

# EC18A 18mm Size Insulated Shaft Type

Absolute type achieving high water resistance and heavy torque



Encoders



## Typical Specifications

Items	Specifications
Rating	1mA 10V DC
Operating life	30,000 cycles
Operating temperature range	-20°C to +60°C

## Product Line

Shaft configuration	Length of the shaft (mm)	Length of the shaft (mm)	Operating direction	Positions	Minimum order unit (pcs.)		Product No.	Drawing No.
					Japan	Export		
Flat	30.72	60±20	Vertical	12	450	900	<b>EC18AGA20402</b>	1
	32.56			15			<b>EC18AGB20407</b>	2
	38.06			16			<b>EC18AGB20401</b>	3

## Packing Specifications

Tray

Number of packages (pcs.)		Export package measurements (mm)
1 case /Japan	1 case /export packing	
450	900	540×360×270

## Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
1			<p>Pattern prohibition area</p>
2			
3			

Metal Shaft

Insulated Shaft

Through Shaft Type

Ring Type

■ Standard Codes  
EC18AGA

Position No.		1	2	3	4	5	6	7	8	9	10	11	12
Rotation angle (°)		0	30	60	90	120	150	180	210	240	270	300	330
TERMINAL NO.	1		●	●			●	●			●	●	
	2			●	●	●	●						
	3					●	●	●	●	●	●		
	4									●	●	●	●
	5 (COM)	●	●	●	●	●	●	●	●	●	●	●	●

EC18AGB20407

Position No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rotation angle (°)		0	24	48	72	96	120	144	168	192	216	240	264	288	312	336
TERMINAL NO.	1	●	●			●	●			●	●			●	●	
	2		●	●	●	●					●	●	●	●		
	3				●	●	●	●	●	●	●	●				
	4								●	●	●	●	●	●	●	●
	5 (COM)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

EC18AGB20401









Position No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rotation angle (°)		0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
TERMINAL NO.	1		●	●			●	●			●	●			●	●	
	2			●	●	●	●					●	●	●	●		
	3					●	●	●	●	●	●	●	●				
	4									●	●	●	●	●	●	●	●
	5 (COM)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

1. The ● marks shows the ON position.
2. The ● marks: Connections between terminals and the 5 (COM) are ON.

■ Waterproof Property

Immersion of encoder, not in operation, in water at depth of 1m at normal temperature for 30 minutes.

Encoders  
Metal Shaft  
Insulated Shaft  
Through Shaft Type  
Ring Type

Type		Metal shaft	Insulated shaft		
		20mm size	12mm size		18mm size
Series		<b>EC20A</b>	<b>EC12E</b>	<b>EC12D</b>	<b>EC18A</b>
Photo					
Output		Incremental (Two phase A and B)			Absolute type
Shaft types		Single-shaft			
Operating direction		Vertical			
Number of pulse / Number of detent		18/18	12/12 24/24 24/without	15/30	12 positions 15 positions 16 positions
Features		—	—	With push-on switch	Water resisting performance (IPX7)
Dimensions (mm)	W	20.2	12.4	12.5	18.8
	D	19.2	13.2	11.7	18
	H	10	5		8.75
Operating temperature range		-30°C to +80°C	-10°C to +70°C	-40°C to +85°C	-20°C to +60°C
Operating life		30,000 cycles	15,000 cycles 30,000 cycles	30,000 cycles	
Automotive use		●	—	●	—
Life cycle (availability)					
Electrical performance	Rating	1mA 5V DC	0.5mA 5V DC	1mA 5V DC	1mA 10V DC
	Max./min. operating current (Resistive load)	—	5mA / 0.5mA	10mA / 1mA	—
	Insulation resistance	10MΩ min. 50V DC		100MΩ min. 250V DC	10MΩ min. 250V DC
	Voltage proof	50V AC for 1 minute or 60V AC for 2s	50V AC for 1 minute	300V AC for 1 minute or 360V AC for 1s	50V AC for 1 minute or 60V AC for 2s
Mechanical performance	Rotational torque (Without detent)	—	10mN·m max. 25±15mN·m 40±15mN·m	—	—
	Detent torque	40±20mN·m	3±2mN·m 3 to 20mN·m	5±3mN·m 10±5mN·m	60±20mN·m
	Push-pull strength	100N	80N	100N	Push 100N / Pull 50N
Shaft configuration		Flat	Flat, Through shaft	Flat	
Terminal type		Insertion			
Switch Specifications	Switch type	Push-on switch	—	Push-on switch	—
	Contact arrangement	Single pole and single throw (Push-on)	—	Single pole and single throw (Push-on)	—
	Travel (mm)	1.5±0.5	—	0.5±0.3	—
	Operating force (N)	4±2	—	3 <sup>+1.5</sup> <sub>-1</sub>   6 <sup>+2.5</sup> <sub>-2</sub>	—
	Rating	0.1A 5V DC (0.1mA 5V DC min. ratings)	—	1mA 5V DC (10mA 5V DC max. ratings)	—
	Contact resistance	100mΩ max. for initial period; 200mΩ max. after operating life.	—	100mΩ max. for initial period; 200mΩ max. after operating life.	—
	Operating life	20,000 times	—	30,000 times	—
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#### Note

