

# Magnet Sensors

◆ Cylindrical Sensors ◆

◆ M5 Threaded Sensors ◆

◆ M8 Threaded Sensors ◆

◆ Flat Pack Sensors ◆

◆ Vertical Floats ◆







◆ Standard Magnets ◆



## Magnet Sensors

### Contents

Magnetic proximity sensors are used where high positional accuracy in sensing is required. Cylindrical magnet sensors are available from the smallest 2.5 mm diameter ultra-miniature packages to the standard 6.0 mm diameter packages. Threaded versions are suitable for applications where positional adjustment is required. Screw mountable magnet sensors can be directly mounted on enclosures, doors and windows. All these sensors come in two versions, one for switching low level 10 W loads, and the other for switching up to 60 W line voltage loads.

	<b>MS-212 Ultra Miniature Magnet Sensor</b> Omni polar, normally open (NO), 2.6 mm diameter x 12.0 mm long, switches loads of up to 10W, configurable cable lengths and connectors.
	<b>MS-214 Miniature Magnet Sensor</b> Omni polar, normally open (NO), 4.0 mm diameter x 25.4 mm long, switches loads of up to 10W, configurable cable lengths and connectors.
	<b>MS-216 Magnet Sensor</b> Omni polar, normally open (NO), 6.0 mm diameter x 25.4 mm long, switches loads of up to 15W, configurable cable lengths and connectors. Withstands higher shock and vibration.
	<b>MS-216-L High Power Magnet Sensor</b> Omni polar, normally open (NO), 6.0 mm diameter x 40.0 mm long, switches loads of up to 60W, configurable cable lengths and connectors. Withstands higher shock and vibration.
	<b>MS-225 Miniature Proximity Sensor</b> Omni polar, 0.5 mm pitch M5 thread for accurate positioning and locking, switches loads of up to 10W, configurable cable lengths and connectors.
	<b>MS-228 High Power Proximity Sensor</b> 0.75 mm pitch M8 thread. Rugged body and high wall thickness of sensor withstands shock and vibration in industrial environments, switches loads of up to 60W, configurable cable lengths and connectors.





Due to continual improvement, specifications are subject to change without notice

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## Proximity Sensors

### Contents

	<b>MS-324 Miniature Flat Pack Sensor</b> Screw mountable, 4.0 mm slot widths, matching actuator magnet, capable of switching 10 W low level voltages, shielded cables available on request, configurable cable lengths and connectors.
	<b>MS-328 High Power Flat Pack Sensor</b> Screw mountable, 8.0 mm slot widths, matching actuator magnet, capable of switching up to 60 W line voltage, shielded cables available on request, configurable cable lengths and connectors.
	<b>Magnets</b> Our range of rare earth NdFeB and SmCo5 cylindrical and bar magnets. Reed switches and magnets should be acquired from one source.
	<b>RoHS Compliance</b> All reed switches are SGS certified for the RoHS compliant levels of Lead, Mercury, Cadmium and Hexalent Chromium.

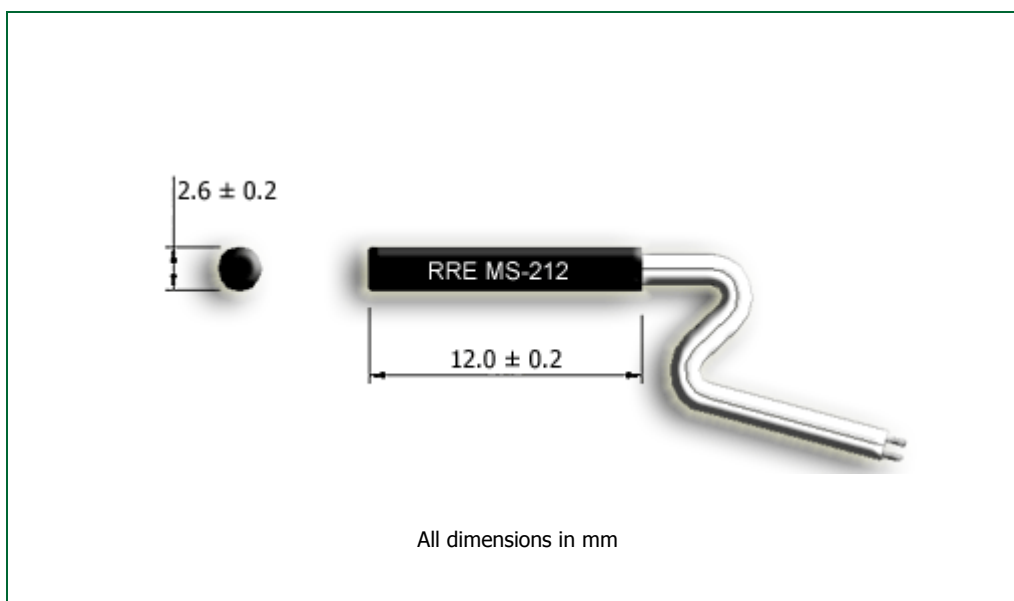
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## MS-212 Cylindrical Magnet Sensor

Ultra-miniature, 2.5 mm Diameter x 12.0 mm, 10 W



- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact
- ◆ Three magnetic sensitivity bands
- ◆ Various types of leads and connectors available
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: dentist drills, model airplanes, implantable devices, musical greeting cards...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	10.0
Switching Current (max)	A	0.5
Carry Current (max)	A	0.5
Switching Voltage (max)	V <sub>DC</sub>	100
Breakdown Voltage (min)	V <sub>DC</sub>	150
Initial Contact Resistance (max)	mΩ	200
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	30
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-212-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
1	10 – 15	S	Stripped to 5mm
2	15 – 20	T	Stripped to 5mm and Tinned
		M	Molex Connector

### Example

MS-212-1-500-M denotes 10-15 Operate AT, with 500 mm cable length and Molex connectors.

