

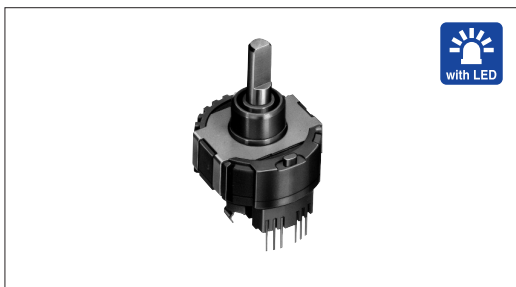
# Encoder 20mm Size Metal Shaft Magnetic Type

EM20B Series



Highly reliable non-contact structure applicable to 31-point LED level indicator mounting.

- Detector
- Push
- Slide
- Rotary
- Encoders
- Power



## Typical Specifications

Items	Specifications
Rating	5V±5% DC
Operating life	500,000rotations
Operating temperature range	-10°C to +70°C

- Dual-in-line Package Type
- TACT Switch™
- Custom-Products

## Product Line

Actuator length (mm)	Torque (mN·m)		Number of detent	Number of pulse	Operating direction	Push switch (N)	Display function	Response time	Minimum order unit (pcs.)	Product No.	Drawing No.
	Rotational torque	Detent torque									
15.5	7 max.	—	Without	40	Vertical	Without	Without	1.3 μ sec. (TYP)	960	EM20B4000000	1
16	—	8±5	40							With (Switch operating force 6±3)	
10								EM20B4014000	2		
										EM20B4014A01	3

- Metal Shaft
- Insulated Shaft
- Hollow Shaft
- Ring Type

## Packing Specifications

### Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case /Japan	1 case /export packing	
480	960	378 × 527 × 262

## Notes

1. This product uses a Hall IC. Be aware of ESD damages.
2. Custom design for shaft configuration are available upon request.
3. Please place purchase orders per minimum order unit N (integer).


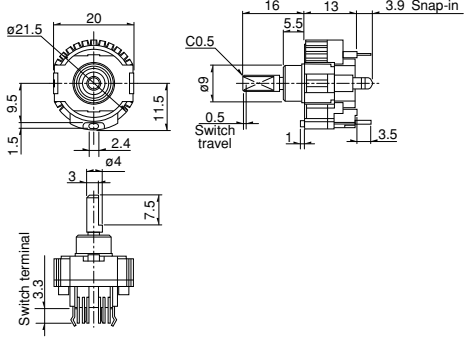
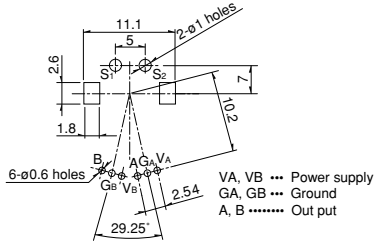

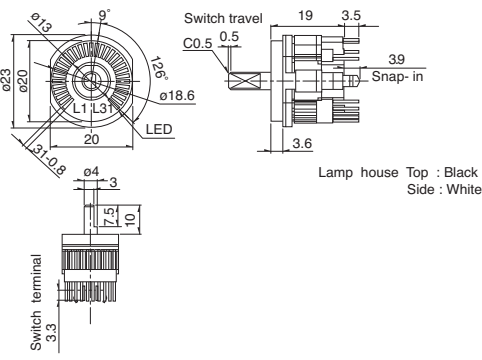
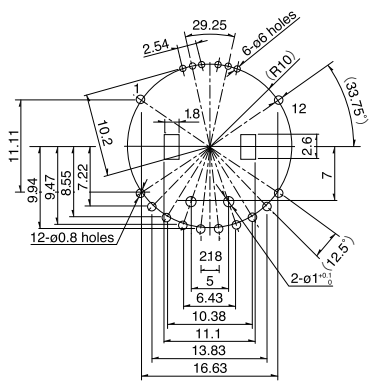
## Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			<p>VA, VB ... Power supply GA, GB ... Ground A, B ..... Out put</p>

