

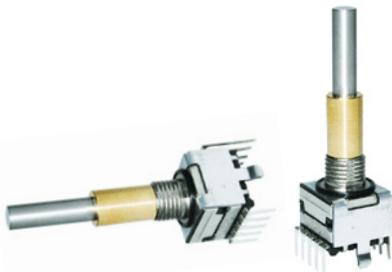
Product description

MAIN FEATURES

DUAL FUNCTION AND HIGH PERFORMANCE

- › Dual encoder: Two encoders - one space
- › Resolution: 16 or 32 detent
- › With or without integrated push button
- › Rotational life: Up to 1 Million revolutions
- › Excellent indexing feel with 0.5, 1, 1.5, 2, 2.5, 3, 3.5 or 4.5 Ncm switching torque (remains consistent over life)
- › Gold plated contacts
- › Robust metal housing
- › Body size: 11.5 x 12.3 x 9.1 mm
- › IP68 shaft and front panel sealing
- › Operating temperature: -40 to +85 °C
- › Shaft electrically insulated > 500 VDC (Shaft to contact system)
- › Various options and customizations

E37



ELV (2000/53/EC)

RoHS (2011/65/EU)

MIL-STD-202G

SWISS CLICK INDEXING SYSTEM™

(for more information see chapter «Technical explanations»)

PRODUCT VARIETY

- Vertical or horizontal mounting
- Threaded or non-threaded bushing
- Push button force 3, 6, 10, 14 N or without push
- Resolution / pulses per revolution (PPR)
32 / 16, 32 / 8, 16 / 16, 16 / 8
- Switching torque 0.5, 1, 1.5, 2, 2.5, 3, 3.5 or 4.5 Ncm or no detent
- Front panel sealing IP60 or IP68

POSSIBLE CUSTOMIZATIONS

- Shaft dimension and shape
- Stainless steel housing
- Switching torque and push button actuation force
- Indexing resolution and PPR

TYPICAL APPLICATIONS

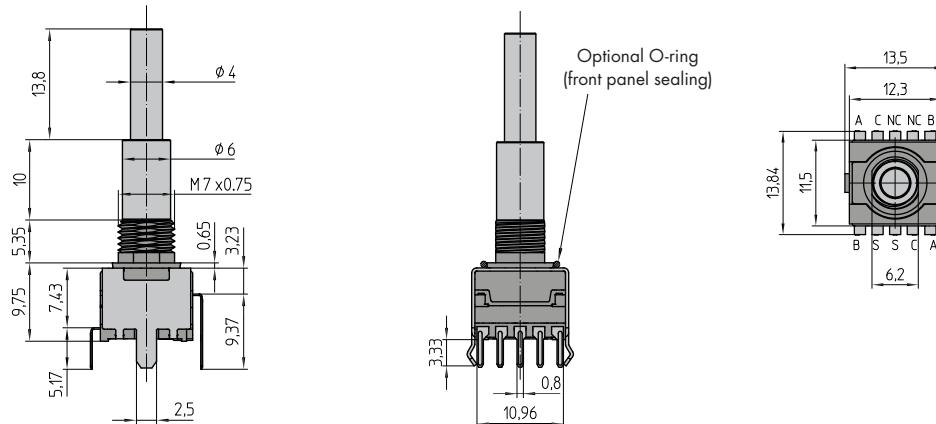
- Cockpit control, radios and navigation
- Desktop and mobile radios
- Professional, portable audio equipment
- Applications where user interface is space critical

Dimensions and pin assignment

SWITCH DESIGN

THT VERTICAL

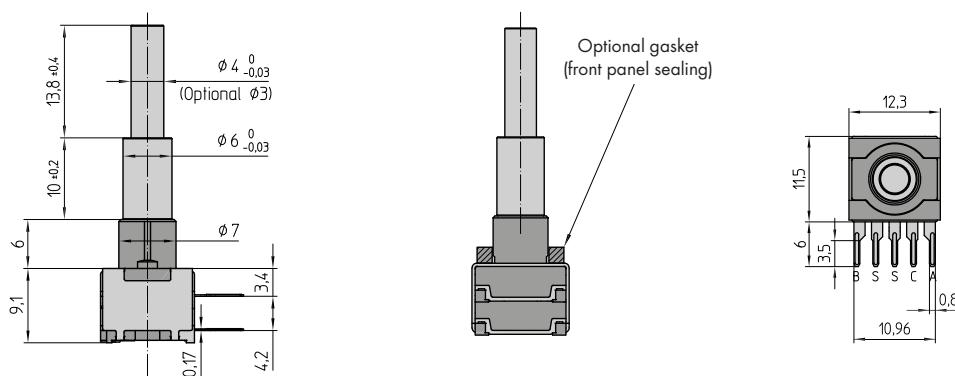
Example of illustration with thread



Both threaded and non-threaded bushing are available for all versions;
THT vertical or THT horizontal (see type key).