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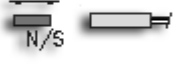
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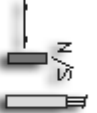
## MS-212 Cylindrical Magnet Sensor

### Actuation Distances


Operate and release distances for the MS-212 ultra-miniature cylindrical sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

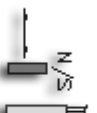
#### MS-212-1 (10-15 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	0.5 - 2.0	1.0 - 2.5
	NDC-T	Ø2.0 x 4.0	1.0 - 2.5	1.5 - 3.0
	NDR-S	6.0 x 2.5 x 2.5	3.5 - 6.5	4.0 - 6.5
	NDC-S	Ø3.0 x 7.0	4.5 - 7.0	5.0 - 7.5
	NDR-M	8.0 x 3.0 x 3.0	6.0 - 8.5	6.5 - 9.0
	NDC-M	Ø4.0 x 10.0	8.0 - 11.5	9.5 - 12.0
	NDR-L	19.0 x 4.0 x 4.0	11.5 - 15.0	12.5 - 15.5
	NDC-L	Ø8.0 x 15.0	21.0 - 27.0	23.0 - 27.5

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	2.0 - 3.5	2.5 - 4.0
	NDC-T	Ø2.0 x 4.0	2.5 - 4.0	3.0 - 4.5
	NDR-S	6.0 x 2.5 x 2.5	5.5 - 7.5	6.0 - 8.0
	NDC-S	Ø3.0 x 7.0	6.0 - 8.5	6.5 - 9.0
	NDR-M	8.0 x 3.0 x 3.0	8.0 - 10.0	8.5 - 10.5
	NDC-M	Ø4.0 x 10.0	10.0 - 12.5	10.5 - 13.0
	NDR-L	19.0 x 4.0 x 4.0	13.0 - 17.0	14.0 - 17.5
	NDC-L	Ø8.0 x 15.0	20.0 - 25.0	21.5 - 26.0

#### MS-212-2 (15-20 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	0.5 - 1.0	1.0 - 1.5
	NDC-T	Ø2.0 x 4.0	1.0 - 2.0	1.5 - 2.5
	NDR-S	6.0 x 2.5 x 2.5	3.0 - 5.0	3.5 - 5.5
	NDC-S	Ø3.0 x 7.0	4.0 - 5.5	4.5 - 6.5
	NDR-M	8.0 x 3.0 x 3.0	5.5 - 7.5	6.0 - 8.0
	NDC-M	Ø4.0 x 10.0	7.5 - 9.5	8.5 - 10.5
	NDR-L	19.0 x 4.0 x 4.0	10.0 - 12.0	11.0 - 13.5
	NDC-L	Ø8.0 x 15.0	19.0 - 22.5	20.5 - 25.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	2.0 - 2.5	2.5 - 3.0
	NDC-T	Ø2.0 x 4.0	2.5 - 3.5	3.0 - 4.0
	NDR-S	6.0 x 2.5 x 2.5	5.0 - 5.5	6.0 - 6.5
	NDC-S	Ø3.0 x 7.0	6.0 - 7.0	6.5 - 8.0
	NDR-M	8.0 x 3.0 x 3.0	7.0 - 8.0	8.0 - 9.0
	NDC-M	Ø4.0 x 10.0	9.0 - 10.5	10.0 - 11.0
	NDR-L	19.0 x 4.0 x 4.0	11.5 - 13.0	12.5 - 15.5
	NDC-L	Ø8.0 x 15.0	19.0 - 21.0	20.5 - 23.0

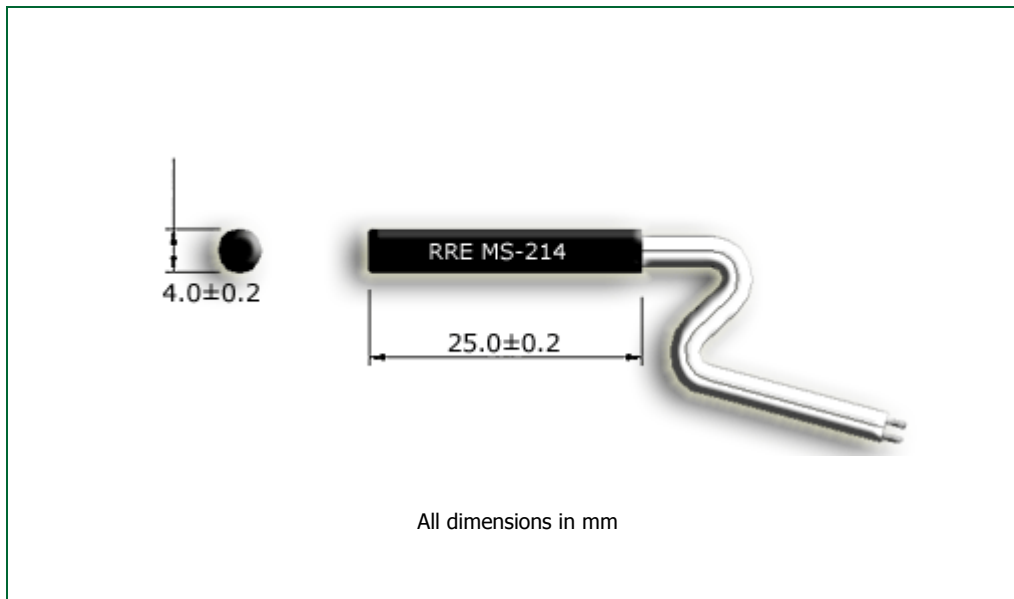
Due to continual improvement, specifications are subject to change without notice

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## MS-214 Cylindrical Magnet Sensor

Miniature, 4.0 mm Diameter x 25.4 mm, 10 W



- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact
- ◆ 10W switching capability
- ◆ Three magnetic sensitivity bands
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: fluid and electricity meters, detergent level sensing in washing machines, two wheeler throttle, accidental airbag deployment prevention...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	10
Switching Current (max)	A	0.5
Carry Current (max)	A	1.5
Switching Voltage (max)	V <sub>DC</sub>	180
Breakdown Voltage (min)	V <sub>DC</sub>	200
Initial Contact Resistance (max)	mΩ	150
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	30
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-214-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
1	10 – 15	S	Stripped to 5mm
2	15 – 20	T	Stripped to 5mm and Tinned
3	20 – 25	M	Molex Connector

### Example

MS-214-1-500-M denotes 10-15 Operate AT, with 500 mm cable length and Molex connectors.

