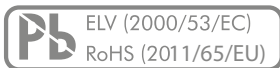


Product description

MAIN FEATURES

MECHANICAL INCREMENTAL ENCODER

- › Body size: 14.4 x 11.4 x 6.5 mm
- › Rotational life: Up to 150'000 revolutions
- › Resolution: 16, 24 or 30 detents
- › Detent torque: 0.5, 1.5 or 2.5 Ncm
- › With or without push button
- › Push force: 3, 6 N
- › Gold plated sliding contacts
- › IP68 shaft sealing available
- › Various shaft types in brass and stainless steel available
- › Reflow ability
- › Various options and customizations possible



MIL-STD-202G

SWISS CLICK INDEXING SYSTEM™

(for more information see chapter «Technical explanations»)



PRODUCT VARIETY

- With and without push button
- THT or SMT reflow
- Threaded or non-threaded bushing
- Detent torque with 0.5, 1.5 or 2.5 Ncm
- Tray or tape & reel packaging
- Shaft mounted, separated or without shaft

POSSIBLE CUSTOMIZATIONS

- Shaft dimension and shape
- Detent torque
- Front panel sealing

TYPICAL APPLICATIONS

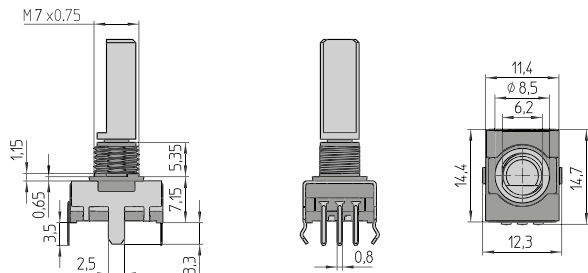
- White goods and household applications
- Home automation
- Two way radio applications
- Power and heat distribution controls
- Water distribution controls
- Industrial controllers
- Audio and entertainment systems

Dimensions and pin assignment

SWITCH DESIGN

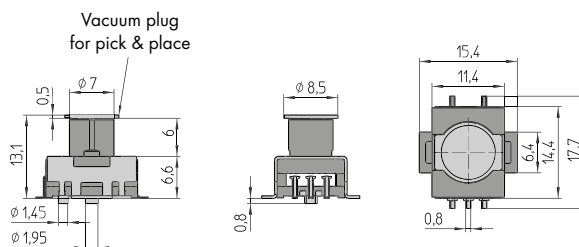
THT VERTICAL

Example of illustration with thread



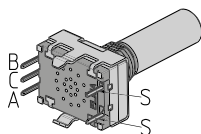
SMT

Example of illustration without thread

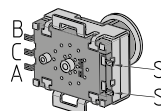


PIN ASSIGNMENT

THT VERTICAL



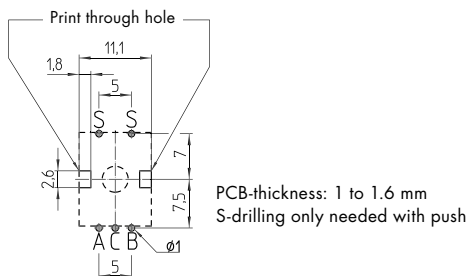
SMT



DRILLING DIAGRAM AND FOOTPRINT

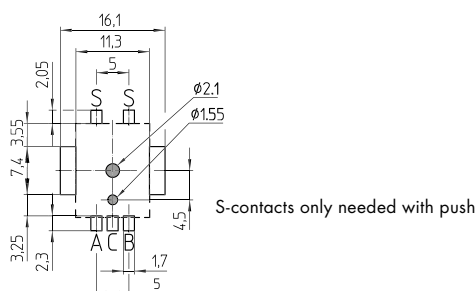
THT VERTICAL

View from component side of the PCB



SMT

View from component side of the PCB

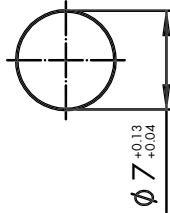
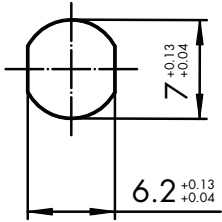


Dimensions and pin assignment

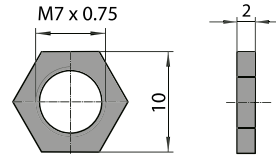
FRONT PANEL CUT OUT

THREADED

NON-THREADED

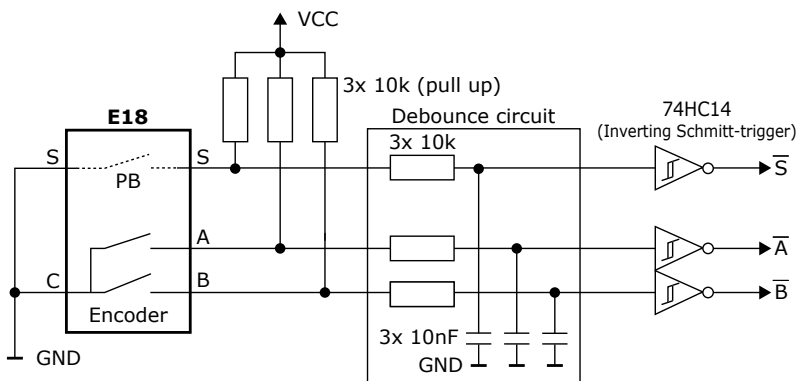


NUT



Circuit diagram

RECOMMENDED SYSTEM INTERFACE



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

Ordering information

ORDERING CODE

E18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-----	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ORIENTATION | MOUNTING

