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Horizontal ABSOLUTE Scale Coolant Proof IP66



Series 572 - Horizontal

You can use this scale unit in adverse environments with water and cutting oil due to its new detection method (electromagnetic induction).

- Specially designed output cables are developed to maintain the water resistant structure.
- You will have no overspeed error since the ABSOLUTE scale does not depend on counting scale graduations.
- Once an absolute zero (origin) point is set, the Digimatic Scale Unit shows the absolute distance from this point when it is powered on, rather than „0“.



572-601

Metric

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	Mass [g]
572-600	0-100	0,03 mm	209	185	390
572-601	0-150	0,03 mm	259	235	410
572-602	0-200	0,03 mm	311	287	430



Functions	Series 572 - Horizontal
ORIGIN (ABS-Zero)	●
Auto Power OFF after 20 min. non use	●
Low voltage alarm	●
Data output	●

Specifications

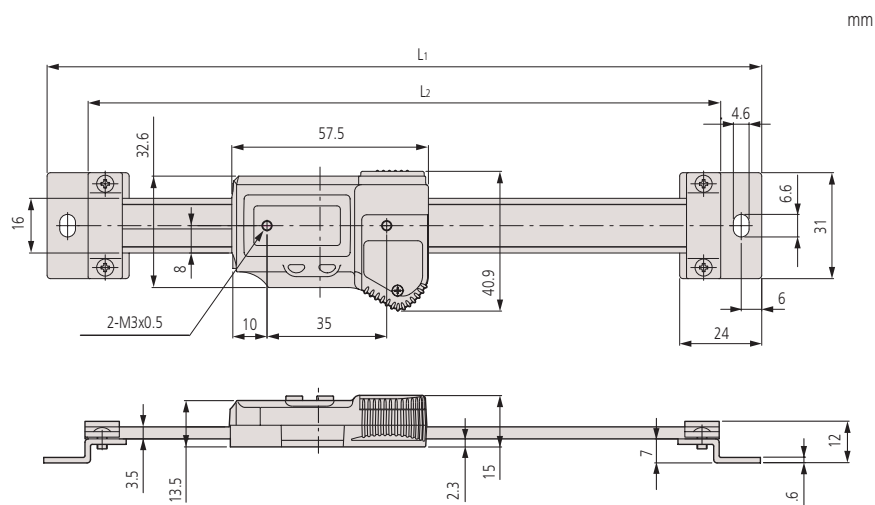
Accuracy	Refer to the list of specifications (excluding quantizing error)
Repeatability	0,01 mm
Max. response speed	Unlimited
Digital step	0,01 mm

Optional accessories

No.	Description
05CZA624	Digimatic cable with data switch (1 m)
05CZA625	Digimatic cable with data switch (2 m)
02AZD790A	Connecting cable U-Wave with data switch
06ADV380A	USB Input Tool Direct cable (2 m)

Consumable spares

No.	Description
938882	Battery SR44



Horizontal ABSOLUTE Scale Standard

Series 572

This unit has an ABSOLUTE capacitive-type scale.

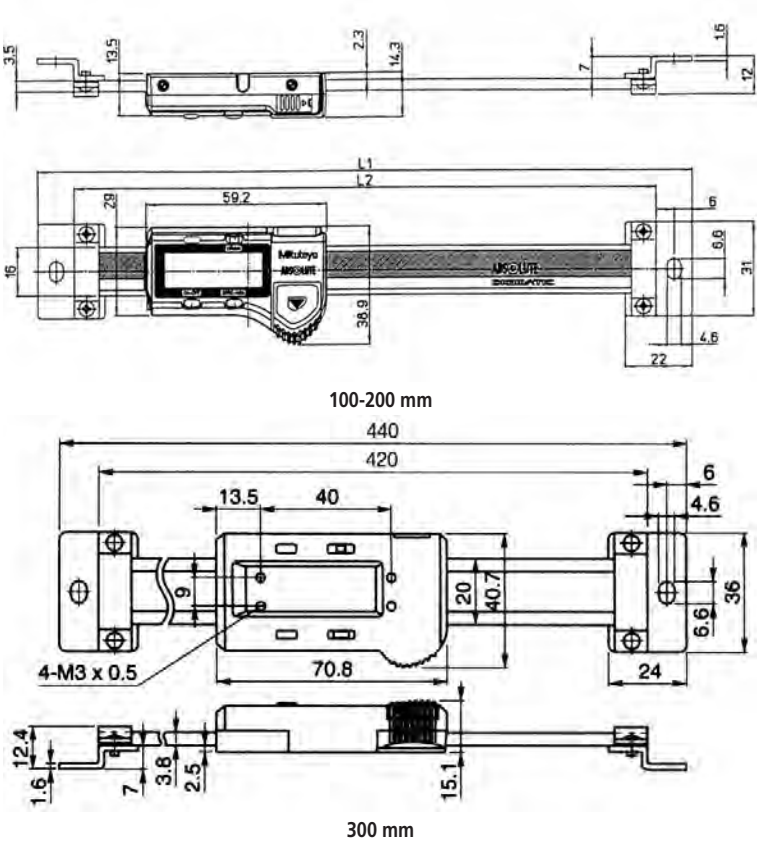
- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- You can make the highest precision measurements even at the highest drive speed.
- The display has large characters, making it easy to read.



572-202-20

Metric

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	Mass [g]
572-200-20	0-100	0,03 mm	209	185	230
572-201-20	0-150	0,03 mm	259	235	250
572-202-20	0-200	0,03 mm	311	287	270
572-203-10	0-300	0,04 mm	444	420	370



ABSOLUTE®

Functions	Series 572
ON/OFF	●
Low voltage alarm	●
Data output	●
ZERO SET	●
ORIGIN	●

Specifications

Accuracy	Refer to the list of specifications (excluding quantizing error)
Max. response speed	Unlimited
Digital step	0,01 mm
Delivered	One battery

Optional accessories

No.	Description
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
959143	Data-hold unit
959149	Digimatic cable with data switch (1 m)
959150	Digimatic cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch
06ADV380C	USB Input tool Direct cable with data switch (2 m)

Consumable spares

No.	Description
938882	Battery SR44

Horizontal ABSOLUTE Scale Measurement Direction Switching

ABSOLUTE®

Functions	Series 572
ON/OFF	●
DATA/HOLD	●
Low voltage alarm	●
Data output	●
ZERO SET	●
ORIGIN	●
PRESET	●
Counting direction switchable	●

Specifications

Accuracy	Refer to the list of specifications (excluding quantizing error)
Max. response speed	Unlimited
Digital step	0,01 mm
Delivered	One battery

Optional accessories

No.	Description
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
06ADV380C	USB Input tool Direct cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch

Consumable spares

No.	Description
938882	Battery SR44

Series 572

This unit has an ABSOLUTE capacitive-type scale.

It offers you the following benefits:

- The ZERO point is set only once and is stored as the ABSOLUTE ZERO point until the next battery replacement.
- You can make the highest precision measurements even at the highest drive speed.
- The display has large characters, making it easy to read.

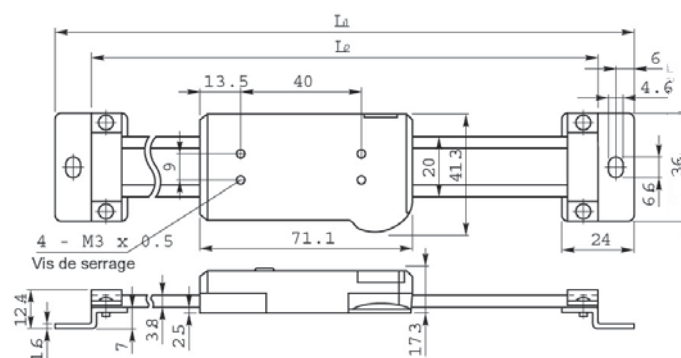


572-461

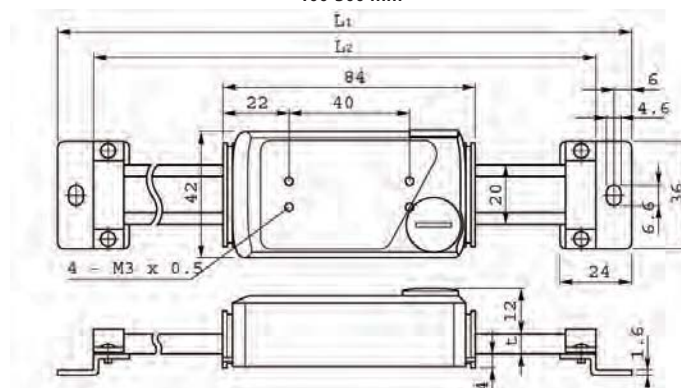
Metric

Without diameter function, with reversible counting direction

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	Mass [g]
572-460	0-100	0,03 mm	244	220	250
572-461	0-150	0,03 mm	294	270	280
572-462	0-200	0,03 mm	344	320	310
572-463	0-300	0,04 mm	444	420	370
572-464	0-450	0,04 mm	594	570	760
572-465	0-600	0,05 mm	774	750	900
572-466	0-800	0,06 mm	974	950	1710
572-467	0-1000	0,07 mm	1174	1150	2040



100-300 mm



450-1000 mm

Horizontal ABSOLUTE Scale Diameter Function

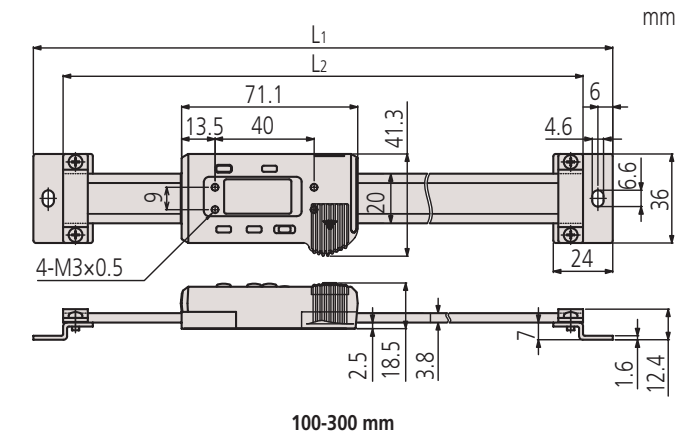
Series 572

- The ZERO point is set only once and is stored as the ABSOLUTE ZERO point until the next battery replacement
- You can make the highest precision measurements even at the highest drive speed.

