

Separate Type ST Series

Sinusoidal Signal & Square-Wave Signal Output Scale Unit (High Accuracy Type)

ST36



Features

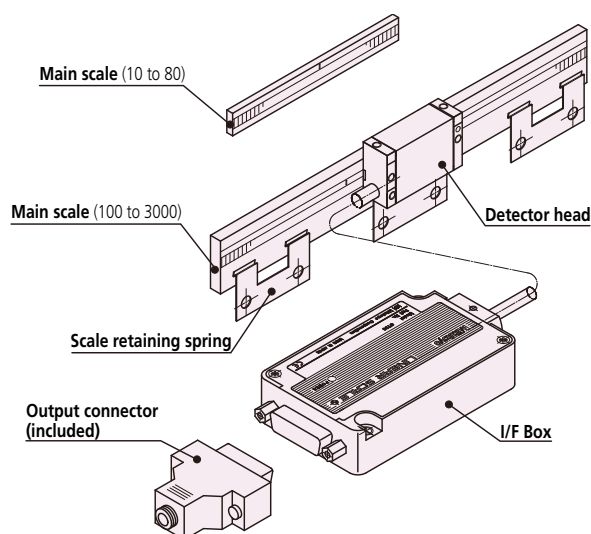
- High accuracy type, 0.5 μm class (effective range up to 300 mm)
- Has a thinner detector head (thickness 11.5 mm).
- The maximum effective measurement range of 3000 mm enables use on large machines.
- 4 different types available for each signal output specification.
- LED display function for indicating signal errors.

Specifications

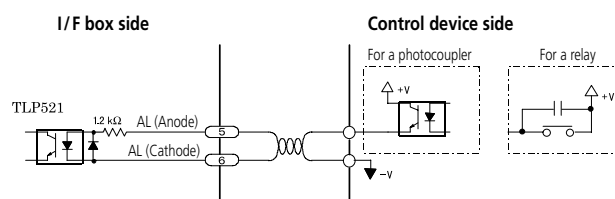
Item	Model	ST36A	ST36B	ST36C	ST36D
Detection method	Reflective optical linear encoder				
Main scale grating pitch	8 μm				
Signal output pitch	4 μm				
Output signal	2-phase sinusoidal signals	2-phase square wave signals (reset input type)		2-phase square wave signals 2-phase sinusoidal signals	1 Vp-p differential sinusoidal signals
Effective range	10 to 3000 mm				
Accuracy (20 °C)	Effective range 10 to 300 mm : ±0.5 μm				
	Effective range 350 to 500 mm : ±1.0 μm				
	Effective range 600 to 1000 mm : ±2.0 μm				
	Effective range 1100 to 3000 mm : ±2.0 μm/m				
Thermal expansion coefficient	≈8×10 ⁻⁶ /K				
Maximum response speed	1200 mm/s (with sinusoidal signals output) Note: For 2-phase square wave signal types, see page 10				
Scale reference point*	With scale reference point (50 mm pitch, 10 to 80 mm: Center point)				
Power supply	5 VDC ±5%				
Maximum current consumption	120 mA	250 mA			190 mA
Operating temperature/humidity	0 to 40 °C, 20 to 80%RH (no condensation)				
Storage temperature/humidity	-20 to 60 °C, 20 to 80%RH (no condensation)				
Alarm indication	A scale alarm is indicated with an LED on the I/F box				

* Maximum speed for scale reference point detection is 20 mm/s.

