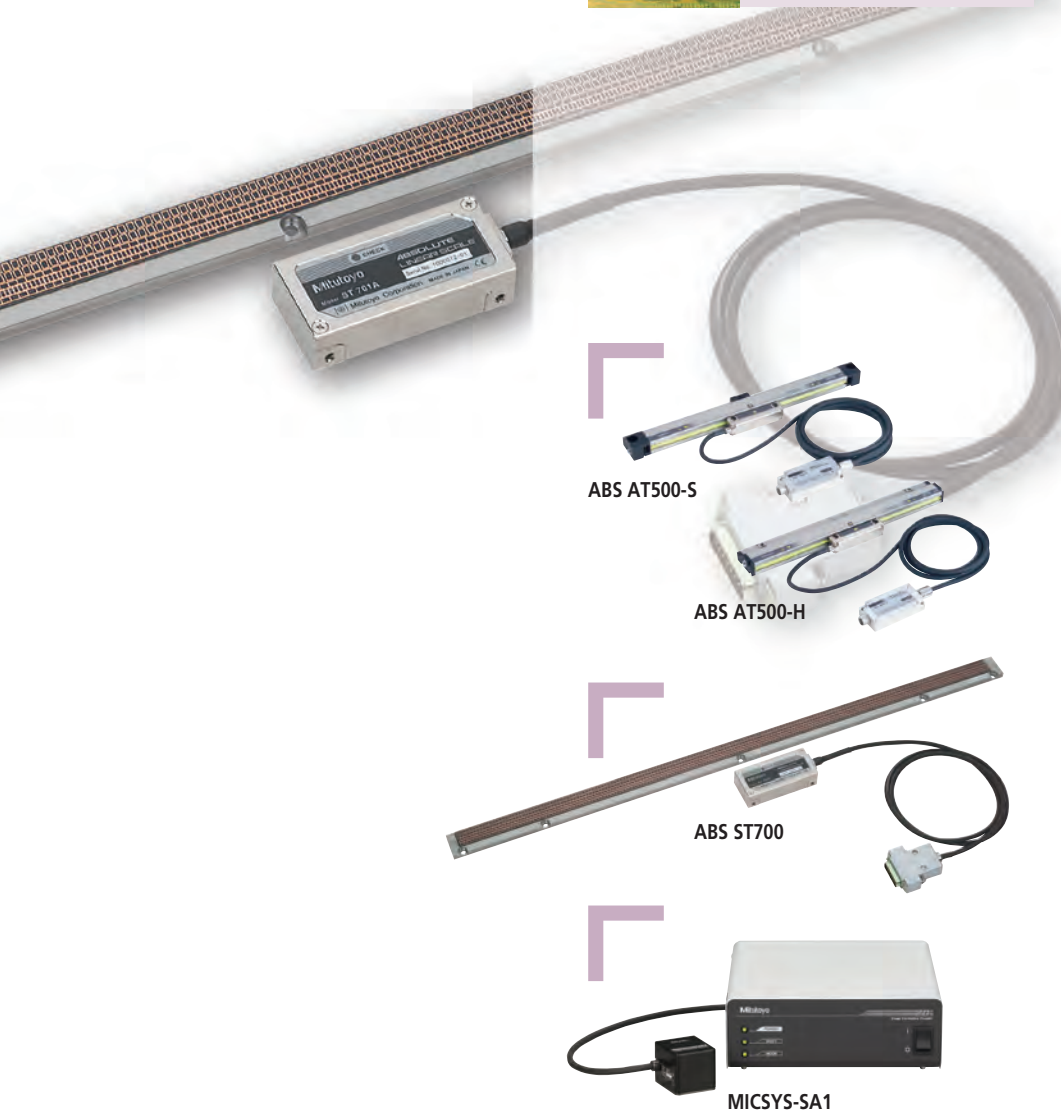
### Digimatic Scale Units



### Linear Scales



### 2D Image Correlation Encoder



ABS AT500-S

ABS AT500-H

ABS ST700

MICSYS-SA1

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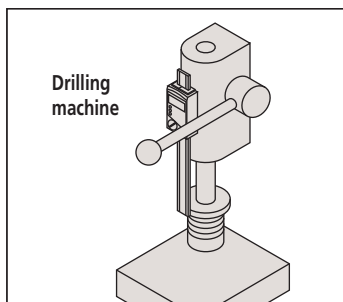
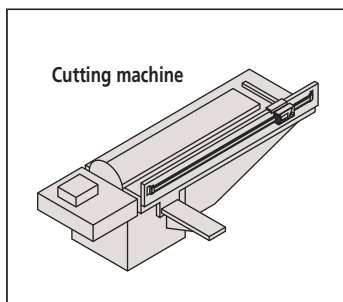
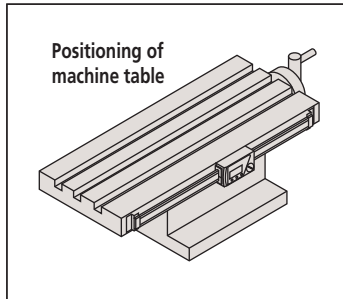
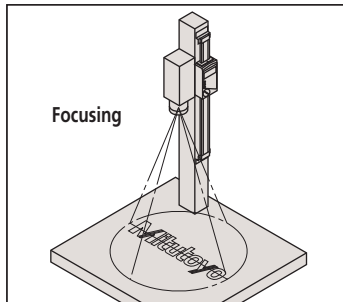
# ABSOLUTE Digimatic Scale Units

## SERIES 572

Mitutoyo's ABSOLUTE Digimatic Scale Units can be installed on almost any equipment, offering the user precise linear measurement capability with the added benefits of LCD readout and output for recording data and SPC.

### APPLICATIONS

- Positioning of tables, etc., in adverse environments
- Measuring equipment to be used on the workshop floor
- Measurement of structure displacements
- Positioning of plain machine tools
- Measuring equipment to be used outside (in the rain)



### EC Counter

#### FEATURES

- The Digimatic Display Unit with GO/NG judgement function offers a large LED display for a Digimatic Scale Unit. The bright LED readout is ideal for low-light situations or when the scale unit must be inserted into an area where its own display cannot be viewed directly.



EC counter: 542-007A

### Coolant Proof Scale Unit



### Single Function Type Scale Unit



### Multi-function Type Scale Unit



### Multi-function Type Scale Unit



RS-232C output



Data entry via USB



1. 05CZA624: 40" / 1m cable with data switch  
05CZA625: 40" / 1m cable with data switch
2. 959149: 40" / 1m cable with data switch  
959150: 40" / 1m cable with data switch
3. 905338: 40" / 1m cable  
905409: 80" / 2m cable
4. 905689: 40" / 1m cable  
905690: 80" / 2m cable

5. 905691: 40" / 1m cable  
905692: 80" / 2m cable
6. 905693: 40" / 1m cable  
905694: 80" / 2m cable
- 936937: 40" / 1m cable  
965014: 80" / 2m cable

Note: Match Key no. to Diagram



# ABSOLUTE Coolant Proof Digimatic Scale Units

## SERIES 572 — With Dust/Water Protection IP66 Level

### FEATURES

- Newly employed detection method (Electromagnetic induction method) enables use in adverse environments with water and cutting oil.
- Specially designed output cables are developed to maintain the water resistant structure.
- No over speed error since it employs absolute scale which reads the absolute value.
- Once an absolute zero (origin) point is set, the Digimatic Scale Unit shows its absolute distance from the point whenever turned on rather than 0.00".



### Technical Data

Accuracy: Refer to the list of specifications  
 Resolution: 0.01mm or .0005"/0.01mm  
 Repeatability: 0.01mm  
 Display: LCD  
 Length standard: ABSOLUTE electromagnetic induction linear encoder  
 Max. response speed: Unlimited  
 Battery: SR44 (1 pc.), **938882**  
 Battery life: Approx. 1.5 years under normal use  
 Dust/Water protection level: IP66

### Function

Origin-set, Zero-setting, Automatic power on/off,  
 Data output, inch/mm conversion (on inch/metric models only)  
 Alarm: Low voltage, Counting value composition error

### Optional Accessories

**05CZA624:** SPC cable with data switch (1m / 40")  
**05CZA625:** SPC cable with data switch (2m / 80")

### IP (International Protection) Codes:

Example, IP66 Means:  
 1st Digit "6": Dust sealing  
 2nd Digit "6": Water Resistant  
 For detailed descriptions, see page X

### SPECIFICATIONS

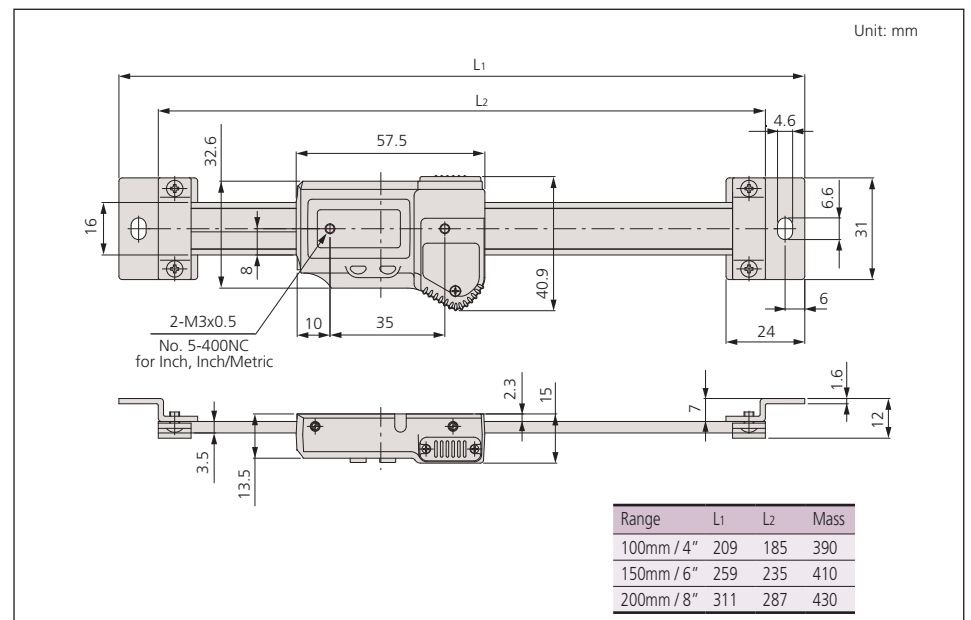
#### Metric

Range	Order No.	Accuracy	Resolution
0 - 100mm	<b>572-600</b>	0.03mm	0.01mm
0 - 150mm	<b>572-601</b>	0.03mm	0.01mm
0 - 200mm	<b>572-602</b>	0.03mm	0.01mm

#### Inch/Metric

Range	Order No.	Accuracy	Resolution
0 - 4" / 0 - 100mm	<b>572-613</b>	.001" / 0.03mm	.0005" / 0.01mm
0 - 6" / 0 - 150mm	<b>572-614</b>	.001" / 0.03mm	.0005" / 0.01mm
0 - 8" / 0 - 200mm	<b>572-615</b>	.001" / 0.03mm	.0005" / 0.01mm

### DIMENSIONS AND MASS



# ABSOLUTE Digimatic Scale Units

## SERIES 572

### FEATURES

- The ORIGIN key allows setting of an absolute zero point to be used as reference in subsequent measurements. Once set, the ABS Digimatic Scale Unit is ready to show its true position whenever turned on rather than 0.00" as with standard models.
- The ZERO/ABS key allows the display to be zero-set at any slider position along the beam for incremental comparison measurements. This key will also allow return to the absolute coordinate with a display of the true position
- from the origin point.
- No rack, no pinion, no glass scale. Digimatic Scale Unit is safely embedded in the hardened stainless steel blade.
- Horizontal or vertical face according to the scale mounting direction.
- Special type that is provided with diameter displaying function is available for lathes.
- All units come with two mounting brackets, each located at either end of the scale.
- With SPC data output.



