

Data Sheet

MXR Analog

Magnetostrictive Linear Position Sensors

- External mounting for new or retrofit designs
- Rugged, up to 100 g shock and 15 g vibration levels
- Flexible, capability to measure a range from 100 to 600 mm



Product overview

The MH-Series Model MXR sensor is available in two versions. The MXRC and the MXRS. Although the two versions are similar in both appearance and performance, there are unique features distinguishing the two sensors from one another. The MXRC is available in four discrete stroke lengths up to 250 mm, while the MXRS is available in stroke lengths up to 600 mm (50 mm ordering increments). The MXRC works with a 5 VDC operating voltage, and provides a voltage output that is ratiometric to the operating voltage. The MXRS can work with an operating voltage of either 12 or 24 VDC, and has multiple analog output options available.

Technical data

	MXRS	MXRC
Input		
Measured value	Linear Position measurement	Linear Position measurement
Stroke length	100...500 mm	109.5 mm, 148.0 mm, 217.3 mm, and 250.1 mm
Output		
Voltage	0.25...4.75 VDC, 0.5...4.5 VDC	0.1...4.9 VDC at +5 VDC supply, ratiometric with V supply
Current	4...20 mA	–
Accuracy		
Resolution	±0.10 mm	±0.10 mm
Linearity	< ±0.04 % F.S.	±0.3 mm
Repeatability	< ±0.1 mm	< ±0.1 mm
Hysteresis	±0.1 mm	±0.1 mm
Operating conditions		
Operating temperature	–40...+105 °C	–40...+75 °C
Storage temperature	–30...+105 °C	–20...+85 °C
Humidity	90% relative humidity, no condensation	90% relative humidity, no condensation
Ingress protection	IP69K with M12 approved connector	IP69K with M12 approved connector
Shock test*	100 g (single hit) / IEC standard 68-2-27 (survivability)	5 g (single hit) / IEC standard 68-2-27 (survivability)
Vibration test*	15 g / 10...2000 Hz / IEC standard 68-2-6	1 g / 10...150 Hz / IEC standard 68-2-6
EMC test	ISO 14982 100 V/m (radiated immunity)	Emmissions: EN61000-6-4 Immunity: EN61000-6-2
Design/Material		
Sensor electronics housing	Stainless steel 1.4305 / AISI 303	Stainless steel 1.4305 / AISI 303
Sensor rod with flange	Stainless steel 1.4306 / AISI 304L	Stainless steel 1.4306 / AISI 304L
Installation		
Mounting	Threaded M10×1.5 stud Optional Ball Joint or Spherical Rod End	Threaded M10×1.5 stud Optional Ball Joint or Spherical Rod End
Electrical connection		
Connection type	M12 connector (male)	M12 connector (male)
Electrical isolation	500 VDC (DC ground to machine ground)	500 VDC (DC ground to machine ground)
Operating voltage	12/24 VDC (8...32 VDC)	5 VDC (4.75...5.5 VDC)
Current consumption	Typical ≤ 80 mA (12 VDC); Typical ≤ 40 mA (24 VDC)	Typical ≤ 40 mA (5 VDC)
Polarity protection	Up to –36 VDC	VDC to GND
Overvoltage protection	Up to 36 VDC	Up to 20 VDC

* The vibration and shock rating is stated for a fully retracted sensor.
The rating for full or partially extended sensor depends on the application

