



The sensors of the MDS-40-MK series are the new generation of cost-effective and flexible magneto-inductive sensors. In addition to the pre-configured preferred types, a combination of further options (power supply, output, plug,...) for serial or industrial applications is possible.

Possible combinations

The following combinations are possible from a quantity of 200 pieces.

Options

MDS - 40 - MK - SA8 - I - 1130 - IP20 - FIX

FIX: supporting surface for curved surfaces

Protection class: IP67 (casting)
 IP20V (IP20 with partial casting)
 IP20 (not molded)

Supply: 1130 (11 - 30 V)
 5 (5 V)
 33 (3.3 V)

Output: I (4 - 20 mA)
 U10 (2 - 10 V)
 U45 (0.5 - 4.5 V)
 U45R (0.5 - 4.5 V, ratiometric)
 F (frequency: time measurement)

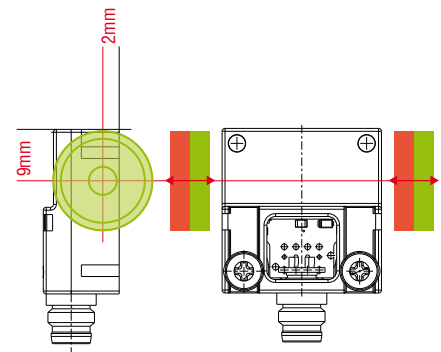
Connector: SA8 (M8x1, axial)
 SR7 (JST JWPF, radial)
 SR0 (JST PA, radial)

		Supply		
		1130	5	33
Output	I	•	-	-
	U10	•	-	-
	U45	•	•	-
	U45R	-	•	•
	F	•	•	•
		Connector / cable		
		SA8	SR7	SR0
Protection class	IP20	•	•	•
	IP67	•	•	-

- Combination possible
- Combination impossible

Main measurement direction

The above-mentioned data refer to the main measurement direction; however, other magnet arrangements and directions of movement are possible and can result in a change of the characteristic line. The magnets can be positioned either to the left or to the right of the sensor regardless of whether the north or the south pole is turned towards the sensor.



Model	Preferred types				MDS-40-MK-XXX
	MDS-40-MK-SA8-I	MDS-40-MK-SR7-U10	MDS-40-MK-SR7-U45R	MDS-40-MK-SR0-F	
Measuring range ¹⁾	RL21 magnet: 30 mm (for other measuring ranges see page 18)				
Magnet included in delivery	-				
Offset distance ¹⁾	RL21 magnet: 1.5 mm				
Linearity ^{1) 2)}	< ± 3 % ... ± 5 % FSO				
Temperature stability	± 500 ppm FSO/K				
Resolution ³⁾	< 0.05 % FSO				
Frequency response (-3 dB)	1000 Hz			-	
Electrical connection	connector axial, M8x1, 4 poles	connector radial, JST JWPF, 4 poles		connector radial, JST PA, 4 poles	selectable
Output	4 ... 20 mA	2 ... 10 V	0.5 ... 4.5 V (ratiometric)	typ. 402 ... 285 Hz (square) (time measurement, p.19)	selectable
Storage temperature	-20 ... +80 °C				
Operating temperature	-20 ... +80 °C				
Supply voltage	11 ... 30 VDC		5 VDC		selectable
Protection class	IP67 (casting) ⁴⁾			IP20 (partial casting)	selectable
Housing materials	PA 6.6 / brass / PUR				
Packaging unit	1 pc		10 pc		from 200 pc

FSO = full scale output

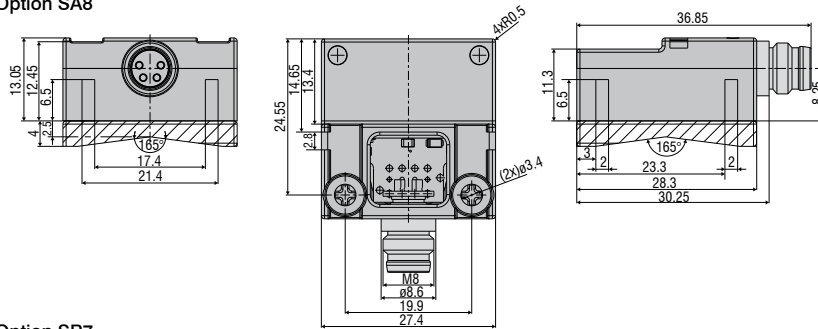
¹⁾ Measuring range changes by using other magnets (see catalog p.18); external magnetic fields and/or ferromagnetic material in the measuring range of the sensor system affect the sensor characteristic line and the technical data.

