

MULTI ROTARY SWITCH X4

MAIN FEATURES

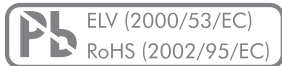
HALL EFFECTED SENSING SYSTEM, CODED SWITCH, ENCODER

- 12 or 24 positions, with selectable end stop
- 1.5 to 20 Ncm switching torque
- Up to 100'000 switching cycles
- Absolute code with analog and PWM outputs, or encoder output
- Optional push button function
- 2.7 to 5.5 VDC operating voltage
- -30 to +85°C operation, with optional IP68 sealing

MIL-STD-202G

MIL-STD-810F

RoHS (2002/95/EC)



POSSIBLE CUSTOMIZATIONS

- Shaft styles
- Indexing feel
- Connectors, cabling and pinning
- Operating voltage; up to 32 VDC
- Interfacing; i.e. asynchronous, SPI, I2C or CAN

TYPICAL APPLICATIONS

- Construction site and transportation controls
- Tool machines and defense applications
- Medical controls

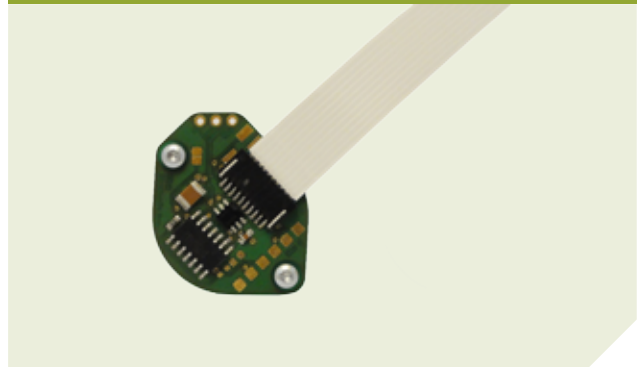
EXAMPLES OF CUSTOMIZATIONS

- Stainless steel bushing with 5 bar sealing
- 1/4" double-D shape shaft with tap screw
- High/low torque function "on/off"

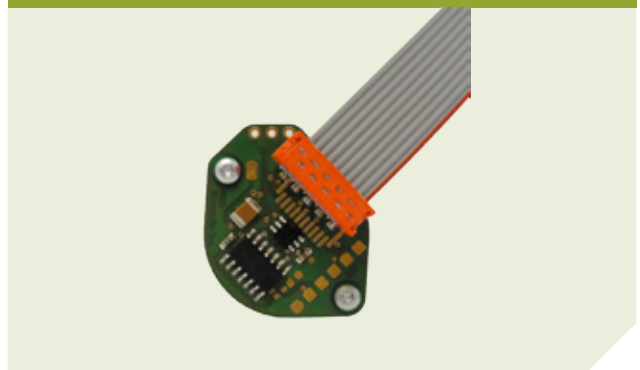
TYPE X4



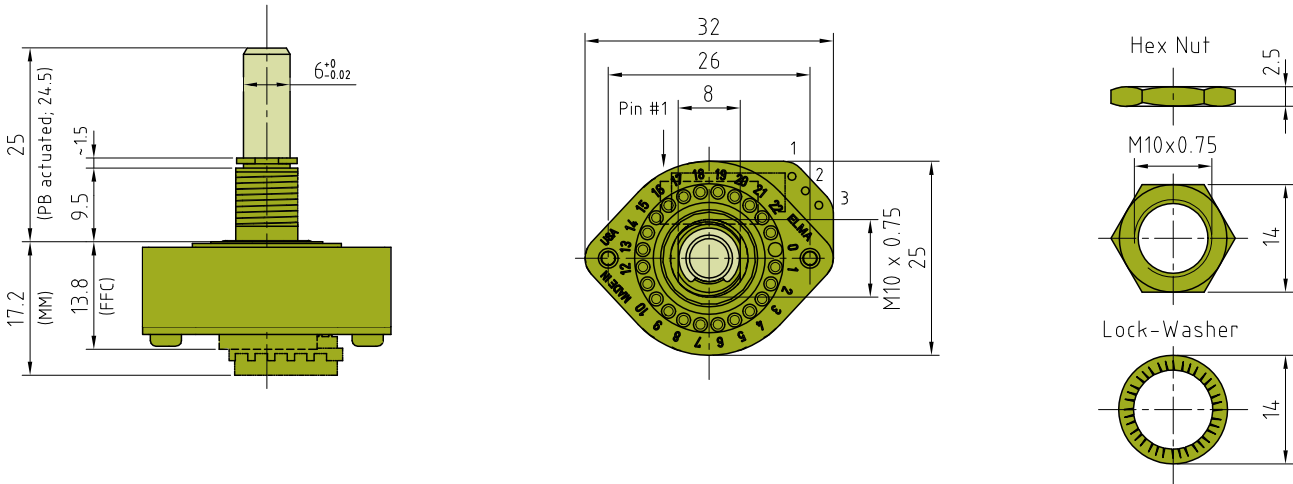
TYPE X4 (WITH FFC CONNECTOR)