- V** THT vertical
- S** SMT vertical

FIXING

- A** Threaded M7 x 0.75
- E** Non-threaded Ø 7

IP-PROTECTION¹

- 0** IP60
- 1¹** IP68 shaft sealing

¹ Shaft sealing (O-ring) of IP68 may slightly increase switching torque

RESOLUTION

- 1** 8 PPR, B before A (16 detents)
- 2** 12 PPR, A before B (24 detents)
- 3** 15 PPR, A before B (30 detents)

PACKAGING

- T** Tray
- R** Tape & reel with vacuum plug (SMT only, shafts separated)

SHAFT TYPE

See the next page for all available shaft types

SHAFT

- M** Mounted
- S** Separated (snap-in shaft mechanism)
- N** No shaft

PUSH BUTTON

- 0** Without push button
- 3** 3 N
- 6** 6 N

SWITCHING TORQUE¹

- B** 0.5 Ncm
- C** 1.5 Ncm
- D** 2.5 Ncm

¹ Shaft sealing (O-ring) of IP68 may slightly increase switching torque

Ordering information

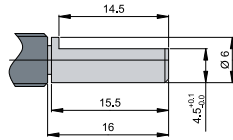
¹ Threaded bushing: Shaft to be ordered separately; shaft mounting after encoder assembly to front panel (nut does not fit 1/4" shaft diameter). OTHER SHAFTS ARE AVAILABLE ON REQUEST.

