

Separate Type ST Series

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

ST36



Features

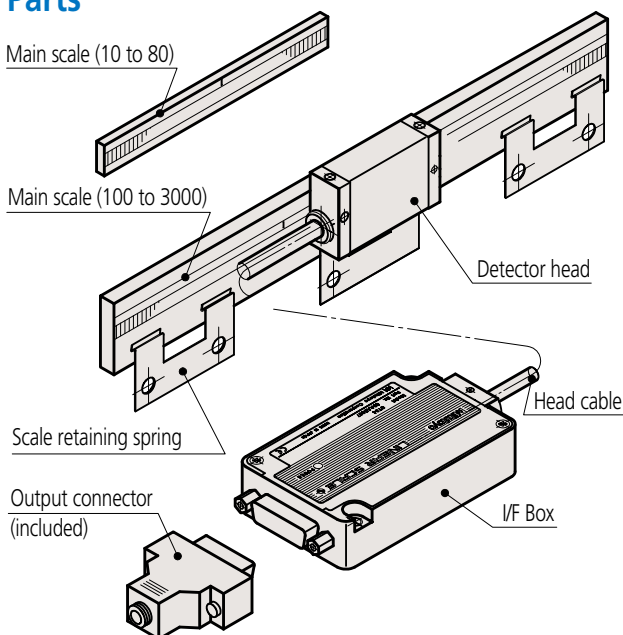
- High accuracy type, 0.5μm class (effective range up to 300mm)
- Has a thinner detector head (thickness 11.5mm).
- The maximum effective measurement length of 3000mm enables use on large machines.
- 4 different types available for each signal output specification.
- LED display function for indicating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

Specifications

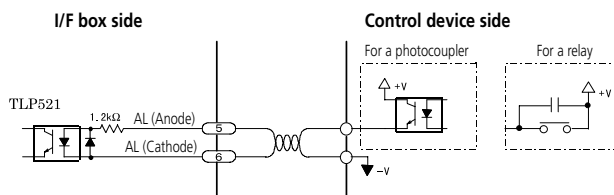
Item	Code	ST36A	ST36B	ST36C	ST36D
Detection method		Reflective photoelectric linear encoder			
Main scale grating pitch		8μm			
Signal output pitch		4μm			
Output signal		2-phase sinusoidal signals	2-phase square wave signals (reset input type)	2-phase square wave signals 2-phase sinusoidal signals	1Vp-p differential sinusoidal signals
Effective range		10 - 3000mm			
Accuracy (20°C)		Effective range 10 to 300mm: ±0.5 μm Effective range 350 to 500mm: ±1.0μm Effective range 600 to 1000mm: ±2.0μm Effective range 1100 to 3000mm: ±2.0μm/m			
Thermal expansion coefficient		≈ 8 × 10 ⁻⁶ / K			
Maximum response speed		1200mm/s (with sinusoidal signals output) (For 2-phase square wave signal types, see page 10)			
Scale reference point*		With scale reference point (50mm pitch, 10 to 80mm: Center point)			
Power supply		5VDC±5%			
Maximum current consumption		120mA	250mA		190mA
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 20mm/s.

Parts



Alarm reset transmission/reception signal circuit (B Type)

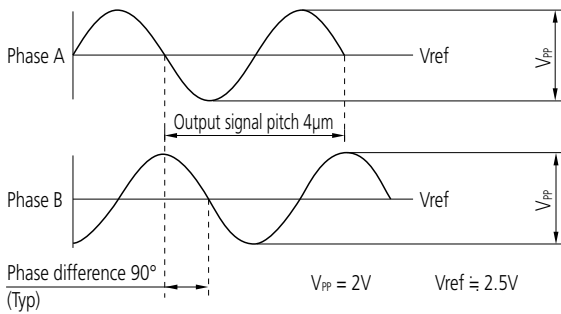


Reset input

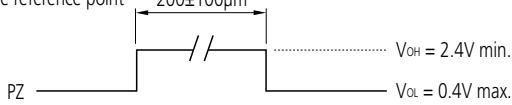
Connect the alarm reset input circuit so that the current is 3 to 10mA. Also, the device has an internal resistor (1.2kΩ), so by applying 5 to 12V with a pulse width of at least 10ms across AL (anode)-AL (cathode), the alarm can be reset. When applying 12V or more, add an external resistance to limit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

