



Midori Precisions Catalog



Company Profile

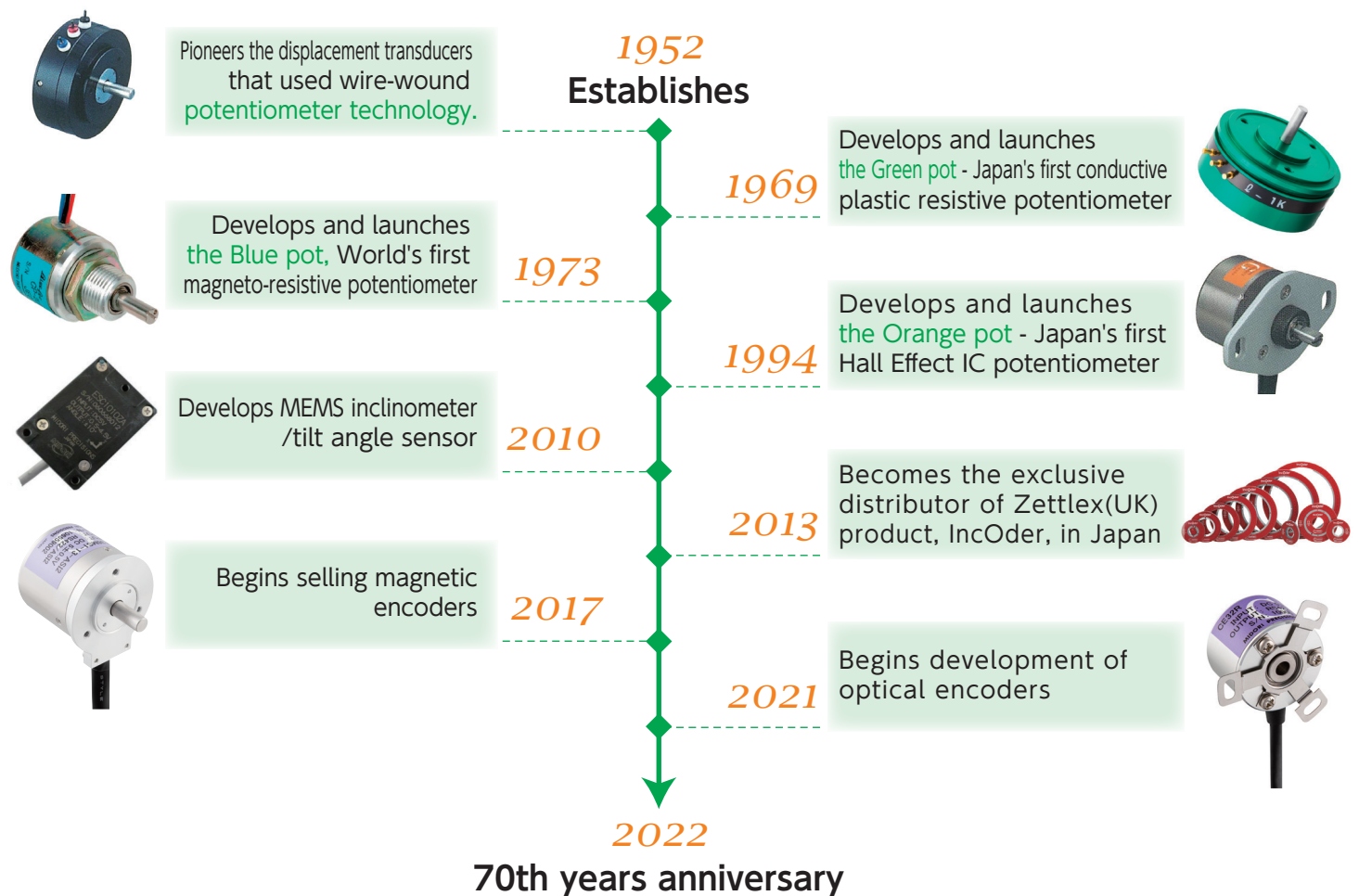
A company with 70 years of expertise in potentiometers

Company Name Midori Precisions	Revenue As of March, 2022 2.75 billion yen
Established July, 1952	Capital 95 million yen
Company Representative Representative Director and President Satoshi Nishiyama	Business Lines Design, manufacture and sale of potentiometer and encoders
Employees 130	Office Hamura-city, Tokyo (Headquarters)



Product Development History

Staying ahead of the curve



Message from MIDORI

It is all about doing the right things right

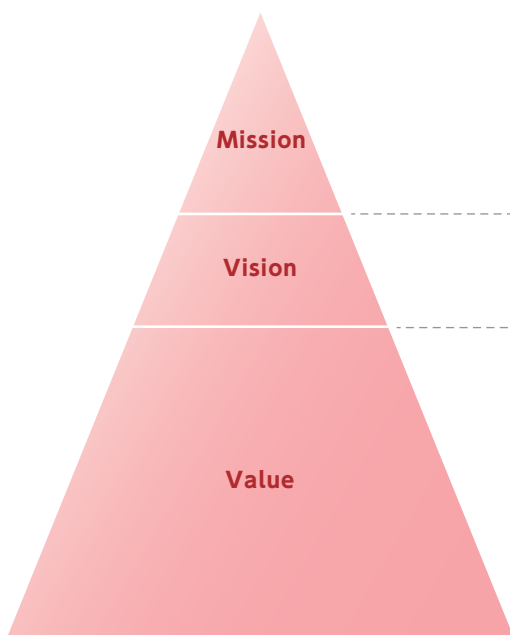
We, at Midori Precisions, place the utmost importance on the relationship and trust with our customers.

Everyone at Midori Precisions assumes leadership to focus on one task: do the right thing, the right way, quickly, and to the fullest for our customers.

We strive to become the True partner of our customers. In compliance with our Code of Conduct, we respond flexibly and promptly to our customers' needs and help them create great things in changing times.

Philosophy

Strictly adhere to our Mission/Vision/Value without compromise



Sensing the Future

Pioneering a sustainable society through sensors

Trusted

To be a truly trustworthy partner.

One Team, One Goal

To pursue and promise high quality and create new value.

- ① Think thoroughly from the customer's point of view and discuss openly and frankly.
- ② Collaborate across departmental with mutual respect and gratitude.
- ③ Challenge new and difficult things without being bound by precedent or failure.
- ④ Act quickly and boldly based on the judgment standard of "what is right as a human being".
- ⑤ Demonstrate initiative and leadership, and persevere to the end
- ⑥ Continuously improve productivity by always being aware of "Efficient" and "Spirit".
- ⑦ Reflect daily on compliance with the Code of Conduct and strive for personal growth and self-realization.

