

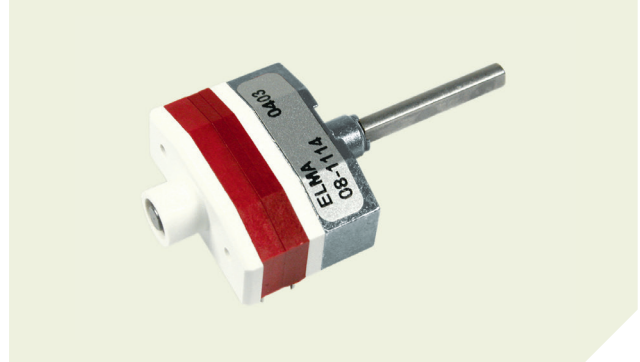
MAIN FEATURES

HORIZONTAL, MULTI WAFER, PCB MOUNTING, UP TO 12 POSITIONS

- > For PCB mounting
- > 25'000 switching cycles with up to 9 Ncm switching torque
- > Gold plated contacts: 3 micron
- > Robust metal housing with metal shaft
- > Operating temperature range: -40° to +85°
- > Various options and customizations

**PRODUCT VARIETY**

- From 1 x 12 to 4 x 3 poles/positions per wafer
- Up to 8 wafers
- Shorting or non-shorting
- Switching torque 3, 6 or 9 Ncm
- Configurable End-Stops

TYPE 08**POSSIBLE CUSTOMIZATIONS**

- Shaft dimension and shape
- Switching torque
- Hollow shaft, inner shaft (see page 106)
- Others

TYPICAL APPLICATIONS

- Industrial controls
- Avionics, instrumentation, test systems
- Medical and audio equipment

1 PREFERENCE TYPES SELECTION CHART

¹ For other types/options, see type key.

| CONTACT ARRANGEMENT | | NUMBER OF WAFERS | FUNCTION (POLES X POSITIONS) | STANDARD TYPE KEY | |
|---------------------------|------------------------------|------------------|------------------------------|-------------------|--------------|
| COMMON WAFER PART CONTACT | SWITCHING WAFER PART CONTACT | | | SHORTING | NON-SHORTING |
| | | 1 | 1 x 12, endless rotating | 08-1103 | 08-1104 |
| | | 2 | 2 x 12, endless rotating | 08-2103 | 08-2104 |
| | | 3 | 3 x 12, endless rotating | 08-3103 | 08-3104 |
| | | 4 | 4 x 12, endless rotating | 08-4103 | 08-4104 |
| | | 1 | 1 x 12 | 08-1113 | 08-1114 |
| | | 2 | 2 x 12 | 08-2113 | 08-2114 |
| | | 3 | 3 x 12 | 08-3113 | 08-3114 |
| | | 4 | 4 x 12 | 08-4113 | 08-4114 |
| | | 1 | 2 x 6 | 08-1263 | 08-1264 |
| | | 2 | 4 x 6 | 08-2263 | 08-2264 |
| | | 3 | 6 x 6 | 08-3263 | 08-3264 |
| | | 4 | 8 x 6 | 08-4263 | 08-4264 |
| | | 1 | 3 x 4 | 08-1343 | 08-1344 |
| | | 2 | 6 x 4 | 08-2343 | 08-2344 |
| | | 3 | 9 x 4 | 08-3343 | 08-3344 |
| | | 4 | 12 x 4 | 08-4343 | 08-4344 |
| | | 1 | 4 x 3 | 08-1433 | 08-1434 |
| | | 2 | 8 x 3 | 08-2433 | 08-2434 |
| | | 3 | 12 x 3 | 08-3433 | 08-3434 |
| | | 4 | 16 x 3 | 08-4433 | 08-4434 |

* Common interconnection to be made on PCB.

