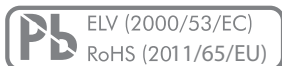


## Product description

### MAIN FEATURES

#### DUAL FUNCTION AND HIGH PERFORMANCE

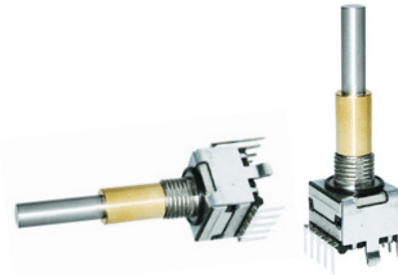
- › Dual encoder: Two encoders - one space
- › Resolution: 16 or 32 detent
- › With or without integrated push button
- › Rotational life: Up to 1 Million revolutions
- › Excellent indexing feel with 0.5, 1, 1.5, 2, 2.5, 3, 3.5 or 4.5 Ncm switching torque (remains consistent over life)
- › Gold plated 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



MIL-STD-202G

SWISS CLICK INDEXING SYSTEM™

(for more information see chapter «Technical explanations»)

**E37**

### 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

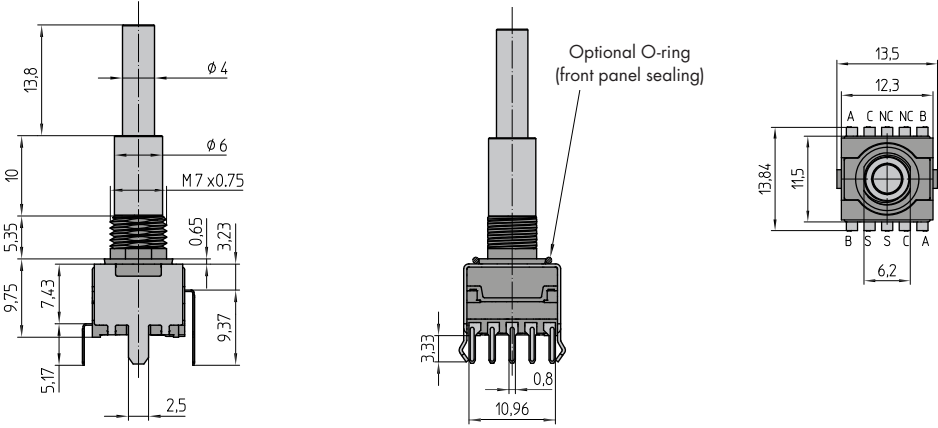
- Cockpit control, radios and navigation
- Desktop and mobile radios
- Professional, portable audio equipment
- Applications where user interface is space critical

**Dimensions and pin assignment**

**SWITCH DESIGN**

THT VERTICAL

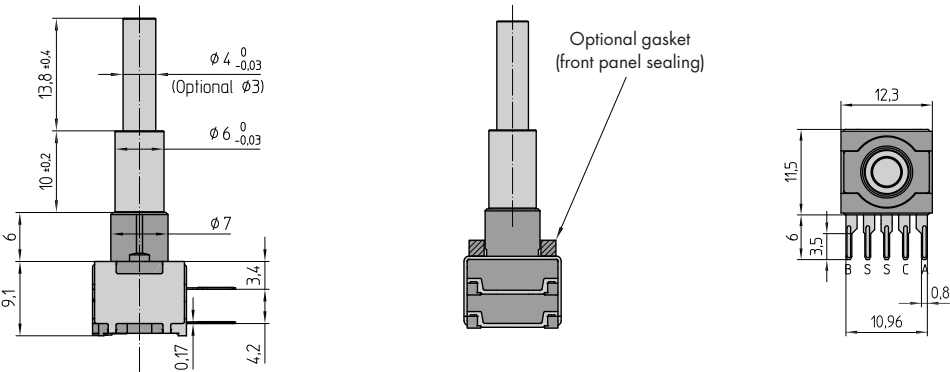
Example of illustration with thread



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

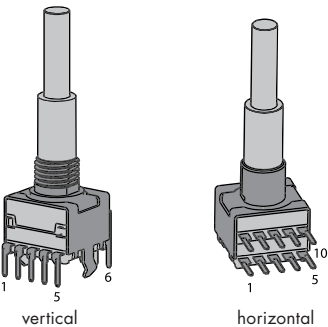
THT HORIZONTAL

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

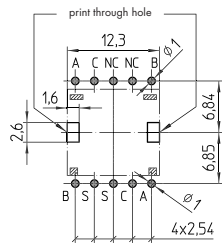
Dimensions in mm  
Tolerances according to DIN ISO 2768-1 (m), unless otherwise specified

## Dimensions and pin assignment

### DRILLING AND FOOTPRINT

#### THT VERTICAL

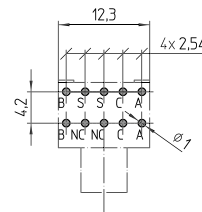
View from component side of the PCB



PCB-thickness: 1 to 1.5 mm

#### THT HORIZONTAL

View from component side of the PCB

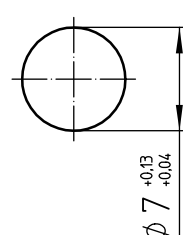
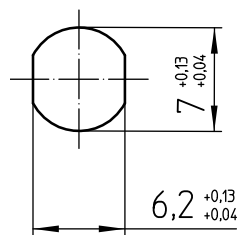