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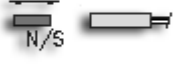
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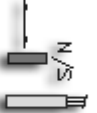
## MS-214 Cylindrical Magnet Sensor

### Actuation Distances

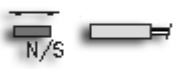
Operate and release distances for the MS-214 miniature cylindrical sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

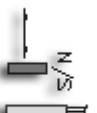
#### MS-214-1 (10-15 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	1.0 - 2.5	1.5 - 3.0
	NDC-T	Ø2.0 x 4.0	1.5 - 2.5	2.0 - 3.5
	NDR-S	6.0 x 2.5 x 2.5	4.5 - 7.5	6.0 - 8.0
	NDC-S	Ø3.0 x 7.0	6.0 - 8.5	8.0 - 9.0
	NDR-M	8.0 x 3.0 x 3.0	8.0 - 11.0	9.5 - 11.5
	NDC-M	Ø4.0 x 10.0	11.5 - 16.0	13.0 - 17.0
	NDR-L	19.0 x 4.0 x 4.0	16.5 - 22.0	19.0 - 23.0
	NDC-L	Ø8.0 x 15.0	30.0 - 39.0	34.0 - 40.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	3.0 - 5.0	3.5 - 5.5
	NDC-T	Ø2.0 x 4.0	3.5 - 6.0	5.0 - 7.0
	NDR-S	6.0 x 2.5 x 2.5	7.5 - 11.0	9.0 - 11.5
	NDC-S	Ø3.0 x 7.0	9.5 - 12.5	10.5 - 13.0
	NDR-M	8.0 x 3.0 x 3.0	11.0 - 15.0	13.0 - 16.0
	NDC-M	Ø4.0 x 10.0	14.0 - 19.0	16.5 - 20.0
	NDR-L	19.0 x 4.0 x 4.0	20.0 - 22.0	23.0 - 24.0
	NDC-L	Ø8.0 x 15.0	30.0 - 38.0	33.0 - 39.0

#### MS-214-2 (15-20 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	0.5 - 1.0	1.0 - 1.5
	NDR-S	6.0 x 2.5 x 2.5	3.5 - 4.5	5.5 - 6.5
	NDC-S	Ø3.0 x 7.0	5.0 - 6.0	7.0 - 8.0
	NDR-M	8.0 x 3.0 x 3.0	6.0 - 8.0	9.0 - 10.0
	NDC-M	Ø4.0 x 10.0	10.0 - 11.5	12.5 - 13.5
	NDR-L	19.0 x 4.0 x 4.0	14.0 - 16.5	18.0 - 19.0
	NDC-L	Ø8.0 x 15.0	26.5 - 30.0	32.0 - 34.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	2.5 - 3.0	3.5 - 4.5
	NDC-T	Ø2.0 x 4.0	3.0 - 3.5	4.0 - 5.0
	NDR-S	6.0 x 2.5 x 2.5	6.5 - 7.5	8.0 - 9.0
	NDC-S	Ø3.0 x 7.0	8.0 - 9.5	10.0 - 11.0
	NDR-M	8.0 x 3.0 x 3.0	10.0 - 11.0	11.0 - 13.0
	NDC-M	Ø4.0 x 10.0	13.0 - 14.0	16.0 - 17.0
	NDR-L	19.0 x 4.0 x 4.0	19.0 - 20.0	22.0 - 23.0
	NDC-L	Ø8.0 x 15.0	27.0 - 30.0	32.0 - 33.0

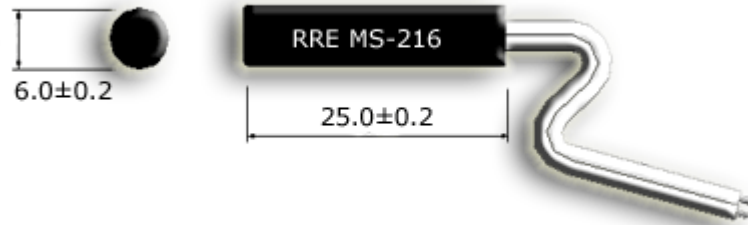
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## MS-216 Cylindrical Magnet Sensor

Standard Size, 6.0 mm Diameter x 25.4 mm, 30 W



Available with optional LED for closure indication  
All dimensions in mm

- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact, others available on request
- ◆ Three magnetic sensitivity bands
- ◆ Contact rating of up to 30W
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: coffee machines, detergent level sensing in washing machines, dishwashers, fluid level sensing, anchor and rudder position sensing in boats, anemometers, treadmills, bicycles...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	10
Switching Current (max)	A	0.5
Carry Current (max)	A	1.5
Switching Voltage (max)	V <sub>DC</sub>	180
Breakdown Voltage (min)	V <sub>DC</sub>	200
Initial Contact Resistance (max)	mΩ	150
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	50
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-216-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
1	10 – 15	S	Stripped to 5mm
2	15 – 20	T	Stripped to 5mm and Tinned
3	20 – 25	M	Molex Connector

### Example

MS-216-1-500-M denotes 10-15 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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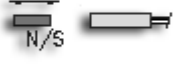


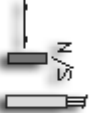
## MS-216 Cylindrical Magnet Sensor

### Actuation Distances

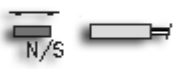
Operate and release distances for the MS-216 cylindrical sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

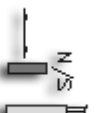
#### MS-216-1 (10-15 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	0.5 - 1.5	1.5 - 2.5
	NDC-T	Ø2.0 x 4.0	1.0 - 2.0	1.5 - 3.0
	NDR-S	6.0 x 2.5 x 2.5	4.5 - 6.5	6.0 - 8.0
	NDC-S	Ø3.0 x 7.0	5.5 - 8.0	7.5 - 9.5
	NDR-M	8.0 x 3.0 x 3.0	7.5 - 10.0	10.0 - 11.0
	NDC-M	Ø4.0 x 10.0	10.5 - 13.5	13.0 - 15.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 - 19.5	18.5 - 21.5
	NDC-L	Ø8.0 x 15.0	28.0 - 36.0	33.0 - 39.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	0.5 - 2.5	1.5 - 3.5
	NDC-T	Ø2.0 x 4.0	1.5 - 3.5	2.5 - 4.5
	NDR-S	6.0 x 2.5 x 2.5	6.0 - 8.5	8.0 - 9.5
	NDC-S	Ø3.0 x 7.0	7.5 - 9.5	9.5 - 10.5
	NDR-M	8.0 x 3.0 x 3.0	9.5 - 11.5	11.0 - 13.0
	NDC-M	Ø4.0 x 10.0	13.0 - 16.5	15.0 - 18.5
	NDR-L	19.0 x 4.0 x 4.0	18.0 - 22.0	21.0 - 24.0
	NDC-L	Ø8.0 x 15.0	28.0 - 34.0	32.0 - 37.0

