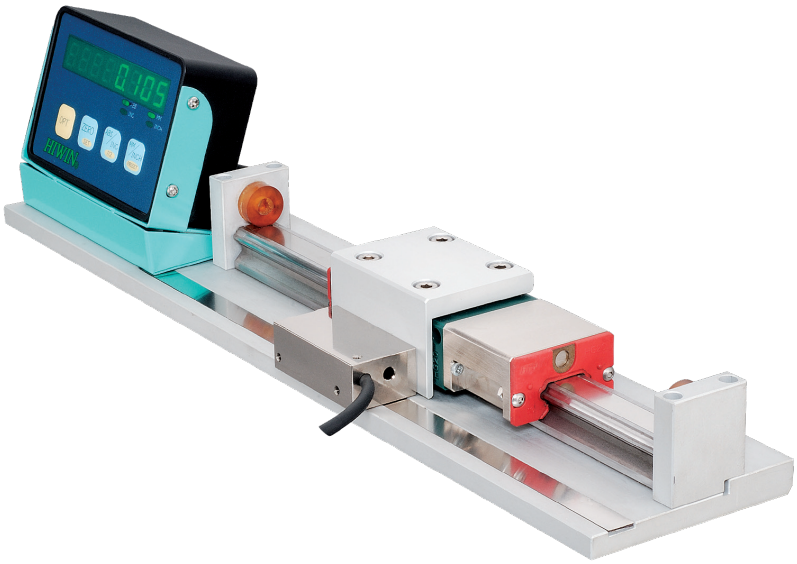
HIWIN®
Linear Motion Products & Technology



Positioning Measurement System

Technical Information

HIWIN®

Linear Motion Products & Technology

High speed | High precision | Multifunctional integration | Ecology first | Humanistic technology

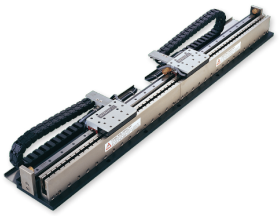
TAIWAN EXCELLENCE
GOLD AWARD 2005

Ballscrew

- For Heavy-Load Drive

TAIWAN EXCELLENCE
2004

Positioning Guideway



TAIWAN EXCELLENCE
GOLD AWARD 2004

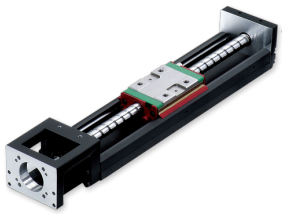
Linear Synchronous Motor

- Coreless Type (LMC)
- Iron-core Type (LMS)

TAIWAN EXCELLENCE
2002

Linear Actuator

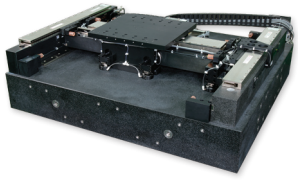
- LAN for Hospital
- LAM for Industrial
- LAS Compact Size
- LAK Controller



TAIWAN EXCELLENCE
GOLD AWARD 2003

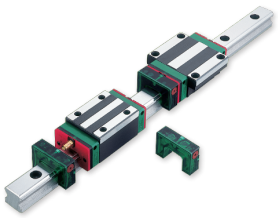
Single Axis Robot

- For Semiconductor & Electronic (KK Robot)
- For Automation (KS, KA Robot)



TAIWAN EXCELLENCE
SILVER AWARD 2009

Linear Motor Air Bearing Platform



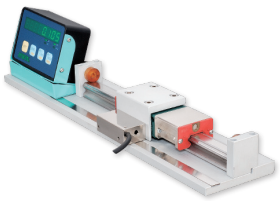
TAIWAN EXCELLENCE
GOLD AWARD 2008

TAIWAN EXCELLENCE
SILVER AWARD 2007, 2002

Linear Guideway

HG/EG/RG/MG Type

- Self-Lubricating (E2)
- Low Noise (Q1)
- Air Jet (A1)



Positioning Measurement System

TAIWAN EXCELLENCE
GOLD AWARD 2009, 2008

TAIWAN EXCELLENCE
SILVER AWARD 2006, 2001, 1993

Ballscrews

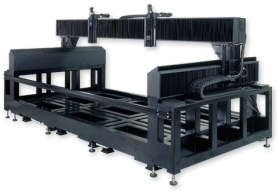
Ground/Rolled

- High Speed (High Dm-N Value/Super S Series)
- Heavy Load (Cool type II)
- Self-Lubricanting (E2)
- Rotating Nut (R1)

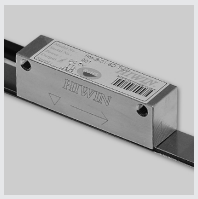
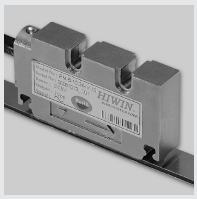
Linear Motor X-Y Robot

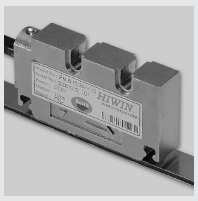
TAIWAN EXCELLENCE
SILVER AWARD 2006

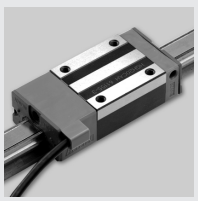
TMS Direct-Driven Positioning System



Linear Motor Gantry









I. 1mm High Resolution Position Measurement System

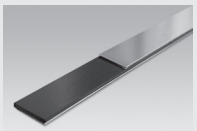
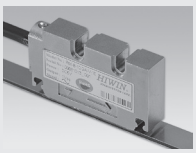
II. 5mm High Resolution Position Measurement System

III. Display and Counter

IV. Accessories

The Component Breakdown of the Positioning Measurement System

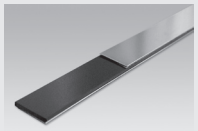
1mm Placement Figure (Analog)

Pole Pitch	Refer Page	Resolution	Encoder Type	Refer Page	Signal	Type of Connector	Refer Page
1mm PS-B-□□□□□ 	Page 1	1μm	T Type PM-B-□□-□A-T-□□ 	Page 2	Analog	No connector  D-sub VGA 15 Pin 	Page 12
			Standard Type PM-B-□□-□A-S-□□ 	Page 4		D-sub 15 Pin  17 Pin Circuit Plug  SCSI 14 Pin  SCSI 14 Pin (with screw) 	
			Vertical Type PM-B-□□-□A-V-□□ 	Page 6			
			PG Type PM-B-□□-□A-G-□□-□ 	Page 8		SCSI 20 Pin 	

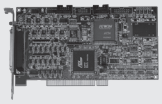
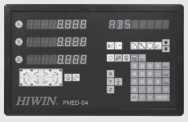
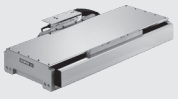
1mm Placement Figure (Analog)

Translator	Refer Page	Trunk Connector	Refer Page	Counter/Display Application	Refer Page
				High Efficiency Single Axis Counter PMED-H1-1-B□-□	Page 29
ST-B-□□	Page 10	D-sub 9 Pin to D-sub VGA 15 Pin STC-□□-00-□	Page 36	High Efficiency Multi-axis Counter PMED-S4-□	Page 34
				Multi-axis Counter PMED-S3-□	Page 32
		D-sub 9 Pin to D-sub 15 Pin STC-□□-01-□		For M Company 3 Axis Counter	
				PLC or Driver	
		Copley Driver No.800-1519A/1513A		Linear Motors (HIWIN LM)	

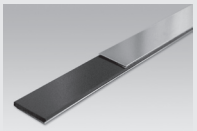
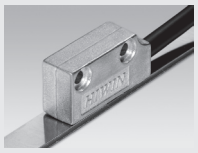
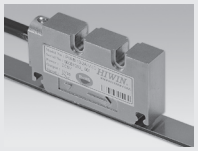
1mm Placement Figure (Digital)

Pole Pitch	Refer Page	Resolution	Encoder Type	Refer Page	Signal	Type of Connector	Refer Page
1mm PS-B-□□□□□ 	Page 1	1μm	T Type PM-B-□□-□D-T-□□ 	Page 2	Digital	Non Connector 	Page 12
						D-sub VGA 15 Pin 	
			Standard Type PM-B-□□-□D-S-□□ 	Page 4		D-sub 15 Pin 	
						17-Pin Circular Plug 	
						SCSI 14 Pin 	
			PG Type PM-B-□□-□D-G-□□-□ 	Page 8		SCSI 14 Pin (with screw) 	
						SCSI 20 Pin 	

1mm Placement Figure (Digital)

	Counter/Display Application	Refer Page
	PLC or Driver 	
	High Efficiency Single Axis Counter PMED-H1-1-00-☐ 	Page 29
	High Efficiency Multi-axis Counter PMED-S4-☐ 	Page 34
	Multi-axis Counter PMED-S3-☐ 	Page 32
Copley Driver No.800-1519A/1513A 	Linear Motors (HIWIN LM) 	

5mm Placement Figure (Analog)

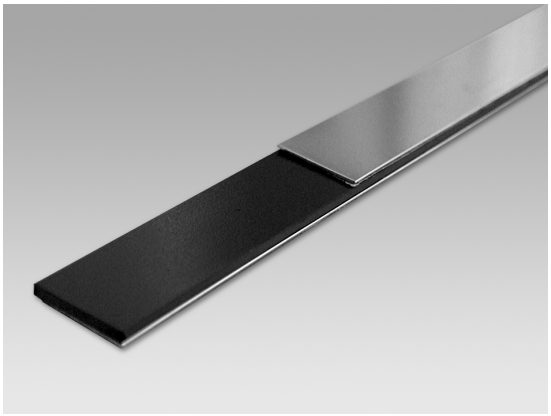
Pole Pitch	Refer Page	Resolution	Encoder Type	Refer Page	Signal	Type of Connector	Refer Page
5mm PS-A-□□□□□ 	Page 16	5μm	E Type PM-A-□□-□A-E-00 	Page 19	Analog	D-sub VGA 15 Pin 	Page 12
						SCSI 14 Pin 	
			H Type PM-A-□□-□A-H-□□ 	Page 21		SCSI 14 Pin (with screw) 	
			Vertical Type PM-A-□□-□A-V-□□ 	Page 17		D-sub VGA 15 Pin 	

5mm Placement Figure (Analog)

Translator	Refer Page	Trunk Connector	Refer Page	Counter/Display Application	Refer Page
				High Efficiency Single Axis Counter PMED-H1-1-A□-□	Page 29
				LED Counter System PMCD-A-1-00	Page 27
ST-A-□□	Page 22	D-sub 9 Pin to D-sub VGA 15 Pin STC-□□-00-□	Page 36	High Efficiency Multi-axis Counter PMED-S4-□	Page 34
				Multi-axis Counter PMED-S3-□	Page 32
		D-sub 9 Pin to D-sub 15 Pin STC-□□-01-□		For M Company 3 Axis Counter	
				PLC or Driver	
ST-A-□□B				High Efficiency Single Axis Counter PMED-H1-1-A□-□	Page 29
				LCD Counter System PMLD-A-□□-□-□□	Page 25

I. 1mm High Resolution Position Measurement System

1. 1mm Positioning Scale



Features:

- Compatible with various measurement instruments to achieve different accuracy requirements.
- Magnetic scale can maintain performance under severe ambient conditions caused by oil, water or dust to gain required accuracy and signal feedback.

