

The motor solution for partners

“SPEED” “INNOVATION” “GLOBAL”

Introduction of Sensors



Manufacturing Sites



Domestic Plant
(Obara-cho, Ota-city, Gunma-ken)

Oversea Plant
(Batam island/Indonesia)



Sales Promotion Policies

Slip Ring

Low price/High reliability (Monitoring cameras & Game machines)

High reliability special products

(Construction machinery & Large size high current applications)

Long life & High reliability achieved by non-contact operation

Potentiometer

Plan for low cost products by oversea production

(VP12 & VP22)

Tough products for construction machinery

Long life & High reliability achieved by non-contact design

(MVP30 & MN28S)

Slip Ring for Monitoring Camera

Model: S33E-9P-04

Features

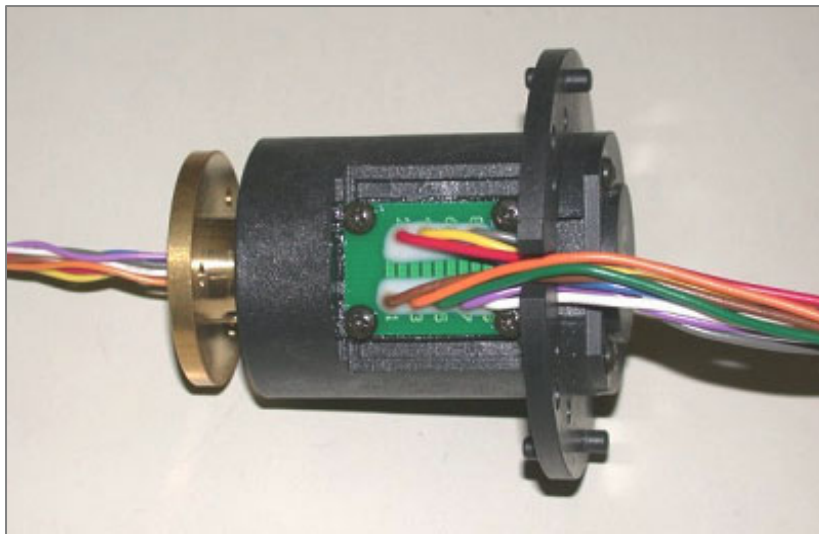
Designed to be directly mounted to the camera.

(Strong shaft strength)