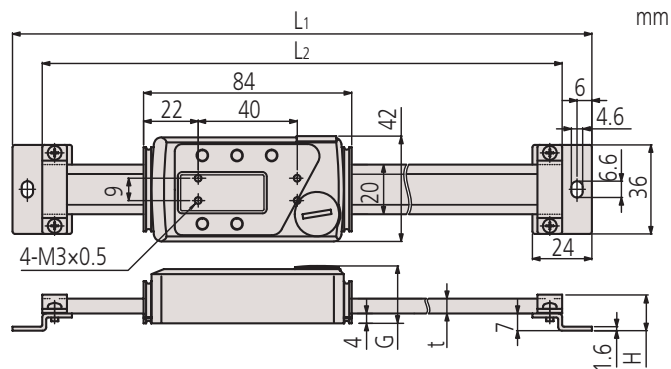


Metric Horizontal multi-function type with diameter displaying function

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	G [mm]	t [mm]	Mass [g]
572-480-10	0-100	0,03 mm	244	220			250
572-481-10	0-150	0,03 mm	294	270			280
572-482-10	0-200	0,03 mm	344	320			310
572-483-10	0-300	0,04 mm	444	420			370
572-484-10	0-450	0,04 mm	594	570	23,2	6	760
572-485-10	0-600	0,05 mm	774	750	23,2	6	900
572-486-10	0-800	0,06 mm	974	950	27,2	10	1710
572-487-10	0-1000	0,07 mm	1174	1150	27,2	10	2040



100-300 mm



450-1000 mm



Functions	Series 572
ON/OFF	
DATA/HOLD	
Low voltage alarm	
Data output	
ZERO SET	
PRESET	
Diameter function	
ORIGIN	

Specifications

Accuracy	Refer to the list of specifications (excluding quantizing error)
Digital step	0,01 mm
Max response speed	Unlimited
Delivered	One battery

Optional accessories

No.	Description
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
06ADV380C	USB Input tool Direct cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch

Consumable spares

No.	Description
938882	Battery SR44

Vertical ABSOLUTE Scale Standard

ABSOLUTE®

Series 572

This unit has an ABSOLUTE capacitive-type scale.

It offers you the following benefits:

- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- You can make the highest precision measurements even at the highest drive speed.
- The display has large characters, making it easy to read.

Functions	Series 572
ON/OFF	●
Low voltage alarm	●
Data output	●
ZERO SET	●
PRESET	●
Counting direction switchable	●
ORIGIN	●

Specifications

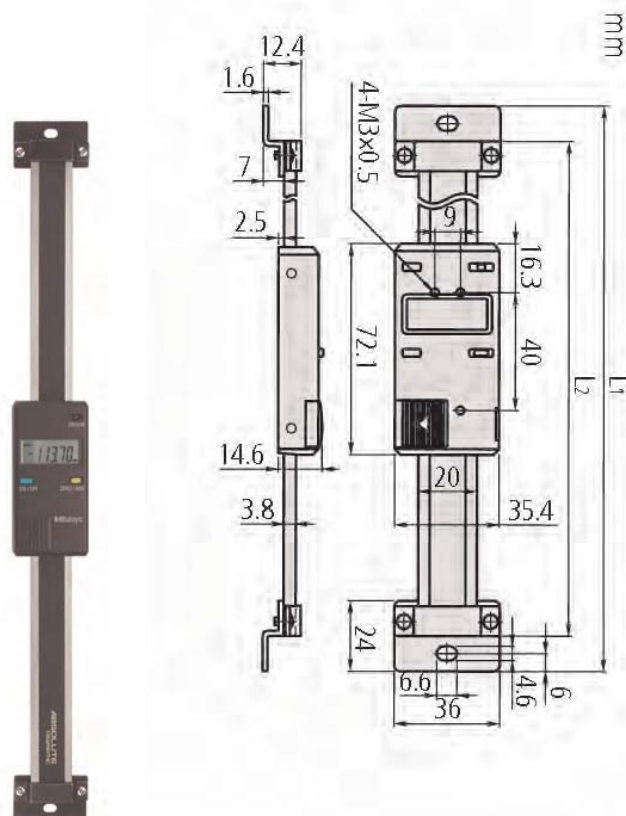
Accuracy	Refer to the list of specifications. (excluding quantizing error)
Max. response speed	Unlimited
Digital step	0,01 mm
Delivered	One battery

Optional accessories

No.	Description
959143	Data-hold unit
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
959149	Digimatic cable with data switch (1 m)
959150	Digimatic cable with data switch (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
06ADV380C	USB Input tool Direct cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch

Consumable spares

No.	Description
938882	Battery SR44



572-302-10

Metric

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	Mass [g]
572-300-10	0-100	0,03 mm	244	220	250
572-301-10	0-150	0,03 mm	294	270	280
572-302-10	0-200	0,03 mm	344	320	310
572-303-10	0-300	0,04 mm	444	420	370



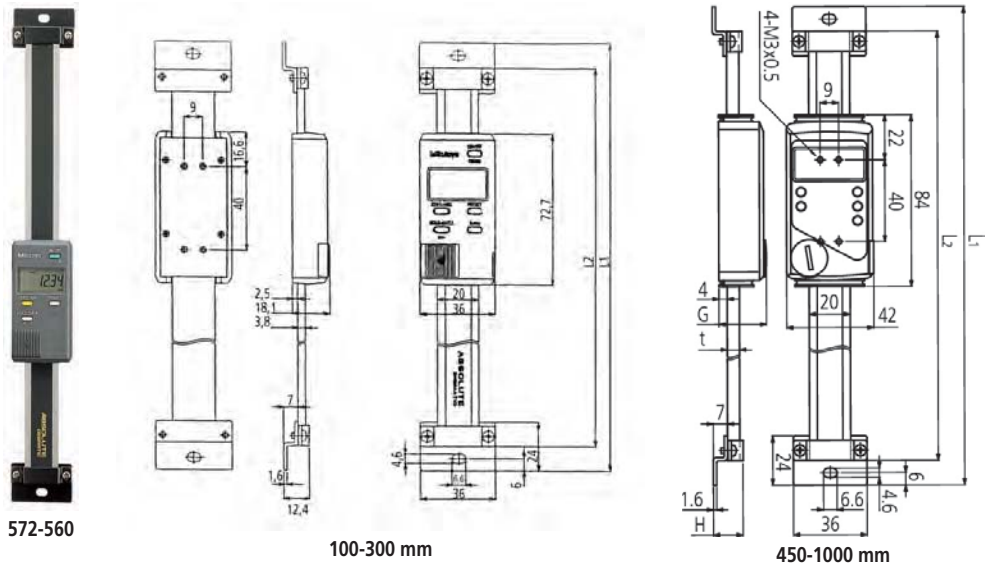
Vertical ABSOLUTE Scale Measurement Direction Switching

Series 572



This unit has an ABSOLUTE capacitive-type scale. It offers you the following benefits:

- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- The display has large characters, making it easy to read.
- Measurement direction switching function is included.



Metric

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	G [mm]	t [mm]	Mass [g]
572-560	0-100	0,03 mm	244	220			250
572-561	0-150	0,03 mm	294	270			280
572-562	0-200	0,03 mm	344	320			310
572-563	0-300	0,04 mm	444	420			370
572-564	0-450	0,04 mm	594	570	23,2	6	760
572-565	0-600	0,05 mm	774	750	23,2	6	900
572-566	0-800	0,06 mm	974	950	27,2	10	1710
572-567	0-1000	0,07 mm	1174	1150	27,2	10	2040



Functions	Series 572
ORIGIN (ABS-Zero)	●
ON/OFF	●
DATA/HOLD	●
Data output	●
ZERO SET	●
PRESET	●
Counting direction switchable	●

Specifications

Accuracy	Refer to the list of specifications (excluding quantizing error)
Max. response speed	Unlimited
Digital step	0,01 mm
Delivered	One battery

Optional accessories

No.	Description
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
06ADV380C	USB Input tool Direct cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch

Consumable spares

No.	Description
938882	Battery SR44

Vertical ABSOLUTE Scale Diameter Function

ABSOLUTE®

Series 572

This unit has an ABSOLUTE capacitive-type scale.

- The ZERO point is set only once and is stored as the absolute ZERO point until the next battery replacement.
- The display has large characters, making it easy to read.
- Diameter measurement function is included.

Functions	Series 572
ON/OFF	●
DATA/HOLD	●
Low voltage alarm	●
Data output	●
ZERO SET	●
PRESET	●
Diameter function	●
ORIGIN	●

Specifications

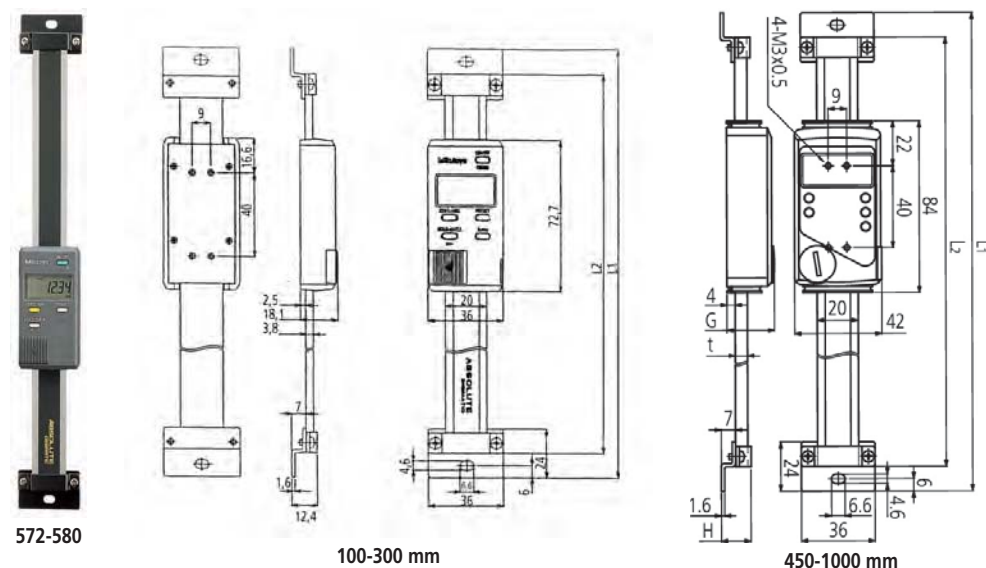
Accuracy	Refer to the list of specifications (excluding quantizing error)
Digital step	0,01 mm
Max. drive speed	Unlimited
Delivered	One battery

Optional accessories

No.	Description
905338	Digimatic cable (1 m)
905409	Digimatic cable (2 m)
905689	Digimatic cable (1 m)
905690	Digimatic cable (2m)
905691	Digimatic cable (1m)
905692	Digimatic cable (2m)
905693	Digimatic cable (1m)
905694	Digimatic cable (2 m)
06ADV380C	USB Input tool Direct cable with data switch (2 m)
02AZD790C	U-WAVE Data Cable with data switch

Consumable spares

No.	Description
938882	Battery SR44



Metric

No.	Range [mm]	Accuracy	L1 [mm]	L2 [mm]	G [mm]	H [mm]	t [mm]	Mass [g]
572-580-10	0-100	0,03 mm	244	220				250
572-581-10	0-150	0,03 mm	294	270				280
572-582-10	0-200	0,03 mm	344	320				310
572-583-10	0-300	0,04 mm	444	420				370
572-584-10	0-450	0,04 mm	594	570	23,2	14,6	6	760
572-585-10	0-600	0,05 mm	774	750	23,2	14,6	6	900
572-586-10	0-800	0,06 mm	974	950	27,2	18,6	10	1710
572-587-10	0-1000	0,07 mm	1174	1150	27,2	18,6	10	2040



