TOKYO SOKUTEIKIZAI CO., LTD.

TOKYO SOKUTEIKIZAI CO., LTD.

Rotary Switch
Catalogue

RS300 ————————————————————————
high blocking voltage model available

RS400 ————————————————————————
compact, shorting/non shorting selectable

RS500 ————————————————————————
various step angles: 15/20/30/45/60 degrees

MR8A ————————————————————————
8mm square tiny rotary switch, waterproof model available

Rotary Switches

RS300/400/500 Series

Tosoku

Outline

Our RS series embody the manufacturing history of our company. All series are sturdy and solid with high dependability designed for control units of plants, installations, audio equipments, etc.
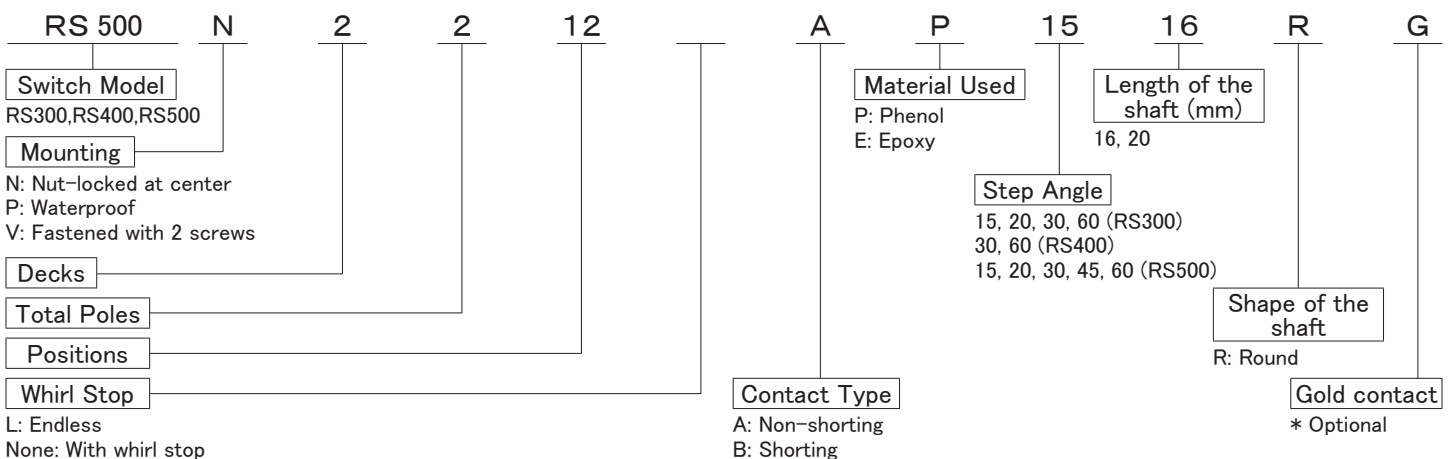
Features

- Free to change the number of switch positions by replacing self-tapping screws
- Various combinations of double shafted model available
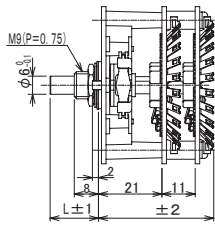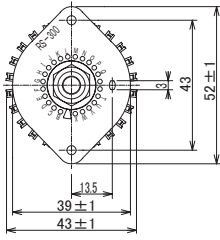- RoHS compliant

Specifications

	RS300	RS400	RS500
Step Angles	15/20/30/60	30/60	15/20/30/45/60
Switching Mechanism	15/20: Shorting 30/60: Non-shorting	Shorting and Non-shorting selectable	15/20: Shorting 30/45/60: Non-shorting
Water Proofing	- - - - - - - - - - - - - -	Adapter panel and rubber o-rings provided at requests	
Gold Contacts	Available		
High-Voltage Withstanding	Available (Up to 6,000V)	- - - - - - - - - - - - - -	
Operating Temperature	-20℃ +70℃		
Storage Temperature	-40℃ +C70℃		
Rotational Torque	0.12N・m ～ 0.35N・m	0.10N・m ～ 0.25N・m	
Terminal Strength	10N		
Nut Tightening Torque	2N・m		
Vibration Resistance	10Hz ～ 55Hz ～ 10Hz/min (vibrated for 1.5mm to each XYZ direction) No defect found under conditions above		
Heat Resistance of Solder	350±10℃ , 3 seconds ±1		
Contact Resistance	(1kHz±200Hz of voltage 20mV. 50mA or less)		
	5mΩ max.	15mΩ max.	10mΩ max.
Insulation Resistance	After 1 min. of 500VDC terminal-terminal 1,000MΩ ≦ terminal-ground 50,000MΩ ≦		
Withstanding Voltage	1,000VAC 1min.	500VAC 1min.	
Rated Value AC	30V 3.0A/200V 0.5A	30V 1.0A/200V 0.2A	30V 1.5A/200V 0.2A
Rated Value DC	20V 3.0A/200V 0.2A	20V 1.0A/200V 0.1A	20V 1.5A/200V 0.1A
Durability	at least 50,000 strokes		

Part Number Designation

RS 500   N   2   2   12   A   P   15   16   R   G

Switch Model
RS300,RS400,RS500

Mounting
N: Nut-locked at center
P: Waterproof
V: Fastened with 2 screws

Decks

Total Poles

Positions

Whirl Stop
L: Endless
None: With whirl stop

Contact Type
A: Non-shorting
B: Shorting

Material Used
P: Phenol
E: Epoxy

Step Angle
15, 20, 30, 60 (RS300)
30, 60 (RS400)
15, 20, 30, 45, 60 (RS500)

Length of the shaft (mm)
16, 20

Shape of the shaft
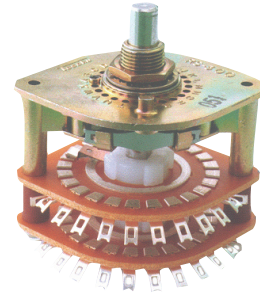R: Round

Gold contact
* Optional

RS300_Dimensions (mm)

Bushing

M9(P=0.75)
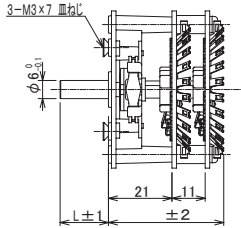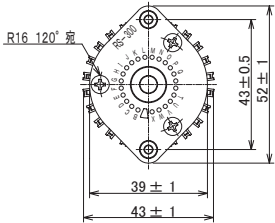
Panel Mounting Hole Dimensions (mm)

RS300/400/500N accessories
M9 Nut (t=2mm)
M9 Toothed lock washer (t=1mm)
Washer (t=0.5mm)

Two screws fix

R16 120° 宛

3-M3×7 皿ねじ

Panel Mounting Hole Dimensions (mm)

Hole for two points fix
Hole for three points fix

RS300V accessory
Three M3x7 screws
(for two points fix, with two screws)

Length (mm)

L	Standard shaft length		
	16	18	20

Number of Layers	1	2	3	4
(mm)	27	38	49	60

RS400_Dimensions (mm)

Bushing
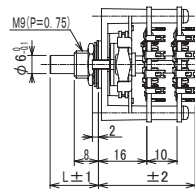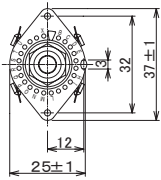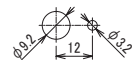
M9(P=0.75)

Panel Mounting Hole Dimensions (mm)

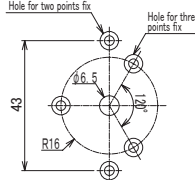*φ3.2hole not needed for waterproof
RS300/400/500N accessories
M9 Nut (t=2mm)
M9 Toothed lock washer (t=1mm)
Washer (t=0.5mm)

Two screws fix

2-M2.3×6皿ねじ

Panel Mounting Hole Dimensions (mm)

Hole for M2.3 screw
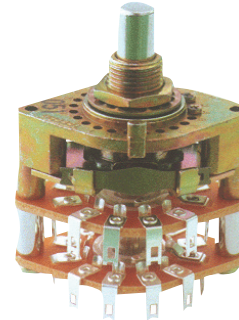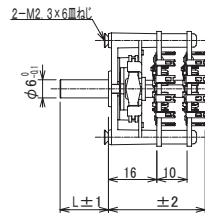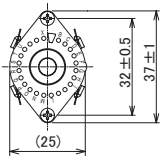
RS400V accessory
Two M2.3x6 screw

Length (mm)

L	Standard shaft length		
	16	18	20

Number of Layers	1	2	3	4
(mm)	22(26)	32(41)	42(56)	52(71)

( ) : for all contacts type

RS500_Dimensions (mm)

Bushing
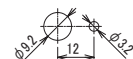
M9(P=0.75)

Panel Mounting Hole Dimensions (mm)

*φ3.2hole not needed for waterproof
RS300/400/500N accessories
M9 Nut (t=2mm)
M9 Toothed lock washer (t=1mm)
Washer (t=0.5mm)

Two screws fix

2-M2.3皿ねじ
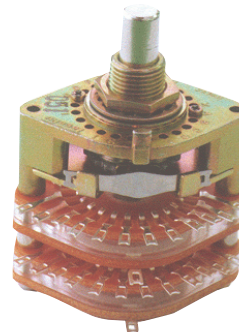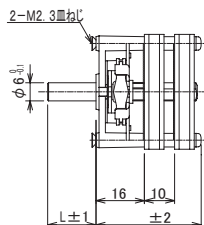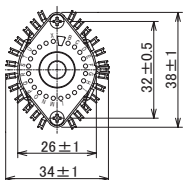
Panel Mounting Hole Dimensions (mm)
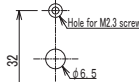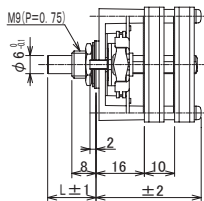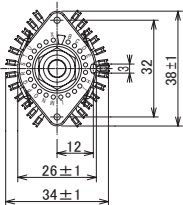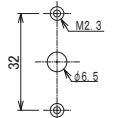
RS500V accessory
Two M2.3x6 screw

Length (mm)

L	Standard shaft length		
	16	18	20

Number of Layers	1	2	3	4
(mm)	26	36	46	56

Ultra Compact Rotary Switch

MR8A Series

Outline

MR8A is our tiniest rotary switch designed for compact devices, used for many different equipments which has very limited space inside.

Features

- 8mm square compact (8.0x8.0 mm)
- Gold plated contacts
- Monolithic sealed structure of the terminals to prevent entry of a soldering flux
- RoHS compliant
- Waterproofed model available

Specifications

Operating temperature		-20℃ ～ +70℃ -4F ～ 158F	Keep the body unfrozen
Storage temperature		-40℃ ～ +70℃ -40F ～ 158F	
Mechanical Specification	Rotational Torque	0.02±0.01N・m	
	Terminal Strength	3N (of static load applied to the tip of the terminal once and in any direction)	
	Rotation Stopper Strength	0.4N・m	
	Panel Nut Tightening Torque	0.8N・m	
	Heat Resistance of Solder	300℃ ±10℃ , 3±1 sec.	
	Water Resistance	Water resistant through the mounted panel (2m deep in the water for 2h)	
Electrical Specification	Contact Capacity	0.4VA (AC&DC)	
	Maximum Voltage	25V (AC&DC)	
	Working Electric Current	0.1mA ～ 50mA (AC&DC)	
	Contact Resistance	80mΩ max.	

Electrical Specification	Insulation Resistance	500MΩmin. (250VDC): Between terminals		
		1000MΩmin. (500VDC): Between Terminals and Ground		
	Withstanding Voltage	300VAC 1min.: Between terminals		
		300VAC 1min.: Between terminals and ground		
Insulation Resistance		DC100V (1min later)	terminal – terminal	100MΩ ≦
		DC500V (1minLater)	terminal – ground	500MΩ ≦
Weight		5.5g		
Durability		50,000 strokes (Rotational Torque: ±20% the initial value, Contact Resistance: Not more than 100mΩ, Insulation Resistance: After 1min 250VDC electrification)		
Humidity Proof		Temperature : +40 ± 2℃ Relative Humidity : 90 ～ 95% (Duration : 48 ± 2h)		

Warranty

- 1 year from the date of shipment.

Part Number Designation

MR8　A　-　V　-　1　-　09　-　30　-　L=12　-　R　-　S

Switch Model

Category
A: Rotary Swtich

Mounting Direction
V: Vertical

Poles
1: 1 pole
2: 2 poles

Positions
02〜12: 2〜12 positions (1 pole)
02〜06: 2〜6 positions (2 poles)

Step Angle
30: 30°

Length of the shaft
12: 12mm

Shape of the shaft
R: Round

Optional Parts
None: No option attached
S: Receiver clamp
P: Waterproof washer
SP: Receiver clamp & Waterproof washer

Dimensions (mm)

Standard
MR8A_

Washer
Nut
M6 (P=0.75)
Mounting Panel : t= 3.3mm max.
Tosoku Logo

With Support
MR8A_S

Mounting Panel : t= 2.8mm max.
M6 (P=0.75)
Tosoku Logo
Support (t=0.5)

With Seal Washer (Front panel seal)
MR8A_P

Mounting Panel : t= 2.9mm max.
M6 (P=0.75)
Seal Washer (1 pc)
Tosoku Logo

With Support & Seal Washer (Front panel seal)
MR8A_SP

Mounting Panel : t= 2mm max.
M6 (P=0.75)
Seal Washer (2 pcs)
Tosoku Logo
Support (t=0.5)
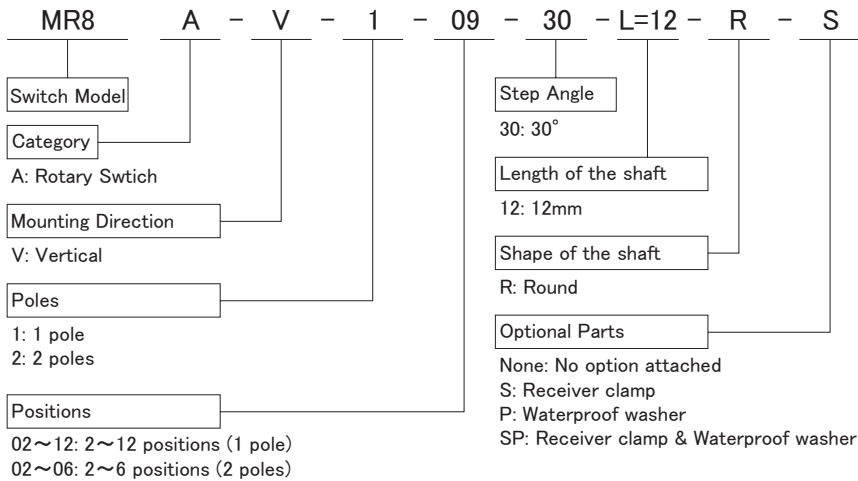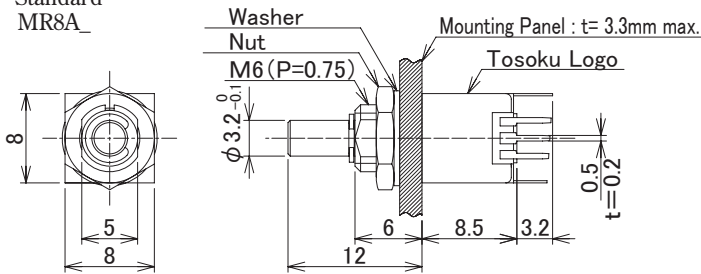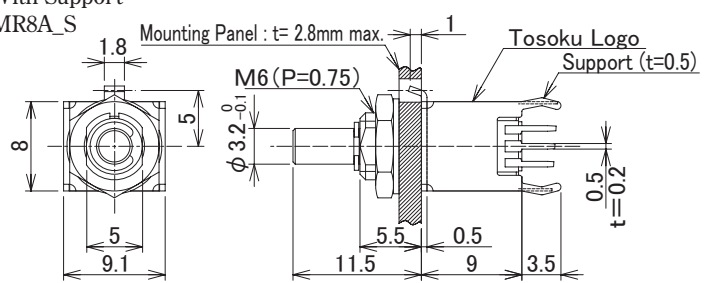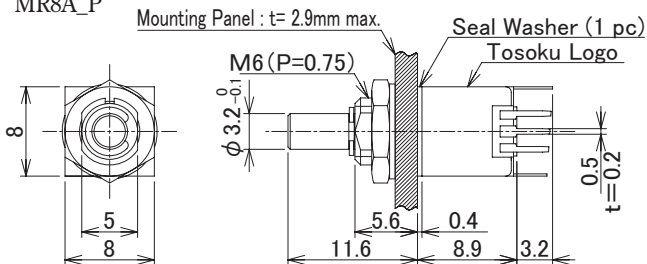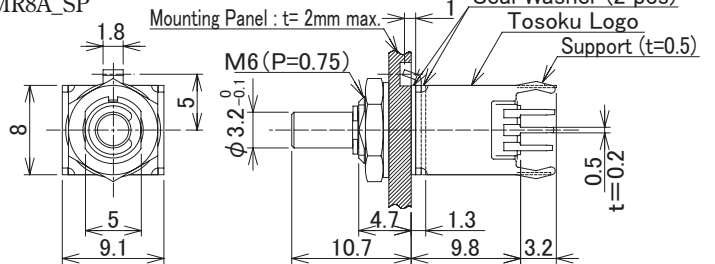
※Use 2 seal washers

PWB Mounting Hole Dimensions (mm)

Standard / With Seal Washer

Seal Washer (2 pcs)
13−φ0.8

※Use 2 seal washers
14−φ0.8
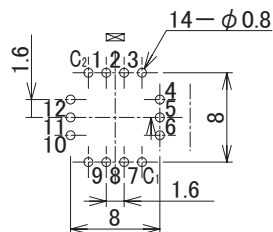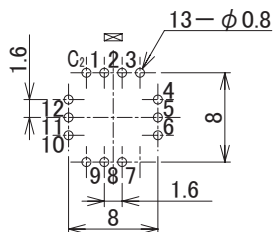
With Support (& Seal Washer)

Seal Washer (2 pcs)
13−φ0.8
4−φ1.2

※Use 2 seal washers
14−φ0.8
4−φ1.2
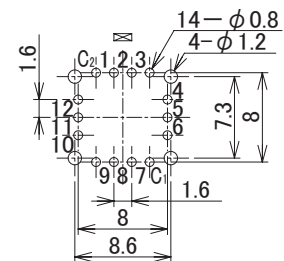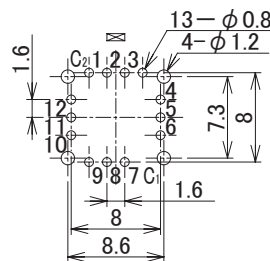
Mounting Hole Dimension (mm)

Standard / With Seal Washer

With Support (& Seal Washer)

※φ2.1
φ6.2
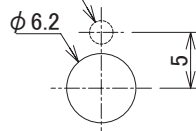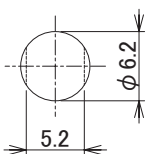
With seal washer,
keep the hole closed.