Parts



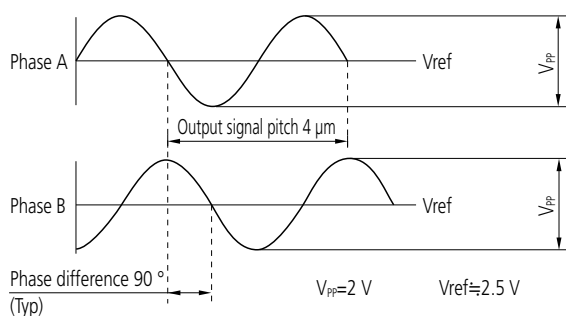
Alarm reset transmission / reception signal circuit (B Type)



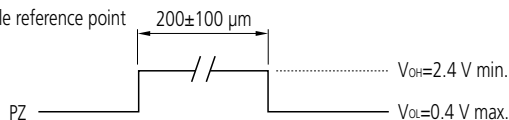
Reset input.
Connect the alarm reset input circuit so that the current is 3 to 10 mA. Also, the device has an internal resistor (1.2 k Ω), so by applying 5 to 12 V with a pulse width of at least 10 ms across AL (anode)-AL (cathode), the alarm can be reset. When applying 12 V or more, add an external resistance to limit the current to within the range stated above.

Output signal waveform

• 2-phase sinusoidal signals (Type A, C)

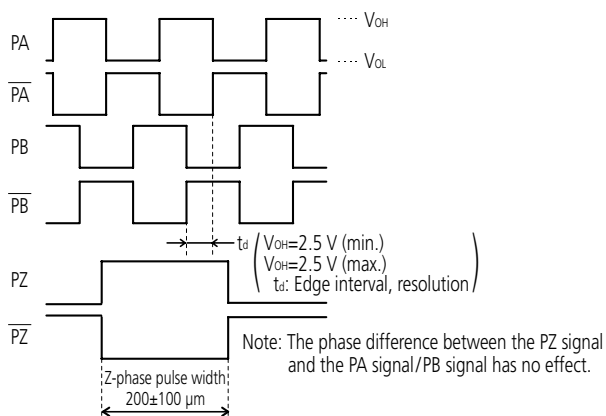


• Scale reference point

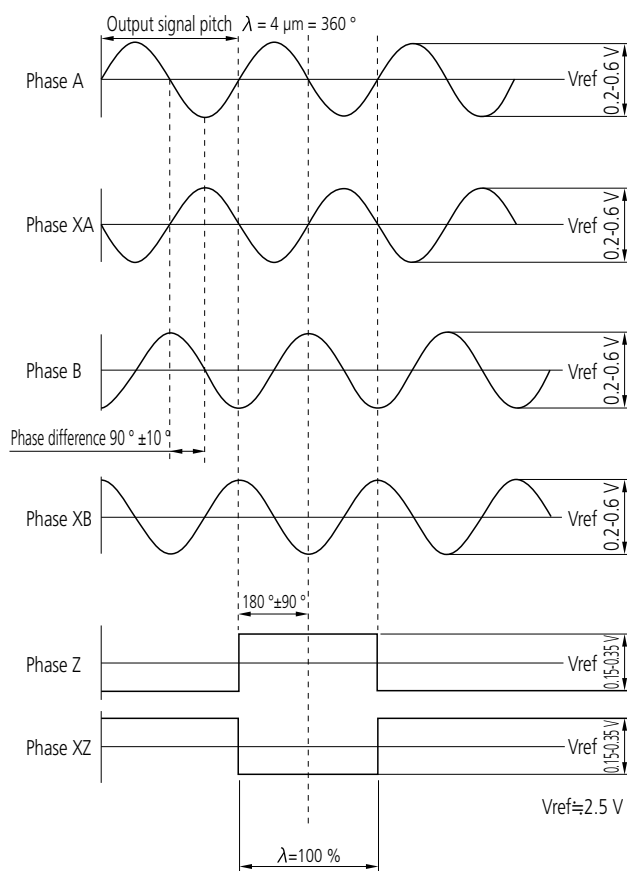


Note: The phase difference between the PZ signal and the Phase A signal (and the Phase B signal) are not defined.