#### MS-216-2 (15-20 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	2.5 - 4.5	5.0 - 6.0
	NDC-S	Ø3.0 x 7.0	3.5 - 5.5	6.5 - 7.5
	NDR-M	8.0 x 3.0 x 3.0	5.0 - 7.5	8.0 - 10.0
	NDC-M	Ø4.0 x 10.0	7.5 - 10.5	11.0 - 13.0
	NDR-L	19.0 x 4.0 x 4.0	11.0 - 15.0	16.5 - 18.5
	NDC-L	Ø8.0 x 15.0	23.0 - 28.0	31.0 - 33.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	0.0 - 1.0	0.5 - 2.0
	NDR-S	6.0 x 2.5 x 2.5	4.0 - 6.0	7.0 - 8.0
	NDC-S	Ø3.0 x 7.0	5.5 - 7.5	8.5 - 9.5
	NDR-M	8.0 x 3.0 x 3.0	7.0 - 9.5	10.0 - 11.0
	NDC-M	Ø4.0 x 10.0	11.0 - 13.0	13.5 - 15.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 - 18.0	20.0 - 21.0
	NDC-L	Ø8.0 x 15.0	25.0 - 28.0	31.0 - 32.0

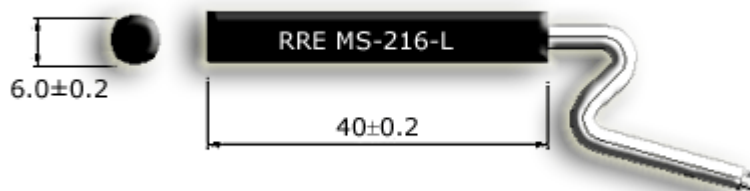
Due to continual improvement, specifications are subject to change without notice

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## MS-216-L Cylindrical Magnet Sensor

Standard Size, 6.0 mm Diameter x 40.0 mm, 30 W, Line Voltage



Available with optional LED for closure indication  
All dimensions in mm

- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact, others available on request
- ◆ Three magnetic sensitivity bands
- ◆ Contact rating of up to 60W
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: door sensing in domestic goods, automobile ABS, fork lifts, adjustable chairs and beds...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	30
Switching Current (max)	A	0.5
Carry Current (max)	A	2.5
Switching Voltage (max)	V <sub>DC</sub> / AC	230
Breakdown Voltage (min)	V <sub>DC</sub>	350
Initial Contact Resistance (max)	mΩ	200
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	150
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-216-L-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
3	20 – 25	S	Stripped to 5mm
4	25 – 30	T	Stripped to 5mm and Tinned
5	30 - 35	M	Molex Connector

### Example

MS-216-L-3-500-M denotes 20-25 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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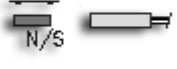
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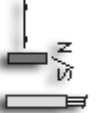
## MS-216-L Cylindrical Magnet Sensor

### Actuation Distances

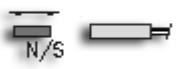
Operate and release distances for the MS-216-L large cylindrical sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

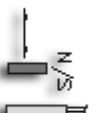
#### MS-216-L-3 (20-25 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	N/A	N/A
	NDC-M	Ø4.0 x 10.0	4.0 – 5.0	12.0 – 15.0
	NDR-L	19.0 x 4.0 x 4.0	7.5 – 9.5	16.0 – 20.0
	NDC-L	Ø8.0 x 15.0	21.0 – 23.0	34.0 – 38.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	2.0 – 5.0	7.0 – 10.0
	NDC-S	Ø3.0 x 7.0	4.5 – 7.0	9.5 – 12.5
	NDR-M	8.0 x 3.0 x 3.0	5.5 – 9.0	11.0 – 15.0
	NDC-M	Ø4.0 x 10.0	9.0 – 13.0	16.0 – 21.0
	NDR-L	19.0 x 4.0 x 4.0	16.0 – 20.0	25.0 – 30.0
	NDC-L	Ø8.0 x 15.0	26.0 – 31.5	38.0 – 45.0

#### MS-216-L-4 (25-30 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	N/A	N/A
	NDC-M	Ø4.0 x 10.0	N/A	N/A
	NDR-L	19.0 x 4.0 x 4.0	2.5 – 7.5	16.0 – 18.0
	NDC-L	Ø8.0 x 15.0	15.0 – 21.0	34.0 – 35.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	1.5 – 2.0	6.0 – 7.0
	NDC-S	Ø3.0 x 7.0	3.0 – 4.5	9.0 – 10.0
	NDR-M	8.0 x 3.0 x 3.0	5.0 – 6.0	11.0 – 12.5
	NDC-M	Ø4.0 x 10.0	8.0 – 9.0	16.0 – 18.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 – 16.0	25.0 – 27.0
	NDC-L	Ø8.0 x 15.0	23.5 – 26.0	38.0 – 40.0

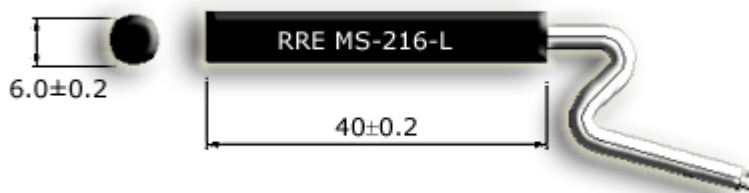
Due to continual improvement, specifications are subject to change without notice

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## MS-216-L Cylindrical Magnet Sensor

Standard Size, 6.0 mm Diameter x 40.0 mm, 30 W, Line Voltage



Available with optional LED for closure indication  
All dimensions in mm

- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact, others available on request
- ◆ Three magnetic sensitivity bands
- ◆ Contact rating of up to 60W
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: door sensing in domestic goods, automobile ABS, fork lifts, adjustable chairs and beds...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	30
Switching Current (max)	A	0.5
Carry Current (max)	A	2.5
Switching Voltage (max)	V <sub>DC</sub> / AC	230
Breakdown Voltage (min)	V <sub>DC</sub>	350
Initial Contact Resistance (max)	mΩ	200
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	150
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-216-L-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
3	20 – 25	S	Stripped to 5mm
4	25 – 30	T	Stripped to 5mm and Tinned
5	30 - 35	M	Molex Connector

### Example

MS-216-L-3-500-M denotes 20-25 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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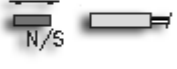
27 December 2013

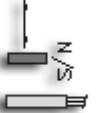
## MS-216-L Cylindrical Magnet Sensor

### Actuation Distances

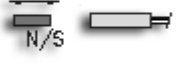
Operate and release distances for the MS-216-L large cylindrical sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.