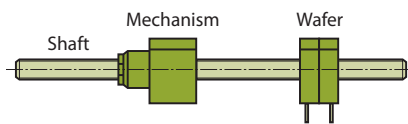
STOP AND FIXING SCREWS

Configurable stop screws can be set at any position between 2 and the maximum. Stop screws have to be ordered separately.

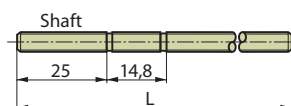
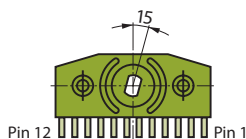
| | PACKAGING SIZE | ORDER NUMBER |
|---------------------|----------------|--------------|
| Stop screw M1.2 | 10 pcs. | 4224-11 |
| Stop screw M1.2 | 100 pcs. | 4224-10 |
| Fixing screw M2 x 6 | 10 pcs. | 4224-01 |

AVAILABLE IN KIT FORM

Mechanism, wafer and shaft are supplied separately. This offers more possibilities to place the switch onto the PC-board.



View of wafer from front side



WAFER

| FUNCTIONS (POLES X POSITIONS) | SHORTING | NON-SHORTING |
|-------------------------------|----------|--------------|
| 1 x 12 | 4217-10 | 4218-10 |
| 2 x 6 | 4217-11 | 4218-11 |
| 3 x 4 | 4217-13 | 4218-13 |
| 4 x 3 | 4217-12 | 4218-12 |

SWITCH MECHANISM

| NUMBER OF POLES | POSITIONS | TORQUE | ORDER NUMBER |
|-----------------|-----------|--------|--------------|
| ≤ 6 | 12 | 6 Ncm | 4214-10 |
| > 6 | 12 | 9 Ncm | 4214-12 |

SHAFT INCLUDING ASSEMBLY MATERIAL

| LENGTH L | NO. OF HOUSINGS | ORDER NUMBER |
|----------|-----------------|--------------|
| 75 mm | 3 | 4211-05 |
| 100 mm | 5 | 4211-10 |
| 125 mm | 7 | 4211-15 |
| 150 mm | 9 | 4211-20 |

SPECIFICATIONS

MECHANICAL DATA

| | |
|-----------------------------------|--|
| Resolution: | 12 positions max. (30° indexing) |
| Switching torque (new condition): | 3, 6 or 9 Ncm (+/- 25%), additional wafers may increase switching torque |
| Rotational life: | 25'000 switching cycles min. |
| Fastening torque of nut: | 200 Ncm max. |

ELECTRICAL DATA

| | |
|--|--|
| Function: | From 1 x 12 to 4 x 3 poles/positions per wafer |
| Switching mode: | Shorting or non-shorting |
| Load current: | 1.5 A max. (resistive load) |
| Switching voltage: | 42 VDC max. |
| Contact resistance (new condition): | 20 mΩ max. |
| Insulation resistance (new condition): | 10 ¹³ Ω min. (contact to contact / housing) |
| Switching capacity: | 1 pF max. (contact to contact) |
| Dielectric withstanding voltage: | 500 VDC during 60 seconds |

MATERIAL DATA

| | |
|----------------------|--|
| Shaft: | Stainless steel |
| Bushing/housing: | Zinc diecast, zinc plated and passivated |
| Contact plating: | Gold; 3 μm |
| Insulation material: | Wafer: PA6/6T, rotor: Polyacetal (POM) |
| Soldering leads: | Alloy copper, tin plated |

ENVIRONMENTAL DATA

| | |
|--------------------------------------|--|
| Operating/storage temperature range: | -40° to +85°C |
| IP sealing: | IP60 shaft/front panel sealing |
| Vibration: | 10 G _{rms} max. @ 10 to 2000 Hz |
| Flammability: | UL94-HB |

PACKAGING QUANTITY

| | |
|-------|---------|
| Tray: | 10 pcs. |
|-------|---------|

SOLDERING CONDITIONS

| | |
|-----------------|---|
| Hand soldering: | 340°C max. during 2 sec max. |
| Wave soldering: | 280°C max. peak temperature during 5 sec max. |