Compact & Light weight

Low noise: Less than 0.3 ohms

Long life: 10 million cycles



Low Price Slip Ring

Model: S28E-8P-01

Features

Compact, Light weight & Low price

Plastic resin parts construction

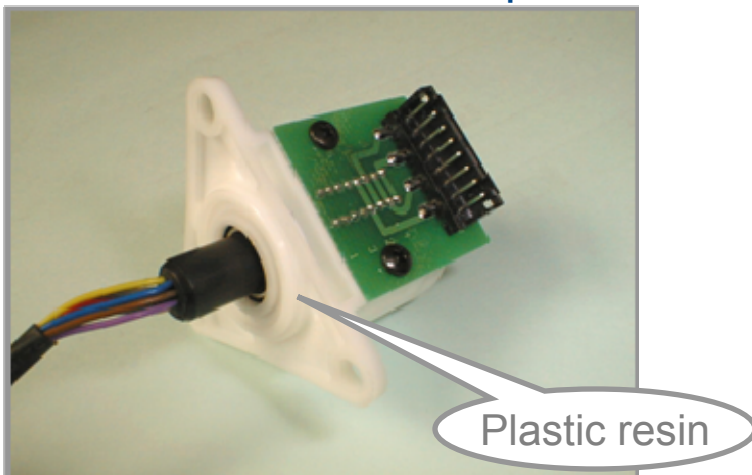
Low noise : 4 pcs. brushes/pole

Rated current : 0.8 A /pole

Connector directly installed on PCB

Applications

Game machine & copier



Slip ring for Constructing Machines

Model: S40-8P

Features

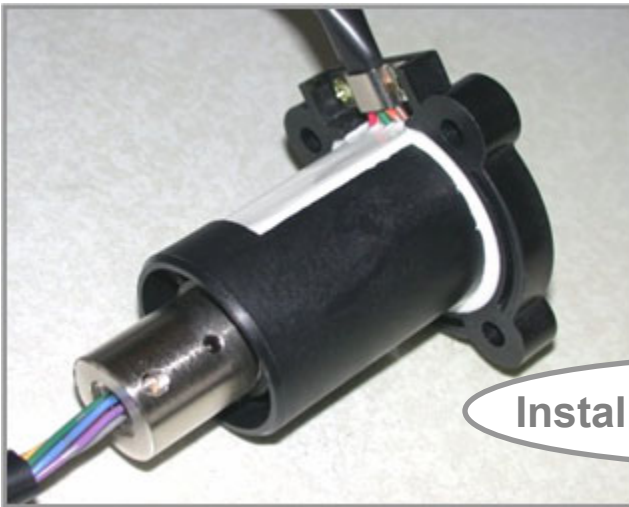
Waterproof: JIS D0207 S2

Anti-Vibration: 4.5 G for 10 to 2,000 Hz

Heat-Shock: 1,000 cycles at -40 deg C & 85 deg C

Applications

Rubber tire type power shovel



Installed under driving seat



Hollow Shaft Slip Ring

Model: S120T-20P

Features

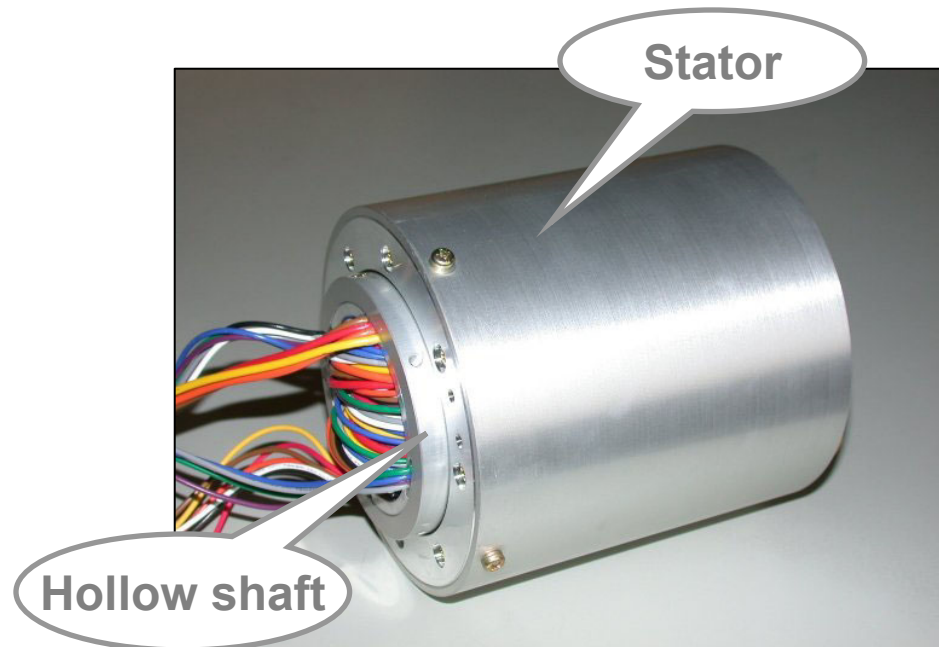
Outer diameter: 120 mm

Hollow shaft inner diameter: 56 mm

Life : 5 million times rotations

Applications

Game machines



Non-Contact Small Slip Ring

Model: S38HL2

Features

Compact : From 85 mm diam. to 38 mm sq.

