## **Encoder** 11mm Size Metal Shaft Type

EC11 Series





## Compact and highly reliable type available in many varieties.



Typical Specifications							
Items	Specifications						
Rating	10mA 5V DC						
Operating life	15,000cycles EC11EH:30,000cycles						

**Detector** 

Push

Slide

**Rotary** 

#### Encoders

Power

Dual-in-line Package Type

TACT Switch™

Custom-**Products** 

Incremental Type
Absolute
Type

#### Product Line

Structure	Actuator configuration	Actuator length ( mm )	Torque (mN·m)	Number of detent	Number of pulse	Push-on switch	Travel of push-on switch( mm )	Operating life ( cycles )	Minimum order unit ( pcs. )	Product No.	Drawing <b>No</b> .
						Without				EC11B15202AA	1
Horizontal			12 ± 7	30	15	With	0.5		700	EC11B15242AE	2
						VVILII	1.5			EC11B15242AF	3
			10 ± 7	18	9					EC11E09204A4	
			10 ± 7	30	15					EC11E15204A3	
			7 + 3	Without	15	Without				EC11E1530401	4
		Flat 20 $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	10 ± 7	36	10			15,000	1,200	EC11E1820402	
			7 + 3	Without	10					EC11E1830401	
	Flot		10 . 7	18	9					EC11E09244BS	
	riat		10 ± /	30	15	15	0.5			EC11E15244G1	
Vertical			7 + 3	Without	15					EC11E153440D	
							EC11E18244AE				
			7 - 4	Without	18	With				EC11E1834404	5
			10 . 7	18	9	VVILII				EC11E09244AQ	5
	10 ± 7 30				EC11E15244B2						
			7 + 3	Without	15		1.5			EC11E1534408	
			10 ± 7	36	18					EC11E18244A5	
			7 + 3	Without	10					EC11E1834403	

#### Product Line

Structure	Actuator configuration	Actuator length ( mm )	Torque (mN·m)	Number of detent	Number of pulse	Push-on switch	Travel of push-on switch (mm)	Operating life (cycles)	Minimum order unit ( pcs. )	Product No.	Drawing <b>No</b> .
Less shaft		18	10 ± 7	30		With	1.5		1,200	EC11G1524402	6
wobble	20-tooth	10	7 + 3	Without	15	VVILII	1.5		1,200	EC11G1534403	
Push lock	serration	25	10 . 7	30	15	Without			1,000	EC11E152T409	7
Push lock		26.4	10 ± 7	30		With	8	15,000	800	EC11E152U402	8
		15				Without				EC1110120005	9
Self-return switch			3 to 30	Without	switch		0.5		1,200	EC1110120103	10
										1.5	
	Flat	20		18			0.5	20,000	1,000	EC11EH124403	
ABC		20		30	ABC	With	0.5			EC11EH224403	11
switch						switch		4.5	30,000	1,000	EC11EH124404
			10 ± 7				1.5			EC11EH224404	
		Inner-shaft=25		30			0.5		1 200	EC11EBB24C03	12
Dual-shaft	Slotted	Outer-shaft=15			15	Without	-	15 000	700	ECTIEBB24C03	12
Duai-snatt	Flat	Inner-shaft=25				With	1.5	15,000		EC11E0B2LB01	13
	Slotted	Outer-shaft=15	3 to 30	Without	Self-return switch	Without	-		700	LCTTEUBZLBUT	13

#### Note

Products other than those listed in the above chart are also available. Please contact us for details.

Incremental Type Absolute Type

Detector

Push

Slide

**Rotary** 

**Encoders** 

Power

Dual-in-line
Package Type

TACT Switch™

CustomProducts

Dimensions Unit:mm PC board mounting hole dimensions
( Viewed from mounting side No. Photo Style Horizontal 3.7 2.1 Mounting surface 7 12 1 3-ø1 holes M7×0.75 5.7 Horizontal with push-on switch Switch travel (travel 0.5mm) 11.7 Mounting surface 2 3.8 √ M7×0.75 0.8 6.9 Horizontal with push-on switch Switch travel (travel 1.5mm) 11.7 3 0.8 14.1 3.8 Vertical 11.7 4 <del>фф</del> АСВ (Switch01) <u>C1</u> R0.5 3.5 9.2 Vertical with push-on switch (travel 0.5/1.5mm) (Switch02) 5 (Switch01) \R0.5 9.2