Horizontal single function type



Horizontal multi-function type



Horizontal multi-function type



Vertical single function type



Vertical multi-function type



Vertical multi-function type



### Technical Data

Accuracy: Refer to the list of specifications.  
 Resolution: 0.01mm or .0005"/0.01mm  
 Display: LCD  
 Length standard: ABSOLUTE electrostatic capacitance type linear encoder  
 Max. response speed: Unlimited  
 Battery: SR44 (1 pc.), **938882**  
 Battery life: Approx. 3.5 years under normal use

### Function

Origin-set, Zero-setting, Power on/off, Presetting, Data hold, Data output, inch/mm conversion (on inch/metric models only), Counting direction switching\*  
 Alarm: Low voltage, Counting value composition error  
 \*not available for single function models

### Optional Accessories

- 959143:** Data hold unit for single function type
- 959149:** SPC cable with data switch for single function type (40" / 1m)
- 959150:** SPC cable with data switch for single function type (80" / 2m)
- 905338:** SPC cable (40" / 1m standard)
- 905409:** SPC cable (80" / 2m standard)
- 905689:** SPC cable (40" / 1m L-shape, back)
- 905690:** SPC cable (80" / 2m L-shape, back)
- 905691:** SPC cable (40" / 1m L-shape, right)
- 905692:** SPC cable (80" / 2m L-shape, right)
- 905693:** SPC cable (40" / 1m L-shape, left)
- 905694:** SPC cable (80" / 2m L-shape, left)

Refer to bottom of page H-2 for SPC cable details

# SPECIFICATIONS

Range	Order No.		Accuracy	Resolution
	Horizontal	Vertical		
100mm	572-200-20	572-300-10	0.03mm	0.01mm
	572-460*	572-560*	0.03mm	0.01mm
	572-480-10**	572-580-10**	0.03mm	0.01mm
150mm	572-201-20	572-301-10	0.03mm	0.01mm
	572-461*	572-561*	0.03mm	0.01mm
	572-481-10**	572-581-10**	0.03mm	0.01mm
200mm	572-202-20	572-302-10	0.03mm	0.01mm
	572-462*	572-562*	0.03mm	0.01mm
	572-482-10**	572-582-10**	0.03mm	0.01mm
300mm	572-203-10	572-303-10	0.04mm	0.01mm
	572-463*	572-563*	0.04mm	0.01mm
	572-483-10**	572-583-10**	0.04mm	0.01mm
450mm	572-464*	572-564*	0.04mm	0.01mm
	572-484-10**	572-584-10**	0.04mm	0.01mm
600mm	572-465*	572-565*	0.05mm	0.01mm
	572-485-10**	572-585-10**	0.05mm	0.01mm
800mm	572-466*	572-566*	0.06mm	0.01mm
	572-486-10**	572-586-10**	0.06mm	0.01mm
1000mm	572-467*	572-567*	0.07mm	0.01mm
	572-487-10**	572-587-10**	0.07mm	0.01mm

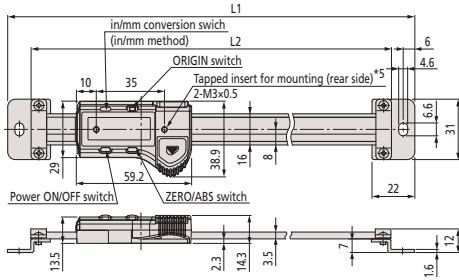
\* Multi-function type  
 \*\*Multi-function type with diameter displaying function for lathe  
 (Counting direction switching function is not provided.)

Range	Order No.		Accuracy	Resolution
	Horizontal	Vertical		
4" / 100mm	572-210-20	572-310-10	.001"	.0005" / 0.01mm
	572-470*	572-570*	.001"	.0005" / 0.01mm
	572-490-10**	572-590-10**	.001"	.0005" / 0.01mm
6" / 150mm	572-211-20	572-311-10	.001"	.0005" / 0.01mm
	572-471*	572-571*	.001"	.0005" / 0.01mm
	572-491-10**	572-591-10**	.001"	.0005" / 0.01mm
8" / 200mm	572-212-20	572-312-10	.001"	.0005" / 0.01mm
	572-472*	572-572*	.001"	.0005" / 0.01mm
	572-492-10**	572-592-10**	.001"	.0005" / 0.01mm
12" / 300mm	572-213-10	572-313-10	.002"	.0005" / 0.01mm
	572-473*	572-573*	.002"	.0005" / 0.01mm
	572-493-10**	572-593-10**	.002"	.0005" / 0.01mm
18" / 450mm	572-474*	572-574*	.002"	.0005" / 0.01mm
	572-494-10**	572-594-10**	.002"	.0005" / 0.01mm
24" / 600mm	572-475*	572-575*	.002"	.0005" / 0.01mm
	572-495-10**	572-595-10**	.002"	.0005" / 0.01mm
32" / 800mm	572-476*	572-576*	.0025"	.0005" / 0.01mm
	572-496-10**	572-596-10**	.0025"	.0005" / 0.01mm
40" / 1000mm	572-477*	572-577*	.0025"	.0005" / 0.01mm
	572-497-10**	572-597-10**	.0025"	.0005" / 0.01mm

\* Multi-function type  
 \*\*Multi-function type with diameter displaying function for lathe  
 (Counting direction switching function is not provided.)

# DIMENSIONS AND MASS

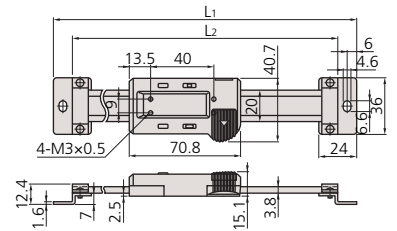
Single function type horizontal (100-200mm / 4-8")



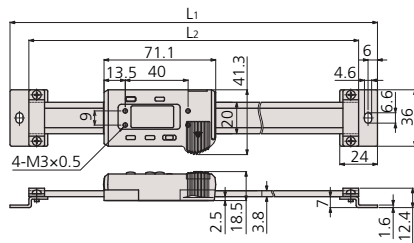
572-200-20~572-202-20  
 572-210-20~572-212-20

Range	L1	L2	Mass
4" / 100mm	209	185	230
6" / 150mm	259	235	250
8" / 200mm	311	287	270
12" / 300mm	444	420	370

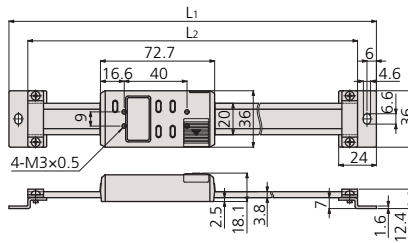
Single function type horizontal (300 / 12")



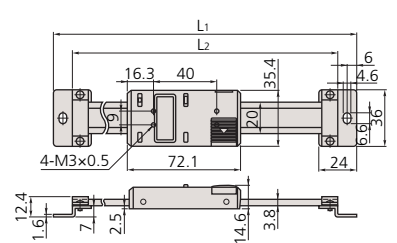
Multi function type horizontal (100-300mm / 4-12")



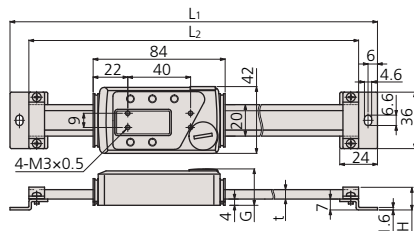
Multi function type vertical (100-300mm / 4-12")



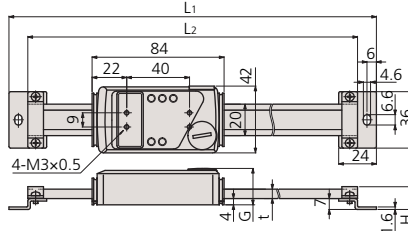
Single function type vertical (100-300mm / 4-12")



Multi function type horizontal (450-1000mm / 18-40")



Multi function type vertical (450-1000mm / 18-40")



Range	L1	L2	Mass
4" / 100mm	244	220	250
6" / 150mm	294	270	280
8" / 200mm	344	320	310
12" / 300mm	444	420	370
18" / 450mm	594	570	760
24" / 600mm	774	750	900
32" / 800mm	974	950	1710
40" / 1000mm	1174	1150	2040

Unit: mm

# Quill Kit with ABSOLUTE Encoder

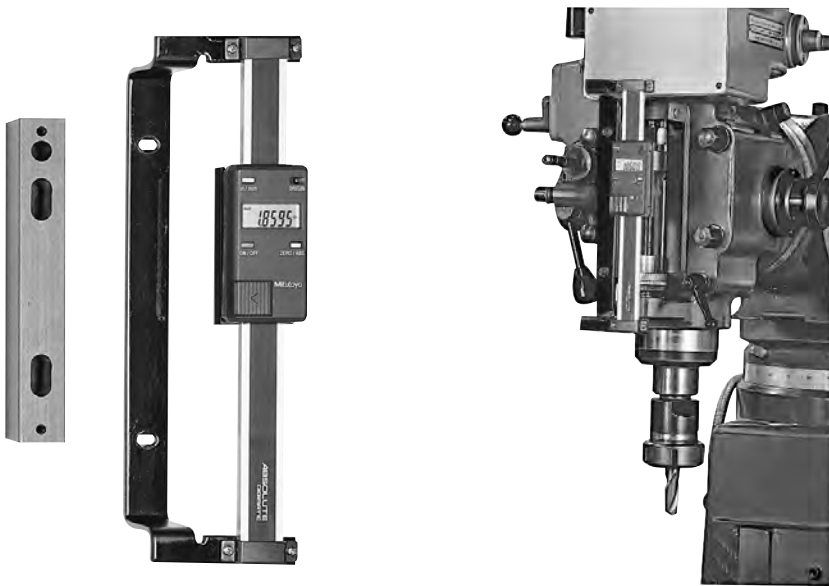
Easy Installation Fits Most Vertical Knee Mills

## FEATURES

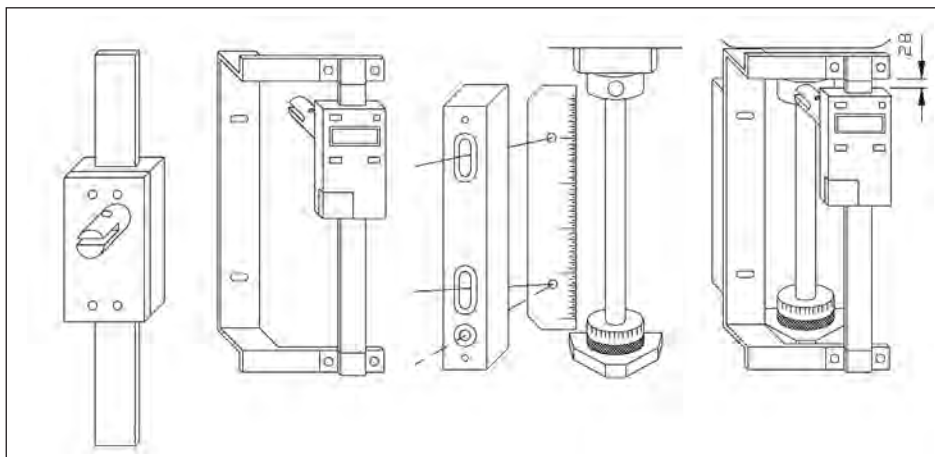
- Easy to read LCD with resolution of .0005"/0.01mm. 0 -6" Travel inch/mm
- Push button controls for inch/mm, Zero-Set and On/Off.
- Powered by a single SR-44 Battery which lasts about 1 year with normal use.
- SPC Output for data transmission to Data Processors or a Remote Display.