● Indicates applicability to all products in the series.

## Reference for Manual Soldering

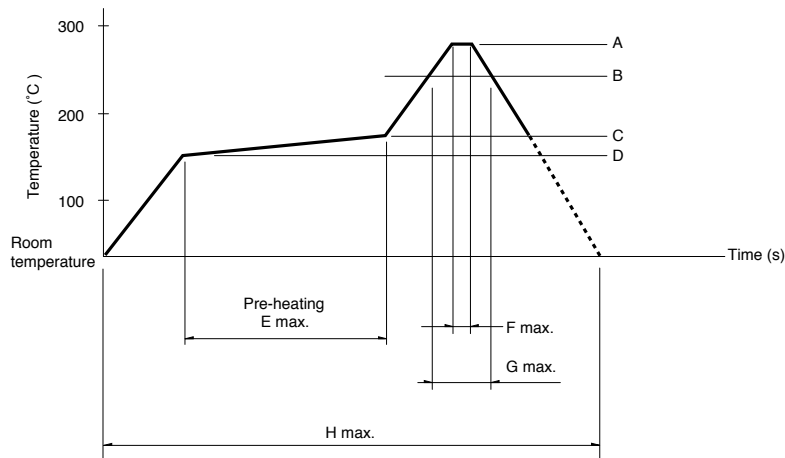
Series	Tip temperature	Soldering time	No. of solders
EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC11M, EC11N, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC40A, EC45A, EC50A, EC60B, EM11B, EC21C, EC28C, EC35CH	350°C max.	3s max.	1 time
EC11J	350±10°C	3 <sup>+1</sup> <sub>0</sub> s	2 times

## Reference for Dip Soldering

Series	Preheating		Dip soldering		No. of solders
	Soldering surface temperature	Heating time	Soldering temperature	Soldering time	
EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC11M, EC11N, EC18A, EC21A, EC28A, EC35A, EC35AH, EC50A, EC60B	100°C max.	2 min. max.	260±5°C	5±1s	2 times max.
EM11B	100°C max.	1 min. max.	260°C max.	3s max.	2 times max.
EC10E, EC12D, EC12E	100°C max.	1 min. max.	260±5°C	3±1s	2 times max.
EC40A	110°C max.	1 min. max.	260°C max.	10s max.	1 time
EC45A	100°C max.	2 min. max.	260°C max.	5s max.	2 times max.

## Example of Reflow Soldering Condition

Temperature profile



Series	A	B	C	D	E	F	G	H	No. of reflows
EC11J	260°C	230°C	180°C	150°C	2 min. max.	3s	40s	4 min. max.	2 times max.
EC05E	250°C min.	230°C min.	180°C	150°C	60s to 120s	—	30s to 40s	—	2 times max.
EC21C	230°C to 245°C	220°C	200°C	150°C	60s to 120s	—	25s to 60s	300s max.	1 time max.
EC28C, EC35CH	260°C	230°C	180°C	150°C	2 min. min.	3s	40s	230s max.	1 time max.

### Notes

- When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
- The temperatures given above are the maximum temperatures at the terminals of the encoder when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the encoder may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the encoder does not rise to 250°C or greater.
- Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.