1.1 Specifications:

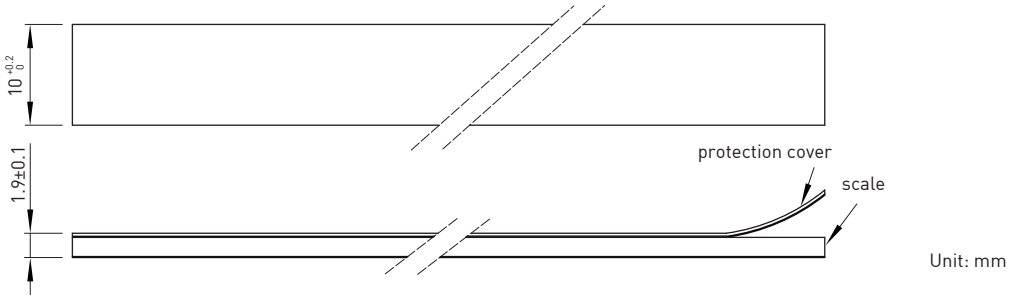
Accuracy	±20μm/m
Pitch	1mm
Width	10mm (+0.2mm~0mm)
Thickness	1.9mm±0.1mm
Max scale length	30m
Linear expansion coefficient	(11±1)×10^{-6}m/K
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP67

1.2 Ordering Code:

PS - B - XXXXX

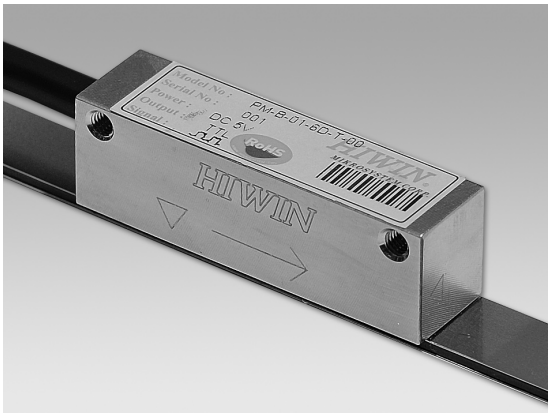
PS: Positioning Scale
XXXXX: Scale length (Unit: mm)
B: Pole pitch (1mm)

1.3 Dimensions:



Caution! Magnetic scale consists of a magnetic substance and should be kept away from strong magnetic fields during installation to prevent a malfunction.

2. Positioning Measurement - Tiny Type



Features:

- Tiny shape
- Digital or analog output available
- Simple design and easy-mounting
- Same installation holes as other optical encoders, easy to switch and replace

2.1 Specifications:

Signal resolution	analog: 1mm digital: 1μm
Repeatability	analog: ±3μm digital: ±2μm
Reference signal	1mm/pulse
Output signal	analog: SIN/COS 1Vp-p digital: 5V RS422/TTL
Max travel speed	analog: 10m/sec digital: 7m/sec
Input power	5VDC ±5%
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP67

2.2 Ordering Code:

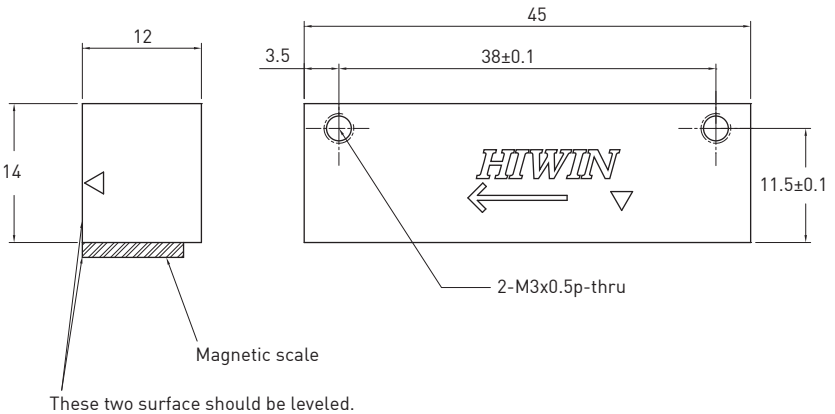
PM - B - XX - XX - T - XX

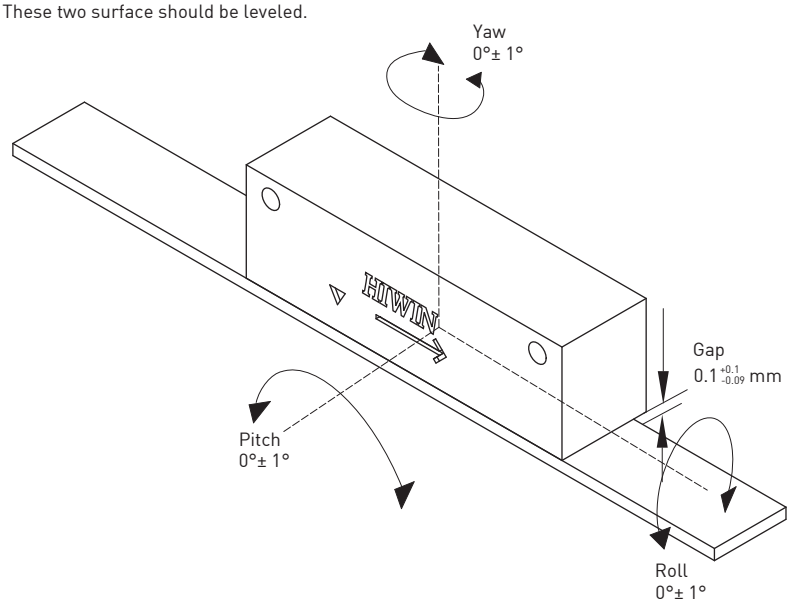
- PM : Positioning Measurement
- 00 : Standard
- T : Tiny type
- A : Analog SIN/COS 1Vp-p
- D : Digital 5V RS422/TTL
- 0 : No termination
- 1 : SCSI 20 Pin
- 2 : SCSI 14 Pin
- 3 : D-sub 15 Pin
- 4 : 17 Pin Circular Plug (M17)
- 5 : SCSI 14 Pin (with screw)
- 6 : D-sub VGA 15 Pin

Note: Refer to Page 12 for wiring

- XX : Cable length (Unit: m ; Max 10m)
- B : Pole pitch (1mm)

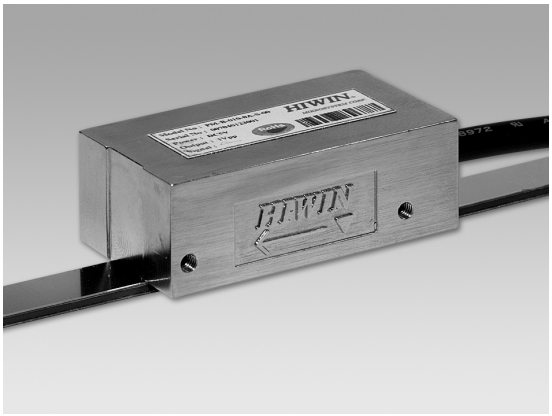
2.3 Dimensions:





Unit: mm

3. Positioning Measurement - Standard Type



Features:

- Digital or analog signal output available
- Simple design and easy-mounting
- Same installation holes as other optical encoders, easy to switch and replace
- Waterproof and dustproof
- Optional metal protection tube

3.1 Specifications:

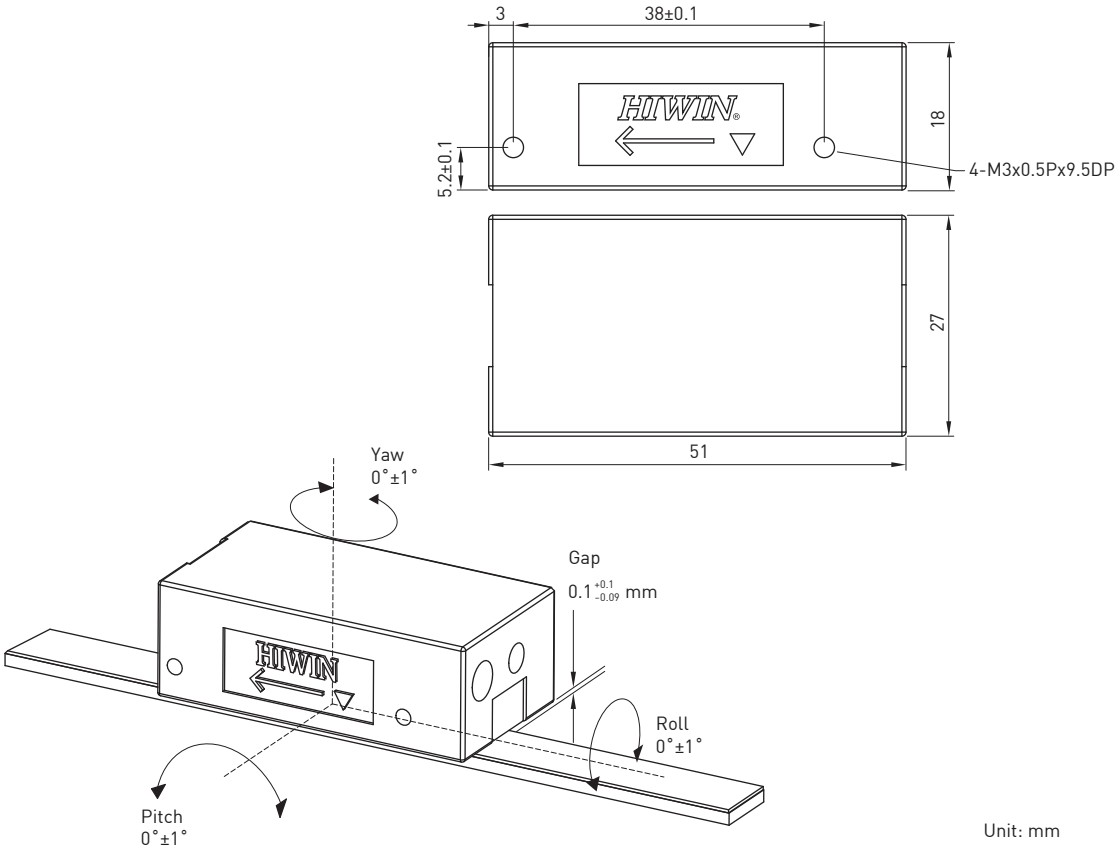
Signal resolution	analog: 1mm digital: 1μm
Repeatability	analog: ±3μm digital: ±2μm
Reference signal	1mm/pulse
Output signal	analog: SIN/COS 1Vp-p digital: 5V RS422/TTL
Max travel speed	analog: 10m/sec digital: 7m/sec
Input power	5VDC ±5%
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP67