Accessories

Nut

Washer

Seal Washer (1 pc)
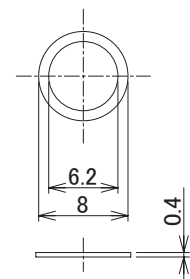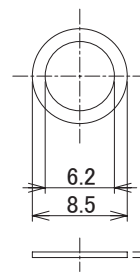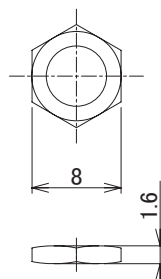
TOKYO SOKUTEIKIZAI CO., LTD.

Code Switch
Catalogue

hermetically sealed, long life, various options

tightly sealed, 2 types of mouting positions

Digital Code Switch

DP Series
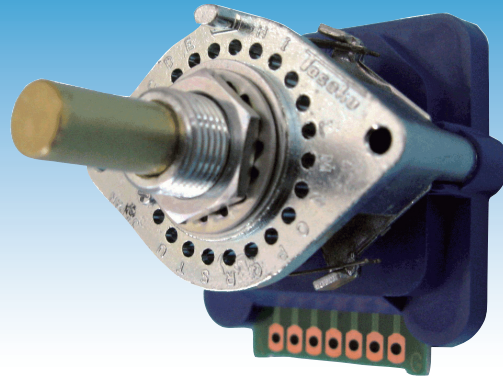
Outline

DP – the market leading digital code switch – series are designed for use in wide range of industrial instruments.

Features

- High reliability with double gold-plated sliding contacts.
- Eco friendly:
  1) Low cost and lesser parts by VA design
  2) RoHS compliant
- Step angles: 13.85°, 15°, 20°, 27.69°, 30°
- Various types of codes: real binary, complementary binary, real gray, complementary gray (either inhibit and/or parity circuit enclosed in all codes for safety). Special codes also available.
- Duration of over 50000 switching cycles
- Waterproofed model available

Specifications

Items	Rated Value	
Operating temperature	-20℃ ～ +70℃ (-4F ～ 158F)	Keep the body unfrozen
Storage temperature	-40℃ ～ +70℃ (-40F ～ 158F)	
Rotational torque	0.1N ～ 0.2N	
Terminal strength	3N	
Panel nut tightening torque	2N・m	
Stopper strength	3N・m	
Vibration Durability	Range 10 ～ 55 ～ 10Hz/min	
	No defect found after 2h of vibration stroke for 1.5mm to each XYZ direction	
Contact resistance	≦ 100mΩ	

Insulation resistance	DC250V/ After 1min	Terminal to terminal	500MΩ ≦	
	DC500V/ After1min	Terminal to groung	5000MΩ ≦	
Withstanding voltage	AC250/1min	Terminal to terminal		
	AC1500V/1min	Terminal to ground		
Load resistance	AC	**5V 0.5A/ 48V 0.05A**		
	DC	5V 0.25A/ 25V 0.05A		
Durability	Rotational	Over 50000 times rotations		
	Contact resistance	≦ 150mΩ		
	Insulation resistance	DC250V/50mΩ ≦ ,(Over a min)		

Warranty

- 1 year from the date of shipment

Part Number Designation

DP   P   01   0   20   J   20   R   CB

Switch Model

N: Non Waterproof
P: Waterproof

Codes
01: Real Binary
02: Complimentary Binary
03: Real Gray
04: Complimentary Gray

Starting Position

End Position

Step Angle
H: 13.85°
J: 15°
N: 30°
L: 20°
S: 27.69°

Length of the Shaft
16: 16mm
20: 20mm

Shape of the Shaft
R: Round

Connector Options
None: No Connector Attached
CB: Vertically Attached
CS: Horizontally Attached

	Step Angle	Range of the Staring/End Positions
H	13.85°	0 ~ 25
J	15°	0 ~ 23
N	30°	0 ~ 11
L	20°	0 ~ 17
S	27.69°	0 ~ 12

Dimensions (mm)

DPN/DPP

DPN/DPP with Connector CB
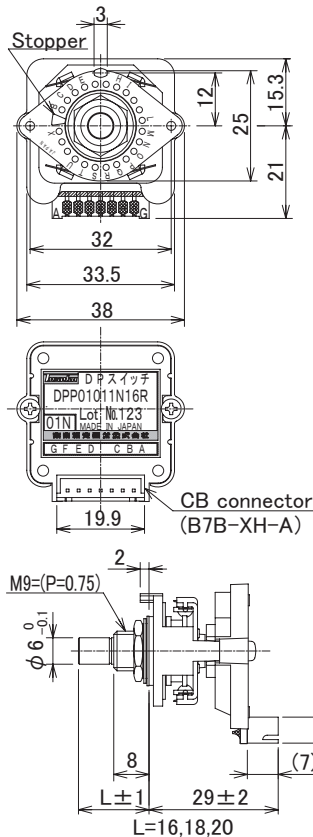
DPN/DPP with Connector CS
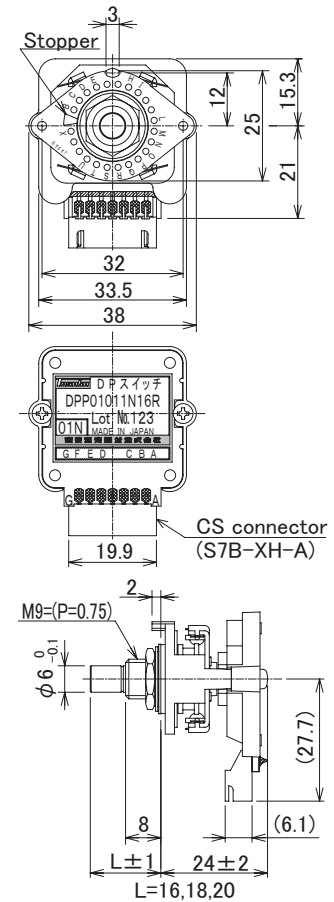
DP Accessory

Adapter(for waterproof)

※Panel thickness is max 2mm, in case of using adapter.

Wire Harness

P/N	L(cm)
A05	50
A15	150
A30	300

Brown: A
Red: B
Orange: C
Yellow: D
Green: E
Blue: F
Puple: G

AWG24

Connector (XHP-7)
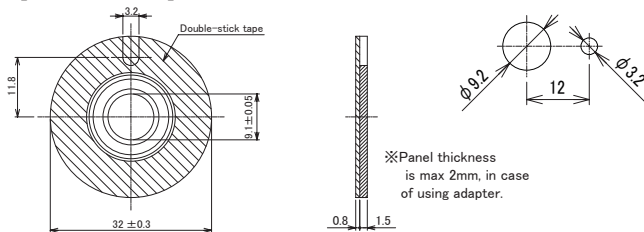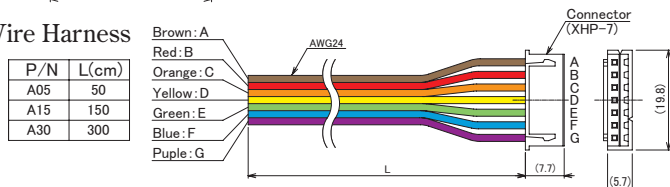
Precautions

● How to connect panel
1. Peer double-sided tape off.
2. Stick double-sided tape to the panel (Pay attention to direction of adapter)
3. Use M9nut, toothed lock washer and washer to tighten panel and adapter.
4. M9 nut tightening torque shall be up to 2N.m.
5. Use double-sided tape under clean condition.

PLEASE NOTE
1. Panel thickness shall be up to 2mm(to use adapter)
2. Panel thickness shall be up to 4mm(without adapter)

● Mounting hole dimensions
1. Make φ9.2 dimensions hole at the panel(to use adapter)
2. Check out left example to use without adapter

Code and Truth Tables

1. Angle of throw(H):13.85° (26-position)
Code : 01   BCD Real Code(with inhibit)

Terminal No.	Code Output	Switch Position 0–25
A	1	
F	2	
B	4	
E	8	
C	16	
G	Inhibit	

Dot(●) indicates terminal to common(D) connection.

2. Angle of throw(H):13.85° (26-position)
Code : 03   Gray Real Code(with parity)

Terminal No.	Code Output	Switch Position 0–25
A		
F		
B		
E		
C		
G	Parity	

Dot(●) indicates terminal to common(D) connection.

3. Angle of throw(J):15° (24-position)
Code : 01   BCD Real Code(with inhibit)

Terminal No.	Code Output	Switch Position 0–23
A	1	
F	2	
B	4	
E	8	
C	16	
G	Inhibit	

Dot(●) indicates terminal to common(D) connection.

4. Angle of throw(J):15° (24-position)
Code : 03   Gray Real Code(with parity)

Terminal No.	Code Output	Switch Position 0–23
A		
F		
B		
E		
C		
G	Parity	

Dot(●) indicates terminal to common(D) connection.

5. Angle of throw(L):20° (18-position)
Code : 01   BCD Real Code(with inhibit)

Terminal No.	Code Output	Switch Position 0–17
A	1	
F	2	
B	4	
E	8	
C	16	
G	Inhibit	

Dot(●) indicates terminal to common(D) connection.

6. Angle of throw(L):20° (18-position)
Code : 03   Gray Real Code(with parity)

Terminal No.	Code Output	Switch Position 0–17
A		
F		
B		
E		
C		
G	Parity	

Dot(●) indicates terminal to common(D) connection.

7. Angle of throw(N):30° (12-position)
Code : 03   Gray Real Code(with parity)

Terminal No.	Code Output	Switch Position 0–11
A		
F		
B		
E		
C	Parity	

Dot(●) indicates terminal to common(D) connection.

8. Angle of throw(N):30° (12-position)
Code : 01   BCD Real Code(with inhibit and parity)

Terminal No.	Code Output	Switch Position 0–11
A	1	
F	2	
B	4	
E	8	
C	Parity	
G	Inhibit	

Dot(●) indicates terminal to common(D) connection.

9. Angle of throw(S):27.69° (13-position)
Code : 01   BCD Real Code(with inhibit and parity)

Terminal No.	Code Output	Switch Position 0–12
A	1	
F	2	
B	4	
E	8	
C	Parity	
G	Inhibit	

Dot(●) indicates terminal to common(D) connection.

10. Angle of throw(S):27.69° (13-position)
Code : 03   Gray Real Code(with parity)

Terminal No.	Code Output	Switch Position 0–12
A		
F		
B		
E		
C	Parity	

Dot(●) indicates terminal to common(D) connection.

Ultra Compact Code Switch

MR8C Series

Outline

MR8C is an ultra compact rotary code switch with resin enclosure designed especially for – but not limited to - usage in devices with limited space for switch units inside.

Features

- 8mm square compact (8.0x8.0 mm)
- Two different step angles; (22.5°,30)
- Gold plated contacts
- Monolithic sealed structure of the terminals to prevent entry of a soldering flux
- RoHS compliant
- Dripproofed model available

Specifications

Operating temperature	-20℃ ～ +70℃ -4F ～ 158F	Keep the body unfrozen	
Storage temperature	-40℃ ～ +70℃ -40F ～ 158F		
Mechanical Specification	Rotational Torque	0.02±0.01N·m	
	Terminal Strength	5N (of static load applied to the tip of the terminal once and in any direction)	
	Rotation Stopper Strength	0.4N·m	
	Panel Nut Tightening Torque	0.6N·m	
	Heat Resistance of Solder	350℃ ±10℃ , 3±1 sec.	
	Water Resistance	Water resistant through the mounted panel (1m deep in the water for 2h)	
Electrical Specification	Contact Capacity	0.2VA (AC&DC)	
	Maximum Voltage	15V (AC&DC)	
	Working Electric Current	0.1mA ～ 20mA (AC&DC)	
	Contact Resistance	200mΩ max.	

Electrical Specification	Insulation Resistance	100MΩminimum (100VDC 1min.): Between terminals
		500MΩminimum (500VDC 1min.): Between Terminals and Ground
	Withstanding Voltage	100VAC 1min.: Between terminals
		500VAC 1min.: Between terminals and ground
Weight		3.5g
Durability		30,000 strokes (Rotational Torque: ±50% the initial value, Contact Resistance: Not more than 1Ω, Insulation Resistance: After 1min 100VDC electrification)
Humidity Proof		Temperature : +40 ± 2℃ Relative Humidity : 90 ～ 95% (Duration : 48 ± 2h)

Warranty

- 1 year from the date of shipment

Part Number Designation

MR8 C - V - 03 - 0 - A - M - 12 - R - S

Switch Model

Category
C: Code Swtich

Mounting Direction
V: Vertical

Code Type
03: Real Gray Code

Start Position
0〜F:Set an optional position between 0〜F (22.5°)
0〜B:Set an optional position between 0〜B (30°)

End Position
0〜F:Set an optional position between 0〜F (22.5°)
0〜B:Set an optional position between 0〜B (30°)

Step Angle
M: 22.5°
N: 30°

Length of the shaft
12: 12mm

Shape of the shaft
R: Round

Optional Parts
None: No option attached
S: Receiver clamp
P: Waterproof washer
SP: Receiver clamp & Waterproof washer

Dimensions (mm)

Standard
MR8C_

Washer
Nut
M6(P=0.75)
Mounting Panel : t= 3.3mm max.
Tosoku Logo
φ3.2 0 -0.1
t=0.2 0 / 0.5
8
E A
D C B
5
8
6
12
8.5
3

With Support
MR8C_S

Mounting Panel : t= 2.8mm max.
1
Tosoku Logo
Support (t=0.5)
1.8
M6(P=0.75)
φ3.2 0 -0.1
t=0.2 0 / 0.5
8
5
E A
D C B
5
9.1
5.5
0.5
11.5
9
3.5
3

With Seal Washer
(Front panel seal)
MR8C_P

Mounting Panel : t= 2.9mm max.
Seal Washer (1 pc)
Tosoku Logo
M6(P=0.75)
φ3.2 0 -0.1
t=0.2 0 / 0.5
8
E A
D C B
5
8
5.6
0.4
11.6
8.9
3

With Support & Seal Washer
(Front panel seal)
MR8C_SP

Seal Washer (2 pcs)
Tosoku Logo
Support (t=0.5)
Mounting Panel : t= 2mm max.
1
1.8
M6(P=0.75)
φ3.2 0 -0.1
t=0.2 0 / 0.5
8
5
E A
D C B
5
9.1
4.7
1.3
10.7
9.8
3
3.1

※Use 2 seal washers

PWB Mounting Hole Dimensions (mm)

Standard / With Seal Washer
5-φ0.8
E A
D C B
8.4
2 2

With Suppoet (+ Seal Washer)
5-φ0.8
4-φ1.2
E A
D C B
7.3
8.4
2 2
8.6

Mounting Hole Dimension (mm)

Standard / With Seal Washer
φ6.2
5.2

With Suppoet (+ Seal Washer)
※φ2.1
φ6.2
5

With seal washer,
keep the hole closed.

Code table

22.5° Step angle
Code Type 03 (Real gray code)   ● indicates terminal connection to common

Terminal No.	Bit No.	Switch Position															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A	1		●	●			●	●			●	●			●	●	
E	2			●	●	●	●					●	●	●	●		
B	4					●	●	●	●	●	●					●	●
D	8									●	●	●	●	●	●	●	●
C	common																

※1

30° Step angle
Code Type 03 (Real gray code)   ● indicates terminal connection to common

Terminal No.	Bit No.	Switch Position											
		0	1	2	3	4	5	6	7	8	9	A	B
E	1		●	●			●	●			●	●	
A	2			●	●	●	●					●	●
B	4					●	●	●	●	●	●		
D	8									●	●	●	●
C	common												

※1

Code Type 01 (Real binary code)   ● indicates terminal connection to common

Terminal No.	Bit No.	Switch Position											
		0	1	2	3	4	5	6	7	8	9	A	B
D	1		●		●		●		●		●		●
B	2			●	●			●	●			●	●
E	4					●	●	●	●				
A	8									●	●	●	●
C	common												

Attention: Terminal A and E of 30° is reverse to 22.5°.

TOKYO SOKUTEIKIZAI CO., LTD.

Rotary Encoder
Catalogue

thin, lightweight, resin shaft/case

waterproof model available, operated at 3.3V/5V

dual (inner/outer) shaft: inner for push button, outer for rotation

push button function added to the rotating shaft, low price

Ultra Slimline Rotary Encoder with Push Switch

RE29 Series

Tosoku
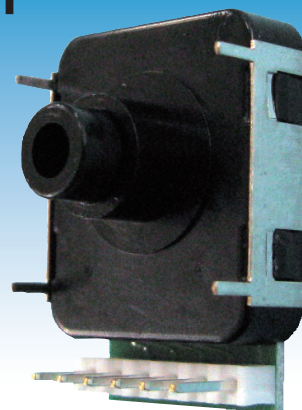
Outline

RE29 series pack compact rotary encoder with dual-functional resin shaft into the space-saving resin enclosure. RE29 is recommended for wide range of machines including measurement components, medical and telecommunication devices.