**Detector** 

Push

Slide

Rotary

#### **Encoders**

Power

Dual-in-line Package Type

TACT Switch™

Custom-**Products** 

Incremental Туре

Absolute Type

Di	mensions		Unit:mn
No.	Photo	Style	PC board mounting hole dimensions (Viewed from mounting side)
6	Less shaft wobble with push-on switch (travel 1.5mm)	Mouting 3.5 18 Switch travel    13.1   11.7	12.5 Center of shate of the shape of the sha
7	Push-lock mechanism	Dummy terminal  5.1  9  Lock travel  Lock travel  11.7  A C B  9.2  20 teeth knurl  90.22  10.1	12.5 Dummy 1.5  A C'B  5-01 holes
8	Push-lock mechanism with push-lock switch	3.5 26.4 Total travel  (Switch02)  (Switch01)  3.5 20 teeth knurl  20 teeth knurl  20 teeth knurl  20 teeth knurl	12.5 D
9	Self-return switch	3.5 5 (15)  Dummy terminal  7 7 7  (Switch01)  3.5 R0.5 C1  20  11.7  A C B  9.2	12.5 Dummy 5 1.5 A C B 5-ø1 holes

Detector

Push

Slide

Rotary

**Encoders** 

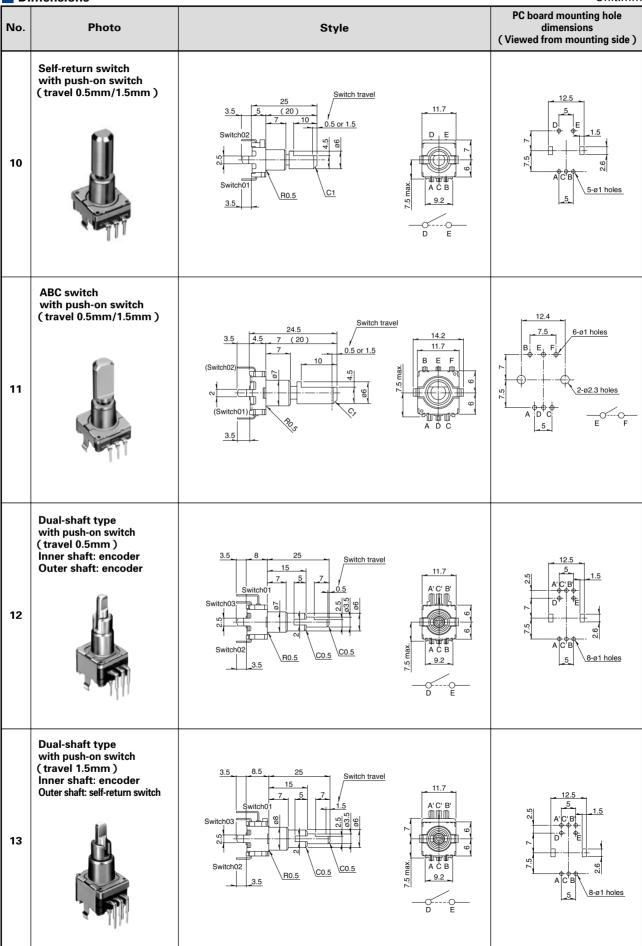
Power

Dual-in-line
Package Type

TACT Switch™

CustomProducts

Incremental Type Absolute Type **Dimensions** Unit:mm



Detector

Push

Slide

Rotary

#### Encoders

Power

Dual-in-line Package Type

TACT Switch™

Custom-Products

Incremental Type

Absolute Type

## **Product Varieties**

Configuration ( Shaft diameter :

Not applicable for EC11E

with push-lock mechanism

#### Shaft Dimensions

1. Single-shaft Type

and EC11G

1) Knurled Type Unit:mm

Detector

Push

Slide

Rotary

Encoders

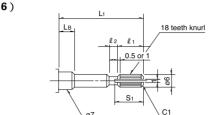
Power

Dual-in-line Package Type

TACT Switch™

Custom-Products

Incremental Type Absolute Type



Deta	Detailed dimensions							
L <sub>1</sub>	Lв	<b>l</b> 1	<b>l</b> 2	S <sub>1</sub>				
20	7	6	1	7				
25	7	10	2	11				

2) Flat Type Unit:mm

Configuration (Shaft diameter: 6



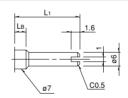
Detailed of	Detailed dimensions								
L <sub>1</sub>	Lв	l							
15	5	7							
15	7	5(6)							
20	7	10( 12 )							
25	7	12							

Does not comply with EC111

Dimensions marked with () apply to products without push-on switches.

