

# TOCOS®

## P'GRID® Type

The world's first-and-only  
detent structure.

## Coded Switches & Incremental Encoders & SW+Potentiometers TP7 Series

**RoHS/ELV**  
Compliant



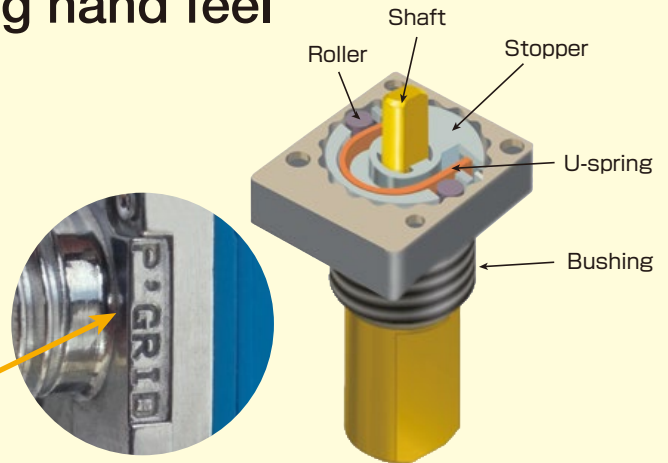
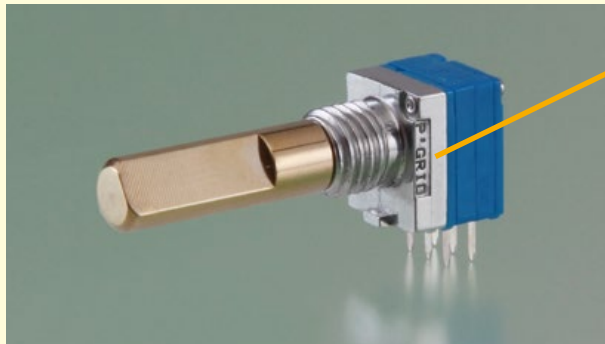
**Tokyo Cosmos Electric Co., Ltd.**

# TP7 Series P'GRID<sup>®</sup> Type

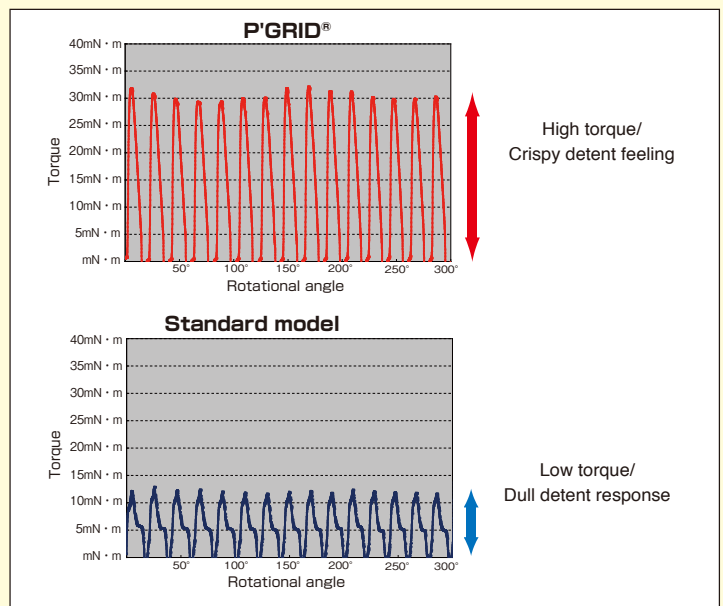
**TOCOS P'GRID<sup>®</sup> is the world's first-and-only detent structure.**

Detent rollers provide smooth, crispy and strong response switching hand feel

TOCOS has developed a very unique and new SW detent structure (P'GRID<sup>®</sup>) that provides accurate and smooth switching operations for 2-way radios and transceivers under any severe conditions.



## ■ Innovations of detent feeling



## ■ Features of P' GRID<sup>®</sup>

### ● Crispy Switching

P' GRID<sup>®</sup> brings a secure ON-OFF feeling even when slow knob turning is given

### ● Silky and smooth

Two rollers provide smoother hand feel

### ● Strong response

Provides a crispy feeling in occasions like an operator turns large knob by wearing thick gloves