Quality Policy

Tirelessly searching for the best solution

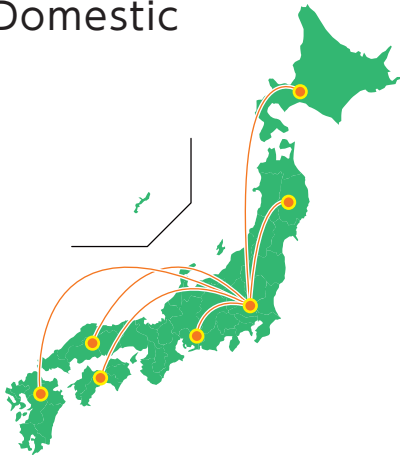
- Continuously seek improvement to provide safety and security on time that complies with laws and regulations
- Consistently brush up on our products and services through technological development and internal/external collaboration
- Adopt a culture of respect, openness, and challenge for the vitality of the organization and the continued growth of our employees



Sales Network

Worldwide sales network

Domestic



Sales Cooperatives

Crown Musen Co., Ltd.
 Inaba Denki Sangyo Co., Ltd.
 Shin-ei Plant Co., Ltd.
 Eikosha Co., Ltd.
 Daiichi-Kagaku.Inc.
 Okamoto Electronics Corporation
 NICHIDEN Corporation
 Kansai Keisou Co., Ltd.
 Higashinihon Denshi Keisoku KK
 Kyoei Communication Industry Co., Ltd.
 Meiji Electric Industries Co., Ltd.

International



Europe

Angst+Pfister Sensors and Power AG(Swiss)
 Klinger Finland Oy(Finland)
 EG Electronics AB(Sweden)

America

ARTRON AMERICA, INC. (US)

South Africa

TILT TECH(South Africa)

Asia

RACOROAD.,CO,LTD(South Korea)
 DONGYANG ELECTRIC.,CO.LTD(South Korea)
 YONG JUN ELECTRONIC CO(South Korea)
 SAN LIEN TECHNOLOGY CORP(Taiwan)
 TOMY INDUSTRIAL CO.,LTD(Hong Kong)
 Yantai Int Measure Instrument Co.,Ltd(China)
 Actsphere Corporation(India)

Oceania

ADM INSTRUMENT ENGINEERING(Australia)

Customers

In cooperation with our partner companies, we have gained much support from our customers

Main Customers

Aichi Corporation	Hitachi Construction Machinery Co., Ltd.
IHI Aerospace Co., Ltd.	Hitachi, Ltd.
SMC Corporation	Hino Motors, Ltd.
Kawasaki Heavy Industries, Ltd.	Furukawa Unic Corporation
Komatsu Ltd.	Mitsubishi Heavy Industries, Ltd.
Shimadzu Corporation	Mitsubishi Electric Corporation
Seibu Electric & Machinery Co., Ltd.	Yuken Kogyo Co., Ltd.
Tadano Ltd.	Yokogawa Electric Corporation
Tokyo Keiki Inc.	ABB
Nabtesco Corporation	WOODWARD, INC.
Nippon Gear Co., Ltd.	KONGSBERG
Mitsubishi Logisnext Co., Ltd.	etc.
NHK MEC Corporation	

Partners

Asama Gosei Co., Ltd.
 Hakuto Electric Industry Co., Ltd.
 Uda Works Co., Ltd.
 Uchino Seisakusho Co., Ltd.
 Kyowafuji Co., Ltd.
 ZETA-Corporation
 Tokuriki Honten Co. Ltd.
 Yayoi Seisakusho Co. Ltd.
 Yamanashi Sanyu Co. Ltd.
 Uchudo Giken Co., Ltd.
 etc.

March, 2022

R&D

Passionate and hardworking

Compact, slim, and space-saving design
Designed to satisfy customers' needs

High-accuracy and environmental resistance
Stable output even under harsh environment

High technology
We constantly improve our foundation in anticipation of our customers' future needs



Customization

We will take care of everything

The effective electrical travel, stroke lengths and tilt angles
We configure the detecting range according to your desire

All types of connector
Choose the connector that satisfy your needs

Shafts
We machine the shaft to your desired shape

Tests
Various types of tests available

Disassemble and inspection
After the evaluation test at the customer's site, disassemble and inspect the product and prepare a report



*Please feel free to reach out for other specifications customizations

After Service

We promise swift and honest response

Response within 24 hours

Thorough on-site approach

Meticulous attention to detail



Industry/Application

From construction machinery to aerospace, our products are used in numerous industries.

Construction Machinery



Excavator

- Arm angle detection
- Operating lever angle detection
- Hydraulic flow detection

Crane

- Boom angle detection
- Body inclination angle detection
- Slewing angle detection

Wheel loader

- Pedal angle detection
- Throttle angle detection
- Bucket position detection

Industrial Vehicle



Truck

- Pedal angle detection
- Clutch stroke amount
- Shift position detection

Forklift

- Mast angle detection
- Tire angle detection
- Operating lever angle detection

Aerial work platform

- Boom angle detection
- Body inclination angle detection
- Turning angle detection

Marine Equipment



Vessel

- Steering angle detection
- Engine control lever angle detection
- Hull inclination angle detection

Pleasure boat

- Electronic lever angle detection
- Steering angle detection
- Outboard motor tilt angle detection

Maritime satellite

- Elevation angle detection
- Antenna angle detection
- Hull tilt angle detection

Instrumentation



Plant equipment

- Liquid flow detection
- Valve opening degree detection
- Cooling water flow rate detection

Sluice gate equipment

- Gate opening degree detection
- Valve opening degree detection
- Water turbine blade angle detection

Power generation facilities

- Liquid level height detection
- Breaker angle detection

Machinery Equipment



Printing machine

- Slit position detection
- Paper tension detection
- Winding amount detection

Winding machine

- Film position detection
- Film tension detection
- Cut position detection

Inspection machine

- Vehicle width detection
- Camber angle detection

Medical Welfare Equipment



Dental chair

- Backrest angle detection
- Leg plate angle detection
- Elevation stroke amount detection

Operating table

- Vertical / horizontal tilt angle detection
- Leg plate angle detection
- Elevation stroke amount detection

Motorized wheelchair

- Throttle angle detection
- Steering wheel angle detection
- Body inclination angle detection

Civil Engineering / Infrastructure Measurement



Pier

- Floor plate displacement detection
- Pier girder tilt angle detection
- Tilt angle of bridge abutment piers detection

