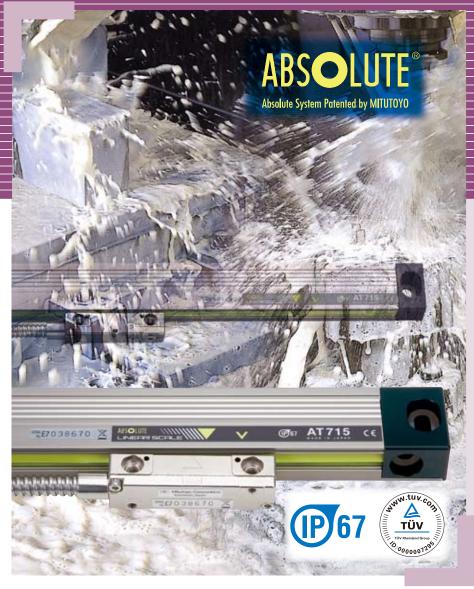
# LINEAR SCALE ABS AT715 ABSOLUTE Linear Encoder for DRO Systems



Catalog No. E4296-539

ABSOLUTE® electromagnetic induction type linear encoder technology gives the AT715 excellent resistance to dust and water for enhanced machine tool usability.



### High environmental resistance linear encoder system Absolute Linear Scale ABS AT715 & KA Counter



### Features: Absolute Linear Scale ABS AT715

- 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
- 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.

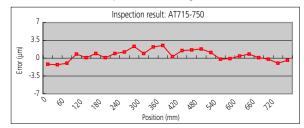
#### **Specifications**

Electromagnetic induction system\*
\*Patented in Japan, USA, India, China, Europe Detecting system Resolution 0.005mm / 0.001mm

(switchable by KA counter setting)

100mm - 1800mm Effective range

±5µm (Effective length Lo: 100~500mm) Accuracy (20°C) ±7µm (Effective length Lo: 600~1800mm)



Response speed 50m/min (max.)

Dust/water protection

Sliding force Less than 5N

Applicable displays KA counter and KLD-200 counter (with

limit signal output function)

Extension cable 2m: 09AAB674A 5m: 09AAB674B (optional, total cable length is less than 15m.)7m: 09AAB674C

