

# ANALOGUE 1- AND 2-AXIS INDUSTRIAL JOYSTICKS MJ-2K CP OM



MJ-2K series joysticks with IP 66 protection and a special lamellar gaiter seal provide a compact and robust human-machine interface. Analogue sensor elements using robust conductive plastic contact technology ensure high-precision control. 1- and 2-axis versions with galvanically isolated directional contacts provide reliable motion control for construction equipment, in mobile hydraulics, for heavy machinery and in marine technology.

## FEATURES

- Long service life
- Robust design
- Compact
- Conductive plastic technology

## APPLICATIONS

- Aerial work platforms
- Radio remote controls
- Forklift trucks
- Hydraulics
- Measuring machines
- Medical technology
- Microscopy



## ELECTRICAL SPECIFICATIONS

<b>Resistance value</b>	5 kΩ *
<b>Resistance tolerance</b>	± 20 %
<b>Deflection angle, el.</b>	> ± 26° *
<b>Independent linearity</b>	± 2 %
<b>Zero position switch per axis</b>	< ± 3° open
<b>Load capacity/axis</b>	0.2 W at 40° C
<b>Operating voltage (VCC)</b>	Max. 30 VDC
<b>Contact current</b>	< 10 μA
<b>Max. contact current</b>	3 mA (typ.: 1 mA; in case of malfunction: max. 5 mA)
<b>Insulation resistance</b>	10 GΩ at 500 VDC
<b>Dielectric strength</b>	2,000 V

## MECHANICAL SPECIFICATIONS

<b>Service life</b>	5 million cycles
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Specifications are subject to change without notice.  
\* Other values on request.

<b>Deflection angle, mech.</b>	See drawing
<b>Operating force</b>	5 N typically
<b>Gate shape</b>	Square, soft cross guide
<b>Wiper zero position</b>	± 1°
<b>Impact strength</b>	200 N
<b>User control</b>	Handle with Gaiter
<b>Mounting</b>	Outside mounting (OM)

## AMBIENT CONDITIONS

<b>Storage temperature</b>	-40° C – +85° C
<b>Operating temperature</b>	-25° C – +70° C
<b>Protection class</b>	IP 66

## MATERIALS

<b>Base</b>	Aluminium
<b>Bearing</b>	Stainless steel/plastic
<b>Electrical connection</b>	12-pin Hirose plug
<b>Mounting</b>	M2.5 x 16 with 3 mm mounting plate, mounting ring. Select screw length to match plate thickness.

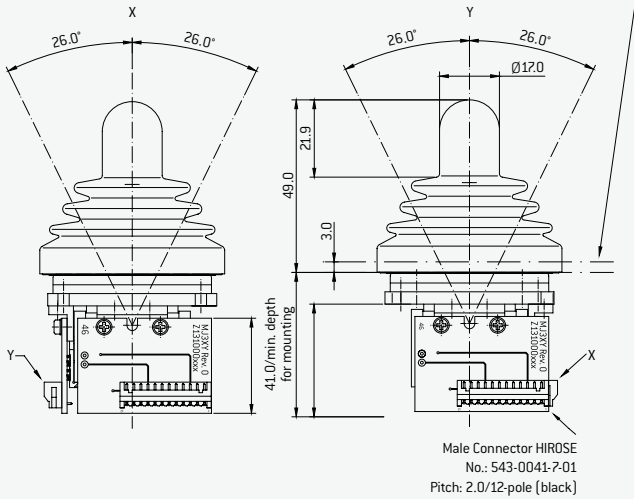
## MJ-2K CP (CONDUCTIVE PLASTIC) ANALOGUE OM

Type Item number	MJ-2K X:0 Y:5k MC 1-0-1 OM Hirose 12-pin E060200412	Type Item number	MJ-2K XYZ: 5k MC 1-0-1 OM Hirose 12-pin E060200380
Type Item number	MJ-2K XY: 5k MC 1-0-1 OM Hirose 12-pin E060200394	Connection cable Item number	MJ-2K Hirose 12-pin (ws) LiYv 0.14mm_500mm Z301000512
Type Item number	MJ-2K XY:5k MC1-0-1 DS series 1B OM Hirose 12-pin E060200395		