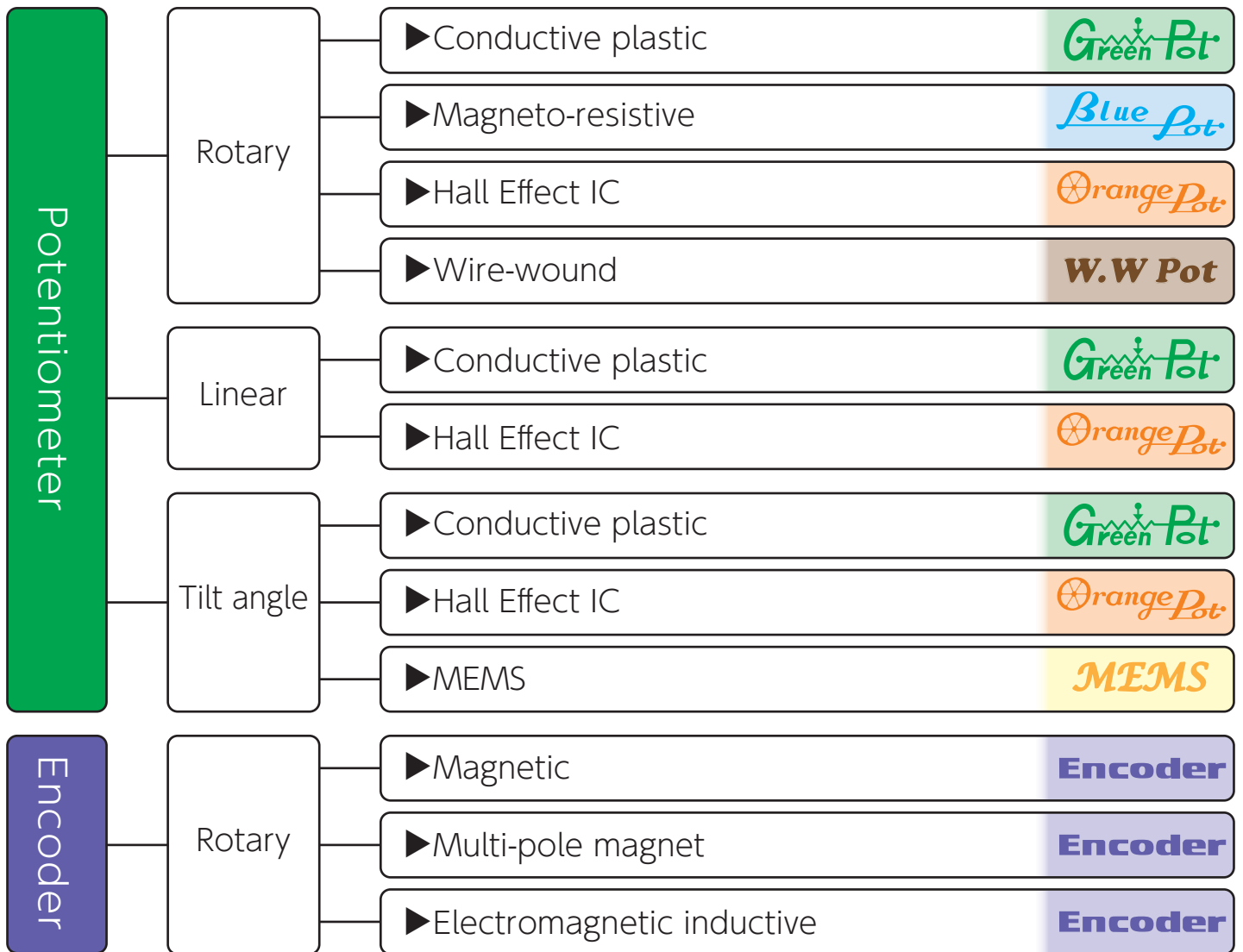
Railroads

- Inclination angle of railway bridge detection
- Rolling stock travel distance detection
- Cant angle detection

Civil engineering

- Monitoring of landslide amount
- Slope angle of embankment detection
- Monitoring of ground displacement

Products



Product Category



Conductive plastic potentiometer

- High accuracy and resolution
- Ample product line-ups



Magneto-resistive potentiometer

- Noiseless/long-life
- Low energy consumption



Hall Effect IC potentiometer

- Noiseless and long-life
- Ample product line-ups



MEMS tilt angle sensor/inclinometer

- High accuracy
- Long-life



Magnetic absolute rotary encoder

- High accuracy
- Hollow/slim



Wire-wound potentiometer

- Small deviation in resistance value
- Low temperature coefficient of resistance

Product list ★Featured products

Items	Part number	Dimensions(mm)	Accuracy/Linearity (O is absolute linearity)	Features			Featured products	Page	
				Long-life	Drip-proof	Multi-turn			
Potentiometer	Rotary	CP-2FL / CP-2FL-6	Φ22.3	±1%FS				★	16
		CP-2FB(b)J / CP-2FK(b)J	Φ22.3	±1%FS					
		CP-2FBJ-6 / CP-2FCB(m)	Φ22.3	±1%FS					
		CP-2FABSJ	Φ28	±3%FS		●			
		CP-45F / CP-45FB	Φ45	±0.1%FS				★	
		CPP-45SB	Φ45	±0.3%FS		●			
		CP-45F×2 / CP-45FB×2	Φ45	±0.1%FS					17
		CPP-60	Φ62	±0.05%FS					
		CP-45FRBN	Φ66	±0.1%FS		●			
		CP-2F-10S-RB	35×23×30	±1.5%FS			●		
		CP-2F-10WP-10S	47×24×34	±1.5%FS		●	●		
		CP-45F-10SX	61×50×38	±0.1%FS			●		
		CP-16U	Φ16	±1.5%FS	●				
		CP-2UN	Φ16	±2%FS	●				
		CP36U	Φ36	±0.2%FS	●	●		★	
	CP-2UKN-A	Φ36	○±2.2%FS	●					
	CP-1HX	14×18×4.4	○±2%FS	●	●		★	18	
	CP-2HB	19.5×16	±3%FS	●					
	QP-2H / -2HC	Φ15	±1.5%FS	●					
	CP-20H	Φ22	○±1%FS	●			★		
	CP-22H-12S	44×22×30	○±1%FS	●	●	●	★		
	CP2HX	30×33.5×7	○±2%FS	●	●		★		
	QP-3HB-111-02	20×21	±2%FS	●	●				
	CP-3HABS	26.5×20	±3%FS	●	●				
	CP-2HA	Φ28	○±1%FS	●	●				
	CP-30H	Φ28	±3%FS	●					
	CP-2HK / -8R / -10R	Φ36	○±1%FS	●				19	
	CP-45H	Φ45	○±0.4%FS	●					
	HP-18	Φ18	±0.25 %FS			●			
	Linear	LP-10F / 10FB	24x20	±1%FS					20
LP-20F / 20FB		Φ25	±1%FS						
LP-10FBS-3 / 20FBS-3		Φ28	±1%FS		●				
LP-30FQJ		Φ8	±1%FS						
LP-20FP / -30FP / -50FP		Φ12	±1%FS					21	
LP-50F / 50FB		□16×20	±0.5%FS						
LP-FJ / FJS		Φ22.2	±0.3%FS		●				
LP-F-63		Φ22.2	±0.3%FS				★		
CP-45F-50LS / -150LS / -200LS		60x104	±0.1%FS						
LP-10HA		Φ22.2	○±1.6%FS	●	●				
Tilt angle	7450POT	80x50x60	±1%		●			22	
	PMP-S10HT	Φ20×40	±1%FS	●					
	THD2000Z	Φ40×10	○±1%FS	●			★		
	WR-7UHA	□61×81	○±0.4%FS	●	●		★		
	PMP-10HTZL	49×92×60	±1%FS	●	●				
	ESC3000Z	70×90×23	○±0.5%FS	●	●		★		
Encoder	Rotary	CE36M	Φ36	○±0.05%FS		●		23	
		CE58M	Φ58	±0.044°	●	●	●		★
		High precision multipole magnet scale							
		IncOder			●	●			
Dial/Ratiometer	Ratiometer DRM0001 / D-12 / H-22 / DM-15 / H-46							23	