²⁾ Deviation to the regression curve according to the method of least squares

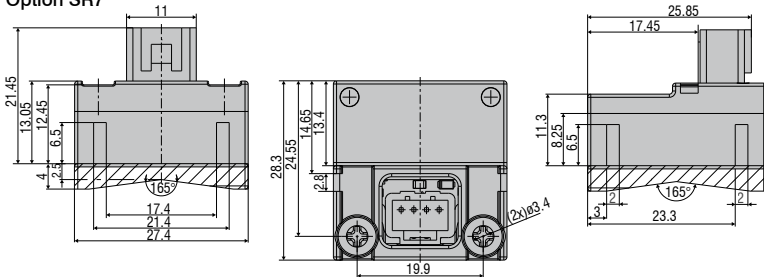
³⁾ Peak-Peak; external first-order low pass; frequency response 5 kHz

⁴⁾ Plugs only in mated and locked condition

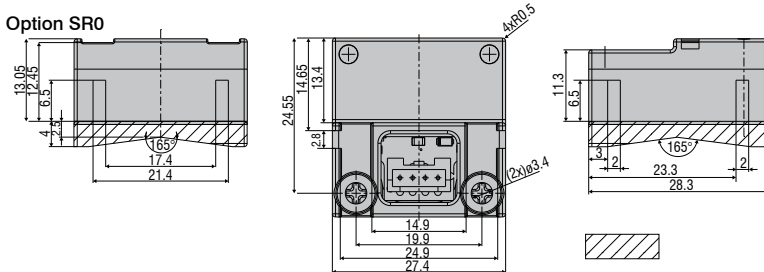
Option SA8



Option SR7

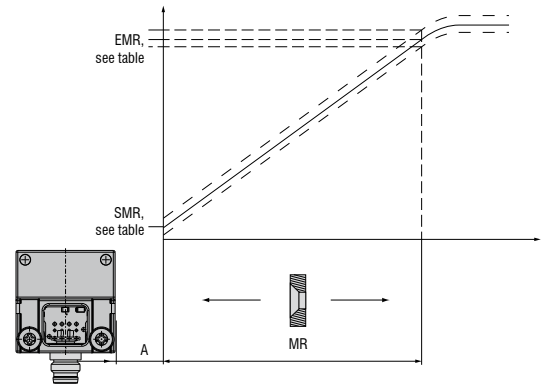


Option SR0



Optional retaining plate not included in delivery

Sensor signal



MDS-40-MK	EMR	SMR	Offset distance A
-SA8-I	19.2 mA ± 0.8 mA	4 mA ± 0.8 mA	1.5 mm
-SR7-U10	9.6 V ± 0.4 V	2 V ± 0.4 V	1.5 mm
-SR7-U45R	4.5 V ± 0.2 V	0.5 V ± 0.2 V	1.5 mm
-MK-SR0-F	285 Hz ± 6 Hz	402 Hz ± 6 Hz	1.5 mm