## SPECIFICATIONS

Order No.	Description
053906B	Digimatic Quill Kit complete with brackets & scale for Bridgeport Type machines.

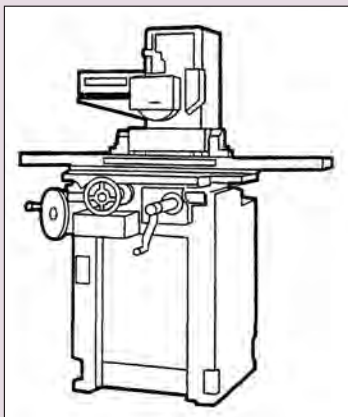
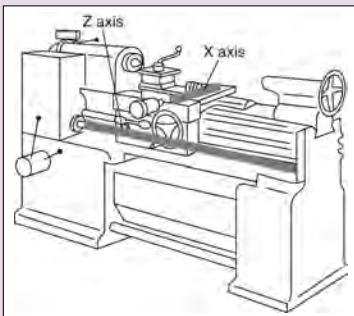
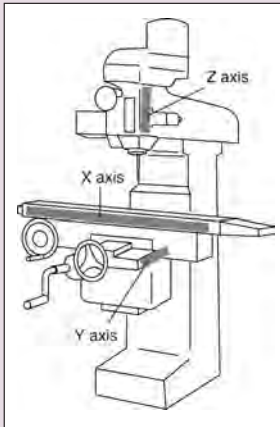


The Mitutoyo Quill Kit mounted on a vertical mill.



## Optional Accessories

- 905338: SPC cable (40" / 1m standard)
- 905409: SPC cable (80" / 2m standard)
- 264-504-5A: DP-1VR data processor, 120V AC
- 02AZD810D: U-Wave-R (wireless receiver)
- 02AZD730D: U-Wave-T/IP67 type (wireless transmitter)
- 02AZD790F: U-Wave connecting cable F
- 02AZE200: U-Wave-T installation brackets kit



# KA Counter DRO packages 2-Axis/3-Axis Travels

For Milling, Lathes & Surface Grinding Systems

## Package Includes:

- KA Counter
- Brackets for Scales
- AT715 and AT116 Linear Scale combinations
- Display Arm Kit
- 2 Axis or 3 Axis

## Glass Linear Scale Packages for Grinder Systems

Vertical	Cross Side			
	AT116-150 (6")	AT116-200 (8")	AT116-250 (10")	AT116-300 (12")
AT116-300 (12")	<b>64PKA026</b>	<b>64PKA028</b>	-	-
AT116-350 (14")	<b>64PKA027</b>	<b>64PKA029</b>	-	-
AT116-400 (16")	-	<b>64PKA030</b>	-	-
AT116-450 (18")	-	-	<b>64PKA031</b>	<b>64PKA033</b>
AT116-500 (20")	-	-	-	<b>64PKA034</b>
AT116-600 (24")	-	-	<b>64PKA032</b>	-

## Lathe Packages

Z axis travel	X Axis Travel (AT116 Slim Glass Scale)					
	AT116-150 (6")	AT116-200 (8")	AT116-250 (10")	AT116-300 (12")	AT116-350 (14")	AT116-400 (16")
AT715-700 (28")	<b>64PKA035</b>	-	-	-	-	-
AT715-750 (30")	<b>64PKA036</b>	-	-	-	-	-
AT715-900 (36")	<b>64PKA037</b>	-	-	-	-	-
AT715-1000 (40")	<b>64PKA038</b>	<b>64PKA039</b>	<b>64PKA042</b>	<b>64PKA046</b>	<b>64PKA052</b>	-
AT715-1100 (44")	-	<b>64PKA040</b>	<b>64PKA043</b>	<b>64PKA047</b>	<b>64PKA053</b>	-
AT715-1200 (48")	-	<b>64PKA041</b>	<b>64PKA044</b>	<b>64PKA048</b>	<b>64PKA054</b>	-
AT715-1300 (52")	-	-	-	<b>64PKA049</b>	<b>64PKA055</b>	-
AT715-1500 (60")	-	-	<b>64PKA045</b>	<b>64PKA050</b>	<b>64PKA056</b>	<b>64PKA057</b>
AT715-1800 (72")	-	-	-	<b>64PKA051</b>	-	-

## Bridgeport Mills Only

X Axis Travel	Y Axis Travel
	12"
30"	<b>64PKA058</b>
36"	<b>64PKA059</b>



## Universal Type Mills Only

X Axis Travel	Y Axis Travel			
	12"	14"	16"	18"
30"	<b>64PKA058</b>	<b>64PKA060</b>	-	-
36"	<b>64PKA059</b>	-	<b>64PKA062</b>	-
40"	-	<b>64PKA061</b>	<b>64PKA063</b>	<b>64PKA064</b>

Available in 3 axis (quill or knee).

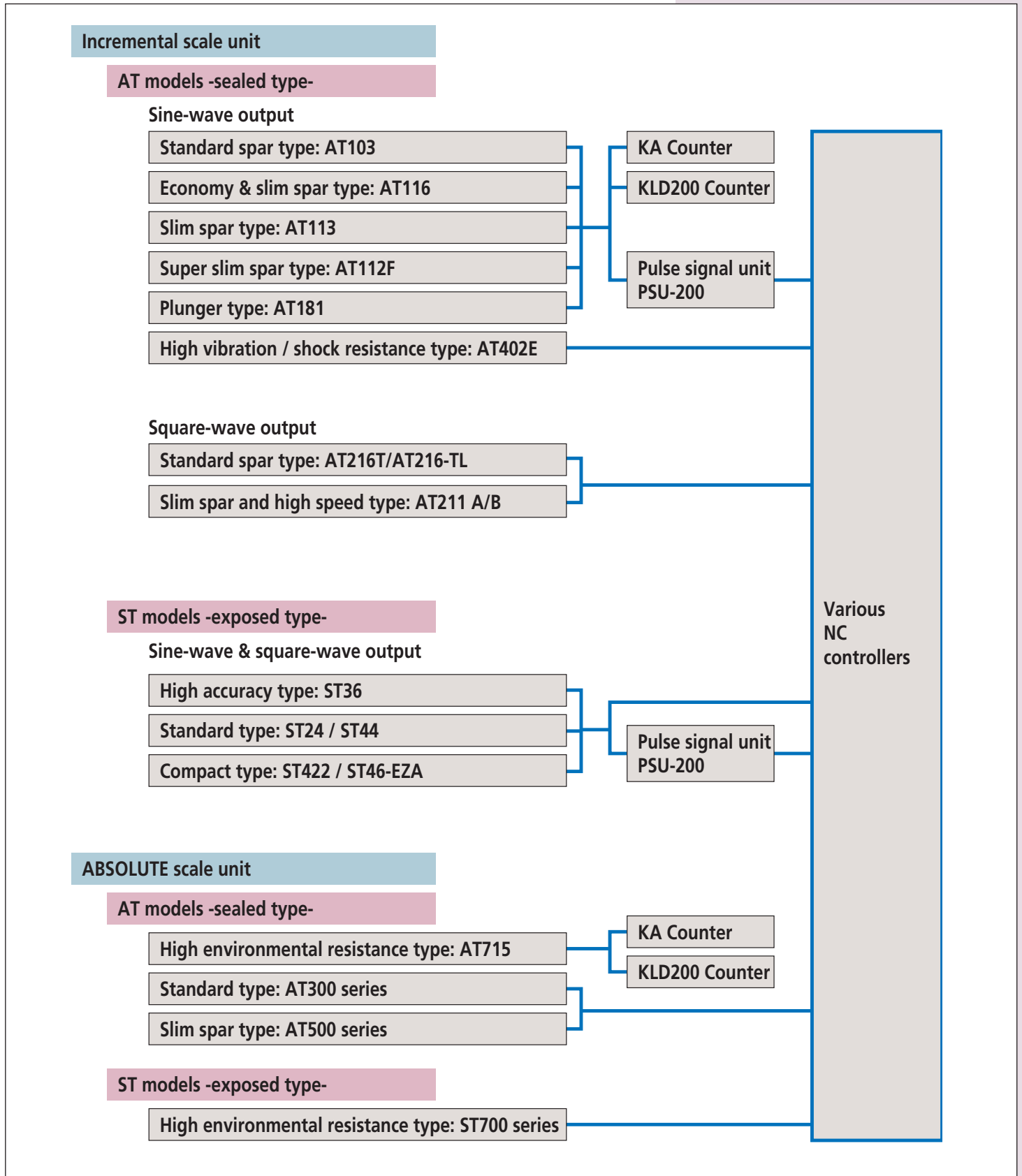
## 3 Axis, KA Counter Milling System (Z Axis 6" Travel AT715)

Order No.	Description
<b>64PKA065</b>	MILL pkg, 3-axis, ABS Scales, 12" x 30" 6", w/DRO
<b>64PKA066</b>	MILL pkg, 3-axis, ABS Scales, 12" x 36" 6", w/DRO
<b>64PKA067</b>	MILL pkg, 3-axis, ABS Scales, 16" x 36" 6", w/DRO

# Linear Scale

## Linear Encoder System

### System Guide





# AT103 Linear Scales

## SERIES 539 — Standard Spar Type

### Technical Data

Effective range:	4 - 240" (100 - 6000mm)	
Accuracy at 20°C:		
Effective range	Standard type	High-accuracy type
100 to 2000mm	(5+5L/1000)µm	(3+3L/1000)µm
2200 to 3000mm	(5+5L/1000)µm	—
3250 to 6000mm	(5+8L/1000)µm	—
	L = Effective range (mm)	
Output wave form:	Two 90° phase-shifted sinusoidal signals	
Maximum response speed:	120m/min. (up to 3000mm)	
	50m/min. (3250mm and over)	
Scale grating pitch:	20µm	
Scale reference point pitch:	50mm	
Dust/water protection level:	IP53	
Operating temperature:	0°C to 45°C	

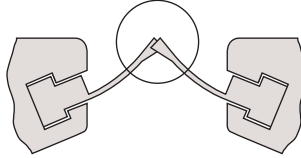
### Optional Accessories

- 09AAA033A: Extension cable (80" / 2m)
- 09AAA033B: Extension cable (200" / 5m)
- 09AAA033C: Extension cable (280" / 7m)

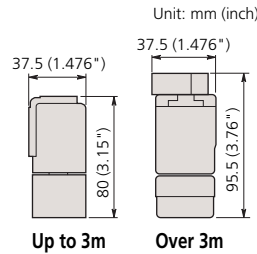
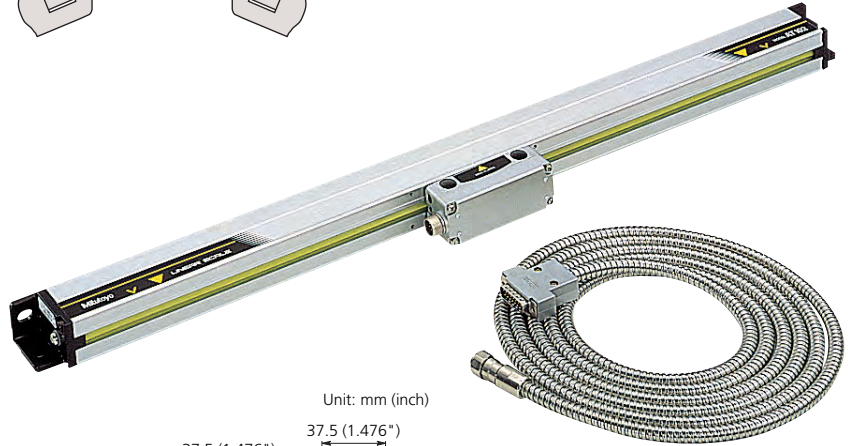


### FEATURES

- Enhanced vibration-resistance and durability.
- The innovative rubber lips keep out contaminants on a machine shop.