Featured products

[CP-2FL / CP-2FL-6] Compact, high accuracy rotary angle sensor

Compact and accurate

Low-cost

Short lead time

**Dia. $\Phi 22.3$
Linearity $\pm 0.5\%$**

Minimal parts count

Ship within one week

- | | |
|-------------------------------|-----------------------|
| Maritime equipment | Instrumentation |
| Electric control lever | Valve openness |
| Medical equipment | Machine and equipment |
| Back board and footrest angle | Paper tension |



Shaft

Choose between the two options below



$\Phi 3.175\text{mm}$
(1/8 inches)

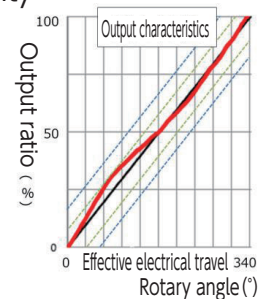


$\Phi 6\text{mm}$

Linearity

Choose the linearity

- Standard : $\pm 1\%$
- Special : $\pm 0.5\%$



[CP-45F / CP-45FB] High accuracy rotary angle sensor

High accuracy

Long-life

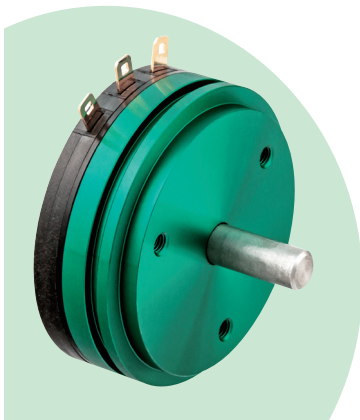
Customizable

Linearity $\pm 0.1\%$

Durable above 50 million rev.

Multi-turn wire extension type

- | | |
|------------------------|-----------------------|
| Construction machinery | Maritime machinery |
| Rotary angle | Control lever |
| Instrumentation | Machine and equipment |
| Valve openness | Film tension |



Standard type



Duplex available

Multi-turn type



Choose from 24/35/60/100 turns

Drip/dust-proof type



IP65 available

Wire extension type



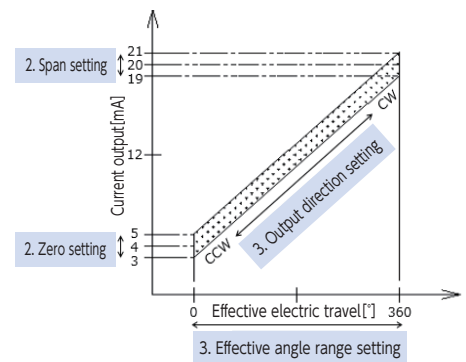
Stroke length 2000mm

[CP36U] Variable current output sensor

Long distance transmission	High accuracy	Settable output	Construction machinery	Maritime equipment
Dual wire 4~20mA current output	Linearity $\pm 0.2\%FS$	Switch unit available	Arm angle	Control lever
			Instrumentation	Machine and equipment
			Valve openness	Film tension



1. Zero/span setting
 2. Effective angle range setting
 3. Output direction setting
- ⇒Reduce setting man-hour

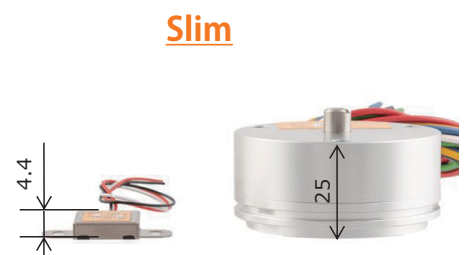
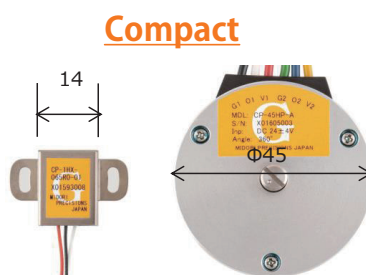


[CP-1HX] Contact-less compact rotary angle sensor

Compact/Slim	Light-weight	Wide angle detection	Construction machinery	Industrial vehicle
W14×D18×H4.4mm	Approx. 5g	Effective electrical travel 360°	Lever angle	Lever angle
			Instrumentation	Medical equipment
			Flapper angle	Throttle angle



The industry's smallest rotation sensor with wide angle detection, born from customer needs. It is 1/3 smaller and 1/6 thinner compared to our wide angle sensor "CP-45H".



[CP-20H] Contact-less compact rotary angle sensor

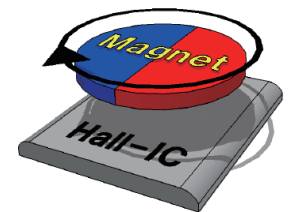
Compact	Long-life	Wide angle detection
$\Phi 22 \times H12.5$	Durable above 100 million rev.	Effective electric travel 360°

Instrumentation	Medical equipment
Valve openness	Throttle angle
Machine and equipment	Machine and equipment
Paper tension	Film tension



- Long-life**
 Operation life of moving parts are infinitely long because there is no contact between moving parts
- Noiseless**
 No output noise (external noise not accounted)
- Low torque**
 Extremely low torque, no loss when starting

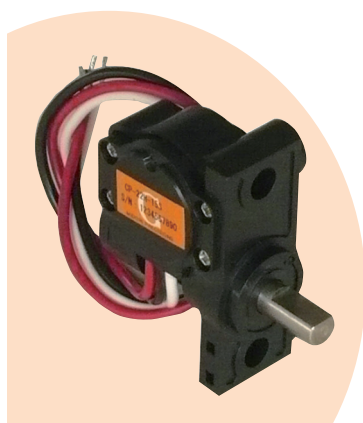
Moving parts



[CP-22H] Multi-turn absolute sensor

Long-life	Multi-turn	Drip-proof
Durable over 100 million rotations	Choose from 5, 10, 30, 50 turns	IP67