Order No.         Model         Lo (mm)         L1 (mm)         L2 (mm)         L3 (mm)         L4 (mm)         L5 (mm)         L6 (mm)         L7 L8 (mm)         Cable (mm)           539-801         AT715-100         100         120         258         242         278         —         —         —         —         3.5           539-802         AT715-150         150         170         308         292         328         —         —         —         —         3.5           539-803         AT715-200         200         220         358         342         378         —         —         —         —         3.5           539-804         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698 <th></th>												
539-801         AT715-100         100         120         258         242         278         —         —         —         3.5           539-802         AT715-150         150         170         308         292         328         —         —         —         3.5           539-803         AT715-200         200         220         358         342         378         —         —         —         3.5           539-804         AT715-250         250         270         408         392         428         —         —         —         3.5           539-805         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-300         300         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5	Order No	Model	Lo		L2	L <sub>3</sub>	L4	L <sub>5</sub>	L <sub>6</sub>	L7	L8	
539-802         AT715-150         150         170         308         292         328         —         —         —         3.5           539-803         AT715-200         200         220         358         342         378         —         —         —         3.5           539-804         AT715-250         250         270         408         392         428         —         —         —         3.5           539-805         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         —         3.5<	Oraci No.	Wiodei	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m)
539-803         AT715-200         200         220         358         342         378         —         —         —         3.5           539-804         AT715-250         250         270         408         392         428         —         —         —         3.5           539-805         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-700         700         740         878         862         898         439         431         —         3.5	539-801	AT715-100	100	120	258	242	278		_			3.5
539-804         AT715-250         250         270         408         392         428         —         —         —         3.5           539-805         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5	539-802	AT715-150	150	170	308	292	328	_	_			3.5
539-805         AT715-300         300         330         468         452         488         —         —         —         3.5           539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         —	539-803	AT715-200	200	220	358	342	378	_	_			3.5
539-806         AT715-350         350         380         518         502         538         —         —         —         3.5           539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-800         800         840         978         962         998         489         481         —         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —	539-804	AT715-250	250	270	408	392	428		_			3.5
539-807         AT715-400         400         430         568         552         588         —         —         —         3.5           539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         — <th>539-805</th> <th>AT715-300</th> <th>300</th> <th>330</th> <th>468</th> <th>452</th> <th>488</th> <th>_</th> <th>_</th> <th></th> <th></th> <th>3.5</th>	539-805	AT715-300	300	330	468	452	488	_	_			3.5
539-808         AT715-450         450         480         618         602         638         —         —         —         3.5           539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         3.5           539-818         AT715-1100         1100         1140         1278         1262         1298         581         —	539-806	AT715-350	350	380	518	502	538	_	_			3.5
539-809         AT715-500         500         540         678         662         698         339         331         —         3.5           539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         3.5           539-817         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         581         —         5	539-807	AT715-400	400	430	568	552	588		_			3.5
539-811         AT715-600         600         640         778         762         798         389         381         —         3.5           539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         3.5           539-816         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         — <th>539-808</th> <th>AT715-450</th> <th>450</th> <th>480</th> <th>618</th> <th>602</th> <th>638</th> <th>_</th> <th>_</th> <th>_</th> <th>_</th> <th>3.5</th>	539-808	AT715-450	450	480	618	602	638	_	_	_	_	3.5
539-813         AT715-700         700         740         878         862         898         439         431         —         3.5           539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         3.5           539-817         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         —         5           539-820         AT715-1400         1400         1440         1578         1562         1598         —         490         — </th <th>539-809</th> <th>AT715-500</th> <th>500</th> <th>540</th> <th>678</th> <th>662</th> <th>698</th> <th>339</th> <th>331</th> <th>_</th> <th>_</th> <th>3.5</th>	539-809	AT715-500	500	540	678	662	698	339	331	_	_	3.5
539-814         AT715-750         750         780         918         902         938         459         451         —         3.5           539-815         AT715-800         800         840         978         962         998         489         481         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         3.5           539-817         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         —         5           539-820         AT715-1300         1300         1340         1478         1462         1498         —         490         —         5           539-821         AT715-1400         1400         1440         1578         1562         1598         —         530         —	539-811	AT715-600	600	640	778	762	798	389	381	_	_	3.5
539-815         AT715-800         800         840         978         962         998         489         481         —         —         3.5           539-816         AT715-900         900         940         1078         1062         1098         539         531         —         —         3.5           539-817         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         —         5           539-820         AT715-1300         1300         1340         1478         1462         1498         —         490         —         5           539-821         AT715-1400         1400         1440         1578         1562         1598         —         530         —         5           539-822         AT715-1500         1500         1540         1678         1662         1698         —	539-813	AT715-700	700	740	878	862	898	439	431	_	_	3.5
539-816         AT715-900         900         940         1078         1062         1098         539         531         —         —         3.5           539-817         AT715-1000         1000         1040         1178         1162         1198         589         581         —         5           539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         —         5           539-820         AT715-1300         1300         1340         1478         1462         1498         —         490         —         5           539-821         AT715-1400         1400         1440         1578         1562         1598         —         530         —         5           539-822         AT715-1500         1500         1540         1678         1662         1698         —         560         —         5           539-823         AT715-1600         1600         1640         1778         1762         1798         889         <	539-814	AT715-750	750	780	918	902	938	459	451	_	_	3.5
539-817       AT715-1000       1000       1040       1178       1162       1198       589       581       —       5         539-818       AT715-1100       1100       1140       1278       1262       1298       —       430       —       5         539-819       AT715-1200       1200       1240       1378       1362       1398       —       460       —       5         539-820       AT715-1300       1300       1340       1478       1462       1498       —       490       —       5         539-821       AT715-1400       1400       1440       1578       1562       1598       —       530       —       5         539-822       AT715-1500       1500       1540       1678       1662       1698       —       560       —       5         539-823       AT715-1600       1600       1640       1778       1762       1798       889       881       430       215       5         539-824       AT715-1700       1700       1740       1878       1862       1898       939       931       460       230       5	539-815	AT715-800	800	840	978	962	998	489	481	_	_	3.5
539-818         AT715-1100         1100         1140         1278         1262         1298         —         430         —         5           539-819         AT715-1200         1200         1240         1378         1362         1398         —         460         —         5           539-820         AT715-1300         1300         1340         1478         1462         1498         —         490         —         5           539-821         AT715-1400         1400         1440         1578         1562         1598         —         530         —         5           539-822         AT715-1500         1500         1540         1678         1662         1698         —         560         —         5           539-823         AT715-1600         1600         1640         1778         1762         1798         889         881         430         215         5           539-824         AT715-1700         1700         1740         1878         1862         1898         939         931         460         230         5	539-816	AT715-900	900	940	1078	1062	1098	539	531	_	_	3.5
539-819       AT715-1200       1200       1240       1378       1362       1398       —       460       —       5         539-820       AT715-1300       1300       1340       1478       1462       1498       —       490       —       5         539-821       AT715-1400       1400       1440       1578       1562       1598       —       530       —       5         539-822       AT715-1500       1500       1540       1678       1662       1698       —       560       —       5         539-823       AT715-1600       1600       1640       1778       1762       1798       889       881       430       215       5         539-824       AT715-1700       1700       1740       1878       1862       1898       939       931       460       230       5	539-817	AT715-1000	1000	1040	1178	1162	1198	589	581			5
539-820       AT715-1300       1300       1340       1478       1462       1498       —       —       490       —       5         539-821       AT715-1400       1400       1440       1578       1562       1598       —       530       —       5         539-822       AT715-1500       1500       1540       1678       1662       1698       —       560       —       5         539-823       AT715-1600       1600       1640       1778       1762       1798       889       881       430       215       5         539-824       AT715-1700       1700       1740       1878       1862       1898       939       931       460       230       5	539-818	AT715-1100	1100	1140	1278	1262	1298	_	_	430		5
539-821     AT715-1400     1400     1440     1578     1562     1598     —     —     530     —     5       539-822     AT715-1500     1500     1540     1678     1662     1698     —     —     560     —     5       539-823     AT715-1600     1600     1640     1778     1762     1798     889     881     430     215     5       539-824     AT715-1700     1700     1740     1878     1862     1898     939     931     460     230     5	539-819	AT715-1200	1200	1240	1378	1362	1398	_	_	460		5
539-822     AT715-1500     1500     1540     1678     1662     1698     —     —     560     —     5       539-823     AT715-1600     1600     1640     1778     1762     1798     889     881     430     215     5       539-824     AT715-1700     1700     1740     1878     1862     1898     939     931     460     230     5	539-820	AT715-1300	1300	1340	1478	1462	1498	_	_	490		5
<b>539-823 AT715-1600</b> 1600 1640 1778 1762 1798 889 881 430 215 5 <b>539-824 AT715-1700</b> 1700 1740 1878 1862 1898 939 931 460 230 5	539-821	AT715-1400	1400	1440	1578	1562	1598	_	_	530	_	5
<b>539-824 AT715-1700</b> 1700 1740 1878 1862 1898 939 931 460 230 5	539-822	AT715-1500	1500	1540	1678	1662	1698	_	_	560	_	5
	539-823	AT715-1600	1600	1640	1778	1762	1798	889	881	430	215	5
<b>539-825</b>   <b>AT715-1800</b>   1800   1840   1978   1962   1998   989   981   560   280   5	539-824	AT715-1700	1700	1740	1878	1862	1898	939	931	460	230	5
	539-825	AT715-1800	1800	1840	1978	1962	1998	989	981	560	280	5

