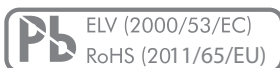


## Product description

### MAIN FEATURES

VERY ROBUST, MULTI WAFER,  
UP TO 24 POSITIONS

- › 25'000 switching cycles with up to 20 Ncm switching torque
- › Gold plated contacts: 3 micron
- › IP68 front panel sealing
- › Operating temperature range: -40 to +85 °C
- › Various options and customizations



04



### PRODUCT VARIETY

- Soldering eyelets or pins for PCB
- From 1 x 24 to 6 x 3 poles x positions per wafer
- Up to 8 wafers
- Detent angle 15° or 30°
- Shorting or non-shorting
- Switching torque: 1.5, 8, 15 or 20 Ncm
- Front panel sealing IP60 or IP68
- Configurable end stops
- Shaft diameter: 6 mm or 1/4"
- Shaft length

### POSSIBLE CUSTOMIZATIONS

- Shaft dimension and shape
- Bushing dimensions
- Switching torque
- Hollow shaft, inner shaft
- Others

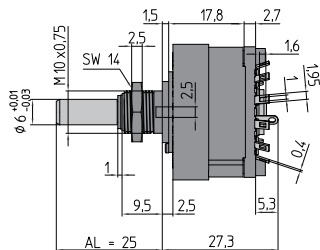
### TYPICAL APPLICATIONS

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

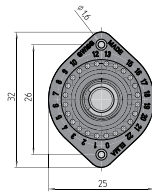
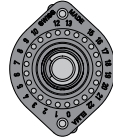
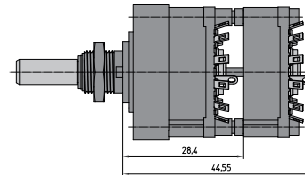
## Dimensions and pin assignment

### SWITCH DESIGN

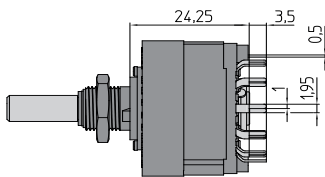
#### WITH SOLDERING EYELETS



SW = key spanner

IP60 version  
(with locating lug)IP68 version  
(without locating lug)

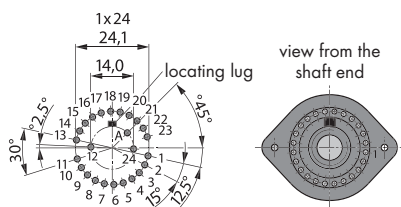
#### WITH PINS FOR PCB MOUNTING



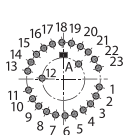
## Dimensions and pin assignment

### PIN ASSIGNMENT AND DRILLING DIAGRAM

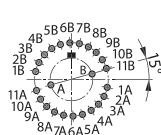
15° DETENT ANGLE



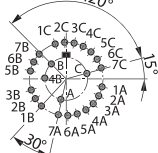
1x23



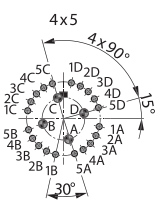
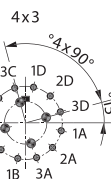
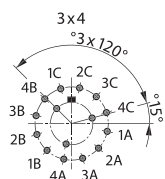
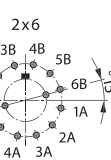
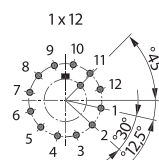
2x11



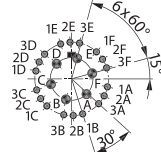
3x7



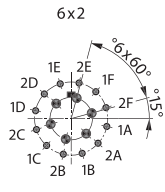
30° DETENT ANGLE



6x3



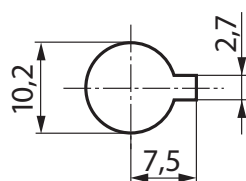
● =  $\varnothing 1,3$  mm  
● =  $\varnothing 2,3$  mm



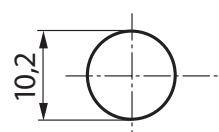
● =  $\varnothing 1,3$  mm  
● =  $\varnothing 2,3$  mm

### FRONT PANEL CUT OUT

IP60 VERSION (WITH LOCATING LUG)

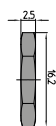


IP68 VERSION (WITHOUT LOCATION LUG)



### NUT

HEX NUT (SUPPLIED) SHAFT  $\varnothing 6$  MM



Screw wrench  
14 mm 10 x 0.75

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

## Ordering information

### ORDERING CODE

|    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

#### BASIC CODE

See standard types

#### NUMBER OF WAFERS

See standard types

#### NUMBER OF POLES

See standard types

#### FACTORY SET CHARACTER

See standard types

#### SWITCHING MODE

- 3** Shorting
- 4** Non-shorting (not for 15° index. angle)