- An armored signal cable is used to connect the scale unit to the DRO counter for safe operation in harsh shop environment.
- The signal cable outlet can be positioned on either side of the detector head so the signal cable can be connected from either direction.



### SPECIFICATIONS

Effective range	Order No. (standard)	Order No. (high-accuracy)	Signal cable length
4" (100mm)	539-111-30	539-111-40	120" / 3m
6" (150mm)	539-112-30	539-112-40	120" / 3m
8" (200mm)	539-113-30	539-113-40	120" / 3m
10" (250mm)	539-114-30	539-114-40	120" / 3m
12" (300mm)	539-115-30	539-115-40	120" / 3m
14" (350mm)	539-116-30	539-116-40	120" / 3m
16" (400mm)	539-117-30	539-117-40	120" / 3m
18" (450mm)	539-118-30	539-118-40	120" / 3m
20" (500mm)	539-119-30	539-119-40	120" / 3m
24" (600mm)	539-121-30	539-121-40	120" / 3m
28" (700mm)	539-123-30	539-123-40	120" / 3m
30" (750mm)	539-124-30	539-124-40	120" / 3m
32" (800mm)	539-125-30	539-125-40	120" / 3m
36" (900mm)	539-126-30	539-126-40	120" / 3m
40" (1000mm)	539-127-30	539-127-40	200" / 5m
44" (1100mm)	539-128-30	539-128-40	200" / 5m
48" (1200mm)	539-129-30	539-129-40	200" / 5m
52" (1300mm)	539-130-30	539-130-40	200" / 5m
56" (1400mm)	539-131-30	539-131-40	200" / 5m
60" (1500mm)	539-132-30	539-132-40	200" / 5m
64" (1600mm)	539-133-30	539-133-40	200" / 5m

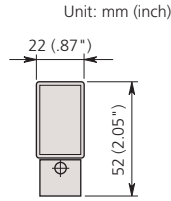
Effective range	Order No. (standard)	Order No. (high-accuracy)	Signal cable length
68" (1700mm)	539-134-30	539-134-40	200" / 5m
72" (1800mm)	539-135-30	539-135-40	200" / 5m
80" (2000mm)	539-136-30	539-136-40	200" / 5m
88" (2200mm)	539-137-30	—	200" / 5m
96" (2400mm)	539-138-30	—	280" / 7m
100" (2500mm)	539-139-30	—	280" / 7m
104" (2600mm)	539-140-30	—	280" / 7m
112" (2800mm)	539-141-30	—	280" / 7m
120" (3000mm)	539-142-30	—	280" / 7m
130" (3250mm)	539-143-30	—	400" / 10m
140" (3500mm)	539-144-30	—	400" / 10m
150" (3750mm)	539-145-30	—	400" / 10m
160" (4000mm)	539-146-30	—	400" / 10m
170" (4250mm)	539-147-30	—	400" / 10m
180" (4500mm)	539-148-30	—	400" / 10m
190" (4750mm)	539-149-30	—	600" / 15m
200" (5000mm)	539-150-30	—	600" / 15m
210" (5250mm)	539-151-30	—	600" / 15m
220" (5500mm)	539-152-30	—	600" / 15m
230" (5750mm)	539-153-30	—	600" / 15m
240" (6000mm)	539-154-30	—	600" / 15m

# AT116 Linear Scales

## SERIES 539 — Economy and Slim Spar Type

### FEATURES

- Suitable for milling machines, XY tables, jigs, etc.
- Dimensionally compatible with AT111 linear scale units.



### SPECIFICATIONS

Effective range	Order No.	Signal cable length
4" (100mm)	<b>539-271-30</b>	140" / 3.5m
6" (150mm)	<b>539-272-30</b>	140" / 3.5m
8" (200mm)	<b>539-273-30</b>	140" / 3.5m
10" (250mm)	<b>539-274-30</b>	140" / 3.5m
12" (300mm)	<b>539-275-30</b>	140" / 3.5m
14" (350mm)	<b>539-276-30</b>	140" / 3.5m
16" (400mm)	<b>539-277-30</b>	140" / 3.5m
18" (450mm)	<b>539-278-30</b>	140" / 3.5m
20" (500mm)	<b>539-279-30</b>	140" / 3.5m
24" (600mm)	<b>539-281-30</b>	140" / 3.5m

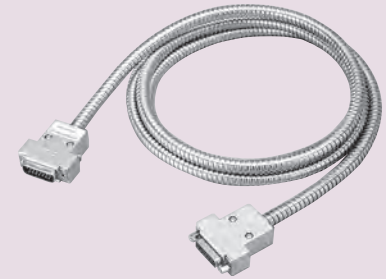
Effective range	Order No.	Signal cable length
28" (700mm)	<b>539-283-30</b>	140" / 3.5m
30" (750mm)	<b>539-284-30</b>	140" / 3.5m
32" (800mm)	<b>539-285-30</b>	140" / 3.5m
36" (900mm)	<b>539-286-30</b>	140" / 3.5m
40" (1000mm)	<b>539-287-30</b>	200" / 5m
44" (1100mm)	<b>539-288-30</b>	200" / 5m
48" (1200mm)	<b>539-289-30</b>	200" / 5m
52" (1300mm)	<b>539-290-30</b>	200" / 5m
56" (1400mm)	<b>539-291-30</b>	200" / 5m
60" (1500mm)	<b>539-292-30</b>	200" / 5m

### Technical Data

Effective range: 4 - 60" (100 - 1500mm)  
 Accuracy at 20°C: (5+5L/1000)µm  
 L = Effective range (mm)  
 Output wave form: Two 90° phase-shifted sinusoidal signals  
 Maximum response speed: 50m/min.  
 Scale grating pitch: 20µm  
 Scale reference point pitch: 50mm  
 Dust/water protection level: IP53  
 Operating temperature: 0°C to 45°C

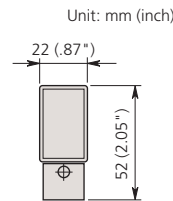
### Optional Accessories

- 09AAB674A:** Extension cable (2m / 80")
- 09AAB674B:** Extension cable (5m / 200")
- 09AAB674C:** Extension cable (7m / 280")



# AT113 Linear Scales

## SERIES 539 — Slim Spar Type



### SPECIFICATIONS

Effective range	Order No. (standard)	Order No. (high-accuracy)	Signal cable length
4" (100mm)	<b>539-201-30</b>	<b>539-201-40</b>	140" / 3.5m
6" (150mm)	<b>539-202-30</b>	<b>539-202-40</b>	140" / 3.5m
8" (200mm)	<b>539-203-30</b>	<b>539-203-40</b>	140" / 3.5m
10" (250mm)	<b>539-204-30</b>	<b>539-204-40</b>	140" / 3.5m
12" (300mm)	<b>539-205-30</b>	<b>539-205-40</b>	140" / 3.5m
14" (350mm)	<b>539-206-30</b>	<b>539-206-40</b>	140" / 3.5m
16" (400mm)	<b>539-207-30</b>	<b>539-207-40</b>	140" / 3.5m
18" (450mm)	<b>539-208-30</b>	<b>539-208-40</b>	140" / 3.5m
20" (500mm)	<b>539-209-30</b>	<b>539-209-40</b>	140" / 3.5m
24" (600mm)	<b>539-211-30</b>	<b>539-211-40</b>	140" / 3.5m

Effective range	Order No. (standard)	Order No. (high-accuracy)	Signal cable length
28" (700mm)	<b>539-213-30</b>	<b>539-213-40</b>	140" / 3.5m
30" (750mm)	<b>539-214-30</b>	<b>539-214-40</b>	140" / 3.5m
32" (800mm)	<b>539-215-30</b>	<b>539-215-40</b>	140" / 3.5m
36" (900mm)	<b>539-216-30</b>	<b>539-216-40</b>	140" / 3.5m
40" (1000mm)	<b>539-217-30</b>	<b>539-217-40</b>	200" / 5m
44" (1100mm)	<b>539-218-30</b>	<b>539-218-40</b>	200" / 5m
48" (1200mm)	<b>539-219-30</b>	<b>539-219-40</b>	200" / 5m
52" (1300mm)	<b>539-220-30</b>	<b>539-220-40</b>	200" / 5m
56" (1400mm)	<b>539-221-30</b>	<b>539-221-40</b>	200" / 5m
60" (1500mm)	<b>539-222-30</b>	<b>539-222-40</b>	200" / 5m

### Technical Data

Effective range: 4 - 60" (100 - 1500mm)  
 Accuracy at 20°C: Standard type (5+5L/1000)µm  
 High-accuracy type (3+3L/1000)µm  
 L = Effective range (mm)  
 Output wave form: Two 90° phase-shifted sinusoidal signals  
 Maximum response speed: 120m/min.  
 Scale grating pitch: 20µm  
 Scale reference point pitch: 50mm  
 Dust/water protection level: IP53  
 Operating temperature: 0°C to 45°C

### Optional Accessories

- 09AAA033A:** Extension cable (80" / 2m)
- 09AAA033B:** Extension cable (200" / 5m)
- 09AAA033C:** Extension cable (280" / 7m)

# AT112 Linear Scales

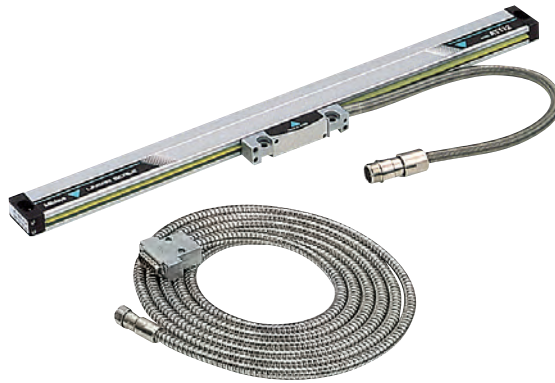
## SERIES 539 — Super Slim Spar High Accuracy Type

