



# MPA-503THNPO

MPA

POSITION SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

Type	Part no.
MPA-503THNP0	1122502

Other models and accessories → [www.sick.com/MPA](http://www.sick.com/MPA)



### Detailed technical data

#### Features

<b>Cylinder type</b>	Universal
<b>Cylinder types with adapter</b>	Round body cylinder Tie rod cylinder T-slot cylinders Festo cylinders DSBC SMC cylinders CP96
<b>Measuring range</b>	503 mm <sup>1)</sup>
<b>Housing length</b>	505 mm
<b>Output function</b>	Analog, IO-Link
<b>Electrical wiring</b>	DC 4-wire
<b>Analog output (current)</b>	4 mA ... 20 mA <sup>2)</sup>
<b>Enclosure rating</b>	IP65, IP67, IP68 <sup>3)</sup>
<b>Adjustment</b>	IO-Link Teaching in the measuring range Resetting the measuring range
<b>IO-Link functions</b>	Standard functions

<sup>1)</sup> ± 1 mm.

<sup>2)</sup> Default setting: Current output active.

<sup>3)</sup> According to EN 60529.

#### Mechanics/electronics

<b>Supply voltage</b>	15 V DC ... 30 V DC
<b>Power consumption</b>	35 mA, without load

<sup>1)</sup> FSR: Full Scale Range; max. measuring range.

<sup>2)</sup> When using IO-Link, the resolution is 0.25 mm.

<sup>3)</sup> At 25 ° C, linearity error (maximum deviation) depending on response curve and minimal deviation function.

<sup>4)</sup> At 25 ° C, repeatability magnet movement in one direction.

<sup>5)</sup> Only in standard mode, not in IO-Link mode.

<sup>6)</sup> The analog measured value can deviate under transient conditions.

<b>Max. load resistance</b>	≤ 500 Ω Power Output, at 24 V
<b>Protection class</b>	III
<b>Required magnetic field sensitivity, typ.</b>	2 mT ... 15 mT
<b>Resolution, typ.</b>	0.03 % FSR (max. ≥ 0.06 mm) <sup>1) 2)</sup>
<b>Linearity error, typ.</b>	0.5 mm <sup>3)</sup>
<b>Repeat accuracy, typ.</b>	0.06 % FSR (≥ 0.1 mm) <sup>4)</sup>
<b>Sampling rate, typ.</b>	1.15 ms <sup>5)</sup>
<b>Reverse polarity protection</b>	Yes
<b>Short-circuit protection</b>	Yes
<b>Status indicator LED</b>	Yes
<b>Teach-in</b>	Yes
<b>Ambient operating temperature</b>	-20 °C ... +70 °C
<b>Shock and vibration resistance</b>	30 g, 11 ms/10 Hz ... 55 Hz, 1 mm
<b>EMC</b>	According to EN 60947-5-2 <sup>6)</sup>
<b>Connection type</b>	Cable with M8 male connector, 4-pin, 0.3 m
<b>Connection type Detail</b>	
Deep-freeze property	Do not bend below 0 °C
Conductor cross section	0.08 mm <sup>2</sup>
Cable diameter	Ø 2.6 mm
Bending radius	With fixed installation > 5 x cable diameter For flexible use > 10 x cable diameter
Cable outlet	Axial
<b>Material</b>	
Housing	Metal, Aluminum, plastic
Cable	PUR
<b>UL File No.</b>	NRKH.E181493 & NRKH7.E181493

<sup>1)</sup> FSR: Full Scale Range; max. measuring range.

<sup>2)</sup> When using IO-Link, the resolution is 0.25 mm.

<sup>3)</sup> At 25 °C, linearity error (maximum deviation) depending on response curve and minimal deviation function.

<sup>4)</sup> At 25 °C, repeatability magnet movement in one direction.

<sup>5)</sup> Only in standard mode, not in IO-Link mode.

<sup>6)</sup> The analog measured value can deviate under transient conditions.

## Safety-related parameters

<b>MTTF<sub>D</sub></b>	128 years
<b>DC<sub>avg</sub></b>	0 %
<b>T<sub>M</sub> (mission time)</b>	20 years

## Communication interface

<b>Communication interface</b>	IO-Link V1.0.1
<b>Communication Interface detail</b>	COM2
<b>Cycle time</b>	2.3 ms
<b>Process data length</b>	16 Bit
<b>Process data structure</b>	Bit 0 ... 3 = reserved Bit 4 ... 5 = position (after decimal point)

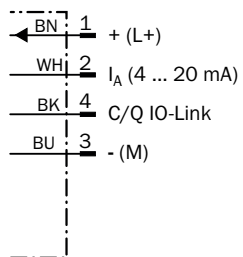
Bit 6 ... 15 = position (before decimal point)

Classifications

<b>ECLASS 5.0</b>	27270104
<b>ECLASS 5.1.4</b>	27270104
<b>ECLASS 6.0</b>	27270104
<b>ECLASS 6.2</b>	27270104
<b>ECLASS 7.0</b>	27270104
<b>ECLASS 8.0</b>	27270104
<b>ECLASS 8.1</b>	27270104
<b>ECLASS 9.0</b>	27270104
<b>ECLASS 10.0</b>	27270104
<b>ECLASS 11.0</b>	27270104
<b>ECLASS 12.0</b>	27274301
<b>ETIM 5.0</b>	EC002544
<b>ETIM 6.0</b>	EC002544
<b>ETIM 7.0</b>	EC002544
<b>ETIM 8.0</b>	EC002544
<b>UNSPSC 16.0901</b>	39122230