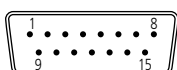
• 2-phase square wave signals (Type B, C)



• 1 Vpp differential sinusoidal signals (Type D)



Output specification



1. Output connector specification (Type A, B, C)

- Output connector (pin type): RDAD-15P-LNA(05) (Hirose Electric or equivalent)
- Applicable connector (standard accessory): D15-403N-110 (Technical Electron or equivalent)

2. Output connector specification (Type D)

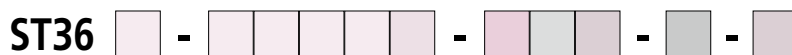
- Output connector (pin type): RDAD-15P-LNA(05) inch screws (Hirose Electric or equivalent)
- Applicable connector (standard accessory): D15-403N-150 inch screws (Technical Electron or equivalent)

Pin No.	Type A Signal	Type B Signal	Type C Signal	Type D Signal
1	0 V (GND)	0 V (GND)	0 V (GND)	Phase XA
2	0 V (GND)	0 V (GND)	0 V (GND)	Phase XB
3	+5 V	+5 V	+5 V	Phase Z
4	+5 V	+5 V	+5 V	+5 V (V_{DD})
5	Phase A	Reset input (anode)	Phase A	+5 V (V_{DD})
6	Phase B	Reset input (cathode)	Phase B	N.C
7	Vref	Vref	Vref	N.C
8	PZ (scale reference point)	PZ (scale reference point)	PZ (scale reference point)	N.C
9	N.C	ALM (alarm, negative logic)	ALM (alarm, negative logic)	Phase A
10	Vref	PA	PA	Phase B
11	N.C	$\overline{\text{PA}}$	$\overline{\text{PA}}$	Phase XZ
12	N.C	PB	PB	0 V (GND)
13	N.C	$\overline{\text{PB}}$	$\overline{\text{PB}}$	0 V (GND)
14	N.C	PZ	$\overline{\text{PZ}}$	N.C
15	F.G	F.G	F.G	0 V (GND)

Separate Type ST Series

- If standard specifications (recommended items marked with ●/◎ symbols below) meet your requirements, please order using Order No. and Model No. shown on page 11.

ST36



Code	Output
A	Sinusoidal signal
B	Square wave signal + External reset input
C	Sinusoidal signal + Square wave signal
D	1 Vpp differential

Code	Output
A	Sinusoidal signal
B	Square wave signal + External reset input
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D	1 Vpp differential

Code	Effective range (mm)	Code	Effective range (mm)
0010	10	0900	900
0025	25	1000	1000
0050	50	1100	1100
0075	75	1200	1200
0080	80	1300	1300
0100	100	1400	1400
0150	150	1500	1500
0200	200	1600	1600
0250	250	1700	1700
0300	300	1800	1800
0350	350	2000	2000
0400	400	2200	2200
0450	450	2400	2400
0500	500	2500	2500
0600	600	2600	2600
0700	700	2800	2800
0800	800	3000	3000

Example of standard specification

Effective range 10 mm: **ST36□-0010**

Effective range 250 mm: **ST36□-0250**

Code	Effective range 10 to 80 μm	Code	Effective range 100 to 3000 mm
●B	Center point (10 to 80)	●A	50 mm pitch
Z	Special position specification	B	Center point
		Z	Special position specification

Code	Effective range 100 to 3000 mm
● A	50 mm pitch
B	Center point
Z	Special position specification

Resolution \ Minimum edge interval	125 ns	250 ns	500 ns	1000 ns
0.01 μm	A: 70 mm/s	B: 30 mm/s	C: 15 mm/s	D: 8 mm/s
0.02 μm	E: 150 mm/s	F: 70 mm/s	G: 30 mm/s	H: 15 mm/s
0.05 μm	J: 360 mm/s	K: 180 mm/s	L: 90 mm/s	M: 45 mm/s
0.1 μm	N: 720 mm/s	● P: 360 mm/s	Q: 180 mm/s	R: 90 mm/s
—	⊙ Z: When [Signal output] is [A] [D], maximum response speed at Sinusoidal signal -3 dB attenuation is 1.2 m/s			