Industrial vehicle	Instrumentation
Tire angle	Float
Medical equipment	Machine and equipment
Stroke	Film tension

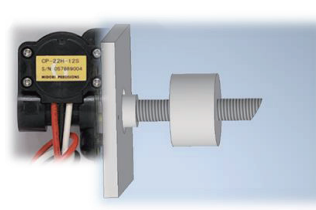


Long-life



- No contact between moving parts thanks to Hall IC

Multi-turn



- Max. 50 turns

Drip-proof



- IP67

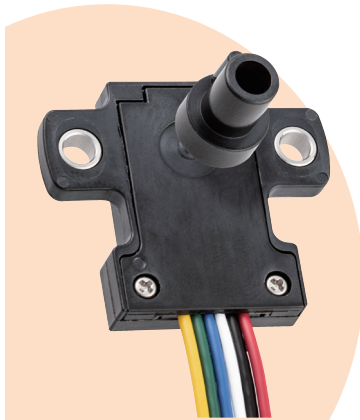
[CP2HX] Separated-type rotary angle sensor

Long-life	Drip-proof	Slim
The sensing part and the shaft are separated	IP67	Overhang during installation is 7mm

Construction machinery	Maritime equipment
Rotary angle	Lever angle
Medical equipment	Machine and equipment
Throttle angle	Paper tension

Separated-type

- By separating the sensing part and the shaft, the product life has been drastically improved



Sensing part



Shaft



Drip-proof



[LP-F-63] Rod-end linear stroke sensor

Space-saving	Easy to install	Vibration-proof
Diameter 22mm slim profile	Rod-end on both end no need to locate the center	Ball joint installed vibration reduced

Civil engineering	Machine and equipment
Ground shift	Paper position
Machine and equipment	Machine and equipment
Film tension	Car width

Space-saving



- Diameter 22mm

Ring structure



- Rod-end on both end Install without contact area



- No need to locate the center
- Not easily affected by vibration

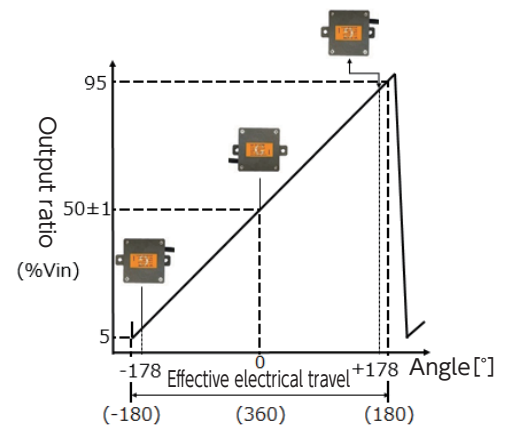
[WR-7UHA] Wide angle tilt angle sensor

Wide angle	High accuracy	Drip-proof
Effective angle 360°	Linearity $\pm 0.4\%$	IP67

Construction machinery	Construction machinery
Arm angle	Boom angle
Industrial vehicle	Civil engineering
Boom angle	Pier tilt angle



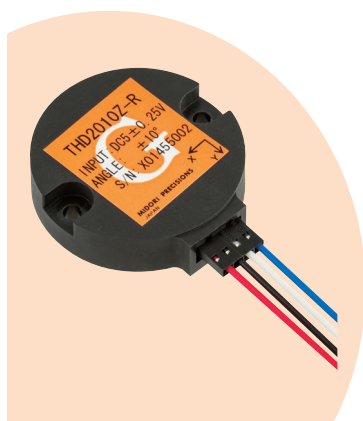
- **360° wide angle** (See the right figure)
- **Wall mount**
Can be used to detect tilt angle and position
- **Aluminum die-cast case-IP67**



[THD2000Z] Compact tilt angle sensor

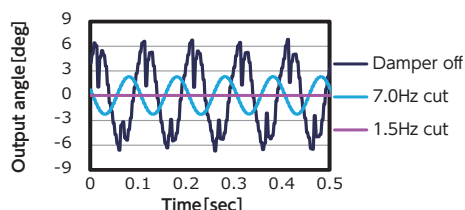
Compact and slim	Vibration-proof	Advanced features
Φ40×H10mm	No mechanical resonance point	Noise cancellation zero reset

Industrial vehicle	Maritime equipment
Car body tilt angle	Positioning
Medical and health care	Civil engineering
Vertical, horizontal and rotary tilt angle	Pier tilt angle



Noise cancellation

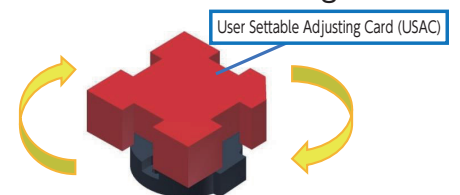
Choose the filter that fits the environment



Choose from 16 steps of frequency responsive characteristics

Zero reset feature

On-site zero resetting

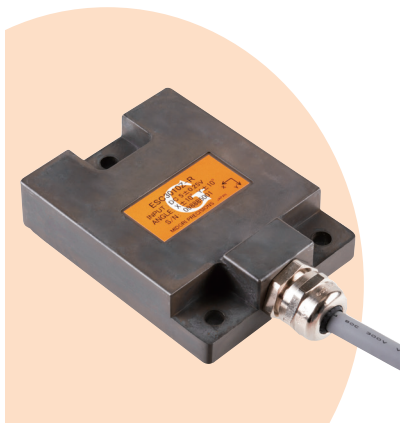


Turn the USAC 90° clock wise 5 times

[ESC3000Z] Advanced features tilt angle sensor

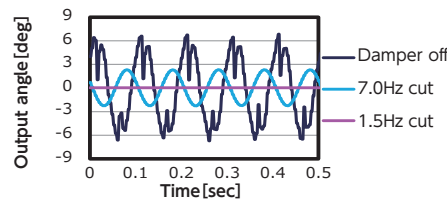
Advanced features	A variety of output types	Drip-proof
Noise cancellation zero reset	Serial, ratio, current	IP67

Construction machinery	Civil engineering
Car body tilt angle	Pier tilt angle
Civil engineering	Civil engineering
Cant angle	Ground shift



Noise cancellation

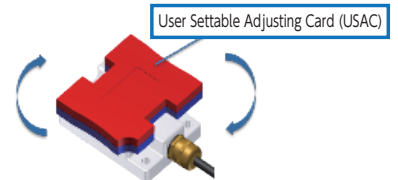
Choose the filter that fits the environment



Choose from 16 steps of frequency responsive characteristics

Zero reset feature

On-site zero resetting



Turn the USAC 90° clock wise 5 times

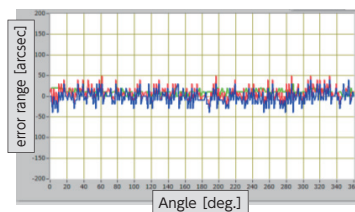
[CE58M] Environment resistant rotary encoder

High resolution	Hollow shaft	Drip-proof
Single-turn 17 bit Multi-turn 16 bit	Hollow and slim profile	IP65

Construction machinery	Construction machinery
Arm angle	Rotary angle
Industrial vehicle	Civil engineering
Rotary angle	Ground shift

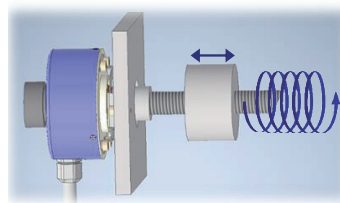


High accuracy



- Resolution: 17bit/turn
- Absolute angle accuracy: $\pm 0.044^\circ$

Multi-turn



- Multi-turn
- Count: 16bit 65536 turns

Drip-proof



- IP65

Rotary potentiometer

- Extensive lineup of products with outer diameters ranging from $\Phi 15$ to $\Phi 87$
- Many types from low price to high precision
- Our products are used in various industries and applications.