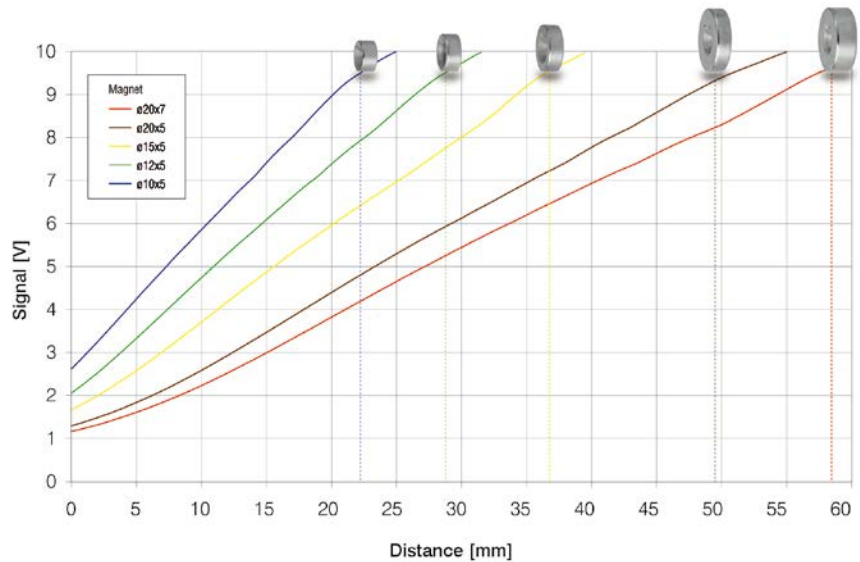
Magnets

The magnets are critical components of the magneto-inductive measuring principle.

Many shapes and materials are available. Application, installation space, temperature and cost factors must be considered. A decisive advantage is that the measuring range of the sensor can be defined by selecting the appropriate magnet. Adapting or set up of the sensor are unnecessary.

Therefore, measuring ranges of 20 to 55mm can be achieved using only one sensor.

Simple change of the measuring range by exchanging the magnet (MDS-45)

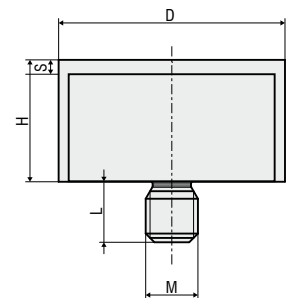
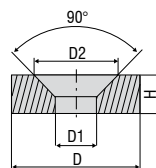


Designation	Measuring range MDS-45 [mm]	Measuring range MDS-35 HT [mm]	Measuring range MDS-40-MK [mm]	T _{max} [°C]	Standard magnets				Standard magnets in pressure housing						
					Material	d	D1	D2	H	Material	d	H	L	M	S
MB20	20	14	-	150	NeFeB, nickel-plated	10	4.3	8.6	5	1.3964 Nitronic 50HS	16	9.5	5	M4	2
MB27	27	18	~ 23	150	NeFeB, nickel-plated	12	4.3	8.6	5	1.3964 Nitronic 50HS	16	9.5	5	M4	2
MB35	35	24	~ 33	150	NeFeB, nickel-plated	15	4.3	8.6	5	1.3964 Nitronic 50HS	26	14	7	M6	3.5
MB45	45	32	~ 45	150	NeFeB, nickel-plated	20	4	8	5	1.3964 Nitronic 50HS	26	14	7	M6	3.5
MB55	55	38	~ 50	150	NeFeB, nickel-plated	20	4	8	7	1.3964 Nitronic 50HS	26	14	7	M6	3.5
RL21	33	22	~ 30	200	SrFe, hard ferrite	20	4.3	-	10	-	-	-	-	-	-
RL20	25	12	~ 25	200	SrFe, hard ferrite	20	4.3	-	6.5	-	-	-	-	-	-
MB35HT	52	35	-	250	Sm2Co5	22	5.2	10.4	6	-	-	-	-	-	-

Magnets at higher temperatures

Permanent magnets present reversible and irreversible temperature dependence. With low temperatures, the magnetic field changes reversibly with the temperature. In the first approximation, this dependence is linear. Irreversible attenuations of the magnetic field are caused by rising temperatures. The main part of these attenuations arises when the temperature is reached for the first time. Therefore, it is recommended that when using magnets in high temperatures, they are heated up only once to the operating temperature or to around 20 °C above the operating temperature, provided that the respective magnet specification allows this.

Please refer to Micro-Epsilon TechNote T016 for further details.



A pressure housing is a method of protecting a magnet from high pressure or aggressive media. This is made from robust stainless steel and resists pressures up to 400 bar.