Special codes

Code	Details
● None	Standard selection specification
7	Special specification

Head cable length

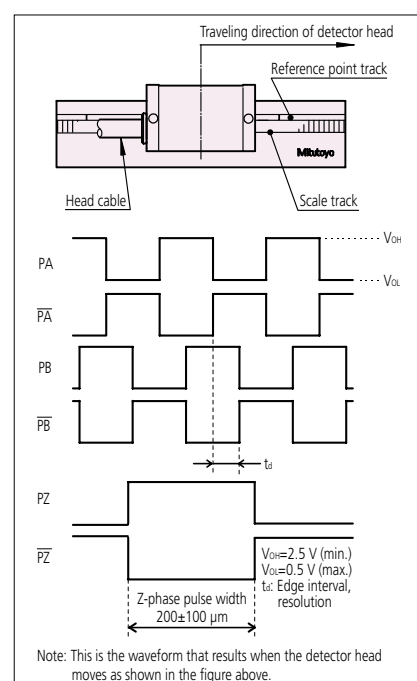
Code	Length
A	1 m (High flex)
B	0.5 m (High flex)
Z	Special length specification (max. 2.5 m)

Alarm output

Code	Details
 S	Alarm signal
 H	High impedance
 Z	When [Signal output] is [A] or [D]

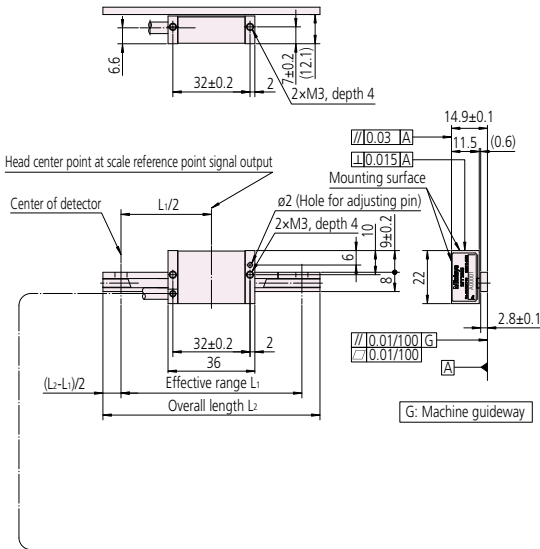
Direction

Code	Details
●1	Normal: PA goes ahead
2	Reverse: PB goes ahead
⊙7	When [Signal output] is [A] or [D]



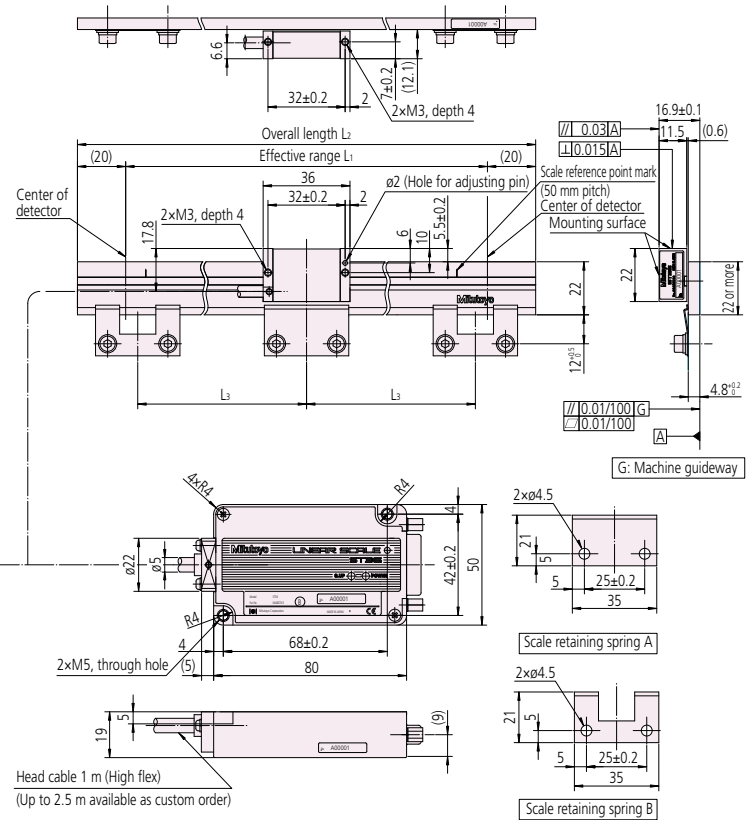
Mounting dimensions

• 10 to 80 mm (Adhesive fixing type)



