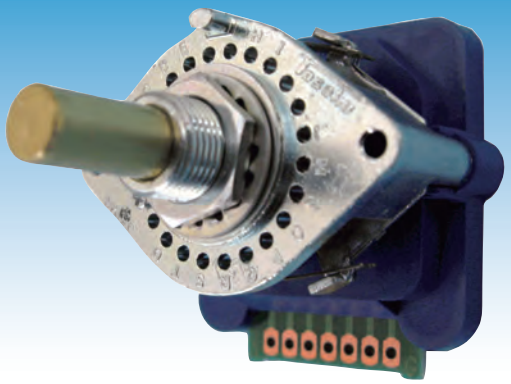
TOKYO SOKUTEIKIZAI CO., LTD.

Code Switch Catalogue

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

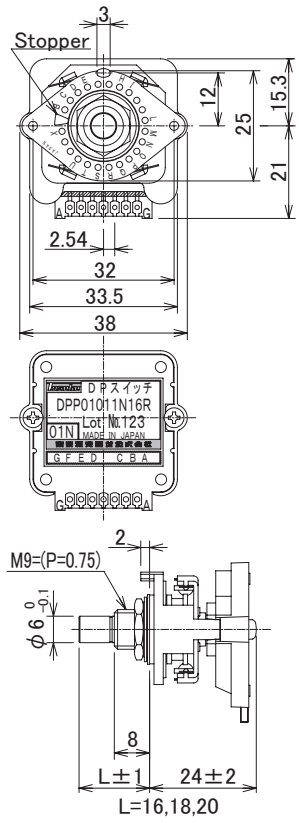
Connector Options
None: No Connector Attached
CB: Vertically Attached
CS: Horizontally Attached

Shape of the Shaft
R: Round

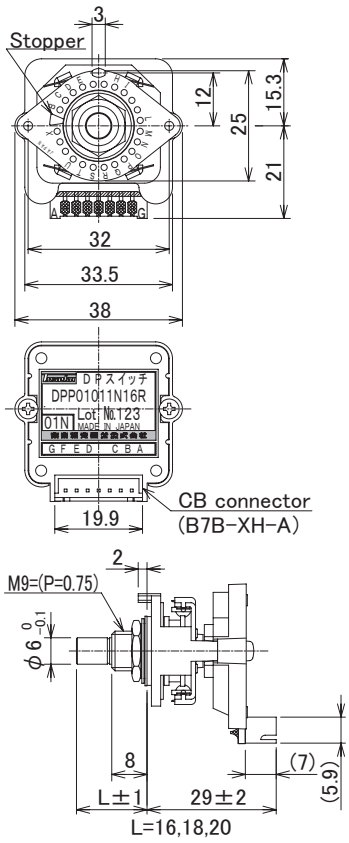
	Step Angle	Range of the Staring/End Positions
H	13.85°	0 ～ 25
J	15°	0 ～ 23
N	30°	0 ～ 11
L	20°	0 ～ 17
S	27.69°	0 ～ 12

Dimensions (mm)

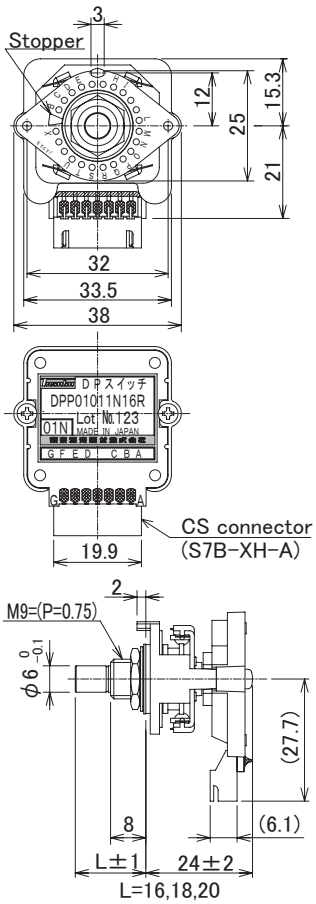
DPN/DPP



DPN/DPP with Connector CB

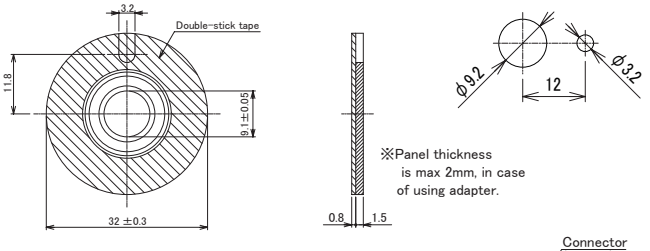


DPN/DPP with Connector CS



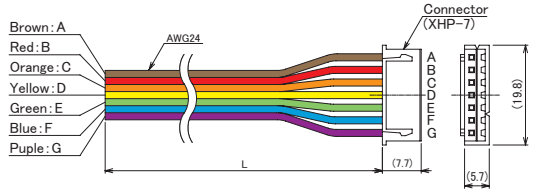
DP Accessory

Adapter(for waterproof)