### Technical Data

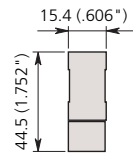
Effective range: 1.5 - 40" (50 - 1020mm)  
 Accuracy at 20°C:  
     High-accuracy type (3+3L/1000) $\mu$ m  
     L = Effective range (mm)  
 Output wave form: Two 90° phase-shifted sinusoidal signals  
 Maximum response speed: 72m/min.  
 Scale grating pitch: 20 $\mu$ m  
 Scale reference point pitch: 50mm  
 Dust/water protection level: IP53  
 Operating temperature: 0°C to 45°C

### Optional Accessories

**09AAA033A:** Extension cable (80" / 2m)  
**09AAA033B:** Extension cable (200" / 5m)  
**09AAA033C:** Extension cable (280" / 7m)



Unit: mm (inch)



### SPECIFICATIONS

Effective range	Order No. (high-accuracy)	Signal cable length
1.5" (50mm)	<b>539-251-10</b>	120" / 3m
2.5" (70mm)	<b>539-252-10</b>	120" / 3m
4.5" (120mm)	<b>539-253-10</b>	120" / 3m
6.5" (170mm)	<b>539-254-10</b>	120" / 3m
8.5" (220mm)	<b>539-255-10</b>	120" / 3m
10.5" (270mm)	<b>539-256-10</b>	120" / 3m
12.5" (320mm)	<b>539-257-10</b>	120" / 3m
14.5" (370mm)	<b>539-258-10</b>	120" / 3m
16.5" (420mm)	<b>539-259-10</b>	120" / 3m
18.5" (470mm)	<b>539-260-10</b>	120" / 3m

Effective range	Order No. (high-accuracy)	Signal cable length
20" (520mm)	<b>539-261-10</b>	120" / 3m
22" (570mm)	<b>539-262-10</b>	120" / 3m
24" (620mm)	<b>539-263-10</b>	120" / 3m
26" (670mm)	<b>539-264-10</b>	120" / 3m
28" (720mm)	<b>539-265-10</b>	120" / 3m
30" (770mm)	<b>539-266-10</b>	120" / 3m
32" (820mm)	<b>539-267-10</b>	120" / 3m
36" (920mm)	<b>539-268-10</b>	120" / 3m
40" (1020mm)	<b>539-269-10</b>	120" / 3m

# AT181 Linear Scales

## SERIES 539 — Plunger Type (High Water-proof Design)

### Technical Data

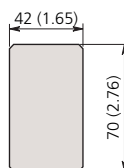
Effective range: 4 - 24" (100 - 600mm)  
 Accuracy at 20°C:  
     Standard type (5+5L/1000) $\mu$ m  
     L = Effective range (mm)  
 Output wave form: Two 90° phase-shifted sinusoidal signals  
 Maximum response speed: 50m/min.  
 Scale grating pitch: 20 $\mu$ m  
 Scale reference point pitch: 50mm  
 Dust/water protection level: IP54  
 Operating temperature: 0°C to 45°C

### Optional Accessories

**09AAA033A:** Extension cable (80" / 2m)  
**09AAA033B:** Extension cable (200" / 5m)  
**09AAA033C:** Extension cable (280" / 7m)



Unit: mm (inch)



### SPECIFICATION

Effective range	Order No. (standard)	Signal cable length
4" (100mm)	<b>539-301</b>	120" / 3m
6" (150mm)	<b>539-302</b>	120" / 3m
8" (200mm)	<b>539-303</b>	120" / 3m
10" (250mm)	<b>539-304</b>	120" / 3m
12" (300mm)	<b>539-305</b>	120" / 3m
14" (350mm)	<b>539-306</b>	120" / 3m
16" (400mm)	<b>539-307</b>	120" / 3m
18" (450mm)	<b>539-308</b>	120" / 3m
20" (500mm)	<b>539-309</b>	120" / 3m
22" (550mm)	<b>539-310</b>	120" / 3m
24" (600mm)	<b>539-311</b>	120" / 3m

# AT715 Linear Scales

## SERIES 539 — ABSOLUTE and High Environment Resistance Type



### FEATURES

- Employs ABSOLUTE® electromagnetic induction system to achieve IP67 environmental resistance.
- Detects and outputs an absolute position - no reference point setup needed at every power-on.
- An abnormal calculation doesn't accumulate even if the calculation mistake is generated by the influence of an electric noise.
- It is the most suitable scale to mount on the X-axis of a small lathe. 2 mounting directions of the scale main unit allows easy to mount on a machining tool with the difficult mounting position.



### Technical Data

Effective range:	100 - 3000mm (4"-120")
Accuracy at 20°C:	±5μm (Lo: 100 - 500mm) ±7μm (Lo: 600 - 1800mm) ±10μm (Lo: 2.000 - 3.000)
	L = Effective range (mm)
Detecting method:	Electromagnetic induction system
Maximum response speed:	50m/min.
Dust/water protection level:	IP67
Operating temperature:	0°C to 45°C

### Optional Accessory

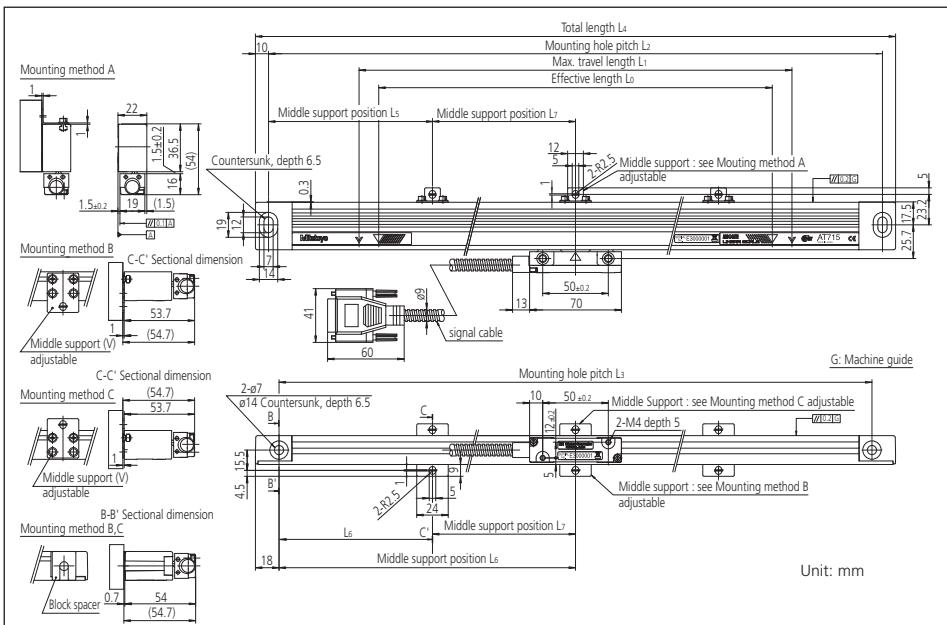
- 09AAB674A: Extension cable 80" / 2m
- 09AAB674B: Extension cable 200" / 5m
- 09AAB674C: Extension cable 280" / 7m

### SPECIFICATIONS

Effective length Lo	Order No.	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	Cable (m)
4" / 100mm	539-801	120	258	242	278	—	—	—	140" / 3.5m
6" / 150mm	539-802	170	308	292	328	—	—	—	140" / 3.5m
8" / 200mm	539-803	220	358	342	378	—	—	—	140" / 3.5m
10" / 250mm	539-804	270	408	392	428	—	—	—	140" / 3.5m
12" / 300mm	539-805	330	468	452	488	—	—	—	140" / 3.5m
14" / 350mm	539-806	380	518	502	538	—	—	—	140" / 3.5m
16" / 400mm	539-807	430	568	552	588	—	—	—	140" / 3.5m
18" / 450mm	539-808	480	618	602	638	—	—	—	140" / 3.5m
20" / 500mm	539-809	540	678	662	698	339	331	—	140" / 3.5m
24" / 600mm	539-811	640	778	762	798	389	381	—	140" / 3.5m
28" / 700mm	539-813	740	878	862	898	439	431	—	140" / 3.5m
30" / 750mm	539-814	780	918	902	938	459	451	—	140" / 3.5m
32" / 800mm	539-815	840	978	962	998	489	481	—	140" / 3.5m
36" / 900mm	539-816	940	1078	1062	1098	539	531	—	140" / 3.5m
40" / 1000mm	539-817	1040	1178	1162	1198	589	581	—	200" / 5m

Effective length Lo	Order No.	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	Cable (m)
44" / 1100mm	539-818	1140	1278	1262	1298	424	416	430	200" / 5m
48" / 1200mm	539-819	1240	1378	1362	1398	459	451	460	200" / 5m
52" / 1300mm	539-820	1340	1478	1462	1498	494	486	490	200" / 5m
56" / 1400mm	539-821	1440	1578	1562	1598	524	516	530	200" / 5m
60" / 1500mm	539-822	1540	1678	1662	1698	559	451	560	200" / 5m
64" / 1600mm	539-823	1640	1778	1762	1798	459	451	430	200" / 5m
68" / 1700mm	539-824	1740	1878	1862	1898	479	471	460	200" / 5m
72" / 1800mm	539-825	1840	1978	1962	1998	459	451	530	200" / 5m
80" / 2000mm	539-860	2040	2178	2162	2198	539	531	550	200" / 5m
88" / 2200mm	539-861	2240	2378	2362	2398	469	461	480	200" / 5m
96" / 2400mm	539-862	2440	2578	2562	2598	509	501	520	280" / 7m
100" / 2500mm	539-863	2540	2678	2662	2698	529	521	540	280" / 7m
104" / 2600mm	539-864	2640	2778	2762	2798	549	541	560	280" / 7m
112" / 2800mm	539-865	2840	2978	2962	2998	489	481	500	280" / 7m
120" / 3000mm	539-866	3040	3178	3162	3198	529	521	530	280" / 7m

### DIMENSIONS

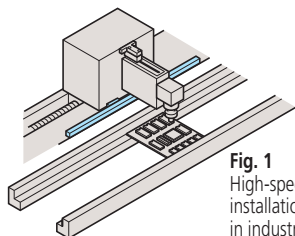


## Technical Data

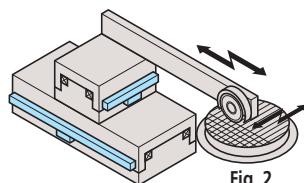
Effective range: 4 - 240" / 100 - 6000mm  
 Accuracy (at 20°C):  
 100 to 1500mm (3+3L/1000)µm  
 1600 to 3000mm (5+5L/1000)µm  
 3250 to 6000mm (5+8L/1000)µm  
 L = Effective range (mm)  
 Output signal: Two 90° phase-shifted quadrature signals  
 Maximum response speed: 11-120m/min.  
 Resolution: 0.1, 0.5, 1µm  
 Scale reference point pitch: 50mm  
 Dust/Water protection level: IP53

### Linear Scales for Numerical Motion Control System

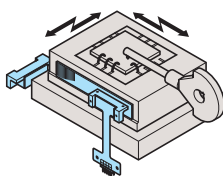
The Linear Scales for the Numerical Motion Control System are high-accuracy linear measurement systems for a wide range of applications. These types of linear scales are designed to be integrated into precision machines and instruments including measuring machines and instruments, as well as machine tools, optics, data equipment, industrial robots, etc. Two types of linear scales for the Numerical Motion Control System are available: the AT Series have the high-accuracy glass scale and the detector head encased together in an aluminum casing for improved durability and resistance against vibration; the ultra-portable and lighter ST Series have the scale and the detector head separately.