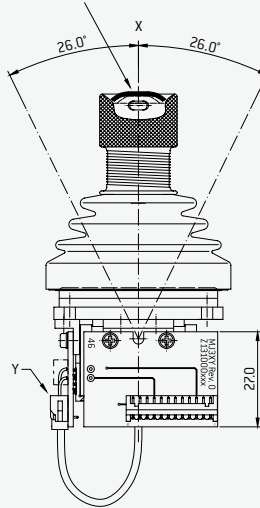
DRAWINGS FOR MJ-2K CP XY OM

DRAWINGS FOR MJ-2K CP XY OM BUTTON

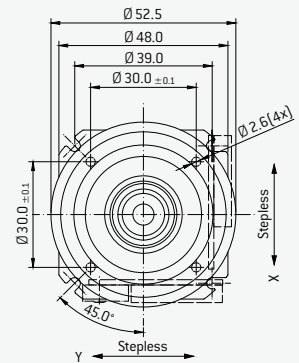
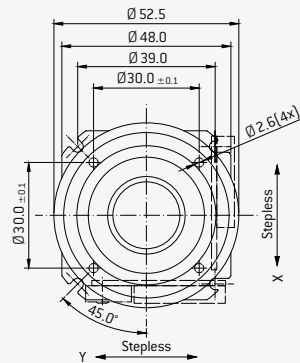
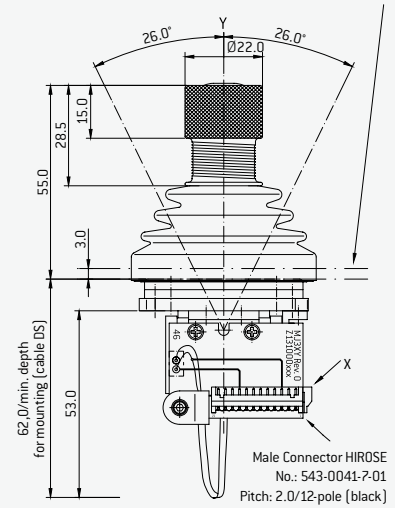
Assembly of Gaiter together with Mounting Ring  
 MJ-2K 4 x M2,5/30 x 30 MLX-Art.-No.: Z404000023  
 If thickness of mounting panel is 3 mm: Use Screw M2,5 x 16 mm/Center Hole D = 35.0



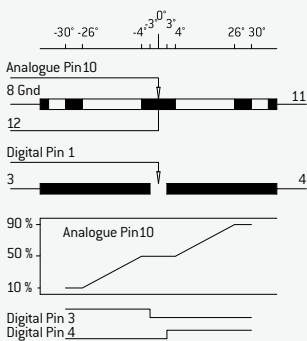
Push to operate  
 "Deadman switch" (DS series IB)



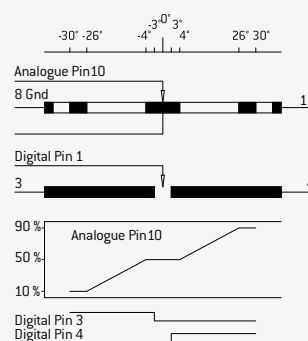
Assembly of Gaiter together with Mounting Ring  
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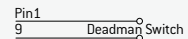
CONNECTOR PIN ASSIGNMENT/DIAGRAM



Connect. Resistance: 5 kOhm  $\pm 20\%$   
 Analogue band: 10 % – 90 %, Utotall  $\pm 3\%$   
 Medium Voltage: 50 %, Utotall  $\pm 2,5\%$   
 Linearity:  $\pm 2\%$   
 Contact Resistance Switch: < 1 kOhm  
 Life CP/PCB: > 5 Mio Cycles



Connect. Resistance: 5 kOhm  $\pm 20\%$   
 Analogue band: 10 % – 90 %, Utotall  $\pm 3\%$   
 Medium Voltage: 50 %, Utotall  $\pm 2,5\%$   
 Linearity:  $\pm 2\%$   
 Contact Resistance Switch: < 1 kOhm  
 Life CP/PCB: > 5 Mio Cycles