#### MS-216-L-3 (20-25 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	N/A	N/A
	NDC-M	Ø4.0 x 10.0	4.0 – 5.0	12.0 – 15.0
	NDR-L	19.0 x 4.0 x 4.0	7.5 – 9.5	16.0 – 20.0
	NDC-L	Ø8.0 x 15.0	21.0 – 23.0	34.0 – 38.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	2.0 – 5.0	7.0 – 10.0
	NDC-S	Ø3.0 x 7.0	4.5 – 7.0	9.5 – 12.5
	NDR-M	8.0 x 3.0 x 3.0	5.5 – 9.0	11.0 – 15.0
	NDC-M	Ø4.0 x 10.0	9.0 – 13.0	16.0 – 21.0
	NDR-L	19.0 x 4.0 x 4.0	16.0 – 20.0	25.0 – 30.0
	NDC-L	Ø8.0 x 15.0	26.0 – 31.5	38.0 – 45.0

#### MS-216-L-4 (25-30 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	N/A	N/A
	NDC-M	Ø4.0 x 10.0	N/A	N/A
	NDR-L	19.0 x 4.0 x 4.0	2.5 – 7.5	16.0 – 18.0
	NDC-L	Ø8.0 x 15.0	15.0 – 21.0	34.0 – 35.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	1.5 – 2.0	6.0 – 7.0
	NDC-S	Ø3.0 x 7.0	3.0 – 4.5	9.0 – 10.0
	NDR-M	8.0 x 3.0 x 3.0	5.0 – 6.0	11.0 – 12.5
	NDC-M	Ø4.0 x 10.0	8.0 – 9.0	16.0 – 18.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 – 16.0	25.0 – 27.0
	NDC-L	Ø8.0 x 15.0	23.5 – 26.0	38.0 – 40.0

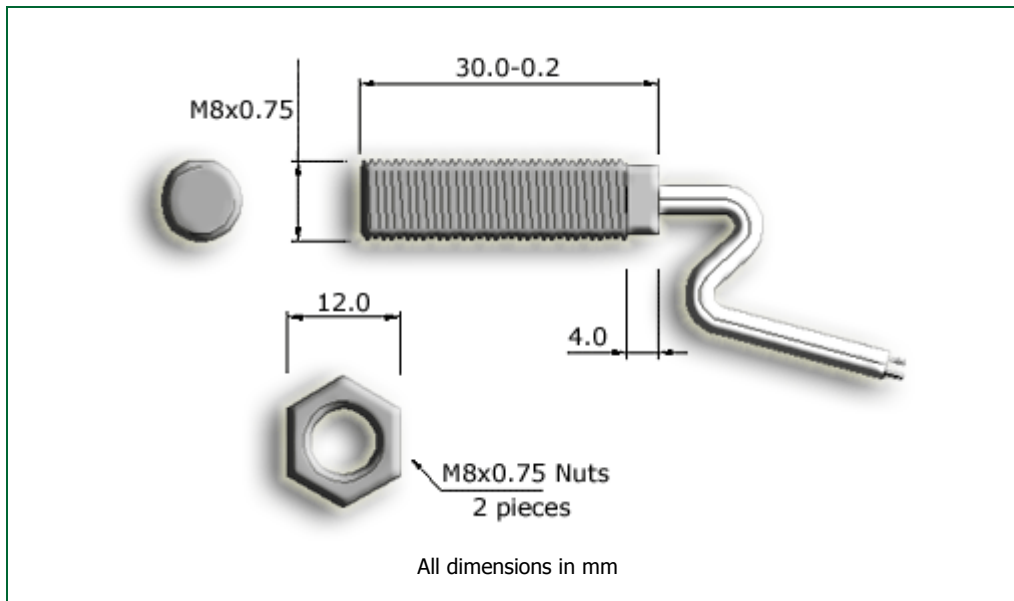
Due to continual improvement, specifications are subject to change without notice

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27 December 2013

## MS-228 Cylindrical Proximity Sensor

M8 threaded, Nickel plated Brass housing, 30 W, Line Voltage



- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact
- ◆ Three magnetic sensitivity bands
- ◆ 0.75 mm pitch threaded barrel for fine adjustment
- ◆ Contact rating of up to 60W
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: satellite television dish positioning, automobile ABS, heavy vehicles, digital speedometers...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	30
Switching Current (max)	A	0.5
Carry Current (max)	A	2.5
Switching Voltage (max)	V <sub>DC</sub> / AC	230
Breakdown Voltage (min)	V <sub>DC</sub>	350
Initial Contact Resistance (max)	mΩ	200
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	50
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-228-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
3	20 – 25	S	Stripped to 5mm
4	25 – 30	T	Stripped to 5mm and Tinned
5	30 – 35	M	Molex Connector

### Example

MS-228-1-500-M denotes 10-15 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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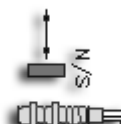
## MS-228 Cylindrical Proximity Sensor

### Actuation Distances


Operate and release distances for the MS-228 M8 threaded proximity sensor, in two AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5\text{mm}$ . Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

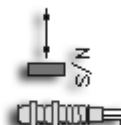
#### MS-228-3 (20-25 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	1.0 – 3.5	7.0 – 9.0
	NDC-M	Ø4.0 x 10.0	5.0 – 7.0	11.0 – 13.0
	NDR-L	19.0 x 4.0 x 4.0	8.0 – 11.0	16.0 – 19.0
	NDC-L	Ø8.0 x 15.0	19.0 – 22.0	30.0 – 33.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	2.5 – 4.0	7.0 – 8.0
	NDC-S	Ø3.0 x 7.0	4.5 – 5.0	8.0 – 10.0
	NDR-M	8.0 x 3.0 x 3.0	6.5 – 8.0	11.0 – 13.0
	NDC-M	Ø4.0 x 10.0	10.0 – 11.0	16.0 – 17.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 – 16.5	22.0 – 25.0
	NDC-L	Ø8.0 x 15.0	22.0 – 25.0	31.0 – 34.0

#### MS-228-4 (25-30 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	N/A	N/A
	NDC-S	Ø3.0 x 7.0	N/A	N/A
	NDR-M	8.0 x 3.0 x 3.0	0.5 – 1.5	7.0 – 8.0
	NDC-M	Ø4.0 x 10.0	2.0 – 5.0	10.0 – 11.0
	NDR-L	19.0 x 4.0 x 4.0	5.0 – 8.0	15.0 – 16.0
	NDC-L	Ø8.0 x 15.0	16.0 – 19.0	29.0 – 30.0

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	1.5 – 2.5	6.5 – 7.5
	NDC-S	Ø3.0 x 7.0	3.5 – 4.5	8.0 – 8.5
	NDR-M	8.0 x 3.0 x 3.0	5.0 – 6.5	10.0 – 11.0
	NDC-M	Ø4.0 x 10.0	8.5 – 10.0	15.0 – 16.0
	NDR-L	19.0 x 4.0 x 4.0	12.5 – 15.0	21.0 – 22.0
	NDC-L	Ø8.0 x 15.0	21.0 – 22.0	31.0 – 32.0