SHAFT TYPES

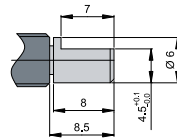
Type 00 - no shaft



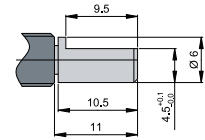
Type 01 - brass



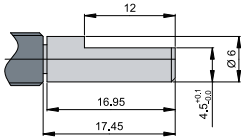
Type 03 - brass



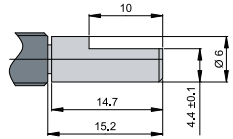
Type 30 - brass



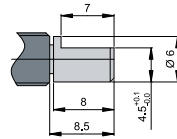
Type 31 - stainless steel



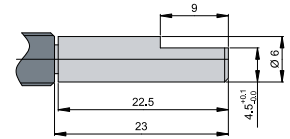
Type 32 - brass



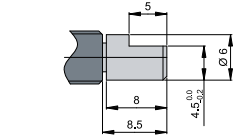
Type 33 - stainless steel



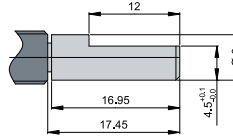
Type 34 - brass



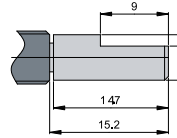
Type 37 - stainless steel



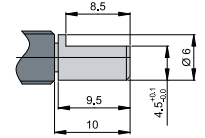
Type 70 - brass



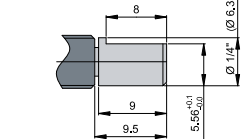
Type 71 - brass



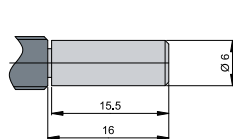
Type 72 - brass



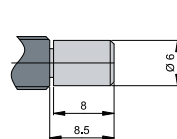
Type¹ 51 - brass



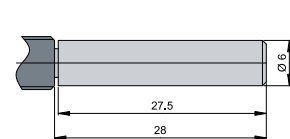
Type 10 - brass



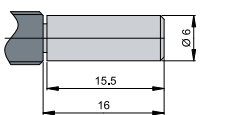
Type 11 - brass



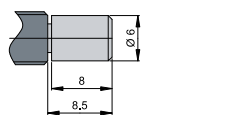
Type 12 - brass



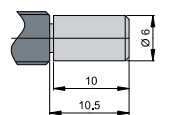
Type 13 - stainless steel



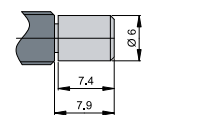
Type 14 - stainless steel



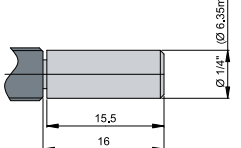
Type 15 - brass



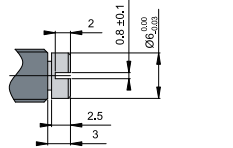
Type 16 - brass



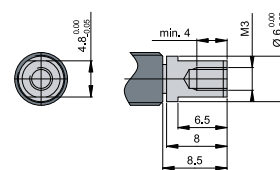
Type¹ 20 - brass



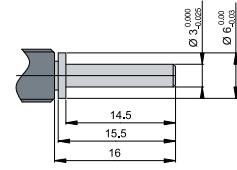
Type 02 - brass



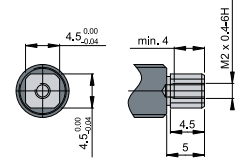
Type 43 - brass



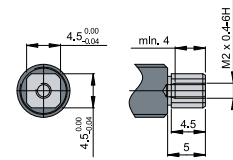
Type 42 - brass



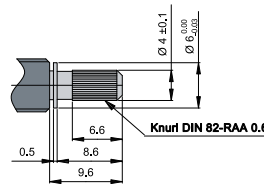
Type 45 - stainless steel



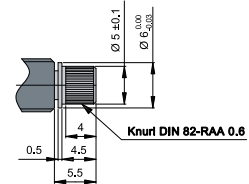
Type 47 - brass



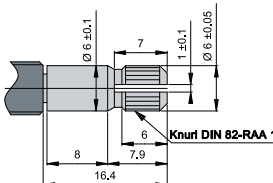
Type 08 - brass



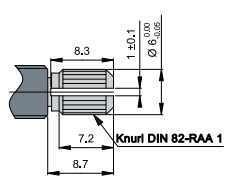
Type 40 - brass



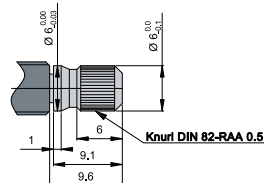
Type 41 - brass



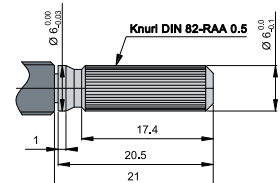
Type 60 - brass



Type 0H - brass



Type 44 - brass



Ordering information

PACKAGING

Blister box:	50 pieces (depending on shipment quantity, nuts are supplied and packed separately)
Tape & reel:	200 pieces (only SMT, shafts and nuts are packed separately)

ACCESSORIES AND SPARE PARTS

Hex nut M7 x 0.75:	Part number 4516-40 (50 pieces / bag), brass, nickel plated
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Specifications

MECHANICAL DATA

Positions:	16 positions 24 positions 30 positions
Switching torque:	0.5, 1.5 or 2.5 Ncm ($\pm 30\%$ in new condition)
Rotational life:	> 150'000 revolutions with 0.5 Ncm (tested at room temperature) > 100'000 revolutions with 1.5 Ncm (tested at room temperature) > 60'000 revolutions with 2.5 Ncm (tested at room temperature)
Allowed shaft load:	100 N push, 100 N pull and 50 N side load (static at 20 mm from the support surface)
Fastening torque of nut (front panel mounting):	M7 x 0.75: < 100 Ncm

ELECTRICAL DATA

Electrical connection:	Pins 0.2 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):	8, 12 or 15 PPR per channel
Phase shift:	90° ($\pm 45^\circ$)
Contact bouncing:	< 8 ms (at 15 RPM)
Dielectric strength:	500 VDC during 60 s (MIL-STD-202G, method 301, between housing and shaft)
Insulation resistance:	> 100 M Ω at 250 VDC (in new condition)

MATERIALS

Shaft:	Brass CuZn38Pb2 or stainless steel 1.4305
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

Specifications

ENVIRONMENTAL DATA

Operating temperature:	-40 to +85 °C (IEC 60068-2-14)
Storage temperature:	-65 to +105 °C (IEC 60068-2-14)
Humidity:	< 93 % relative humidity (MIL-STD-202G, method 103B, condition B)
IP sealing against front panel:	IP60 without sealing IP68 with shaft sealing (2 bar, 1 h)
Vibration:	9 G _{RMS} at 50 to 2'000 Hz (MIL-STD-202G, method 214A, duration 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
Wave soldering:	< 280 °C during 5 s
Reflow soldering:	according to IPC / JEDEC J-STD-020C*

MECHANICAL DATA FOR PUSH BUTTON

Actuation force:	3, 6 N (±30 % in new condition)
Travel:	0.5 (±0.2) mm
Lifecycles:	> 100'000 cycles (tested at room temperature)

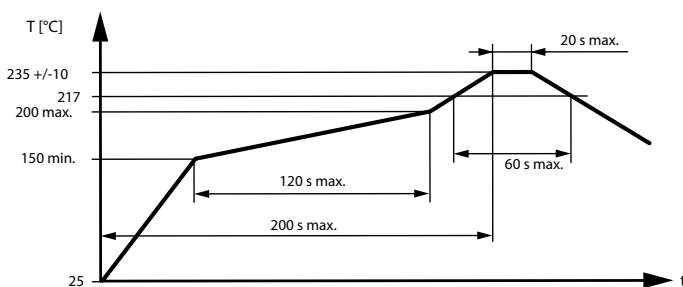
ELECTRICAL DATA FOR PUSH BUTTON

Contact resistance:	< 10 Ω (over entire rotational life)
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

*REFLOW SOLDERING



Temperatures or process durations exceeding rated maximum conditions may harm switch function.

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