3.2 Ordering Code:

PM - B - XX - XX - S - XX

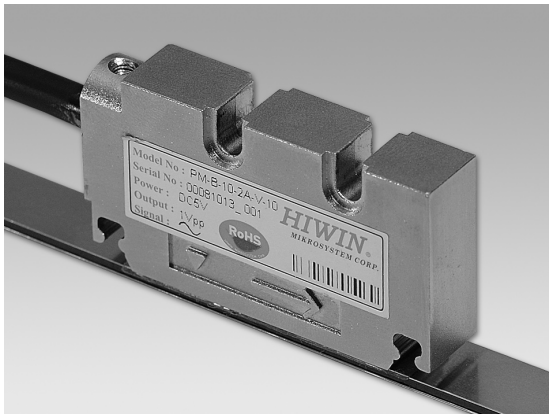
PM : Positioning Measurement
00 : Standard
01 : with metal tube
S : Standard type
A : Analog SIN/COS 1Vp-p
D : Digital 5V RS422/TTL
0 : No termination
1 : SCSI 20 Pin
2 : SCSI 14 Pin
3 : D-sub 15 Pin
4 : 17 Pin Circular Plug (M17)
5 : SCSI 14 Pin (with screw)
6 : D-sub VGA 15 Pin
Note: Refer to Page 12 for wiring
XX : Cable length (Unit: m ; Max 10m)
B : Pole pitch (1mm)

3.3 Dimensions:



Unit: mm

4. Positioning Measurement - Vertical Type



Features:

- Analog signal output available
- Vertical shape, optimal for space-saving applications
- Optional metal protection tube

4.1 Specifications:

Signal resolution	analog: 1mm
Repeatability	±3μm
Reference signal	2mm/pulse
Output signal	analog: SIN/COS 1Vp-p
Max travel speed	analog: 10m/sec
Input power	5VDC ±5%
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP67

4.2 Ordering Code:

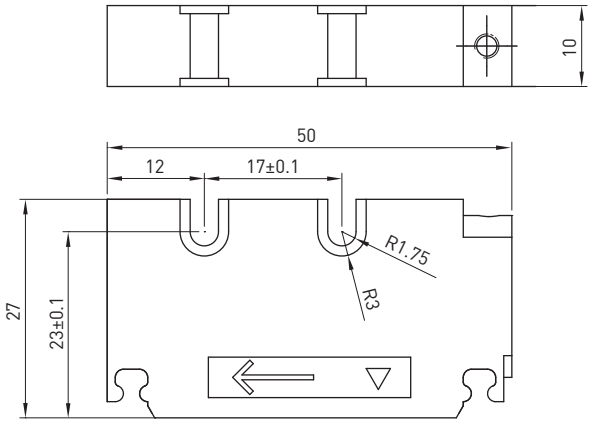
PM - B - XX - XX - V - XX

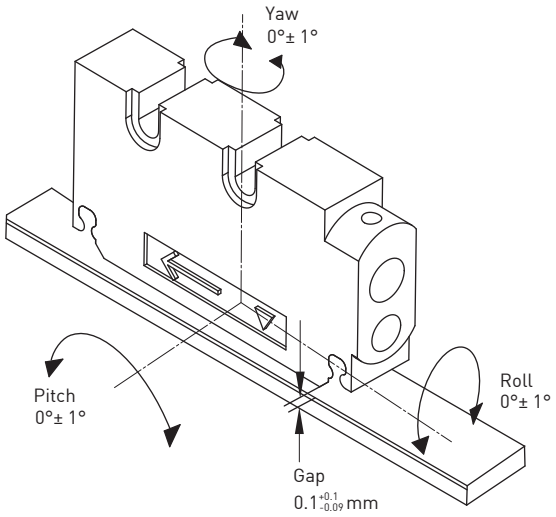
- PM : Positioning Measurement
- 10 : Standard
- 11 : with metal tube
- V : Vertical type
- A : Analog SIN/COS 1Vp-p
- 0 : No termination
- 1 : SCSI 20 Pin
- 2 : SCSI 14 Pin
- 3 : D-sub 15 Pin
- 4 : 17 Pin Circular Plug (M17)
- 5 : SCSI 14 Pin (with screw)
- 6 : D-sub VGA 15 Pin

Note: Refer to Page 12 for wiring

- XX : Cable length (Unit: m ; Max 10m)
- B : Pole pitch (1mm)

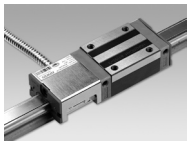
4.3 Dimensions:





Unit: mm

5. Positioning Measurement - PG Type



Features:

- Digital or analog signal output available
- Compact design and compatible with HIWIN linear guideways
- Cost-effective and reliable
- Optimal solution for automation equipment that requires precise position feedback

5.1 Specifications:

Signal resolution	analog: 1mm digital: 1μm
Repeatability	analog: ±3μm digital: ±2μm
Reference signal	1mm/pulse
Output signal	analog: SIN/COS 1Vp-p digital: 5V RS422/TTL
Max travel speed	analog: 10m/sec digital: 7m/sec
Input power	5VDC ±5%
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP67

5.2 Ordering Code:

PM - B - XX - XX - G - XX - X

PM : Positioning Measurement

X:
- 0 : standard
- 1 : with metal tube

XX : for Hxx type (H20, H25 available)

G : PG type

XX:
- A : Analog SIN/COS 1Vp-p
- D : Digital 5V RS422/TTL

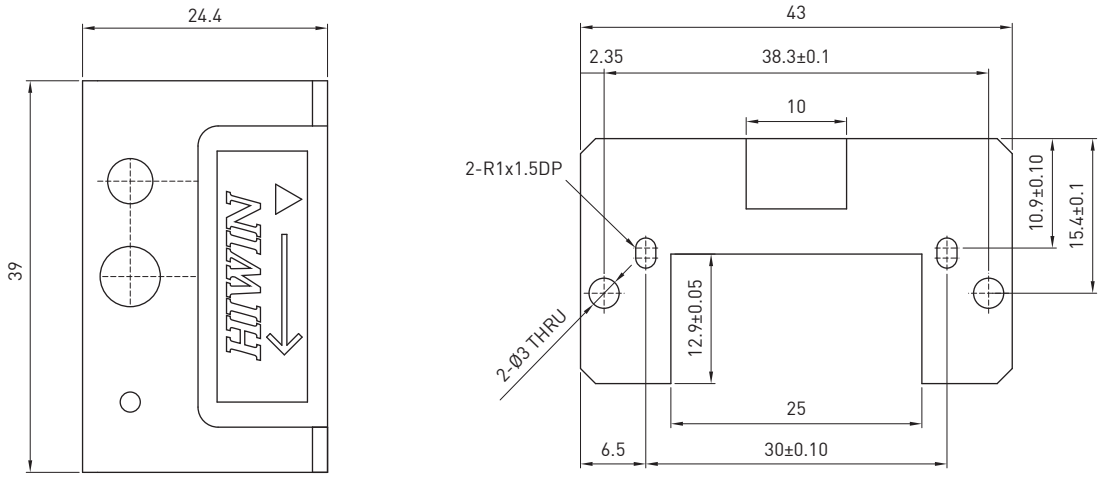
XX:
- 0 : No termination
- 1 : SCSI 20 Pin
- 2 : SCSI 14 Pin
- 3 : D-sub 15 Pin
- 4 : 17 Pin Circular Plug (M17)
- 5 : SCSI 14 Pin (with screw)
- 6 : D-sub VGA 15 Pin

Note: Refer to Page 12 for wiring

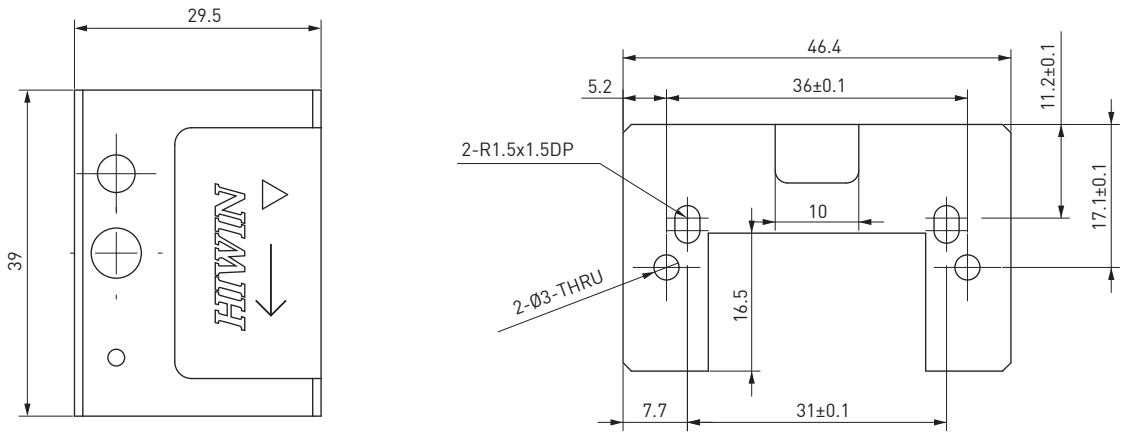
XX : Cable length (Unit: m ; Max 10m)

B : Pole pitch (1mm)

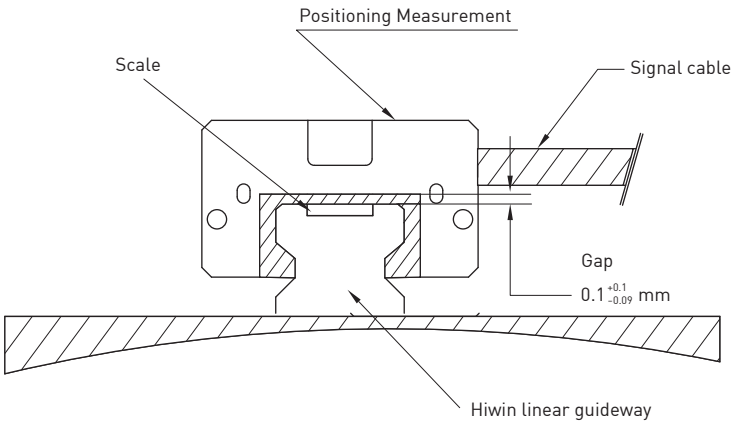
5.3 Dimensions:



Note: These dimensions are applicable for the Hiwin PGH20 linear guideway



Note: These dimensions are applicable for the Hiwin PGH25 linear guideway



Unit: mm

6. 1mm Signal Translator

Features:

- Converting an analog signal input into a digital signal output
- Output signal 5V RS422/TTL or open collector
- Suitable for precise position feedback to a PC or PLC connection

