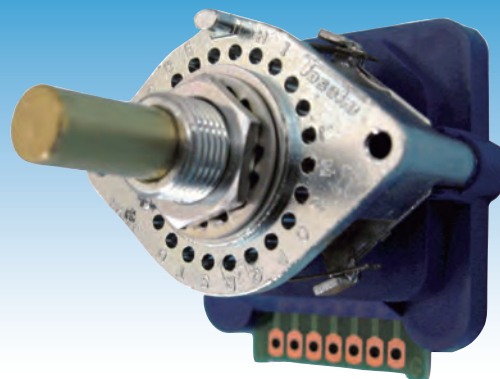


# TOKYO SOKUTEIKIZAI CO., LTD.

## Code Switch Catalogue

D P	_____	P . 0 2
hermetically sealed, long life, various options		
M R 8 C	_____	P . 0 5
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

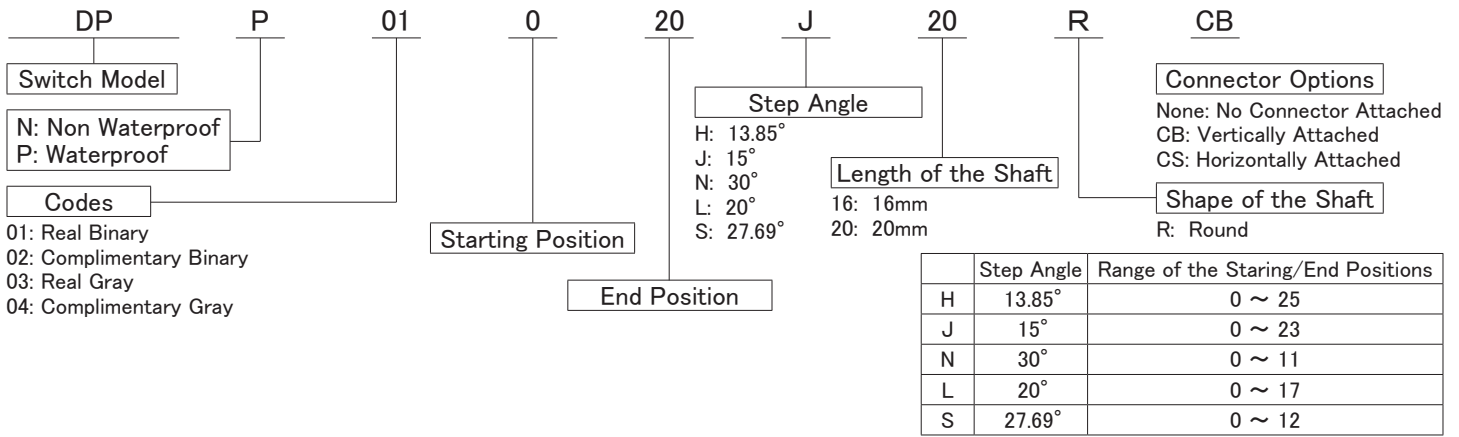
Items	Rated Value	
Operating temperature	-20℃ ~ +70℃ (-4F ~ 158F)	Keep the body unfrozen
Storage temperature	-40℃ ~ +70℃ (-40F ~ 158F)	
Rotational torque	0.1N ~ 0.2N	
Terminal strength	3N	
Panel nut tightening torque	2N · m	
Stopper strength	3N · m	
Vibration Durability	Range 10 ~ 55 ~ 10Hz/min	
	No 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 ground	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

