







## List of Varieties

- Detector
- Push
- Slide
- Rotary
- Encoders**
- Power
- Dual-in-line Package Type
- TACT Switch™
- Custom-Products

Type	Hollow shaft		Magnetic		
	5mm size	10mm size	11mm size	20mm size	
Series	EC05E	EC10E	EM11B	EM20B	
Photo					
Output	Incremental				
Outline specifications	Shaft types	Hollow shaft		Single-shaft	
	Operating direction	Vertical/Horizontal	Horizontal	Vertical	
	Number of pulse/Number of detent	12/12	12/24	16/16	40/40
	Push switch (Travel mm)	Without		With( 0.5 )	Without/With( 0.5 )
	Optional functions	_____			Display function
	Changeover angle	_____			
Dimensions (mm)	W	5.7	9.8	10.8	20
	D	2.7	12.6	11	22.25
	H	6.5	4.4	7.5	13
Soldering	Manual soldering	350 max. 3s max.			
	Dip soldering	_____	260 ± 5 , 3 ± 1s	260 max. 3s max.	_____
	Reflow soldering	Please see P.189			
Operating temperature range	- 30 to + 85			-10 to + 70	
Maximum operating current( resistive load )	0.55mA	1mA	V <sub>Hi</sub> : + 4.0V min. V <sub>Lo</sub> : 0.5V max. ( I <sub>sink</sub> =5mA )		
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference		A,B( Square wave )	
	Output type	Incremental			
	Insulation resistance	50M min. 50V DC		100M min. 100V DC	100M min. 250V DC
	Voltage proof	50V AC for 1minute		250V AC for 1minute	300V AC for 1minute
Mechanical performance	Rotational torque	_____			7mN·m max.
	Detent torque	1.6 ± 1.3mN·m	5 ± 3mN·m	10 ± 5mN·m	8 ± 5mN·m
	Push-pull strength	_____			100N
Environmental performance	Cold	- 40 ± 3 for 240h		- 40 ± 3 for 96h	- 30 ± 3 for 240h
	Dry heat	85 ± 3 for 240h		85 ± 3 for 96h	80 ± 3 for 240h
	Damp heat	40 ± 2 , 90 to 95%RH for 240h		40 ± 2 , 90 to 95%RH for 96h	40 ± 2 , 90 to 95%RH for 240h
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- Incremental Type
- Absolute Type

### Push-on Switch Specifications

Items	EM11B	EM20B
Contact arrangement	Single pole and single throw( Push-on )	
Travel( mm )	0.5 <sup>+ 0.3</sup> / <sub>- 0.2</sub>	0.5 <sup>+ 0.4</sup> / <sub>- 0.3</sub>
Operating force ( N )	5.5 ± 3	6 ± 3
Rating	5mA 5V DC ( 50mA 12V DC )	
Contact resistance	500m max for initial period;5 max after operating life	100m max for initial period;200m max after operating life
Operating life	1,000,000times min.	25,000times min.

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#### Note

※ The operating temperature range for automotive applications can be raised upon request. Please contact us for requirements of this kind.