#### SWITCHING TORQUE

- 15 Ncm (standard)
- M** 8 Ncm
- N** 20 Ncm
- R** 1.5 Ncm

#### SHAFT DIAMETER

- 0** 6 mm
- Z** 1/4" (6.35 mm)

#### NUMBER OF POSITIONS

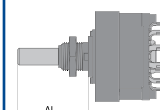
- 00** Standard
- 23** 23 positions
- 22** 22 positions
- 21** 21 positions
- 20** 20 positions
- 19** 19 positions
- 18** 18 positions
- 17** 17 positions
- 16** 16 positions
- 15** 15 positions
- 14** 14 positions
- 13** 13 positions
- 12** 12 positions
- 11** 11 positions
- 10** 10 positions
- 09** 9 positions
- 08** 8 positions
- 07** 7 positions
- 06** 6 positions
- 05** 5 positions
- 04** 4 positions
- 03** 3 positions
- 02** 2 positions

#### SHAFT LENGTH (AL)

- 000** 25 mm
- xxx**<sup>1</sup> customized  
(shaft length rounded to next 0.5 mm,  
e.g. 10.3 mm = 10.5 mm or 10 mm)

<sup>1</sup> Customized shaft length (AL)  
AL measured from mounting face (see picture below)

Max. shaft length (AL):  
 $\varnothing 1/4" = 25 \text{ mm}$   
 $\varnothing 6 \text{ mm} = 50 \text{ mm}$



#### PIN STYLE | IP-SEALING

- 00** Soldering eyelets | IP60
- 20** Pins for PCB | IP60
- 30** Soldering eyelets | IP68
- 70** Pins for PCB | IP68

## Ordering information

### STANDARD TYPES<sup>1</sup>

DETENT ANGLE 15°, SHORTING (NON-SHORTING NOT AVAILABLE)

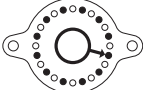
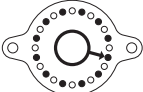
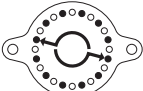
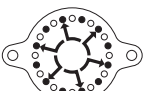
| CONTACT<br>ARRANGEMENT                                                              | NUMBER OF WAFERS | FUNCTION<br>(POLES X POSITIONS) | PART NUMBER         |                   |
|-------------------------------------------------------------------------------------|------------------|---------------------------------|---------------------|-------------------|
|                                                                                     |                  |                                 | WITH SOLDER EYELETS | WITH PINS FOR PCB |
|    | 1—H              | 1 x 24   endless rotating       | 04-1103             | 04-1103-20        |
|                                                                                     | 2—HH             | 2 x 24   endless rotating       | 04-2103             | —                 |
|                                                                                     | 3—HHH            | 3 x 24   endless rotating       | 04-3103             | —                 |
|                                                                                     | 4—HHHH           | 4 x 24   endless rotating       | 04-4103             | —                 |
|    | 1—H              | 1 x 24                          | 04-1133             | 04-1133-20        |
|                                                                                     | 2—HH             | 2 x 24                          | 04-2133             | —                 |
|                                                                                     | 3—HHH            | 3 x 24                          | 04-3133             | —                 |
|                                                                                     | 4—HHHH           | 4 x 24                          | 04-4133             | —                 |
|   | 1—H              | 2 x 11                          | 04-1213             | 04-1213-20        |
|                                                                                     | 2—HH             | 4 x 11                          | 04-2213             | —                 |
|                                                                                     | 3—HHH            | 6 x 11                          | 04-3213             | —                 |
|                                                                                     | 4—HHHH           | 8 x 11                          | 04-4213             | —                 |
|  | 1—H              | 3 x 7                           | 04-1373             | 04-1373-20        |
|                                                                                     | 2—HH             | 6 x 7                           | 04-2373             | —                 |
|                                                                                     | 3—HHH            | 9 x 7                           | 04-3373             | —                 |
|                                                                                     | 4—HHHH           | 12 x 7                          | 04-4373             | —                 |
|  | 1—H              | 4 x 5                           | 04-1453             | 04-1453-20        |
|                                                                                     | 2—HH             | 8 x 5                           | 04-2453             | —                 |
|                                                                                     | 3—HHH            | 12 x 5                          | 04-3453             | —                 |
|                                                                                     | 4—HHHH           | 16 x 5                          | 04-4453             | —                 |
|  | 1—H              | 6 x 3                           | 04-1633             | 04-1633-20        |
|                                                                                     | 2—HH             | 12 x 3                          | 04-2633             | —                 |
|                                                                                     | 3—HHH            | 18 x 3                          | 04-3633             | —                 |
|                                                                                     | 4—HHHH           | 24 x 3                          | 04-4633             | —                 |