OPTIONS/ACCESSORIES

Description	Short form	Description	Option
Cross gate	CG	Without direction guide	NG
Soft Control	SC	Mechanical detents	1 – 5 steps with end stops, free combination
(60 % of standard operation force, not in combination with mechanical detents)		Outside mounting	OM
Digital to ground switching	GND	Electrical contact	Solder connection
Push Button in the handle	DS (series IB)		

# ANALOGUE 3-AXIS INDUSTRIAL JOYSTICK MJ-2K OM



The 3-axis version of the MJ-2K series joystick with IP 66 protection stands out through its high-precision zero return. A special lamellar gaiter seal provides the required operating reliability even in harsh environments. Analogue sensors enable high-precision control at low power consumption. Galvanized isolated directional contacts provide reliable operation on construction sites, in robotics, in mechanical and systems engineering, for construction equipment and even boats.

## FEATURES

- Long service life
- Robust design
- Compact
- Conductive plastic technology

## APPLICATIONS

- Aerial work platforms
- Radio remote controls
- Forklift trucks
- Hydraulics
- Robotics
- Microscopy



## ELECTRICAL SPECIFICATIONS

Resistance value	5 kΩ *
Resistance tolerance	± 20 %
Deflection angle, el.	XY: > ±19.5°; Z: > ± 37°*
Independent linearity	± 2 %
Zero position switch per axis	XY: < ±3° open; Z: < ±4° open
Load capacity/axis	0.2 W at 40° C
Operating voltage (VCC)	Max. 30 VDC
Contact current	< 10 μA
Max. contact current	3 mA (typ.: 1 mA; in case of malfunction: max. 5 mA)
Insulation resistance	10 GΩ at 500 VDC
Dielectric strength	2,000 V

## MECHANICAL SPECIFICATIONS

**Service life** XY: 5 million cycles, Z: 3 million cycles

Specifications are subject to change without notice.  
\* Other values on request.

Deflection angle, mech.	See drawing
Operating force	XY: 5 N typically
Gate shape	Square, soft cross guide
Wiper zero position	± 1°
Impact strength	XY: 150 N/Z: 1.5 Nm
User control	Handle with Gaiter
Mounting	Outside mounting (OM)

## AMBIENT CONDITIONS

Storage temperature	-40° C – +85° C
Operating temperature	-25° C – +70° C
Protection class	IP 66

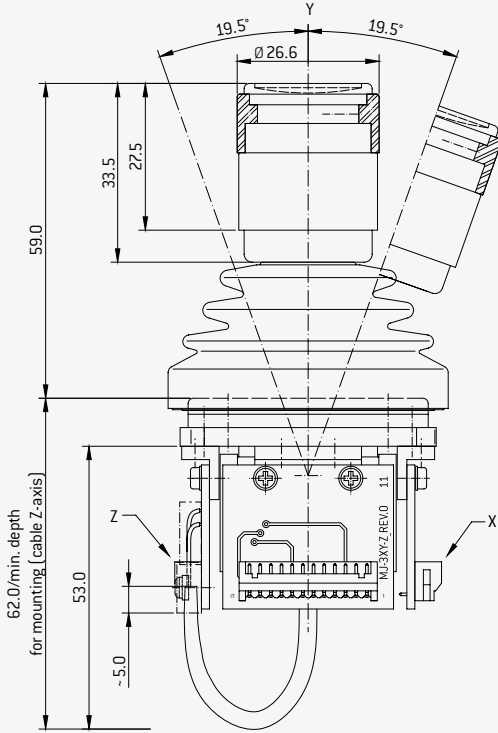
## MATERIALS

Base	Aluminium
Bearing	Stainless steel/plastic
Electrical connection	12-pin Hirose plug
Mounting	M2.5 x 16 with 3 mm mounting plate, mounting ring. Select screw length to match plate thickness.

