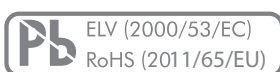


Product description

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



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

04

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

SWITCH DESIGN

Technical drawing of a shaft-hub assembly with a pin. The shaft has a diameter of 6 mm with a tolerance of +0.01/-0.03 and a thread of M10 x 0.75. The hub has a bore diameter of 6 mm with a tolerance of +0.01/-0.03. The pin has a diameter of 2.5 mm and a length of 17.8 mm. The assembly is shown in a cross-section view with dimensions for the shaft, hub, and pin.

Technical drawing of a diamond-shaped metal plate. The plate has a central circular hole with a diameter of $\phi 16$. The outer boundary is a diamond shape with a width of 32 and a height of 26. The plate is divided into four quadrants by a horizontal and vertical centerline. The quadrants are labeled with numbers 1 through 24. The top quadrant is labeled 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. The right quadrant is labeled 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24. The bottom quadrant is labeled 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36. The left quadrant is labeled 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48. The plate is shown with a cross-section view on the right side, indicating a thickness of 25.

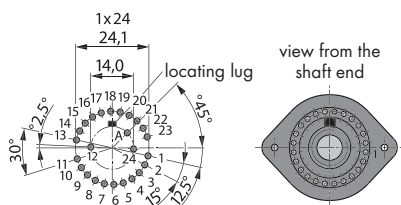
Technical drawing of the front view of a mechanical assembly. The drawing shows a central shaft with a flange and a large housing with internal components. Dimensions 28.4 and 44.55 are indicated at the bottom.

2|9

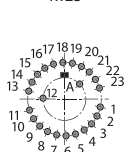
Dimensions and pin assignment

PIN ASSIGNMENT AND DRILLING DIAGRAM

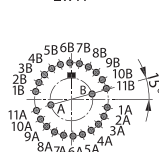
15° DETENT ANGLE



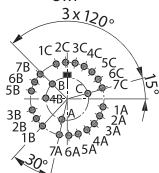
1x23



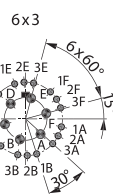
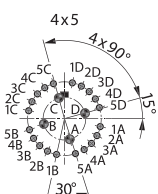
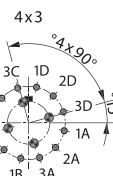
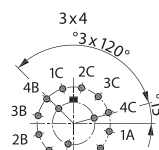
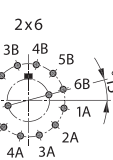
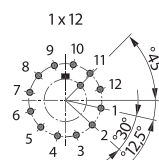
2x11



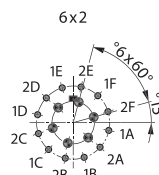
3x7



30° DETENT ANGLE



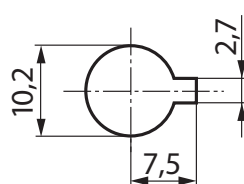
● = $\varnothing 1,3 \text{ mm}$
 ● = $\varnothing 2,3 \text{ mm}$



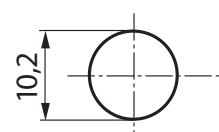
● = $\varnothing 1,3 \text{ mm}$
 ● = $\varnothing 2,3 \text{ mm}$

FRONT PANEL CUT OUT

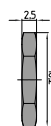
IP60-VERSION (WITH LOCATING LUG)



IP68-VERSION (WITHOUT LOCATION LUG)



NUT

HEX NUT (SUPPLIED) SHAFT $\varnothing 6 \text{ mm}$ 

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

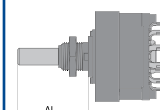
- 00** Standard
- 23** 23 positions
- 22** 22 positions
- 21** 21 positions
- 20** 20 positions
- 19** 19 positions
- 18** 18 positions
- 17** 17 positions
- 16** 16 positions
- 15** 15 positions
- 14** 14 positions
- 13** 13 positions
- 12** 12 positions
- 11** 11 positions
- 10** 10 positions
- 09** 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**¹ customized
(shaft length rounded to next 0.5 mm,
e.g. 10.3 mm = 10.5 mm or 10 mm)

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

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



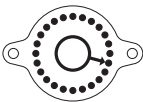
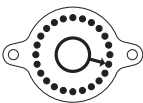
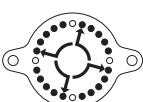
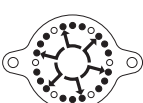
PIN STYLE | IP-SEALING