High speed : From 500 Kbps to 12 Mbps

Applications

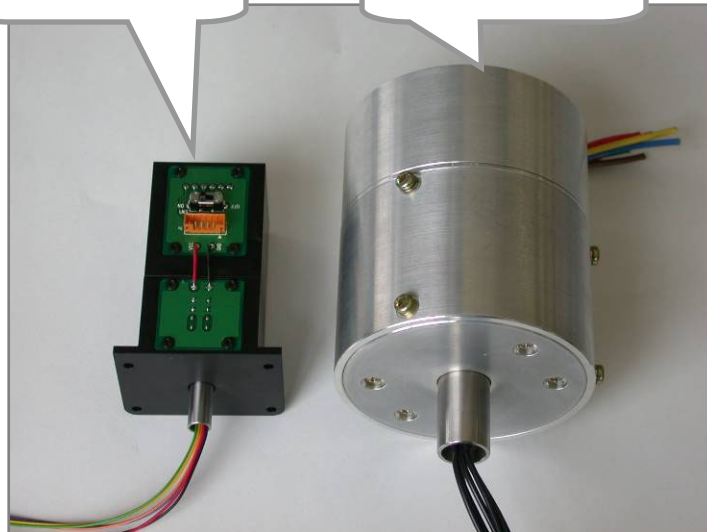
Modular mounting machine

Modular mounting machine

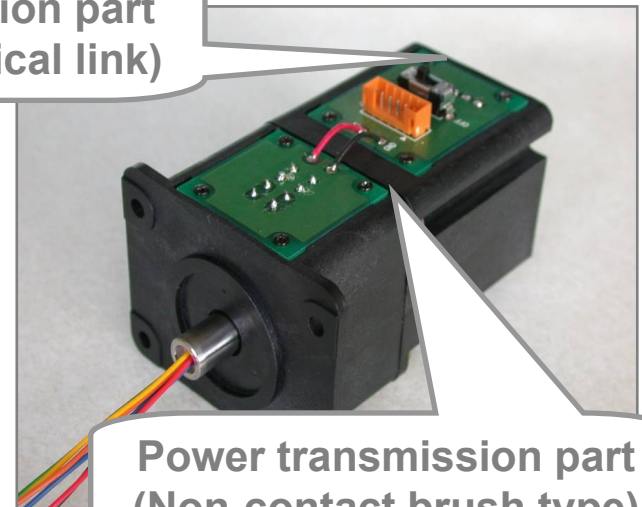


S38HL2-2P

S85HL2-6P

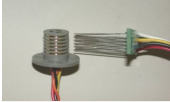


Signal transmission part
(Non-contact optical link)



Power transmission part
(Non-contact brush type)

Slip Rings

Customer	Model Name	Outline	Housing	No of Poles	Max. Current	Shaft	Bearing	Life (cycle)
General	S28-8P-03		Plastic	8	0.8 A/P	Plastic 8 mm diam	Plastic	1*10 ⁶
OEM model	S20-7P-06		Zinc die-cast	7	1.2 A/P	SUS 8 mm diam	Ball bearing	2*10 ⁶
	S08BC-6P-03		—	6	1 A/P	—	—	1.2*10 ⁶
	S25E-6P-02		Plastic mold	6	1.2 A/P	SUS 8 mm diam	Ball bearing	2*10 ⁶
	S30-6P-03		Machined Al	6	1.2 A/P	SUS 17 mm diam	Ball bearing	5*10 ⁶
	S30-9P-03		Machined Al	9	1.2 A/P	SUS 17 mm diam	Ball bearing	5*10 ⁶
	S33E-9P-02		Plastic mold	9	1.2 A/P	SUS 8 mm diam	Ball bearing	5*10 ⁶

Low price potentiometer

Model: VP12

Features

Compact & Light weight : 12 mm outer diameter & 5 g weight

High accuracy: linearity $\pm 2\%$ (for standard products) & $\pm 1\%$ (for precision type)

Long life: Rotational operation of 5 million cycles

High temp. resistance type: Up to 105 deg C

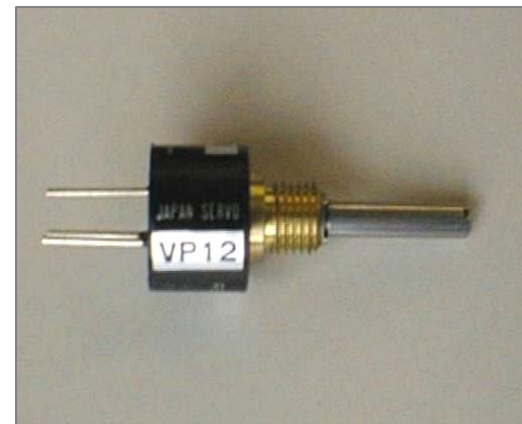
Low price: Oversea production

Applications

Professional video camera, Monitoring-camera, Game machines & etc



Lens control
(Zoom lens)



Potentiometer for Vehicles

Model: VP22

Features

Long life : Rotational operation 60 million cycles

Toughness : Anti-Shock 50G & Anti-Vibration 30G

Anti-high temp. : Up to 120 deg C

Water resistant construction (O-ring installed at bearing part)

