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DATASHEET

MULTI ROTARY SWITCH

MR50

ELMA
Your Solution Partner

Product description

MAIN FEATURES

1/2" SELECTOR SWITCH

- Dimensions Ø 1/2"
- Switching mode: Shorting or non-shorting
- 10, 12 and 16 selector switch positions
- Switching torque: Up to 6 Ncm
- Gold plated contacts
- Rugged design
- Sealing up to IP68
- Operating temperature range: -45 to +85 °C
- Not ITAR related
- Various options and customizations

MR50



Pb ELV (2000/53/EC)
RoHS (2011/65/EU)

PRODUCT VARIETY

- Number of selector positions | indexing angles
- Shaft styles
- Shorting or non-shorting
- Switching torque with 3 or 6 Ncm
- Front panel sealing IP60 and IP68

POSSIBLE CUSTOMIZATIONS

- Shaft style and material
- Bushing style
- Switching torque
- Number of poles
- Customizable end position
- Interface solutions (socket plug)
- Shaft diameter

TYPICAL APPLICATIONS

- Target aiming devices
- Night vision devices
- Two way radios
- Cockpit applications (aircraft, automotive, construction machines, military vehicles)
- Portable devices (communication, medical, rescue, sports, transportation, measuring, photo / video)
- Test equipment

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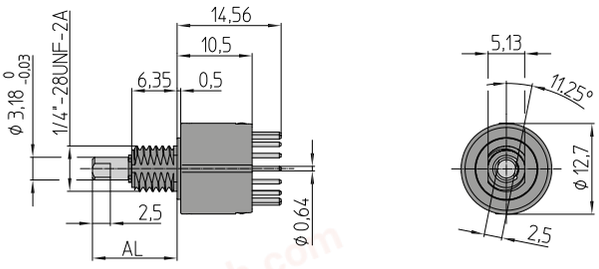
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Dimensions and pin assignment

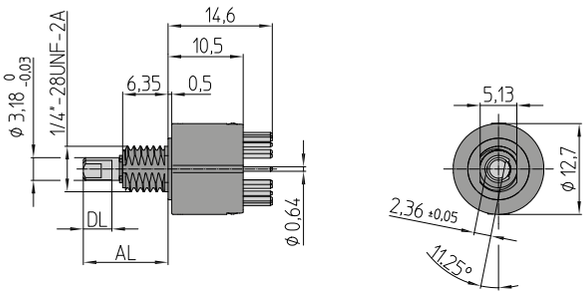
SWITCH DESIGN

		DL
AL	11.85 mm ±0.3 mm	4 mm
	16.35 mm ±0.3 mm	8.5 mm
	21.35 mm ±0.3 mm	13.5 mm

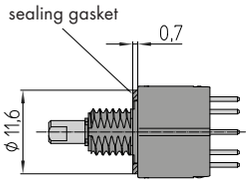
ROUND SHAFT



D-SHAFT



FRONT PANEL SEALING IP68



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

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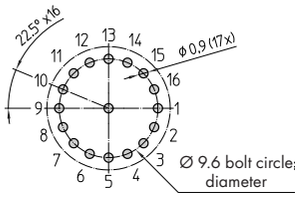
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Dimensions and pin assignment

DRILLING DIAGRAM AND FOOTPRINT

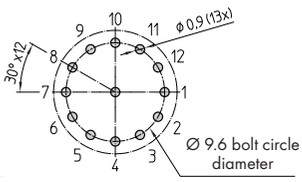
16 POSITIONS | 1 POLE

View from the PCB



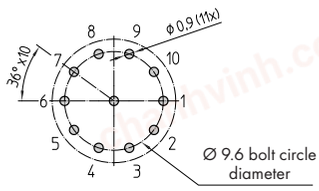
12 POSITIONS | 1 POLE

View from the PCB



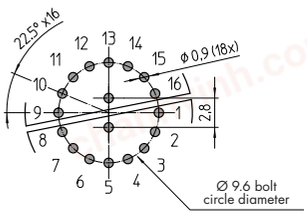
10 POSITIONS | 1 POLE

View from the PCB



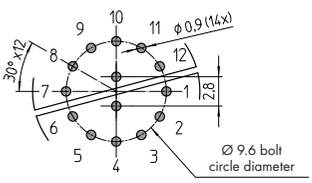
8 POSITIONS | 2 POLE

View from the PCB



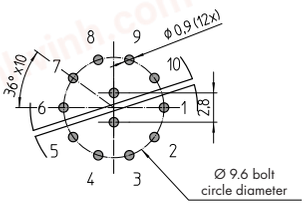
6 POSITIONS | 2 POLE

View from the PCB



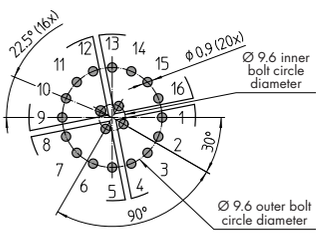
5 POSITIONS | 2 POLE

View from the PCB



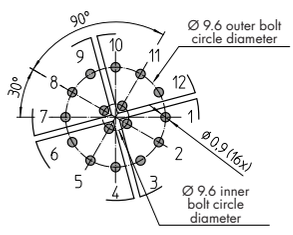
4 POSITIONS | 4 POLE

View from the PCB



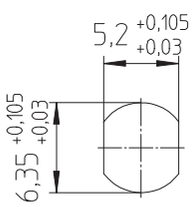
3 POSITIONS | 4 POLE

View from the PCB



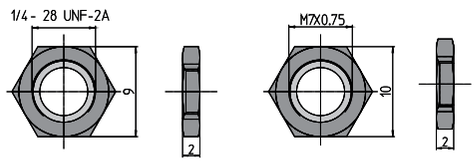
FRONT PANEL CUT OUT

FOR BUSHING 1/4"-28 UNF-2A



NUT

HEX NUT (SUPPLIED)