Connection diagram

Cd-355



**Dimensional drawing** (Dimensions in mm (inch))

Cable with M8 male connector, 4-pin




	Total length (L1) mm	Measuring range (L2) mm		Total length (L1) mm	Measuring range (L2) mm
<b>MPA-107</b>	109	107	<b>MPA-575</b>	577	575
<b>MPA-143</b>	145	143	<b>MPA-611</b>	613	611
<b>MPA-179</b>	181	179	<b>MPA-647</b>	649	647
<b>MPA-215</b>	217	215	<b>MPA-683</b>	685	683
<b>MPA-251</b>	253	251	<b>MPA-719</b>	721	719
<b>MPA-287</b>	289	287	<b>MPA-755</b>	757	755
<b>MPA-323</b>	325	323	<b>MPA-791</b>	793	791
<b>MPA-359</b>	361	359	<b>MPA-827</b>	829	827
<b>MPA-395</b>	397	395	<b>MPA-863</b>	865	863
<b>MPA-431</b>	433	431	<b>MPA-899</b>	901	899
<b>MPA-467</b>	469	467	<b>MPA-935</b>	937	935
<b>MPA-503</b>	505	503	<b>MPA-971</b>	973	971
<b>MPA-539</b>	541	539	<b>MPA-1007</b>	1,009	1,007





- ① Function signal indicator 1
- ② Function signal indicator 2
- ③ Teach-Pad
- ④ Connection

**Recommended accessories**

Other models and accessories → [www.sick.com/MPA](http://www.sick.com/MPA)

	Brief description	Type	Part no.
<b>Magnets</b>			
	Magnet with mounting hole for M3 countersunk screw, Ø 15.2 mm, height 6 mm	Magnet	5327349

	Brief description	Type	Part no.
Brackets for cylinder sensors			
	Sensor adapter DSBC-32, Stainless steel V2A	BEF-KHZPF032MPA	2086744
	Sensor adapter DSBC-40, Stainless steel V2A	BEF-KHZPF040MPA	2086745
	Sensor adapter DSBC-50, Stainless steel V2A	BEF-KHZPF050MPA	2086746
	Sensor adapter DSBC-63, Stainless steel V2A	BEF-KHZPF063MPA	2086747
	Sensor adapter DSBC-80, Stainless steel V2A	BEF-KHZPF080MPA	2086748
	Sensor adapter DSBC-100, Stainless steel V2A	BEF-KHZPF100MPA	2086749
	Sensor adapter DSBC-125, Stainless steel V2A	BEF-KHZPF125MPA	2086750
	For tie-rod cylinder (diameter tie-rod max. 18 mm), Aluminum alloy (adapter), Stainless steel V2A (mounting-/fixing screw)	BEF-KHZPZ1MPA	2065578
	For round body cylinders with diameter up to 85 mm, Stainless steel V2A	BEF-KHZR085MPA	2066626
	For round body cylinders with diameter up to 135 mm, Stainless steel V2A	BEF-KHZR135MPA	2066627
	For round body cylinders with diameter up to 210 mm, Stainless steel V2A	BEF-KHZR210MPA	2066628
	Sensor adapter CP96-63, Stainless steel V2A	BEF-KHZTS063MPA	2086756
	Sensor adapter CP96-80, Stainless steel V2A	BEF-KHZTS080MPA	2086757
	Sensor adapter CP96-100, Stainless steel V2A	BEF-KHZTS100MPA	2086758
	Sensor adapter CP96-125, Stainless steel V2A	BEF-KHZTS125MPA	2086759
	For T-slot cylinders, Stainless steel V2A (bracket/mounting screw), Brass (fixing screw/sliding nut)	BEF-KHZT01MPA	2065575
	Mounting brackets and plates		
	Bracket for low mounting, Stainless steel V2A (bracket/mounting screw), Brass (fixing screw)	BEF-WNL01MPA	2065973
	Bracket for lateral mounting, Stainless steel V2A (bracket/mounting screw), Brass (fixing screw)	BEF-WNZ01MPA	2065577
Other mounting accessories			
	10 pieces, Label Holder, 2.5 mm to 3.5 mm, 10 pcs., TPU	LABEL HOLDER	2086019
Others			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M8, 4-pin, angled, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Solder connection</li> <li><b>Permitted cross-section:</b> <math>\leq 0.25 \text{ mm}^2</math></li> </ul>	DOS-0804-W	6009975
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M8, 4-pin, straight, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> <math>0.14 \text{ mm}^2 \dots 0.5 \text{ mm}^2</math></li> </ul>	DOS-0804-G	6009974
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M8, 4-pin, straight, A-coded</li> <li><b>Description:</b> Unshielded</li> <li><b>Connection systems:</b> Screw-type terminals</li> <li><b>Permitted cross-section:</b> <math>0.14 \text{ mm}^2 \dots 0.5 \text{ mm}^2</math></li> </ul>	STE-0804-G	6037323

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF8U14-020UA3XLEAX	2094791
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YF8U14-050UA3XLEAX	2094792
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, angled, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 2 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG8U14-020UA3XLEAX	2095589
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M8, 4-pin, angled, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Zones with oils and lubricants, Drag chain operation, Robot</li> </ul>	YG8U14-050UA3XLEAX	2095590

## Recommended services

Additional services → [www.sick.com/MPA](http://www.sick.com/MPA)

	Type	Part no.
Function Block Factory		
<ul style="list-style-type: none"> <li>• <b>Description:</b> The Function Block Factory supports common programmable logic controllers (PLCs) from various manufacturers, such as Siemens, Beckhoff, Rockwell Automation and B&amp;R. More information on the FBF can be found <a href="https://fbf.cloud.sick.com target='_blank'">here</a>.</li> <li>• <b>Note:</b> You can configure your function block at <a href="https://fbf.cloud.sick.com target='_blank'">Function Block Factory</a>. As a login please use your SICK ID.</li> </ul>	Function Block Factory	On request

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)