CP-2FL / CP-2FL-6 ★

Compact High Accuracy



[Application]
Valve positioner: valve angle detection

Conductive plastic	
Effective electrical travel	340 +2 -3(°)
Accuracy (Linearity)	$\pm 0.5, \pm 1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-2FB(b)J

Compact



[Application]
Electric microscope: XY axis detection

Conductive plastic	
Effective electrical travel	340 +2 -3(°)
Accuracy (Linearity)	$\pm 1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-2FK(b)J

Compact



[Application]
Stage equipment: pan, tilt angle detection

Conductive plastic	
Effective electrical travel	340 +2 -3(°)
Accuracy (Linearity)	$\pm 1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-2FBJ-6

Compact



[Application]
Joy stick: control angle detection

Conductive plastic	
Effective electrical travel	340 +2 -3(°)
Accuracy (Linearity)	$\pm 1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-2FCB(m)

Compact



[Application]
Valve positioner: valve openness position detection

Conductive plastic	
Effective electrical travel	340 +2 -3(°)
Accuracy (Linearity)	$\pm 1\%$
Resistance value	1, 5k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-2FABSJ

Drip-proof



[Application]
Tractor: Pedal position detection

Conductive plastic	
Effective electrical travel	90°, 340°
Accuracy (Linearity)	$\pm 3\%$
Resistance value	1k Ω
Mechanical angle	100 $\pm 5^\circ$
Output type	Ratio

CP-45F / CP-45FB ★

High Accuracy



[Application]
Winding machine: Dancer roll angle detection

Conductive plastic	
Effective electrical travel	350 +3 -2(°)
Accuracy (Linearity)	$\pm 0.1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CPP-45SB

Drip-proof



[Application]
Autopilot: control angle detection

Conductive plastic	
Effective electrical travel	350 +2 -3(°)
Accuracy (Linearity)	$\pm 0.3\%$
Resistance value	1, 2, 5, 10, 20k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-45FX2 / CP-45FBX2

High Accuracy



[Application]
Aerial work platform: Rotary angle detection

Conductive plastic	
Effective electrical travel	350 +3 -2(°)
Accuracy (Linearity)	$\pm 0.1\%$
Resistance value	1, 2, 5, 10k Ω
Mechanical angle	360°Endless
Output type	Ratio

CPP-60

High Accuracy



[Application]
Measuring instrument: rotary angle

Conductive plastic	
Effective electrical travel	355 +1 -2(°)
Accuracy (Linearity)	$\pm 0.05\%$
Resistance value	1, 2, 5, 10, 20k Ω
Mechanical angle	360°Endless
Output type	Ratio

CP-45FRBN

Drip-proof



[Application]
Autopilot: angle detection

Conductive plastic	
Effective electrical travel	350 +2 -3(°)
Accuracy (Linearity)	±0.1%
Resistance value	1, 2, 5, 10kΩ
Mechanical angle	360°Endless
Output type	Ratio

CP-2F-10S-RB

Multi-turn



[Application]
Semi-conductor manufacture machine:
Internal resistance position detection

Conductive plastic	
Effective electrical travel	3400 +20 -30(°)
Accuracy (Linearity)	±1.5%
Resistance value	1, 2, 5kΩ
Mechanical angle	360°Endless
Output type	Ratio

CP-2FWP-10S

Compact

Multi-turn



[Application]
Assisted bath: up/down stroke control

Conductive plastic	
Effective electrical travel	3400 +20 -30(°)
Accuracy (Linearity)	±1.5%
Resistance value	1, 2, 5kΩ
Mechanical angle	360°Endless
Output type	Ratio

CP-45F-10SX

Multi-turn



[Application]
Water level gauge: float position detection

Conductive plastic	
Effective electrical travel	3500 +20 -30(°)
Accuracy (Linearity)	±0.1%
Resistance value	1, 2, 5, 10kΩ
Mechanical angle	360°Endless
Output type	Ratio

CP-16U

Compact

Long life



[Application]
Valve positioner: valve openness position detection

Magneto-resistive element	
Effective electrical travel	±45°
Accuracy (Linearity)	±1.5%
Input voltage	DC3~5.5V
Output type	Ratio

CP-2UN

Compact

Long life



[Application]
Winding machine: tension detection

Magneto-resistive element	
Effective electrical travel	±45°
Accuracy (Linearity)	±2%
Input voltage	DC10V以下
Output type	Ratio

CP36U

High Accuracy

Long life

Drip-proof



[Application]
Valve: Openness position detection

Magneto-resistive element	
Effective electrical travel	360°
Accuracy (Linearity)	±0.2
Input voltage	24±8Vdc
Output type	Current

CP-2UKN-A

Long life



[Application]
Printer: sweeper angle detection

Magneto-resistive element	
Effective electrical travel	±45°
Accuracy (Linearity)	±2.2%
Input voltage	DC24V±4
Output type	Current

CP-1HX

Compact

Long life

Drip-proof



[Application]
Flowmeter: valve openness detection

Hall Effect IC	
Effective electrical travel	±180°
Accuracy (Linearity)	±2%FS
Input voltage	DC5±0.5V
Output type	Ratio/PWMx1/x2

CP-2HB

Compact

Long life



[Application]
Industrial sewing machine: pedal angle detection

Hall Effect IC	
Effective electrical travel	±45°
Accuracy (Linearity)	±3%
Input voltage	DC5V±0.5
Output type	Ratio

QP-2H / QP-2HC

High Accuracy

Long life



[Application]
Packaging machine: dancer roll angle detection

Hall Effect IC	
Effective electrical travel	±45°
Accuracy (Linearity)	±1.5%
Input voltage	DC5V±0.5
Output type	Ratio

CP-20H

High Accuracy

Long life



[Application]
Specialty vehicle: lever angle detection

Hall Effect IC	
Effective electrical travel	±170°(340°), ±180°(360°)
Accuracy (Linearity)	±1%FS
Input voltage	DC5V±0.5V
Output type	Ratio