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

## Ordering information

### STANDARD TYPES<sup>1</sup>

DETENT ANGLE 30°, NON-SHORTING (SHORTING ON REQUEST)

| CONTACT<br>ARRANGEMENT                                                              | NUMBER OF WAFERS | FUNCTION<br>(POLES X POSITIONS) | PART NUMBER         |                   |
|-------------------------------------------------------------------------------------|------------------|---------------------------------|---------------------|-------------------|
|                                                                                     |                  |                                 | WITH SOLDER EYELETS | WITH PINS FOR PCB |
|    | 1—H              | 1 x 12   endless rotating       | 04-1104             | 04-1104-20        |
|                                                                                     | 2—HH             | 2 x 12   endless rotating       | 04-2104             | —                 |
|                                                                                     | 3—HHH            | 3 x 12   endless rotating       | 04-3104             | —                 |
|                                                                                     | 4—HHHH           | 4 x 12   endless rotating       | 04-4104             | —                 |
|    | 1—H              | 1 x 12                          | 04-1124             | 04-1124-20        |
|                                                                                     | 2—HH             | 2 x 12                          | 04-2124             | —                 |
|                                                                                     | 3—HHH            | 3 x 12                          | 04-3124             | —                 |
|                                                                                     | 4—HHHH           | 4 x 12                          | 04-4124             | —                 |
|   | 1—H              | 2 x 6                           | 04-1264             | 04-1264-20        |
|                                                                                     | 2—HH             | 4 x 6                           | 04-2264             | —                 |
|                                                                                     | 3—HHH            | 6 x 6                           | 04-3264             | —                 |
|                                                                                     | 4—HHHH           | 8 x 6                           | 04-4264             | —                 |
|  | 1—H              | 3 x 4                           | 04-1344             | 04-1344-20        |
|                                                                                     | 2—HH             | 6 x 4                           | 04-2344             | —                 |
|                                                                                     | 3—HHH            | 9 x 4                           | 04-3344             | —                 |
|                                                                                     | 4—HHHH           | 12 x 4                          | 04-4344             | —                 |
|  | 1—H              | 4 x 3                           | 04-1434             | 04-1434-20        |
|                                                                                     | 2—HH             | 8 x 3                           | 04-2434             | —                 |
|                                                                                     | 3—HHH            | 12 x 3                          | 04-3434             | —                 |
|                                                                                     | 4—HHHH           | 16 x 3                          | 04-4434             | —                 |
|  | 1—H              | 6 x 2                           | 04-1624             | 04-1624-20        |
|                                                                                     | 2—HH             | 12 x 2                          | 04-2624             | —                 |
|                                                                                     | 3—HHH            | 18 x 2                          | 04-3624             | —                 |
|                                                                                     | 4—HHHH           | 24 x 2                          | 04-4624             | —                 |

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

## Ordering information

### PACKAGING

Foam polystyrene box: 10 pieces

### ACCESSORIES AND SPARE PARTS

Hex nut M10 x 0.75:

Part number 4124-21 (10 pieces / bag), brass, galvanized and passivated

Stop screw M1.4:

Part number 4124-21 (10 pieces / bag), steel

Part number 4124-20 (100 pieces / bag), steel

Spacer:

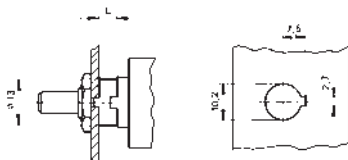
Spacers can be used in many cases instead of shortened bushes; made of glass-fibre reinforced plastic to compensate the front panel thickness; available in two standard lengths. Can not be used for IP68 versions.

Part number 4124-31 (10 pieces / bag), 3.5 mm length (L)

Part number 4124-30 (100 pieces / bag), 3.5 mm length (L)

Part number 4124-36 (10 pieces / bag), 5.5 mm length (L)

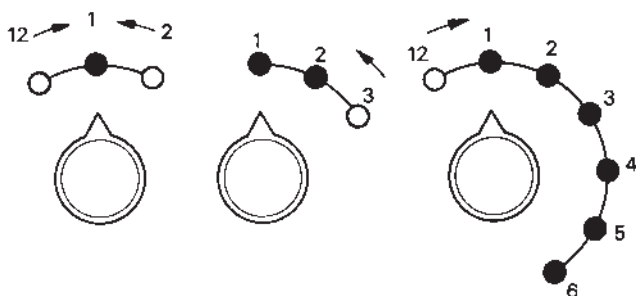
Part number 4124-35 (100 pieces / bag), 5.5 mm length (L)