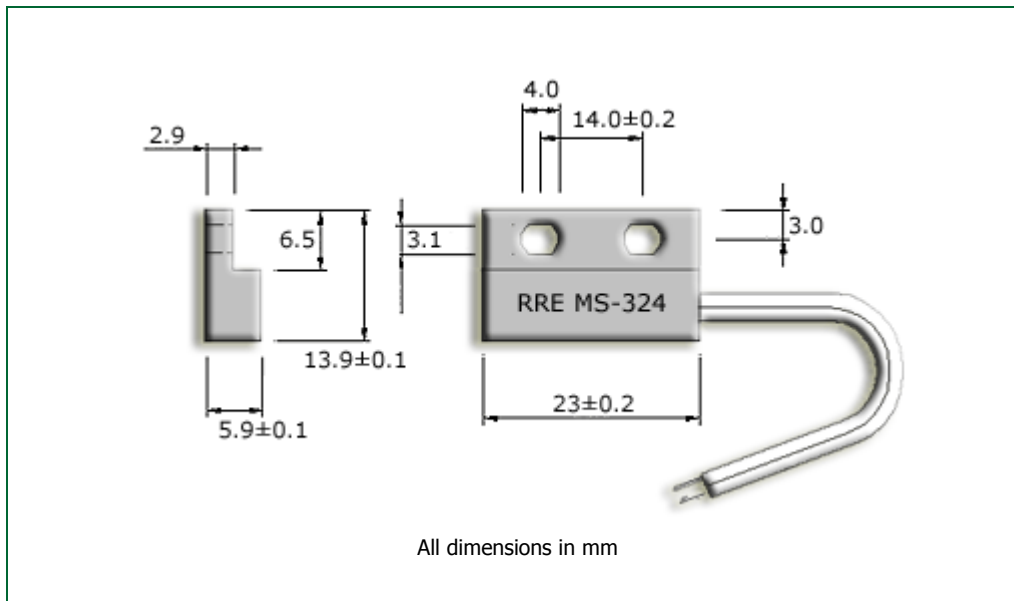
Due to continual improvement, specifications are subject to change without notice

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## MS-324 Flat pack Magnet Sensor

Miniature, 4.0 mm mounting slot, 10 W



- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact, others available on request
- ◆ Three magnetic sensitivity bands
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: coil winder tension sensing, fluid and electricity meters, coffee machines, dishwashers, fluid level sensing, two wheeler side stand, accidental airbag deployment prevention, door and window security, tamper proofing...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	10.0
Switching Current (max)	A	0.5
Carry Current (max)	A	1.5
Switching Voltage (max)	V <sub>DC</sub>	180
Breakdown Voltage (min)	V <sub>DC</sub>	200
Initial Contact Resistance (max)	mΩ	150
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	50
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-324-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
1	10 – 15	S	Stripped to 5mm
2	15 – 20	T	Stripped to 5mm and Tinned
3	20 – 25	M	Molex Connector

### Example

MS-324-1-500-M denotes 10-15 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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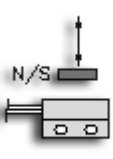


## MS-324 Flat pack Magnet Sensor

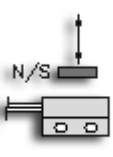
### Actuation Distances

Operate and release distances for the MS-324 miniature Flat pack sensor in three standard AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5$ mm. Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

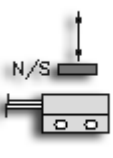
#### MS-324-1 (10-15 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	1.0 - 2.0	2.0 - 3.5
	NDC-T	Ø2.0 x 4.0	1.5 - 3.0	3.0 - 4.0
	NDR-S	6.0 x 2.5 x 2.5	6.0 - 8.0	8.0 - 10.0
	NDC-S	Ø3.0 x 7.0	7.5 - 9.5	9.5 - 11.5
	NDR-M	8.0 x 3.0 x 3.0	9.5 - 11.5	12.0 - 13.5
	NDC-M	Ø4.0 x 10.0	12.0 - 16.0	15.0 - 18.0
	NDR-L	19.0 x 4.0 x 4.0	18.0 - 22.0	22.0 - 24.0
	NDC-L	Ø8.0 x 15.0	27.0 - 33.0	32.0 - 36.0

#### MS-324-2 (15-20 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	0.5 - 1.0	1.0 - 2.0
	NDC-T	Ø2.0 x 4.0	1.0 - 1.5	2.5 - 3.0
	NDR-S	6.0 x 2.5 x 2.5	4.0 - 6.0	7.0 - 8.0
	NDC-S	Ø3.0 x 7.0	6.0 - 7.5	9.0 - 10.0
	NDR-M	8.0 x 3.0 x 3.0	8.0 - 9.5	11.0 - 12.0
	NDC-M	Ø4.0 x 10.0	11.0 - 12.0	14.0 - 15.0
	NDR-L	19.0 x 4.0 x 4.0	16.0 - 18.0	21.0 - 22.0
	NDC-L	Ø8.0 x 15.0	24.0 - 27.0	31.0 - 32.0

#### MS-324-3 (20-25 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	0.5 - 1.0	2.0 - 2.5
	NDR-S	6.0 x 2.5 x 2.5	4.0 - 5.0	6.5 - 7.5
	NDC-S	Ø3.0 x 7.0	6.0 - 6.5	6.5 - 9.0
	NDR-M	8.0 x 3.0 x 3.0	7.0 - 8.0	10.0 - 11.0
	NDC-M	Ø4.0 x 10.0	10.0 - 11.0	13.0 - 14.0
	NDR-L	19.0 x 4.0 x 4.0	13.5 - 16.0	19.0 - 21.0
	NDC-L	Ø8.0 x 15.0	22.0 - 24.0	29.0 - 31.0

Due to continual improvement, specifications are subject to change without notice