Wire Harness

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



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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	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	1	2	3	4	5	6	7	8	9	10	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	1	2	3	4	5	6	7	8	9	10	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	1	2	3	4	5	6	7	8	9	10	11	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	1	2	3	4	5	6	7	8	9	10	11	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

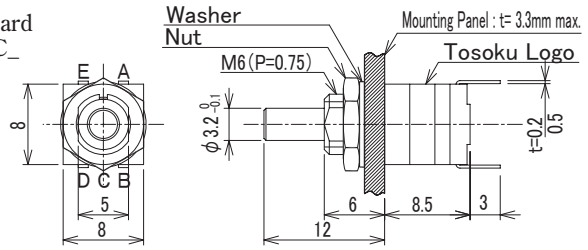
Part Number Designation

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

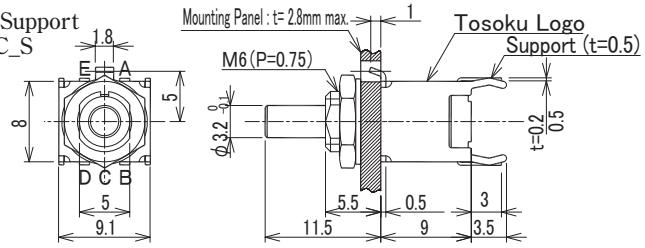
- MR8: Switch Model
- C: Category — C: Code Swtich
- V: Mounting Direction — V: Vertical
- 03: Code Type — 03: Real Gray Code
- 0: Start Position — 0～F:Set an optional position between 0～F (22.5°) / 0～B:Set an optional position between 0～B (30°)
- A: End Position — 0～F:Set an optional position between 0～F (22.5°) / 0～B:Set an optional position between 0～B (30°)
- M: Step Angle — M: 22.5° / N: 30°
- 12: Length of the shaft — 12: 12mm
- R: Shape of the shaft — R: Round
- S: Optional Parts — None: No option attached / S: Receiver clamp / P: Waterproof washer / SP: Receiver clamp & Waterproof washer

Dimensions (mm)

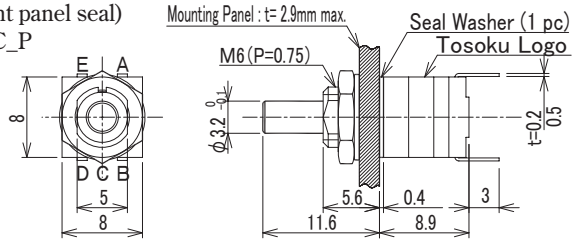
Standard
MR8C_



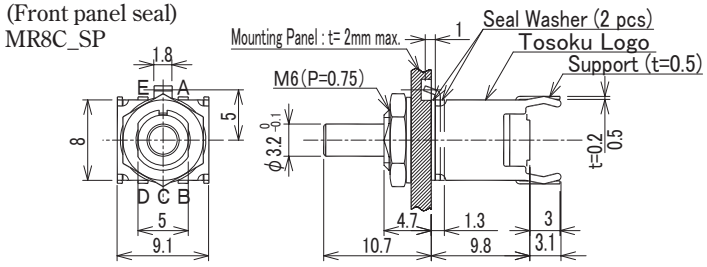
With Support
MR8C_S



With Seal Washer
(Front panel seal)
MR8C_P



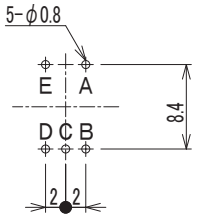
With Support & Seal Washer
(Front panel seal)
MR8C_SP



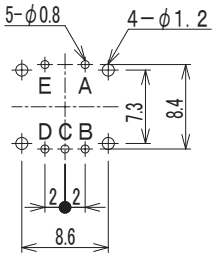
※Use 2 seal washers

PWB Mounting Hole Dimensions (mm)

Standard / With Seal Washer

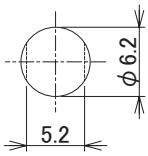


With Suppoet (+ Seal Washer)

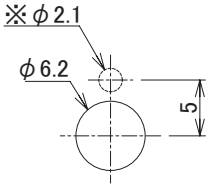


Mounting Hole Dimension (mm)

Standard / With Seal Washer



With Suppoet (+ Seal Washer)



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
※1	A	1		●	●			●	●			●	●			●	●	
	E	2			●	●	●						●	●	●	●		
	B	4					●	●	●	●	●	●	●					
	D	8									●	●	●	●	●	●	●	●
	C	common																

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
※1	E	1		●	●			●	●			●	●	
	A	2			●	●	●	●						●	●
	B	4					●	●	●	●	●	●	●	●
	D	8									●	●	●	●
	C	common												

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° .