Output signal waveform

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

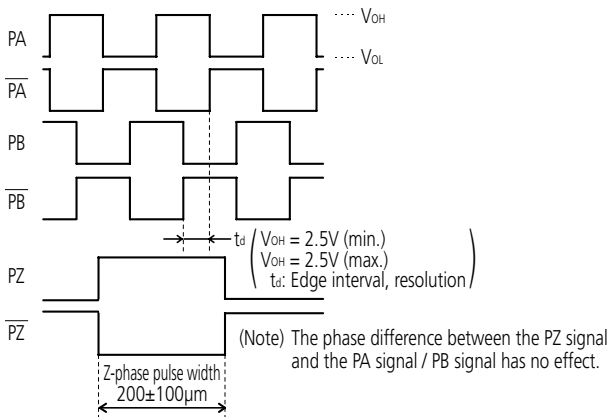


• Scale reference point

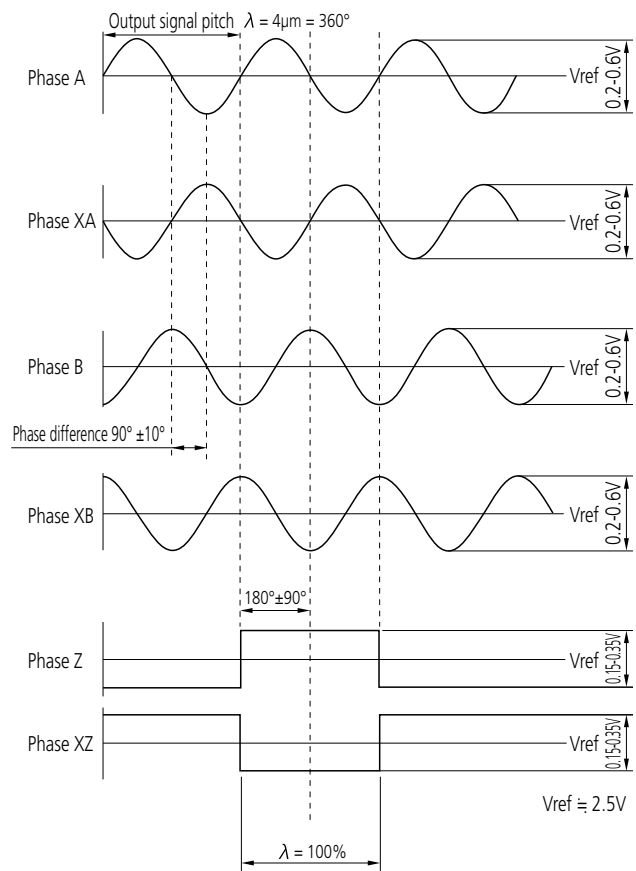


(Note) The phase difference between the PZ signal and the Phase A signal (and the Phase B signal) are not defined.

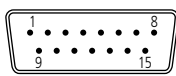
• 2-phase square wave signals (Type B, C)



• 1Vp-p 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	0V (GND)	0V (GND)	0V (GND)	Phase XA
2	0V (GND)	0V (GND)	0V (GND)	Phase XB
3	+5V	+5V	+5V	Phase Z
4	+5V	+5V	+5V	+5V (V_{DD})
5	Phase A	Reset input (anode)	Phase A	+5V (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{PA}	\overline{PA}	Phase XZ
12	N.C	PB	PB	0V (GND)
13	N.C	\overline{PB}	\overline{PB}	0V (GND)
14	N.C	PZ	PZ	N.C
15	F.G	F.G (= 0V)	F.G (= 0V)	0V (GND)

Specification Selection Method

- There is an extensive selection of specifications for ST36.
 - Choose the appropriate numbers and letters below according to specification required.
- If standard specifications (recommended items marked with ●/◎ symbols below) meet your requirements, please order using the code numbers shown on page 11.

How to read the code

ST36 - - - -

Signal output

Code	Output
A	Sinusoidal signal
B	Square wave signal + external reset input
C	Sinusoidal signal + Square wave signal
D	1Vp-p differential

Effective range

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

Note: For the standard specification, the indicated effective range depends on the product code.

Example of standard specification

Effective range 10mm: ST36□-0010

Effective range 250mm: ST36□-0250

Scale reference point

Code	Details
●A	50mm pitch (100 to 3000)
◎B	Center point (10 to 3000)
Z	Special position specification

Note: For reference positions in the effective range of 10 to 80mm, [B: Center point] is the standard specification.

Resolution / Minimum edge interval

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

Note: The minimum edge interval varies 0 to -10% based on the operating environmental conditions.

Special codes

Code	Details
●None	Standard selection specification
Z	Special specification

Note: If there are special details, please select Z.

Head cable length

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

Note: If there are special details, please select Z.

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
◎Z	When [Signal output] is [A] or [D]