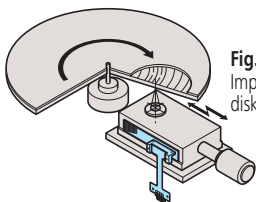
**Fig. 1**  
High-speed, high-accuracy installation of electronics in industrial robots



**Fig. 2**  
Positioning dicing saw in semiconductor production process



**Fig. 3**  
Positioning IC tip for wire-bonding



**Fig. 4**  
Improving seek-time of disk drive system

## Technical Data

Effective range: 4 - 60" (100 - 1500mm)  
 Accuracy at 20°C:  
 Effective range Standard type High-accuracy type  
 100 to 500mm (3+3L/1000)µm (2+2L/1000)µm  
 500 to 1500mm (3+3L/1000)µm —  
 L = Effective range (mm)  
 Output signal: Two 90° phase-shifted quadrature signals  
 Maximum response speed: 5.4 - 120m/min.  
 Resolution: 0.1, 0.2, 0.5, 1, 2.5, 5µm  
 Signal output pitch: 20mm  
 Dust/Water protection level: IP53

# AT203 Linear Scales

## SERIES 539 — Standard Spar Type

### FEATURES

- Sealed type incremental linear scales suitable for feedback system of NC machine tools.
- Direct connection with NC machine tools are possible.



### SPECIFICATION

Effective range	Order No.	Signal cable length
4" / 100mm	539-411-30	200" / 5m
6" / 150mm	539-412-30	200" / 5m
8" / 200mm	539-413-30	200" / 5m
10" / 250mm	539-414-30	200" / 5m
12" / 300mm	539-415-30	200" / 5m
14" / 350mm	539-416-30	200" / 5m
16" / 400mm	539-417-30	200" / 5m
18" / 450mm	539-418-30	200" / 5m
20" / 500mm	539-419-30	200" / 5m
24" / 600mm	539-421-30	200" / 5m
28" / 700mm	539-423-30	200" / 5m
30" / 750mm	539-424-30	200" / 5m
32" / 800mm	539-425-30	200" / 5m
36" / 900mm	539-426-30	200" / 5m
40" / 1000mm	539-427-30	200" / 5m
44" / 1100mm	539-428-30	200" / 5m
48" / 1200mm	539-429-30	200" / 5m
52" / 1300mm	539-430-30	200" / 5m
56" / 1400mm	539-431-30	200" / 5m
60" / 1500mm	539-432-30	200" / 5m
64" / 1600mm	539-433-30	200" / 5m

Effective range	Order No.	Signal cable length
68" / 1700mm	539-434-30	200" / 5m
72" / 1800mm	539-435-30	200" / 5m
80" / 2000mm	539-436-30	200" / 5m
88" / 2200mm	539-437-30	200" / 5m
96" / 2400mm	539-438-30	200" / 5m
100" / 2500mm	539-439-30	200" / 5m
104" / 2600mm	539-440-30	200" / 5m
112" / 2800mm	539-441-30	200" / 5m
120" / 3000mm	539-442-30	200" / 5m
130" / 3250mm	539-443-30	200" / 5m
140" / 3500mm	539-444-30	200" / 5m
150" / 3750mm	539-445-30	200" / 5m
160" / 4000mm	539-446-30	200" / 5m
170" / 4250mm	539-447-30	200" / 5m
180" / 4500mm	539-448-30	200" / 5m
190" / 4750mm	539-449-30	200" / 5m
200" / 5000mm	539-450-30	200" / 5m
210" / 5250mm	539-451-30	200" / 5m
220" / 5500mm	539-452-30	200" / 5m
230" / 5750mm	539-453-30	200" / 5m
240" / 6000mm	539-454-30	200" / 5m

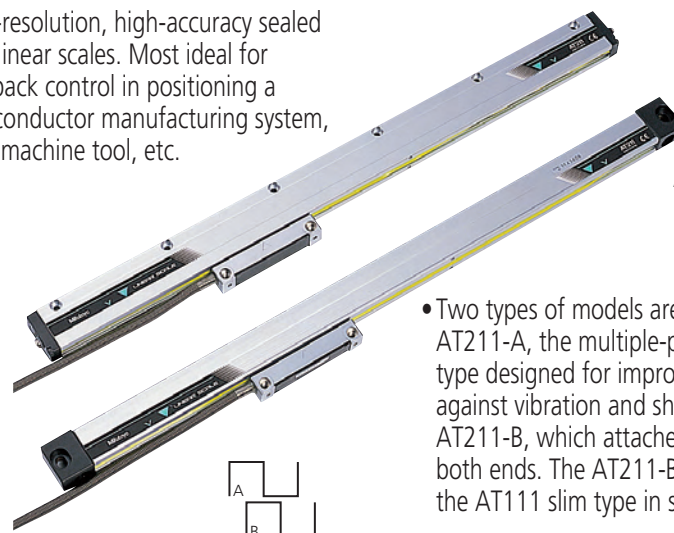
# AT211A / AT211B Linear Scales

## SERIES 539 — Slim Spar Type

### FEATURES

- High-resolution, high-accuracy sealed type linear scales. Most ideal for feedback control in positioning a semiconductor manufacturing system, CNC machine tool, etc.

AT211A model



AT211B model

- Two types of models are available: the AT211-A, the multiple-point installation type designed for improved resistance against vibration and shock, and the AT211-B, which attaches to a machine at both ends. The AT211-B is compatible with the AT111 slim type in size.



# AT402E Linear Scales

## SERIES 539 — High Vibration / Shock Resistance Type

### FEATURES

- Achieving the world-class vibration resistance (20G) and shock resistance (40G) for using with a heavy cutting machine tool.
- Multi-point elastic fixing for very linear and smooth expansion and contraction with temperature changes
- 1Vpp/20µm signal output for high connectivity with various machine controllers.
- Absolute Interval Code for a simple and affordable Absolute Measuring System.
- High-response speed of 120m/min
- High measuring accuracy of ±2µm (up to 540mm)



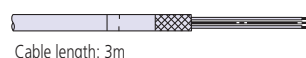
### Technical Data

Effective range:	(140 - 3040mm)
Accuracy (at 20°C):	
140 to 540mm	±2µm
640 to 940mm	±3µm
1040 to 3040mm	±3µm/m
Output signal:	Two 90° phase-shifted sinusoidal signals (1 Vpp)
Maximum response speed:	120m/min.
Signal output pitch:	20µm
Dust/water protection level:	IP53
Operating temperature:	0°C to 45°C

### SPECIFICATIONS

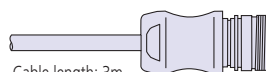
Effective length	Order No. (w/o cable)	Order No. (w/ cable A)	Order No. (w/ cable B)	Order No. (w/ cable C)
140mm	539-371-00	539-371-01	539-371-02	539-371-03
240mm	539-373-00	539-373-01	539-373-02	539-373-03
340mm	539-374-00	539-374-01	539-374-02	539-374-03
440mm	539-375-00	539-375-01	539-375-02	539-375-03
540mm	539-376-00	539-376-01	539-376-02	539-376-03
640mm	539-377-00	539-377-01	539-377-02	539-377-03
740mm	539-378-00	539-378-01	539-378-02	539-378-03
840mm	539-379-00	539-379-01	539-379-02	539-379-03
940mm	539-380-00	539-380-01	539-380-02	539-380-03
1040mm	539-381-00	539-381-01	539-381-02	539-381-03
1140mm	539-382-00	539-382-01	539-382-02	539-382-03
1240mm	539-383-00	539-383-01	539-383-02	539-383-03
1340mm	539-384-00	539-384-01	539-384-02	539-384-03
1440mm	539-385-00	539-385-01	539-385-02	539-385-03
1540mm	539-386-00	539-386-01	539-386-02	539-386-03
1640mm	539-387-00	539-387-01	539-387-02	539-387-03
1740mm	539-388-00	539-388-01	539-388-02	539-388-03
1840mm	539-389-00	539-389-01	539-389-02	539-389-03
2040mm	539-390-00	539-390-01	539-390-02	539-390-03
2240mm	539-391-00	539-391-01	539-391-02	539-391-03
2440mm	539-392-00	539-392-01	539-392-02	539-392-03
2640mm	539-393-00	539-393-01	539-393-02	539-393-03
2840mm	539-394-00	539-394-01	539-394-02	539-394-03
3040mm	539-395-00	539-395-01	539-395-02	539-395-03

Cable A: Lead wires type



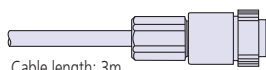
Cable length: 3m

Cable B: Connectable to Euro controller



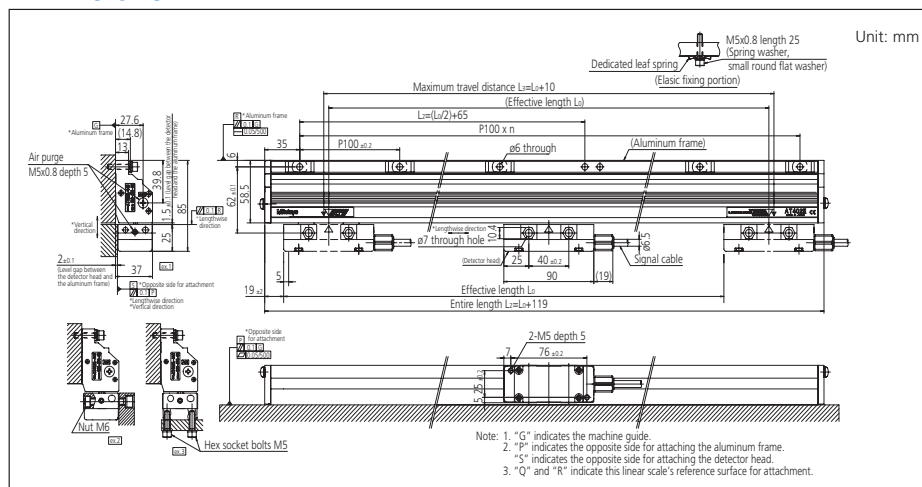
Cable length: 3m

Cable C: Connectable to FANUC serial board C



Cable length: 3m

### DIMENSIONS





### Technical Data

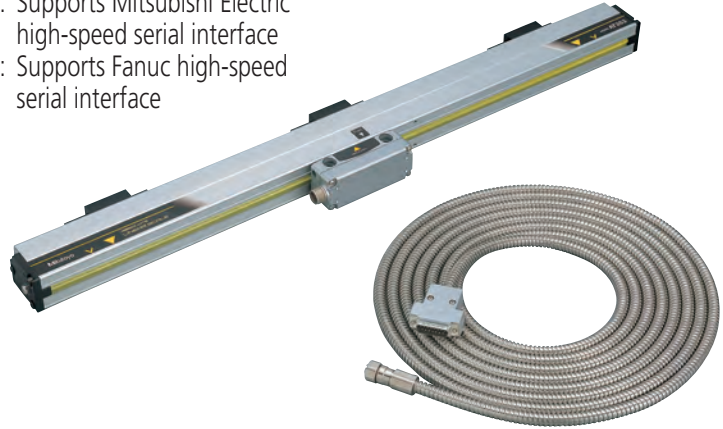
Effective range:	4 - 120" (100 - 3000mm)
Accuracy (at 20°C):	
100 to 1500mm	(3+3L/1000)µm
1600 to 3000mm	(5+5L/1000)µm
	L = Effective range (mm)
Signal output pitch:	20µm
Maximum response speed:	120m/min.
Resolution:	0.05µm
Dust/Water protection level:	IP53

# AT300 Linear Scales

## SERIES 539 — ABSOLUTE and Standard Spar Type

### FEATURES

- Sealed type absolute linear scales with very fine resolution up to 0.05µm.
- Direct connection with NC machine tools are possible.
  - ABS AT303: Supports Mitutoyo standard serial interface
  - ABS AT343: Supports Mitsubishi Electric high-speed serial interface
  - ABS AT353: Supports Fanuc high-speed serial interface



# AT500 Linear Scales

## SERIES 539 — ABSOLUTE and Slim Spar Type

### FEATURES

- Sealed type absolute linear scales with very fine resolution up to 0.05µm.
- Direct connection with NC machine tools are possible.
  - ABS AT505/AT503: Supports Mitutoyo standard serial interface
  - ABS AT545/AT543: Supports Mitsubishi Electric high-speed serial interface
  - ABS AT555/AT553: Supports Fanuc high-speed serial interface
- Two types are available:
  - S model: high-rigid type
  - H model: high-accuracy type.