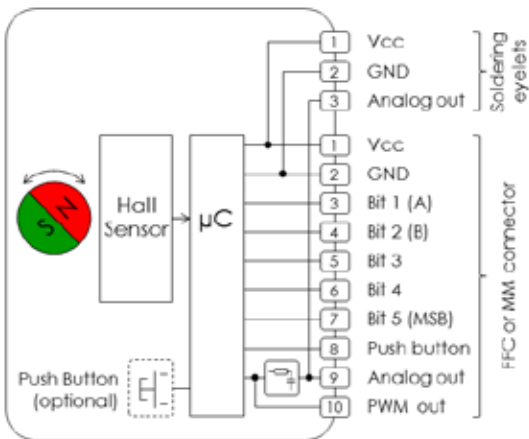
TYPE X4 (WITH MICROMATCH CONNECTOR)



DIMENSIONS (mm)



CIRCUIT AND PIN ALLOCATION



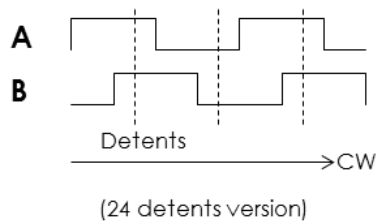
ABSOLUTE CODE OUTPUT (GRAY)

Absolute Code Output (Gray)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
2	Low	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
3	Low	Low	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
4	Low	Low	Low	High	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

■ High

ENCODER OUTCOME



MULTI ROTARY SWITCH X4

SPECIFICATIONS

MECHANICAL DATA

Indexing Resolution:	12 positions (30° Indexing; 330° total switch travel) or 24 positions (15° indexing; 345° total switch travel)
Switching torque:	1.5, 4, 8, 15 or 20 Ncm (+/- 30%, over temperature range and life)
Rotational life:	100'000 cycles with 1.5 Ncm switching torque (over temperature range, at 120 RPM) 50'000 cycles with 4 or 8 Ncm switching torque (over temperature range, at 120 RPM) 30'000 cycles with 15 or 20 Ncm switching torque (over temperature range, at 120 RPM)
Shaft strength:	1'000 N push, 200 N pull, 500 N side force min. (all static, against housing, for 1 minute max.)
End stop strength:	250 Ncm min. (push button not actuated)
Mounting torque (Nut):	300 Ncm max.
Connector:	FFC (10 positions, 1 mm pitch, top contacts), or MicroMaTch, (10 positions)

ELECTRICAL DATA

Operating voltage (Vcc):	2.7 to 5.5 VDC (stabilized, 20 mVpp max. ripple). With encoder option; 2.7 to 3.3 VDC
Current consumption:	20 mA max. (at 5.5 VDC, +85°C and no load condition)
Digital outputs:	Push/pull, 10 mA max. per output pin
Absolute code:	12 or 24 positions Gray code, toggle free
Encoder:	12 PPR (pulses per revolution), channel A leading B (in clockwise direction), toggle free
Push button:	De-bounced, active high
Analog output	Scaling from 0 VDC to Vcc, voltage is proportional to switch position (ccw), output resistance; 1'000 Ω typ., ripple; 30 mV typ. (over temperature range, at 5 VDC), not provided with encoder option
PWM output:	10 bit resolution, approx. 5 kHz (at room temperature and 5 VDC), duty cycle; 0 to 100%, duty cycle is proportional to switch position (ccw), not provided with encoder option
Response times:	Rotary operation; 100 ms max. (120 RPM max.), push button; 10 ms max.
Insulation resistance (new condition):	1 G Ω min. @ 500 VDC
Dielectric withstanding voltage:	500 VDC during 60 seconds (pin to pin, pin to housing)

MATERIAL DATA

Shaft:	Stainless steel (1,4305)
Housing:	Zinc diecast, matt nickel plated
Nut:	Brass, zinc plated and passivated
Lock Washer:	Spring steel, zinc plated

ENVIRONMENTAL DATA

Temperature ranges:	-30 to +85°C max. operating, -55 to +85°C max. storage
Humidity:	90% relative humidity max., non-condensing (against front panel, MIL-STD-202G, method 103B, condition B)
Salt atmosphere:	With IP68 sealing option only (against front panel, MIL-STD-810F, method 509.4; 96 hrs.)
IP sealing:	IP60, optional IP68 (against front panel, steady state, 50 m submersion for 4 hrs. max.)
Vibration:	29 G _{rms} max. at 100 to 1,000 Hz (MIL-STD-202G, method 214A, condition 1H/15 minutes)
Flammability:	UL94-HB