### ■ Other improvements

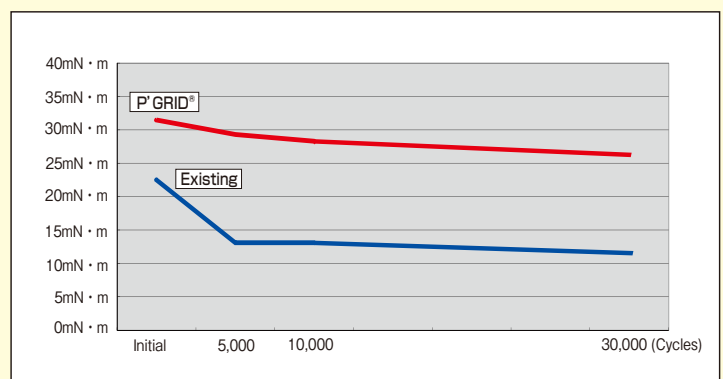
- (1) Increased shaft inner dia. provides secure shaft drop strength on a par with TP9 series.
- (2) M6 bushing shape is suitably designed for panel sealed.

### ■ Further Developments expected

- (1) Dual shafts: Inner shaft with Incremental encoder
- (2) Single shaft : 2ch/3ch/4ch coded SW

Options : Waterproof (Sealed with O ring in between shaft and bushing). Stainless shafts.

## ■ Innovations of detent life

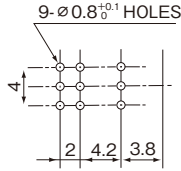
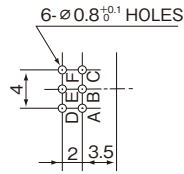


Note: The data described here is only one example and does not provide any guarantees.

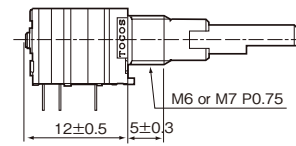
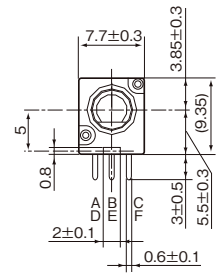
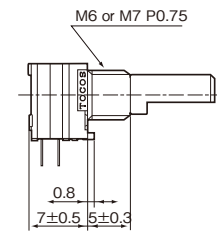
# Coded Switches



## Dimensions



## 16CH



## Specifications

Items	Spec.
	16CH
Rating	DC5V/1mA
Contact resistance	ON: 1 Ω max. OFF: 1 MΩ min.
Dielectric strength	AC300V at 1 minute
Insulation resistance	DC250V 100MΩ min.
Operating force	19.6-39.2 mN·m (200-400 gf·cm)
Step angle	20±3°, 22.5±3°
Rotational angle	300±5°, endless
Shaft stopper strength	0.39 N·m min. (4kgf·cm min.)
Shaft wobble and bend	Radial: 0.5×Shaft length / 30 mm max. (Single shaft, Dual outer shaft) 0.7×Shaft length / 30 mm max. (Dual inner shaft)
	Thrust: 0.5 mm max.
	* 2.5 N (250 gf) applied to tip of the shaft
Rotational life	30,000 cycles

## 16CH CODE (20° step 300° type)

	A-B	B-C	B-D	B-F
1	●	○	●	○
2	○	○	●	○
3	○	○	○	○
4	●	○	○	○
5	●	●	○	○
6	○	●	○	○
7	○	●	●	○
8	●	○	●	○
9	●	●	●	●
10	●	○	○	●
11	○	○	●	●
12	○	○	○	●
13	●	○	○	●
14	●	●	○	●
15	○	●	○	●
16	○	●	●	●

## 16CH CODE (22.5° step Endless type)

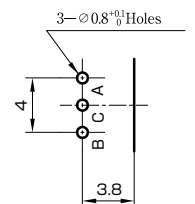
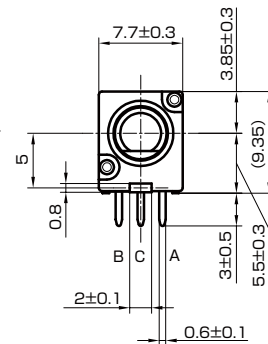
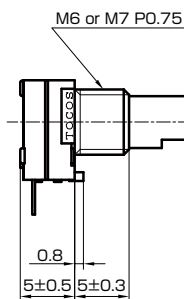
	A-B	B-C	B-D	B-F
1	●	●	●	○
2	●	○	●	○
3	○	○	●	○
4	○	●	●	○
5	○	●	○	○
6	○	○	○	○
7	●	○	○	○
8	●	●	○	○
9	●	●	○	●
10	●	○	○	●
11	○	○	○	●
12	○	●	○	○
13	○	●	●	●
14	○	○	●	●
15	●	○	●	●
16	●	●	●	●