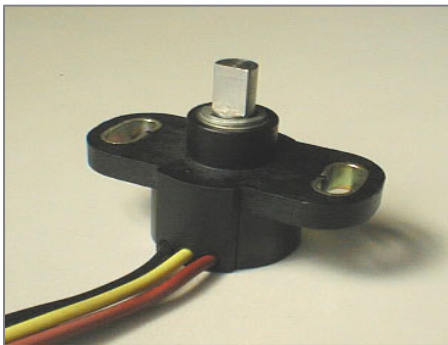
Low price : Oversea production

Applications

Vehicles

Construction machinery

Agricultural machinery



Engine speed control
Throttle valve control
(Open/Close angle control)

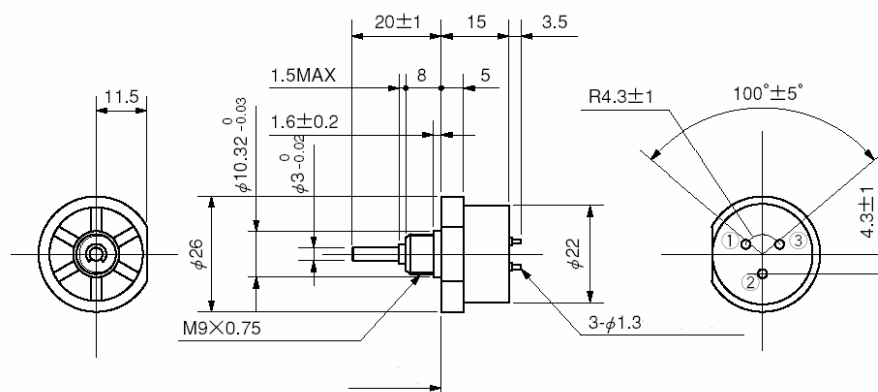
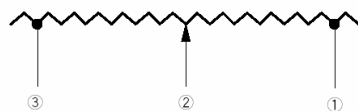
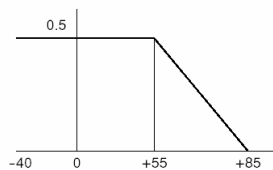
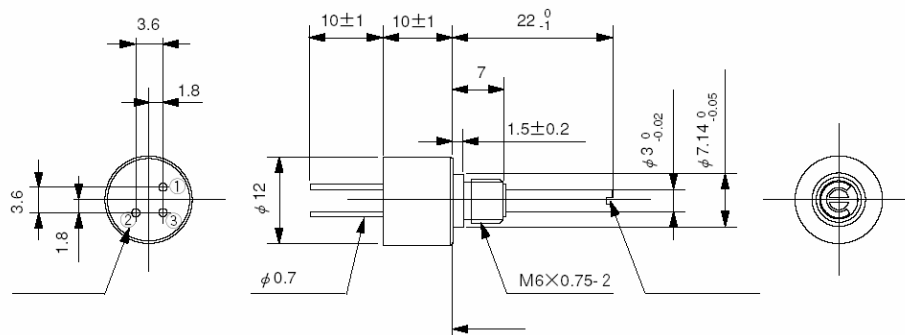
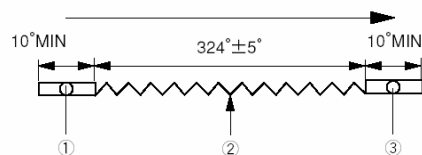
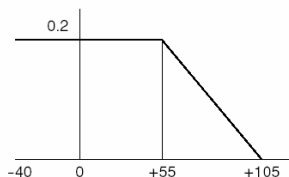