Features

● Extremely thin (6.6mm) and lightweight (7g)

● Multi-functional with 2 way acting – push switch function and rotating function – shaft

● Eco friendly:

　1) Low cost and lesser parts by VA design

　2) RoHS compliant

● Designed to be soldered to printed circuit board

Specifications

1. Electrical and Mechanical specifications

Items			Rated Value
Rotary Encoder	Number of Pulses		6 PPR
	Number of Clicks		24 Clicks
	Supply Voltage		DC3.3V ± 5% ≦ 20mA 6mA TYP
			DC5V ± 5% ≦ 10mA 4mA TYP
	Output Signals		Channel A/B: Square Wave CMOS chip
	Output Voltage	High	(Supply Voltage − 2.5V) ≦
		Low	≦ 0.5V
	Response Frequency		100Hz
	Rotational Torque		4 ± 2 mN・m
Push switch	Rating of contact		≦ DC12V 0.1 ～ 10mA $\left(\begin{array}{c}\text{Resistance}\\\text{load}\end{array}\right)$
	Travel of switch		0.2 ± 0.1 mm
	Operational Force		5 ± 2 N
	Weight		7g

2. Reliability and Environmental Specifications

Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N・m
Rotational durability			1 million strokes (No load)
Screw Torque			Not more than 1N・m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			-0℃ 32F ～ +55℃ 131F
Storage temperature			− 40℃ − 40F ～ +85℃ 185F

Output Waveform

1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);

2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage(1);

3) Either signal A or B switches from 0→1 or 1→0 for every single click (Quad edge evaluation spec).
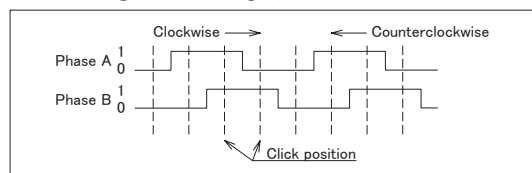
Part Number Designation
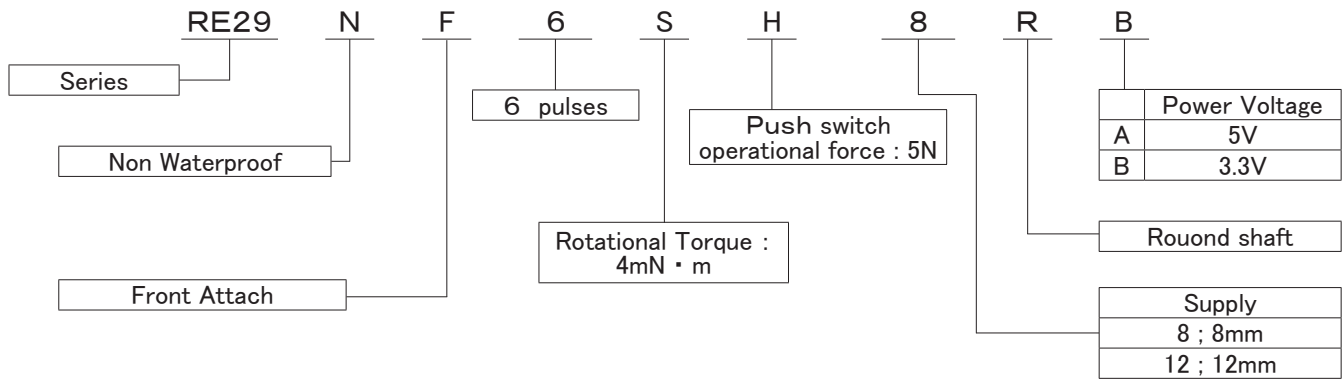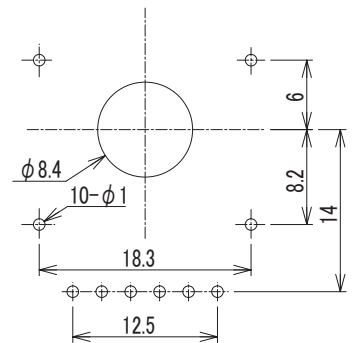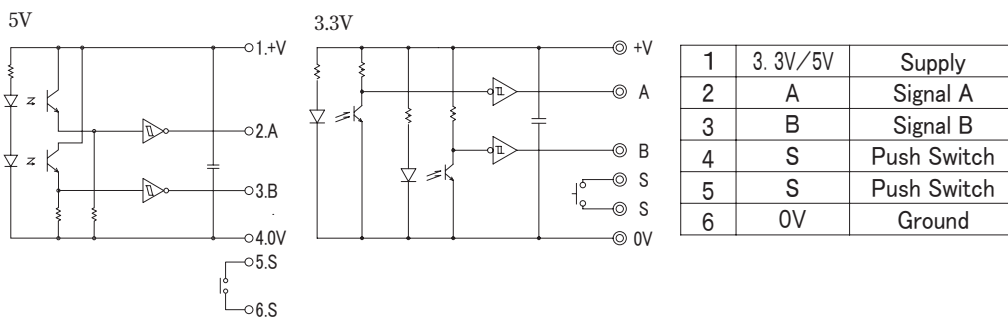
RE29　N　F　6　S　H　8　R　B

- **RE29** — Series
- **N** — Non Waterproof
- **F** — Front Attach
- **6** — 6 pulses
- **S** — Rotational Torque : 4mN・m
- **H** — Push switch operational force : 5N
- **8** — Supply
- **R** — Rouond shaft
- **B** — Power Voltage

	Power Voltage
A	5V
B	3.3V

	Supply
8 ;	8mm
12 ;	12mm

Dimensions (mm)

PWB (max 2mm)

Lot No.

9.5
25.5
11.7

6　5　4　3　2　1

15

18.6

□0.63

$\phi 6 {}^{0}_{-0.1}$

3.1
3.5
4.5　6.2
L±1　6.6

RE29 6P

6SH 123

Tosoku

Ⓤ Ⓜ1294V-0▲

5V　A　B　S　S　0V
1　2　3　4　5　6

PWB mounting hole dimensions (mm)

$\phi 8.4$
10-$\phi 1$
6
8.2
14
18.3
12.5

Circuitry

5V

1.+V
2.A
3.B
4.0V
5.S
6.S

3.3V

+V
A
B
S
S
0V

1	3.3V／5V	Supply
2	A	Signal A
3	B	Signal B
4	S	Push Switch
5	S	Push Switch
6	0V	Ground

Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.

Warranty

● 1 year from the date of shipment

Optical Rotary Encoder

RE25 Series

Tosoku
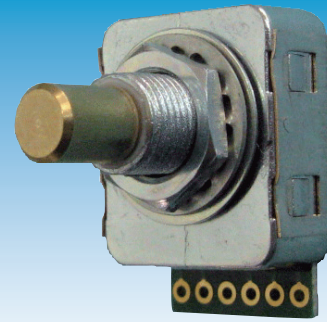
Outline

RE25 is a VA designed eco friendly – power-saving and low cost with lesser parts – rotary encoder. Its size, mounting procedures and inner-structures have been designed for a wide-array of uses; measurement devices, medical equipments, industrial machineries, telecommunication devices and machine tools.

Features

- Eco friendly:
  1) Power-saving
  2) Low cost and lesser parts by VA design
  3) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Various types of models with options: lead wire with or without connector, clamp for horizontal/vertical mounting
- Long-lasting without "contact chatter" due to its optical switching function
- Waterproofed model available

Specifications

1. Electrical and Mechanical specifications

Items		Rated Value	
Number of pulses		16PPR, 25PPR	
Supply voltage		3.3V±10%	5V±10%
		20mA	10mA
Output signals		Channel A/B: Square Wave CMOS chip	
Output voltage	High	Supply Voltage (3.3V): − 0.3V ≦ , (5V): − 0.5V ≦	
	Low	≦ 0.4V	
Response frequency		200Hz	
Rotational Torque	Light: S	4±1mN・m	
	Standard: C	6±2mN・m	
	Medium: M	10.5±3.5mN・m	
	High: H	16±5mN・m	
Weight		18g	

2. Reliability and Environmental specifications

Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N・m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		
	High: H		100 thousand strokes (No load)
Screw Torque			Not more than 1N・m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ～ +55℃ / 32F ～ 131F
Storage temperature			− 40℃ ～ +85℃ / − 40F ～ 185F

Output Waveform

1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage (1);
3) Detent positions are where both signal A and B are low (0).

Part Number Designation

RE25   N   S   25   C   20   R   A

Series

	Waterproof
N	No
P	Yes

	Wiring
S	Standard
C	With wire
F	Front Mount
V	Vortical Mount

	Pulse
16	16PPR
25	25PPR

	Ckick	Rotation Torque
S		4mN m
C	With	6mN・m
M		10.5mN・m
H		16mN・m
Non	W/O	≦ 4mN・m

	Power Voltage
A	5V
B	3.3V

	Shaft Shape
R	Round

	Shaft length
16	16mm
20	20mm

Dimensions (mm)

RE25NS／RE25PS

RE25NF (front mount)

RE25NC／RE25PC(with wire)

RE25NV／RE25PV (vertical mount)

Circuitry

RE25 5V

RE25 3.3V

Terminal number

1	3. 3V／5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground

Mounting hole dimensions (mm)

φ9.2

8.2

PWB mounting hole dimensions (mm)

RE25NF   RE25_V

Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N・m.

Warranty

● 1 year from the date of shipment.

Rotary Encoder with Dual Functional Shaft

TOSOKU

RE24 Series
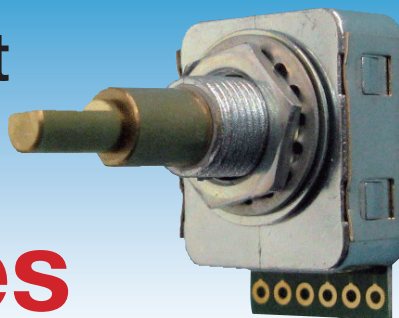
Outline

RE24 rotary encoder series contain unique mechanism for its shaft; its rotational outer axis for rotary encoder and the inner axis for push switch. RE24 is designed for use in various industrial areas: measurement component, medical equipment, industrial machinery, telecommunication device and machine tool.

Features

- Dual inner/outer axes mechanism to help prevent misoperation
- Eco friendly:
  1) Low cost and lesser parts by VA design
  2) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Long-lasting without "contact chatter" due to its optical switching function
- Specially designed knob (GG60) available

Specifications

1. Electrical and Mechanical specifications

Items		Rated Value	
Number of pulses		16PPR, 25PPR	
Supply voltage		3.3V±10%	5V±10%
		20mA	10mA
Output signals		two square wave output (A/B), CMOS chip	
Output voltage	High	(Supply Voltage − 0.5V) ≦	
	Low	≦ 0.5V	
Response frequency		200Hz	
Rotational torque	Light: S	4±1mN・m	
	Standard: C	6±2mN・m	
	Medium: M	10.5±3.5mN・m	
	High: H	16±5mN・m	
Push switch	Rating of contact	≦ DC12V 0.1 ～ 10mA	
	Travel of switch	0.2±0.1mm	
	Operational Force	S	3.2±1N
		M	4.0±1N
		H	5.0±1N
Weight		18g	

Note : In case Rotational Torque M or H, Operational Torque should be either M or H.

2. Reliability and Environmental specifications

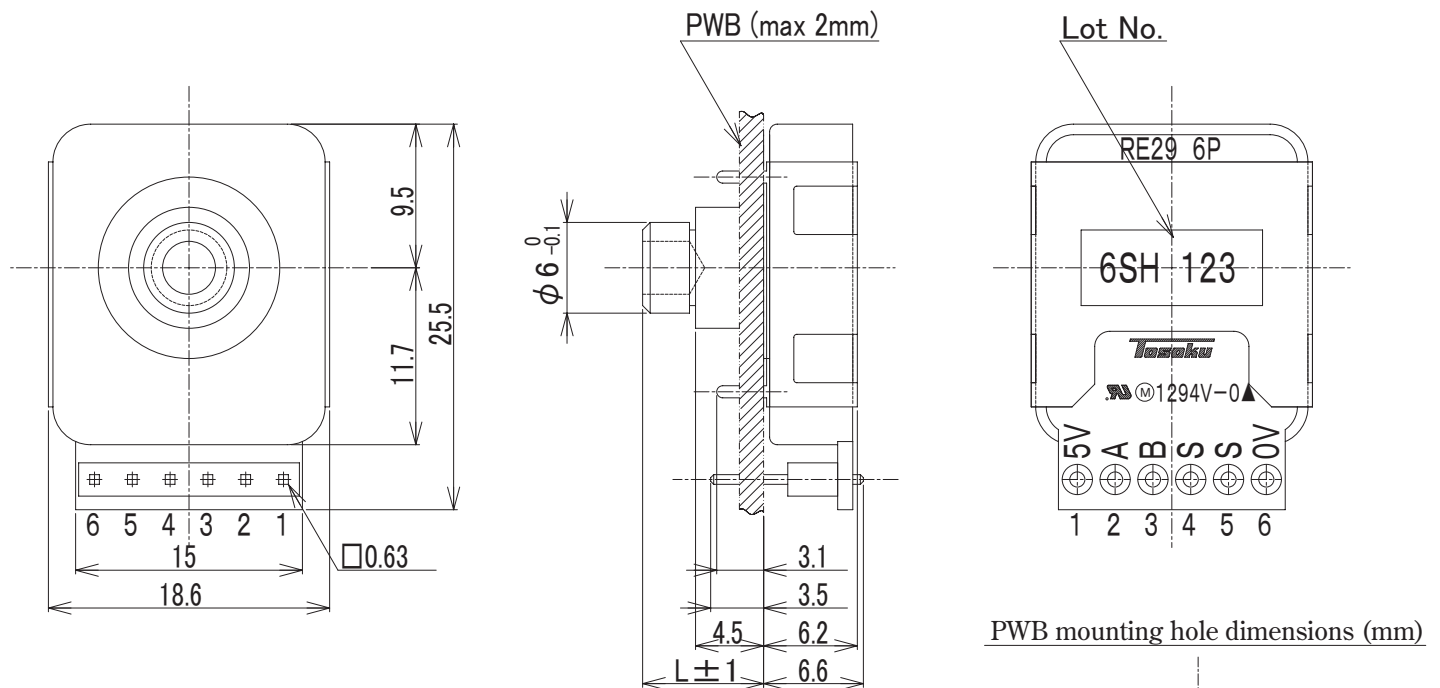| Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N・m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		
	High: H		100 thousand strokes (No load)
Screw Torque			Not more than 1N・m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ～ +55℃ / 32F ～ 131F
Storage temperature			− 40℃ ～ +85℃ / − 40F ～ 185F

Output Waveform

1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage(1);
3) Detent positions are where both signal A and B are low (0).

Part Number Designation

RE24   N   S   25   C   S   16/24   R   A

Series
RE24

	Waterproof
N	No

	Wiring
S	Standard
C	With Code
F	Front Mount
V	Vortical Mount

	Pulse
16	16PPR
25	25PPR

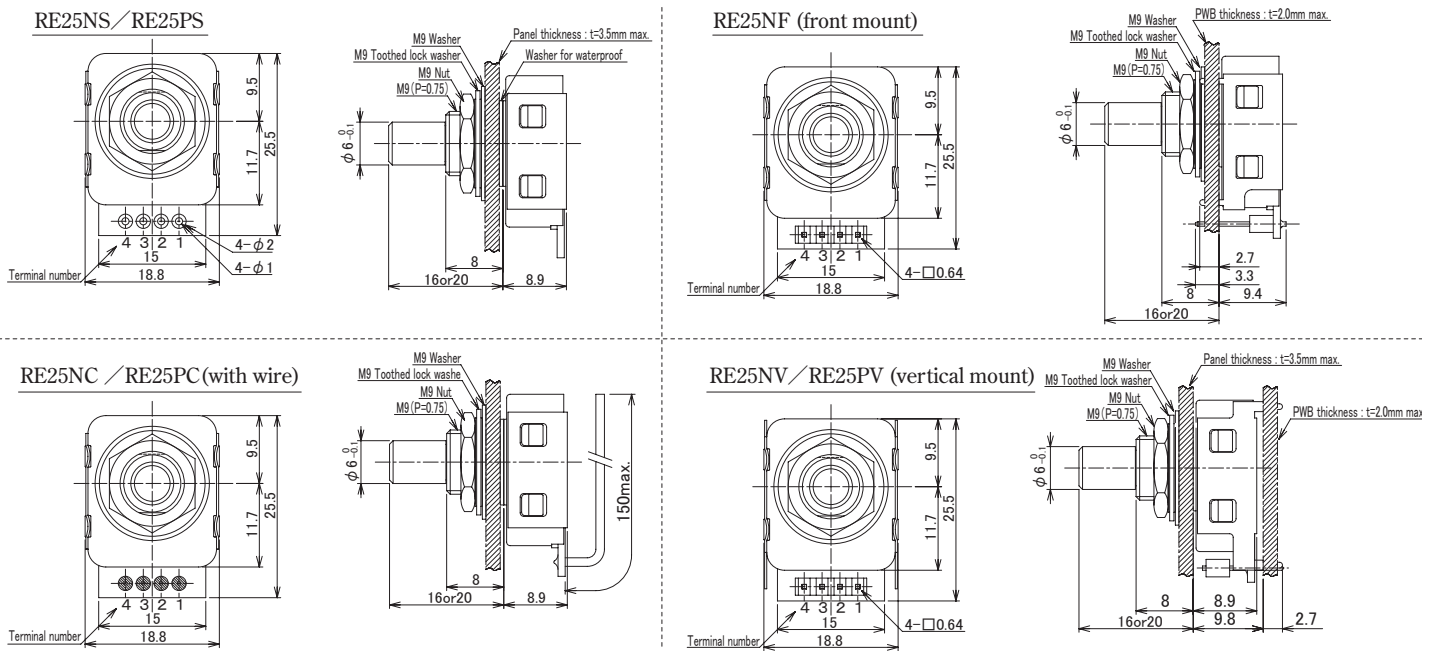|	Ckick	Rotation Torque
S		4mN・m
C	With	6mN・m
M		10.5mN・m
H		16mN・m
Non	W/O	≦ 4mN・m

	Push Switch Force
S	3.2N
H	5N

	Power Voltage
A	5V
B	3.3V

	Shaft Shape
F	Flat

	Shaft length
16	16mm (inner)
20	24mm (outer)

Dimensions (mm)

RE24NS

RE24NF (front mount)

RE24NF (front mount)

RE24NV (vertical mount)

Circuitry

RE24 5V

RE24 3.3V

Terminal number

1	3. 3V/5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground
5	S	Push Switch
6	S	Push Switch

Mounting hole dimensions (mm)

PWB mounting hole dimensions (mm)

RE24NF   RE24NV

Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N・m.

Warranty
● 1 year from the date of shipment.

09.12

Optical Rotary Encoder with Push Switch

TOSOKU

RE23 Series

Outline

RE23 series are optical rotary encoders with dual functions of pushing and rotating on its shaft. Its size, mounting procedures and inner-structures have been designed for a wide-array of uses; measurement devices, medical equipments, industrial machineries, telecommunication devices and machine tools.

Features

- Multi-functional with 2 way acting – pushing and rotating – shaft
- Eco friendly:
  1) Low cost and lesser parts by VA design
  2) RoHS compliant
- Thin-line (18.8x25.5x8.9mm) and lightweight (18g)
- Various types of models with options: lead wire with or without connector, clamp for horizontal/vertical mounting
- Long-lasting without "contact chatter" due to its optical switching function

Specifications

1. Electrical and Mechanical specifications

Items		Rated Value	
Number of pulses		16PPR, 25PPR	
Supply voltage		3.3V±10%	5V±10%
		20mA	10mA
Output signals		Channel A/B: Square Wave CMOS chip	
Output voltage	High	(Supply Voltage − 0.5V) ≦	
	Low	≦ 0.5V	
Response frequency		200Hz	
Rotational torque	Light: S	4±1mN・m	
	Standard: C	6±2mN・m	
	Medium: M	10.5±3.5mN・m	
	High: H	16±5mN・m	
Push switch	Rating of contact	≦ DC12V 0.1 ～ 10mA	
	Travel of switch	0.2±0.1mm	
	Operational Force	S	3.2±1N
		M	4.0±1N
		H	5.0±1N
Weight		18g	

Note : In case Rotational Torque M or H, Operational Torque should be either M or H.