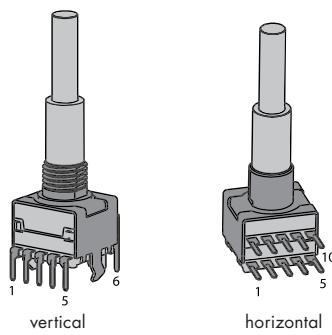
THT HORIZONTAL

Example of illustration without thread



Both threaded and non-threaded bushing are available for all versions;
THT vertical or THT horizontal (see type key).

PIN ASSIGNMENT



PIN	1	2	3	4	5
Bi	S	S	Ci	Ai	
6	7	8	9	10	
Bo	NC	NC	Co	Ao	

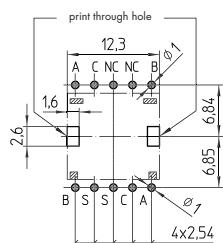
Dimensions in mm
Tolerances according to DIN ISO 2768-1 (m), unless otherwise specified

Dimensions and pin assignment

DRILLING AND FOOTPRINT

THT VERTICAL

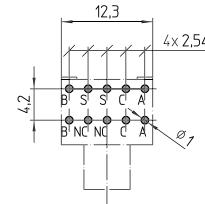
View from component side of the PCB



PCB-thickness: 1 to 1.5 mm

THT HORIZONTAL

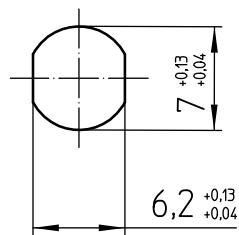
View from component side of the PCB



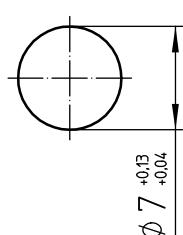
PCB-thickness: 1 to 1.5 mm

FRONT PANEL CUT OUT

THREADED

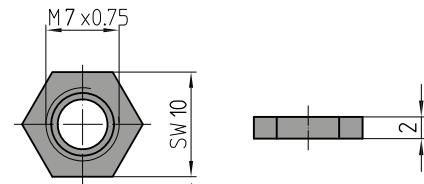


NON-THREADED



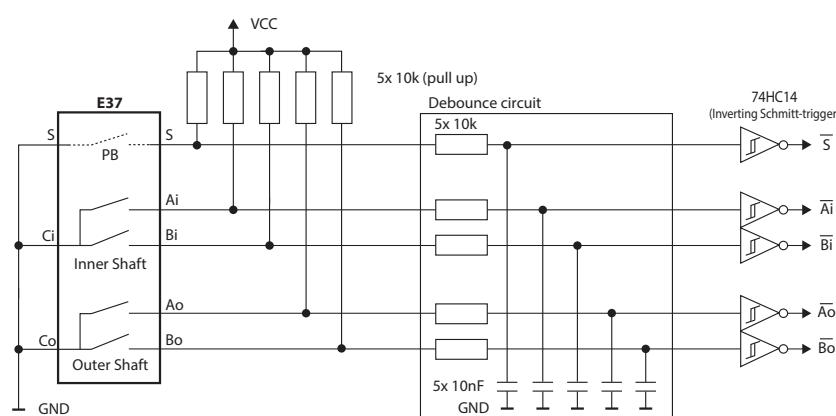
NUT

HEX NUT (SUPPLIED)



Circuit diagram

RECOMMENDED SYSTEM INTERFACE



Ordering information

ORDERING CODE

E37	-	-	-	-	-	-	-	-	-
ORIENTATION MOUNTING					SHAFT TYPE				
BUSHING					IP SEALING				
PUSH BUTTON					INNER SHAFT¹ RESOLUTION TORQUE				
OUTER SHAFT¹ RESOLUTION TORQUE					INNER SHAFT¹ RESOLUTION TORQUE				
INNER SHAFT¹ RESOLUTION TORQUE					OUTER SHAFT¹ RESOLUTION TORQUE				
OUTER SHAFT¹ RESOLUTION TORQUE					OUTER SHAFT¹ RESOLUTION TORQUE				