Lo: Effective length

L<sub>1</sub>: Maximum travel length

L<sub>2</sub>, L<sub>3</sub>: Mounting hole pitch

L4: Total length



# Linear Scale ABS AT715



### KA Counter for standard/lathe applications, high performance to cost ratio and easy to use



174-173 / for 1-axis or 2-axis

**Specifications** 

5 poemica dono						
Order No.	120V AC	174-173A	174-175A			
	110V AC	174-173B	174-175B			
	230V AC	174-173D	174-175D			
	240V AC*	174-173E	174-175E			
	240V AC**	174-173F	174-175F			
	220V AC***	174-173DC	174-175DC			
	220V AC****	174-173K	174-175K			
Scale in	put ports	2-1	3			
Resoluti	on	0.001mm, 0.005mm, .0001", .0005"(selectable)				
Display		7-digit LED and a negative [-] sign				
Functions		Zero-setting, ABS/INC coordinate selection, Preset, 1/2 calculation, mm/inch conversion, Counting direction setting, Diameter display, Addition of 2-scale data, Zero approach machining, Bolt-hole circle machining, Pitch machining, Touch-signal probe input				
Applicable scale unit		AT100 series and ABS AT715				
Power supply		100V-240V AC, 50/60Hz				
Operating temperature		0°C to 40°C				
Mass		1.1kg	1.2kg			

<sup>\*</sup> for UK/\*\* For Australia/\*\*\* For China/\*\*\* For Korea



174-175 / for 3-axis

#### **Optional accessory**

RS-232C codeout unit: **09CAB217** 

Touch signal probe:

**938140** (ø20mm shank) **935094** (ø32mm shank)

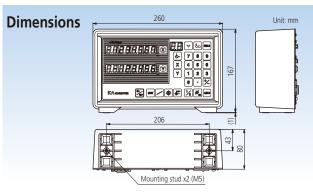
Linear scale adapter (5S): **09AAA207**Digimatic micrometer head adapter (square wave):

**09AAA207** (for MHD-25 series) **09CAB231** (for MHD-50 series)

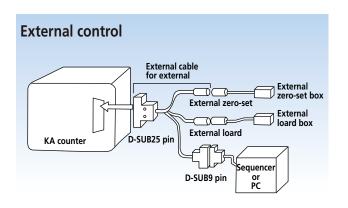
Linear gage adapter (square wave with origin point mark):

09ACB393 Linear gage adapter (square wabe): 09ACB913 Adapter for AT211 (square wave): 09ACB391 Adapter for ST scale (square wave): 09ACE392 Extended cable for external: 09ACF941 External loard box (1-axis)\*: 937326 External loard box (2-axis)\*: 937327 External laord box (3-axis)\*: 937328 External zero-set box (1-axis)\*: 936551 External zero-set box (2-axis)\*: 936551 External zero-set box (3-axis)\*: 936552

<sup>\*</sup>RS-232C unit (09CAB217) and extended cable for external (09ACF941) are required.