CP-22H



Long life Drip-proof Multi-turn

[Application]
Forklift: Steering angle detection



Hall Effect IC	
Effective electrical travel	$\pm 2, 160(\text{standard})/\pm 9000^\circ$
Accuracy (Linearity)	$\pm 1\%FS$
Input voltage	DC5 \pm 0.5V
Output type	Ratio

CP2HX



Compact Long life Drip-proof

[Application]
Industrial vehicle: control lever angle detection

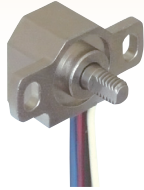


Hall Effect IC	
Effective electrical travel	$\pm 180^\circ$
Accuracy (Linearity)	$\pm 2\%FS$ (When misalignment is within regulatory limits)
Input voltage	DC5 \pm 0.5V
Output type	Ratio/PWM

QP-3HB-111-02

Long life Drip-proof

[Application]
Industrial vehicle: lever position/pedal angle detection



Hall Effect IC	
Effective electrical travel	$\pm 45^\circ$
Accuracy (Linearity)	$\pm 2\%$
Input voltage	DC5V \pm 0.5
Output type	Ratio

CP-3HABS

Long life Drip-proof

[Application]
Industrial vehicle: pedal angle detection



Hall Effect IC	
Effective electrical travel	$\pm 45^\circ$
Accuracy (Linearity)	$\pm 4\%$
Input voltage	DC5V \pm 0.5
Output type	Ratio

CP-2HA

Long life Drip-proof

[Application]
Industrial vehicle: steering angle detection



Hall Effect IC	
Effective electrical travel	$\pm 175^\circ$
Accuracy (Linearity)	$\pm 1\%$
Input voltage	DC5V \pm 0.5
Output type	Ratio

CP-30H

Long life

[Application]
Winding machine: tension detection



Hall Effect IC	
Effective electrical travel	$\pm 50^\circ$
Accuracy (Linearity)	$\pm 6\%$
Input voltage	DC5V \pm 0.5
Output type	Ratio

CP-2HK / -8R / -10R

Long life

[Application]
Food packaging machine: film tension detection

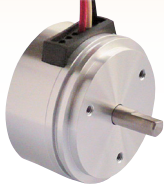


Hall Effect IC	
Effective electrical travel	$\pm 40^\circ$
Accuracy (Linearity)	$\pm 1\%$
Input voltage	DC5V \pm 0.5/8V \pm 0.5/10V \pm 0.5
Output type	Ratio

CP-45H

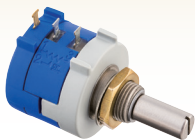
Long life

[Application]
Measuring instrument: stage rotary angle detection



Hall Effect IC	
Effective electrical travel	$\pm 180^\circ$
Accuracy (Linearity)	$\pm 0.4\%$
Input voltage	DC5V \pm 0.5
Output type	Ratio

HP-18



10-Turn Pot	
Total Resistance	1, 2, 5, 10, 20k Ω
Independent Linearity	$\pm 0.25\%$
Shaft dia.	$\Phi 6 \times 20\text{mm}$
Effective Electrical Travel	3600 $^\circ$

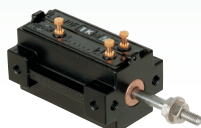
Linear potentiometer

- Stroke range from 10 to 2000mm
- Many types from small to drip-proof are available, and they are used in applications such as machinery and equipment.



LP-10F

Compact

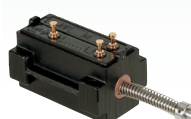


[Application]
Sheet metal processing machine: pedal stroke detection

Conductive plastic	
Effective stroke	10±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1kΩ
Mechanical stroke	12±1
Output type	Ratio

LP-10FB

Compact



[Application]
Rehabilitation machine: wire extension detection

Conductive plastic	
Effective stroke	10±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1kΩ
Mechanical stroke	12±1
Output type	Ratio

LP-20F

Compact



[Application]
Tractor: stroke detection

Conductive plastic	
Effective stroke	20±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1、2kΩ
Mechanical stroke	22±1
Output type	Ratio

LP-20FB

Compact



[Application]
Pull test machine: anchor bolt displacement detection

Conductive plastic	
Effective stroke	20±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1、2kΩ
Mechanical stroke	22±1
Output type	Ratio

LP-10FBS-3

Compact

Drip-proof



[Application]
Grinding machine: grinding volume detection

Conductive plastic	
Effective stroke	10±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1kΩ
Mechanical stroke	12±1mm
Output type	Ratio

LP-20FBS-3

Compact

Drip-proof



[Application]
Boring machine: cylinder stroke detection

Conductive plastic	
Effective stroke	20±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1、2kΩ
Mechanical stroke	22±1mm
Output type	Ratio

LP-30FQJ

Compact



[Application]
Amusement robot: cylinder position detection

Conductive plastic	
Effective stroke	30±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1kΩ
Mechanical stroke	35±1mm
Output type	Ratio

LP-FP

Compact



[Application]
Electric microscope: XY stage position detection

Conductive plastic	
Effective stroke	20~50±0.5mm
Accuracy (Linearity)	±1%
Resistance value	1kΩ
Mechanical stroke	22mm~52±1mm
Output type	Ratio

LP-50F

High Accuracy

[Application]
Sheet metal processing machine:
material position detection



Conductive plastic	
Effective stroke	50±0.5mm
Accuracy (Linearity)	±0.5%
Resistance value	1, 2, 5, 10kΩ
Mechanical stroke	55±1mm
Output type	Ratio

LP-50FB

High Accuracy

[Application]
Automobile inspection machine:
wheel alignment position detection



Conductive plastic	
Effective stroke	50±0.5mm
Accuracy (Linearity)	±0.5%
Resistance value	1, 2, 5, 10kΩ
Mechanical stroke	55±1mm
Output type	Ratio

LP-FJ

High Accuracy Drip-proof

[Application]
Injection molding machine:
mold clamping stroke detection



Conductive plastic	
Effective stroke	50~300±1mm
Accuracy (Linearity)	±0.5%(±0.2%)/±0.3%(±0.1%)
Resistance value	1.5, 5, 10kΩ
Mechanical stroke	54~304±1mm
Output type	Ratio

LP-FJS

High Accuracy Drip-proof

[Application]
Industrial vehicle: oil pressure cylinder position detection



Conductive plastic	
Effective stroke	50~300±1mm
Accuracy (Linearity)	±0.5%(±0.2%)/±0.3%(±0.1%)
Resistance value	1.5, 5, 10kΩ
Mechanical stroke	54~304±1mm
Output type	Ratio