PUSH BUTTON RATING

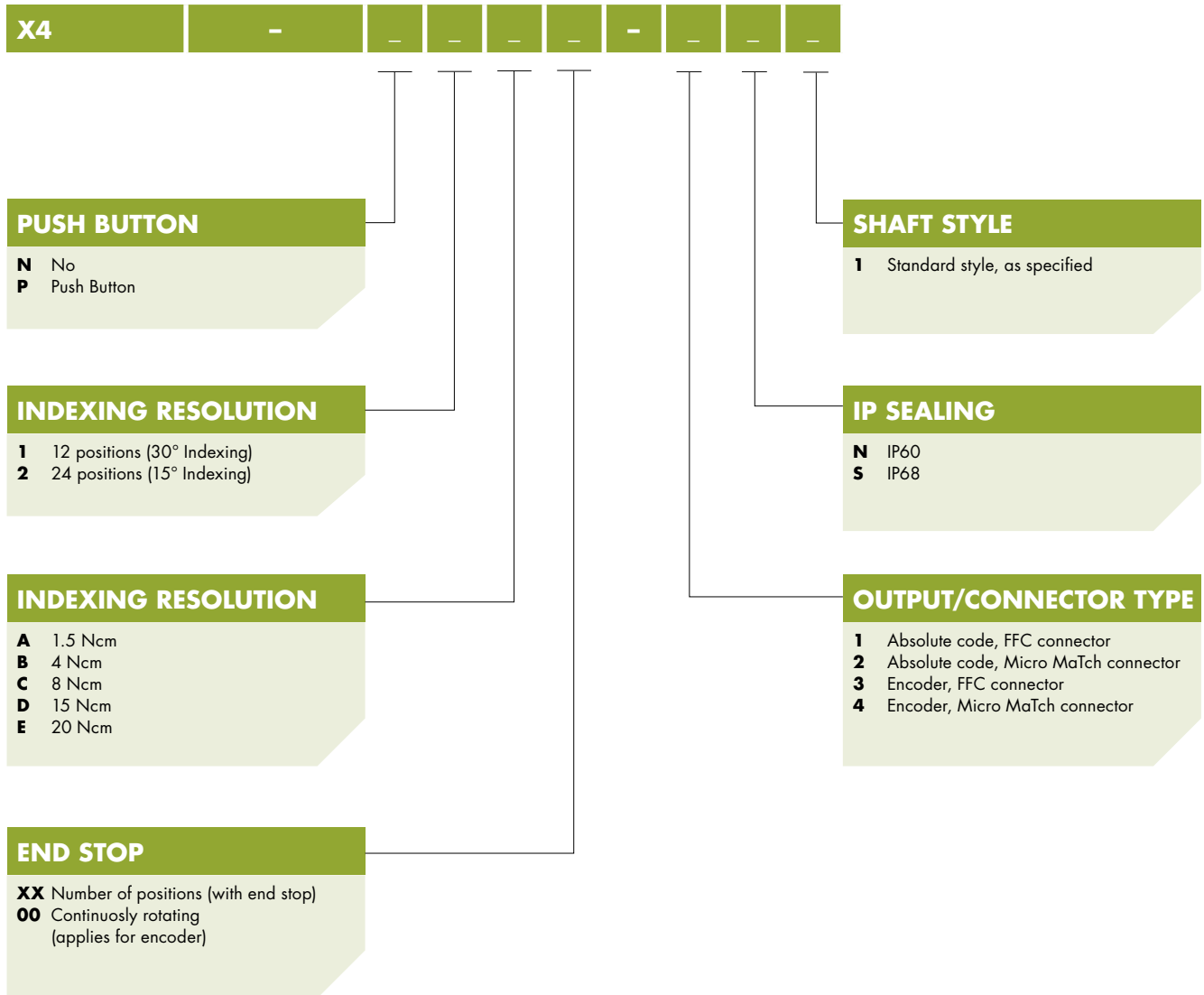
Type:	Tact switch, IP67 sealed
Actuation force:	6 N (+/-30%, over temperature range and life)
Actuation life:	100'000 cycles min. at 2 Hz max. actuation speed (over temperature range)
Switch travel:	0.5 mm (+/- 0.2 mm)
Contact plating	Silver

PACKAGING QUANTITY

Tray:	Single piece packed (ESD shielded bag), nut and lock washer are included 2 s max.
-------	---

MULTI ROTARY SWITCH X4

TYPE KEY



ACCESSORIES TO ORDER

Spare nuts with lock washer (10 pcs. pack): P/N M10NUTWASH10

Stop screws (10 pcs. pack): P/N X4-STOP10