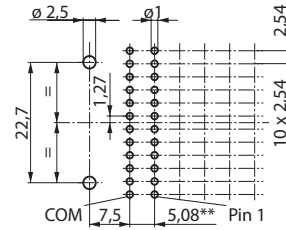
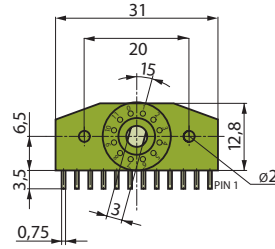
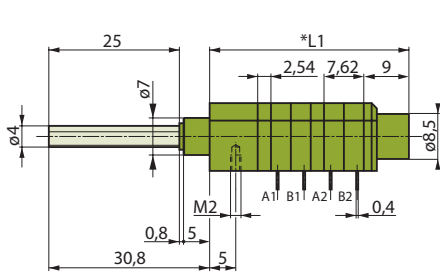
SWITCHING MODES

For information about switching modes please see **technical explanations** at the end of the catalog

DRAWINGS

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

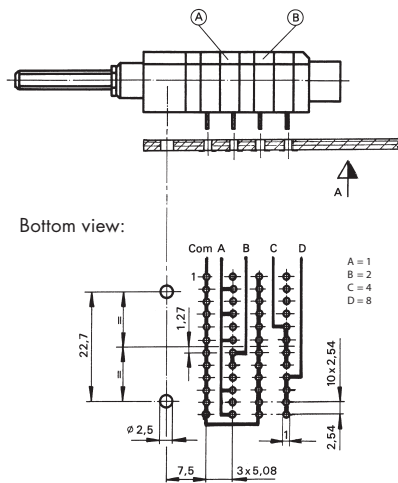
SWITCH WITH 2 WAFERS



Ax = Common contact wafer of x
Bx = Switching contact wafer of x

* L - 1 wafer 28 mm
2 wafers 38.16 mm
3 wafers 48.32 mm
4 wafers 58.48 mm
per additional wafer + 10.16 mm
** All further steps are in 5.08 mm pitch

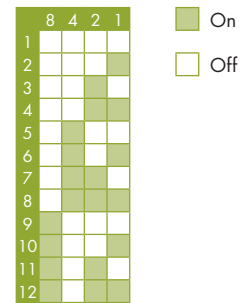
SWITCH WITH BCD CODING



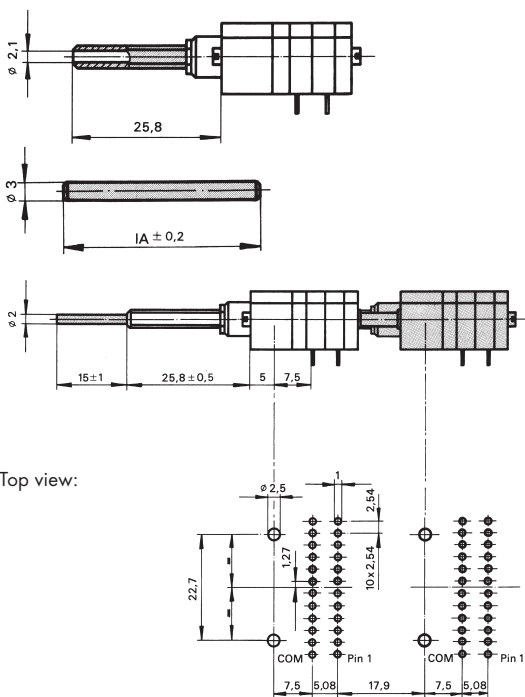
BCD CODING

For 12 positions, the coding will be made according to the layout on the left (on the printed circuit). If the switch is composed of component parts, the housings A (3 x 4) and B (1 x 12) have to be ordered. Limiting to 10 positions (BCD) is done with a stop screw M1.2 x 2.5.