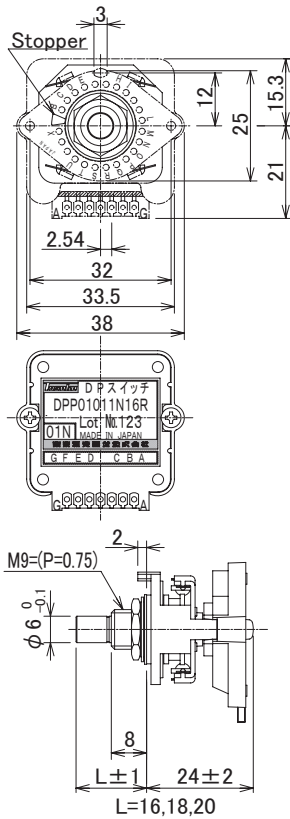
- 1 year from the date of shipment

# Part Number Designation

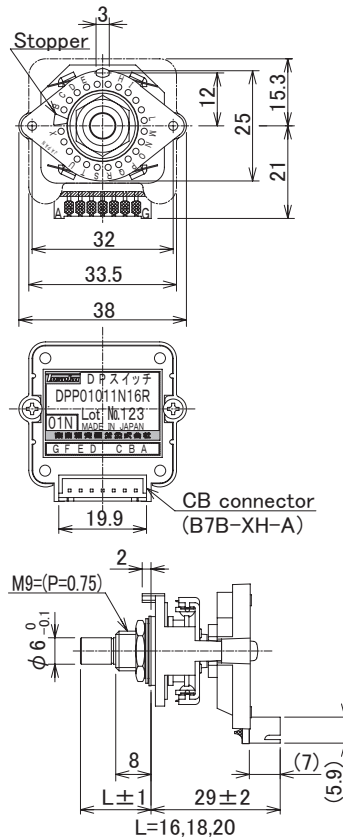


## Dimensions (mm)

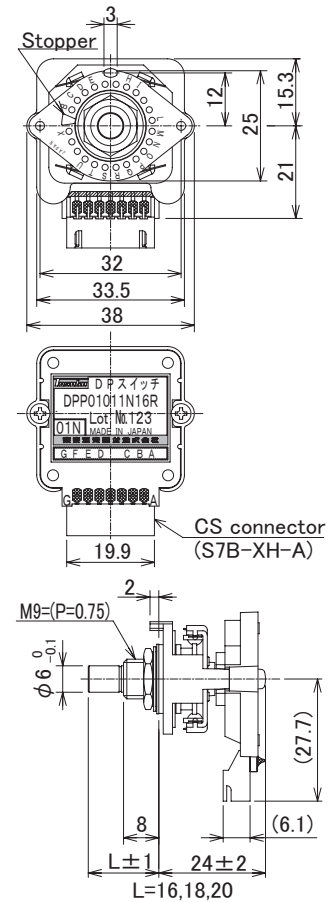
DPN/DPP



DPN/DPP with Connector CB

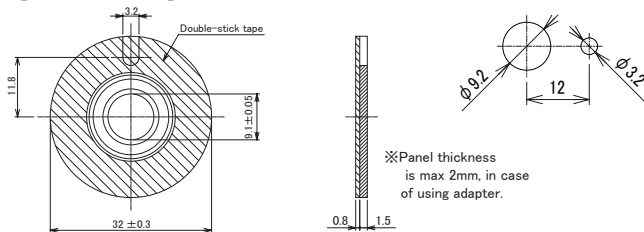


DPN/DPP with Connector CS

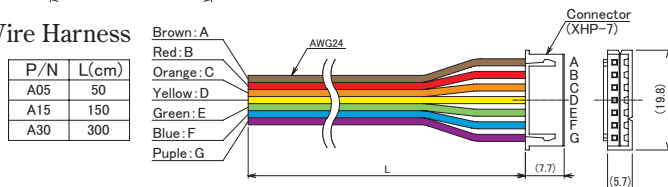


## DP Accessory

Adapter (for waterproof)



Wire Harness



## 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  $\phi 9.2$  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.

### 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.

### 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.

### 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.

### 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.

### 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.

### 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.

### 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.

### 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.

### 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

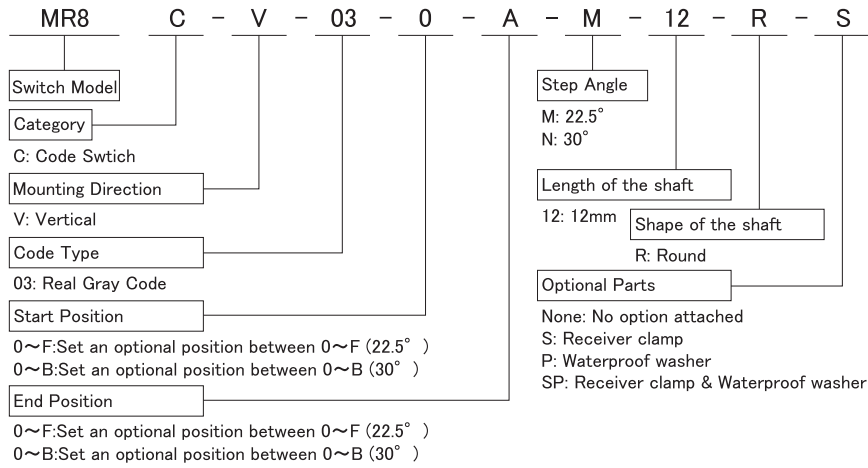
Operating temperature		-20℃ ~ +70℃ -4F ~ 158F	Keep the body unfrozen
Storage temperature		-40℃ ~ +70℃ -40F ~ 158F	
Mechanical Specification	Rotational Torque	0.02±0.01N・m	
	Terminal Strength	5N (of static load applied to the tip of the terminal once and in any direction)	
	Rotation Stopper Strength	0.4N・m	
	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	100MΩ minimum (100VDC 1min.): Between terminals
		500MΩ minimum (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°C Relative Humidity : 90 ~ 95% (Duration : 48 ± 2h)