6.1 Specifications:

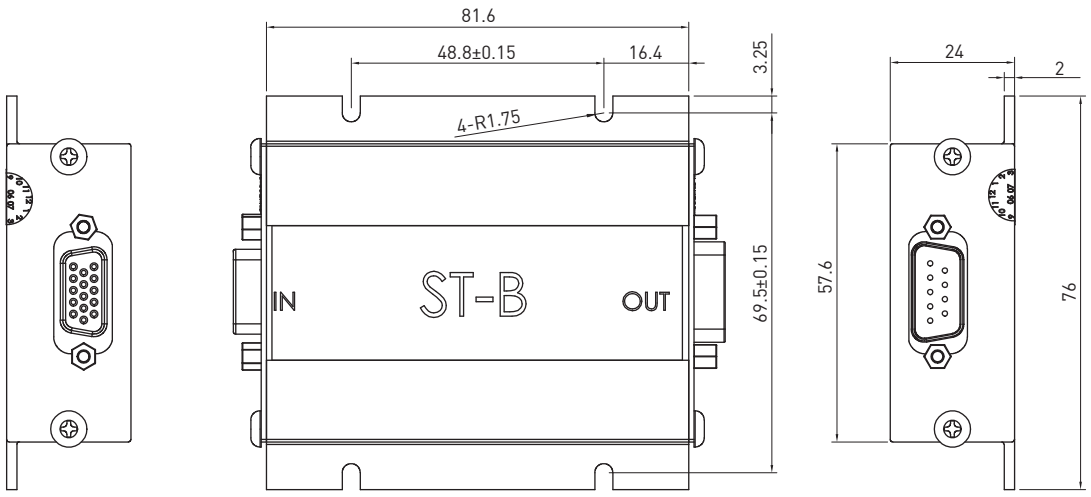
Repeatability	±3μm
Resolution	1μm, 2μm, 5μm, 10μm
Input signal	analog: Sin/Cos 1Vp-p
Output signal	digital: 5V RS422/TTL or 24V/Open collector
Max output frequency	1.25MHz (Resolution: 1μm mode)
Power input	5VDC ±5%/0.5A
Max travel speed	5m/sec
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP43

6.2 Ordering Code:

ST - B - XX

ST : Signal Translator
1 : 5V RS422 / TTL
2 : 24V / Open collector
1 : Resolution 1μm
2 : Resolution 2μm
3 : Resolution 5μm
4 : Resolution 10μm
B : Pole pitch (1mm)

6.3 Dimensions:



Unit: mm

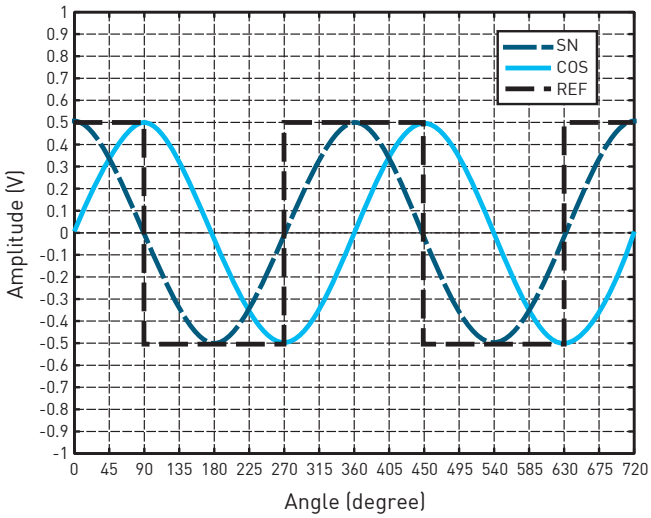
7. Cable Color and Pin Assignment

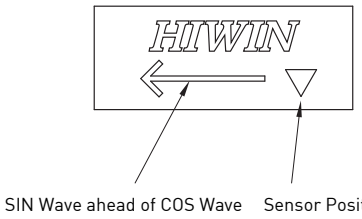
Function	Signal		Color	Connector (SCSI 14 Pin) Analog	Connector (SCSI 20 Pin)		Connector (D-sub 15 Pin)		Connector (17 Pin Circular Plug)	Connector (D-sub VGA 15 Pin)		No Termination
	Analog	Digital			Analog	Digital	Analog	Digital		Analog	Digital	
Power	5V		Brown	1	3	3	4	7	4/5	1	1	Brown
	0V		White	8	2	2	12	2	12/13	2	2	White
Incremental signals	SIN+	A+	Green	10	16	4	9	14	9	11	3	Green
	SIN-	A-	Yellow	11	17	5	1	6	1	12	9	Yellow
	COS+	B+	Blue	3	18	6	10	13	10	13	4	Blue
	COS-	B-	Red	4	19	7	2	5	2	14	10	Red
Reference mark	REF+	Z+	Violet	5	8	8	3	12	3	7	7	Violet
	REF-	Z-	Gray	6	9	9	11	4	11	8	8	Gray
Shield				case	1/case		case		case	case		

Note: 17 pin circular plug
Brand: Intercontec Corp.
P/N: AKUA874MR1087004A000

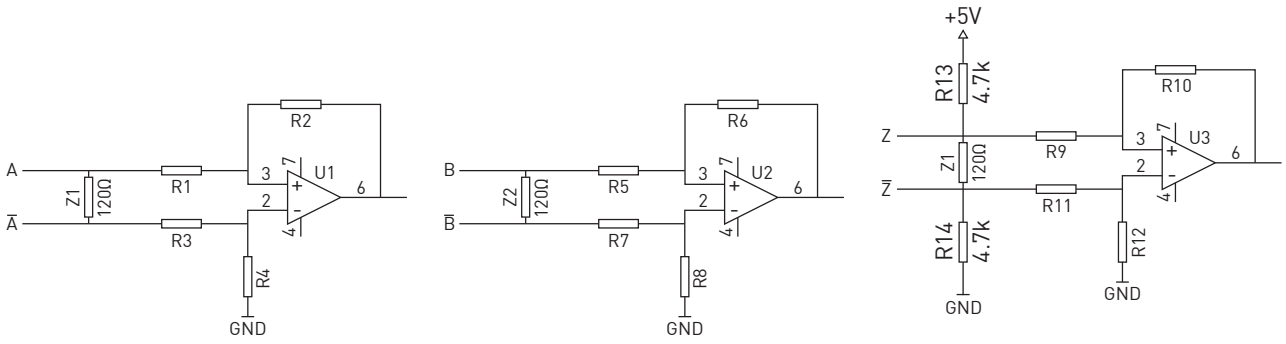
8. Output Signal Definition

8.1 Analog Signal Definition:





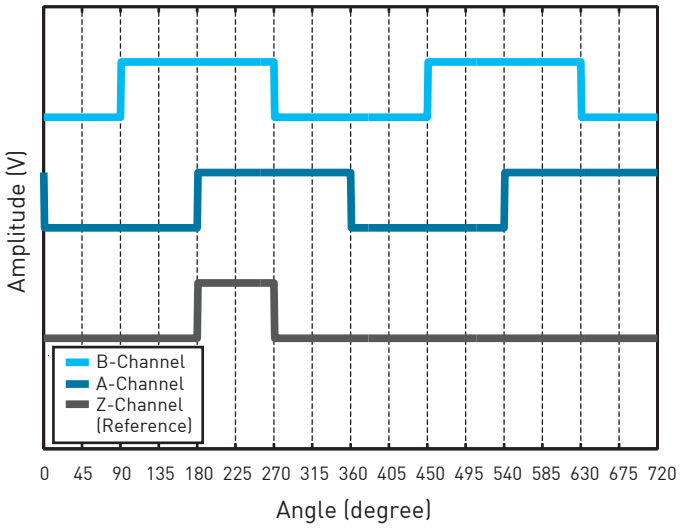
Recommended input circuit of the following electronic device:



A-channel B-channel Reference-channel

Analog Output

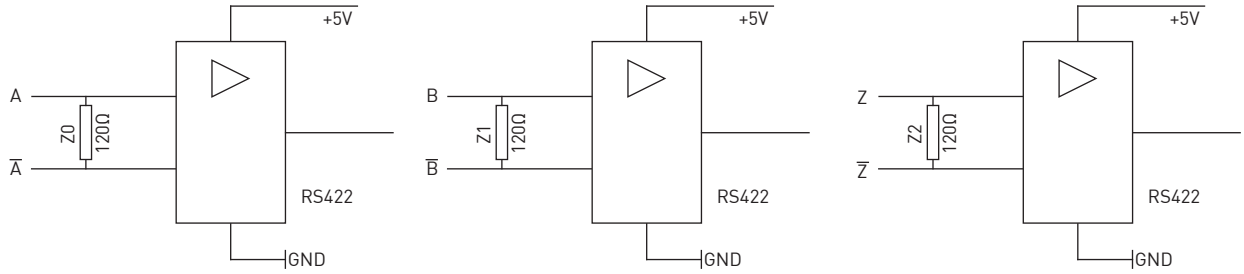
8.2 Digital Signal Definition:



Digital TTL Output

Digital TTL output according to RS422:
- 90° Phase shifted square signal in compliance with RS422 specification
- Recommended termination Z=120 Ohm
- Differential output signal A,$\overline{A}$,B,$\overline{B}$,Z,$\overline{Z}$

Recommended input circuit of the following electronic device:



A-channel B-channel Reference-channel

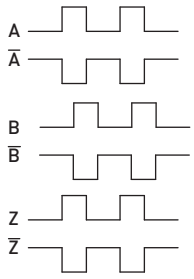
Digital Output

9. Signal Translator Pin Assignment

Output Signal and Application:

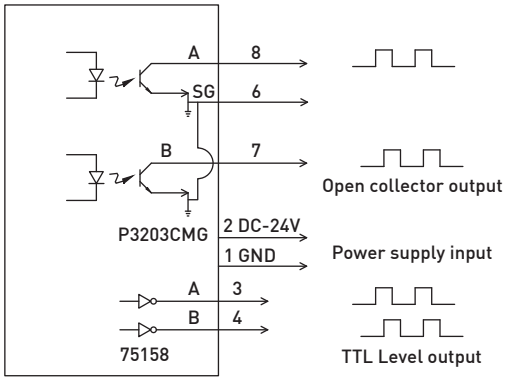
ST-B-□1: D-sub 9 pin definition for signal output connector

Pin No.	Signal	I/O
1	GND	I
2	DC5V	I
3	A	O
8	$\overline{A}$	O
4	B	O
7	$\overline{B}$	O
5	Z	O
9	$\overline{Z}$	O
6	SGND	I



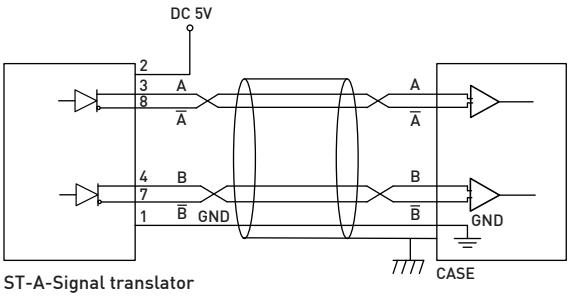
ST-B-□2: D-sub 9 pin definition for signal output connector

Pin No.	Signal	I/O
1	GND	I
2	DC24V	I
8	A (open collector)	O
7	B (open collector)	O
3	A (TTL level)	O
4	B (TTL level)	O
5	Z	O
9	$\overline{Z}$	O
6	SGND	I

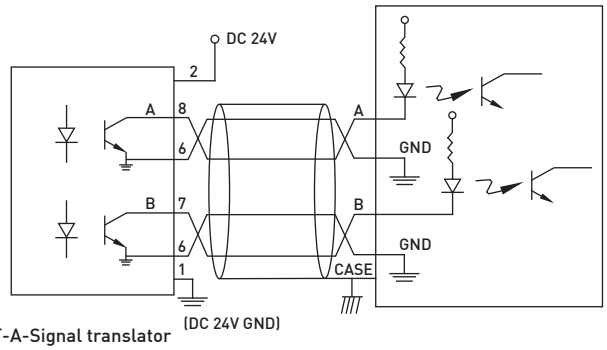


Application Example:

ST-B-□1(5V RS422/TTL) Wiring

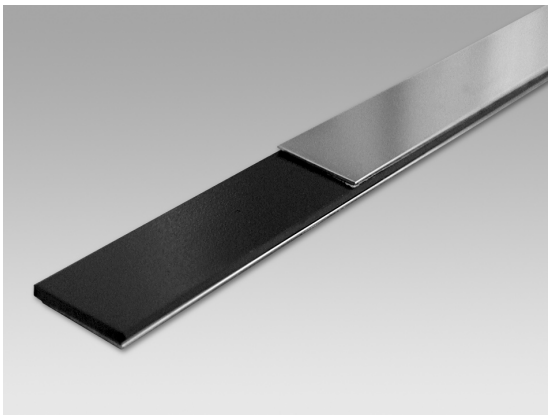


ST-B-□2(24V/O.C.) Wiring



II. 5mm High Resolution Position Measurement System

10. 5mm Positioning Scale



Features:

- Compatible with various measurement instruments to achieve different accuracy requirements.
- Magnetic scale can maintain performance under severe ambient conditions caused by oil, water or dust to gain required accuracy and signal feedback.