DRO Scale Unit Selection Guide



AT 715
Absolute Type

AT 103
Standard-size Type

AT 113
Slim Type

Model	AT715	AT103	AT113, AT116	AT112-F	AT181
Measurement method	Electromagnetic induction system		Photoelectric (transparent linear encoder)		
Light source	LED				
Receptor	Phototransistor			Photodiode	
Output wave form	2-phase sine waves with a phase difference of 90°				
Effective length (for high accuracy type)	100 - 3000mm	100 - 6000mm (100 - 2000mm)	100 - 1500mm (100 - 1500mm)	50 - 1020mm (50 - 1020mm)	100 - 600mm (100 - 600mm)
Accuracy* [high accuracy type]	±5μm (Effective length: 100 - 500mm) ±7μm (Effective length: 600 - 1800mm) ±10μm (Effective length: 2000 - 3000mm)	(5+5L/1000)μm*1 [(3+3L/1000)μm]	(5+5L/1000)μm [(3+3L/1000)μm**2]	(5+5L/1000)μm [(3+3L/1000)μm]	(5+5L/1000)μm [(3+3L/1000)μm]
* Excluding quantizing error of a 1 count					
Maximum response speed	50m/min.	120m/min.*3	120m/min. (50m/min.; AT116)	50m/min.	50m/min.
Scale reference point	Absolute system		At every 50mm interval		
Linear expansion coefficient			(8±1)×10 ⁻⁶ /°C		
Power supply	5V±5% DC		5V±5% DC		
Max. current consumption	70mA		70mA**1 (60mA: AT113, AT116)		70mA
Operating temperature	0°C to 45°C				
Storage temperature	-20°C to 70°C				
Relative humidity	20 - 80%RH				
Head Cable length	—	—	*1	0.3m	—
Sliding force	5N or less		5N or less		6N or less
Single cable*5	Standard accessory (refer to individual specifications for the length)				
Dust/water protection level	IP67		IP53		IP54

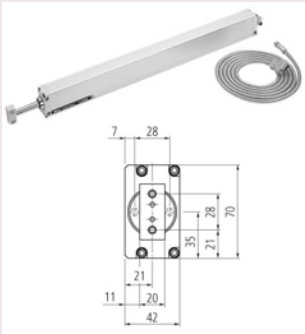
*1: (5+5L/1000)μm for models over 1020mm effective length *2: not available for AT116 *3: 50m/min. for models over 3250mm effective length *4: 140mA for models over 3250mm effective length
*5: Vinyl-coated type single cable and extension cable are available on request. *6: AT103 0.3m AT116: Without head cable



AT 116
Economy and Slim Type



AT 112-F
Super Slim Type



AT 181
Plunger Type

DRO LINEAR SCALES AT103

Specifications

Effective range (L0)	100-3000 mm
Accuracy	(5+5L/1000) µm L = Effective range (mm)
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Max. drive speed	120 m/min.
Signal period	20 µm
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC ± 10%

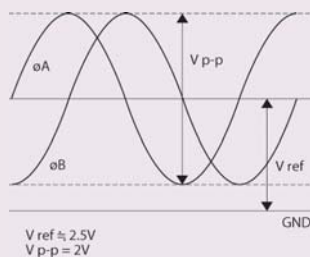
Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-177D	KLD200 Counter 4-step limit signal output



Extension cable

Legend
L0 Effective range
L1 Travel range
L2 Bore centre distance
L3 Total length
L4-L6 Support bracket position



Output waveform

Series 539 - Incremental sealed Standard type

This linear scale gives you enhanced vibration resistance and durability.

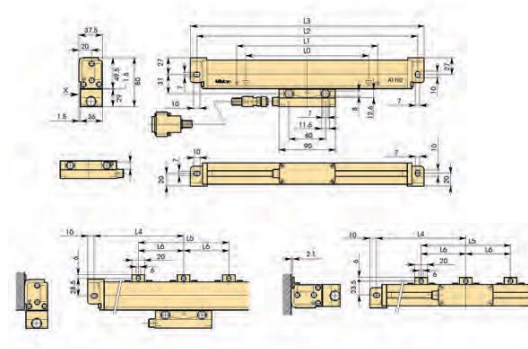
This version of the AT103 offers you the following benefits:

- The innovative rubber lips keep out contaminants when you are using the scale in a machine shop.
- An armoured signal cable is used to connect the scale unit to the DRO counter, so you can operate it safely even in hostile environments.
- The signal cable outlet can be positioned on either side of the slider so you can connect the signal cable from either direction.



539-133

No.	Cable length [m]	Effective range	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	Mass [kg]
539-111-30	3	100 mm	120	248	268				1,5
539-112-30	3	150 mm	170	298	318				
539-113-30	3	200 mm	220	348	368				
539-114-30	3	250 mm	270	398	418				
539-115-30	3	300 mm	330	458	478				
539-116-30	3	350 mm	380	508	528				
539-117-30	3	400 mm	430	558	578				
539-118-30	3	450 mm	480	608	628				
539-119-30	3	500 mm	540	668	688				
539-121-30	3	600 mm	650	778	798				2,6
539-123-30	3	700 mm	760	888	908				2,8
539-124-30	3	750 mm	810	938	958				2,9
539-125-30	3	800 mm	860	988	1008				3
539-126-30	3	900 mm	960	1088	1108				3,3
539-127-30	5	1000 mm	1060	1188	1208	594			3,7
539-128-30	5	1100 mm	1160	1288	1308	644			4
539-129-30	5	1200 mm	1260	1388	1408	694			4,2
539-130-30	5	1300 mm	1360	1488	1508	744			4,4
539-131-30	5	1400 mm	1460	1588	1608	794			4,6
539-132-30	5	1500 mm	1560	1688	1708	844			4,8
539-133-30	5	1600 mm	1690	1818	1838		610		5,1
539-134-30	5	1700 mm	1790	1918	1938		650		5,3
539-135-30	5	1800 mm	1890	2018	2038		670		5,5
539-136-30	5	2000 mm	2100	2228	2248		740		6
539-137-30	5	2200 mm	2300	2428	2448		800		6,4
539-138-30	7	2400 mm	2500	2628	2648	1314	1300	650	7,1
539-139-30	7	2500 mm	2600	2728	2748	1364	1340	670	7,3
539-140-30	7	2600 mm	2700	2828	2848	1414	1400	700	7,5
539-141-30	7	2800 mm	2900	3028	3048	1514	1500	750	7,9
539-142-30	7	3000 mm	3100	3228	3248	1614	1600	800	8,3



DRO LINEAR SCALES AT103

Series 539 - Incremental sealed Standard - Long stroke type

This linear scale gives you enhanced vibration resistance and durability.
This version of the AT103 offers you the following benefits:

- The innovative rubber lips keep out contaminants when you are using the scale in a machine shop.
- An armoured signal cable is used to connect the scale unit to the DRO counter, so you can operate it safely even in harsh environments.
- The signal cable outlet can be positioned on either side of the slider, so you can connect the signal cable from either direction.



539-133

No.	Cable length [m]	Effective range	L ¹ [mm]	L ³ [mm]	L ⁴ [mm]	L ⁵ [mm]	L ⁶ [mm]	Mass [kg]
539-143-30	10	3250 mm	3350	3470	135	3200	800	10,8
539-144-30	10	3500 mm	3600	3720	160	3400	850	11,4
539-145-30	10	3750 mm	3850	3970	125	3720	930	12
539-146-30	10	4000 mm	4100	4220	110	4000	1000	12,6
539-147-30	10	4250 mm	4350	4470	135	4200	1050	13,2
539-148-30	10	4500 mm	4600	4720	160	4400	1100	13,8
539-149-30	15	4750 mm	4850	4970	85	4800	800	15,2
539-150-30	15	5000 mm	5100	5220	120	4980	830	15,8
539-151-30	15	5250 mm	5350	5470	125	5220	870	16,4
539-152-30	15	5500 mm	5600	5720	130	5460	910	17
539-153-30	15	5750 mm	5850	5970	135	5700	950	17,6
539-154-30	15	6000 mm	6100	6220	110	6000	1000	18,2

Specifications

Effective range (L0)	3250-6000 mm
Accuracy	(5+8L/1000) µm L = Effective range (mm)
Output waveform	Two 90° phased-shifted sinusoidal signals (2Vpp)
Max. drive speed	50 m/min.
Signal period	20 µm
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC ± 10%

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output



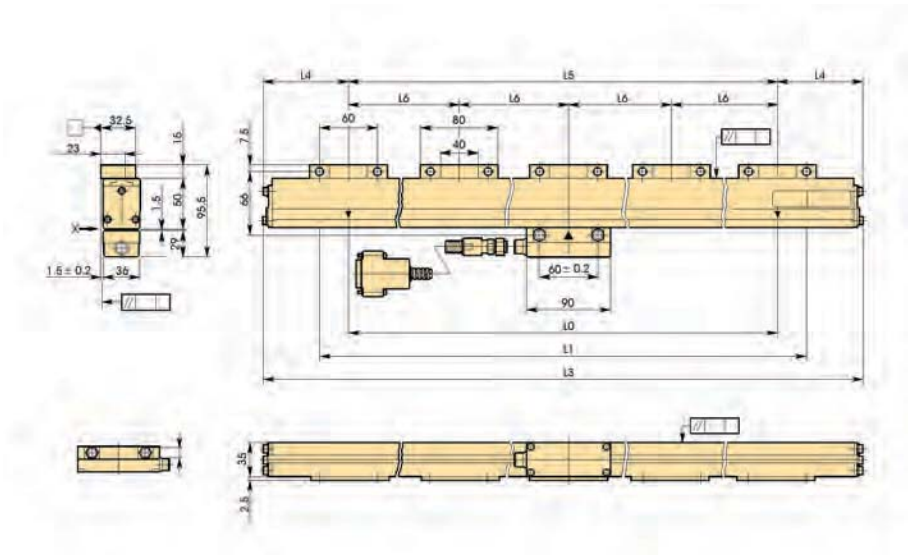
Extension cable

Legend

- L0 Effective range
- L1 Travel range
- L2 Bore centre distance
- L3 Total length
- L4-L6 Support bracket position



Please refer to the DRO leaflet for more details.



DRO LINEAR SCALES AT103 - High Accuracy

Specifications

Effective range (L0)	100-2000 mm
Accuracy	(3+3L/1000) µm L = Effective range (mm)
Scale reference points	every 50 mm
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Dust/water protection level	IP53
Signal period	20 µm
Operation temperature	0°C to 45°C
Max. drive speed	up to 120 m/min.
Power supply	5V DC ± 10%

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output



Extension cable

Legend
 L0 Effective range
 L1 Travel range
 L2-L3 Mount interval
 L4 Overall length
 L5-L6 Support bracket position



Refer to the DRO System leaflet for more details.

Series 539 - Incremental sealed Standard type

This linear scale gives you enhanced vibration resistance and durability.