<sup>&</sup>lt;sup>-1</sup>: Available as a 1-axis counter by changing the parameter setting

# KA Counter

## Counter

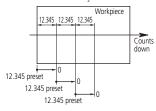
#### **Zero-setting**

The display can be set to "0" (zero) at any scale position.



#### **Preset**

This function allows the user to enter a numeric value on the counter display. Any preset value can be retrieved whenever necessary.

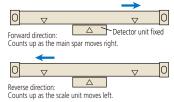


#### **Resolution setting**

The most suitable resolution can be selected to meet measuring applications. Available resolutions depend upon the Counter to be used.

#### **Counting direction setting**

The counting up direction can be selected



#### mm/inch conversion

The counting unit can be changed between "mm" and "inch" (or between "mm" and "E (=1/25.4mm)" depending on the model.)

#### 1/2 calculation

This function halves the display value.

#### Lower digit blanking out

Unnecessary lower digits (up to 9 digits of the lowest digits) can be blanked out.

#### Memory backup

The backup battery retains the most recent display value even when the counter is off.

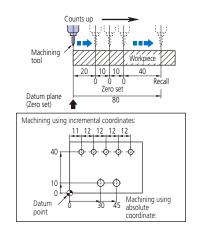
#### Pitch machining

This mode allows the line between any two points in the X-Y plane to be divided into any number of equally spaced divisions.



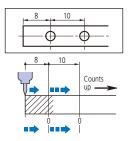
### Absolute/incremental coordinate selection

For each axis, the measured value can be displayed in either absolute (ABS) or incremental (INC) coordinates. This function is useful by enabling incremental mode operations to be performed while the workpiece datum point is retained ready to use for operations based on absolute mode coordinates.



#### Zero approach machining [INC mode]

Zero approach machining can be repeated at a preset interval without error. Since the counter keeps the total displacement in the absolute coordinate system, cumulative error is automatically eliminated at each tool position.



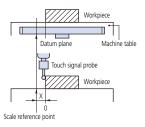
#### **Bolt-hole circle machining**

Drilling positions along the circumference of a bolthole circle in the absolute zero approach mode can be easily displayed by entering the center coordinates, diameter, and number of divisions of the base circle.



#### Scale reference point setting

The distance from a scale reference point to the machine origin can be registered as an offset value, and will be retained even when the power is off (hold function). When the power is turned on again, the machine origin (or machining datum) can be easily recalled (set function).



#### **Diameter display**

This convenient feature can be used to directly display the diameter of a workpiece during a turning operation on a lathe.



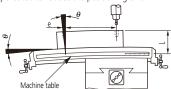
#### Addition of 2-scale data

If a machine has two slides, each with its own scale, this function can be used to sum the two values to display the total workpiece displacement.



#### **Linearity error compensation**

Machine errors caused due to workpiece weight, inaccurate table adjustment, etc., can be linearly compensated to reduce the positioning error.



#### **Smoothing**

Smoothing makes the display value easier to read when a minimum reading fluctuates due to machine vibration.

#### **RS-232C Interface Unit**

The EIA standard RS-232C connector provides data transfer to/from a personal computer with an RS-232C Interface Unit. Not only can coordinate data be output from this connector, but it can also receive signals from the personal computer to perform zero setting, presetting, etc.





### **KLD-200 Counter with limit signal outputs**

- A 1-axis counter dedicated to sending signals when a linear scale displacement value and a preset limit value coincide.
- Two types of limit setting are available: 2 step and 4 step
- AT715 and AT100 series linear scales can be connected.

#### **Specifications**

Order No.	120V	174-146A	174-147A		
	230V	174-146D	174-147D		
	240V*	174-146E	174-147E		
	240V**	174-146F	174-147F		
	220V***	174-146DC	174-147DC		
	220V****	174-146K	174-147K		
Type of limit sett	ing	2 step	4 step		
Resolution		0.0005/0.001/0.002/0.005/0.01mm/ .00002"/.00005".0001"/.0002"/0005"/.001"			

<sup>\*</sup> for UK/\*\* For Australia/\*\*\* For China/\*\*\* For Korea

Specifications are subject to change without notice.

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