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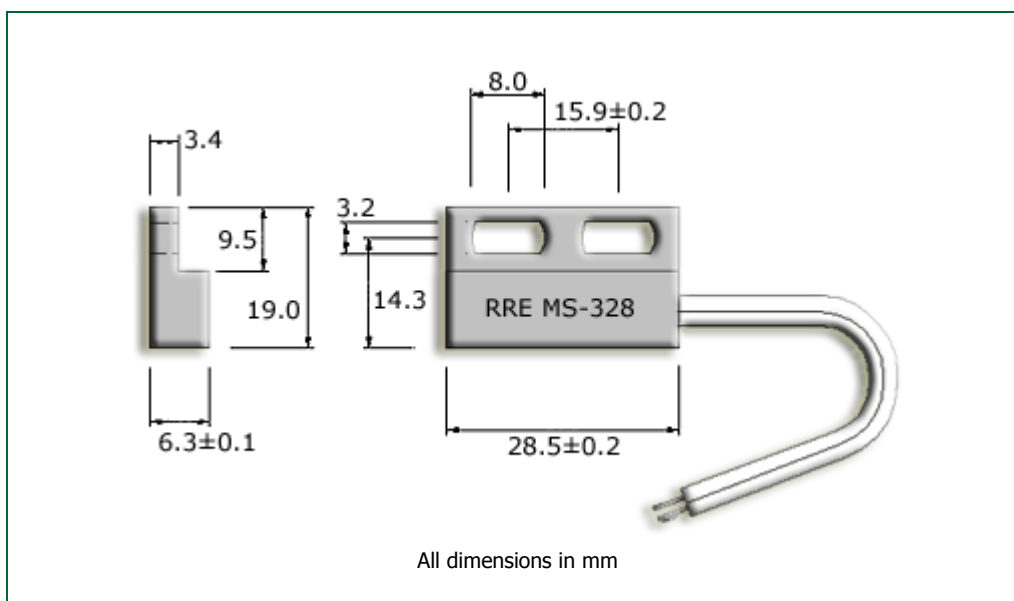
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## MS-328 Flat pack Magnet Sensor

Standard Size, 8.0 mm mounting slot, 30 W, Line Voltage



- ◆ Does not require power for operation
- ◆ Omni-polar device; actuates with either pole of magnet
- ◆ Normally open (NO) contact, others available on request
- ◆ Three magnetic sensitivity bands
- ◆ Contact rating of up to 60W
- ◆ Lead (Pb) free and RoHS compliant

### Applications

This magnet sensor is suitable for use in the following applications and many others: satellite television dish positioning, door sensing in domestic goods, heavy vehicles, door and window security, fork-lifts, adjustable chairs and beds...

### Specification

Contact Form		A
Contact Rating (max)	W / VA	30.0
Switching Current (max)	A	0.5
Carry Current (max)	A	2.5
Switching Voltage (max)	V <sub>DC</sub> / AC	230
Breakdown Voltage (min)	V <sub>DC</sub>	350
Initial Contact Resistance (max)	mΩ	200
Operating Temperature	°C	-40 to +70
Shock Resistance (½Sin wave for 11ms)	g	50
Vibration Resistance (10-2000Hz)	g	20

### Ordering Code

MS-328-(Operate AT Code)-(Cable length in mm)-(Lead Code)

OAT Code		Lead Code	
3	20 – 25	S	Stripped to 5mm
4	25 – 30	T	Stripped to 5mm and Tinned
5	30 - 35	M	Molex Connector

### Example

MS-328-3-500-M denotes 20-25 Operate AT, with 500 mm cable length and Molex connectors.

Due to continual improvement, specifications are subject to change without notice

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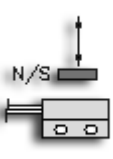
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## MS-328 Flat pack Magnet Sensor

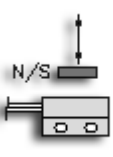
### Actuation Distances

Operate and release distances for the MS-328 miniature Flat pack sensor in three AT bands when actuated (as shown in the sketches) with NdFeB standard magnets is shown below. All distances given are in mm with tolerances of  $\pm 0.5$ mm. Although some of the AT band / magnet combinations will produce similar actuating distances, selecting the right AT band and magnet for an application is important and can be done by going through our AT band FAQ and our magnet selection guide.

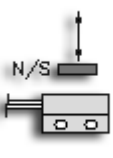
#### MS-328-3 (20-25 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	4.0 – 5.0	7.0 – 8.0
	NDC-S	Ø3.0 x 7.0	5.0 – 6.5	9.5 – 10.0
	NDR-M	8.0 x 3.0 x 3.0	7.0 – 8.5	12.0 – 13.0
	NDC-M	Ø4.0 x 10.0	9.5 – 12.0	16.0 – 18.0
	NDR-L	19.0 x 4.0 x 4.0	15.0 – 18.0	23.0 – 24.0
	NDC-L	Ø8.0 x 15.0	23.0 – 27.0	34.0 – 36.0

#### MS-328-4 (25-30 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	3.0 – 4.0	7.0 – 8.0
	NDC-S	Ø3.0 x 7.0	4.5 – 5.0	9.0 – 9.5
	NDR-M	8.0 x 3.0 x 3.0	6.5 – 7.0	11.0 – 12.0
	NDC-M	Ø4.0 x 10.0	9.0 – 10.0	15.0 – 16.0
	NDR-L	19.0 x 4.0 x 4.0	14.0 – 15.0	22.0 – 23.0
	NDC-L	Ø8.0 x 15.0	22.0 – 23.0	33.0 – 34.0

#### MS-328-5 (30-35 AT)

Actuation Sketch	Magnet	Dimensions	Operate Distance	Release Distance
	NDR-T	4.0 x 1.5 x 1.5	N/A	N/A
	NDC-T	Ø2.0 x 4.0	N/A	N/A
	NDR-S	6.0 x 2.5 x 2.5	2.5 – 3.0	7.0 – 7.5
	NDC-S	Ø3.0 x 7.0	4.0 – 5.0	9.0 – 9.5
	NDR-M	8.0 x 3.0 x 3.0	5.5 – 6.5	11.0 – 12.0
	NDC-M	Ø4.0 x 10.0	8.0 – 9.5	15.0 – 16.0
	NDR-L	19.0 x 4.0 x 4.0	12.0 – 14.0	21.0 – 23.0
	NDC-L	Ø8.0 x 15.0	20.0 – 22.0	31.0 – 33.0

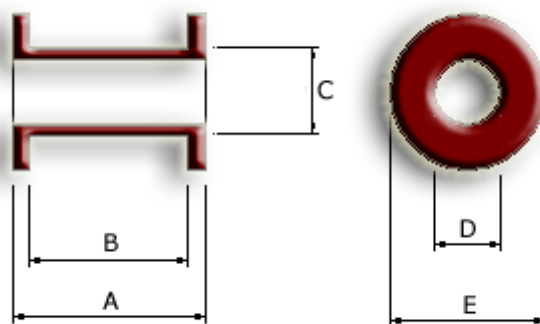
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## Test Coils