2. Reliability and Environmental specifications

Items			Rated Value
Durability of operating area	Thrust direction	Push	100N
		Pull	50N
	Radial		1N・m
Rotational durability	Light: S		1 million strokes (No load)
	Standard: C		
	Medium: M		
	High: H		100 thousand strokes (No load)
Screw Torque			Not more than 1N・m
Heat resistance of solder	Solder bit temp.: MAX 350℃		Within 3 seconds for each terminal
Operating temperature			0℃ ～ +55℃ 32F ～ 131F
Storage temperature			− 40℃ ～ +85℃ − 40F ～ 185F

Output Waveform

1) Turning the shaft clockwise will generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise will generate the signal A when the signal B outputs a high voltage(1);
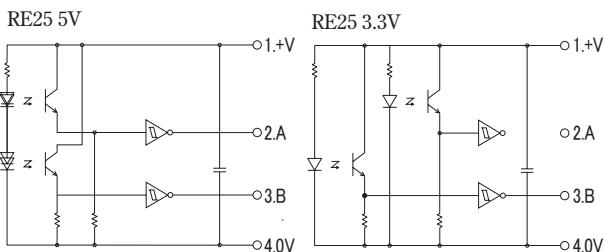3) Detent positions are where both signal A and B are low (0).

Part Number Designation

RE23   N   S   25   C   S   20   R   A

	Series
	RE23

	Waterproof
N	No

	Wiring
S	Standard
C	With wire
F	Front Mount
V	Vortical Mount

	Pulse
16	16PPR
25	25PPR

	Ckick	Rotation Torque
S	With	4mN・m
C	With	6mN・m
M	With	10.5mN・m
H	With	16mN・m
Non	W/O	≦ 4mN・m

	Push Switch Force
S	3.2N
H	5N

	Power Voltage
A	5V
B	3.3V

	Shaft Shape
R	Round

	Shaft length
16	16mm
20	20mm

Dimensions (mm)

RE23NS

RE23NF (front mount)

RE23NC (with wire)

RE23NV (vertical mount)

Circuitry

RE23 5V

RE23 3.3V

Terminal number

1	3. 3V/5V	Supply
2	A	Signal A
3	B	Signal B
4	0V	Ground
5	S	Push Switch
6	S	Push Switch

Mounting hole dimensions (mm)

φ9.2

8.2

PWB mounting hole dimensions (mm)

RE23NF   RE23NV

Precautions

Wiring	Use buffering amplifier when extending lead wire over 30cm.
Soldering	Do not put a load on the terminal area during and immediately after soldering.
Operation	Do not use flow/reflow soldering machines.
Power	Use under specified power voltage and connect properly.
Waterproofing	Do not fasten tighter with the torque of more than 1.5N・m.

Warranty

● 1 year from the date of shipment.

09.12

TOKYO SOKUTEIKIZAI CO., LTD.

Manual Pulse Generator
Catalogue

Manual Pulse Generator

RE45T series
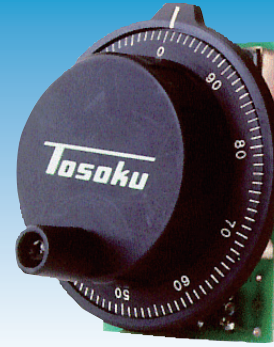
Outline

RE45T/V series are compact optical manual pulse generators that allow accurate and smooth manual motion for NC machine tools, industrial machines etc.

Features

- Eco friendly: RoHS compliant
- Various Options
  - terminal block mounted type/direct moulding type
  - output circuit: CMOS, open collector, line driver
- Enclosed structure design
- Protection from flux
- 100PPR, 25PPR available
- Long life use

Specifications

Model	RE645T***5 RE45V***5	RE45T***1	RE45T***D	RE45***T2
Application	5V input	12V input	Differential line	Photo coupler
Power Voltage	DC5V±10%	DC12V±10%	DC5V±10%	DC10.8Vto 26.4V
Current Power	≦ 80mA	≦ 60mA	≦ 150mA (90mAtyp)	≦ 60mA
Current Power (Open collector)	≦ 30mA	≦ 40mA		
Out put	CMOS (45T) 330Ωpull-up or open collector	2.2KΩpull-up or open collector	RS-422A (Line driver) Receiver's terminator : 100Ω for each signal	Open collector (Current out put type)
Out put voltage	level 1: (Power voltage –0.5V) ≦			level 1: TR is ON
Out put voltage (Pull up)	level 0: ≦ 0.4V (No-load)			level 0: TR is OFF
Collector voltage (Open collector)	not more than DC30V or 50mA			not more than DC30V or 50mA
Pulse per revolution	100pulse/100Click or 25Pulse/100Click			
Click torque	S: (Soft torque) 8 ～ 16mN.m			
	C: (Standard) 32 ～ 64mN.m			
Rotational Durability	Over a million times			
Protection against water	2m water resistant (2h) (Do not push or rotate under the water)			
Operating Temperature	-10℃	～		60℃
	14F			140F

Part number designation

RE45T   1   C   M   1   B   1
         ①   ②   ③   ④   ⑤   ⑥

①   Number of pulses
1: 100PPR
2: 25PPR

②   Click
C: Standard
S: Soft
Blank: without click

③   Output
M: CMOS
O: Open Collector
D: Line Driver
R: Pull up

④   Supply Voltage
1: 12V
2: 24V
5: 5V

⑤   Dial Knob
B: 15mm, with Tosoku logo
C: 15mm, without logo
D: 15mm, with customer logo
H: 25mm with Tosoku logo
J: 25mm without logo
K: 25mm, with customer logo

⑥   Dial base / Shaft length
Blank: W/O dial base,16mm
0: W/O dial base, 18mm
1: With dial base, 18mm

Models	Supply	Out-put	Pulse Per Revolution	
RE45T1_M5	5V	5V	100PPR	Standard Model for 5V
RE45T1_R1	12V	12V	100PPR	Standard Model for 12V
RE45T1_O5	5V	OC	100PPR	
RE45T1_O1	12V	OC	100PPR	
RE45T1_O2	24V	OC*	100PPR	12V ～ 24V input, photo coupler only
RE45T1_D5	5V	Differential Line*	100PPR	Special model for noise resistance
RE45T2_M5	5V	5V	25PPR	
RE45T2_M1	12V	5V*	25PPR	12V input, 5Voutput
RE45T2_O1	12V	OC	25PPR	
RE45T2_O2	24V	OC*	25PPR	12V ～ 24V input, photo coupler only
RE45T2_D5	5V	Differential Line*	25PPR	Special model for noise resistance

*Differential Line: Connect with terminating resistance 100Ω(Based on RS-422 line receiver).
*5V: power voltage = 12V. Output voltage = 5V
*OC(For photo coupler): Out put voltage/0level=transistor /OFF=Current/0

Dimensions (mm)

M9(P=0.75)
φ5.9
φ6
29
(63)
19
34
2
3
38.8
46
1.6
L
10.1
6
L=16 or 18

On terminal block　（Line driver）

RE45T
+V B A 0V
4-M3 screw

RE45T
+5V B̄ B Ā A 0V
6-M3 screw

■Dial

5.5
M4 Screw
φ48
φ60
24 or 15
16.7
9.5

■Dial base

R36.5
8
φ9
3.5
1.5
φ60.8
φ66
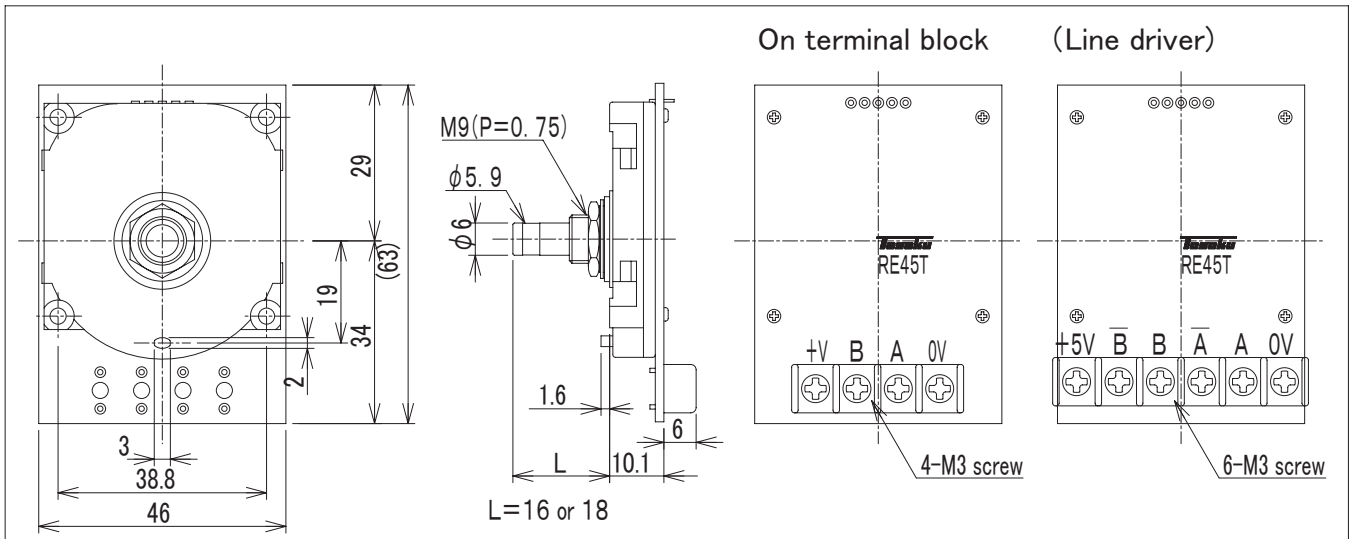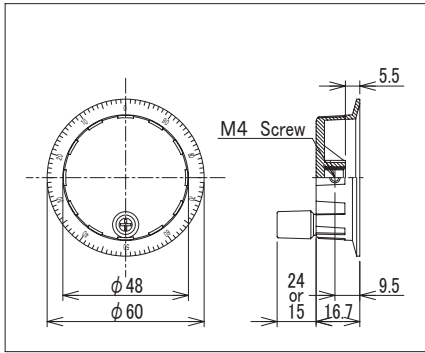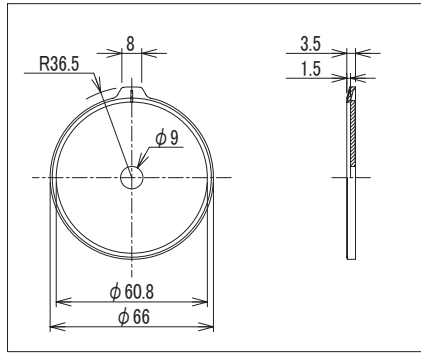
■Dial attached on the dial base

Panel <2
Dial base
Dial
M4 Screw
φ48
φ66
24 or 15
21.8
14.6

■Mounting hole dimensions (mm)

φ9.2
19
φ3.3 Depth1.8
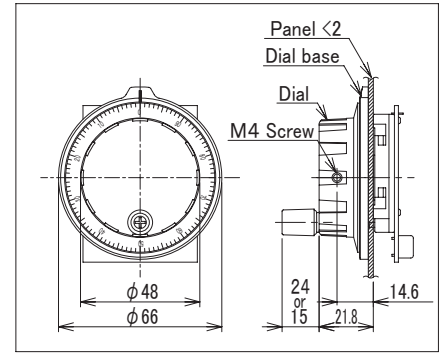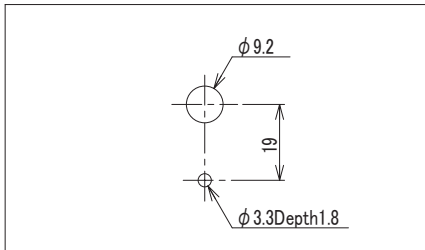
Precautions

Soldering	Temperature	Time
Manual Soldering	Up to 350°	Within 3 seconds for each terminal
Flow soldering	Up to 260°	Within 5 seconds for each terminal

NOTE: Do not put pressure on terminal during heating or soon after.

■Circuitry

●CMOS (M)
+V
A／B
TC4050
0V
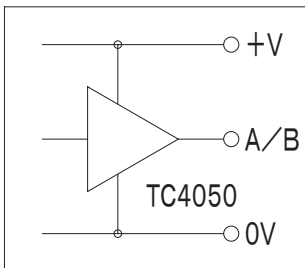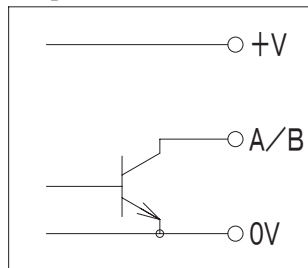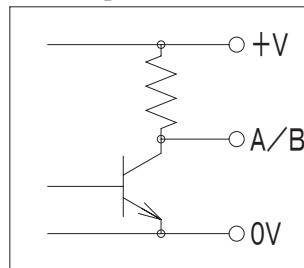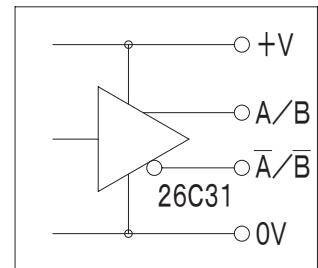
●Open Collector (O)
+V
A／B
0V

●Pull up (R)
+V
A／B
0V

●Line driver (D)
+V
A／B
Ā／B̄
26C31
0V

■Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

Clockwise　→　　←　Counterclockwise
Signal A 1/0
Signal B 1/0
25PPR Detent Positions
100PPR Detent Positions
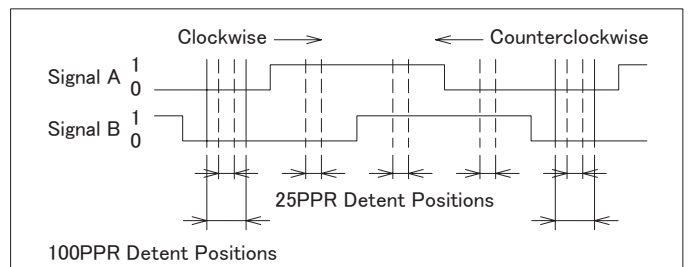
Manual Pulse Generator

RE45B series

Tosoku

Outline

RE45B series are optical manual pulse generator developed for NC machine tools

Features

- ● Eco friendly: RoHS compliant
- ● Comfortable wide knob
- ● Various Options
- ● Printing Logo type on the wheel cover upon request
- ● Long life use

Specifications

Application	5V input	2V input	Differential line	Photo coupler
Power Voltage	DC5V±10%	DC12V±10%	DC5V±10%	DC10.8V to 26.4V
Current power (pull up)	≦ 80mA	≦ 60mA	≦ 150mA (90mAtyp)	≦ 60mA
Current power (Open collector)	≦ 30mA	≦ 40mA		
Output	330ΩPull-up or Open collector	2.2KΩPull-up or Open collector	RS-422A (Line driver) Terminating register at receiver :100Ω/phrase	Open collector (Current output type)
Output voltage	1 level:(Power voltage –0.5V) ≦			1level:Transistor/ON
Output voltage (pull up)	0 level: ≦ 0.4V (No-load)			0level:Transistor/OFF
Collector voltage	≦ DC30V			≦ 30V
Collector voltage (Open corrector)	≦ 40mA			≦ 50mA
Pulse per revolution	100pulse/100Click or 25pulse/100Click			
Click torque	A,B,C : 8 ～ 16mN.m			
	D: 32 ～ 64mN.m			
Rotational Durability	Over a million rotations			
Water resistance	D type only: 2m water resistant (2h) **(Do not push or rotate under the water)**			
Operating Temperature	-10℃	～		60℃
	14F			140F

Part number designation

RE45B   A   1   R   5   B
           ①   ②   ③   ④   ⑤

①   Type
A: With φ 80 dial / mounted by 3 nuts
C: With φ 66 dial / mounted by 1 nut
D: Without Dial

②   Number of pulses
1: 100PPR
2: 25PPR

③   Output
R: Voltage Output
O: Open Collector
D: Line Driver

④   Supply Voltage
5: 5V
1: 12V
2: 24V

⑤   Dial Knob (color:black)
B: 15mm, with Tosoku logo
C: 15mm, without logo
D: 15mm, with customer logo
H: 24mm with Tosoku logo
J: 24mm without logo
K: 24mm, with customer logo

Models	Supply		Pulse Per Revolution
RE45B_1R5	5V	5V	100PPR
RE45B_1R1	12V	12V	100PPR
RE45B_1O5	5V	OC	100PPR
RE45B_1O1	12V	OC	100PPR
RE45B_1O2	24V	OC*	100PPR
RE45B_1D5	5V	Differential Line*	100PPR
RE45B_2R5	5V	5V	25PPR
RE45B_2R1	12V	5V*	25PPR
RE45B_2O5	12V	OC	25PPR
RE45B_2O1	12V	OC	25PPR
RE45B_2O2	24V	OC*	25PPR
RE45B_2D5	5V	Differential Line*	100PPR

*Differential Line: Connect with terminating resistance 100Ω(Based on RS-422 line receiver).
*5V:Supple voltage=12V, Output voltage=5V
*OC:For photo coupler only, Supply voltage 12 ～ 24V

Dimensions (mm)

●Type A (with 80φ dial / mounted by 3 nuts)

■Type A, Mounting hole dimensions (mm)

Panel thickness : t=3 max.   Terminal Block with Cover   3－M4 Studs L=8 P. C. D 72

41.5

φ53
φ72
φ80±1

24 or 15   25.4   28.5   38

Packing

+5V 0V A B
RE45B

φ60±0.5

3－φ4. 5holes   φ72   φ62±0.5

120°   120°

●Type C (with 66φ dial / mounted by 1 nut)

■Type C,D, Mounting Hole Dimension (mm)
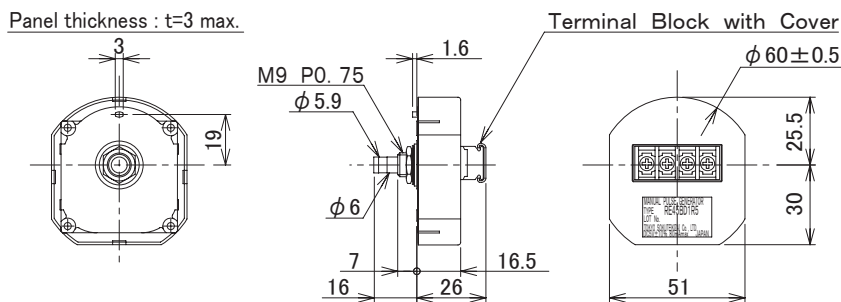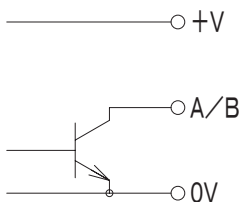
Panel thickness : t=1.5～2.0   Terminal Block with Cover

φ60±0.5

36.5

φ48
φ60
φ66±1

24 or 15   21.8   26   16.5

+5V 0V A B
RE45B

25.5   30

51

φ3.3 Depth 1.8   9.2

19±0.1

●Type D (without dial)

Panel thickness : t=3 max.   Terminal Block with Cover

3

19

M9 P0. 75
φ5.9

1.6

φ6

7   16   26   16.5

φ60±0.5

MANUAL PULSE GENERATOR
TYPE RE45D1RG
LOT No.