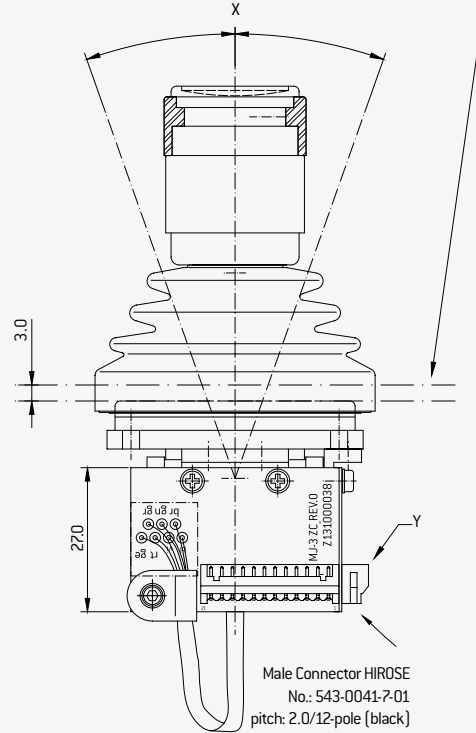
## MJ-2K CP (CONDUCTIVE PLASTIC) ANALOGUE OM

Type Item number	MJ-2K X:0 Y:5k MC 1-0-1 OM Hirose 12-pin E060200412	Type Item number	MJ-2K XYZ: 5k MC 1-0-1 OM Hirose 12-pin E060200380
Type Item number	MJ-2K XY: 5k MC 1-0-1 OM Hirose 12-pin E060200394	Connection cable Item number	MJ-2K Hirose 12-pin (ws) LiYv 0.14mm_500mm Z301000512
Type Item number	MJ-2K XY:5k MC1-0-1 DS series IB OM Hirose 12-pin E060200395		

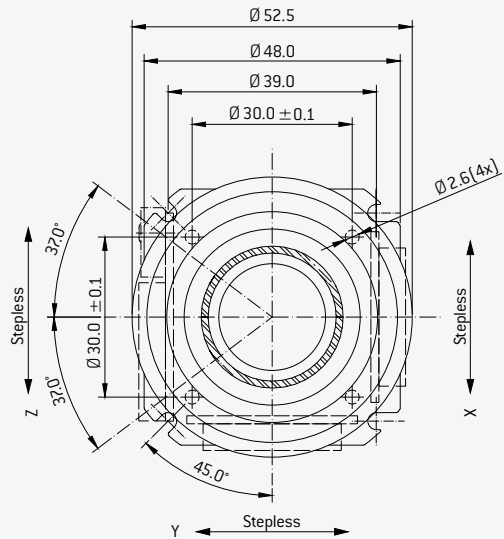
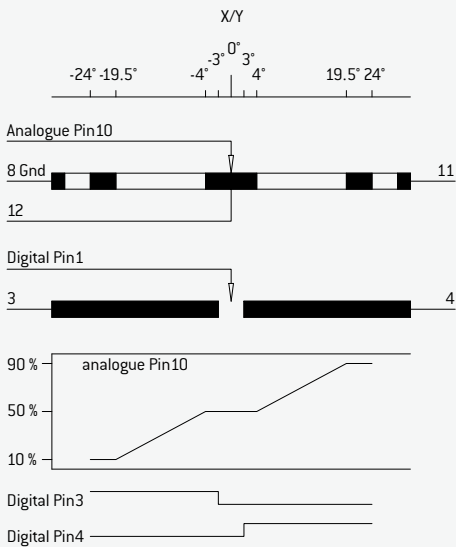
**DRAWINGS FOR MJ-2K CP XYZ 0M**



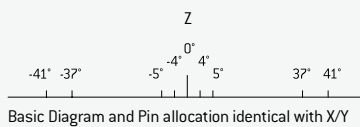
Assembly of Gaiter together with Mounting Ring  
 MJ-2K 4 x M2,5/30 x 30 MLX-Art.-No.: Z404000023  
 If thickness of mounting panel is 3 mm: Use Screw M2,5 x 16 mm/Center Hole D = 35.0



**CONNECTOR PIN ASSIGNMENT/DIAGRAM**



Connect. Resistance: 5 kOhm  $\pm 20\%$   
 Analogue band: 10% - 90%,  $U_{total} \pm 3\%$   
 Medium Voltage: 50%,  $U_{total} \pm 2.5\%$   
 Linearity:  $\pm 2\%$   
 Contact Resistance Switch: < 1 kOhm  
 Life CP/PCB: > 5 Mio Cycles



# DIGITAL 1- AND 2-AXIS INDUSTRIAL JOYSTICK MJ-2K CP OM



The MJ-2K series joysticks are also available with digital output signals. Mechanical detents provide tactile feedback. The galvanized isolated directional contacts provide maximum operating reliability for the control of crane systems on factory floors or on construction sites. Despite their robustness, the joysticks are very light and ergonomically designed for comfortable operation.

