

SPEED & PROXIMITY

SENSORS



High Performance & Reliability

Total Design Assistance

Advanced Manufacturing

CHERRY 

**A Worldwide Company
With Old World Service**

Founded in 1953 by Walter L. Cherry, The Cherry Corporation manufactures proprietary and custom sensors, electrical switches, keyboards, and electronic controls for the automotive, computer, and consumer and commercial markets in this country and around the world. To compete in today's global marketplace, The Cherry Corporation maintains offices and production facilities in twelve U.S. and International locations. Each employs its own engineering and sales staff. Quality leadership, state-of-the-art technologies and customer satisfaction are the hallmarks of The Cherry Corporation.



**A d v a n c e d
S o l u t i o n s**



**R e l i a b l e
P e r f o r m a n c e**



Cherry Sensor Products

Cherry speed and proximity sensors bring tremendous freedom and unmatched performance and reliability to your consumer, commercial and industrial equipment designs. Available in a variety of standard sizes and configurations, they serve as highly reliable replacements for mechanical and optical components in applications where performance and reliability cannot be compromised, regardless of the operating environment. Dirt. Grime. Heat. Even electrical interference.



Available in a variety of configurations, all Cherry sensors feature rugged construction and are immune to dirt, water, oil and other contaminants typically found in agricultural and other heavy equipment applications.

Cherry speed and proximity sensors continue to perform. And with no moving parts, they do so with a virtually infinite life expectancy.

Our full line of speed and proximity sensors is divided into five product series to ease your selection process. These product series, detailed in this catalog, are as follows:

- MP Series — Magnetic Proximity Sensors
- GS Series — Geartooth Speed Sensor Assemblies
- SD Series — Geartooth Speed & Direction Sensors
- VN Series — Vane Switches
- Miscellaneous Products & Accessories



The direct, digital output offered by Cherry sensors ties directly to micro-processors used in advanced consumer and commercial-grade appliances.

Your Total Design Partner

To augment our line of standard sensor products, Cherry also offers a wide variety of packaging and wiring options to suit your application. If your design calls for a product we don't currently offer as part of our standard line, our in-house design staff will work with you to develop a semi- or fully-custom solution to your exact requirements.

Utilizing the latest design modeling and rapid prototyping tools, we offer unequaled product development assistance.

- In the initial design stages, our magnetic modeling capabilities serve to verify the design concept, while also helping to obtain the optimal match of sensor and magnet to your application.
- Once the design concept is approved, we enter the physical prototyping stage, using Pro Engineering solid modeling software to create the physical design and stereolithography for rapid prototyping. Our in-house plastic molding capabilities allow us to provide prototype or production parts in a very timely manner.
- Finally, our certified qualification lab offers complete environmental testing, product life testing and magnetic test capabilities; the final step in readying your sensor solution for final production.



World-Class Manufacturing

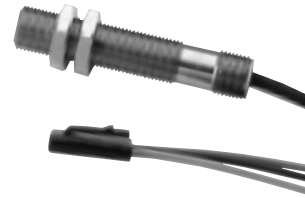
Incorporating the Kaizen philosophy of continual improvement, our Advanced Manufacturing Group has designed and developed proprietary assembly equipment to provide you unmatched production flexibility. The capabilities of our ISO9001 Certified Manufacturing Center range from plastic molding to automated surface mount circuit board assembly.

Cherry sensor products offer accurate and reliable speed and proximity sensing in demanding environments, making them ideal for industrial control and factory automation equipment.

From concept to completion, Cherry is your source for Advanced Sensor Solutions.