25.5   30

51

■Circuitry

●Open collector (code:O)

○＋V

○A／B

○0V

●Votage Output (code:R)

○＋V

○A／B

○0V

●Line Driver (code:D)

○＋V

○A／B

○Ā／B̄

26C31

○0V


■Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);

2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

Clockwise ⟶   ⟵ Counterclockwise

Signal A 1 0

Signal B 1 0

25PPR Detent Positions

100PPR Detent Positions
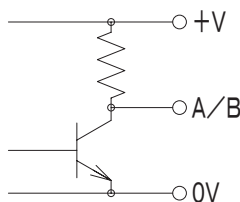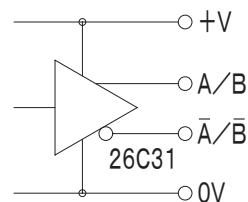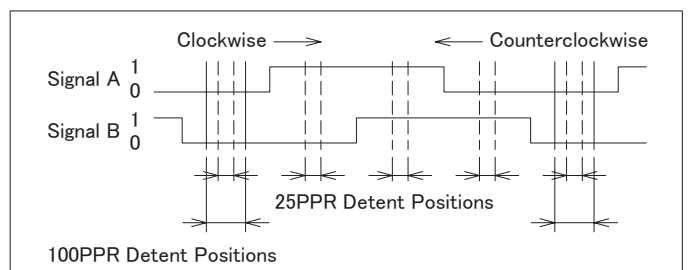
Manual Pulse Generator

RE46 series

Tosoku

Outline

RE46 series are incremental optical manual pulse generators developed for NC machine tools. The depth of the surface-bottom is mere 8mm which allows you to save space behind the panel.

Features

- Eco friendly: RoHS compliant
- Fine operability with a large wheel and a weight inside
- Various Options of the input/output circuit: CMOS, open collector, line driver
- Chattering-free and long-life use with optical unit
- Original logos available on the wheel cover

Specifications

Application	5V input	12V input	Differential line	Photo coupler(12 ～ 24V)
Power Voltage	DC5V±10%	DC12V±10%	DC5V±10%	DC10.8V to 26.4V
Current power (pull up)	≦ 80mA	≦ 60mA	≦ 150mA (90mAtyp)	≦ 60mA
Current power(Open collector)	≦ 30mA	≦ 40mA		
Output	330ΩPull-up or Open collector	2.2KΩPull-up or Open collector	RS-422A (Line driver) Terminating register at receiver :100Ω/phrase	Open collector (Current output type)
Output voltage (pull up)	1 level:(Power voltage –0.5V) ≦ 0 level: ≦ 0.4V (No-load)			1level:Transistor/ON 0level:Transistor/OFF
Collector voltage (Open corrector)	≦ DC30V ≦ 50mA			≦ 30V ≦ 50mA
Pulse per revolution	100pulse/100Click or 25pulse/100Click			
Click torque	32 ～ 64mN.m (320 ～ 640gf.cm)			
Rotational Durability	Over a million rotations			
Operating Temperature	-10℃ ～ 60℃ (14F ～ 140F)			
Weight	220g			

Part number designation

RE46	A	1	C	R	5	B
	①	②	③	④	⑤	⑥

① Type

② Number of Pulses
1: 100PPR
2: 25PPR

③ Click
C: Standard

④ Output
R: Voltage Output
O: Open Collector
D: Line Driver

⑤ Supply Voltage
5: 5V
1: 12V
2: 12 ～ 24V

⑥ Dial Knob (color black)
B: 15mm with Tosoku logo
C: 15mm without logo
D: 15mm customer logo
H: 24mm with Tosoku logo
J: 24mm without logo
K: with customer logo

Models	Supply		Pulse Per Revolution
RE46A1CR5_	5V	5V	100PPR
RE46A1CR1_	12V	12V	100PPR
RE46A1CO5_	5V	OC	100PPR
RE46A1CO1_	12V	OC	100PPR
RE46A1CO2_	24V	OC*	100PPR
RE46A1CD5_	5V	Differential Line*	100PPR
RE46A2CR5_	5V	5V	25PPR
RE46A2CR1_	12V	5V*	25PPR
RE46A2CO5_	5V	OC	25PPR
RE46A2CO1_	12V	OC	25PPR
RE46A2CO2_	24V	OC*	25PPR
RE46A2CD5_	5V	Differential Line*	25PPR

*Differential Line: Connect with terminating resistance 100Ω(Based on RS-422 line receiver).
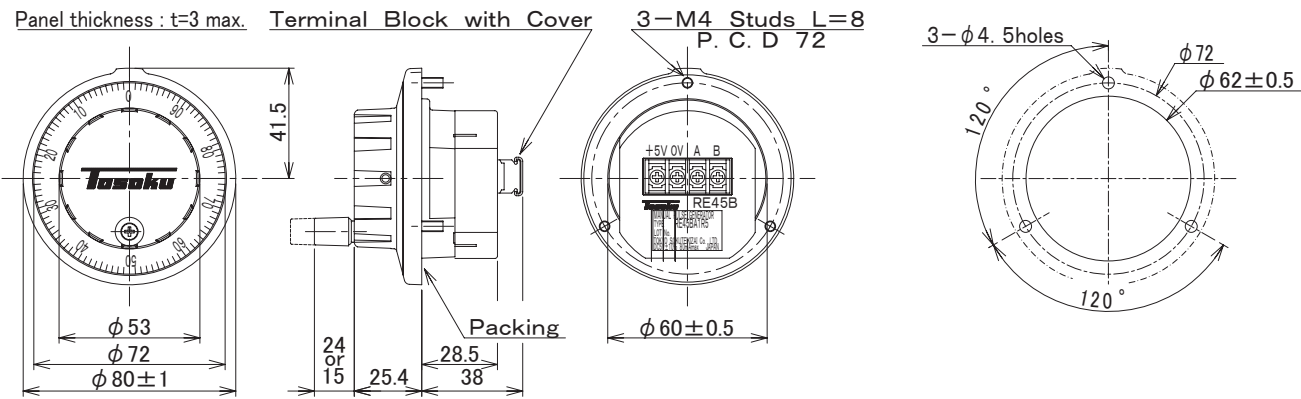*5V:Supply voltage=12V, Output voltage=5V
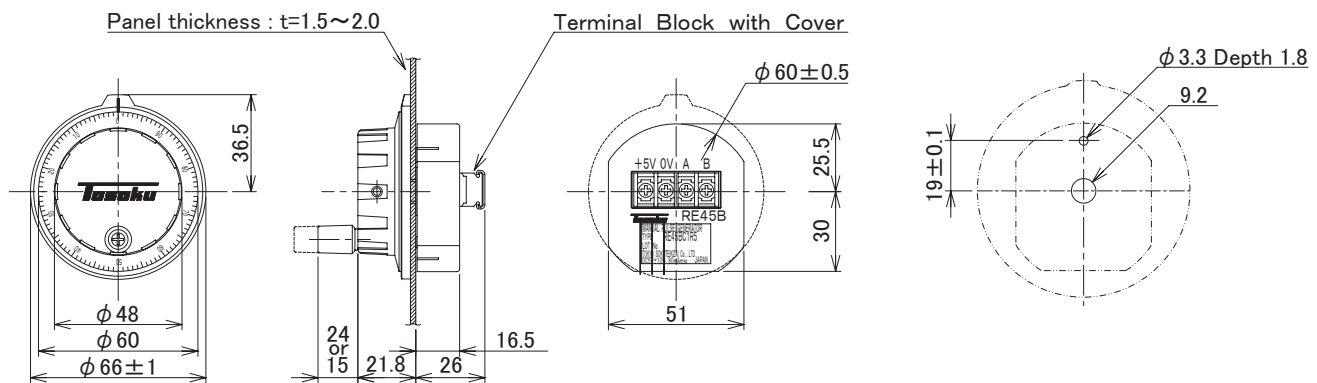*OC:For photo coupler only, Supply voltage 12 ～ 24V

Dimensions (mm)

* Line Driver is in the drawing below

3−M4

4−M3

MANUAL PULSE GENERATOR
TYPE RE46A1CR5
LOT No.
TOKYO SOKUTENZAI Co.,LTD.
DC5V±10%50mAmax JAPAN.

+V 0V A B

R41.5

φ60

φ61.2
φ80

24 or 15   (26)   Packing   8

Accessories
M4 Nut : t3.2mm
M4 Teeth Washer : t=0.9mm
M4 Washer : t=0.8mm

Panel Mounting Hole

3−φ4.5
φ72±0.1
φ62±0.5

120°

120°

Thickness of the Panel : ≦ 3 mm
Recommended Torque for fastening the nut
: 0.4 ～ 0.5 N・m (4～5 Kgf・cm)

Line Driver (6 terminals)

MANUAL PULSE GENERATOR
TYPE RE46A1CD5
LOT No.
TOKYO SOKUTENZAI Co.,LTD.
DC5V±10%150mAmax JAPAN.

+V 0V A A B B

6−M3

■Circuitry

●Open collector (code:O)

○ +V

○ A／B

○ 0V

●Votage Output (code:R)

○ +V

○ A／B

○ 0V

●Line Driver (code:D)

○ +V

○ A／B

○ Ā／B̄

26C31

○ 0V

■Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);

2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

Clockwise ⟶   ⟵ Counterclockwise

Signal A 1 0

Signal B 1 0

25PPR Detent Positions

100PPR Detent Positions
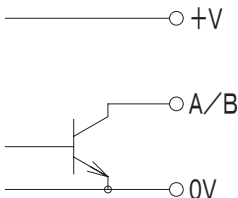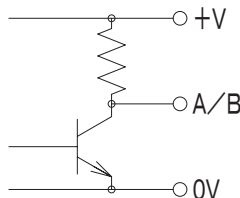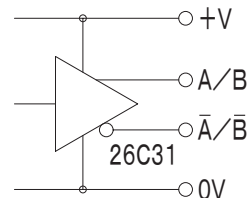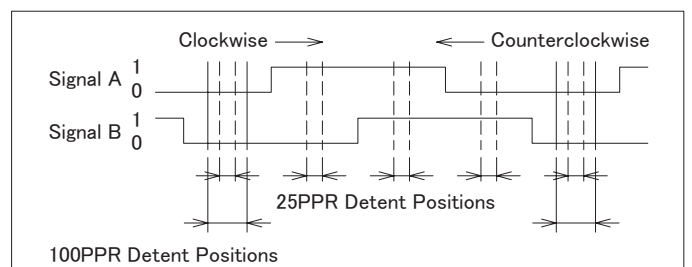
Manual Pulse Generator

RE47 series

Outline

RE47 is an incremental optical manual pulse generator developed mainly for NC machine tools. The series are most compact of all MPGs on our line-up and universally compatible with various sorts of compact MPGs.

Features

- Eco friendly: RoHS compliant
- ϕ 60mm diameter
- Less than 10mm in depth (from surface-to-bottom) allows you to save space behind the panel
- Fine operability with a weight inside of the dial.
- Various Options of the input/output circuit: CMOS, open collector, line driver
- Chattering-free and long-life use with optical unit
- Original logos available on the dial

Specifications

Application	5V input	12V input	Differential line	Photo coupler(12 ～ 24V)
Power Voltage	DC5V±10%	DC12V±10%	DC5V±10%	DC10.8V to 26.4V
Current power (pull up)	≦ 80mA	≦ 60mA	≦ 150mA (90mAtyp)	≦ 60mA
Current power(Open collector)	≦ 30mA	≦ 40mA		
Output	330ΩPull-up or Open collector	2.2KΩPull-up or Open collector	RS-422A (Line driver) Terminating register at receiver :100Ω/phrase	Open collector (Current output type)
Output voltage (pull up)	1 level:(Power voltage –0.5V) ≦ 0 level: ≦ 0.4V (No-load)			1level:Transistor/ON 0level:Transistor/OFF
Collector voltage (Open corrector)	≦ DC30V ≦ 50mA			≦ 30V ≦ 50mA
Pulse per revolution	100pulse/100Click or 25pulse/100Click			
Panel water resistance	IP54			
Click torque	8 ～ 16mN.m (80 ～ 160gf.cm)			
Rotational Durability	Over a million rotations			
Operating Temperature	-10℃ ～ 60℃ (14F ～ 140F)			
Weight	85g			

Part number designation

RE47　　　A　　1　　S　　R　　5　　B
　　　　　　①　　②　　③　　④　　⑤　　⑥

① Type

② Number of Pulses
1: 100PPR
2: 25PPR

③ Click
S: Soft

④ Output
R: Voltage Output
O: Open Collector
D: Line Driver

⑤ Supply Voltage
5: 5V
1: 12V
2: 12 ～ 24V

⑥ Dial Knob (color black)
B: 15mm with Tosoku logo
C: 15mm without logo
D: 15mm customer logo

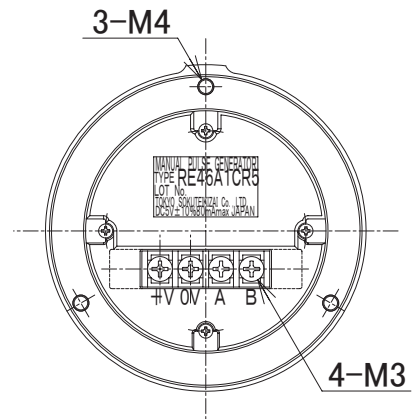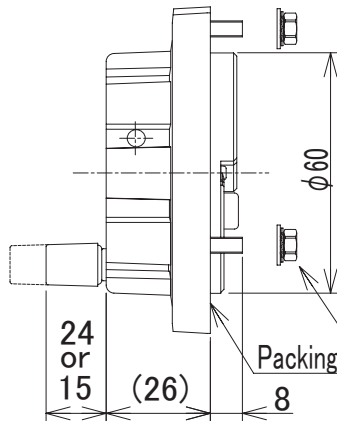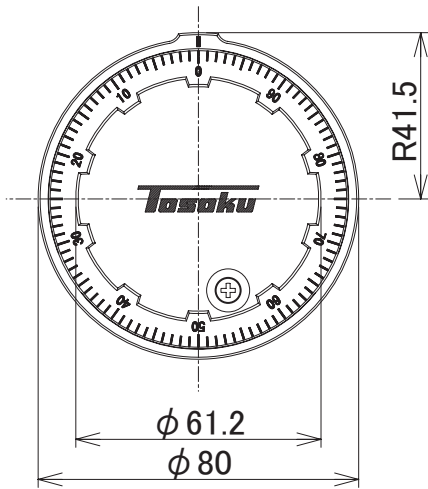| Models	Supply		Pulse Per Revolution
RE47A1SR5_	5V	5V	100PPR
RE47A1SR1_	12V	12V	100PPR
RE47A1SO5_	5V	OC	100PPR
RE47A1SO1_	12V	OC	100PPR
RE47A1SO2_	24V	OC*	100PPR
RE47A1SD5_	5V	Differential Line*	100PPR
RE47A1SR5_	5V	5V	25PPR
RE47A1SR1_	12V	5V*	25PPR
RE47A1SO5_	5V	OC	25PPR
RE47A1SO1_	12V	OC	25PPR
RE47A1SO2_	24V	OC*	25PPR
RE47A1SD5_	5V	Differential Line*	25PPR

*Differential Line: Connect with terminating resistance 100Ω(Based on RS-422 line receiver).
*5V:Supply voltage=12V, Output voltage=5V
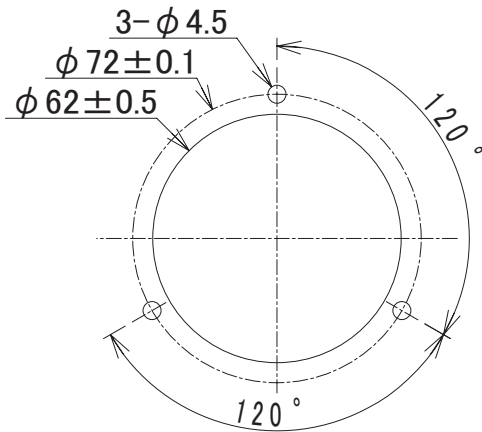*OC:For photo coupler only, Supply voltage 12 ～ 24V

Dimensions (mm)

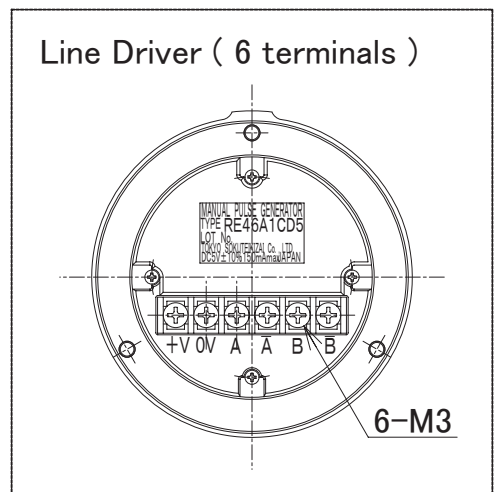＊Line Driver is in the drawing below

Accessories

3−M3

φ45

MANUAL PULSE GENERATOR
TYPE RE47A1SR5
LOT No. 235
TOKYO SOKUTEIKIZAI Co.,LTD.
±V5mAmax80%10DC JAPAN
+5V 0V A B

4−M3

Packing

(15) (25) (10)

(37)
φ45
φ60.6

6.2
7.62

Accessories
M3 Nut : t2.4mm
M3 Teeth Washer : t=0.7mm
M3 Washer : t=0.5mm

Panel Mounting Hole

3−φ3.6
φ53±0.2
φ46±0.5

120°
120°

Thickness of the Panel : ≦ 3 mm
Recommended Torque for fastening the nut
: 0.4 ～ 0.5 N・m (4～5 Kgf・cm)

Line Driver (6 terminals)

LOT No. 275
¥M+1F04A¥M+1F04B¥M+1F04C¥M+1F04D¥M+1F04E
JAPAN
¥M+1F050¥M+1F051RE47A1SD5
+5V 0V A B

6−M3

■Circuitry

●Open collector (code:O)

+V

A／B

0V

●Votage Output (code:R)

+V

A／B

0V

●Line Driver (code:D)

+V

A／B

Ā／B̄

0V

26C31

■Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage (1);

Clockwise ⟶ ⟵ Counterclockwise

Signal A 1
          0
Signal B 1
          0

25PPR Detent Positions

100PPR Detent Positions
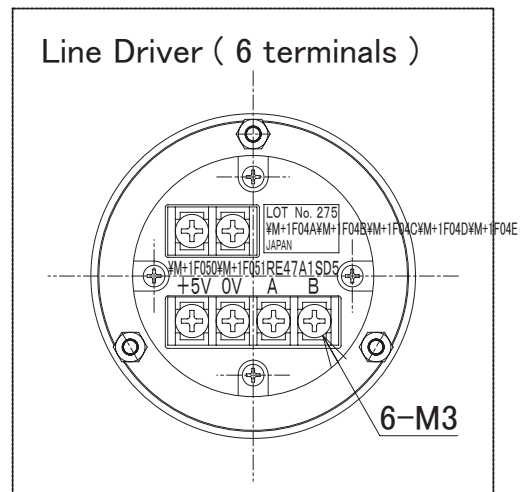
TOKYO SOKUTEIKIZAI CO., LTD.