Model MXR sensor dimension references

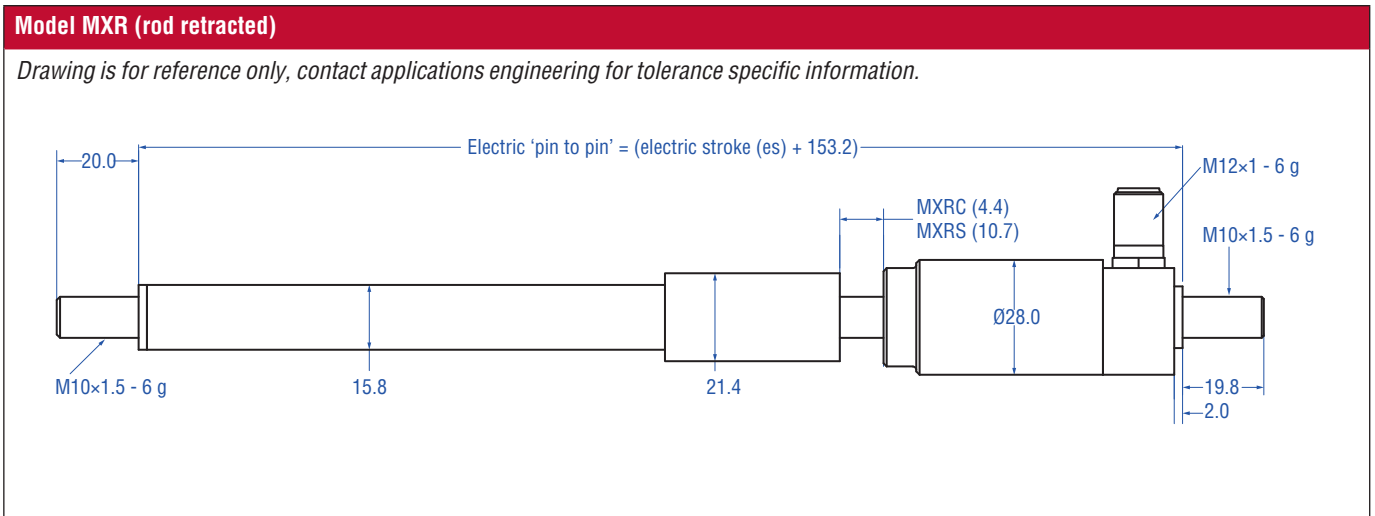


Figure 1. MH-Series Model MXR sensor dimension reference (Model MXRS shown)

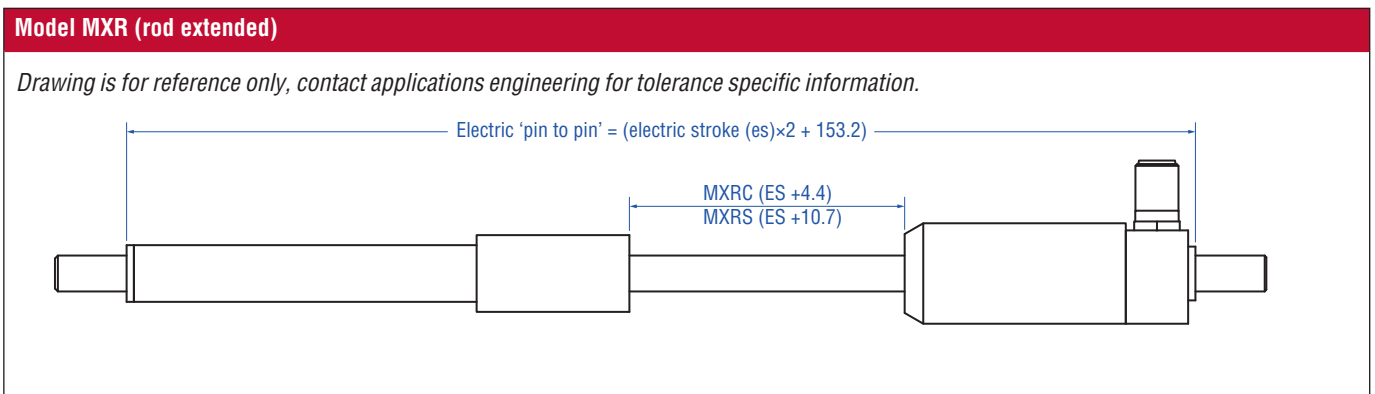


Figure 2. MH-Series Model MXR sensor dimension reference (Model MXRC shown)

Connections and wiring

Connection Type

The Temposonics® M12 integrated connector (shown in Figure 3), meets the most stringent protection requirements important for the difficult environmental conditions of mobile hydraulics applications. Protection type IP69K makes the robust metal housing not only completely dust and waterproof, even the harshest cleaning measures cannot damage the sensor.