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

Ordering information

STANDARD TYPES¹

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

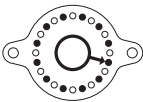
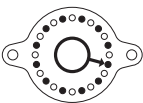
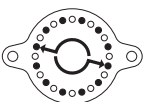
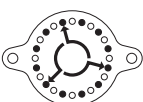
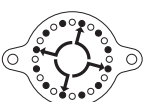
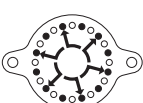
CONTACT ARRANGEMENT	NUMBER OF WAFERS	FUNCTION (POLES X POSITIONS)	PART NUMBER	
			WITH SOLDER EYELETS	WITH PINS FOR PCB
	1—H	1 x 24 endless rotating	04-1103	04-1103-20
	2—HH	2 x 24 endless rotating	04-2103	—
	3—HHH	3 x 24 endless rotating	04-3103	—
	4—HHHH	4 x 24 endless rotating	04-4103	—
	1—H	1 x 24	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	—

¹ For other types | options see ordering code

Ordering information

STANDARD TYPES¹

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

CONTACT ARRANGEMENT	NUMBER OF WAFERS	FUNCTION (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	—

¹ 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:

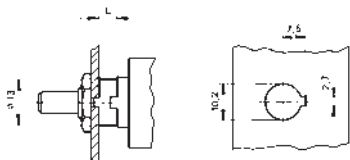
Spacers can be used in many cases instead of shortened bushes; made of glass-fibre reinforced plastic to compensate the front panel thickness; available in two standard lengths. Can not be used for IP68 versions.

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)

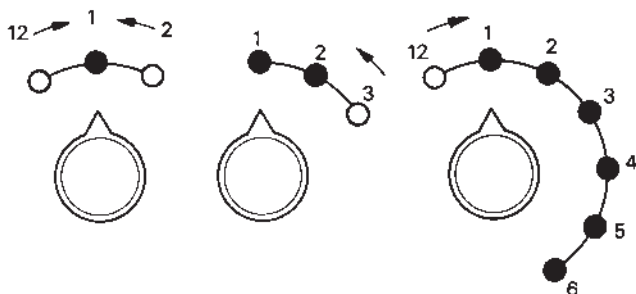
Part number 4124-35 (100 pieces / bag), 5.5 mm length (L)



Customized solutions

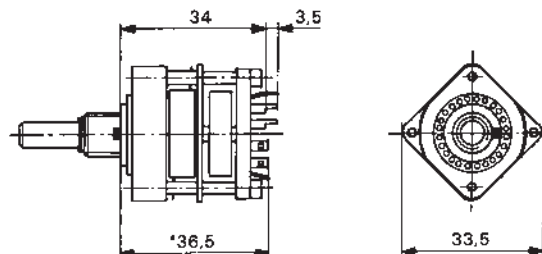
SWITCH WITH MOMENTARY CONTACT

EXAMPLES



● Detent position
○ Momentary contact

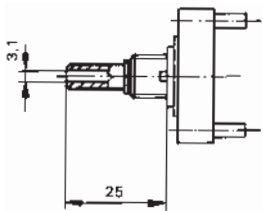
DIMENSIONS



*17.5 mm extra per wafer

HOLLOW SHAFT SYSTEM

HOLLOW SHAFT



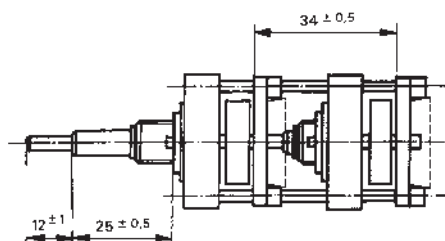
Available for switches up to 5 wafers.
Inner shaft ($\varnothing 3$ mm) must be ordered separately.

INNER SHAFT



For switches with mounting plate or hollow shaft.
Hollow shaft must 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 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 Pins for PCB
Switching voltage:	< 42 VDC (resistive load)
Switching current:	< 2'000 mA (resistive load)
Contact resistance:	< 10 m Ω (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) Non-shorting (for 30° detent angle)
Dielectric strength:	500 VDC during 60 s (pin-to-pin, pin-to-housing)
Insulation resistance:	> 1 G Ω 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 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 IP68 with shaft and front panel sealing (2 bar, 1 h)
Vibration:	10 G _{RMS} 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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