PCB-thickness: 1 to 1.5 mm

### FRONT PANEL CUT OUT

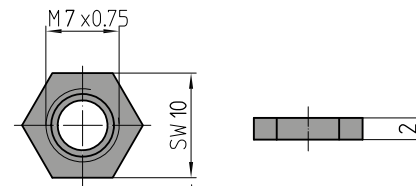
#### THREADED

#### NON-THREADED



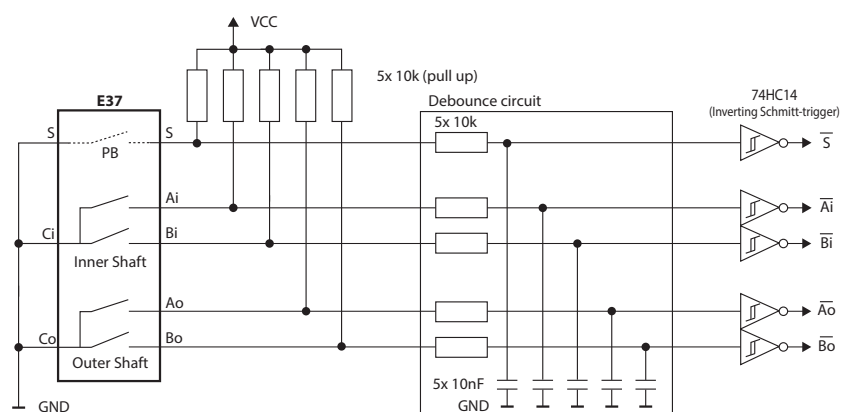
### NUT

#### HEX NUT (SUPPLIED)



## Circuit diagram

### RECOMMENDED SYSTEM INTERFACE



## Ordering information

### ORDERING CODE

E37	-	-	-	-	-	-	-	-	-
-----	---	---	---	---	---	---	---	---	---

#### ORIENTATION | MOUNTING

- 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 SHAFT<sup>1</sup> | RESOLUTION | TORQUE

- |          |           |          |         |
|----------|-----------|----------|---------|
| <b>2</b> | 16 detent | (8 PPR)  | 1.5 Ncm |
| <b>3</b> | 16 detent | (8 PPR)  | 2.5 Ncm |
| <b>4</b> | 16 detent | (16 PPR) | 1.5 Ncm |
| <b>6</b> | 16 detent | (16 PPR) | 2.5 Ncm |
| <b>8</b> | No detent | (16 PPR) |         |
| <b>9</b> | No detent | (8 PPR)  |         |
| <b>G</b> | 16 detent | (8 PPR)  | 4.5 Ncm |

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

#### SHAFT TYPE

- 1** Basic (see drawing)  
**2** Inner shaft; Ø 3 mm, same length as basic type

#### IP SEALING

- 0** IP60  
**1'** IP68 shaft sealing  
**2'** IP68 shaft | front panel sealing  
 (non-threaded bushing gasket provides IP65,  
 O-ring | gasket is mounted)

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

#### OUTER SHAFT<sup>1</sup> | RESOLUTION | TORQUE

- |                      |           |          |         |
|----------------------|-----------|----------|---------|
| <b>1</b>             | 32 detent | (16 PPR) | 2 Ncm   |
| <b>2</b>             | 16 detent | (8 PPR)  | 1.5 Ncm |
| <b>3</b>             | 16 detent | (8 PPR)  | 2.5 Ncm |
| <b>4</b>             | 32 detent | (8 PPR)  | 2 Ncm   |
| <b>5</b>             | 16 detent | (16 PPR) | 1.5 Ncm |
| <b>6</b>             | 16 detent | (16 PPR) | 2.5 Ncm |
| <b>8</b>             | No detent | (16 PPR) |         |
| <b>9</b>             | No detent | (8 PPR)  |         |
| <b>A</b>             | 32 detent | (16 PPR) | 0.5 Ncm |
| <b>B<sup>2</sup></b> | 32 detent | (16 PPR) | 1 Ncm   |
| <b>C</b>             | 32 detent | (16 PPR) | 1.5 Ncm |
| <b>D</b>             | 32 detent | (16 PPR) | 3 Ncm   |
| <b>E</b>             | 16 detent | (8 PPR)  | 0.5 Ncm |
| <b>F</b>             | 16 detent | (8 PPR)  | 3.5 Ncm |
| <b>G</b>             | 16 detent | (8 PPR)  | 4.5 Ncm |

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

<sup>2</sup> Available with non-threaded bushing only



## Ordering information

### PREFERENCE TYPES SELECTION CHART<sup>1</sup>

PUSH BUTTON	INNER SHAFT	OUTER SHAFT	IP SEALING	PART NUMBER	
				THT VERTICAL (THREADED BUSHING)	THT HORIZONTAL (THREADED BUSHING)
Yes, 6 N	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
			IP68	E37-VT6312-1	E37-CT6312-1

### 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
<b>2 pc sets:</b>	
Silver: CAE041559	
Black: CAE041560	

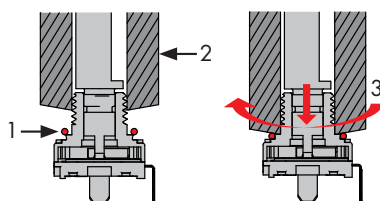
<sup>1</sup> For other types | options see ordering code

## 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 $\Omega$ (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 $\Omega$ at 500 VDC (in new condition)

## 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 <sub>RMS</sub> 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-V0 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)

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