• 100 to 3000 mm

Unit: mm



Dimensions of scale units

Order No.*	Model	Effective range L ₁ (mm)	Overall length L ₂ (mm)	Scale fixing pitch L ₃ (mm)	Retaining spring A	Retaining spring B
579-501-0□	ST36◇-10	10	30	—	—	—
579-502-0□	ST36◇-25	25	45	—	—	—
579-503-0□	ST36◇-50	50	70	—	—	—
579-504-0□	ST36◇-75	75	90	—	—	—
579-505-0□	ST36◇-80	80	100	—	—	—
579-506-0□	ST36◇-100	100	140	50	1 pc.	2 pcs.
579-507-0□	ST36◇-150	150	190	75	1 pc.	2 pcs.
579-508-0□	ST36◇-200	200	240	100	1 pc.	2 pcs.
579-509-0□	ST36◇-250	250	290	60	1 pc.	4 pcs.
579-510-0□	ST36◇-300	300	340	75	1 pc.	4 pcs.
579-511-0□	ST36◇-350	350	390	85	1 pc.	4 pcs.
579-512-0□	ST36◇-400	400	440	100	1 pc.	4 pcs.
579-513-0□	ST36◇-450	450	490	75	1 pc.	6 pcs.
579-514-0□	ST36◇-500	500	540	80	1 pc.	6 pcs.
579-515-0□	ST36◇-600	600	640	100	1 pc.	6 pcs.
579-516-0□	ST36◇-700	700	740	85	1 pc.	8 pcs.
579-517-0□	ST36◇-800	800	840	100	1 pc.	8 pcs.

Order No.*	Model	Effective range L ₁ (mm)	Overall length L ₂ (mm)	Scale fixing pitch L ₃ (mm)	Retaining spring A	Retaining spring B
579-518-0□	ST36◇-900	900	940	90	1 pc.	10 pcs.
579-519-0□	ST36◇-1000	1000	1040	100	1 pc.	10 pcs.
579-520-0□	ST36◇-1100	1100	1140	90	1 pc.	12 pcs.
579-521-0□	ST36◇-1200	1200	1240	100	1 pc.	12 pcs.
579-522-0□	ST36◇-1300	1300	1340	130	1 pc.	10 pcs.
579-523-0□	ST36◇-1400	1400	1440	100	1 pc.	14 pcs.
579-524-0□	ST36◇-1500	1500	1540	125	1 pc.	12 pcs.
579-525-0□	ST36◇-1600	1600	1640	100	1 pc.	16 pcs.
579-526-0□	ST36◇-1700	1700	1740	120	1 pc.	14 pcs.
579-527-0□	ST36◇-1800	1800	1840	100	1 pc.	18 pcs.
579-528-0□	ST36◇-2000	2000	2040	100	1 pc.	20 pcs.
579-529-0□	ST36◇-2200	2200	2240	100	1 pc.	22 pcs.
579-530-0□	ST36◇-2400	2400	2440	100	1 pc.	24 pcs.
579-531-0□	ST36◇-2500	2500	2540	95	1 pc.	26 pcs.
579-532-0□	ST36◇-2600	2600	2640	100	1 pc.	26 pcs.
579-533-0□	ST36◇-2800	2800	2840	100	1 pc.	28 pcs.
579-534-0□	ST36◇-3000	3000	3040	100	1 pc.	30 pcs.

* The above Order No. are for recommended items marked with ●/○ symbols.
If recommended specifications meet your requirements, use these Order No. to order.
The □ and ◇ symbols in the tables above have the following meanings:
◇→A (2-phase sinusoidal signals) : □→1
◇→B (2-phase square wave signals + reset input) : □→2
◇→C (2-phase sinusoidal signals + 2-phase square wave signals) : □→3
◇→D (1 Vpp differential) : □→4