●:ON  
○:OFF

# Incremental Encoders



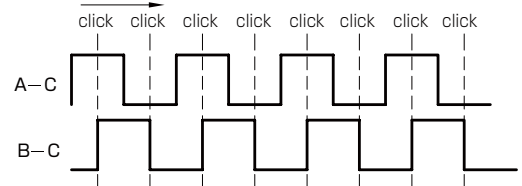
## Dimensions



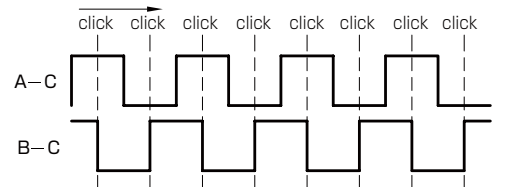
## Specifications

Rating	DC5V/1mA
Contact resistance	ON: 1Ω max. OFF: 1MΩ min.
Dielectric strength	AC300V at 1 minute
Insulation resistance	DC250V 100MΩ min.
Pulse	10 pulses
The number of detents	20 detents
Switching angle	18±5°
Operating force	4.9-19.6mN·m (50-200gf·cm) 19.6-39.2mN·m (200-400gf·cm)
Strength	Shaft push/pull 98.1N (10kgf) min.
Shaft wobble and bend	Radial: 0.5× (Shaft length / 30mm) max. Thrust
	Thrust: 0.5mm max.
Rotational life	30,000 cycles

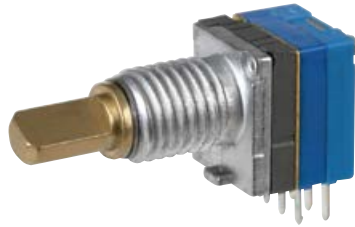
## CW direction



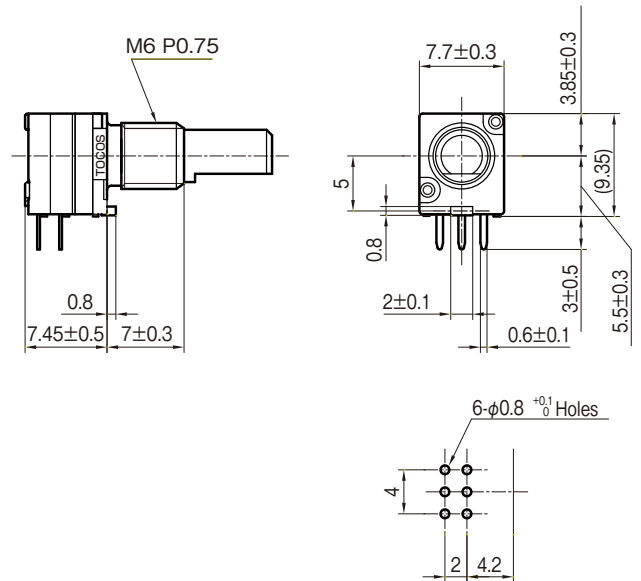
## CCW direction



# SW+Potentiometers



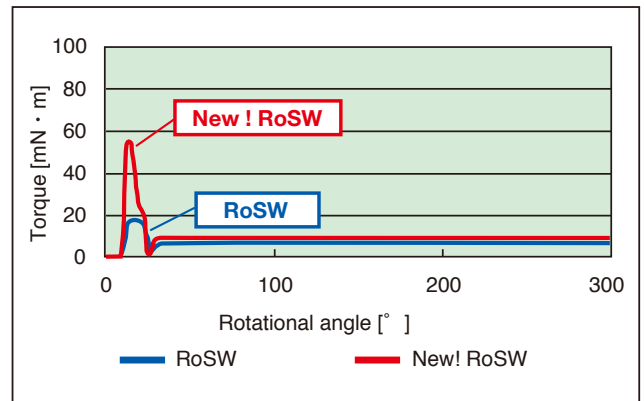
## ■Dimensions



## ■Specifications

Total resistance	15A · 1B · 15C 2k to 500kΩ
End resistance	50Ω max.
Noise	100mV max.(JIS method-A)
Insulation resistance	DC250V 100MΩ min.
Dielectric strength	1 minute at AC300V
Rotational torque	2.0 to 24.5mN · m(20 to 250gf · cm)
Shaft stopper strength	0.3N · m(3kgf · cm) min.
Strength	Shaft push/pull 98.1N (10kgf) min.
Rotational life	15,000 cycles
Switch configuration	S.P.S.T
Switch rating	DC10V 0.1A
Switch angle	50° max.
Switch torque	98.1mN · m(1kgf · cm) max.
Switch contact resistance	500mΩ max.
Switch life	10,000 cycles

## ■Torque



●Any part of this catalog may be modified for improvements without prior notice. Please therefore read and confirm the contents of the catalog.



ISO9001-2008, ISO14001-2004 Certified

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