Specification of VP12 & VP22



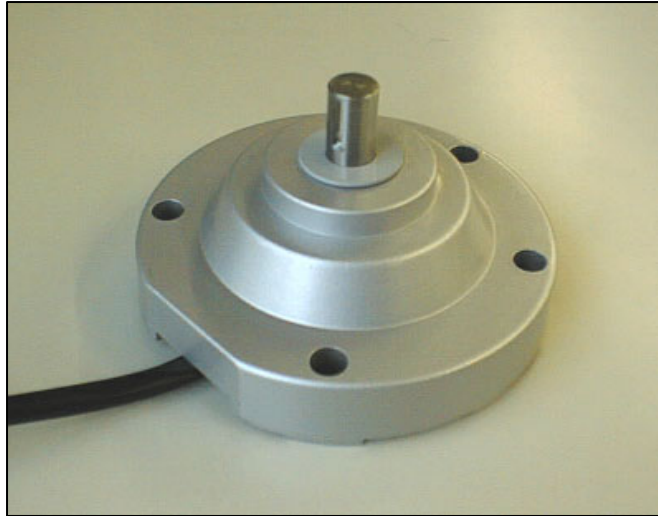
	VP12 5 K	VP12 10 K	VP22N 5 K	VP22N 10 K
Resistance (ohm)	5 k	10 k	5 k	10 k
Maximum input voltage (V)	31.6	44.7	50	70.7
Resistance tolerance (%)	+/- 15		+/- 20	
Independent linearity (%)	+/-2		+/-2	
Effective electrical angle (deg)	324+/-5		315+/-5	
Power rating (W at deg C)	0.2 W at 55 deg C 0 W at 105 deg C		0.5 W at 55 deg C 0 W at 85 deg C	
Resolution (%)	Infinite		Infinite	
Resistance Temp coefficient (PPM/deg C)	+/- 400		+/- 400	
Output smoothness (%)	0.1 Max.		0.1 Max.	
Mechanical rotation angle (deg)	360 deg (Cont)		320 deg (Cont)	
Torque (mN-m)	2		2	
Maximum rotation speed (rpm)	100 Max.		100 Max.	
Bearing type	Sleeve Bearing		Sleeve Bearing	
Ambient temperature (deg C)	-40 to 105 deg C		-40 to 85 deg C	

Outline Drawing of VP12 & VP22



Potentiometer for Constructing M/C

Model: 110



Features

Thin type & Light weight

Anti-Shock : 100 G

Anti-Vibration : 30 G

Water-proof (Oil seal installed at bearing part)



Non-Contact Potentiometer

Model: MVP30

Features

Non-contact type potentiometer

Hall IC type

Effective electric angle : 100 deg Max

Operational temp.: 140 deg C Max.

Water resistant construction

Application

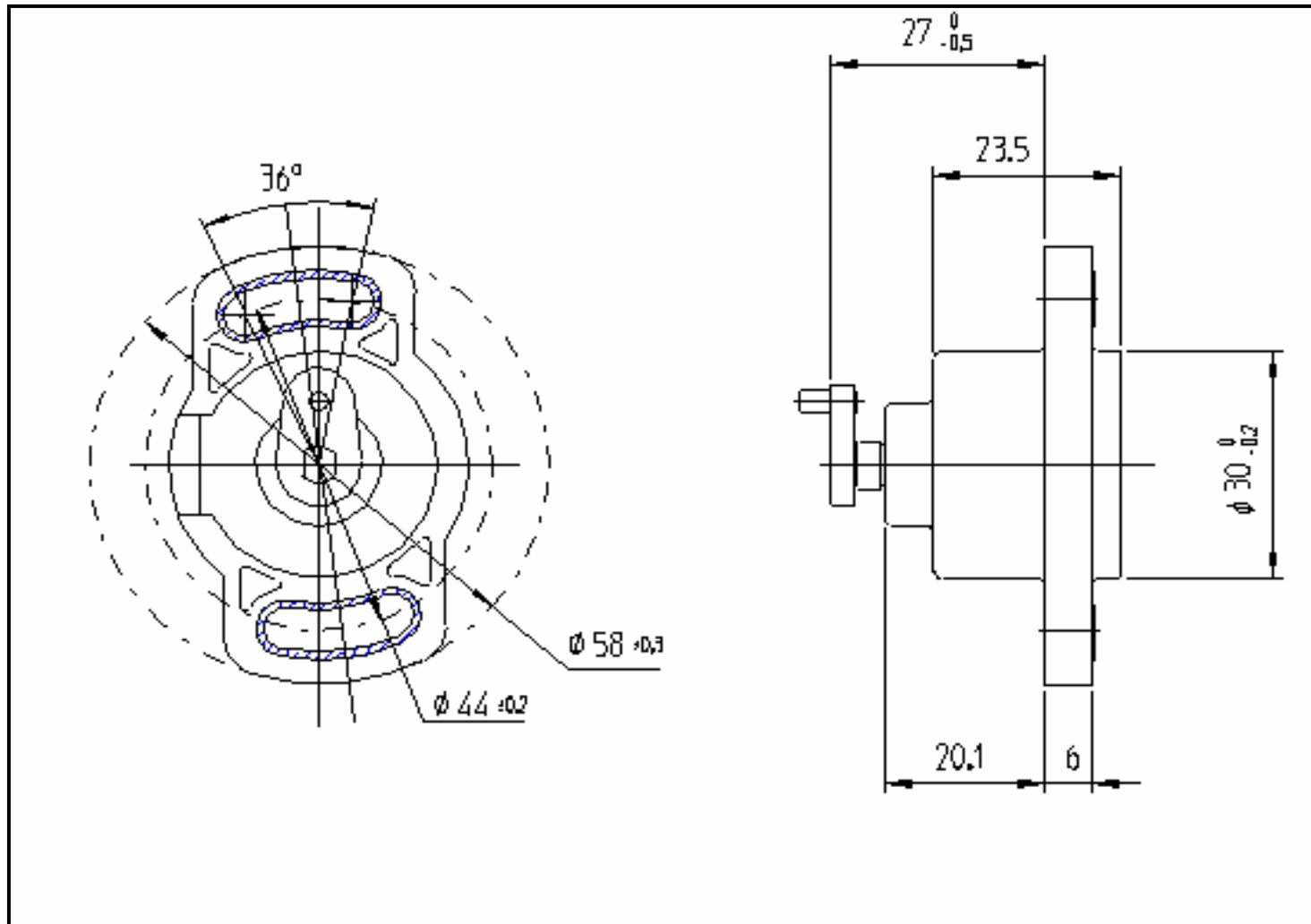
Angular sensor for electric power steering