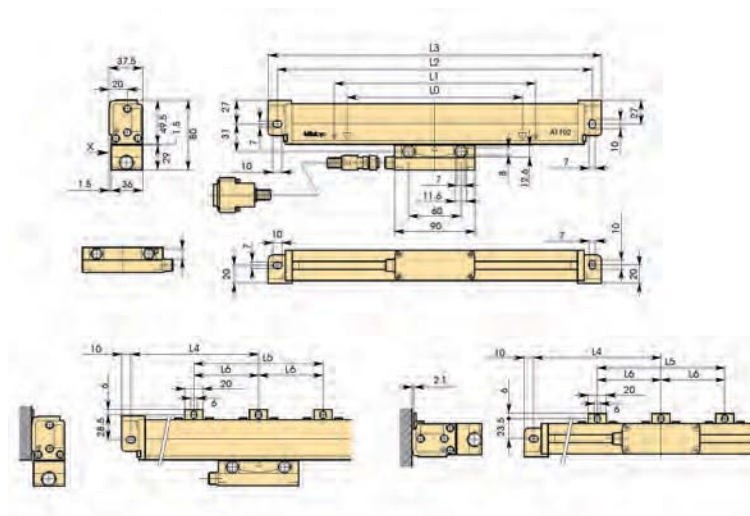
This version of the AT103 offers you the following benefits:

- The innovative rubber lips keep out contaminants when you are using the scale in a machine shop.
- An armoured signal cable is used to connect the scale unit to the DRO counter, so you can operate it safely even in harsh environments.
- The signal cable outlet can be positioned on either side of the slider so you can connect the signal cable from either direction.



539-133

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	L ⁴ [mm]	L ⁵ [mm]	Mass [kg]
539-111-40	3	100 mm	120	248	268			1,5
539-112-40	3	150 mm	170	298	318			
539-113-40	3	200 mm	220	348	368			
539-114-40	3	250 mm	270	398	418			
539-115-40	3	300 mm	330	458	478			
539-116-40	3	350 mm	380	508	528			
539-117-40	3	400 mm	430	558	578			
539-118-40	3	450 mm	480	608	628			
539-119-40	3	500 mm	540	668	688			
539-121-40	3	600 mm	650	778	798			2,6
539-123-40	3	700 mm	760	888	908			2,8
539-124-40	3	750 mm	810	938	958			2,9
539-125-40	3	800 mm	860	988	1008			3
539-126-40	3	900 mm	960	1088	1108			3,3
539-127-40	5	1000 mm	1060	1188	1208	594		3,7
539-128-40	5	1100 mm	1160	1288	1308	644		4
539-129-40	5	1200 mm	1260	1388	1408	694		4,2
539-130-40	5	1300 mm	1360	1488	1508	744		4,4
539-131-40	5	1400 mm	1460	1588	1608	794		4,6
539-132-40	5	1500 mm	1560	1688	1708	844		4,8
539-133-40	5	1600 mm	1690	1818	1838		610	5,1
539-134-40	5	1700 mm	1790	1918	1938		650	5,3
539-135-40	5	1800 mm	1890	2018	2038		670	5,5
539-136-40	5	2000 mm	2100	2228	2248		740	6



DRO LINEAR SCALES AT113

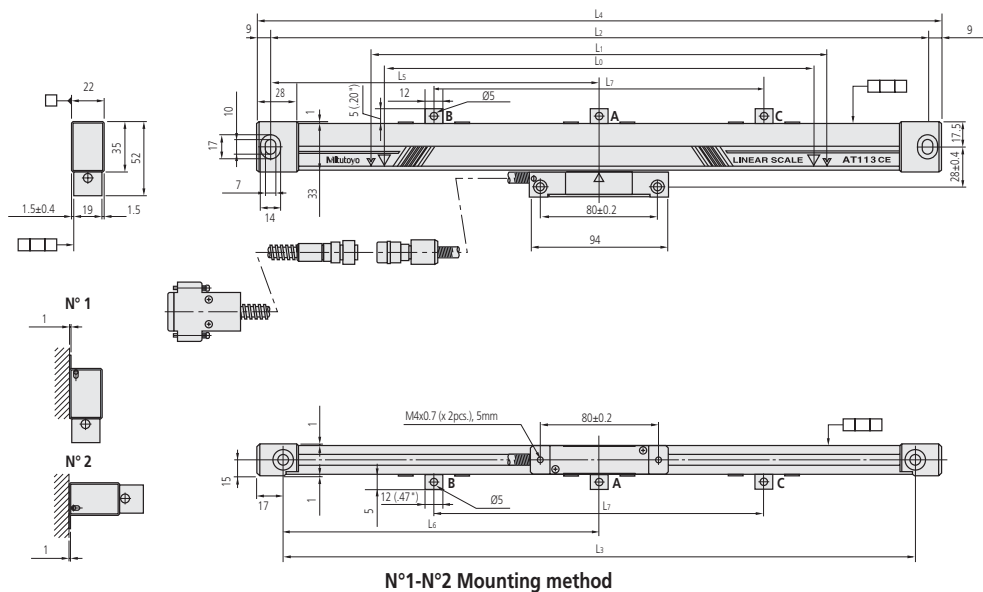
Series 539 - Incremental Sealed Slim Line type

- Glass scale - Zero not coded
- Expansion factor $(8 \pm 1) \times 10^{-6}/K^{-1}$
- An armoured inox signal cable is used to connect the DRO counter



539-201-30

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	L ⁴ [mm]	L ⁵ [mm]	L ⁶ [mm]	L ⁷ [mm]	Mass [kg]
539-201-30	3,5	100 mm	120	258	242	276				0,9
539-202-30	3,5	150 mm	170	308	292	326				
539-203-30	3,5	200 mm	220	358	342	376				
539-204-30	3,5	250 mm	270	408	392	426				
539-205-30	3,5	300 mm	330	468	452	486				
539-206-30	3,5	350 mm	380	518	502	536				
539-207-30	3,5	400 mm	430	568	552	586				
539-208-30	3,5	450 mm	480	618	602	636				
539-209-30	3,5	500 mm	540	678	662	696	339	331		
539-211-30	3,5	600 mm	640	778	762	796	389	381		1,3
539-213-30	3,5	700 mm	740	878	862	896	439	431		1,3
539-214-30	3,5	750 mm	780	918	902	936	459	451		1,4
539-215-30	3,5	800 mm	840	978	962	996	489	481		1,4
539-216-30	3,5	900 mm	940	1078	1062	1096	539	531		1,4
539-217-30	5	1000 mm	1040	1178	1162	1196	589	581		1,9
539-218-30	5	1100 mm	1140	1278	1262	1296			430	1,9
539-219-30	5	1200 mm	1240	1378	1362	1396			460	2
539-220-30	5	1300 mm	1340	1478	1462	1496			490	2,2
539-221-30	5	1400 mm	1440	1578	1562	1596			530	2,2
539-222-30	5	1500 mm	1540	1678	1662	1696			560	2,2



Specifications

Effective range (L0)	100-1500 mm
Accuracy	(5+5L/1000) μm L = Effective range (mm)
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Max. drive speed	120 m/min
Signal period	20 μm
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC ± 10%

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output

Legend

L0 Effective range

L1 Travel range

L2-L3 Mount interval

L4 Overall length

L5-L7 Support bracket position



Refer to the DRO System leaflet for more details.

DRO LINEAR SCALES AT113 - High Accuracy

Specifications

Effective range (L0)	100-1500 mm
Accuracy	(3+3L/1000) µm L = Effective range (mm)
Max. drive speed	120 m/min
Signal period	20 µm
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC ± 10%

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output

Series 539 - Incremental Sealed Slim Line type

- Glass scale - Zero not coded
- Expansion factor $(8 \pm 1) \times 10^{-6}/K^{-1}$
- An armoured inox signal cable is used to connect the DRO counter



539-201-40

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	L ⁴ [mm]	L ⁵ [mm]	L ⁶ [mm]	L ⁷ [mm]	Mass [kg]
539-201-40	3,5	100 mm	120	258	242	276				0,9
539-202-40	3,5	150 mm	170	308	292	326				
539-203-40	3,5	200 mm	220	358	342	376				
539-204-40	3,5	250 mm	270	408	392	426				
539-205-40	3,5	300 mm	330	468	452	486				
539-206-40	3,5	350 mm	380	518	502	536				
539-207-40	3,5	400 mm	430	568	552	586				
539-208-40	3,5	450 mm	480	618	602	636				
539-209-40	3,5	500 mm	540	678	662	696	339	331		
539-211-40	3,5	600 mm	640	778	762	796	389	381		1,3
539-213-40	3,5	700 mm	740	878	862	896	439	431		1,3
539-214-40	3,5	750 mm	780	918	902	936	459	451		1,4
539-215-40	3,5	800 mm	840	978	962	996	489	481		1,4
539-216-40	3,5	900 mm	940	1078	1062	1096	539	531		1,4
539-217-40	5	1000 mm	1040	1178	1162	1196	589	581		1,9
539-218-40	5	1100 mm	1140	1278	1262	1296			430	1,9
539-219-40	5	1200 mm	1240	1378	1362	1396			460	2
539-220-40	5	1300 mm	1340	1478	1462	1496			530	2,2
539-221-40	5	1400 mm	1440	1578	1562	1596			530	2,2
539-222-40	5	1500 mm	1540	1678	1662	1696			560	2,2

Legend

L0 Effective range

L1 Travel range

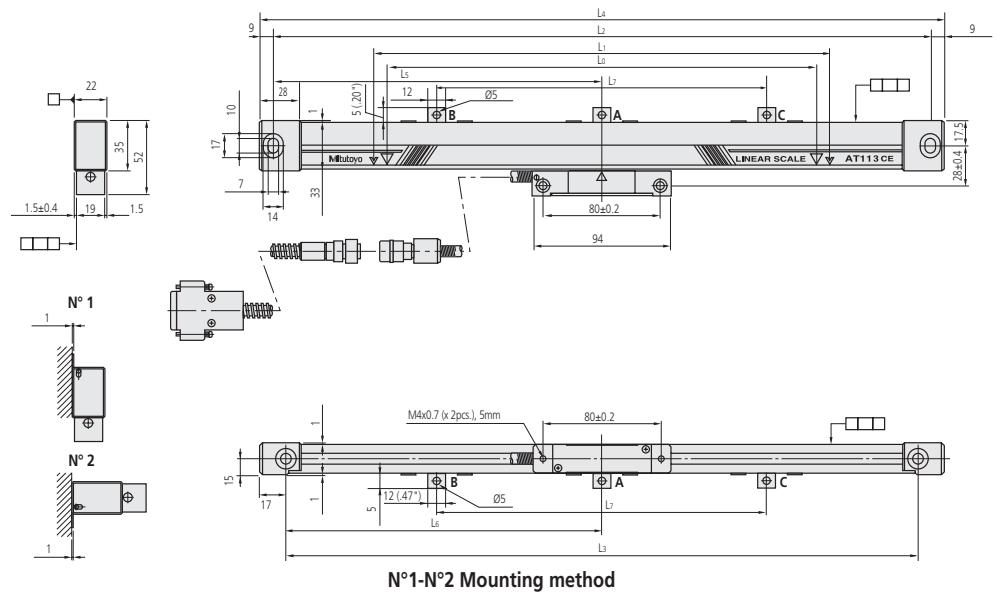
L2-L3 Mount interval

L4 Overall length

L5-L7 Support bracket position



Refer to the DRO System leaflet for more details.



