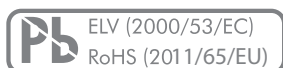


## Product description

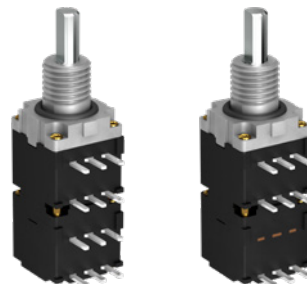
### MAIN FEATURES

#### MULTI LAYER OR ON / OFF FUNCTION

- › Multi layer coded switch (up to 2 layers)
- › High / low torque function «on» / «off»
- › BCD, Hex or Gray coding 2 to 16 positions
- › Switching mode: Shorting
- › Switching torque per layer: Up to 3.5 Ncm
- › For rugged environments
- › Gold plated contacts
- › THT horizontal
- › IP68 front panel sealing (up to 5 bar)
- › Operating temperature range: -40 to +85 °C
- › Various options and customizations



#### 07ML



### PRODUCT VARIETY

- BCD, Hex or Gray coding
- Multi layer (up to 2 layers)
- Switching torque per layers
  - BCD: 1.5, 2.2 or 3.5 Ncm
  - Hex or Gray: 1.5, 3.2 or 3.5 Ncm
- With or without high / low torque function «on» / «off»
- With end stop or endless rotating
- Numbers of positions
- Shaft length
- Front panel sealing IP60 or IP68

### POSSIBLE CUSTOMIZATIONS

- Additional layers
- Non-shorting
- Shaft dimension and shape
- Bushing style
- IP sealing
- Switching torque
- 4 (5) positions selector switch

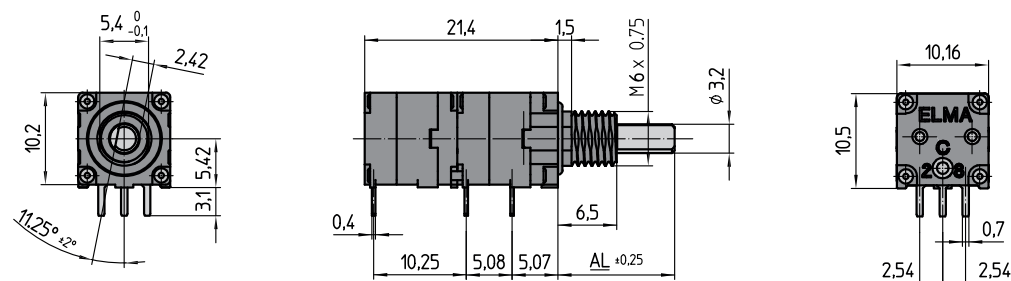
### TYPICAL APPLICATIONS

- Frequency and channel selection for two way radios
- Target aiming devices
- Aircraft transponders
- Medical equipment
- Industrial automation

## Dimensions and pin assignment

### SWITCH DESIGN

WITH ON / OFF FUNCTION



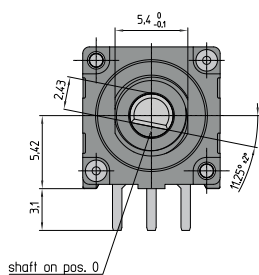
**AL**

13 mm  $\pm 0.25$  mm

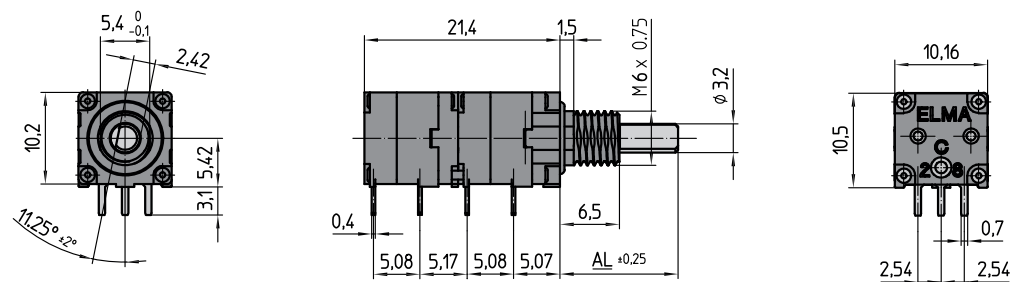
15 mm  $\pm 0.25$  mm

16 mm  $\pm 0.25$  mm

SHAFT FOR BCD CODING



WITHOUT ON / OFF FUNCTION, ONLY SECOND LAYER



**AL**

13 mm  $\pm 0.25$  mm

15 mm  $\pm 0.25$  mm

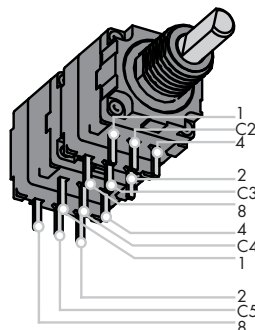
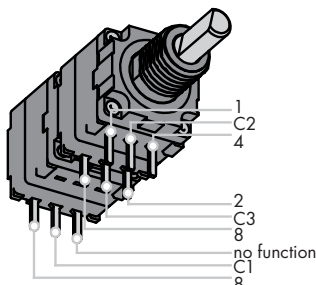
16 mm  $\pm 0.25$  mm