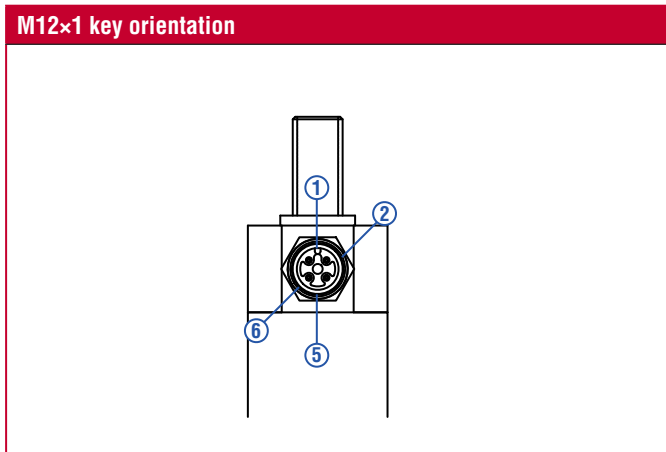


Figure 3. M12x1 connector key orientation

Connector PIN Assignment Reference

Integrated connector (male) as viewed when looking at the sensor

Standard	Integrated connector	Pin assignment and function
N_E	4-pin M12x1	2-3-4; Power, ground, output
N_G	4-pin M12x1	1-3-4; Power, ground, output
N_H	4-pin M12x1	1-3-2; Power, ground, output

Table 1. PIN assignments

Model MXRS ordering information

Use the table below to configure your sensor part number.

M	X	R	S				M	N				3			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

SENSOR MODEL _____ =

M	X	R
---	---	---

 1-3
MXR = Externally mounted sensor with self-contained housing

SENSOR STYLES _____ =

S

 4
S = Version S Electronics

STROKE LENGTH (ORDER LENGTH) _____ =

			M
--	--	--	---

 5-8
 ___ M = Millimeters
 100...500 mm in 50 mm increments

CONNECTION TYPE _____ =

N		
---	--	--

 9-11
N = **Integrated:**
 N = Integrated M12×1 connector

Key orientations (See Figure 3) (90° M12 connector plugged):

- | | |
|---------------------------------|----------------------------------|
| 1 = Connector key at 0° | 5 = Connector key at 180° |
| 2 = Connector key at 45° | 6 = Connector key at 225° |

Termination type and pin assignment (See Table 1):

- N_E** = M12×1, IP69K, 4 pin (pin assignment 2-3-4)
N_G = M12×1, IP69K, 4 pin (pin assignment 1-3-4)
N_H = M12×1, IP69K, 4 pin (pin assignment 1-3-2)

MOUNTING HARDWARE _____ =

--

 12
A = No Additional Hardware
B = 2 × Ball Joint Ends with 2 × M10 Hex Nuts
C = 2 × Spherical Ball Ends with 2 × M10 Hex Nuts

INPUT VOLTAGE _____ =

3

 13
3 = +12/24 VDC

OUTPUT _____ =

--	--	--

 14-16

Voltage:

- V11** = 0.25...4.75 VDC
V12 = 0.5...4.5 VDC

Current:

- A01** = 4...20 mA

Model MXRC ordering information

Use the table below to configure your sensor part number.

M	X	R	C				M	N				5	V	C	1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

SENSOR MODEL _____ =

M	X	R
---	---	---

1-3
MXR = Externally mounted sensor with self-contained housing

SENSOR STYLES _____ =

C

4
C = Version C Electronics

STROKE LENGTH (ORDER LENGTH) _____ =

			M
--	--	--	---

5-8
 ___ M = Millimeters
109 = 109.5 mm stroke **217** = 217.3 mm stroke
148 = 148.0 mm stroke **250** = 250.1 mm stroke

CONNECTION TYPE _____ =

N		
---	--	--

9-11
N__ = **Integrated:**
N = Integrated M12×1 connector

Key orientations (See Figure 3) (90° M12 connector plugged):

- | | |
|---------------------------------|----------------------------------|
| 1 = Connector key at 0° | 5 = Connector key at 180° |
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Termination type and pin assignment (See Table 1):

- N_E** = M12×1, IP69K, 4 pin (pin assignment 2-3-4)
N_G = M12×1, IP69K, 4 pin (pin assignment 1-3-4)
N_H = M12×1, IP69K, 4 pin (pin assignment 1-3-2)