### Technical Data

Effective range:	
-S model	4 - 88" (100 - 2200mm)
-H model	4 - 40" (100 - 1000mm)
Accuracy (at 20°C):	
-S model	(3+3L/1000)µm
-H model	(2+2L/1000)µm
	L = Effective range (mm)
Signal output pitch:	20µm
Maximum response speed:	150m/min.
	(72m/min: ABS AT5_5-H model)
Resolution:	
ABS AT5_5 model:	0.005µm
ABS AT5_3 model:	0.05µm
Dust/Water protection level:	IP53



# ST700 Series Linear Scales

## SERIES 579 — ABSOLUTE and High Environment Resistance Type



### FEATURES

- Absolute scales have eliminated the need for origin restoration.
- Optimized for the control of linear motors.
- Optimized for high-speed, high-acceleration control.
- Provides high resistance to the contamination of water and oil.
- A non-contact detection system allows a longer service life.
- Signal adjustment at installation is automatically performed with dedicated software.



### Technical Data

Effective range:	4 - 240" (100 - 6000mm)
Accuracy (at 20°C):	(8+5L/1000)µm L = Effective range (mm)
Detecting method:	Electromagnetic induction system
Resolution:	0.1, 0.5µm
Maximum response speed:	5000mm/sec
Dust/Water protection level:	IP65

### Signal Adjusting Method When Mounting ABS ST700 Series

Patented (United States), patent pending (Japan, China, and Europe).

In order for signal adjustment and confirmation after the unit is mounted, the "ABS ST700 Signal Adjustment Program" dedicated software and a conversion unit are necessary.

Using this software, the following settings and confirmation can be made.

- 1) Automatic adjustment of scale signals → The scale base and detector head must have been mounted observing the prescribed dimensions
- 2) Scale signal amplitude (signal intensity) check
- 3) Scale origin (absolute position data = 0) setting
- 4) Absolute position data check
- 5) Error history clear
- 6) ABS synthesis error check (only for models with effective measuring length of 3200mm to 6000mm).

#### Required Items

Item	Qty	Description	Remarks
PC*	1	Windows	Prepared by the customer.
Conversion unit	1	SS-4248WP-1or2 (System Sacom Sales Corp.)	Option (package deal)
Connection cable A	1	RS-232C cable	
Connection cable B	1	RS-485 cable	
Dedicated software	1	Name of software: "ABS ST700 Signal Adjustment Program"	

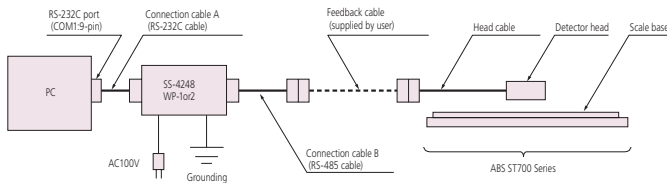
\*The following defines the minimum specification of the PC necessary to run this program.  
 PC : DOS/V with Pentium 200 MHz or faster (with RS-232C port)  
 Memory : 64 MB min. (128 MB or more recommended)  
 Program size : 10MB  
 OS : Windows95 or later  
 Monitor : 256 colors, 800 x 600 or higher resolution  
 (1,024 x 768 or higher resolution recommended)  
 RS-232C : COM1 port normally used (another can also be used.)

#### "Conversion Unit, Dedicated Software" Set Parts No.\*

Power Supply Specifications	Parts No.	Scale Type
AC adaptor specifications	09ZAA175	ABS ST74□A, ABS ST74□AL Note: When connected to MR-J2S.
	09ZAA177	ABS ST77□A, ABS ST77□AL, ABS ST78□A, ABS ST78□AL
	09ZAA179	ABS ST74□A, ABS ST74□AL Note: When connected to MR-J3. ABS ST70□A, ABS ST70□AL, ABS ST74□L, ABS ST74□L
	06ACN747	ABS ST75□, ABS ST75□L
Power supply cable specifications	09ZAA176	ABS ST74□A, ABS ST74□AL Note: When connected to MR-J2S.
	09ZAA178	ABS ST77□A, ABS ST77□AL, ABS ST78□A, ABS ST78□AL
	09ZAA180	ABS ST74□A, ABS ST74□AL Note: When connected to MR-J3. ABS ST70□A, ABS ST70□AL, ABS ST74□L, ABS ST74□L
	06ACN750	ABS ST75□, ABS ST75□L

\*With 0.05 µm resolution, custom software is required.

#### Connection Method



\*Ground the device to prevent the risk of electric shock  
 \*Connect the head cable with connection cable B when using "Part No.09ZAA179" and "Part No.09ZAA180".

### Compatibility of Detector Head and Main Scale

- For the ST700A series with effective range of 3000mm or less and the ST700AL series with effective range of 3200mm or more, note the following differences when mounting the detector head.

Please note that ST700A (100mm-3000mm range) and ST700AL (3200mm-6000mm range) detector head or scale **are not** compatible. ST700A scale and detector head are compatible. Also, ST700AL scale and detector head **are** compatible. ST700AL (3200mm-6000mm) requires signal adjustment software.

Main Scale		Detector Head
For effective range of 3200mm to 6000mm	← Compatible →	For effective range of 3200mm to 6000mm
	← Incompatible →	
For effective range of 3000mm or less	← Compatible →	For effective range of 3000mm or less

### Feedback cable

- Yaskawa Electric Corporation serial cable can be used as the feedback cable to connect to a Yaskawa Electric Corporation servo amplifier.

Cable model number : JZSP-CLP- (03, 05, 10, 15, 20)

- For the feedback cable to connect to a Mitsubishi Electric Corporation MR-J2S/MR-J3, contact Mitutoyo with the following code numbers.

For the MR-J2S	5m :	No.06ACF116A
	10m :	No.06ACF116B
For the MR-J3	5m :	No.06ACF117A
	10m :	No.06ACF117B



### Technical Data

Effective range:	0.4 - 120" (10 - 3000mm)	
Accuracy (at 20°C):		
10 - 300mm	±0.5µm	
350 - 500mm	±1µm	
500 - 1000mm	±2µm	
1000 - 3000mm	±2µm/m	
Output signal:	Two 90° phase-shifted sinusoidal signals	
	Two 90° phase-shifted quadrature signals	
Scale grating pitch:	8µm	
Signal output pitch:	4µm	
Resolution:	0.01, 0.02, 0.05, 0.1µm	
Maximum response speed:	1200mm/sec	
Scale reference point pitch:		
10 - 80mm	Center point	
100 - 3000mm	50mm	

## ST36 Linear Scales

### SERIES 579 — High Accuracy Type

#### FEATURES

- High-resolution, high-accuracy and portable model designed for exposed installation.
- High-reliability with stable signal output.
- Outputs two-phase sine wave signal (signal pitch 4µm) and two-phase pulse signal simultaneously.
- Equipped with a compact interface box.



### Technical Data

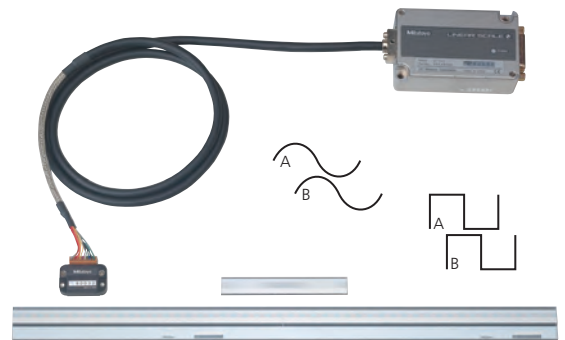
Effective range:	0.4 - 120" (10 - 3000mm)	
Accuracy (at 20°C):		
10 - 300mm	±1µm	
350 - 500mm	±2µm	
500 - 1000mm	±3µm	
1100 - 3000mm	±3.0µm/m	
Output signal:	Two 90° phase-shifted sinusoidal signals	
	Two 90° phase-shifted quadrature signals	
Scale grating pitch:	40µm	
Signal output pitch:	40µm	
Resolution:	0.2, 0.5, 1, 5µm	
Maximum response speed:	5000mm/sec	
Scale reference point pitch:		
10 - 75mm	Center point	
100 - 3000mm	50mm	

## ST422 Linear Scales

### SERIES 579 — Compact Type

#### FEATURES

- Compact design exposed type incremental linear scales.
- Maximum of up to 5000mm/s high response speed.
- Provided with alarm LED error indication with fault detection signal output for over speed and sinusoidal signal anomaly errors.



### Technical Data

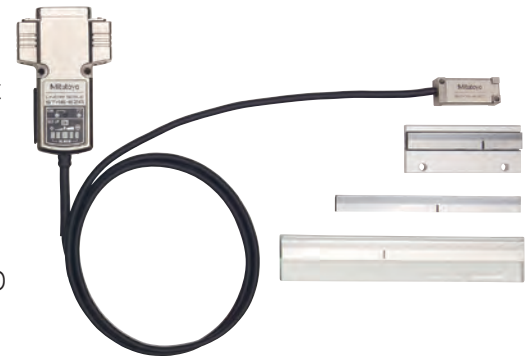
Effective Range:	10 - 3000mm (Glass scale)	
Accuracy (at 20°C) :		
10 - 300mm	±1µm	
350 - 500mm	±2µm	
600 - 1000mm	±3µm	
1100 - 3000mm	±3µm/m	
Output signal:	Pulse and sinusoidal signal outputs compliant with RS-422	
Scale grating pitch:	20µm	
Signal output pitch:	20µm	
Minimum resolution:	0.05µm	
Maximum response speed:	2600mm/s	
Scale reference point pitch:		
10-80mm	Center point	
100-3000mm	50mm	
Equipped with EZA function		

## ST46-EZA Glass Linear Scales

### SERIES 579 — Glass and EZA Type

#### FEATURES

- EZA function enhanced ST46, valued for compact reader head.
- Simple installation and adjustment without oscilloscope, dedicated tester and PC.
- Compact detector head and control unit design promotes efficient integration.
- Maximum effective length of 3000mm for large device applications.
- Anomalies signaled through integrated LED display.
- Maximum response speed of 2600mm/sec (Sine wave max response speed at -3dB).