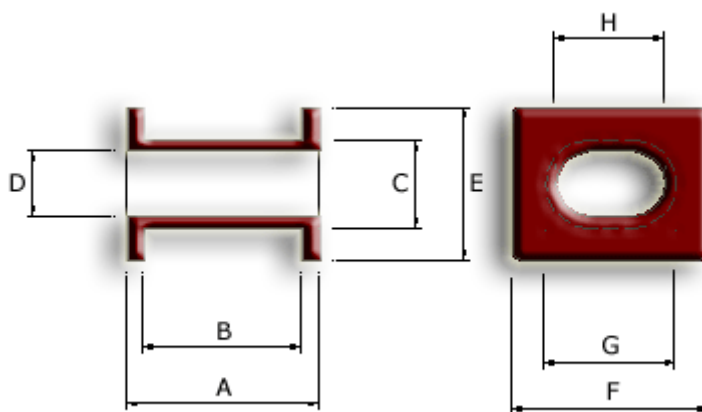
For Reed Switches and Sensors



### Cylindrical

Test Coil No.	717 102 001	717 102 002	717 102 003	717 102 004	717 102 005
A	53.3	21.0	12.0	27.8	19.0
B	50.8	19.0	10.0	25.4	15.0
C	7.6	4.3	3.3	8.7	3.7
D	5.6	3.4	2.3	2.4	2.9
E	14.1	7.7	11.0	17.2	11.0
Wire Diameter	0.090	0.050	0.060	0.100	0.071
Turns	10000	5000	5000	5000	5000
Coil Res. $\Omega$	845	740	600	404	450

All dimensions in mm



### Rectangular

Test Coil	TCP 3001	TCP3002	TCP 3003	TCP 3004
A mm	13.5	23.3	42.5	42.5
B mm	7	19.7	36.5	36.5
C mm	8	6.8	14.8	15.8
D mm	6	6.2	13.8	13.8
E mm	14	14.8	25.0	25.0
F mm	18	20.6	28.6	35.6
G mm	12	12.2	14.6	22.8
H mm	10	11.6	13.6	20.8
Wire Diameter mm	0.05	0.08	0.15	0.15
Turns	5000	10000	5000	5000
Coil Resistance $\Omega$	2000	1900	290	440

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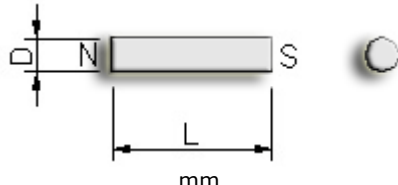
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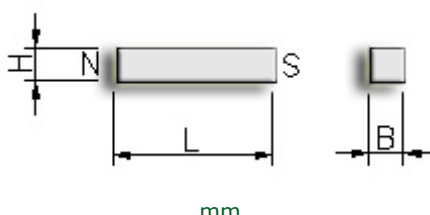
## Standard Magnets

For Reed Switches and Sensors

### Cylindrical Magnets

	Part Number	Material	D (mm)	L (mm)
	NDC-T	NdFeB:N35	2.0	4.0
	NDC-S	NdFeB:N35	3.0	7.0
	NDC-M	NdFeB:N35	4.0	10.0
	NDC-L	NdFeB:N35	8.0	15.0

### Bar Magnets

	Part Number	Material	L (mm)	B (mm)	H (mm)
	NDR-T	NdFeB:N35	4.0	1.5	1.5
	NDR-S	NdFeB:N35	6.0	2.5	2.5
	NDR-M	NdFeB:N35	8.0	3.0	3.0
	NDR-L	NdFeB:N35	19.0	4.0	4.0

### Magnet Material Specifications

Magnet Type		Remanance	Coercivity		Energy Product max.	Operating Temperature
Composition	Code	Br (mT)	HcB (kA/m)	HcJ (kA/m)	BH (kJ/m <sup>3</sup> )	(°C)
Ferrite	C8	385	235	242	27.8	300
AlNiCo	LNG37	1180	48	53	37	550
NdFeB	N35	1180	880	955	270	80
NdFeB	N35SH	1180	880	1353	270	120
SmCo	YX20	925	680	1595	160	300

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## Restriction of Hazardous Substances

### RoHS Compliance

In late 2002 the European Parliament approved two directives related to the reduction of electrical and electronic waste, namely the Waste Electrical and Electronic Equipment (WEEE) and Restriction of the use of certain Hazardous Substances (RoHS) Directives. The WEEE Directive aims to regulate the reuse, recycling and recovery of waste electrical and electronic equipment; the ultimate goal is to prevent the disposal of this waste.

In the RoHS Directive, the use of the aforementioned substances in most electrical and electronic equipment will be banned or severely restricted. The RoHS Directive calls for the elimination of these substances from most electronic equipment starting 1 July 2006. Our products are SGS certified for the RoHS compliant levels of Lead, Mercury, Cadmium and Hexavalent Chromium.

#### End-of-Life Vehicle (ELV)

End-of-Life Vehicle (ELV) regulations set limits for the following substances:

Lead  
Mercury  
Cadmium  
Hexavalent Chromium

#### Restriction of Hazardous Substances (RoHS)

The Reduction of Hazardous Substances (RoHS) regulations set limits for the following substances:

Lead  
Mercury  
Cadmium  
Hexavalent Chromium  
Polybrominated Biphenyls (PBB)  
Polybrominated Diphenyl Ethers (PBDE)

To certify to the above compliances, these substances must not be intentionally added to the product AND cannot exceed the following maximum allowable levels as a trace substance:

0.1% (1,000 ppm) for: Lead\*, Mercury, Hexavalent Chromium, PBB and PBDE  
0.01% (100 ppm) for: Cadmium

\*Lead as an alloying element in copper alloys is allowed up to 4.0% (40,000 ppm); in steel up to 0.35% (3,500 ppm) is allowed; in aluminum alloys up to 0.40% (4,000 ppm) is allowed. These requirements must be applied at the homogeneous material level. Since RoHS compliance is a stricter standard than ELV compliance, parts that are RoHS compliant are also ELV compliant.

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## Magnet Sensor Usage Notes

Magnet Sensors are delicate products. Handle with extra care.

### ✓ Do's

When switching inductive or capacitive loads, use contact protection circuits.

### ✗ Don'ts

Do not use ferro-magnetic mounting parts, screws, or other ferro-magnetic devices nearby. This will affect the sensitivity (AT).

When manual soldering, do not subject to more than a 5 second dwell. This may cause damage to the seals, change sensitivity, and reduce solderability.

Do not drop. Dropping or subjection to shock will permanently damage the contact or alter the sensitivity (AT).

Switching voltage, switching current, and contact rating should not exceed maximum limits stated in specification sheets.

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