Handy Manual Pulse Generator Catalogue

Metal holders are provided for all Handy MPGs. Magnets are optionally provided.
Original company logos can be printed on the dials.

Handy Manual Pulse Generator

HT Series

Outline

HT series are easy-to-handle and compact Handy MPGs which put a premium on safety with 3-position enabling switches and emergency stop buttons.

Features

● Ergonomically designed and compact to be held with one hand
● 3-position (off-on-off) enabling switch available on either side
● Upper part is free to design and allows various kinds of switches (including emergency stop button) to be set
● RoHS compliant
● On the middle part: either MR8A - the rotary switch series or MR8C - the digital code switch series selectable
● Strong plate magnets available on back side (as option)
● Various types of curl cords provided along with connectors of all sorts at your request

Specifications

1. Body	
Dimension	170×80×39(mm)
LED light	DC24V Green
Enabling switches	Available on both sides
Logo	Logo available on the wheel cover

| 2. Mechanical specifications	
2.1 Rotary Encoder Unit	
Output Voltage	DC5V±10%, DC12V±10% or 12~24V
Wheel	100 clicks / rotation 100 pulses or 25 pulses per rotation
Rotational Durability	Over 1,000,000 times

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);
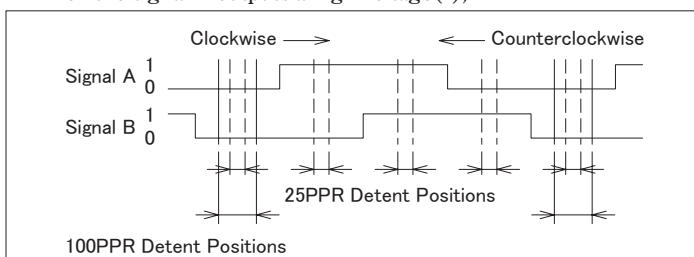
* See RE45B catalog for more details

2.2 Selector Switches

MR8A (rotary switch) 25V15mA (AC/DC)
MR8C (code switch) 15V10mA (AC/DC)
* See MR8A/MR8C catalog for more details

3. Curl/Straight Cords	
Curl Cord	19/25-conductor shielded cable 19-conductor: select from 2m, 3m, 4m, 5m 25-conductor: select from 3m, 5m (We will select either 19 or 25-conductor in accordance with required functions) For further details, please see the catalogues for curl cords
Straight Cord	Also available

5. Connector Unit	
Connector	Dripproofed connector to be attached on the end of the cord optionally provided (EBSP2119-D/EBSP2119FGS-D by DDK)

Warranty

● 1 year from the date of shipment.

Dimensions (mm)

HT Unit with curl cord   ※ This drawing is an example, it may differ according to number of swithes etc.

Emergency Stop Switch

With water−proof connector

EBSP2119MG−D
DDK

Enable Switch

Label

X Y Z
OFF   4
Axial Selection

X10 X100
X1
Magnification
Selection

− +

LED

Scale Plate

Tosoku

Logo Mark

Dial

19/25
conductors

100

1000

(250)

(150)

170

24

39

(5)   80

(55)

26   31

4

Length (as reference)

for 2m	(460mm)	*
for 3m	(690mm)	
for 4m	(920mm)	*
for 5m	(1080mm)	

*19 conductors only

L

Original Holder

Material : SPCC

Cathodic Electrodeposition Coating

Hole for 3−M4

9.7   189.3
50   73.8
40

33   60   85.7

18.1   31.3

H T series Order Sheet   Print out this page for sending orders.

We'll hand in to you a drawing in accordance with your order. The drawing shall be approved before starting in on production.

1) Select one from each spec table and fill blank spaces with " ".

Pulses/Rev.	
	100PPR
	25PPR

*25PPR and yet 100 Clicks/Revolution

Power Supply		Output
	5V	5V 330Ω Pull Up
	5V	Open Collector
	5V	for Line Driver
	12V	5V 2.2kΩ Pull Up
	12V	12V 2.2kΩ Pull Up
	12V	Open Collector
	12V-24V	for Photocoupler Open Collector

* Transistor will be "OFF" at every clicked positions.

 For other open collector output models, transistors will be "ON" at every clicked positions.

Logo on the dial	
	None
	with "TOSOKU" logo
	with an original logo( )

3-Positions Enabling Switch (contacts)	
	None
	One on the left
	On both sides

* Assigned contacts should be 2 or less for normally open (NO) and 2 or less for normally closed (NC). (2A2B maximum.)

Emergency Switch contacts	
	None
	Mounted

* 1 for (NO), 4 for (NC) maximum (1A/4B). Maximum of 4 contacts in total (1A3B or 4B).

Magnet on the backside	
	None
	Mounted

Axis Selector/Multiplication Selector Switches	
	MR8C type Gray code switch
	MR8A type Selection switch

Indications for Axis Selector   left

e.g.	OFF, X, Y, Z, 4, 5

Indications for Multiplication Selector   right

e.g.	×1, ×10, ×100

Curl Cord Length	
	2m Curl Cord (for only 19-conductor cord)
	3m Curl Cord
	4m Curl Cord (for only 19-conductor cord)
	5m Curl Cord

* We will select either 19-conductor cord or 25-conductor cord to cover your requested specs

Waterproofed Connector for curl cord	
	None
	Male connector EBSP2119MG-D, DDK
	Female connector EBSP2119FGS-D, DDK

* Fill in both spaces to order both connectors.

2) Other options

Other options to request
e.g. Switches with LED illumination x 2 2 contact selector switch x
----

Tosoku

Rotary Encoders   Code Switches
Pulse Generators   Lever Switches
Rotary Switches   Trackballs

TOKYO SOKUTEIKIZAI Co., Ltd.

http://www.tosoku-inc.co.jp/

Handy Manual Pulse Generator

HC1 Series

Outline

HC1 is the most compact model of all our MPG series, developed for usage in numerous industrial areas.

Features

- Compact, thin-line and lightweight (26mm)
- Axis/Multiplication selection can be set according to customers' requirement
- Sealed structured box
- RoHS compliant (box/cord)
- Exclusive easy-to-attach holder as a standard accessory
- Rubber magnet for option
- Logo can be printed on the wheel cover

Specifications

1. Body	
Dimension	124×73×26(mm)＊
LED Visible Indicator	DC24V Green
Noise Immunity	EN50082-2 compliant
Other Features	Logo available on the wheel cover

＊ excluding hook, switch and knob

2. Mechanical specifications
2.1 Rotary Encoder Unit

＊ See RE45B page for details

2.2 Selector Switches

＊ See MR8A/MR8C page for details

3. Environmental specifications	
Operating temperature	-10℃ ～ +60℃ 14F ～ 140F
Storage temperature	-40℃ ～ +70℃ 40F ～ 158F

4. Curl/Straight Cords	
Curl Cord	19/25-conductor shielded cable 19-conductor: select from 2m, 3m, 4m, 5m 25-conductor: select from 3m, 5m (We will select either 19 or 25-conductor in accordance with required functions) For further details, please see the catalogues for curl cords
Straight Cord	Also available

5. Connector Unit	
Connector	Waterproofed connector to be attached on the end of the cord optionally provided

Warranty

- 1 year from the date of shipment.

Dimensions (mm)

HC1 main unit with curl cord

Scale Plate
LED
X Y Z
OFF   4
X1 X10 X100
Axis Selection
Multiplication Selection
Logo Mark
Tosoku
Dial

73
31
26
15
23
124
(55)

Label
4
100
1000
(250)
(150)

EBSP2119MG

Original Holder(THA)

73
23.6
8
12
142
50
32
6-M4hole
78
32

Material：SPCC(t2.3)
(Black chromate filming)
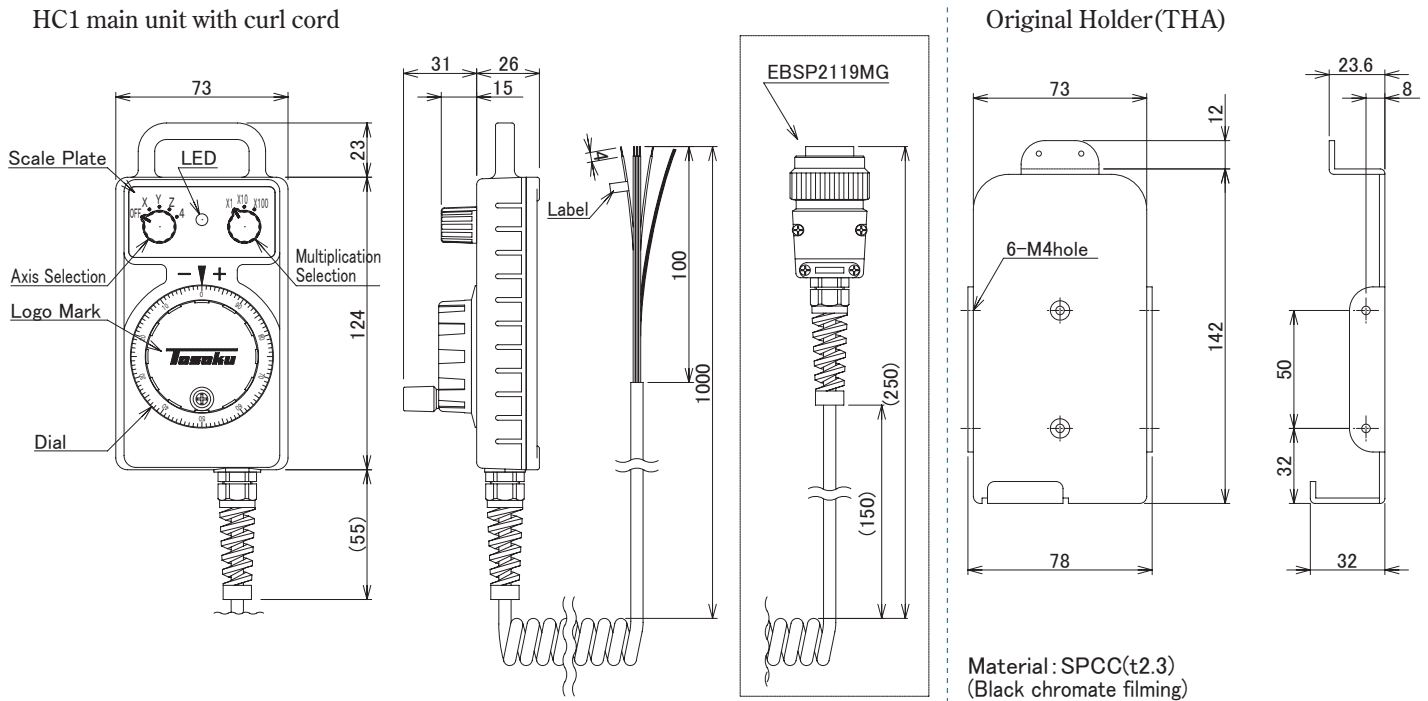
Part Number Designation

HC1   2   1   A   B   2   1   03

Name of series

※1		number of pulse
	1	100 PPR
	2	25 PPR

※1 100 clicks / 25 pulses per rotation.

※2		power supply voltage
	1	12V
	5	5V
	D	5V (a differential output)
	2	24V (for photocoupler only)

※2 Output circuit is open collector.

		Optional selector switch
※6	none	selection switch
	03	Digital code switch (Gray code 30° type)

※6 The starting position of a cordswithc is 0, and the step angle is 30°.

※5		Options of connectors
	0	without connector
	1	With a male side connector
	2	With a male & a female side conector
	9	With a specification connector

※5 In case nothing specified, there will be no connector attached.

※4		Curl Cord
	1	With 2m curl cord*
	2	With 3m curl cord
	3	With 5m curl cord
	4	With 4m curl cord*

※4 Tosoku choose the number of cables by the function.
*19 conductors only

	Logo Mark on Dial
B	With TOSOKU Logo Mark
C	With No Logo Mark
D	With a specified Logo Mark

※3	Axial Select Description	Magnification Select Description
A	OFF X Y Z 4	×1 ×10 ×100
B	OFF X Y Z 4 5	×1 ×10 ×100
C	OFF X Y Z 4 5 6	×1 ×10 ×100
D	OFF X Y Z 4 5 6 7	×1 ×10 ×100
E	OFF X Y Z 4 5 6 7 8	×1 ×10 ×100
F	OFF X Y	×1 ×10 ×100
G	OFF X Y Z	×1 ×10 ×100
H	X Y	×1 ×10 ×100
J	X Y Z	×1 ×10 ×100
K	X Y Z 4	×1 ×10 ×100
L	X Y Z 4 5	×1 ×10 ×100
M	X Y Z 4 5 6	×1 ×10 ×100
N	X Y Z 4 5 6 7	×1 ×10 ×100
P	X Y Z 4 5 6 7 8	×1 ×10 ×100

※3 Description other than above is available upon reqest.

★HC115 is for FANAC NC equipment.
★HC121 is for MITSUBISHI NC equipment. (MELDAS)

Circuitry

HC115A***

Curl Code Wiring

Terminal No.	Terminal symbol	Color of wire	Function
1	+5V	Brown	Dial +5VDC
2	—	Red	
3	B	Orange	Dial Channel B Output (0/5V)
4	—	Yellow	
5	A	Green	Dial Channel A Output (0/5V)
6	0V	Blue	Dial 0VDC
7	COM	Purple	Common Terminal of Multiplication Switch
8	x1	Gray	X1
9	x10	White	X10
10	x100	Black	X100
11	X	Pink	Axis X
12	Y	Light blue	Axis Y
13	Z	Yellow-green	Axis Z
14	4	Light purple	Axis 4
15	5	Color-less/BK	(Axis 5)
16	6	Light blue/BK	(Axis 6)
17	−L	Yellow-green/BK	LED Lamp (−)
18	+L	Yellow-green/BK	LED Lamp +24VDC
19	—	Light brown	
20	E		Shielding Wire (connect to GND)

* /BK：with Black line

LED Lamp and Switches

LED Lamp

Magnification Switch

Axis Selector Switch

X1　X10　X100

OFF　X　Y　Z　4

DIAL

Supply Voltage：5V
Output：5V
Resolution：100PPR
(100−Detent)

MAGNIFICATION

X10　X100
x1　(OFF)　COM

AXIS SELECTOR

Z　4　(5)
Y　(6)
X　OFF COM

LAMP

R1

+5V
B
A
0V
COM
x1
x10
x100
X
Y
Z
4
5
6
−L
+L
E

Shield

Circuitry

HC115A***03

Curl Code Wiring

Terminal No.	Terminal symbol	Color of wire	Function
1	+5V	Brown	Dial +5VDC
2	—	Red	
3	B	Orange	Dial Channel B Output (0/5V)
4	—	Yellow	
5	A	Green	Dial Channel A Output (0/5V)
6	0V	Blue	Dial 0VDC
7	RC	Purple	Common Terminal of Multiplication Switch
8	R1	Gray	Terminal E
9	R2	White	Terminal A
10	R4	Black	Terminal B
11	—	Pink	
12	L1	Light blue	Terminal E
13	L2	Yellow-green	Terminal A
14	L4	Light purple	Terminal B
15	L8	Color-less	Terminal D
16	LC	Color-less/BK	Common Terminal of Axis Selector Switch
17	-L	Light blue/BK	LED Lamp (-)
18	+L	Yellow-green/BK	LED Lamp +24VDC
19	—	Light brown	
20	E		Shielding Wire (connect to GND)

* /BK:with Black line

LED Lamp and Switches

LED Lamp

X1 X10 X100

Magnification Switch

OFF X Y Z 4

Axis Selector Switch

DIAL

Supply Voltage:5V
Output:5V
Resolution:100PPR (100-Detent)

+5V B A 0V

CD1

R4 R3 R1 R2

C2 TR2 TR1 C4 C3

5 4 3 2 1

MAGNIFICATION

	E	A	B
X 1			
X 10		●	●
X 100		●	●

RC R1 R2 R4

E A B D C

AXIS SELECTOR

	E	A	B	D
OFF				
X				●
Y	●	●	●	
Z	●	●		
4	●			

L1 L2 L4 L8 LC

E A B D C

LAMP

-L +L E

R1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Shield
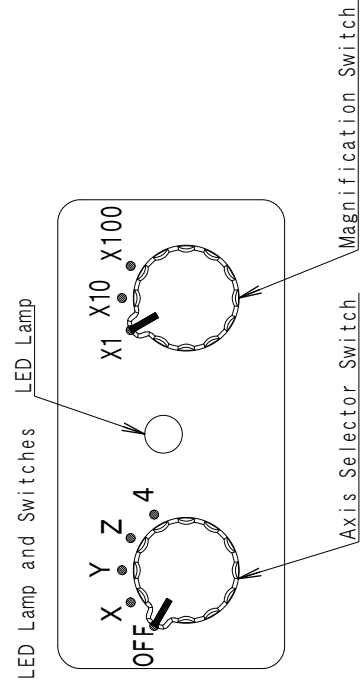
Circuitry