LP-F-63

High Accuracy Drip-proof

[Application]
Packaging machine:
wrapping paper position detection



Conductive plastic	
Effective stroke	100±0.5mm~300±1mm
Accuracy (Linearity)	±0.3% (±0.1%)
Resistance value	1, 2, 5, 10kΩ
Output type	Ratio

CP-45F-50LS

High Accuracy

[Application]
Lift: up/down stroke position detection



Conductive plastic	
Effective stroke	50~610±mm
Accuracy (Linearity)	±0.1%
Resistance value	1, 2, 5, 10 (Option:0.5, 20) kΩ
Mechanical stroke	Ratio

CP-45F-200LS

High Accuracy

[Application]
Landslide measuring device: landslide measurement



Conductive plastic	
Effective stroke	2235±20mm
Accuracy (Linearity)	±0.1%
Resistance value	1, 2, 5, 10 (Option:0.5, 20) kΩ
Output type	Ratio

LP-10HA

Long life Drip-proof

[Application]
Forklift: steering position detection



Hall Effect IC	
Effective stroke	10mm
Accuracy (Linearity)	±1.6%FS
Resistance value	DC5V±0.5
Mechanical stroke	11±1mm
Output type	Ratio



Tilt angle sensor/Inclinometer

- Inclination angle detection from $\pm 5^\circ$ to $\pm 180^\circ$ is possible.
- It is mainly used in the construction machinery and civil engineering measurement industries.



7450POT

High Accuracy Drip-proof



[Application]
Aerial work platform: boom angle detection

Conductive plastic	
Effective tilt angle	Above 110, CCW above 95, CW above 10°
Accuracy (Linearity)	$\pm 1.0\%$
Resistance value	500 Ω
Output type	Ratio

PMP-S10HT

Long life



[Application]
Maritime satellite: antenna angle detection

Hall Effect IC	
Effective tilt angle	$\pm 10^\circ$
Accuracy (absolute linearity)	$\pm 1\%FS$
Input voltage	DC5V ± 0.5
Output type	Ratio

THD2000Z

Compact Long life



[Application]
Operation table: horizontal/vertical tilt angle detection

Hall Effect IC	
Effective tilt angle	$\pm 10 \sim \pm 60^\circ$ Different angle for XY axis possible
Accuracy (Linearity)	$\pm 1\%FS$
Input voltage	DC 5 $\pm 0.25V$
Output type	Ratio/Serial(RS-485)

WR-7UHA

Long life Drip-proof



[Application]
Crane: boom angle detection

Hall Effect IC	
Effective tilt angle	90~360°
Accuracy (absolute linearity)	$\pm 0.4 \sim 0.8\%FS$
Input voltage	DC 5 $\pm 0.5V$
Output type	Ratio

PMP-10HTZL

Long life Drip-proof



[Application]
Dump truck: body tilt angle detection

Hall Effect IC	
Effective tilt angle	$\pm 10^\circ$
Accuracy (Linearity)	$\pm 1\%FS$
Input voltage	DC5V ± 0.5
Output type	Ratio

ESC3000Z

High Accuracy Long life Drip-proof



[Application]
Lift: Shield tunneling machine: body tilt angle detection

Hall Effect IC	
Effective tilt angle	$\pm 10 \sim 80^\circ$ Different angle for XY axis possible
Accuracy (absolute linearity)	$\pm 0.5\%FS$ $\pm 0.1^\circ (\sim 10^\circ) \pm 0.2^\circ (\sim 30^\circ) \pm 0.5^\circ (\sim 80^\circ)$
Input voltage	DC 5 $\pm 0.25V$
Output type	Ratio/Voltage/Current/Serial(RS-485)



Encoder

- Rotary encoders with both high resolution and environmental resistance
- Hollow type and multi revolution type are available.
- These encoders are used mainly in the construction machinery and civil engineering measurement industries.



CE36M

High Accuracy Drip-proof

[Application]
Aerial work platform: boom angle detection

Magneto-resistive element		
Resolution	13bit	
Accuracy	$\pm 0.175^\circ$ (11bit)	
Output type	Interface	RS-422
	Format	ASI, SSI
Max mechanical revolution	10,000rpm	



CE58M

High Accuracy Long life Drip-proof Multi-turn

[Application]
Landslide measuring device:
wire extension length detection

Magneto-resistive element		
Hollow shaft dia.	$\Phi 15$	
Accuracy	17bit	
Accuracy	$\pm 0.044^\circ$ (13bit)	
Output type	Interface	RS-422
	Format	ASI, SPI, SSI, BiSS
Max mechanical revolution	3000rpm	



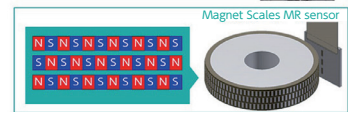
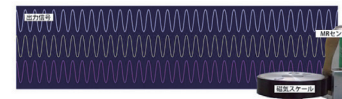
High Precision Multipole Magnet Scale High precision multipole magnetic scale For Magnetic Encoders



[Application examples] Application to magnetic rotary encoders

- ◆Multi-pole magnetization (standard) 512 poles, 256 poles
- ◆High accuracy
Single pitch accuracy: 0.1%, Cumulative pitch accuracy: 0.4
- ◆Fine pitch support
Magnetizing pitch: 100 μm minimum
- ◆Multiple tracks can be magnetized in a single drum.
- ◆Mixed pitches can be mixed in a single track
- ◆Maximum workpiece size: 200 mm x 20 mm
- ◆Harmonic distortion rate 2% (2nd to 7th order)

When combined with a magnetolectric conversion element such as an MR sensor, the signal shown in the figure can be obtained. The signal can be used as an encoder.



Other

- Multi-turn potentiometer setting
- Multi-dial
- Other



Ratiometer



Measuring instrument	
Display	0.0~100.0
Accuracy	±0.2%
Power	DC3V(AA battery*2)
The output of the potentiometer is displayed as a voltage ratio.	

D-12



[Application] Control, testing, experimentations

Vernier Dial	
Turn count	0~10T
Minimum memory	1/500
Shaft diameter	Φ6
The potentiometer can be used in combination with the HP-18.	

H-22



[Application] Control, testing, experimentations

Vernier Dial	
Turn count	0~15T
Minimum memory	1/500
Shaft diameter	Φ6
The potentiometer can be used in combination with the HP-18.	

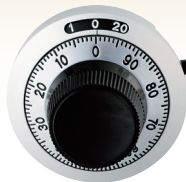
DM-15



[Application] Control, testing, experimentations

Vernier Dial	
Turn count	0~10T
Minimum memory	1/5000
Shaft diameter	Φ6
Max. Display Count	000~999
The potentiometer can be used in combination with the HP-18.	

H-46



[Application] Control, testing, experimentations

Vernier Dial	
Turn count	0~20T
Minimum memory	1/1000
Shaft diameter	Φ6
The potentiometer can be used in combination with the HP-18.	

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