ORIENTATION | MOUNTING

V THT vertical
C THT horizontal

BUSHING

T Threaded M7 x 0.75 x 6 mm
 (nut supplied, packed separately)
N Non-threaded Ø 7 x 6 mm

PUSH BUTTON

0 Without push button
3 3 N
6 6 N
A 10 N
E 14 N

INNER SHAFT¹ | RESOLUTION | TORQUE

2	16 detent	(8 PPR)	1.5 Ncm
3	16 detent	(8 PPR)	2.5 Ncm
4	16 detent	(16 PPR)	1.5 Ncm
6	16 detent	(16 PPR)	2.5 Ncm
8	No detent	(16 PPR)	
9	No detent	(8 PPR)	
G	16 detent	(8 PPR)	4.5 Ncm

¹ O-ring of IP65 / IP68 shaft sealing may slightly increase switching torque

OUTER SHAFT¹ | RESOLUTION | TORQUE

1	32 detent	(16 PPR)	2 Ncm
2	16 detent	(8 PPR)	1.5 Ncm
3	16 detent	(8 PPR)	2.5 Ncm
4	32 detent	(8 PPR)	2 Ncm
5	16 detent	(16 PPR)	1.5 Ncm
6	16 detent	(16 PPR)	2.5 Ncm
8	No detent	(16 PPR)	
9	No detent	(8 PPR)	
A	32 detent	(16 PPR)	0.5 Ncm
B²	32 detent	(16 PPR)	1 Ncm
C	32 detent	(16 PPR)	1.5 Ncm
D	32 detent	(16 PPR)	3 Ncm
E	16 detent	(8 PPR)	0.5 Ncm
F	16 detent	(8 PPR)	3.5 Ncm
G	16 detent	(8 PPR)	4.5 Ncm

¹ O-ring of IP65 / IP68 shaft sealing may slightly increase switching torque
² Available with non-threaded bushing only

Ordering information

PREFERENCE TYPES SELECTION CHART¹

PUSH BUTTON	INNER SHAFT	OUTER SHAFT	IP SEALING	PART NUMBER	
				THT VERTICAL (THREADED BUSHING)	THT HORIZONTAL (THREADED BUSHING)
Yes, 6 N 2.5 Ncm	16 detent (8 PPR) 2.5 Ncm	16 detent (8 PPR) 2.5 Ncm	IP60	E37-VT6330-1	E37-CT6330-1
			IP68	E37-VT6332-1	E37-CT6332-1
	32 detent (16 PPR) 2 Ncm	IP60	E37-VT6310-1	E37-CT6310-1	E37-CT6312-1
		IP68	E37-VT6312-1		

PACKAGING

Blister box:

20 pieces (nuts are supplied and packed separately)

ACCESSORIES AND SPARE PARTS

Hex nut M7 X 0.75:

Part number 4516-40 (50 pieces / bag), brass, nickel plated

RECOMMENDED KNOBS



CLASSIC COLLETS 10 / 14.5 MM (FOR SHAFT TYPE Ø 3 MM)

Inner shaft	Cap	10 mm black, glossy	040-1020
	Knob	10 mm, classic collet, glossy	020-2120
Outer shaft	Knob	14.5 mm, classic collet, glossy	020-3440
Inner shaft	Cap	10 mm black, matt	040-1025
	Knob	10 mm, classic collet, matt	020-2125
Outer shaft	Knob	14.5 mm, classic collet, matt	020-3445



METAL KNOBS 11 / 15 MM (FOR SHAFT TYPES Ø 4 MM)

Inner shaft	11 mm, metal
Outer shaft	15 mm, metal
2 pc sets:	
Silver: CAE041559	
Black: CAE041560	

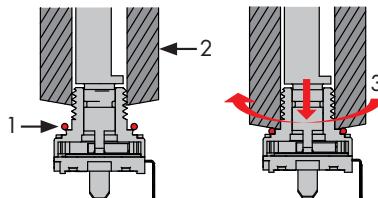
¹ For other types | options see ordering code

Ordering information

ACCESSORIES AND SPARE PARTS



Part number: E33-ORING-TOOL



- 1 Slip the lubricated O-ring over the bushing.
- 2 Slide the mounting tool over the bushing.
- 3 While pushing down the O-ring simultaneously rotate the mounting tool.