MOUNTING HARDWARE _____ =

--

12
A = No Additional Hardware
B = 2 × Ball Joint Ends with 2 × M10 Hex Nuts
C = 2 × Spherical Ball Ends with 2 × M10 Hex Nuts

INPUT VOLTAGE _____ =

5

13
5 = +5 VDC


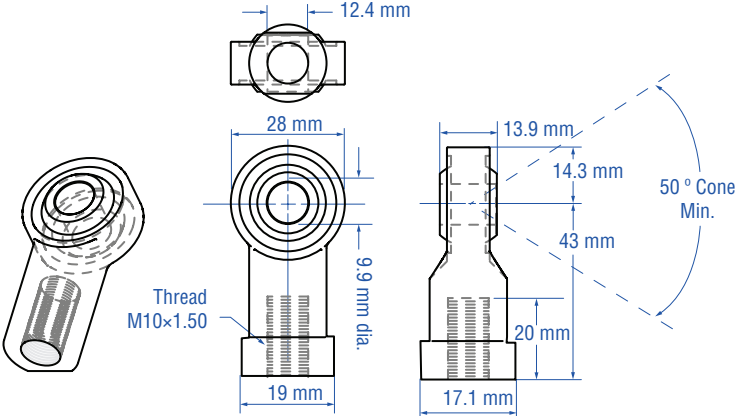

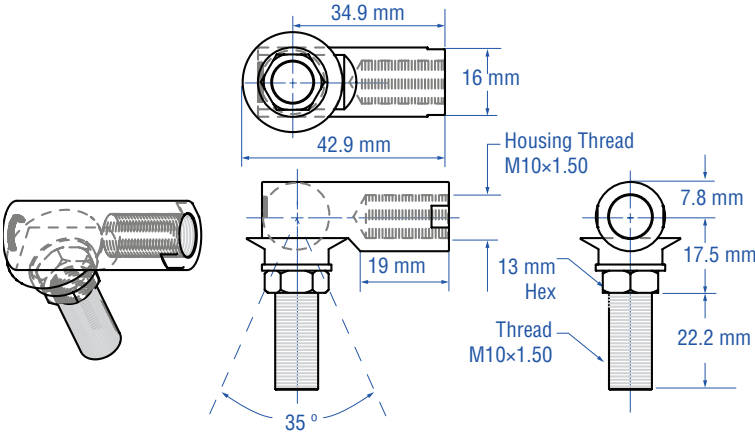

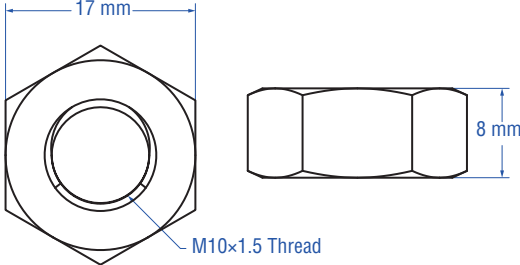
OUTPUT _____ =

V	C	1
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14-16
Voltage:
VC1 = 0.1...4.9 VDC at +5 VDC supply, output ratiometric with V supply

Accessory selections

Mounting accessories available for the Model MXR sensor.

Spherical Rod End	Dimension reference	Part number
		<p>Spherical Rod End 500035</p> <p>Spherical Rod End Kit (includes 2 rod ends and 2 hex nuts) 201947</p>
Ball Joint End	Dimension reference	Part number
		<p>Ball Joint End 500036</p> <p>Ball Joint End Kit (includes 2 Ball Joints and 2 Hex Nuts) 201948</p>
M10 Hex Nut	Dimension reference	Part number
		<p>561788</p>

Accessory selections (Cont.)

Optional accessories available for the Model MXR sensor.

MH-Series Analog/PWM Tester	Part number
The MH-Series Tester includes: <ul style="list-style-type: none">• MH-Series analog / PWM Tester• 12 VDC battery charger with (adapter main plug North America, adapter main plug EU or adapter main plug UK)• Cable with M12×1 connector• Cable with pigtailed wires• Carrying case• CD-Rom with user's guide	280 618



MH-Series Analog/PWM Tester, part no.: 280618



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