10.1 Specifications:

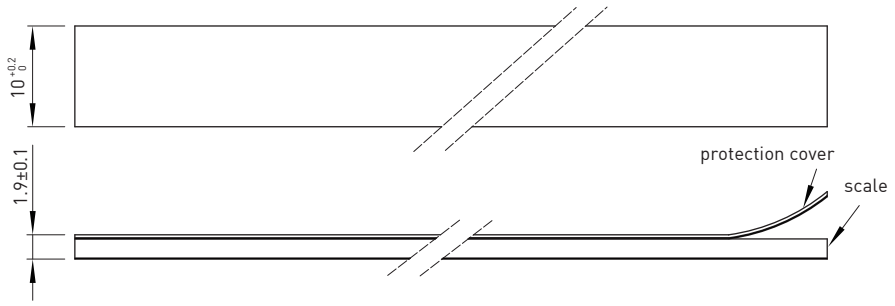
Accuracy	± (80μm+15μm/mxL) L: Length (unit: m)
Pitch	5mm
Width	10mm (+0.2mm~0mm)
Thickness	1.9mm±0.1mm
Max scale length	30m
Linear expansion coefficient	(11±1) x10^{-6} m/K
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP67

10.2 Ordering Code:

PS - A - XXXXX

PS : Positioning Scale
XXXXX : Scale length (Unit: mm)
A : Pole pitch (5mm)

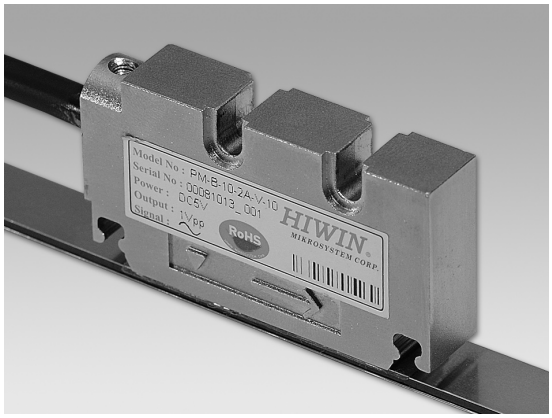
10.3 Dimensions:



Unit: mm

Caution! Magnetic scale consists of a magnetic substance and should be kept away from strong magnetic fields during installation to prevent a malfunction.

11. Positioning Measurement - Vertical Type



Features:

- Analog signal output
- Vertical shape, optimal for space-saving applications
- Optional metal protection tube and scraper available

11.1 Specifications:

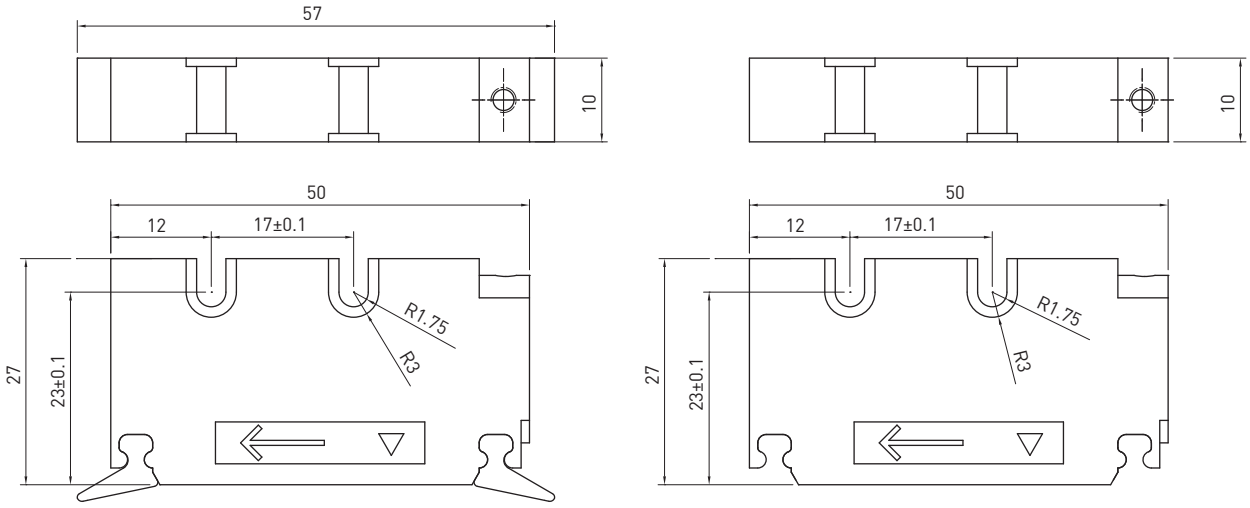
Signal resolution	analog: 5mm
Repeatability	±10μm
Output signal	analog: SIN/COS 1Vp-p
Max travel speed	analog: 10m/sec
Input power	5VDC ±5%
Operating temperature	0˚C~50˚C
Storage temperature	-5˚C~70˚C
Protection class	IP67

11.2 Ordering code:

PM - A - XX - XX - V - XX

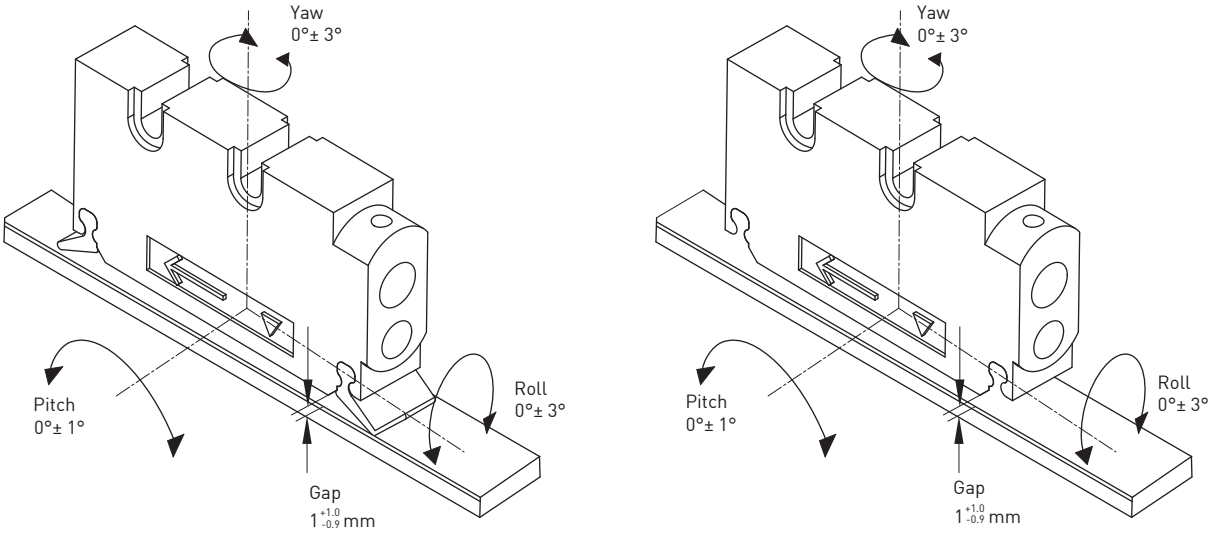
PM : Positioning Measurement
10 : Standard
11 : with metal tube
12 : with scraper
13 : with metal tube and scraper
V : Vertical type
A : Analog SIN/COS 1Vp-p
0 : No termination
2 : SCSI 14 Pin
5 : SCSI 14 Pin (with screw)
6 : D-sub VGA 15 Pin (match with ST-A-☐☐B or PMED-H1-1-A0-☐)
Note: Refer to Page 12 for wiring
XX : Cable length (Unit: m ; Max 10m)
A : Pole pitch (5mm)

11.3 Dimensions:



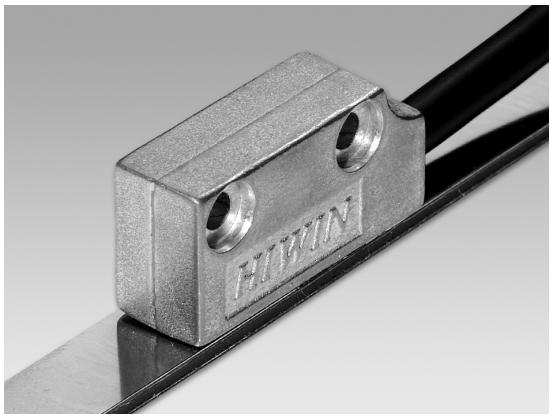
Read head with scraper

Standard read head



Unit: mm

12. Positioning Measurement - E Type



Features:

- Analog signal output
- Optimal for space-saving applications
- Dustproof and waterproof, up to IP67 protection class

12.1 Specifications:

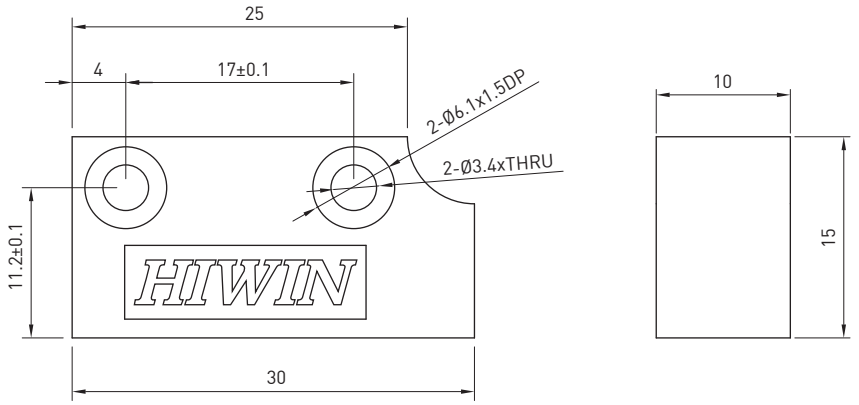
Signal resolution	5mm
Repeatability	±20μm
Output signal	analog: SIN/COS 50mVp-p
Max travel speed	10m/sec
Input power	3.3VDC ±5%
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP67