BCD Coding



HOLLOW SHAFT SYSTEM (CUSTOMIZED SOLUTION)



HOLLOW SHAFT

Available for switches up to 4 wafers; inner shaft ($\varnothing 2$ mm) to be ordered separately.

INNER SHAFT

Must be ordered separately for switches with hollow shaft.

SWITCH WITH CONCENTRIC SHAFTS

Consisting of a hollow outer and inner shaft, the inner shaft driving a maximum of 3 wafers with 4 wipers each. Please indicate type of each switch.

TYPE KEY



STANDARD TYPE KEY
(see page 104)

NUMBER OF WAFERS
(max. 8)
> 8 on request

NUMBER OF POLES
Number of poles per wafer

FACTORY SET CHARACTER
Defined by Elma
(see page 104, is composed of switching mode, poles and positions)

SWITCHING MODE
3 Shorting
4 Non-shorting

TORQUE
- 6 Ncm
M 3 Ncm
N 9 Ncm

FACTORY SET END-STOP

- 00** 12 pos. (standard)
- 11** 11 pos.
- 10** 10 pos.
- 09** 09 pos.
- 08** 08 pos.
- 07** 07 pos.
- 06** 06 pos.
- 05** 05 pos.
- 04** 04 pos.
- 03** 03 pos.
- 02** 02 pos.

SHAFT LENGTH (AL)

- 000** 30.8 mm
- ¹xxx** Custom
(e.g. 18.5 mm = 185)

¹ Customized shaft length
Shaft length (AL) description measured from mounting face (see picture below).

Max. shaft length (AL): 30.8mm

TECHNICAL EXPLANATIONS

GENERAL SWITCH KNOWLEDGE

POSITION

A position is the mechanical detent of a switch actuator.

DETENT

A detent is a mechanical positioning device for stopping actuator travel at each successive electrical circuit; for example, a spring-operated ball and groove.

POLE

A pole is a single common electrical input having one or more outputs.

WAFER, DECK OR LAYER

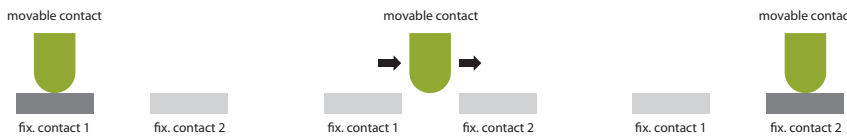
A wafer/deck or layer is a section what the contacts are mounted on.

INDEXING ANGLE

An indexing angle is the number of degrees between each position.
For example: 12 positions for a total of 360 degrees result a 30 degrees indexing angle.

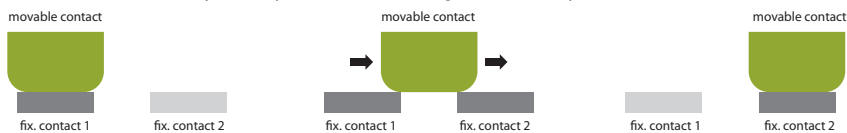
NON-SHORTING CONTACTS "BREAK BEFORE MAKE"

A non-shorting contact is also known as "break before make" and describes the action of one circuit of a pole before interrupting another of the same pole. The switch will be momentarily interrupted before it changes from position 1 to position 2 during actuation (see picture).



SHORTING CONTACTS "MAKE BEFORE BREAK"

A shorting contact is also known as "make before break" and describes the action of one circuit of a pole before interrupting another of the same pole. The switch will momentarily "short" position 1 and 2 during actuation (see picture).



CYCLE

A cycle is the complete sequence of indexing through all successive switch positions and returning to the original position. The rotational life from coded or selector switches are usually specified with cycles.

REVOLUTION

A revolution is the complete sequence of indexing through all successive switch positions in the same direction. The rotational life from encoded switches are usually specified with revolutions.

BENEFITS OF GOLD-PLATED CONTACTS

Gold-plated contacts should be used for longer rotational life, in corrosive environment or in case the switch will not be actuated for a long period of time.