DRO LINEAR SCALE AT112 - High Accuracy

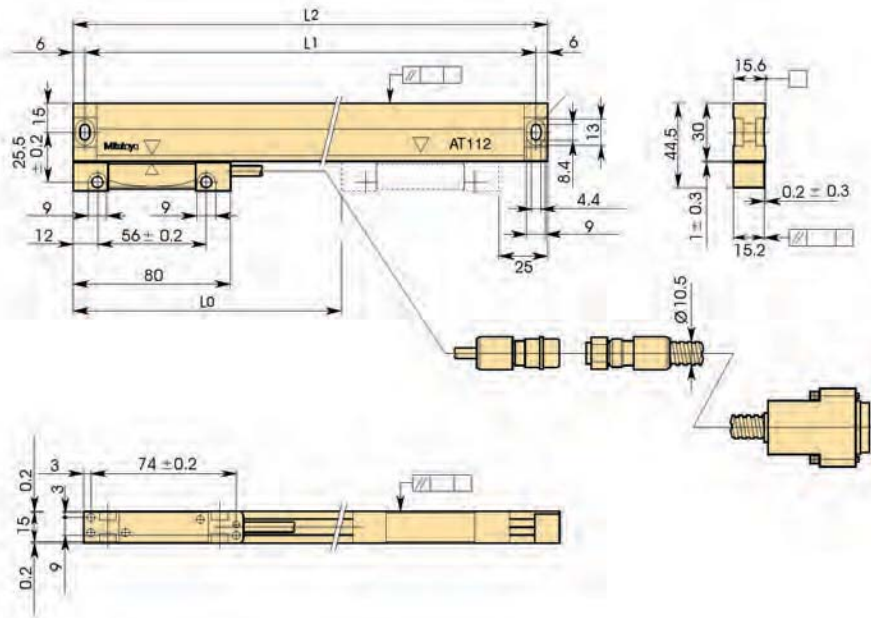
Series 539 - Super Slim

- Extra-slim construction
- Glass scale - Zero not coded
- Expansion factor $(8 \pm 1) \times 10^{-6}/K^{-1}$
- An armoured inox signal cable is used to connect the DRO counter



High accuracy

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	Mass [kg]
539-251-10	3	50 mm	143	155	0,72
539-252-10	3	70 mm	163	175	0,74
539-253-10	3	120 mm	213	225	0,8
539-254-10	3	170 mm	263	275	0,85
539-255-10	3	220 mm	313	325	0,9
539-256-10	3	270 mm	363	375	0,95
539-257-10	3	320 mm	413	425	1
539-258-10	3	370 mm	463	475	1,05
539-259-10	3	420 mm	513	525	1,1
539-260-10	3	470 mm	563	575	1,15
539-261-10	3	520 mm	613	625	1,2
539-262-10	3	570 mm	663	675	1,25
539-263-10	3	620 mm	713	725	1,3
539-264-10	3	670 mm	763	775	1,35
539-265-10	3	720 mm	813	825	1,4
539-266-10	3	770 mm	863	875	1,45
539-267-10	3	820 mm	913	925	1,5
539-268-10	3	920 mm	1013	1025	1,56
539-269-10	3	1020 mm	1113	1125	1,62



Legend
L0 Effective range
L1 Mount interval
L2 Overall length

Specifications

Effective range (L0)	50-1020 mm
Accuracy	$(3+3L/1000) \mu m$ L = Effective range (mm)
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Max. drive speed	up to 72 m/min
Signal period	20 μm
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC $\pm 10\%$
Delivered	Mounting set

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output



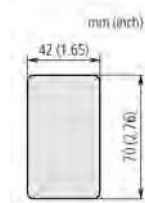
Refer to the DRO System leaflet for more details.

DRO LINEAR SCALES AT181 Plunger Type

Series 539 - Incremental Sealed Plunger type



- Specific type for bending presses and grinding machines
- Expansion factor $8 \times 10^{-6}/K^{-1}$



Specifications

Effective range (L0)	100-600 mm
Accuracy	Standard type ($5+5L/1000$) μm
	High-accuracy type ($3+3L/1000$) μm
	L = Effective range (mm)
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Max. drive speed	up to 50 m/min
Signal period	20 μm
Scale reference points	every 50 mm
Dust/water protection level	IP54
Operation temperature	0°C to 45°C
Power supply	5V DC \pm 10%

Optional accessories

No.	Description
09AAA033A	Extension cable (2 m)
09AAA033B	Extension cable (5 m)
09AAA033C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output



Refer to the DRO System leaflet for more details.

High accuracy

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	Mass [kg]
539-301-10	3	100 mm	130	255	270	1,7
539-302-10	3	150 mm	180	305	320	1,9
539-303-10	3	200 mm	230	355	370	2,1
539-304-10	3	250 mm	280	405	420	2,3
539-305-10	3	300 mm	330	455	470	2,5
539-306-10	3	350 mm	380	505	520	2,7
539-307-10	3	400 mm	430	555	570	2,9
539-308-10	3	450 mm	480	605	620	3,1
539-309-10	3	500 mm	530	655	670	3,3
539-310-10	3	550 mm	580	705	720	3,5
539-311-10	3	600 mm	630	755	770	3,7

Standard accuracy

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	Mass [kg]
539-301	3	100 mm	130	255	270	1,7
539-302	3	150 mm	180	305	320	1,9
539-303	3	200 mm	230	355	370	2,1
539-304	3	250 mm	280	405	420	2,3
539-305	3	300 mm	330	455	470	2,5
539-306	3	350 mm	380	505	520	2,7
539-307	3	400 mm	430	555	570	2,9
539-308	3	450 mm	480	605	620	3,1
539-309	3	500 mm	530	655	670	3,3
539-310	3	550 mm	580	705	720	3,5
539-311	3	600 mm	630	755	770	3,7

DRO LINEAR SCALES AT116

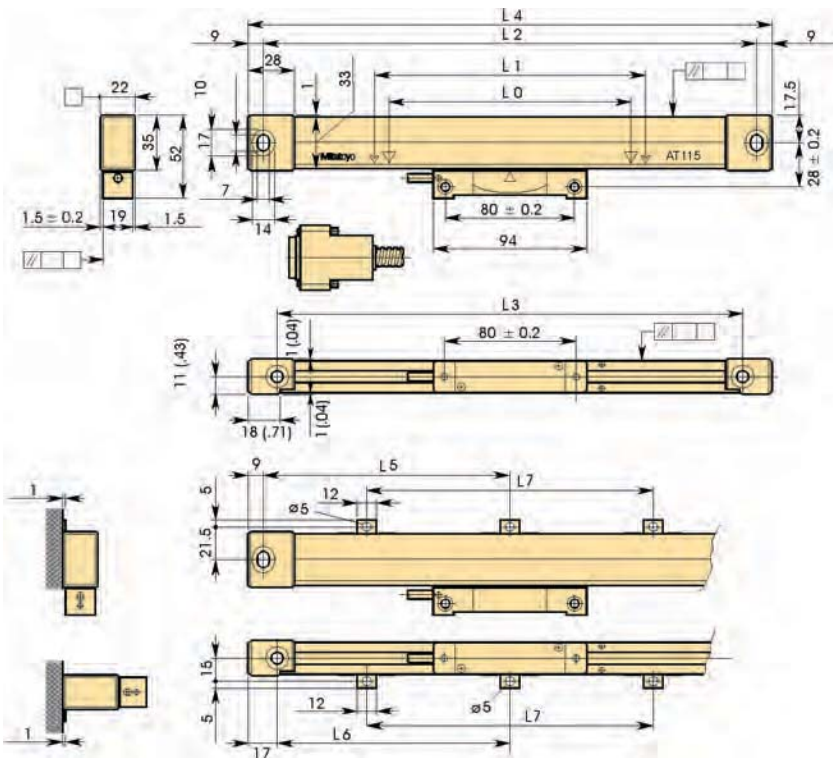
Series 539 - Economy & Slim Type

- Suitable for milling machines, XY tables, jigs, etc.
- Glass scale - Zero not coded
- Expansion factor $(8 \pm 1) \times 10^{-6}/K^{-1}$
- An armoured inox signal cable is used to connect the DRO counter



539-271-30

No.	Cable length [m]	Effective range	L ¹ [mm]	L ² [mm]	L ³ [mm]	L ⁴ [mm]	L ⁵ [mm]	L ⁶ [mm]	L ⁷ [mm]	Mass [g]
539-271-30	3,5	100 mm	120	258	242	276				550
539-272-30	3,5	150 mm	170	308	292		326			600
539-273-30	3,5	200 mm	220	358	342	376				700
539-274-30	3,5	250 mm	270	408	392	426				800
539-275-30	3,5	300 mm	330	468	452	486				900
539-276-30	3,5	350 mm	380	518	502	536				1000
539-277-30	3,5	400 mm	430	568	552	586				1050
539-278-30	3,5	450 mm	480	618	602	636				1150
539-279-30	3,5	500 mm	540	678	662	696	339	331		1250
539-281-30	3,5	600 mm	640	778	762	796	389	381		1450
539-283-30	3,5	700 mm	740	878	862	896	439	431		1600
539-284-30	3,5	750 mm	780	918	902	936	459	451		1700
539-285-30	3,5	800 mm	840	978	962	996	489	481		1800
539-286-30	3,5	900 mm	940	1078	1062	1096	539	531		1950
539-287-30	5	1000 mm	1040	1178	1162	1196	589	581		2350
539-288-30	5	1100 mm	1140	1278	1262	1296			430	2500
539-289-30	5	1200 mm	1240	1378	1362	1396			460	2700
539-290-30	5	1300 mm	1340	1478	1462	1496			490	2850
539-291-30	5	1400 mm	1440	1578	1562	1596			530	3050
539-292-30	5	1500 mm	1540	1678	1662	1696			560	3250



Specifications

Effective range (L0)	100-1500 mm
Accuracy	(5+5L/1000) μ m L = Effective range (mm)
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp)
Max. drive speed	up to 50 m/min
Signal period	20 μ m
Scale reference points	every 50 mm
Dust/water protection level	IP53
Operation temperature	0°C to 45°C
Power supply	5V DC \pm 10%

Optional accessories

No.	Description
09AAA720A	Extension cable (2 m)
09AAA720B	Extension cable (5 m)
09AAA720C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output



Extension cable

Legend

- L0 Effective range
- L1 Travel range
- L2-L3 Mount interval
- L4 Overall length
- L5-L7 Support bracket position



Refer to the DRO System leaflet for more details.

Specifications

Effective range (L0)	100-3000 mm
Accuracy	100 to 500 mm $\pm 5 \mu\text{m}$ 600 to 1800 mm $\pm 7 \mu\text{m}$ 2000 to 3000 mm $\pm 10 \mu\text{m}$
Max. drive speed	50 m/min
Signal period	20 μs
Measuring method	Electromagnetic induction system
Operation temperature	0-45 °C
Power supply	5V DC $\pm 10\%$

Optional accessories

No.	Description
09AAB674A	Extension cable (2 m)
09AAB674B	Extension cable (5 m)
09AAB674C	Extension cable (7 m)
174-173D	KA-Counter 2 axes
174-175D	KA-Counter 3 axes
174-147D	KLD200 Counter 4-step limit signal output

Legend

L0 Effective range

L1 Travel range

L2-L4 Mounting hole pitch

L5-L8 Middle support positions



Refer to the DRO System leaflet for more details.