## FEATURES

- Long service life
- Robust design
- Compact
- Conductive plastic technology

## APPLICATIONS

- Aerial work platforms
- Radio remote controls
- Forklift trucks
- Hydraulics



## ELECTRICAL SPECIFICATIONS

<b>Switching current</b>	5 mA at 5 V *
<b>Versions</b>	Digital 1- to 4-stage (1-0-1 to 4-0-4), optional: 5-0-5
<b>Deflection angle, el.</b>	4 x 6.5°*, optional: 5 x 5.2°
<b>Zero position switch per axis</b>	< ± 3° open
<b>Load capacity/axis</b>	0.2 W at 40° C
<b>Operating voltage (VCC)</b>	Max. 30 VDC
<b>Insulation resistance</b>	1 GΩ at 500 VDC
<b>Dielectric strength</b>	2,000 V

## MECHANICAL SPECIFICATIONS

<b>Service life</b>	> 3 million cycles
<b>Deflection angle, mech.</b>	See drawing
<b>Operating force</b>	5 N typically

Specifications are subject to change without notice.  
\* Other values on request.

<b>Gate shape</b>	Square, soft cross guide
<b>Wiper zero position</b>	± 1°
<b>Impact strength</b>	200 N
<b>User control</b>	Handle with Gaiter
<b>Mounting</b>	Outside mounting (OM)

## AMBIENT CONDITIONS

<b>Storage temperature</b>	-40° C – +85° C
<b>Operating temperature</b>	-25° C – +70° C
<b>Protection class</b>	IP 66

## MATERIALS

<b>Base</b>	Aluminium
<b>Bearing</b>	Stainless steel/plastic
<b>Electrical connection</b>	12-pin Hirose plug
<b>Mounting</b>	M2.5 x 16 with 3 mm mounting plate, mounting ring. Select screw length to match plate thickness.

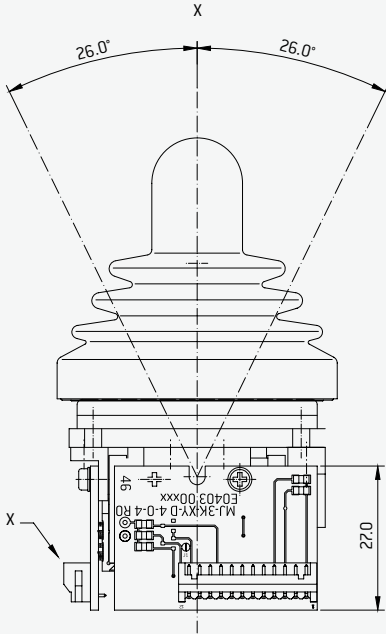
## MJ-2K CP (CONDUCTIVE PLASTIC) DIGITAL OM

Type	MJ-2K CP X: 0 Y: 4-0-4 OM Hirose 12-pin	Type	MJ-2K CP XY: 4-0-4 DS series IB OM Hirose 12-pin
Item number	E060200421	Item number	E060200397
Type	MJ-2K CP XY: 4-0-4 OM Hirose 12-pin	Connection cable	MJ-2K Hirose 12-pin (ws) LiYv 0.14mm_500mm
Item number	E060200398	Item number	Z301000512