3) Slotted Type Unit:mm

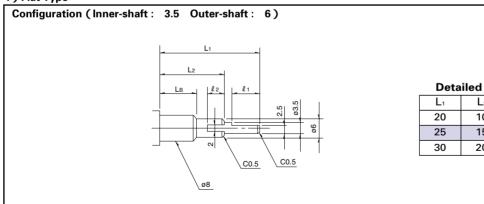
Configuration (Shaft diameter :



Detailed dimens	Detailed dimensions						
L <sub>1</sub>	Lв						
15	7						
20	7						
25	7						

#### 2. Standard Dimensions and configuration of Dual-shaft Type

1) Flat Type Unit:mm



Deta	Detailed dimensions									
L <sub>1</sub>	L <sub>2</sub>	Lв	<b>l</b> 1	<b>l</b> 2						
20	10	5	7	4						
25	15	7	7	5						
30	20	7	7	5						

#### Notes

- 1. The highlighted figures in shaft types refer to Product Specifications in P.181 and P.182.
- 2. Products other than those listed in the above chart are also available. Please contact us for details

# List of Varieties

Detector

Push

Slide

Rotary

**Encoders** 

Power

Dual-in-line Package Type

TACT Switch<sup>™</sup>

Custom-Products

Incremental Type Absolute Type

					2.0						
	Туре	9mm	cizo		IVI	etal shaft	11				
	Series	EC0		EC1	1D	EC.	11mm size	EC111	EC1	1EH	
	Photo		<u> </u>	£61							
	Output	4-	In.	crement	al	7711	4-1/1	Self-return switch	V.	BC	
			e-shaft	BC							
Operatin Number Number		Verti			ntal						
			15/30	I .		15/ 18/	/30 /36		6×A 10×A	BC/18 ABC/30	
ne tion	(Travel mm)			W		/With( 0.5, 1.5	5)				
<u>σ</u>	Optional functions	_				Push-lock mechanism Without detent					
	Changeover angle							17 to 40°			
Dimensis	W 9.5 12.3 11.					1.7					
(mm)	D		-	13.			2	13	1	2	
	Н	4.9	5	5.4	1	4.5 8.5		5	4	.5	
Soldering	Manual soldering		350 max. 3s max.								
	Dip soldering		, 3 ± 1s				· · · · · · · · · · · · · · · · · · ·	-			
	g temperature range	–40 to	+ 85				-30 to +85		–40 to	0 +85	
Maximum ope	erating current(Resistive load) Output signal	0	A and B signals,			10mA		Self-return switch	I	se A, B and C	
Electrical performance	Output wave	A signal OFF  B signal OFF  De  CW direction	Please see P.191								
	Sliding noise	V1 = V2 = 1.5V ma  Test circuit  F OTERMINAL A O TERMINAL B  Encoder  Terminal C  Measurement condition: Redation speed 360 %  At R = 5 k  Chattering: Bounce	Please see P.191								
Bounce :2ms max.  Insulation resistance 100M min. 250V DC											
	Voltage proof	300V AC for 1minute									
Mechanical performance	Rotational torque  Detent torque	8 ± 5m	Nam	12 . 7	NI.	7 : 3 1		3 to 30mN⋅m	10 . 7	mN	
nica		o±5m	IN-III	12±7mN⋅m 10±7mN⋅m 10±7n					111111111		
	Push-pull strength	¥									
nviro	Cold Dry heat	10 - 20 10 10 10 10 10 10 10 10 10 10 10 10 10									
Environmental performance	Dry neat  Damp heat			85 ± 3 for 240h 60 ± 2 , 90 to 95%RH for 240h							
	Circuit · number of contacts		c:								
-	Travel( mm )	0.5 ± 0.3	1.5 ± 0.5	tingle pole and single throw( Push-on ) $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$					0.5 + 0.4	1.5 ± 0.5	
Push-on Switch Specifications	Operating force(N)	0.5 ± 0.3 6 + 2.5	1.5 ± 0.5 4 ± 2	0.0	5 ± 2	0.5 ± 0.3 6 + 2.5	8 ± 0.8 4 ± 2	<del>                                     </del>	0.5 : 6.3 6 ± 2.5		
offic ific	Rating	10mA 5		3A 16V (10mA 16V DC n			8max. . 16V DC min. rating			16V DC C min. ratings	
Sw	Contact esistance	IOTIA		<u> (10mA 16V DC r</u> or initial	-	,	ıx. after opera		<u>J( 1mA 16V D(</u>	umin. ratings	
itch	Operating life	10,000tim		25,000 times min.	POTIO	20,00	Otimes min. times min.	ang mo.		000 cles	
		18	^				181		<u> </u>		