Dimensions in mm

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

## Dimensions and pin assignment

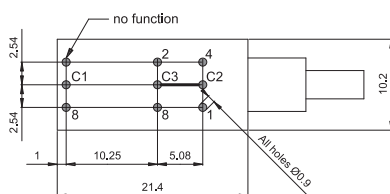
### PIN ASSIGNMENT



### DRILLING DIAGRAM AND FOOTPRINT

WITH ON / OFF FUNCTION

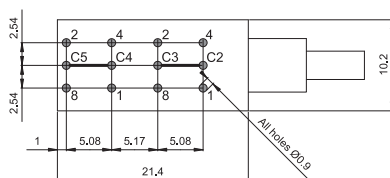
View from component side of the PCB



Commons (C2, C3) must be connected together on the PCB

WITHOUT ON / OFF FUNCTION, ONLY SECOND LAYER

View from component side of the PCB



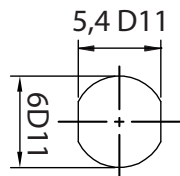
Commons (C2, C3) must be connected together on the PCB

Dimensions in mm

Tolerances according to DIN ISO 2768-1 (M), unless otherwise specified

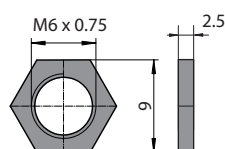
## Dimensions and pin assignment

### FRONT PANEL CUT OUT

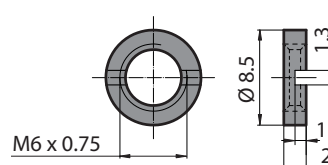


### NUT

#### HEX NUT

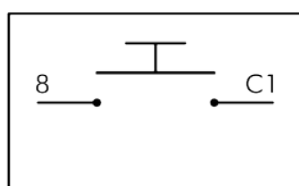


#### SLOTTED NUT



## Circuit diagram

### CONNECTIONS ON / OFF FUNCTION



## Ordering information

### ORDERING CODE

07ML	-	-	-	-	-	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---

#### CODING

**3** BCD (max. 10 positions)  
**4** BCD complementary (max. 10 positions)  
**5** Hex  
**6** Hex complementary  
**7** Gray  
 Explanation see chapter «Technical explanations»

#### BUSHING | IP SEALING | NUT

**10** Threaded | IP60 | hex nut  
**20** Threaded | IP60 | slotted nut  
**30** Threaded | IP60 | hex nut  
**40** Threaded | IP68 | slotted nut  
**50** Threaded | IP60 | without nut  
**60** Threaded | IP68 | without nut  
**XX** Customized solutions on request

#### ADJUSTABLE END STOP | POSSIBLE POSITION TRAVEL

**S** Standard: BCD: 10 positions | Hex / Gray: 16 positions<sup>1</sup>  
<sup>1</sup> End stop between position 0 to F (Hex / Gray) and position 0 to 9 (BCD)

#### PACKAGING

- Standard tray 50 or 200 pieces<sup>2</sup>  
**A** Antiastic tray 100 pieces  
<sup>2</sup> The packaging size depends on shipment quantity. If the shipment quantity is  
 < 200 pieces then standard tray 50 pieces  
 ≥ 200 pieces then standard tray 200 pieces

#### SWITCHING MODE

**S** Shorting  
**N** Non-shorting<sup>3</sup>  
<sup>3</sup> Non-shorting not possible with Gray Code, BCD complementary and Hex complementary

#### LAYER 2: TORQUE AT LAYER 2

**O** 5.0 Ncm (on / off function)<sup>4</sup>  
**B** 1.5 Ncm (Gray / Hex / BCD)<sup>5</sup>  
**C** 3.2 Ncm (Gray / Hex) | 2.2 Ncm (BCD)<sup>5</sup>  
**D** 3.5 Ncm (Gray / Hex / BCD)<sup>5</sup>  
**X** Customized solutions on request  
 Caution:  
<sup>4</sup> During the on / off-actuation (position 0 to 1) the torque-force will be increased.  
<sup>5</sup> Additional layer increase the torque-force according to the chosen torque-force.