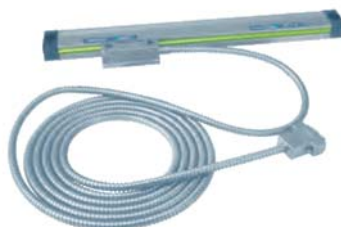
DRO ABS LINEAR SCALES AT715

Series 539 - Absolute IP67 Linear Scale

This linear scale is based on the ABSOLUTE electromagnetic induction principle, thus offering you increased environmental protection to IP67 level.

In addition:

- The AT715 detects and displays the absolute position, so you do not have to enter the reference point setting after each power on.



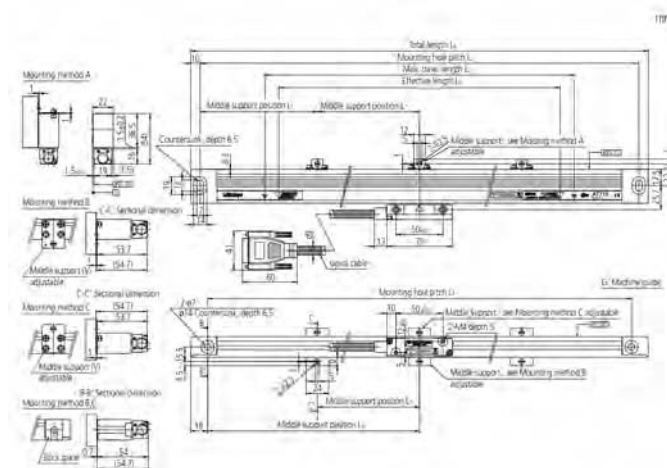
Safety
Dust- and
Water-
Protected
www.tuv.com
ID: 9900007295



ABSOLUTE®



No.	Cable length [m]	Effective range	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	L7 [mm]	L8 [mm]
539-801	3,5	100 mm	120	258	242	278				
539-802	3,5	150 mm	170	308	292	328				
539-803	3,5	200 mm	220	358	342	378				
539-804	3,5	250 mm	270	408	392	428				
539-805	3,5	300 mm	330	468	452	488				
539-806	3,5	350 mm	380	518	502	538				
539-807	3,5	400 mm	430	568	552	588				
539-808	3,5	450 mm	480	618	602	638				
539-809	3,5	500 mm	540	678	662	698	339	331		
539-811	3,5	600 mm	640	778	762	798	389	381		
539-813	3,5	700 mm	740	878	862	898	439	431		
539-814	3,5	750 mm	780	918	902	938	459	451		
539-815	3,5	800 mm	840	978	962	998	489	481		
539-816	3,5	900 mm	940	1078	1062	1098	539	531		
539-817	5	1000 mm	1040	1178	1162	1198	589	581		
539-818	5	1100 mm	1140	1278	1262	1298	624	616	430	
539-819	5	1200 mm	1240	1378	1362	1398	659	651	460	
539-820	5	1300 mm	1340	1478	1462	1498	694	686	490	
539-821	5	1400 mm	1440	1578	1562	1598	724	716	530	
539-822	5	1500 mm	1540	1678	1662	1698	759	751	560	
539-823	5	1600 mm	1640	1778	1762	1798	789	781	590	215
539-824	5	1700 mm	1740	1878	1862	1898	819	811	620	230
539-825	5	1800 mm	1840	1978	1962	1998	849	841	650	280
539-860	7	2000 mm	2040	2178	2162	2198	939	931	750	
539-861	7	2200 mm	2240	2378	2362	2398	969	961	780	
539-862	7	2400 mm	2440	2578	2562	2598	1009	1001	820	
539-863	7	2500 mm	2540	2678	2662	2698	1039	1031	850	
539-864	7	2600 mm	2640	2778	2762	2798	1069	1061	880	
539-865	7	2800 mm	2840	2978	2962	2998	1089	1081	900	
539-866	7	3000 mm	3040	3178	3162	3198	1119	1111	930	



Universal DRO KA Counter

Series 174 - DRO counter for Linear Scales

This counter displays length indication transmitted from a linear scale.

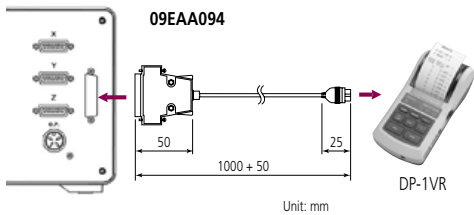
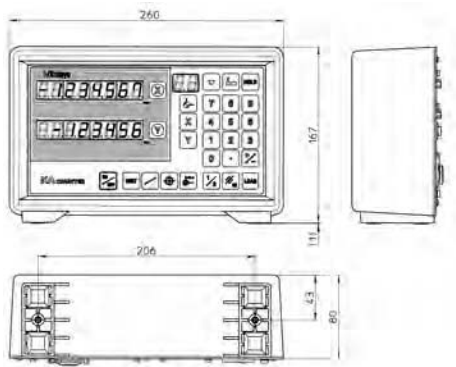
The KA-Counter offers you the following benefits:

- Easy to operate, multifunctional display unit for milling machines and lathes.
- You can connect the following linear scales to the counter: AT103/AT112/AT113/AT116/AT181/AT715.
- Easy to operate, multifunctional display unit for milling, grinding and lathes.
- You can connect the following old model linear scales to the counter: AT102/AT111/AT115.

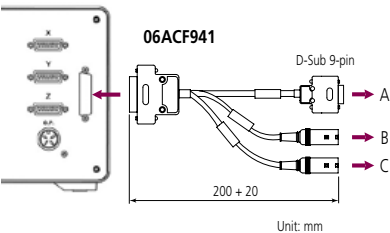


174-175

No.	Axes	Mass [kg]
174-173D	2	1,25
174-175D	3	1,33



Unit: mm



Unit: mm

- A: PC
B: External load box / Foot switch
C: External zero-set box

Functions	Series 174 - DRO counter for Linear Scales
ABS/INC mode	●
PRESET	●
Diameter display	●
Counting direction switchable	●
Selectable resolution	●
mm / inch switching	●
Zero approach machining	●
Pitch circle	●
Hole sequence processing	●
Scale reference points	●
Tool specification	●
Macro function keys for lathes, milling and surface grinding machines	●
Programming function	●
Addition of values from 2 axes (not available on 2 axes counter)	●
Addition/subtraction	●
Linearity error compensation	●
Lost motion compensation	●
Lower digit blank-out	●
Storage of the last display value	●
Copying of coordinate data	●
Data transmission from DIGIMATIC measuring instruments	●
ZERO/ABS (only with AT715)	●
Zero approach function (absolute mode)	●
Zero approach function (Incremental mode)	●

Specifications

Display	7 Digit, sign (-)
Dimensions (WxDxH)	260 x 167 x 80 mm
Operation temperature	0°C to 45°C
Power supply	100-240V-AC 50/60 Hz

Optional accessories

No.	Description
09EAA094	RS-232C Data cable 1 m (25-pin) for connecting DP-1VR to Linear Scale KA counter
965004	Foot switch
06ACF941	External extension cable
09CAB217	RS-232 C interface
937326	External load box 1 axis
937327	External load box 2 axis
937328	External load box 3 axis
936551	External "Null Box" 1 axis
936552	External "Null Box" 2 axis
936553	External "Null Box" 3 axis
938140	Touch signal probe ø 20 *
935094	Touch signal probe ø 32 *

*with Linear Scale AT1xx only

DRO KLD200 Counter

Specifications

Digital step	0,001 mm (Indication range: -9999,999 mm to +99999,999 mm) 0,005 mm (Indication range: -9999,995 mm to +99999,995 mm)
Scale input ports	1
Power supply	100-120V/200-240V AC 50/60 Hz
Display	9-Digit LED and a negative (-) sign

Optional accessories

No.	Description
965004	Foot switch
937326	External load box 1 axis
936551	External "Null Box" 1 axis
938140	Touch signal probe ø 20 *
935094	Touch signal probe ø 32 *

*with Linear Scale AT1xx only

Series 174

The KLD200 Counter is a single axis linear scale display unit with limit signal output.

The KLD200 offers you the following benefits:

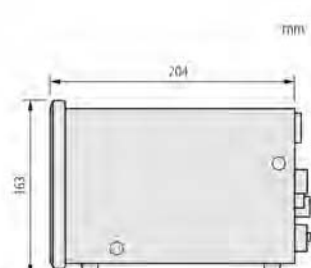
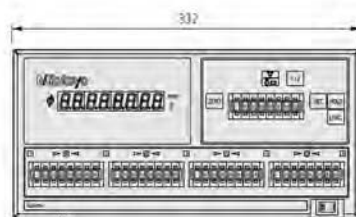
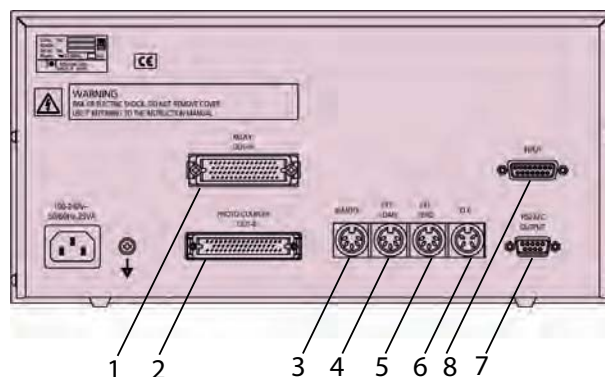
- The counter is designed to signal when a linear scale displacement value and a preset limit value coincide.
- You have a choice of two types of limit settings (2 step and 4 step).
- Ideal for controlling vertical positioning on an EDM or a grinding machine.
- You can connect it to a computer or a sequencer via an RS-232C Interface or limit signal output (offered as standard).
- You can connect the following linear scales to the counter: AT103/AT112/AT113/AT116/AT181/AT715.



174-147

No.	Mass [kg]	Description
174-147D	4,1	4-step limit signal output
174-146D	4,2	2-step limit signal output

1. Relay signal output
2. Photocoupler signal output
3. Remote signal input
4. External load signal input
5. External zero-set signal input
6. Touch signal input
7. RS-232C interface
8. Input Linear Scale Signal



Touch Probe

Series 174

- Touch probe for Linear Scale Counter (e.g. KA and KLD Counter)
- This Touch probe can only be used in combination with Counter and Linear Scales AT1XX
- For setting the origin (or datum) point on a machine tool.
- Holds the displayed value on contact with the workpiece.