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

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Ordering information

ORDERING CODE

MR50	-	_	_	_	_	-	_	_	_	_

DETENT ANGLE | POLE | SWITCHING MODE

A1 22.5° | 1 pole | shorting
A2 22.5° | 1 pole | non-shorting
A3 22.5° | 2 pole | shorting
A4 22.5° | 2 pole | non-shorting
A5 22.5° | 4 pole | shorting
A6 22.5° | 4 pole | non-shorting

B1 30° | 1 pole | shorting
B2 30° | 1 pole | non-shorting
B3 30° | 2 pole | shorting
B4 30° | 2 pole | non-shorting
B5 30° | 4 pole | shorting
B6 30° | 4 pole | non-shorting

C1 36° | 1 pole | shorting
C2 36° | 1 pole | non-shorting
C3 36° | 2 pole | shorting
C4 36° | 2 pole | non-shorting

Explanation see chapter «Technical explanations»

NUMBER OF POSITIONS

0 No end position (endless rotation)
1 End position between position 1 and last position
2 Positions
3 Positions
4 Positions
5 Positions
6 Positions
7 Positions
8 Positions
9 Positions
A 10 Positions
B 11 Positions
C 12 Positions
D 13 Positions
E 14 Positions
F 15 Positions

MOUNTING | SWITCH ORIENTATION | STOP CONTACTS | IP-SEALING

Hex nut (supplied)

A 1/4"-28 UNF-2A x 6.35 mm | vertical THT | PCB assembly | IP60
B 1/4"-28 UNF-2A x 6.35 mm | vertical THT | PCB assembly | IP68

X Customized solutions on request

Central mounting dimension and shape see drawing
1/4" = 6.35 mm

SHAFT STYLE (AL) AND MATERIAL

12 Ø 1/8" x 11.85 mm | round | stainless steel
13 Ø 1/8" x 11.85 mm | D-shaft | stainless steel
16 Ø 1/8" x 16.35 mm | round | stainless steel
17 Ø 1/8" x 16.35 mm | D-shaft | stainless steel
21 Ø 1/8" x 21.35 mm | round | stainless steel
22 Ø 1/8" x 21.35 mm | D-shaft | stainless steel

XX Customized solutions on request

Shaft dimensions and shape see drawing
Ø 1/8" = Ø 3.18 mm

FACTORY SET CHARACTER

1

SWITCHING TORQUE

B 3 Ncm
D 6 Ncm

X Customized solutions on request

PACKAGING

- Antistatic tray (50 pieces)

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Ordering information

PREFERENCE TYPES SELECTION CHART[1]

IP-SEALING	SWITCHING MODE	DETENT ANGLE | POSITIONS	SWITCHING TORQUE	PART NUMBER
IP68	Shorting	22.5° | 16	3 Ncm	MR50-A11B-B113
			6 Ncm	MR50-A11B-D113
		30° | 12	3 Ncm	MR50-B11B-B113
			6 Ncm	MR50-B11B-D113
		36° | 10	3 Ncm	MR50-C11B-B113
			6 Ncm	MR50-C11B-D113
	Non-shorting	22.5° | 16	3 Ncm	MR50-A21B-B113
			6 Ncm	MR50-A21B-D113
		30° | 12	3 Ncm	MR50-B21B-B113
			6 Ncm	MR50-B21B-D113
		36° | 10	3 Ncm	MR50-C21B-B113
			6 Ncm	MR50-C21B-D113

PACKAGING

Antistatic blister box: 50 pieces

ACCESSORIES AND SPARE PARTS

Hex nut: $^1/_4$"-28 UNF-2A
Part number 4516-50 (50 pieces / bag), brass, nickel plated

[1] For other types | options see ordering code

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Specifications

MECHANICAL DATA

Detent angle | positions:	22.5° detent angle | 16 positions 30° detent angle | 12 positions 36° detent angle | 10 positions
Rotary limitation | end stop:	Configurable
Switching torque:	3 or 6 Ncm (±30 % over life time)
Rotational life:	> 20'000 cycles (tested at room temperature)
Allowed shaft load:	400 N push, 400 N pull and 200 N side force (static at 10 mm from supporting surface)
Rotational stop strength:	> 85 Ncm
Fastening torque of nut (front panel mounting):	$^1/_4$"-28 UNF-2A: < 170 Ncm

ELECTRICAL DATA

Electrical connection:	Pins Ø 0.9 mm
Switching voltage:	< 28 VDC (resistive load)
Switching current:	< 200 mA (resistive load)
Contact resistance:	< 50 mΩ (in new condition)
Switching mode:	Shorting or non-shorting
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 steel 1.4305
Bushing | housing:	Zinc die casting (nickel plated)
Contact surface:	Cu alloy (Au plated)
Soldering leads:	Cu alloy (nickel and tin plated)
Hex nut:	Brass (nickel plated)
Snap ring:	Spring steel (nickel plated)
O-rings:	FPM (Viton), 70 shore A
Front panel sealing:	MVQ (silicone), 60 shore A

ENVIRONMENTAL DATA

Operating temperature:	-45 to +85 °C (IEC 60068-2-14)
Storage temperature:	-50 to +125 °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 and front panel sealing (2 bar, 1 h)
Vibration:	10 G_{RMS} at 10 to 2'000 Hz (MIL-STD-202G, method 214A, condition 1/C)
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

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