Throttle sensor

Other vehicle sensors



Outline Drawing of MVP30-X



Digital Non-contact Potentiometer

Model: MN28S

Features

Long life & High reliability by non-contact.

Analogue output type

Same mounting size as CP-POT "N28S"

Easy mounting by reset function

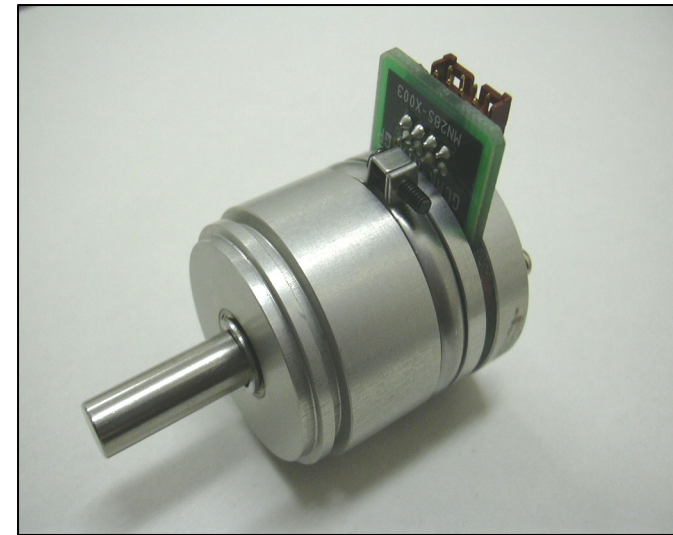
Easy replacement for existing potentiometer without circuit change if supply voltage is 5V.