Note

marked specification is only applicable to EC11E152U402.

# List of Varieties

Voltage proof   300 V AC for 1minute   50 V AC for 1minute   300		T		Meta	Insulated shaft							
Photo		туре		11mm size			20mm size		n size			
Shaft types		Series	EC11G	EC11J	EC11k	<b>‹</b>	EC20A/RK203		12mm size  EC12E EC12D  Indard detent Without detent With push-on switc  12/12 24/24  Without Without With (0.5)			
Shaft types   Single-shaft   Vertical   Ve		Photo										
Number of plates   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   15/30   18/18   12/12   15/30   18/18   12/12   15/30   18/18   15/30   18/18   12/12   15/30   18/18   15/30   18/18   12/12   15/30   18/18   15/30   18/18   12/12   15/30   18/18   15/30   1		Output				In	cremental					
Number of pulse/  Number of detent   15/30   9/18   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   18/18   12/12   15/30   15/30   15/30   18/18   12/12   15/30		Shaft types				S	ngle-shaft					
Please see P.191   Please see	<u>&amp;</u>						Vertical					
Please see P.191   Please see	Outli pecifica	Number of detent		15	/30					15/30		
Changeover angle	ne ations	(Travel mm) Optional	With( 1.5 )	With( (	).5, 1.5 )		With( 1.5 )	Wit	hout —	With( 0.5 )		
Dimensions												
Manual soldering		W		11.7			2.0	12	2.4	12.5		
Manual soldering   350 max. 3s max.		D	12	14	4.2		19.2	13	3.2	11.7		
Dip soldering   260±5 ,5±1s   260±5 ,5±1s   260 ±5 ,3±1s   260 ±	(11111)	Н		4.5			10		į	5		
Reflow soldering Please see P.189  Operating temperature range -30 to +85		Manual soldering				350	max. 3s max.					
Name	Soldering	Dip soldering	260 ± 5 , 5 ± 1s		26	0 ± 5	,5±1s		5 ,3±1s			
National operating current (Resistive load)   10mA		Reflow soldering		Please see P.189								
Output signal  Output wave  Please see P.191  Sliding noise  Please see P.191  Please see P.191  Sliding noise  Please see P.191  Please see P.191  Please see P.191  Sliding noise  Please see P.191  Please see P.191  Please see P.191  Output wave  Please see P.191  At R = 10k Chattering: 3ms max. Bounce: 2ms ma	Operating t	emperature range	-30 to +85	–40 to	+ 85		-30 to +80	-10 to +70 -40 to		-40 to +85		
Output wave  Please see P.191  Sliding noise  Please see P.191  Sliding noise  Please see P.191  Sliding noise  Please see P.191  A signal OFF ON Detent stability point (When the switch is provided)  CW direction  V1 = V2 = 1.5V max.  Test circuit SV DC  Resource 1 Terminal C Silicing direction  At R = 10k Chattering: 3ms max. Bounce 1 2ms max. Bounce 2 2ms max.  Insulation resistance  Voltage proof  300V AC for 1 minute  Town min. 50V DC  100M min. 50V DC  100M min. 50V DC  100M min. 50V DC  100M min. 250V DC  100M min.	Maximum operati	ing current( Resistive load )		10mA			1mA	5mA 10mA				
Sliding noise   Please see P.191     Determinal Substitution provided   CW direction   Determinal Substitution provided   CW direction   Determinal Substitution provided   CW direction		Output signal		Output	of A and B	signals	, proportionate t	o phase dif	ference			
Neasurement condition : Rotation speed 360/s t : Masking time to avoid chattering : 3ms max. Bounce : 2ms max. Bounce	Ele	Output wave		Please	see P.191			B signal OFF ON Other the switch is provided (				
Rounce : 2ms max.   Bounce : 2ms max.   Boun	ctrical performance	Sliding noise		Please see P.191						B ON OFF ON Sliding direction  O'/s t: Masking time to avoid chattering		
Voltage proof   300 V AC for 1 minute   50 V AC for 1 minute   300 V AC for 1 minute or 360 V						Bounce : 2ms max. Bo						
Rotational torque   7 1 3 mN·m	Ins											
Rotational torque		Voltage proof	30	OV AC for 1min	ute		50V AC	for 1minu		300V AC for 1minute or 360V AC for 1s.		
	Mech:	•						3+2mN+m	25 ± 15mN · m	5 + 3mN+m		
	nan	•	10 ± 7mN⋅m				40 ± 20mN⋅m	3 to 20mN⋅m		10 ± 5mN⋅m		
Cold   -40±3   for 240h   -40±3   for 240h ± 10h				10				80	-			
The state of the	Enviro	Dry heat 85±3 for 240h							40 ± 3 fo	r 240h ± 10h		
3.2	onme											
		•						60 ± 2	, 90 to 95%			
	Circ									Single pole and single throw ( Push-on )		
Travel(mm) 0.5±0.3 1.5±0.5 0.5±0.3 1.5±0.5 0.5±0.3 1.5±0.5 0.5±0.3	S P			<b> </b>								
Operating force(N) 6: 25		• , ,										
Rating (1.5A 16V DC (1mA 16V DC min. ratings) 0.1A 5V DC (1mA 16V DC min. ratings) 1mA 5V DC	on S	Rating		0.1A	5V DC	(				1mA 5V DC		
Contact esistance   100m   for initial period; 200m   after operating life   1000   000   500   500   500   100		ontact esistance	100m fo	r initial period;	200m aft	er ope	erating life			100m for initial period; 200m after operating life		
1 1,000,000 300,000 1,000,000 100,000 20 000times	s h	Operating life	20,000times min.	times times	times t	imes	,			30,000times min.		
1.000 1.000 1.000		Page	181	<b>-</b>	87		190		19	92		