HC11DA***
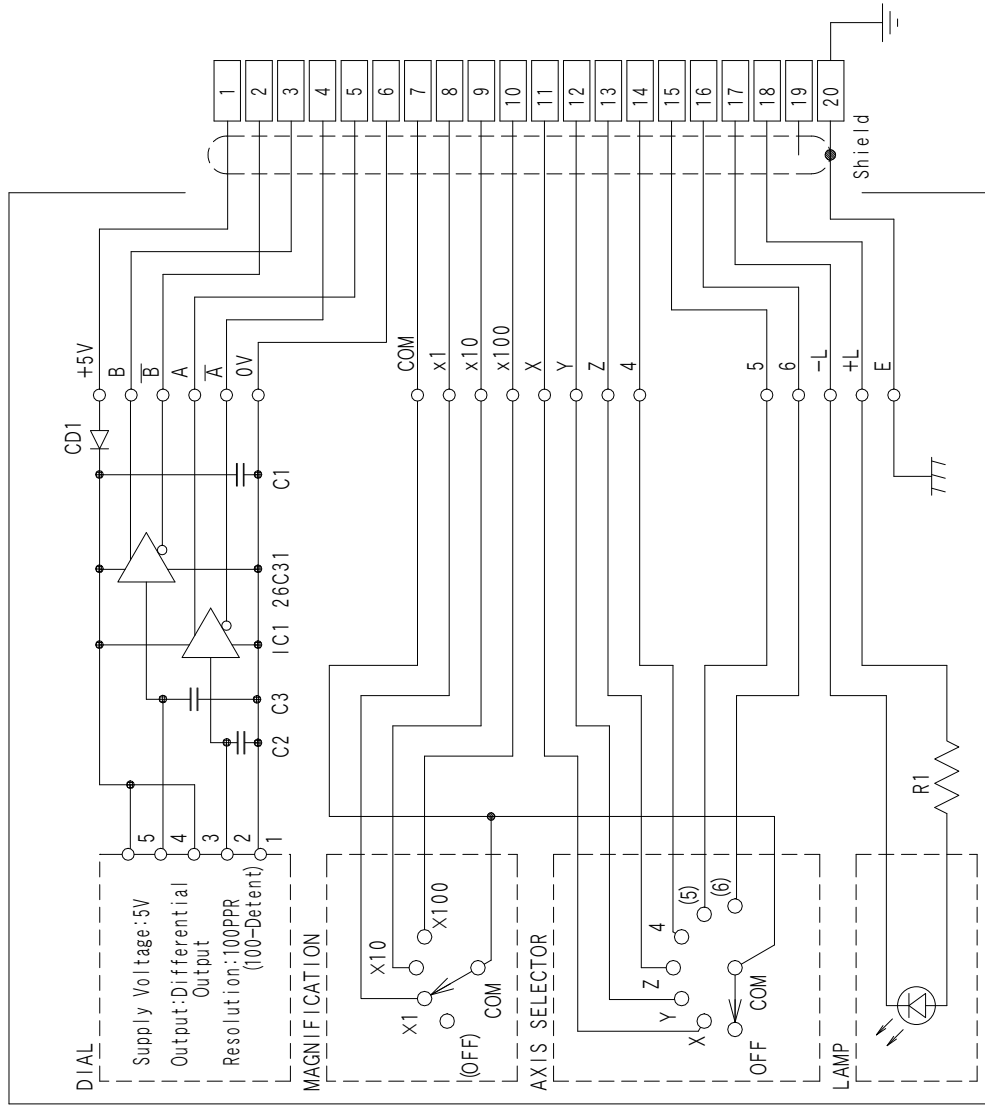
Curl Code Wiring

Terminal No.	Terminal symbol of wire	Color of wire	Function
1	+5V	Brown	Dial +5VDC
2	$\overline{B}$	Red	Dial Channel B Inverting Output
3	B	Orange	Dial Channel B Output
4	$\overline{A}$	Yellow	Dial Channel A Inverting Output
5	A	Green	Dial Channel A Output
6	0V	Blue	Dial 0VDC
7	COM	Purple	Common Terminal of Multiplication Switch
8	X1	Gray	X1
9	X10	White	X10
10	X100	Black	X100
11	X	Pink	Axis X
12	Y	Light blue	Axis Y
13	Z	Yellow-green	Axis Z
14	4	Light purple	Axis 4
15	5	Color-less	(Axis 5)
16	6	Color-less/BK	(Axis 6)
17	-L	Light blue/BK	LED Lamp (-)
18	+L	Yellow-green/BK	LED Lamp +12~+24VDC
19	-	Light brown	
20	E		Shielding wire (connect to GND)

* /BK:with Black line

LED Lamp and Switches

LED Lamp

Magnification Switch

Axis Selector Switch

X1 X10 X100

OFF X Y Z 4
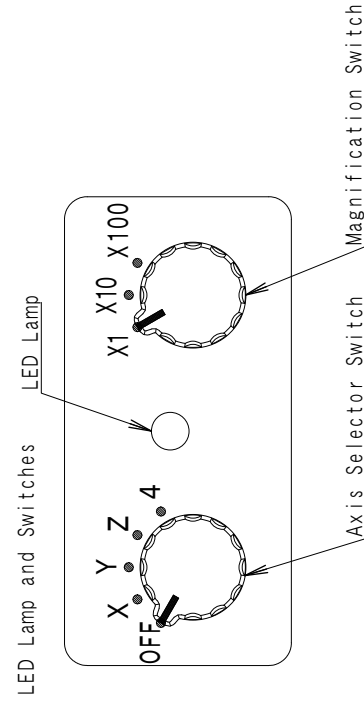
How to mount knobs for selector switches (HC1/HM/HT series)

1. All switches select OFF circuits (position no.1) when fully turned counterclockwise. 1 click/2 clicks clockwise will make a connection of position no.2/no.3 with COM which feeds a signal for each.

2. If the indications on the plate begin with "OFF", "0" or any other indication to render disconnection, confirm that the shaft is turned fully counterclockwise to the end, then screw the knob on to it within 5kgf.cm of torque.
   If the indications begin with "X", "x1" or any other indication to render connection, 1) turn 1 click clockwise from the very left end, 2) adjust the white line on the knob with the indication, then 3) tighten the screw of the knob (cf. picture 2. multiplier switch).

3. The standard wiring diagrams indicated do not necessarily be consistent with the actual delivered products. Confirm the diagrams on the specifications when mounting the knobs.

4. When the knob is turned, it will stop where stopper-pin is inserted. To alter the position to stop, refer to picture 3 and 4, then re-insert the pin into the designated position.
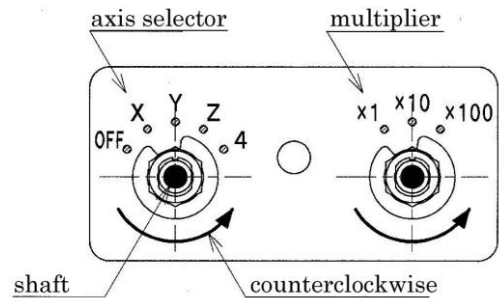
Picture 1.   plate
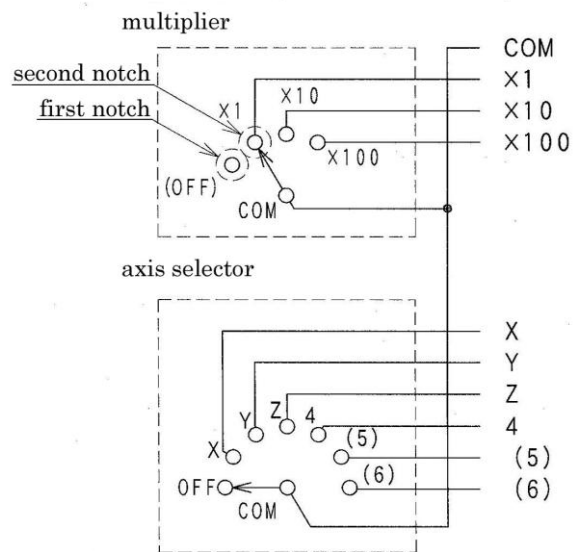
Picture 2.   Indications and wiring
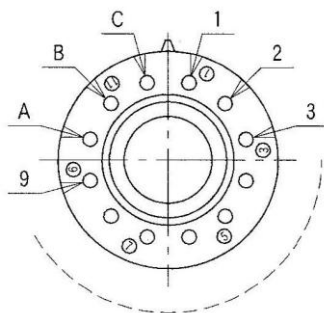
Picture 3.   The back of the knob

(holes for stopper-pins)
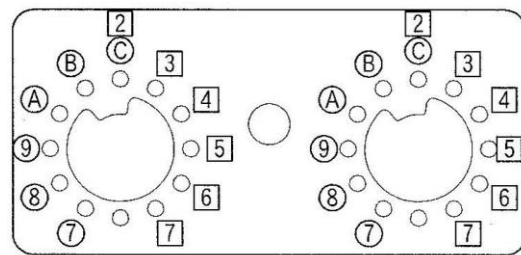
Numbers and alphabets with ○ show positions to start, and those with □ show positions to stop. Select the appropriate position from the picture 4 and insert the pins into the correspondent positions.

e.g. The plate shown in the picture 1 will be set as follows.
Axis Selector: A, 4/ Multiple Selector: B, 3.

Picture 4.   Correspondent Positions of the Pins

Handy Manual Pulse Generator

HM Series

Outline

HM series have a variety of switches which can be customized according to your requests. The model is compact and lightweight, which is perfect for accurate and smooth manual operation.

Features

- Various switches available : Emergency switch (2 positions), side mounted (right/left) enabling switches, 2 rotary switches (as axis and multiplication selector etc.)
- Compact, thin-line and lightweight.
- Strong plate magnets available on back side. (optional)
- RoHS compliant (box/cord)
- Various types of curl cords provided along with connectors of all sorts at your request.

Specifications

1. Body	
Dimension	145×73×35(mm)
LED light	DC24V Green
Enabling Switch	Available on both sides
Logo	Logo available on the wheel cover

2. Mechanical specifications	
2.1 Rotary Encoder Unit	
Output Voltage	DC5V±10%, DC12V±10%
Wheel	100 clicks / rotation 100 puluse or 25 pulses per rotation
Rotational Durability	Over 1,000,000 times

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

* See RE45B page for details

2.2 Selector Switches	

MR8A (Rotary switch) 25V15mA (AC/DC)
MR8C (Code switch) 15V10mA (AC/DC)
* See MR8A/MR8C pages for details

3. Curl/Straight Cords	
Curl Cord	19/25-conductor shielded cable 19-conductor: select from 2m, 3m, 4m, 5m 25-conductor: select from 3m, 5m (We will select either 19 or 25-conductor in accordance with required functions) For further details, please see the catalogues for curl cords
Straight Cord	Also available

4. Connector Unit	
Connector	Dripproofed connector to be attached on the end of the cord optionally provided

Warranty

- 1 year from the date of shipment.

Dimensions (mm)

HM Unit with curl cord   ※ This drawing is an example, it may differ according to number of swithes etc.

With Dripproofed connector

DDK

Emergency Stop Switch

Enabling Switch

Axis Selector

LED

Logo Mark

Dial

Multiplication Selector

Label

Scale Plate

19/25 conductors

Length (as reference)		
for 2m	(460mm)	*
for 3m	(690mm)	
for 4m	(920mm)	*
for 5m	(1080mm)	

*19 conductors only
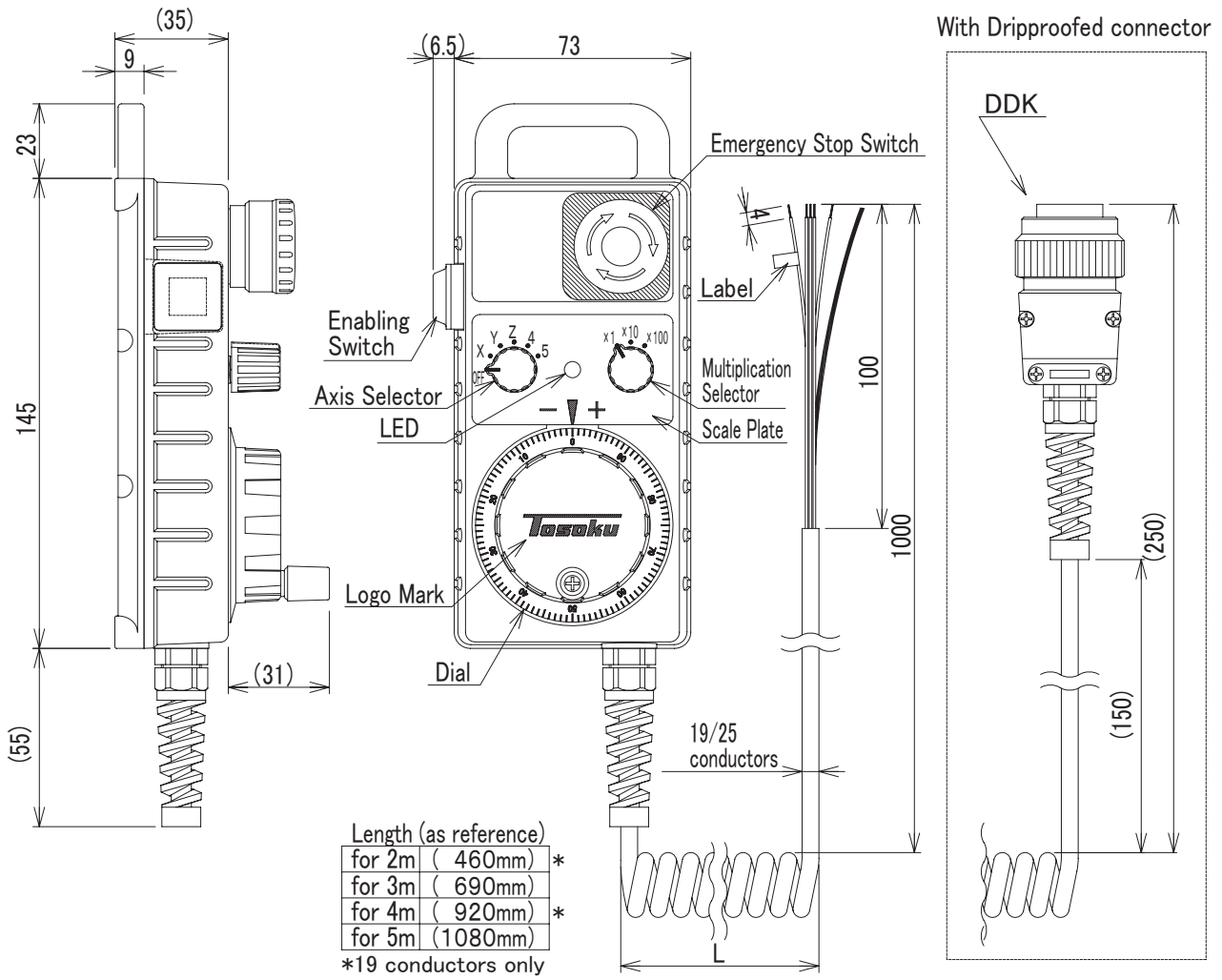
Samples of Case layout

Original Holder

ラベル

7-M4用皿穴

H M series Order Sheet   Print out this page for sending orders.

We'll hand in to you a drawing in accordance with your order. The drawing shall be approved before starting in on production.

1) Select one from each spec table and fill blank spaces with "   ".

Pulses/Rev.	
	100PPR
	25PPR

*25PPR and yet 100 Clicks/Revolution

Power Supply	Output
5V	5V 330Ω Pull Up
5V	Open Collector
5V	for Line Driver
12V	5V 2.2kΩ Pull Up
12V	12V 2.2kΩ Pull Up
12V	Open Collector
12V-24V	for Photocoupler Open Collector

* Transistor will be "OFF" at every clicked positions.
For other open collector output models, transistors will be "ON" at every clicked positions.

Logo on the dial	
	None
	with "TOSOKU" logo
	with an original logo( )

2-Position Enabling Switch	
	None
	One on the left
	On both sides

Emergency Switch contacts	
	None
	Mounted

* 1 for (NO), 4 for (NC) maximum (1A/4B). Maximum of 4 contacts in total (1A3B or 4B).

Magnet on the backside	
	None
	Mounted

Axis Selector/Multiplication Selector Switches	
	MR8C type Gray code switch
	MR8A type Selection switch

Indications for Axis Selector left	
e.g.	OFF, X, Y, Z, 4, 5

Indications for Multiplication Selector right	
e.g.	×1, ×10, ×100

Curl Cord Length	
	2m Curl Cord (for only 19-conductor cord)
	3m Curl Cord
	4m Curl Cord (for only 19-conductor cord)
	5m Curl Cord

* We will select either 19-conductor cord or 25-conductor cord to cover your requested specs

Waterproofed Connector for curl cord	
	None
	Male connector EBSP2119MG-D, DDK
	Female connector EBSP2119FGS-D, DDK

* Fill in both spaces to order both connectors.

2) Other options

Other options to request
e.g.
Switches with LED illumination x 2
2 contact selector switch x

Handy Manual Pulse Generator

HR Series

Tosoku

Outline

HR series provide you comfort in long time use and safety with various options of switches.

Features

- Ergonomically designed to be held with one hand
- 3-position (off-on-off) switch available on both sides
- RoHS compliant (box/cord)
- Upper part is free to design and allows various kinds of switches (including emergencystop button) to be set
- HR series also provide you various line-up of switches to be set on the middle part:
  DP - the digital code switch series, RS400 - the rotary switch series etc.
- Strong plate magnets available on back side. (optional)
- Various types of curl cords provided along with connectors by all sorts of your request
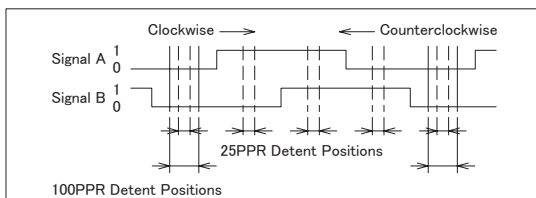
Specifications

1. Body	
Dimension	190×100×50.5(mm)
Enabling Switch	Available on both sides
Other Features	Logo available on the wheel cover

2. Mechanical specifications	
2.1 Rotary Encoder Unit	
Output Voltage	DC5V±10%, DC12V±10%
Wheel	100 clicks / rotation 100 puluse or 25 pulses per rotation
Rotational Durability	Over 1,000,000 times

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

* See RE45B page for details

2.2 Selector Switches
* See RS400/DP pages for details

3. Curl/Straight Cords	
Curl Cord	19/25-conductor shielded cable 19-conductor: select from 2m, 3m, 4m, 5m 25-conductor: select from 3m, 5m (We will select either 19 or 25-conductor in accordance with required functions) For further details, please see the catalogues for curl cords
Straight Cord	Also available