938140

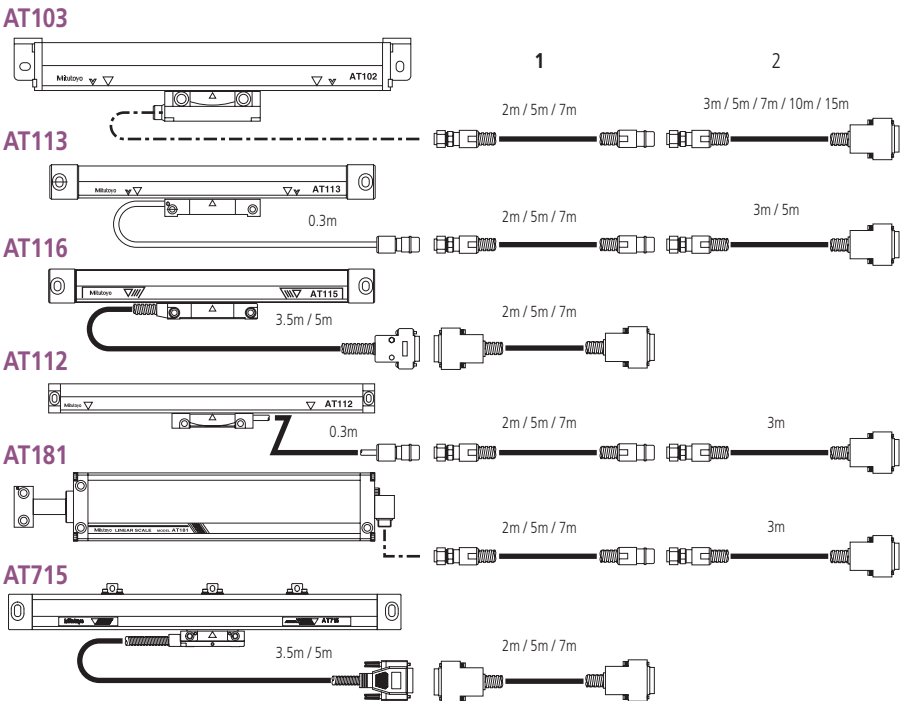
No.	Shaft ø [mm]	Connecting cable [m]	Ball ø
938140	20	3	10 ±0,002 mm
935094	32	3	10 ±0,002 mm

Optional accessories

No.	Description
935203	Extension cable

DRO Extension cables selection guide

Series 0944



Extension cable selection guide



KA Counter



KLD Counter

Overview of CNC Linear Scale System

	Scale Name (code)	Reference point	ABSOLUTE function	Main scale grating pitch	Signal output pitch	Signal unit	No. of Division	Resolution	Maximum response speed	Minimum edge interval
Separate Type Linear Scales	ST36B ST36C (ST36A) (ST36D)	○	×	8μm	4μm	- (PSU-200)	400	0.01μm	70mm/s	125ns
							200	0.02μm	150mm/s	
							80	0.05μm	260mm/s	
							40	0.1μm	720mm/s	
	ST24B ST24C	○	×	20μm	10μm	-	200	0.05μm	360mm/s	125ns
							100	0.1μm	720mm/s	
							20	0.5μm	1200mm/s	250ns
							10	1μm	1200mm/s	500ns
	ST46-EZA	○	×	20μm	20μm	-	400	0.05μm	900mm/s	50ns
							200	0.1μm	1800mm/s	
							40	0.5μm	2600mm/s	
							20	1μm	2600mm/s	
	ST422	○	×	40μm	40μm	-	200	0.2μm	1500mm/s	125ns
							80	0.5μm	3600mm/s	
							40	1μm	5000mm/s	
							8	5μm	5000mm/s	250ns
	ABS ST700 Compact type	-	○	3.072mm	3.072mm	-	30720	0.1μm	5000mm/s	-
Assembly Type Linear Scales	AT402E	○	△	20μm	20μm	-	-	-	2000mm/s	1Vp-p differential sine wave
	AT211	○	×	20μm	20μm	-	200	0.1μm	710mm/s	125ns
							100	0.2μm	1400mm/s	
							40	0.5μm	2000mm/s	250ns
							20	1μm		500ns
							8	2.5μm		1000ns
	AT203	○	×	20μm	20μm	-	4	5μm	2000mm/s	250ns
							200	0.1μm		
							40	0.5μm		
	ABS AT500	-	○	20μm	20μm	-	20	1μm	2500mm/s*1	-
							4096	0.005μm		
	ABS AT300	-	○	20μm	20μm	-	400	0.05μm	2000mm/s	-

*1 Maximum response speed of H type with 0.005μm resolution is 1200mm/s.

CNC LINEAR SCALES AT402E

Series 539 - Sealed incremental type - Standard dimension

This linear scale gives you world-class vibration resistance (20 G) and shock resistance (40 G) when you use it with machine tools.

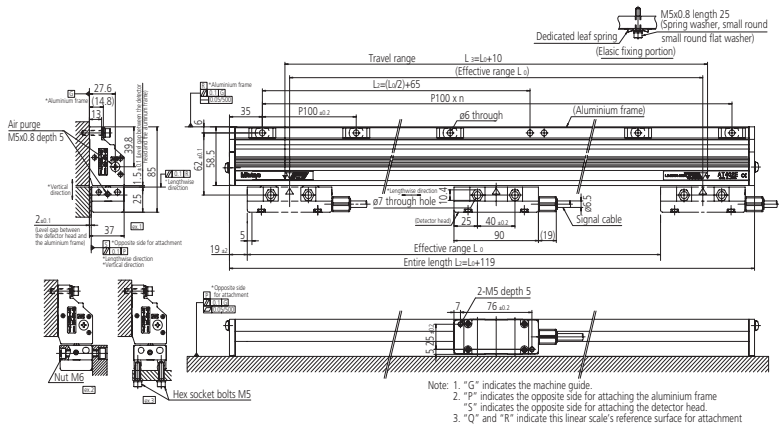
- The 1Vpp/20µm signal output gives you high connectivity with various machine controllers.
- The ABSOLUTE Interval Code saves you time and money.
- Suggested resolution 1 µm - 0,5 µm



Without cable (-00)

No.	Effective range	n (number of holes)	L ¹ [mm]	L ² [mm]	L ³ [mm]
539-371-00	140 mm	2	259	135	150
539-373-00	240 mm	3	359	185	250
539-374-00	340 mm	4	459	235	350
539-375-00	440 mm	5	559	285	450
539-376-00	540 mm	6	659	335	550
539-377-00	640 mm	7	759	385	650
539-378-00	740 mm	8	859	435	750
539-379-00	840 mm	9	959	485	850
539-380-00	940 mm	10	1059	535	950
539-381-00	1040 mm	11	1159	585	1050
539-382-00	1140 mm	12	1259	635	1150
539-383-00	1240 mm	13	1359	685	1250
539-384-00	1340 mm	14	1459	735	1350
539-385-00	1440 mm	15	1559	785	1450
539-386-00	1540 mm	16	1659	835	1550
539-387-00	1640 mm	17	1759	885	1650
539-388-00	1740 mm	18	1859	935	1750
539-389-00	1840 mm	19	1959	985	1850
539-390-00	2040 mm	21	2159	1085	2050
539-391-00	2240 mm	23	2359	1185	2250
539-392-00	2440 mm	25	2559	1285	2450
539-393-00	2640 mm	27	2759	1385	2650
539-394-00	2840 mm	29	2959	1485	2850
539-395-00	3040 mm	31	3159	1585	3050

mm



CNC LINEAR SCALES AT203

Series 539 - Sealed incremental type - Standard dimension



This sealed-type incremental linear scale is suitable for feedback systems in NC machine tools.

The AT203 offers you the following benefits:

- You can connect it directly with NC machine tools.
- Construction is identical to corresponding AT103 scales.



CNC LINEAR SCALES AT211

Series 539 - Sealed incremental type - Slim & High Speed Type



This sealed-type linear scale gives you high resolution and high accuracy.

The AT211A/B offers you the following benefits:

- Ideal for feedback control in positioning machines in semiconductor manufacturing systems, CNC machine tools, etc.
- You have a choice of two models: the AT211A, the multiple-point installation type designed for improved resistance against vibration and shock, and the AT211B, which attaches to a machine at each end only. The AT211B is compatible with the AT111 slim type in size.
- You can connect it directly with a machine controller via a quadrature signal output (conforming to RS-422A).

Installation dimensions are available from Mitutoyo – please contact.



AT211A



AT211B

Specifications

Effective range (L0)	100 - 6000 mm
Accuracy	100 to 1500 mm (3+3L/1000) μ m 1600 to 3000 mm (5+5L/1000) μ m 3250 to 6000 mm (5+8L/1000) μ m L = Effective range (mm)
Max. drive speed	up to 120 m/min
Scale reference points	every 50 mm
Cable length	5 m
Output waveform	Two 90° phase-shifted quadrature signals (RS422) Differential line driver
Resolution	0,1; 0,5; 1
Power supply	5V DC \pm 10%

Specifications

Effective range (L0)	100 - 1500 mm
Accuracy	100 to 1500 mm (3+3L/1000) μ m (standard type) (2+2L/1000) μ m (high-accuracy type) 500 to 1500 mm (3+3L/1000) μ m L = Effective range (mm)
Max. drive speed	up to 120 m/min
Signal period	20 μ m
Resolution	0,1; 0,5; 1 μ m
Output waveform	Two 90° phase-shifted quadrature signals (RS422) Differential line driver
Power supply	5V DC \pm 10%

CNC ABS LINEAR SCALES AT300

Series 539 - Sealed Absolute type - Standard dimension

This sealed-type, ABSOLUTE linear scale gives you very fine resolution up to 0,05µm. The AT300 offers you the following benefits:

- You can connect it directly with NC machine tools.
- ABS AT303: Supports Mitutoyo standard serial interface.
- ABS AT343: Supports Mitsubishi® Electric high-speed serial interface.
- ABS AT353: Supports Fanuc® high-speed serial interface.
- Installation dimensions are available from Mitutoyo – please contact.



AT300



Specifications	
Effective range (L0)	100 - 3000 mm
Accuracy	100 to 1500 mm (3+3L/1000) µm 1600 to 3000 mm (5+5L/1000) µm L = Effective range (mm)
Max. drive speed	up to 120 m/min
Resolution	0,05 µm
Signal period	20 µm
Power supply	5V DC ± 10%



Refer to the NC Linear Scale brochure for more details

CNC ABS LINEAR SCALES AT500

Series 539 - Sealed Absolute type - Slim line

This sealed-type, ABSOLUTE linear scale gives you very fine resolution up to 0,05µm. The AT500 offers you the following benefits:

- You can connect it directly with NC machine tools.
- 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.
- You have a choice of two types:
 - SC model: high-rigidity type
 - HC model: high-accuracy type.
- Installation dimensions are available from Mitutoyo – please contact.



AT553-HC



AT553-SC



Specifications	
Accuracy	S model (3+3L/1000) µm H model (2+2L/1000) µm E model (2+2L/1000) µm L = Effective range (mm)
Max. drive speed	S model 150 m/min. H model 72 m/min E model 72/150 m/min 0,05/0,005 µm
Resolution	AT5_5 model: 0,005 µm AT5_3 model: 0,05 µm AT5_ _E model : 0,05 /0,005µm
Signal period	20 µm
Power supply	5V DC ± 10%



Refer to the NC Linear Scale brochure for more details

No.	Effective range (L0)
AT500	S model 100 - 2200 mm
	H model 100 - 1000 mm
	E model 100 - 1200 mm

CNC LINEAR SCALES ST24

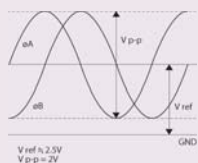
Series 579 - Open scales with Sine & Square-Wave Output

This standard-type linear scale gives you a maximum response speed of up to 1200mm/s
The AT500 offers you the following benefits:

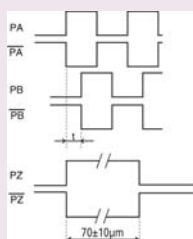
- It Includes an LED alarm enabling you to detect overspeed and sinusoidal signal anomalies.
- Installation dimensions are available from Mitutoyo – please contact.