Specifications

Mechanical data

Positions:	Inner shaft: 16 positions or no detent Outer shaft: 16, 32 positions or no detent
Switching torque:	Inner shaft: 16 positions with 1.5, 2.5 Ncm, 4.5 Ncm or without detent ($\pm 30\%$ in new condition) Outer shaft: 32 positions with 0.5, 1, 1.5, 2 or 3 Ncm ($\pm 30\%$ in new condition) 16 positions with 0.5, 1.5, 2.5, 3.5, 4.5 Ncm or no detent ($\pm 30\%$ in new condition)
Rotational life:	> 1'000'000 revolutions with 0.5, 1 or 1.5 Ncm switching torque or no detent > 500'000 revolutions with 2 Ncm switching torque > 300'000 revolutions with 2.5 Ncm switching torque > 100'000 revolutions with 3, 3.5 or 4.5 Ncm switching torque (tested at room temperature)
Allowed shaft load:	50 N push, 50 N pull and 50 N side load (static at 20 mm from support surface)
Fastening torque of nut (front panel mounting):	M7 x 0.75: < 100 Ncm

Electrical data

Electrical connection:	Pins 0.23 x 0.8 mm
Switching voltage:	< 15 VDC (resistive load)
Switching current:	< 10 mA (resistive load)
Contact resistance:	< 10 Ω (over the entire rotational life)
Signal coding:	2-Bit quadrature
Resolution (pulses per revolution):	16 or 8 PPR per channel
Rotational speed:	< 60 rpm
Phase shift:	90° ($\pm 70^\circ$)
Contact bouncing:	< 2 ms (at 60 rpm)
Dielectric strength:	500 VDC during 60 s (MIL-STD-202G, method 301)
Insulation resistance:	> 1 G Ω at 500 VDC (in new condition)

Specifications

MATERIALS

Shaft:	Inner shaft: Stainless steel 1.4305 Outer shaft: Brass CuZn38Pb2
Bushing housing:	Zinc die casting nickel plated, fiberglass reinforced high performance plastic
Contact surface:	Cu alloy (Au plated)
Soldering leads:	Cu alloy (tin plated)
Hex nut:	Brass (nickel plated)
Housing clamp:	Tinplate
O-rings:	NBR (nitrile rubber), 70 shore A
Front panel sealing:	Threaded bushing: O-ring Non-threaded bushing: EPDM-rubber, 45 shore A, complies with SAE J 18-79

ENVIRONMENTAL DATA

Operating temperature:	-40 to +85 °C (IEC 60068-2-14)
Storage temperature:	-65 to +125 °C (IEC 60068-2-14, MIL-STD202G, method 107G, condition B-3)
Humidity:	< 93 % relative humidity (MIL-STD-202G, method 103B, condition B)
IP sealing against front panel:	IP60 without sealing IP65 with non-threaded bushing, shaft and front panel sealing IP68 with threaded bushing, shaft and front panel sealing (2 bar, 1 h)
Vibration:	29 G _{RMS} at 100 to 1'000 Hz (MIL-STD-202G, method 214A, condition 1 h / 15 min)
Shock:	100 G (MIL-STD-202G, method 213B, condition C)
Flammability:	UL94-VO Gaskets UL94-HB

SOLDERING CONDITIONS

Hand soldering:	< 300 °C during 3 s
Reflow soldering:	< 280 °C during 5 s

MECHANICAL DATA FOR PUSH BUTTON

Actuation force:	3, 6, 10 or 14 N (±30 % in new condition)
Travel:	0.5 (±0.2) mm
Lifecycles:	> 200'000 cycles (tested at room temperature)

ELECTRICAL DATA FOR PUSH BUTTON

Switching voltage:	< 15 VDC (resistive load)
Switching current:	< 10 mA (resistive load)
Contact bouncing:	< 2 ms (at 2 Hz)

MATERIALS FOR PUSH BUTTON

Contact surface:	Cu alloy (Au plated)
Snap dome:	Stainless steel (Au plated)

©Copyright 2018 by Elma Electronic AG, CH-8620 Wetzikon. Subject to technical modifications, all data supplied without liability.

Please contact our sales team for more details.

China: +86 21 5866 5908
France: +33 388 56 72 50

Germany: +49 7231 97 34 0
Israel: +972 3 930 50 25

Singapore: +65 6479 8552
Switzerland: +41 44 933 41 11

United Kingdom: +44 1234 838 822
United States: +1 510 656 3400