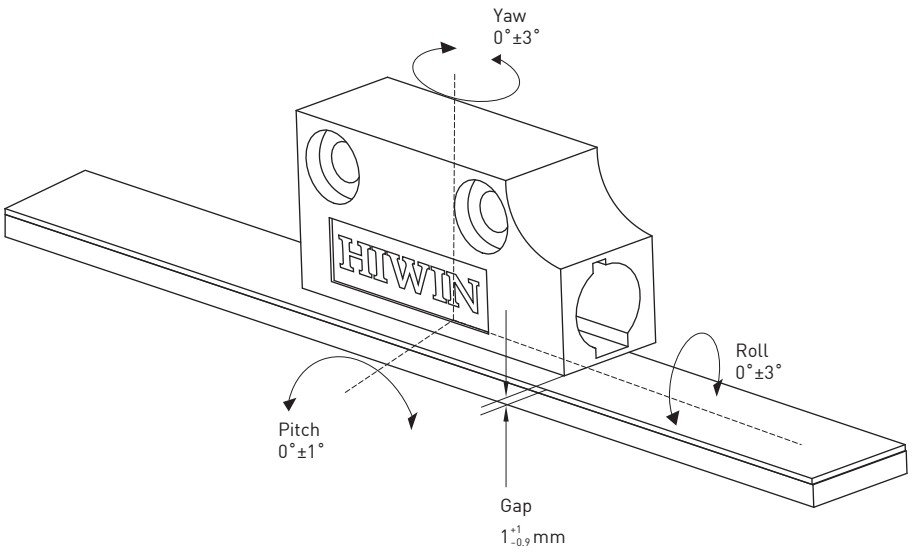
12.2 Ordering Code:

PM - A - XX - XX - E - XX

- PM : Positioning Measurement
- 00 : Standard
- E : E type
- A : Analog SIN/COS 50mVp-p
- 2 : SCSI 14 Pin
- 5 : SCSI 14 Pin (with screw)
- 6 : D-sub VGA 15 Pin (match with PMED-H1-1-A1-□)
- Note: Refer to Page 12 for wiring
- XX : Cable length (Unit: m ; Max 10m)
- A : Pole pitch (5mm)

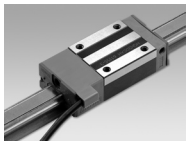
12.3 Dimensions:





Unit: mm

13. Positioning Measurement - H Type



Features:

- Analog signal output
- Compact design used with Hiwin linear guideways
- Optimal for space-saving applications
- Easy installation

13.1 Specifications:

Signal resolution	5mm
Repeatability	±20μm
Output signal	analog: SIN/COS 50mVp-p
Max travel speed	10m/sec
Input power	3.3VDC ± 5%
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP67

13.2 Ordering Code:

PM - A - XX - XX - H - XX

- PM : Positioning Measurement
- XX : for Hxx type (H20, H25, H30, H35, H45...available)
- H : H type
- A : Analog SIN/COS 50mVp-p
- 2 : SCSI 14 Pin
- 5 : SCSI 14 Pin (with screw)
- 6 : D-sub VGA 15 Pin (match with PMED-H1-1-A2-☐)
- Note: Refer to Page 12 for wiring
- XX : Cable length (Unit: m ; Max 10m)
- A : Pole pitch (5mm)

14. 5mm Signal Translator

ST-A-□□

ST-A-□□B

Features:

- Converting an analog signal input into a digital signal output
- Output signal 5V RS422/TTL or open collector
- Suitable for precise position feedback to a PC or PLC connection

14.1 Specifications:

Type	ST-A-□□	ST-A-□□B
Accuracy	±(80μm+15μm/mxL) L: Length (unit: m)	±(80μm+15μm/mxL) L: Length (unit: m)
Repeatability	±10μm	±10μm
Signal resolution	5 or 10μm	5 or 10μm
Output pulse signal	5V RS422/TTL or open collector	5V RS422/TTL or open collector
Max output frequency	64KHz/32KHz (Resolution: 5/10μm mode)	0.25MHz/0.125MHz (Resolution: 5/10μm mode)
Power input	5VDC ± 5% / 0.5A	5VDC ± 5% / 0.5A
Max travel speed	1.2m/sec	5m/sec
Operating temperature	0°C~50°C	0°C~50°C
Storage temperature	-5°C~70°C	-5°C~70°C
Protection class	IP43	IP43

14.2 Ordering Code:

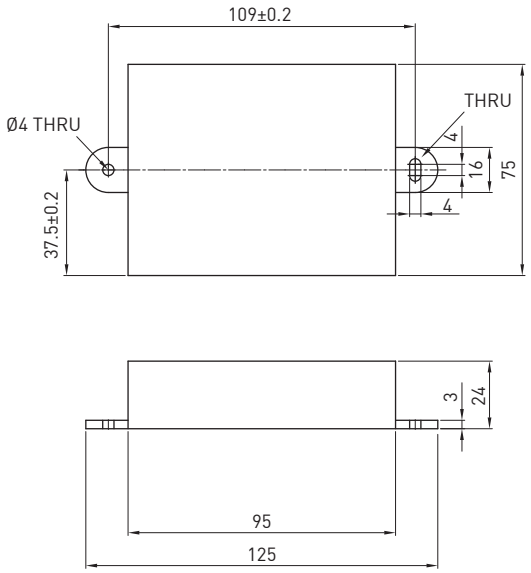
ST - A - XX

- ST : Signal Translator
- 1 : 5V RS422/TTL
- 2 : 24V/Open collector
- 1 : Resolution 5μm
- 2 : Resolution 10μm
- A : Pole pitch (5mm)

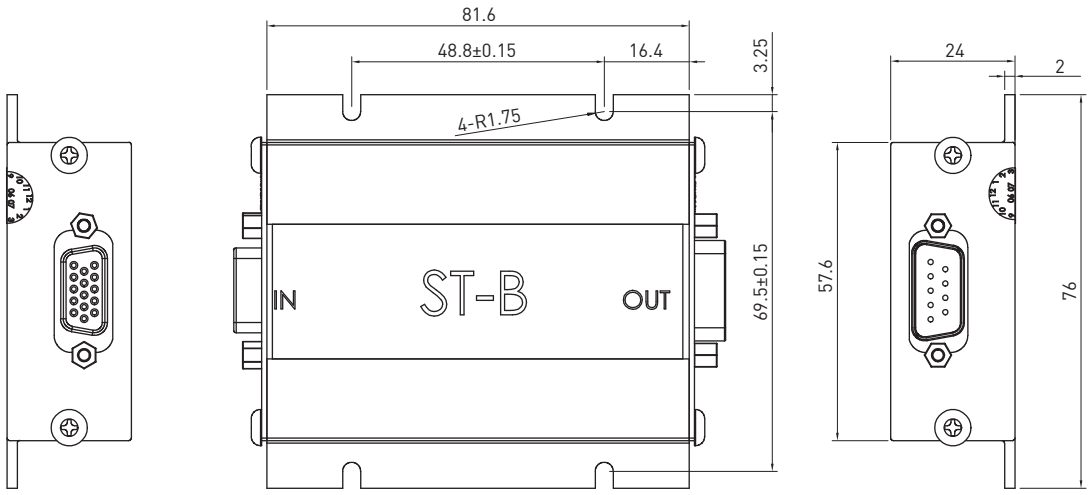
ST - A - XXB

- ST : Signal Translator
- B : For V type and 1Vp-p signal
- 1 : 5V RS422/TTL
- 2 : 24V/Open collector
- 1 : Resolution 5μm
- 2 : Resolution 10μm
- A : Pole pitch (5mm)

14.3 Dimensions:



Note: These dimensions are applicable for ST-A-□□



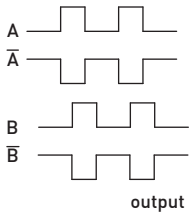
Note: These dimensions are applicable for ST-A-□□B

Unit: mm

15. Output Signal and Application

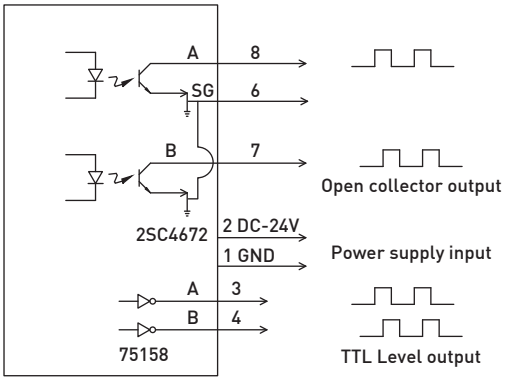
ST-A-□1 and ST-A-□1B: D-sub 9 pin definition for signal output connector

Pin No.	Signal	I/O
1	GND	I
2	DC5V	I
3	A	O
8	$\overline{A}$	O
4	B	O
7	$\overline{B}$	O
6	SGND	I



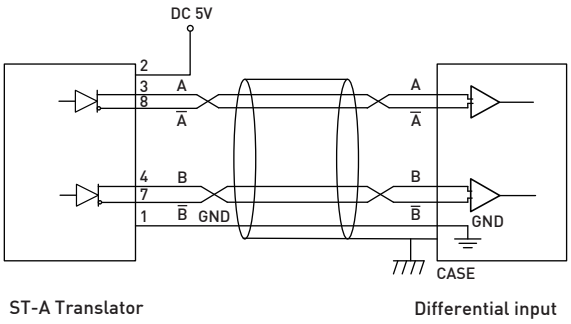
ST-A-□2 and ST-A-□2B: D-sub 9 pin definition for signal output connector

Pin No.	Signal	I/O
1	GND	I
2	DC24V	I
8	A (open collector)	O
7	B (open collector)	O
3	A (TTL level)	O
4	B (TTL level)	O
6	SGND	I

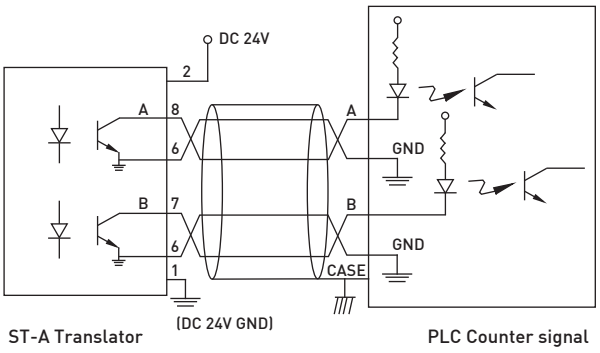


Application:

ST-A-□1 and ST-A-□1B (5V RS422/TTL) Wiring



ST-A-□2 and ST-A-□2B (24V/O.C.) Wiring



III. Display and Counter

16. LCD Counter System

Features:

- LCD display using 2 AA batteries
- Embedded read head, suitable for cutting and wood-processing machines
- Memory mode available
- Compact and cost-effective