4. Connector Unit	
Connector	Dripproofed connector to be attached on the end of the cord optionally provided

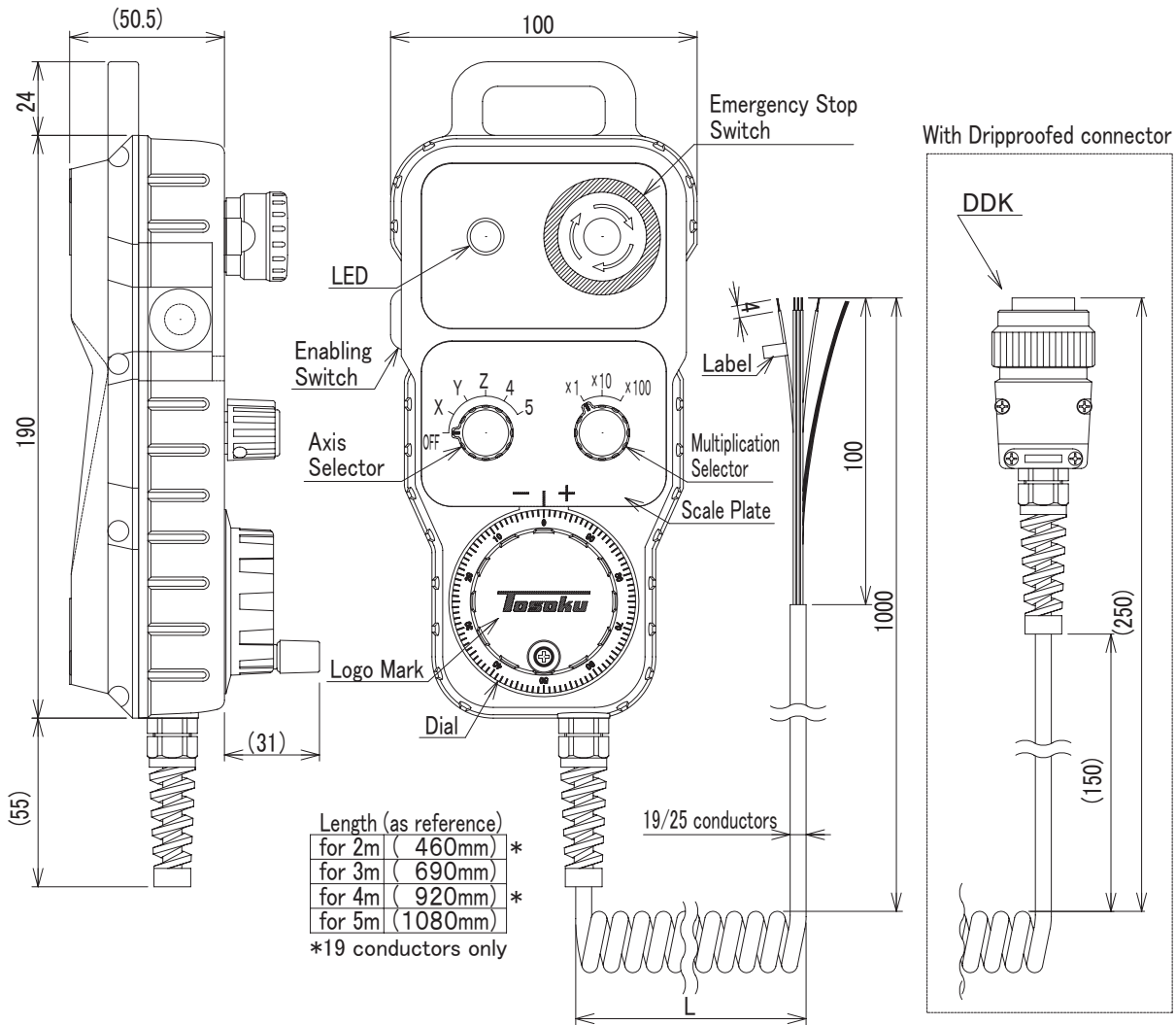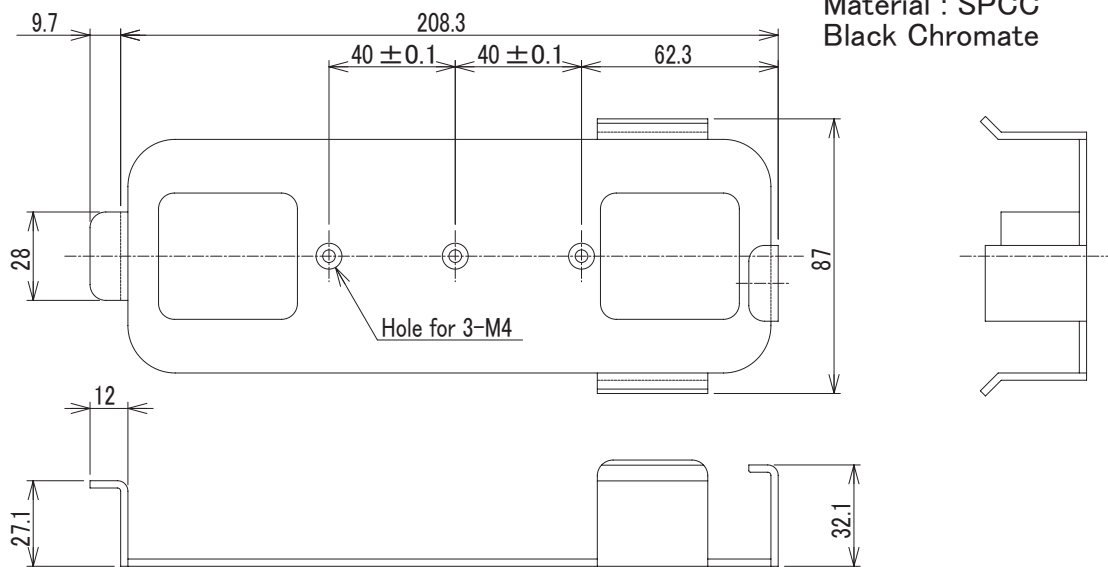## Warranty

- 1 year from the date of shipment.

Dimensions (mm)

※ This drawing is an example, it may differ according to number of swithes etc.

(50.5)

24

190

(55)

(31)

100

Emergency Stop Switch

LED

Enabling Switch

Axis Selector

Logo Mark

Dial

X Y Z 4
OFF 5

− +

Tosoku

x1 x10 x100

Multiplication Selector

Scale Plate

Label

100

1000

19/25 conductors

L

Length (as reference)

for 2m	(460mm)	*
for 3m	(690mm)	
for 4m	(920mm)	*
for 5m	(1080mm)	

*19 conductors only

With Dripproofed connector

DDK

(250)

(150)

Original Holder

9.7

208.3

40 ± 0.1   40 ± 0.1   62.3

28

87

Hole for 3−M4

12

27.1

32.1

Material : SPCC
Black Chromate

H R series Order Sheet   Print out this page for sending orders.

We'll hand in to you a drawing in accordance with your order. The drawing shall be approved before starting in on production.

1) Select one from each spec table and fill blank spaces with "　".

Pulses/Rev.	
	100PPR
	25PPR

*25PPR and yet 100 Clicks/Revolution

Power Supply	Output
5V	5V 330Ω Pull Up
5V	Open Collector
5V	for Line Driver
12V	5V 2.2kΩ Pull Up
12V	12V 2.2kΩ Pull Up
12V	Open Collector
12V-24V	for Photocoupler Open Collector

* * Transistor will be "OFF" at every clicked positions.

For other open collector output models, transistors will be "ON" at every clicked positions.

Logo on the dial	
	None
	with "TOSOKU" logo
	with an original logo( )

3-Positions Enabling Switch (contacts)	
	None
	One on the left
	On both sides

* Assigned contacts should be 2 or less for normally open (NO) and 2 or less for normally closed (NC). (2A2B maximum.)

Emergency Switch contacts	
	None
	Mounted

* 1 for (NO), 4 for (NC) maximum (1A/4B). Maximum of 4 contacts in total (1A3B or 4B).

Magnet on the backside	
	None
	Mounted

Axis Selector/Multiplication Selector Switches	
	Gray code switch
	Binary code switch
	Selection switch

Indications for Axis Selector   left

e.g.	OFF, X, Y, Z, 4, 5

Indications for Multiplication Selector   right

e.g.	×1, ×10, ×100

Curl Cord Length	
	2m Curl Cord (for only 19-conductor cord)
	3m Curl Cord
	4m Curl Cord (for only 19-conductor cord)
	5m Curl Cord

* We will select either 19-conductor cord or 25-conductor cord to cover your requested specs

Waterproofed Connector for curl cord	
	None
	Male connector EBSP2119MG-D, DDK
	Female connector EBSP2119FGS-D, DDK

* Fill in both spaces to order both connectors.

2) Other options

Other options to request
e.g. Switches with LED illumination x 2 2 contact selector switch x
----

Handy Manual Pulse Generator

HS Series

Outline

HS is a free-to-design handheld manual pulse generator which allows wide variety of switches laid out at your service.
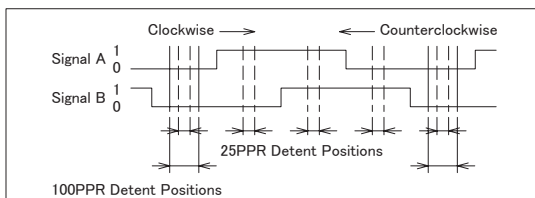
Features

● Optional layout of switches
● 3-position (off-on-off) switch available on both sides
● RoHS compliant (box/cord)
● Emergency stop button also available
● Holder provided
● Strong plate magnet as an additional accessory. (optional)
● Various types of curl cords provided along with connectors by all sorts of your request

Specifications

1. Body	
Dimension	180×96×50(mm)
Enabling Switch	Available on both sides
Other Features	Logo available on the wheel cover

2. Mechanical specifications
2.1 Rotary Encoder Unit

Output Voltage	DC5V±10%, DC12V±10%
Wheel	100 clicks / rotation 100 puluse or 25 pulses per rotation
Rotational Durability	Over 1,000,000 times

Output Waveform

1) Turning the shaft clockwise would generate the signal A when the signal B outputs a low voltage (0);
2) Rotating the shaft counter-clockwise would generate the signal A when the signal B outputs a high voltage(1);

* See RE45B page for details

2.2 Selector Switches

RS400 (Rotary switch)
   AC 30V1.0A / 200V0.2A
   DC 20V1.0A / 200V0.1A (Registance Load)
DP (Code switch)
   AC 5V0.5V/50V0.05A
   DC 5V0.25A / 25V0.05A (Registance Load)

* See RS400/DP pages for details

| 3. Curl/Straight Cords	
Curl Cord	19/25-conductor shielded cable 19-conductor: select from 2m, 3m, 4m, 5m 25-conductor: select from 3m, 5m (We will select either 19 or 25-conductor in accordance with required functions) For further details, please see the catalogues for curl cords
Straight Cord	Also available

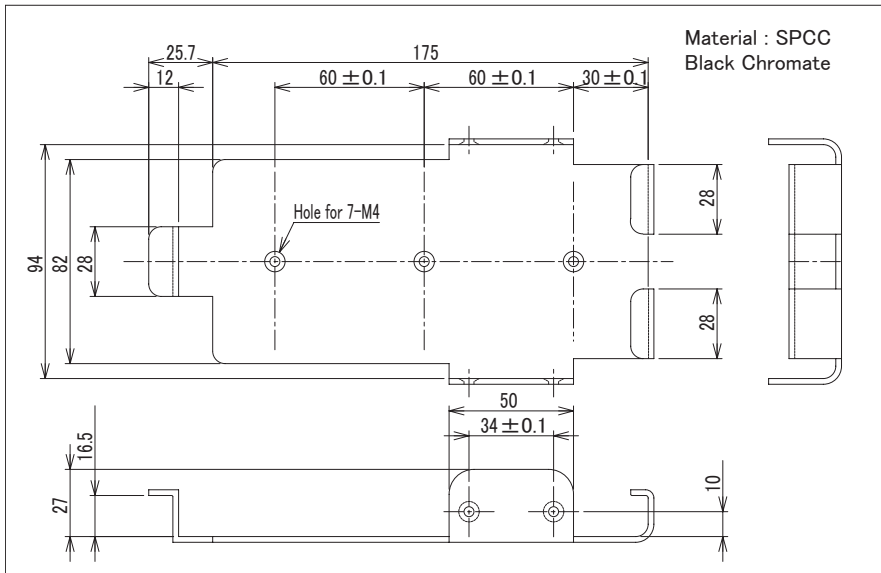| 4. Connector Unit	
Connector	Dripproofed connector to be attached on the end of the cord optionally provided

Warranty

● 1 year from the date of shipment.

Dimensions (mm)

HS Main unit　※ This drawing is an example, it may differ according to number of swithes etc.

HS Original holder

Material : SPCC
Black Chromate

Hole for 7-M4
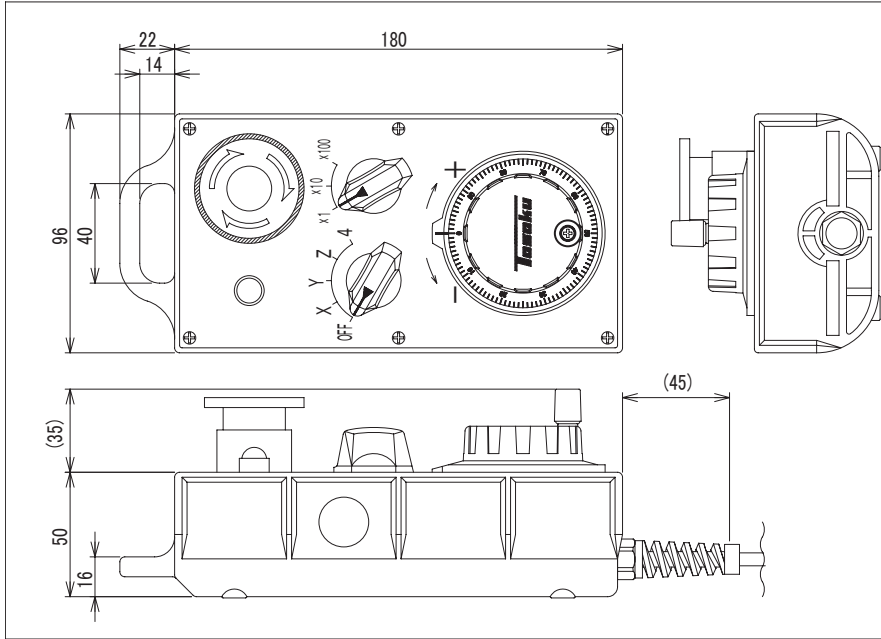
HS Layout examples

TOKYO SOKUTEIKIZAI CO., LTD.

Trackball
Catalogue

Track ball

TB36 Series

Outline

TB36 series are high-spec trackballs for various sorts of professional use: for medical devices (e.g. ultrasonic reflectoscope, specular microscope), mixing units of audio devices, factory automation systems etc.
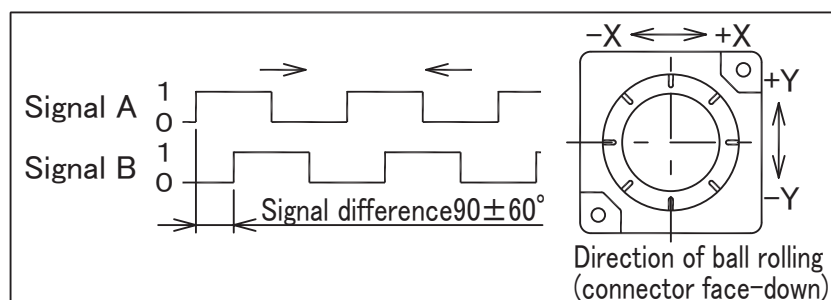
Features

● Low Cost
● RoHS compliant
● Translucent ball with LED option
● Easy Maintenance
● Long life use
  -Over 3million ball revolutions.

Specifications

Operating temperature	0℃ to +45℃ 32F to 113F
Supply voltage	DC5V±5% no more than 30mA
Ball	S φ 36mm/1.4inch
Output axes	2way axes (X, Y)
Pulse	216 pulses per ball generation (±10%)
Out put signals	Two square wave signals: CMOS (TTL)
Ball driving force	15±10mN
Life time	Over 3million ball revolutions
Ball load	200N maximum downward pressure
Mounting position	Horizontal to 30°

Output Wave form

Signal A 1 0
Signal B 1 0
Signal difference90±60°

−X ←→ +X
+Y
−Y
Direction of ball rolling
(connector face−down)

Part Number Designation

TB36   L   S   W
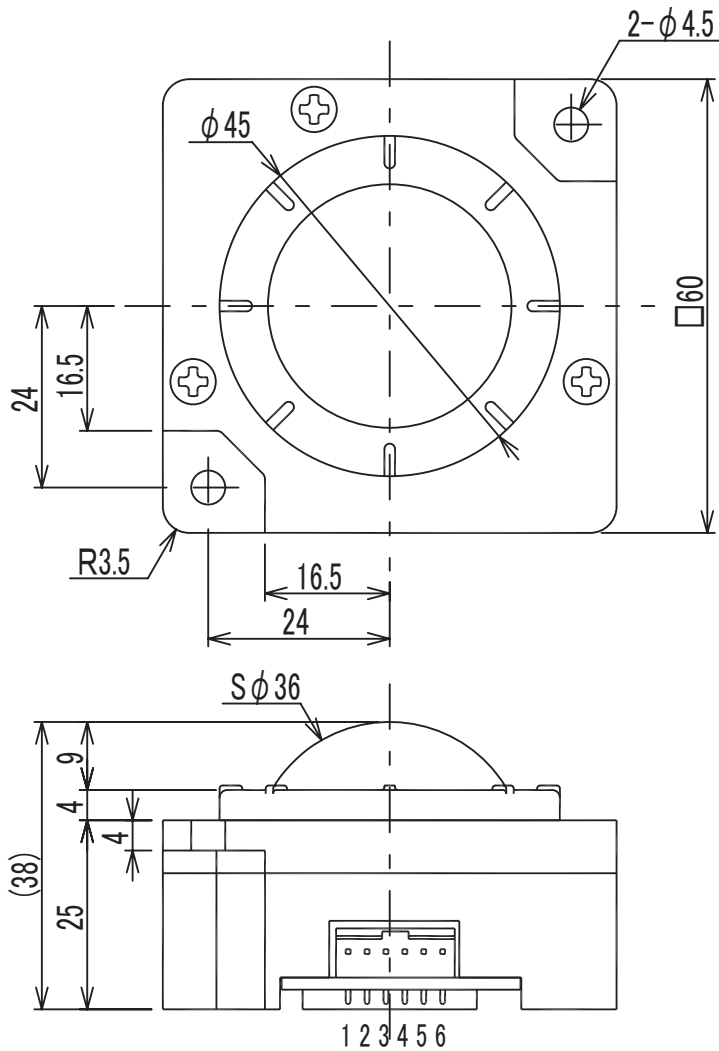①   ②   ③   ④

①   38mm Tranck
②   Operational touque : Light
③   Output signal: Two square wave output (A/B)
④   Color :
     W: Ivory white
     T: Transparent

Dimensions (mm)

2−φ4.5

φ45

□60

24
16.5

R3.5

16.5
24

Sφ36

9
4
4
25
(38)

1 2 3 4 5 6

Connection

Pin No.	Function
1	+5V Input
2	0V Common return
3	XA Signal output
4	XB Signal output
5	YA Signal output
6	YB Signal output

Connector :
IL−6PS3FP2−1 (JAE)

Pick up/
Bring back
position

Idler

Precautions

● Maintenance
Pick up ball:
-Turn the ring counterclockwise by approx. 40°.
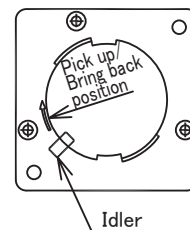-Set the idler on the arrow position.
Bring back ball:
-Set the idler on the arrow position, and turn the ring clockwise.
● Cleaning:
 -XY axis sendor, Idler: Wipe with cotton buds.
-Ball: Wipe with dry cloth.
     : If balls are still unclean, use ethyl alcohol or neutral detergent (grit, alkaline are not included)

NOTE: 1) Any shock or vibration may cause malfunctions.
       2) TB36 series are not waterproof.