## Warranty

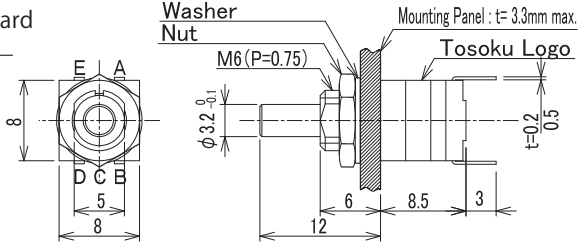
- 1 year from the date of shipment

# Part Number Designation

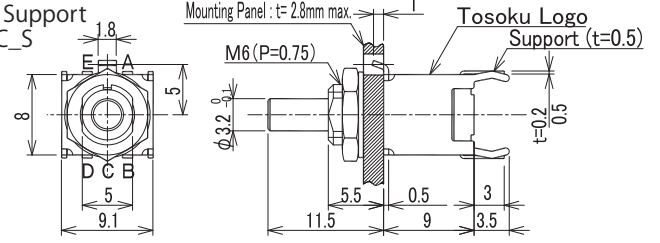


## Dimensions (mm)

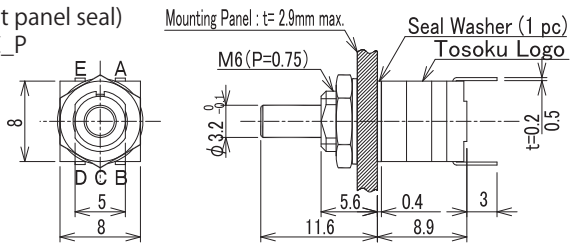
Standard  
MR8C\_



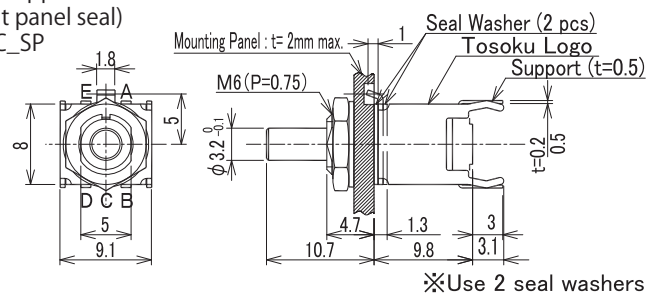
With Support  
MR8C\_S



With Seal Washer  
(Front panel seal)  
MR8C\_P

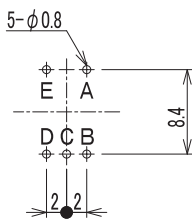


With Support & Seal Washer  
(Front panel seal)  
MR8C\_SP

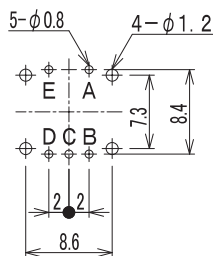


## PWB Mounting Hole Dimensions (mm)

Standard / With Seal Washer

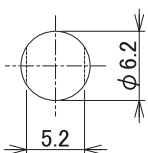


With Support (+ Seal Washer)

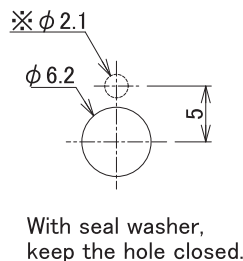


## Mounting Hole Dimension (mm)

Standard / With Seal Washer



With Support (+ Seal Washer)



## Code table

22.5° Step angle

Code Type 03 (Real gray code) ● indicates terminal connection to common

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

※1

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