16.1 Specifications:

Display	8 digit LCD display with +/- sign
Resolution	5μm
Accuracy	±(80μm+15μm/mxL) L: Length (unit: m)
Repeatability	±10μm
Operation speed	3m/sec (max 2G acceleration)
Input power	commercial AA No. 3 battery x 2
Battery life	1 year by setting it at 1.5m/s
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	positioning measurement IP67 display IP43

16.2 Functions:

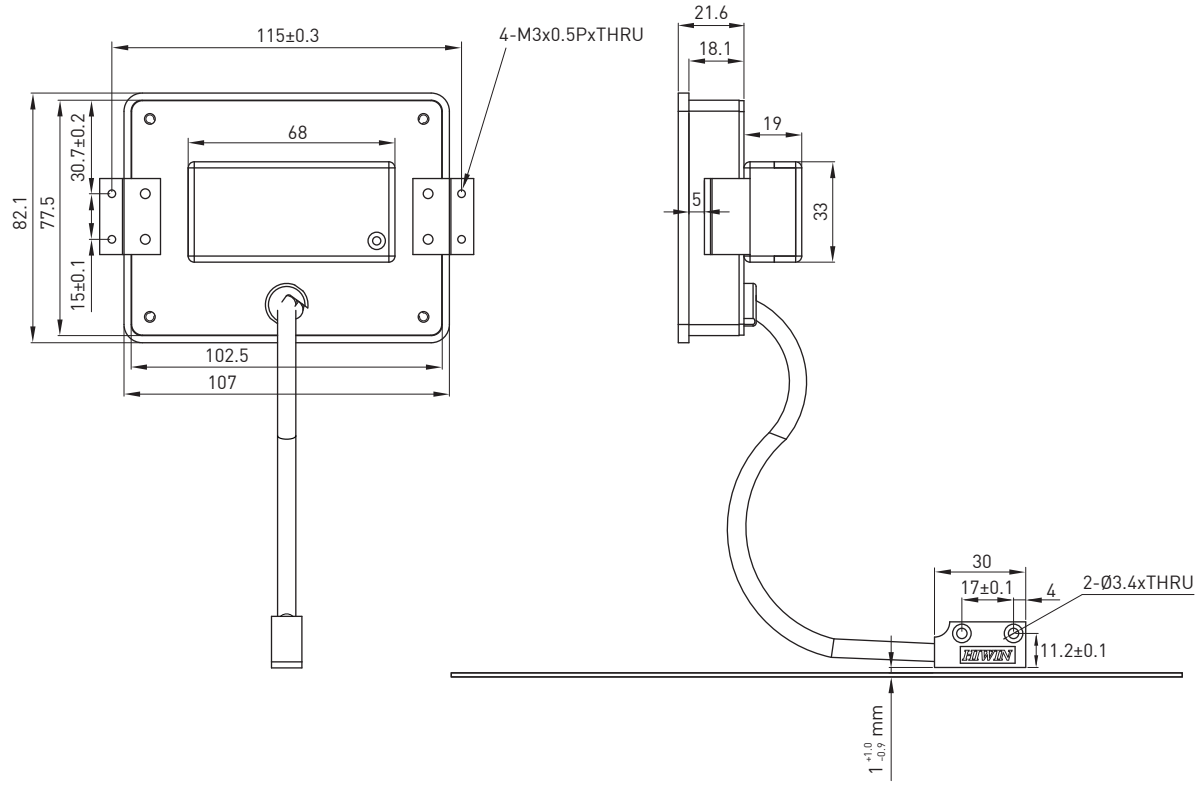
- Set reading direction
- Metric / English / angle measurement
- Set resolution
- 5 sets of independent incremental counters for relative positioning
- Set reference point
- Indicate gap of adjustment
- Save parameter-setting
- Lock keypad
- Indicate location of decimal point
- Measure absolute and relative position
- Programmable reference point compensation; 5 sets
- Maximal velocity setting (default : 1.5 m/s); 5 sets
- Set programmable coefficient ratio
- Indicate and monitor available power capacity
- Set programmable radius

16.3 Ordering Code:

PMLD - A - XX - X - XX

- 00 : standard
  XX : For HXX type (H20, H25, H30, H35, H45...available)
- E : for E type positioning Measurement
  H : for H type positioning Measurement
- XX : Cable length (Unit: m ; Max 3m)
- A : Pole pitch (5mm)

16.4 Dimensions:



Unit: mm

17. LED Counter System

Features:

- LED Display
- Suitable for heavy-cutting and wood-processing machines
- Memory mode available
- Compact design and cost-effective

17.1 Specifications:

Display	8 digital LED Display
Resolution	5μm
Accuracy	±(80μm+15μm/mxL) L: Length (unit: m)
Repeatability	±10μm
Operation speed	3m/sec (max 2G acceleration)
Input power	5VDC ± 5% / 1A
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	positioning measurement IP67 display IP43

17.2 Functions:

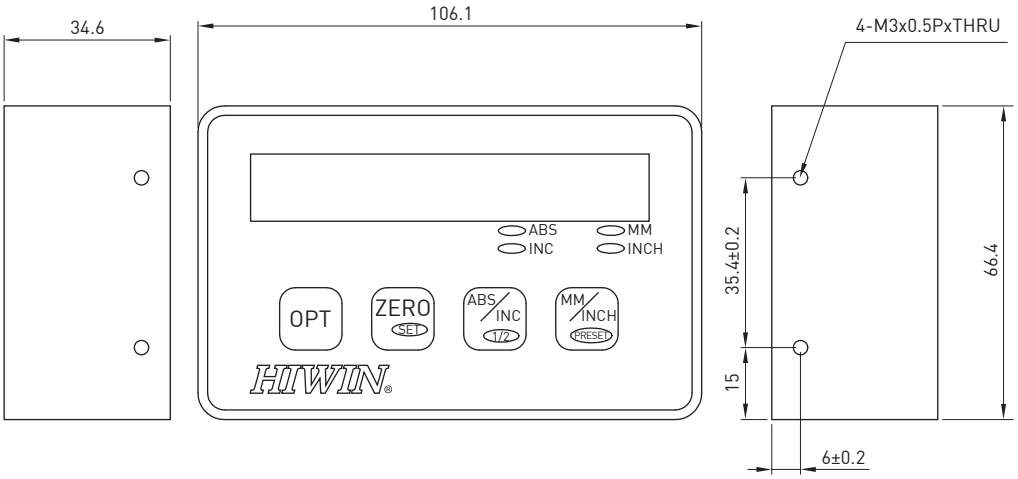
- Up / down switch over
- Adjustable decimal point
- mm / inch switch over
- Absolute / incremental measurement

17.3 Ordering Code:

PMCD - A - 1 - 00

- 00 : standard
- 1 : 1 axis counter
- A : Pole pitch (5mm)

17.4 Dimensions:



Unit: mm

18. High Efficiency Single Axis Counter

Features:

- LED display
- Can be used with other digital optical encoders
- Consists of multiple output interfaces
- Suitable for cutting and wood-processing machines
- Compact design and easy installation

18.1 Specifications:

Display	8 digit LED display
Resolution	1μm, 2μm, 5μm, 10μm
Input signal	analog: SIN/COS 1Vp-p digital: 5V RS422/TTL
Frequency	analog: 2KHz digital: 0.5MHz
Input power	DC 5V ±5% / 1A
Relay contact rating	DC 24V/2A
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP43

18.2 Functions:

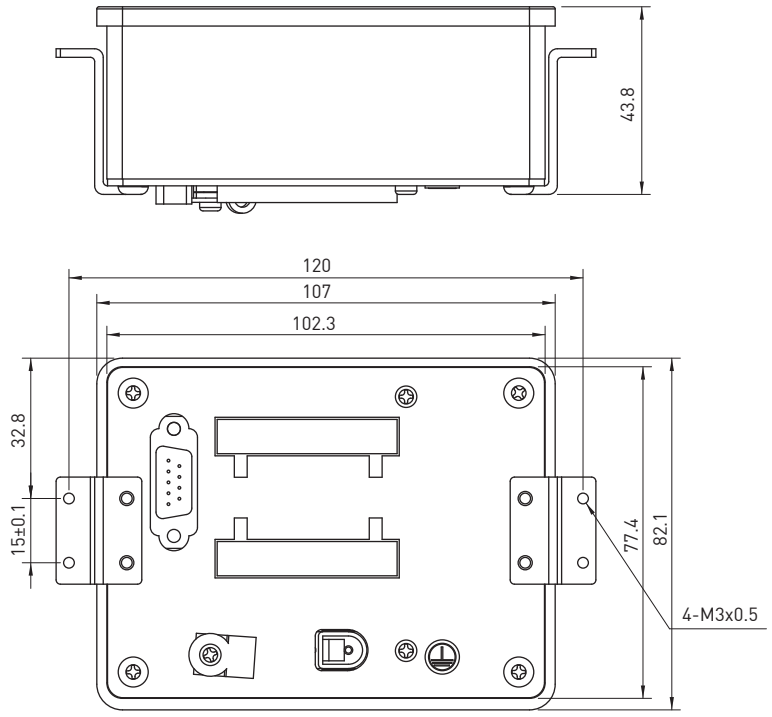
- Zero and auto-center (1/2) function
- Incremental / absolute switch over
- mm / inch switch over
- Optional resolution: 1μm, 2μm, 5μm, 10μm
- Preset function; 8 sets
- Relay output function; 4 sets
- Current value read will be automaically saved during a temporary power failure
- RS-232 output (optional)

18.3 Ordering Code:

PMED - H1 - 1 - XX - X

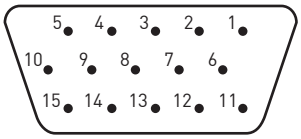
- 0 : standard(Relay output; 4 sets)
- 1 : relay output; 4 sets and RS-232 output (optional)
- 00 : for HIWIN 1mm positioning measurement system (analog/digital)
- A0 : for HIWIN 5mm positioning measurement system (analog/digital)
- A1 : for HIWIN 5mm E type or H type positioning measurement
- 1 : 1 axis display
- H1 : H1 display

18.4 Dimensions:



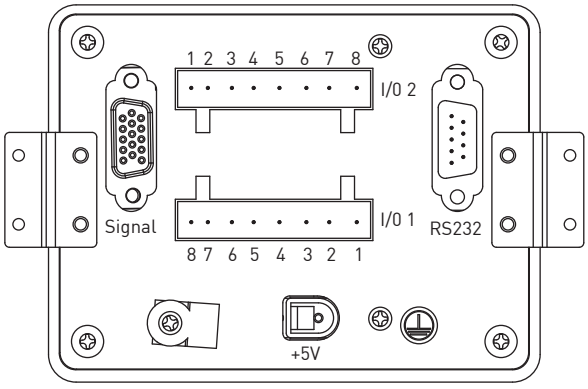
Unit: mm

18.5 Description of Input Signal:



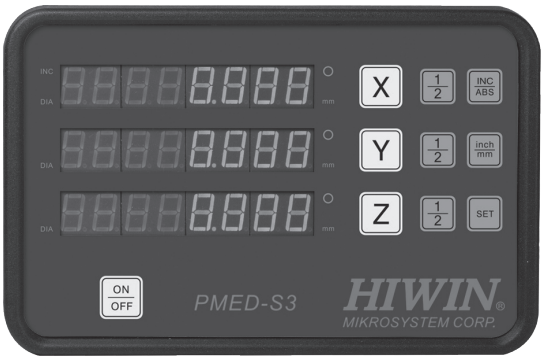
Pin	Designation	Pin	Designation	Pin	Designation
1	+5V	6	FG	11	A+(Analog)
2	GND	7	Z+	12	A-(Analog)
3	A+(Digital)	8	Z-	13	B+(Analog)
4	B+(Digital)	9	A-(Digital)	14	B-(Analog)
5	NC	10	B-(Digital)	15	NC