# KA Counter

## SERIES 174 — Standard Type

### FEATURES

- High performance, low cost 2 or 3 axis counter
- The KA counter has both mill and lathe functions, as well as standard functions
- Connectable with AT715 electromagnetic scales and AT100 series glass scales



174-173A (for 1-axis or 2-axis)

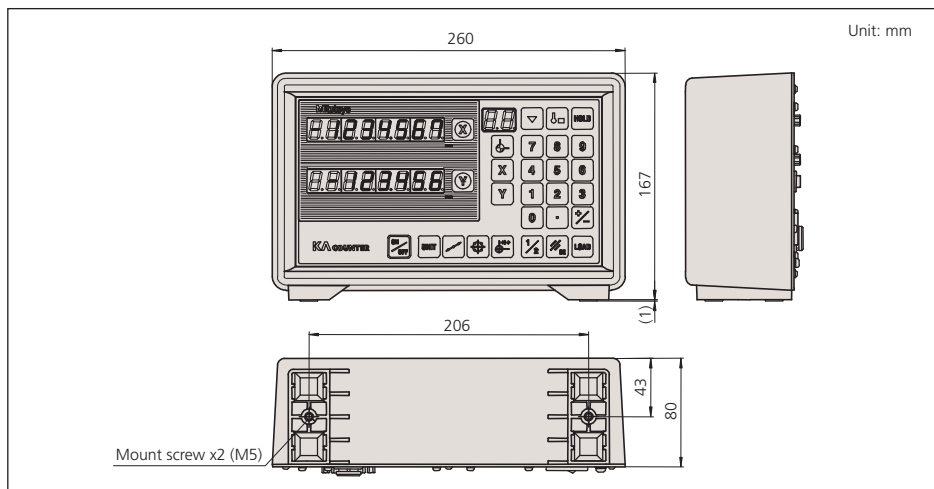


174-175A (for 3-axis)

### SPECIFICATIONS

Order No.	174-173A	174-175A
Scale input ports	2	3

### DIMENSIONS

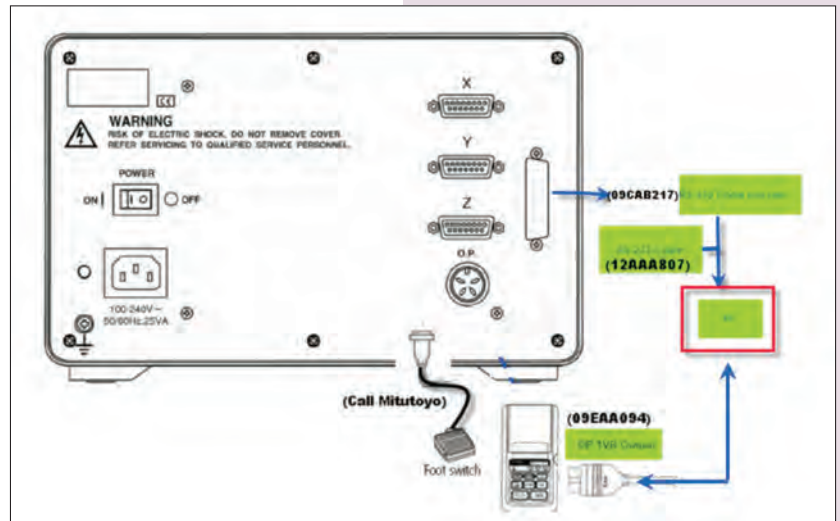


### Technical Data: Common

Scale input ports: 2, 3  
 Resolution: .000005", .00005", .0001", .0002", .0005"  
 (0.0001mm, 0.001mm, 0.002mm, 0.005mm, 0.010mm) (changeable with parameters)  
 Display: 7-digit LED and a negative [-] sign  
 Power supply: 100V-240V AC, 50/60Hz  
 Mass: 1.1kg (2-axis), 1.2kg (3-axis)

### Optional Accessories

- 09CAB217: RS232C code out unit
- 64PMT114: Converter cable, RS232C to Digimatic SPC
- 965004: RS-232C ext. load foot switch
- 264-504-5A: DP-1VR, 120V AC
- 09EAA094: RS-232C counter cable



### Functions

ZERO	Zero-Setting	●
P.SET	Preset	●
0.001 / 1.001	Resolution setting	● <sup>1</sup>
→	Counting direction setting	●
mm / in	mm/inch conversion	●
1/2	1/2 calculation	●
↔	ABS/INC coordinate selection	● <sup>2</sup>
123	Lower digit blanking out	●
📄	Memory backup	●
📏	Expansion/contraction coefficient setting	●
📏	Zero approach machining [ABS mode]	●
📏	Zero approach machining [INC mode]	●
📏	Bolt-hole circle machining	●
📏	Touch-signal probe	○
📏	Scale reference point setting	● <sup>6</sup>
MAX / MIN	Maximum/minimum value hold	●
DIA	Diameter display	●
Z1-Z2	Addition of 2-scale data	● <sup>4</sup>
TOOL	Cutting tool selection	● <sup>5</sup>
📏	Linearity error compensation	●
1234	Smoothing	●
RS-232C OUTPUT	RS-232C Interface Unit	○

- : Provided as standard
- : Optional accessory
- <sup>1</sup> Resolutions to be set differ depending upon the type of Counters.
- <sup>2</sup> 1 absolute (ABS) coordinate and 9 incremental (INC) coordinate are provided for the KA Counter.
- <sup>4</sup> Not available on the 1-axis Counters.
- <sup>5</sup> Not available on the 2-axis Counters.
- <sup>6</sup> 10 cutting tools can be specified on the KA Counter. When connecting AT100 Series Glass Scale.

# KLD Counter

## SERIES 174 — Special Purpose Type with Limit Signal Output

### FEATURES

- A 1-axis counter dedicated to sending signals when a linear scale displacement value and a preset limit value coincide.
- Two types of limit settings are available: 2 steps, 4 steps.
- Connectable with AT715 electromagnetic scale or AT100 series glass scale.
- For controlling a vertical position of an EDM or a grinding machine.
- Can be connected to a personal computer or a sequencer by installing an RS-232C Interface Unit or a BCD Code Out Unit. (Both interface units are optional accessories.)

### Technical Data: Common

Limit signal output: 1-step, 4-step  
 Scale input ports: 1  
 Resolution: 0.0005mm, 0.001mm, 0.002mm, 0.005mm, 0.01mm, .00002", .00005", .0001", .0002", .0005", .001"  
 Display: 9-digit LED and a negative [-] sign  
 Limit value setting method: Digital switch, Ten-keyboard  
 Power supply: 100-120V/200-240V AC, 50/60Hz  
 Mass: 4.5kg

### Optional Accessories

**907569:** RS-232C Interface Unit  
**907570:** BCD Code Out Unit  
**965004:** External load foot switch\*  
**937326:** External load box\*  
**936551:** External zero-set box  
 \*RS-232C Interface Unit (907569) is required



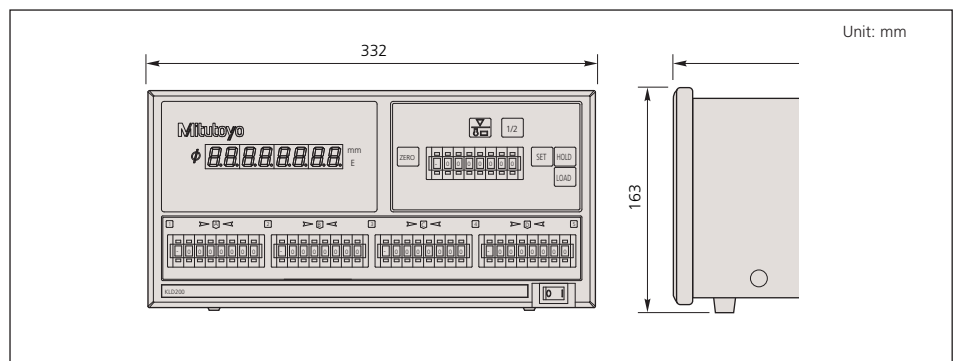
### SPECIFICATIONS

Order No.	174-147A
Limit signal output	4-step
Limit value setting method	Digital switch

Function	Counter	KLD
Zero-setting	●	●
Zero-set remote controller	—	—
Preset	●	●
Resolution setting	●	●
Counting direction setting	●	●
mm/inch conversion	●	●
1/2 calculation	●	●
ABS/INC coordinate selection	—	—
Lower digit blanking out	●	●
Memory backup	●	●
Expansion/contraction coefficient setting	●	●
Zero approach machining (ABS mode)	—	—
Zero approach machining (INC mode)	—	—
Bolt-hole circle machining	—	—
Touch-signal probe	▲	▲
Scale reference point setting	●	●
Addition/subtraction	—	—
Maximum/minimum value hold	●	●

●: Provided as standard  
 ▲: Optional accessory  
 —: Not available

### DIMENSIONS



# PSU-200

## SERIES 539 — Pulse Signal Conversion Interface

### FEATURES

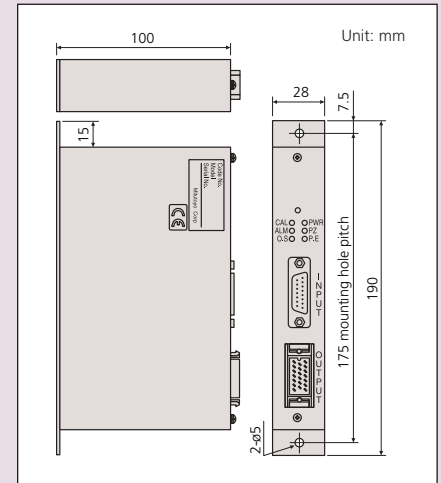
- Applicable with Linear Scales with the sinusoidal signal output.
- Quadrature signal output (conforming to EIA standard RS422-A).
- Alarm function for detecting broken wires or short circuits in the detector, over-speed and fluctuation errors in the input signal from the detector.

### SPECIFICATIONS

Order No.	539-005
Number of axes	1
Number of deviation	4, 8, 10, 20, 40, 80, 100 or 200 (switchable)
Functions	Division setting, Min. edge interval setting, LED for alarm indication, Alarm output mode switching, LED for origin detection, LED for low-level power supply voltage warning
Power supply	DC5V±5%
Consumption	200mA
Mass	620g



### DIMENSIONS



# MICSYS-SA1 2D Image Correlation Encoder

## SERIES 549

### FEATURES

- High accuracy non-contact 2D encoder using image correlation.
- Simultaneous X-Y position measurements.
- Nanometer resolution.
- Easy alignment.
- Allows minute strain measurement and deflection measurement.

### Applications

1. Evaluation of stages used in manufacturing equipment and inspection systems

a) Evaluation of position repeatability      b) Evaluation of standstill stability and drift
2. Highly accurate positioning of workpieces

Actuator      Device      Setting and removal      X and Y stages
3. Measurement of minute displacement

Load      Structure (beam)      MICSYS      Device      Measure displacement caused by temperature or humidity fluctuations or other factors and displacement caused during a material attachment process, etc.

a) Measurement of minute displacement of a structure      b) Measurement of minute displacement of a workpiece



### Technical Data

Effective range:	±100μm (2D)
Accuracy (at 20°C):	±100nm
Resolution:	1nm
Working Distance:	10±0.2mm (Including thickness of standard target: 6.1mm)
Linearity (at 20°C):	80nm
Repeatability (at 20°C):	5nm