## Customized solutions

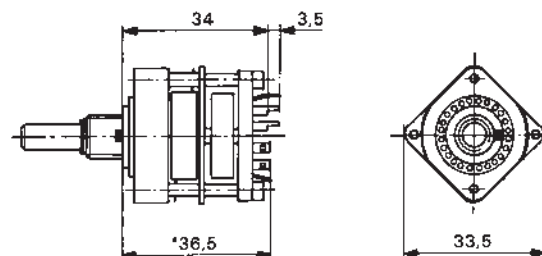
### SWITCH WITH MOMENTARY CONTACT

#### EXAMPLES



● Detent position  
○ Momentary contact

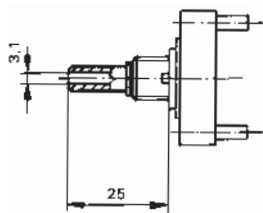
#### DIMENSIONS



\*17.5 mm extra per wafer

### HOLLOW SHAFT SYSTEM

#### HOLLOW SHAFT



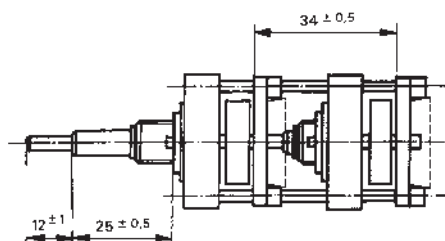
Available for switches up to 5 wafers.  
Inner shaft ( $\varnothing 3$  mm) must be ordered separately.

#### INNER SHAFT



For switches with mounting plate or hollow shaft.  
Hollow shaft must to be ordered separately.  
Please state exact length.

#### SWITCHES WITH CONCENTRIC SHAFTS



Consisting of a hollow outer and inner shaft.  
The inner shaft driving a max. of 3 wafers with 6 wipers each.  
Please give type description of each switch.

## Specifications

### MECHANICAL DATA

|                                                 |                                                                    |
|-------------------------------------------------|--------------------------------------------------------------------|
| Detent angle   positions:                       | 15° detent angle   24 positions<br>30° detent angle   12 positions |
| Rotary limitation   end stop:                   | Configurable                                                       |
| Switching torque:                               | 1.5, 8, 15 or 20 Ncm ( $\pm 25\%$ in new condition)                |
| Rotational life:                                | > 25'000 cycles (tested at room temperature)                       |
| Rotational stop strength:                       | > 250 Ncm                                                          |
| Fastening torque of nut (front panel mounting): | M10 x 0.75: < 300 Ncm                                              |

### ELECTRICAL DATA

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| Electrical connection: | Soldering eyelets<br>Pins for PCB                                              |
| Switching voltage:     | < 42 VDC (resistive load)                                                      |
| Switching current:     | < 2'000 mA (resistive load)                                                    |
| Contact resistance:    | < 10 m $\Omega$ (in new condition)                                             |
| Switching capacity:    | < 1 pF (between the contacts)                                                  |
| Switching function:    | 1 x 24 to 6 x 3 poles x positions per wafer, max. 8 wafers                     |
| Switching mode:        | Shorting (for 15° and 30° detent angle)<br>Non-shorting (for 30° detent angle) |
| Dielectric strength:   | 500 VDC during 60 s (pin-to-pin, pin-to-housing)                               |
| Insulation resistance: | > 1 G $\Omega$ at 500 VDC (pin-to-pin, pin-to-housing, in new condition)       |

### MATERIALS

|                      |                                                   |
|----------------------|---------------------------------------------------|
| Shaft:               | Stainless steel 1.4305                            |
| Bushing   housing:   | Zinc die casting (zinc plated and passivated)     |
| Contact surface:     | Cu alloy (Au plated)                              |
| Insulation material: | Wafer: PEAK or ceramic<br>Rotor: Polybutylen (PB) |
| Soldering leads:     | Cu alloy (Au plated)                              |
| Hex nut:             | Brass (zinc plated and passivated)                |

### ENVIRONMENTAL DATA

|                                 |                                                                              |
|---------------------------------|------------------------------------------------------------------------------|
| Operating temperature:          | -40 to +85 °C (IEC 60068-2-14)                                               |
| Storage temperature:            | -40 to +85 °C (IEC 60068-2-14)                                               |
| IP sealing against front panel: | IP60 without sealing<br>IP68 with shaft and front panel sealing (2 bar, 1 h) |
| Vibration:                      | 10 G <sub>RMS</sub> at 10 to 2'000 Hz                                        |
| Flammability:                   | UL94-HB                                                                      |

### SOLDERING CONDITIONS

|                 |                     |
|-----------------|---------------------|
| Hand soldering: | < 340 °C during 2 s |
| Wave soldering: | < 280 °C during 5 s |

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