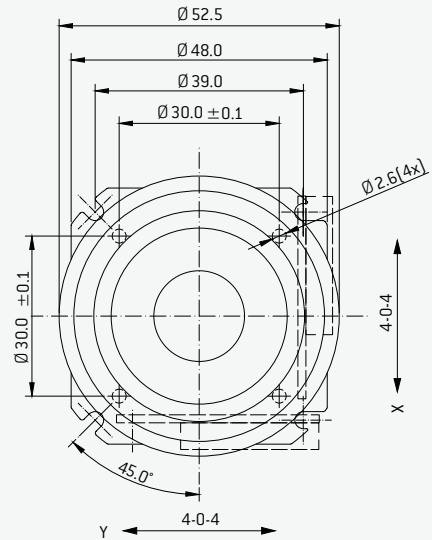
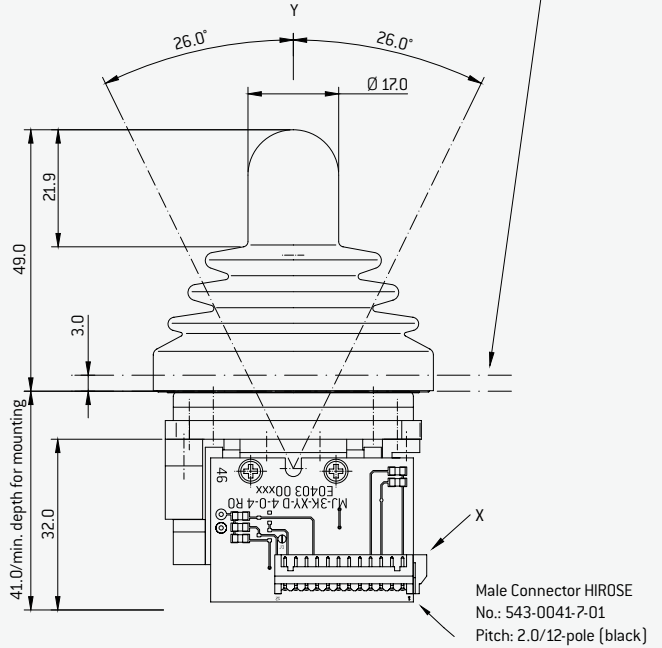
## MJ-2K CP (CONDUCTIVE PLASTIC) ANALOGUE OM/MECHANICAL DETENTS

Type	MJ-2K X:0 Y: 4-0-4 5k MC 1-0-1 OM Hirose 12-pin	Type	MJ-2K X:0 Y: 5-0-5 5k MC 1-0-1 OM Hirose 12-pin
Item number	E060200450	Item number	E060200451
Type	MJ-2K XY: 4-0-4 5k MC 1-0-1 OM Hirose 12-pin	Type	MJ-2K XY: 5-0-5 5k MC 1-0-1 OM Hirose 12-pin
Item number	E060200402	Item number	E060200443
Type	MJ-2K XY: 4-0-4 5k MC 1-0-1 DS series IB OM Hirose 12-pin	Connection cable	MJ-2K Hirose 12-pin (ws) LiYv 0.14mm_500mm
Item number	E060200420	Item number	Z301000512

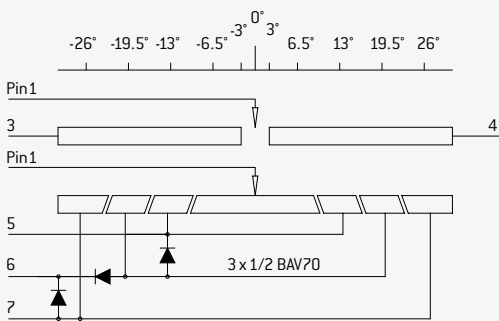
**DRAWINGS FOR MJ-2K CP XY OM**



Assembly of Gaiter together with Mounting Ring  
 MJ-2K 4 x M2,5/30 x 30 MLX-Art.-No.: Z40400023  
 If thickness of mounting panel is 3 mm: Use Screw M2,5 x 16 mm/Center Hole D = 35,0



**CONNECTOR PIN ASSIGNMENT/DIAGRAM 4-0-4**



Contact Resistance Switch: < 1 kOhm  
 Life CP/PCB: > 3 Mio Cycles  
 Anti-interference condensator (100 pF) for switch contacts 4-0-4

	-26°	-19.5°	-13°	-6.5°	0°	6.5°	13°	19.5°	-26°
PIN 3	x	x	x	x					
PIN 4						x	x	x	x
PIN 5	o	x	x				x	x	o
PIN 6	x	x						x	x
PIN 7	x								x

x = electrical Connection/Combination o = optional with Solder-Jumper J1