**Dimensions**

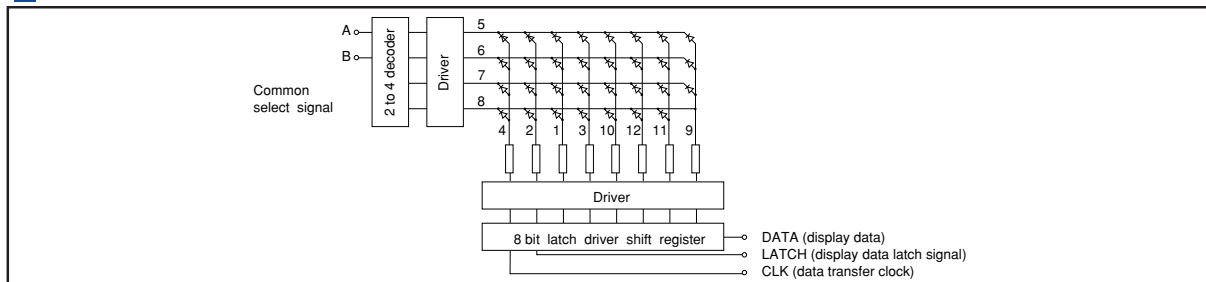
Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
2			 <p>VA, VB ... Power supply  GA, GB ... Ground  A, B ..... Out put</p>
3		 <p>Lamp house Top : Black  Side : White</p>	





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**LED Unit Recommended Drive Circuit Block Diagram**



## List of Varieties

Type		Metal shaft			
		11mm size		20mm size	
Series		EC11K	EC11J	EC20A/RK203	EM20B
Photo					
Output		Incremental			
Outline specifications	Shaft types	Single-shaft			
	Operating direction	Vertical			
	Number of pulse/ Number of detent	9/18 15/30		18/18	40/40
	Push switch (Travel mm)	Without With (0.5, 1.5)		Without With (1.5)	Without With (0.5)
	Optional function	—————			Display function
Dimensions (mm)	W	11.7		20.2	20
	D	12	14.2	19.2	22.25
	H	4.5		10	13
Soldering	Manual soldering	350°C max. 3s max.			
	Dip soldering	260±5°C, 3±1s	—————	260±5°C, 5±1s	260°C max. 3s max.
	Reflow soldering	—————	Please see P.212	—————	—————
Operating temperature range		-40°C to +85°C			-10°C to +70°C
Automotive use		○	○	○	—
Maximum operating current (Resistive load)		10mA			—————
Electrical performance	Output signal	Output of A and B signals, proportionate to phase difference			$V_{HI} : +4.0V \text{ min.}$ $V_{LO} : 0.5V \text{ max. (Isink=5mA)}$
	Output wave	Please see P.217			—————
	Output phase	—————			A, B (Squarewave)
	Sliding noise	Please see P.217			—————
	Insulation resistance	100MΩ min. 250V DC		10MΩ min. 50V DC	100MΩ min. 250V DC
	Voltage proof	300V AC for 1minute		50V AC for 1minute	300V AC for 1minute
Mechanical performance	Rotational torque	—————			7mN·m max.
	Detent torque	12±5mN·m		40±20mN·m	8±5mN·m
	Push-pull strength	100N			
Environmental performance	Cold	-40±2°C for 240h		-40±3°C for 240h	-30±3°C for 240h
	Dry heat	85±2°C for 240h		85±3°C for 240h	80±3°C for 240h
	Damp heat	60±2°C, 90 to 95% RH for 240h		60±3°C, 90 to 95%RH for 240h	40±2°C, 90 to 95%RH for 240h
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## Push-on Switch Specifications

Items	EC11K/EC11J		EC20A	EM20B
Contact arrangement	Single pole and single throw (Push-on)			
Travel (mm)	0.5±0.3	1.5±0.5		0.5 <sup>+0.4</sup> <sub>-0.3</sub>
Operating force (N)	5±2	4±2		6±3
Rating	0.1A 5V DC		0.5A 16V DC (1mA 16V DC min. ratings)	0.1A 5V DC
Contact resistance	100mΩ for initial period; 200mΩ after operating life			
Operating life	1,000,000 times min.	100,000 times min.	20,000times min.	25,000times min.

## Note

○marks in "Available for automotive use" indicate that some of the series products can work at the operating temperature range from -40°C to +85°C.

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line  
Package Type

TACT Switch™

Custom-  
ProductsMetal  
ShaftInsulated  
ShaftHollow  
ShaftRing  
Type