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line Package Type

TACT Switch™

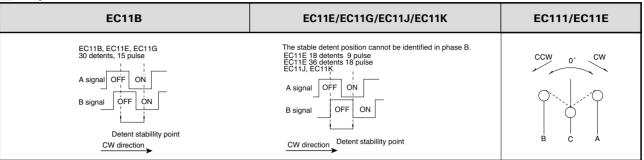
Custom-Products

Incremental Type Absolute

Туре

# **Product Specifications**

#### Output Wave



EC11EH EC20A A signal OFF A( Terminal A-C ) ON Clockwise OFF B signal B( Terminal B-C ) ON C signal OFF ON Counter-clockwise Detent position B( Terminal B-C ) CW direction

## Detector

Push

Slide

Rotary

#### Encoders

Power

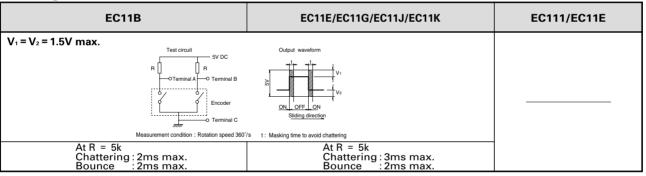
Dual-in-line Package Type

TACT Switch™

Custom-Products

Incremental Type Absolute Type

#### Sliding Noise



Test circuit

Test circuit

Test condition Rotation speed 360 /s

ABC switch

ABC switch

Test condition Rotation speed 360 /s

ABC switch

ABC switch

ABC switch

ABC switch

ABC switch

Test condition Rotation speed 360 /s

ABC switch

ABC switch

ABC switch

ABC switch

Measurement condition: Rotation speed 360 /s

At R = 5k

Chattering: 5ms max.

Bounce: 5ms max.

Bounce: 5ms max.

# **Attached Parts**

### EC11B Series Unit:mm