ST24



Model C



Model B/C

CNC LINEAR SCALES ST36

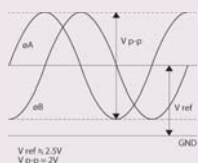
Series 579 - Open scales with Sine & Square-Wave Output

This is a high resolution, high accuracy, portable model designed for exposed installations.
The ST36 offers you the following benefits:

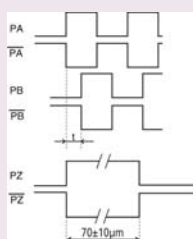
- High reliability with stable signal output.
- Outputs two-phase sinusoidal signal (signal pitch 4µm) and two-phase square-wave signal simultaneously.
- Outputs two-phase sinusoidal signal (signal pitch 4µm) and two-phase square-wave signal simultaneously.
- You are provided with a compact interface box as standard.
Installation dimensions are available from Mitutoyo – please contact.



ST36



Model A/C



Model B/C

Specifications

Effective range (L0)	10 - 3000 mm
Accuracy	10 - 300 mm ±0,5 µm 350 - 500 mm ±1 µm 600 - 1000 mm ±2 µm 1100 - 3000 mm ±2 µm/m
Max. drive speed	1200 mm/sec
Signal period	8 µm
Scale reference points	10 - 75 mm Center point scale 100 - 3000 mm every 50 mm
Signal period	4 µm
Resolution	0,01; 0,02; 0,05; 0,1 µm
Output waveform	Two 90° phase-shifted sinusoidal signals 2Vpp (Model A and C) Two 90° phase-shifted square-wave signals (Model B and C) RS422 Line Driver
Power supply	5V DC ± 10%

CNC LINEAR SCALES ST422

Series 579 - Open scales with Sine & Square Wave Output

This compact-type, exposed-type incremental linear scale gives you a maximum response speed of 5000 mm/sec.

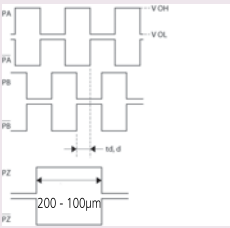
The ST422 offers you the following benefits:

- It is provided with alarm LED error indication with fault detection signal output for overspeed and sinusoidal signal anomalies.
- Installation dimensions are available from Mitutoyo – please contact.

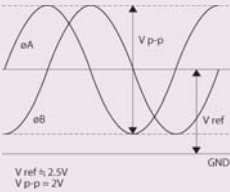


ST422

Specifications	
Effective range (L0)	10 - 3000 mm
Accuracy	10 - 300 mm $\pm 1 \mu\text{m}$ 350 - 500 mm $\pm 2 \mu\text{m}$ 600 - 1000 mm $\pm 3 \mu\text{m}$ 1100 - 3000 mm $\pm 3 \mu\text{m}$
Max. drive speed	up to 5000 mm/sec
Scale reference points	10 - 75 mm Center point scale 100 - 3000 mm every 50 mm
Signal period	40 μm
Resolution	0,2; 0,5; 1; 5 μm
Output waveform	Two 90° phase-shifted sinusoidal signals (2Vpp) Two 90° phase-shifted square-wave signals (RS422) Line driver
Power supply	5V DC $\pm 10\%$



Two 90° phase-shifted square waves signals



Refer to the NC Linear Scale brochure for more details



Refer to the Linear Scale ST700 brochure for more details

CNC LINEAR SCALES ST700

Series 579 - Electromagnetic induction Absolute open scales- Compact Type

ABSOLUTE scales have eliminated the need to re-establish the origin.

The ST700 offers you the following benefits:

- It is optimized for the control of linear motors.
- Optimized for high-speed, high-acceleration control.
- A non-contact detection system ensures a long service life for your product.
- Signal adjustment at installation is automatically performed with dedicated software.



Applicable system	Resolution 0,1 µm 50 mm head No.
[Amplifiers supporting Mitutoyo ENSIS interface] Nikki Denso Co., Ltd. VC Series Servoland Corporation SVF Series PMAC JAPAN Co., Ltd. controller	ABS ST708A ABS ST708AL
FANUC® Ltd. FS-I Series control unit, Power Mate® i	ABS ST758 ABS ST758L
Mitsubishi® Electric Corporation MELDAS® Series Supported amplifier : MDS-Vn-V1/V2	ABS ST748 ABS ST748L
Mitsubishi® Electric Corporation MR-J2S/MR-J3 Series	ABS ST748A ABS ST748AL
Panasonic Matsushita® Electric Industrial Co, Ltd., Motor Company MINAS® A4, A4P, A4N Series	ABS ST778A ABS ST778L
Yaskawa® Electric Corporation Σ-III Series	ABS ST788A ABS ST788L

Item	Scale type	Scale base type	Glass scale type
Resolution		0.1µm (0.05µm: special order)	
Detection method		Electromagnetic induction Absolute position detection method*	
Shape		Separate type scale	
Effective range (accuracy guarantee range)		100 to 3000mm / 3200 to 6000mm	100 to 1100mm
Accuracy (20°C)		(5+5L/1000) µm L: Effective range mm	(3+3L/1000) µm L: Effective range mm
Maximum feed speed		5 m/s	
Thermal expansion coefficient		(12.0±1.5) ×10 ⁻⁶ /°C (when attached to material equivalent to steel)	(8±1.0) ×10 ⁻⁶ /°C
Operating conditions	Temperature	0 to 50°C	
	Humidity	20 to 80%RH	
Storage conditions	Temperature	-20 to 70°C	
	Humidity	20 to 80%RH	
Power supply voltage		5V±10% (at the detector head) (Ripple and spike noise should not exceed 100mV)	
Current consumption		270mA (Max.)	
Vibration resistance		300m/s ² (55 to 2000Hz)	100m/s ² (55 to 2000Hz)
Shock resistance		500m/s ² (half-sine, 11ms)	150m/s ² (half-sine, 11ms)
Head cable	Length/cable diameter	1m / ø3.8mm (high-flex cable)	
	Connector	1) D-sub (15-pin pin type) connector (not waterproof) 2) D-sub (9-pin socket type) connector (not waterproof): for ST788A	
Maximum signal cable length		Up to 29m (head cable length included) (Please consult the user's manual)	
Detector mounting		1 location each on top and sides	
Direction of cable outlet		4 sides (top, bottom, left, right) can be selected	

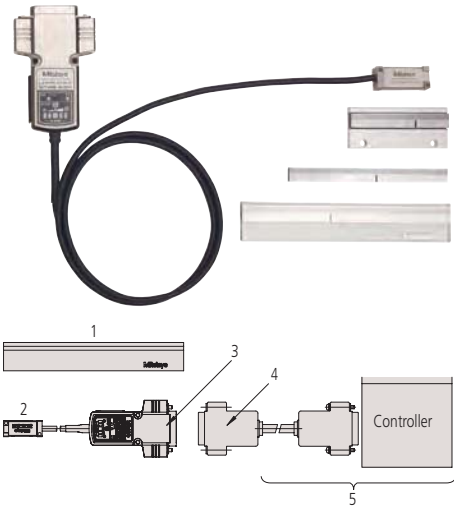
CNC Linear Scale ST46-EZA

Series 579 - Open scales with Sine & Square Wave Output

Compact Type - Incremental Reflective Glass scale

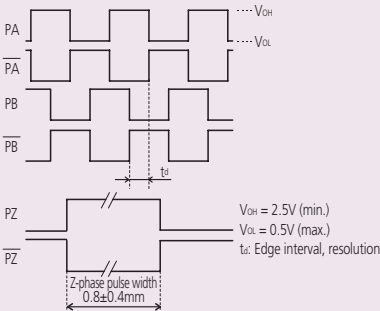
- Grating pitch 20
- Signal period 20
- Zero not coded
- Expansion factor $(8 \pm 1) \times 10^6/k-1$
- Maximum response speed 2,6 m/s (At sine wave amplitude -3B)
- Includes LED alarm for detection for overspeed
- Can be used for Metal Tape Scale Manufacture
- Self Diagnosis Function with USB Connector

No.	Detection Method
ST46EZA Type B	Reflective photoelectric linear encoder
ST46EZA Type C	Reflective photoelectric linear encoder

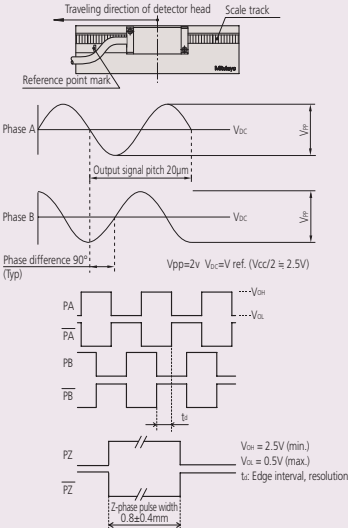


1: Main scale; 2: Detector unit; 3: Output connector (included); 4: Feedback cable; 5: To be supplied by customer (feedback cable/controller)

Specifications	
Effective range	10 to 3000 mm
Maximum response speed	2,6 m/s (at sine wave amplitude -3dB)
Internal expansion coefficient	$(8 \pm 1) \times 10^{-6}^{\circ}\text{C}$
Output signal	Type B: 2-phase square wave signals, reference point pulse, external reset input Type C: 2-phase square wave signals, reference point pulse, 2 phase sinusoidal signal
Scale reference point	With scale reference point (50 mm pitch, 10 to 80 mm: Center point)
Scale specifications	Grating pitch: 20 μm , Material: glass
Scale grating pitch	20 μm
Storage temperature/humidity	-20 to 60°C, 20 to 80% RH (no condensation)
Operating temperature/humidity	0 to 40°C, 20 to 80% RH (no condensation)
Maximum current consumption	250mA
Power supply voltage	5VDC \pm 5%



Output Signal Type B



Output Signal Type C



Brochure on request

MICSYS-SA1

Series 549

This high-accuracy non-contact 2D encoder uses image correlation. The MICSYS-SA1 offers you the following benefits:

- Simultaneous XY position measurements.
- Nanometer resolution.
- Possible to measure on workpiece.
- You can align it easily.
- It allows you to carry out minute strain and deflection measurements.

Applications:

- Nano positioning
- Monitor performance of metrology and manufacturing frames (drift, hysteresis, repeatability)
- Measure deformation

Specifications

Effective range (L0)	$\pm 100 \mu\text{m}$ (2D)
Accuracy	$\pm 100 \text{ nm}$
Linearity (at 20°)	80 nm
Repeatability (20°)	5 nm
Digital step	1 nm
Working distance	10 \pm 0,2 mm (including thickness of standard target : 6,1 mm)
Data Update Period	20Hz
Laser wavelength	650 nm (Visible) Class 2
Operating temperature and humidity	Detector: 15 - 25°C, I/F unit: 0-40°C, 20 - 80 % RH (Non-condensing)
Interface	RS-232C
Standard accessories	Standard target, Sample software for data correlation (on CD-ROM)
Power supply	AC100-240V 45W 50/60Hz



Refer to the Micsys brochure for more details



549-701D

No.

549-701D