#### LAYER 1: TORQUE AT LAYER 1

**B** 1.5 Ncm (Gray / Hex / BCD)  
**C** 3.2 Ncm (Gray / Hex) | 2.2 Ncm (BCD)  
**D** 3.5 Ncm (Gray / Hex / BCD)  
**X** Customized solutions on request

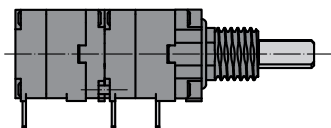
#### D-SHAFT LENGTH

**13** Standard | 13 mm length  
**15** Standard | 15 mm length  
**16** Standard | 16 mm length  
**XX** Customized solutions on request  
 Shaft dimension and shape see drawing

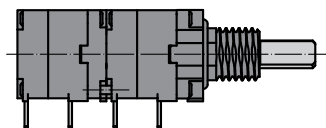
## Ordering information

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

WITH ON / OFF FUNCTION



WITHOUT ON / OFF FUNCTION



STANDARD SHAFT LENGTH, IP68, HEX NUT SUPPLIED, SHORTING

CODING	INDEXING ANGLES   POSITIONS	ON / OFF FUNCTION	TORQUE   LAYER	PART NUMBER
BCD	36°   10 (0 – 9)	With	Layer 1: 3.5 Ncm Layer 2: 5 Ncm <sup>2</sup>	07ML-330A-13DOS
		Without	Layer 1: 3.5 Ncm Layer 2: 3.5 Ncm	07ML-330S-13DDS
BCD complementary	36°   10 (0 – 9)	With	Layer 1: 3.5 Ncm Layer 2: 5 Ncm <sup>2</sup>	07ML-430S-13DOS
		Without	Layer 1: 3.5 Ncm Layer 2: 3.5 Ncm	07ML-430S-13DDS
Hex	22.5°   16 (0 – F)	With	Layer 1: 3.5 Ncm Layer 2: 5 Ncm <sup>2</sup>	07ML-530S-13DOS
		Without	Layer 1: 3.5 Ncm Layer 2: 3.5 Ncm	07ML-530S-13DDS
Hex complementary	22.5°   16 (0 – F)	With	Layer 1: 3.5 Ncm Layer 2: 5 Ncm <sup>2</sup>	07ML-630S-13DOS
		Without	Layer 1: 3.5 Ncm Layer 2: 3.5 Ncm	07ML-630S-13DDS
Gray	22.5°   16 (0 – F)	With	Layer 1: 3.5 Ncm Layer 2: 5 Ncm <sup>2</sup>	07ML-730S-13DOS
		Without	Layer 1: 3.5 Ncm Layer 2: 3.5 Ncm	07ML-730S-13DDS

### PACKAGING

Foam polystyrene box:

50 or 200 pieces (depending on shipment quantity)

### ACCESSORIES AND SPARE PARTS

Hex nut M6 x 0.75:

Part number 4424-22 (50 pieces / bag), brass

Slotted nut M6 x 0.75:

Part number 4424-28 (50 pieces / bag), brass

Part number 4424-31 (50 pieces / bag), stainless steel (cross slot)

<sup>1</sup> For other types | options see type key<sup>2</sup> Torque of 5 Ncm only applies for the on / off function

## Specifications

### MECHANICAL DATA

Detent angle   positions:	22.5° detent angle   16 positions 36° detent angle   10 positions
Rotary limitation   end stop:	Configurable
Switching torque:	22.5°: 1.5, 3.2 or 3.5 Ncm (±25 % in new condition) 36°: 1.5, 2.2 or 3.5 Ncm (±25 % in new condition) On / off function: 5 Ncm (±25 % in new condition)
Rotational life:	> 10'000 cycles (tested at room temperature)
Rotational stop strength:	22.5° detent angle: > 35 Ncm 36° detent angle: > 45 Ncm
Fastening torque of nut (front panel mounting):	M6 x 0.75: < 100 Ncm

### ELECTRICAL DATA

Electrical connection:	Pins 0.4 x 0.7 mm
Switching voltage:	< 42 VDC (resistive load)
Switching current:	< 200 mA (resistive load)
Contact resistance:	< 50 mΩ (in new condition)
Switching   breaking capacity:	< 5 VA
Signal   coding:	10 positions: BCD or BCD complementary 16 positions: Hex, Hex complementary or Gray
Switching mode:	Shorting or non-shorting (non-shorting with Gray, BCD complementary and Hex complementary not possible)
Dielectric strength:	500 VDC during 60 s (pin-to-pin, pin-to-housing)
Insulation resistance:	> 1 GΩ at 500 VDC (pin-to-pin, pin-to-housing, in new condition)

### MATERIALS

Shaft:	Stainless 1.4305
Bushing   housing:	Zinc die casting, fiberglass reinforced high performance plastic
Contact surface:	Cu alloy (Au plated)
Soldering leads:	Cu alloy (tin plated)
Hex nut:	Brass
Slotted nut:	Brass or stainless steel

### ENVIRONMENTAL DATA

Operating temperature:	-40 to +85 °C (IEC 600068-2-14)
Storage temperature:	-40 to +85 °C (IEC 600068-2-14)

### SOLDERING CONDITIONS

Hand soldering:	< 280 °C during 2 s
Wave soldering:	< 280 °C during 2 s

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