18.6 Description of Relay Output Signal:



I/O 1		I/O 2	
Pin	Designation	Pin	Designation
1	NC	1	NC
2		2	
3	NC	3	NC
4		4	
5	Relay 0(CH-0)	5	Relay 2(CH-2)
6		6	
7	Relay 1(CH-1)	7	Relay 3(CH-3)
8		8	

19. Multi-axis Counter



Features:

- LED display, high brightness
- Easy operation, suitable for cutting machines, traditional gantry milling machines, and programmable drilling machines
- Compact design and easy installation

19.1 Specifications:

Display	8 digit LED display
Resolution	0.1μm, 0.2μm, 0.5μm, 1μm, 2μm, 5μm, 10μm, 20μm, 50μm
Frequency	< 1.5MHz
Input signal	digital: 5V/TTL
Input power	DC 8V~30V / 0.08A
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP43

19.2 Functions:

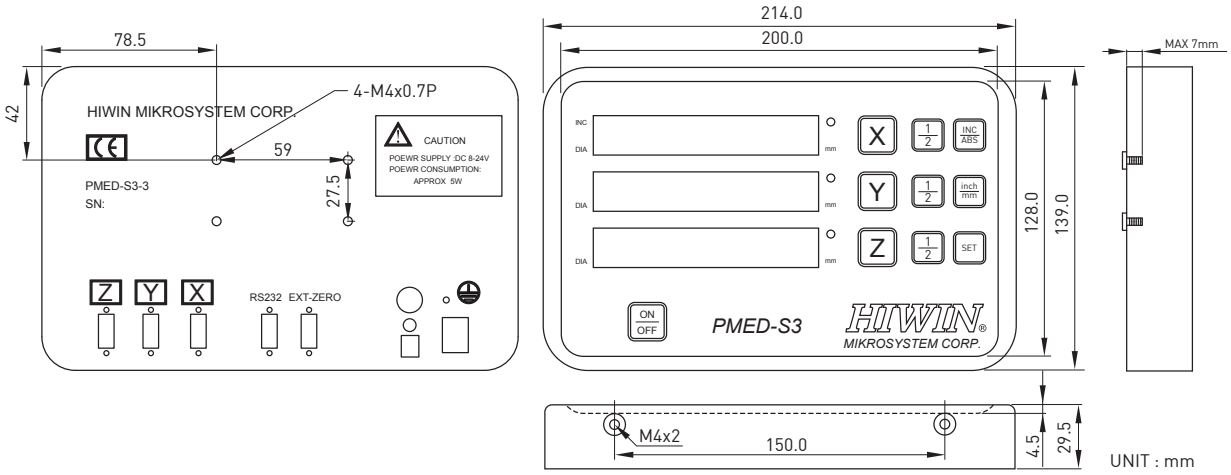
- Zero and auto-center (1/2) function
- mm / inch switch over
- Radius / diameter switch over
- Encoder (ENCODE): 1°~ 0.0001°
- Linear and non-linear mechanical error compensation
- Current value read will be automaically saved during a temporary power failure
- RS232 output
- Optional resolution : 0.1μm, 0.2μm, 0.5μm, 1μm, 2μm, 5μm, 10μm, 20μm, 50μm,100μm, 200μm, 500μm, 1mm, 5mm, 10mm

19.3 Ordering Code:

PMED - S3 - X

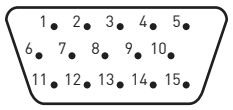
- 2 : 2 axis display
- 3 : 3 axis display
- S3 : S3 display

19.4 Dimensions:



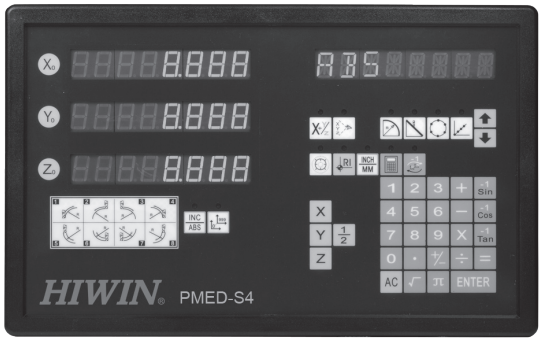
STANDARD 15 PIN D-TYPE ASSIGNMENTS(F)
15 pin D-Sub signal (female)

NC : No Connection
FG : Frame Ground



1	2	3	4	5	6	7	8
+5V	0V	A	B	RI	FG	NC	NC
9	10	11	12	13	14	15	
NC	NC	NC	NC	NC	NC	NC	

20. High Efficiency Multi-axis Counter



Features:

- LED display
- Suitable for CNC machine centers, gantry machine centers, milling machines and drilling machines
- Easy operation and installation

20.1 Specifications:

Display	8 digit LED display
Resolution	0.1μm, 0.2μm, 0.5μm, 1μm, 2μm, 5μm,10μm, 20μm, 50μm
Frequency	< 2MHz
Input signal	digital: 5V/TTL
Input power	AC 90V~240V
Operating temperature	0°C~50°C
Storage temperature	-5°C~70°C
Protection class	IP43

20.2 Functions:

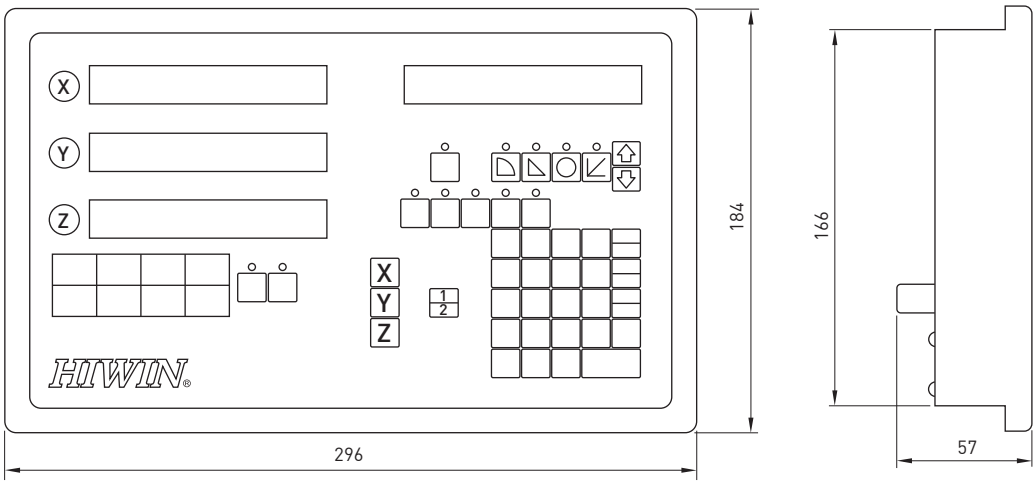
- Zero and auto-center (1/2) function
- Radius / diameter switch over
- Incremental / absolute switch over
- 1000 sets of coordinate storage
- Peak rate and numeration
- Linear error compensation
- Slope manipulation
- Circular-arc manipulation
- Optional resolution: 0.1μm, 0.2μm, 0.5μm, 1μm, 2μm, 5μm, 10μm, 20μm, 50μm,100μm, 200μm, 500μm, 1mm, 5mm, 10mm
- Multiple machining functions: Bolt circle machining, R-angle, divide holes on an oblique line, machining on an oblique line

20.3 Ordering Code:

PMED - S4 - X

- 2 : 2 axis display
- 3 : 3 axis display
- S4 : S4 display

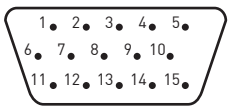
20.4 Dimensions:



UNIT : mm

STANDARD 15 PIN D-TYPE ASSIGNMENTS(F)
15 pin D-Sub signal (female)

NC : No Connection
FG : Frame Ground



1	2	3	4	5	6	7	8
+5V	0V	A	B	RI	FG	NC	NC
9	10	11	12	13	14	15	
NC	NC	NC	NC	NC	NC	NC	

IV. Accessories

21. Signal Transfer Cable

Signal transfer cable for alternative display devices

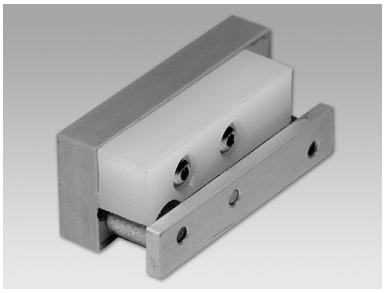
21.1 Ordering Code:

STC - XX - XX - X

- STC: Signal Transfer Cable
- 0 : standard type
- 1 : with metal tube
- 00 : D-sub VGA 15 Pin (for Hiwin display)
- 01 : D-sub 15 Pin (for M brand display)
- 01 : cable length 1m
- 02 : cable length 2m

22. Positioning Scale Installation Fixture

Allows for easy installation and ensures that the scale is parallel to the measurement sensor throughout the entire stroke



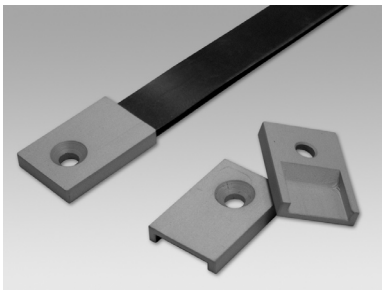
22.1 Ordering Code:

PST - 01

- PST : Positioning Scale Installation Fixture
- 01: for standard type positioning measurement

23. Lateral Fixture

Used to mark the end of the scale



23.1 Ordering Code:

PSF - 01

- PSF : Positioning Scale Fixture
- 01 : standard type

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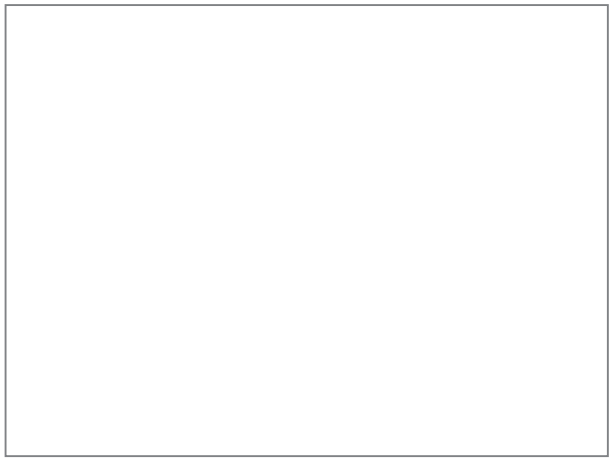

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