Digital output type

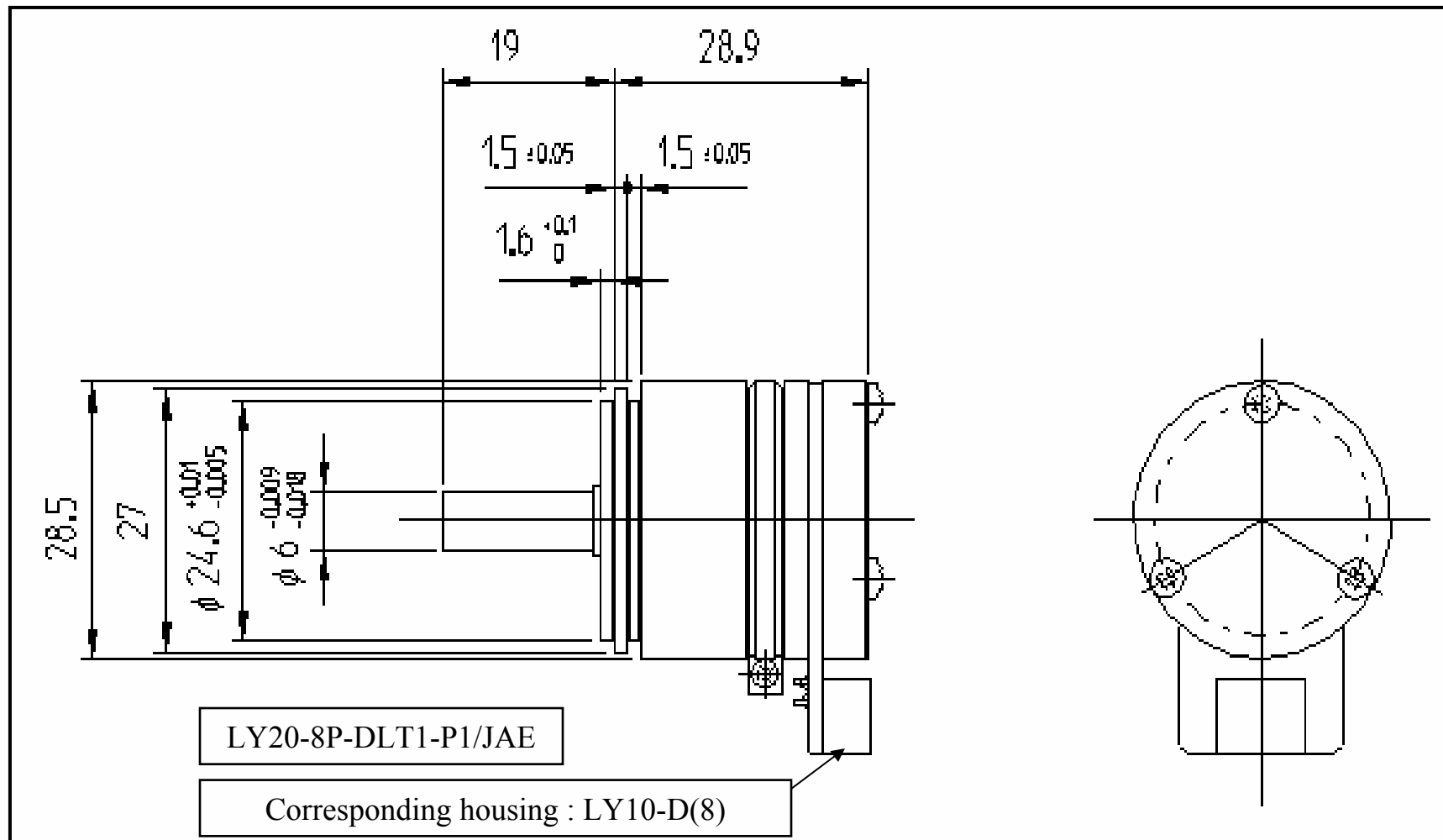
Replacement for absolute value encoder

Applications

Semi-conductor manufacturing, Mounting, NC machine, Construction machinery & etc.



Outline Drawing of MN28S-X



Specification of MN28S-X

1 Type

Hall IC Type

2 Electrical specification

(1) Supply voltage (VCC)	: 5 ± 0.5	: [VDC]
(2) Rated current	※ : 40 max	: [mA]
(3) Output voltage	: 0 ~ 5	: [VDC]
(4) Effective electric angle	: 345 ± 5	: [°]
(5) Output resolution	※ : 0.05	: [%]
(6) Single linearity	: ± 0.3	: [%]
(7) Smoothness	※ : 0.1 typ	: [%]

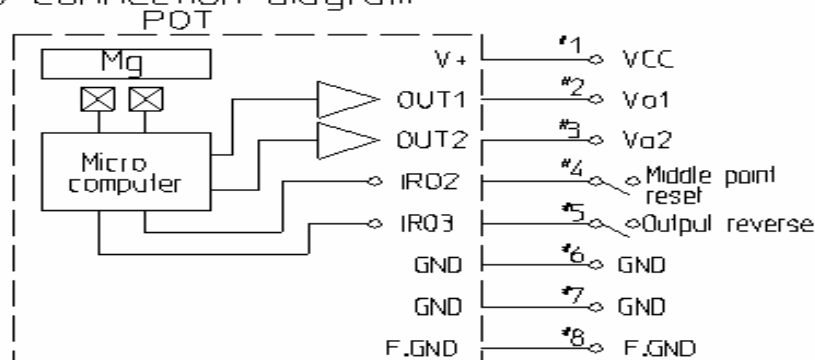
3 Mechanical specification

(1) Mechanical rotation angle	: 360 CONT.	: [°]
(2) Rotational torque	※ : 40 max	: [g-cm]
(3) Allowable shaft rotation	※ : 400	: [r/min]
(4) Dimension	: Refer to outline drawing	:

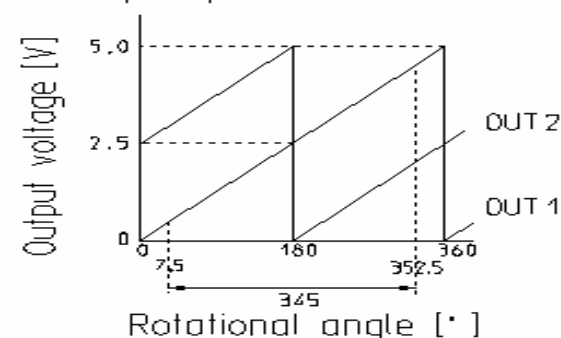
4 Environmental condition

(1) Life	: TBD	
(2) Operational temperature range	: $-20 \sim 70$	: [°C]
(3) Mounting place	: Mounting place shall be free from strong magnetic field.	

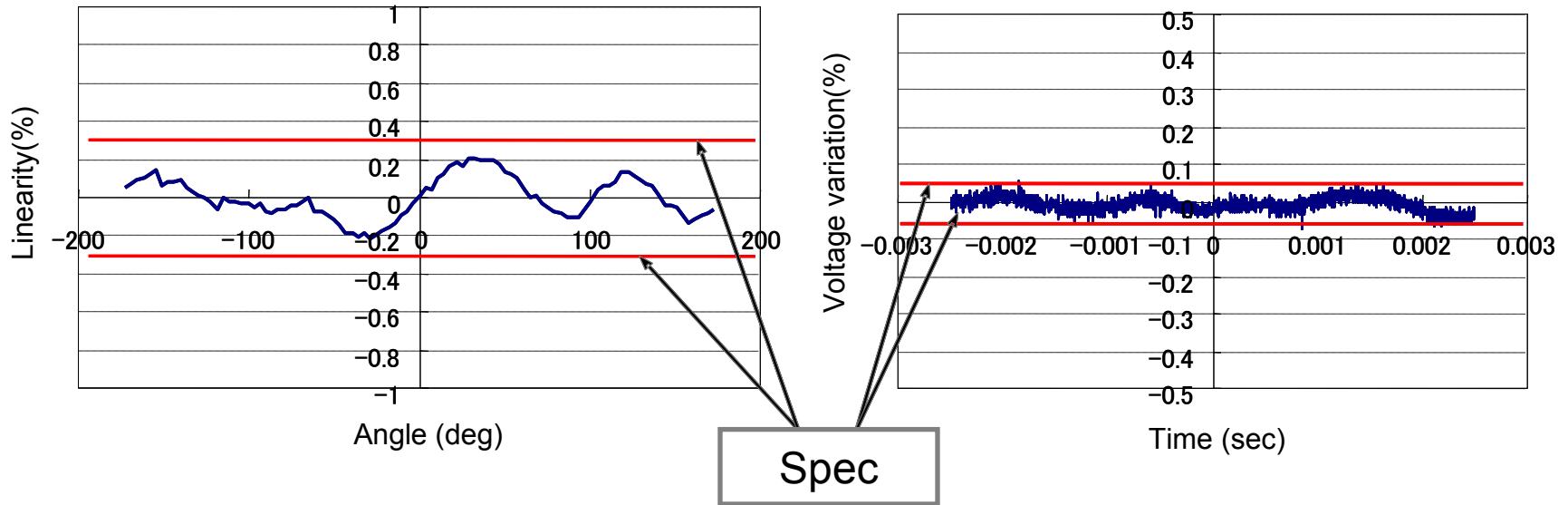
5 Connection diagram



6 Output performance



Performance of MN28S-X



Linearity

Output smoothness

MN28S-X Performance comparison

	N28S-2K (Current, double)	MN28S-X (Developing type)
Method of output	180 deg Phase diff, 2-outputs	180 deg Phase diff. 2-output
Electric angle [deg]	345 +/- 2	345 +/- 5
Mechanical angle [deg]	360 continuous	360 continuous
Single linearity [%]	+/- 0.3	+/- 0.3
Repeatability [%]	0.1 Max.	0.1 Max.
Smoothness [%]	0.1 Max.	0.1 Max.
Operational temp. [degC]	-40 to +85	-20 to +70
Zero reset function	N/A	Available in optional pos.
Detecting method	Detecting contact resist.	Non-contact detection of flux by hall IC