Table Of CONTENTS

MP Series Magnetic Proximity Sensors



PAGES 4-8

GS Series Geartooth Speed Sensors



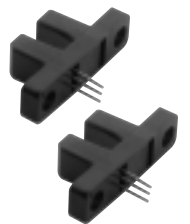
PAGES 9-11

SD Series Speed and Direction Sensors



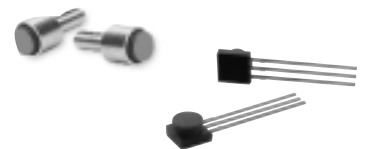
PAGE 12

VN Series Vane Switches



PAGE 13

Misc. Products & Accessories



PAGES 13-15

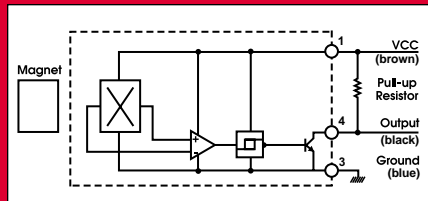
MP1001 Industrial Grade



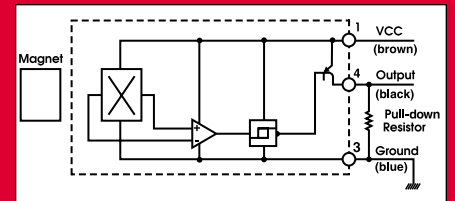
Solid State, magnetic proximity sensors in adjustable, threaded barrels.

- Immune to Hostile Environments
- High-Speed Capability
- Reverse Battery Protection to -24Vdc
- "CE Plus" Protection (with MP1001 Series)
- Sourcing or Open Collector Output
- MP100105 and MP100106 use Omnipolar GMR Sensing Element for Extra Wide Airgap
- South Pole Sensitive (except MP100105 and MP100106)
- M12 Integral Connector Meets IEC 60947-5-2

Open Collector Sinking Block Diagram



Sourcing Block Diagram



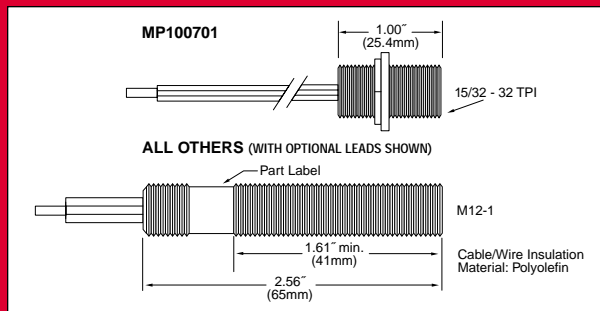
Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Operate Point, gauss (max.)	Release Point, gauss (min.)	Housing	Cable	Connector
MP100101	5 to 24	12	3-wire sink	700	25	-40 to 105	-40 to 105	300	60	SST		12mm circular
MP100102	5 to 24	12	3-wire sink	700	25	-40 to 125	-40 to 125	300	60	SST	22AWG x 1m BBB	
MP100103	5 to 24	12	3-wire source	Vcc-900 min	20	-40 to 105	-40 to 105	300	60	SST		12mm circular
MP100104	5 to 24	12	3-wire source	Vcc-900 min	20	-40 to 125	-40 to 125	300	60	SST	22AWG x 1m BBB	
MP100105	5 to 24	10	3-wire sink	700	24	-40 to 105	-40 to 105	25*	1*	SST		12mm circular
MP100106	5 to 24	10	3-wire sink	700	24	-40 to 125	-40 to 125	25*	1*	SST	22AWG x 1m BBB	

*The GMR IC is approximately .100" inside the barrel. Gauss figures at the barrel end will be somewhat higher. Consult Cherry Engineering for details.

MP1005 Commercial Grade



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Operate Point, Gauss (max.)	Release Point, Gauss (min.)	Housing	Leads	Connector
MP100501	4.75 to 24	12	3-wire sink	700	25	-40 to 105	-40 to 105	300	60	Alum (red)		12mm circular
MP100502	4.75 to 24	12	3-wire sink	700	25	-40 to 125	-40 to 125	300	60	Alum (red)	20 AWG x 1m BBB	
MP100503	4.75 to 24	12	3-wire source	Vcc-200 min	25	-40 to 105	-40 to 105	300	60	Alum (red)		12mm circular
MP100504	4.75 to 24	12	3-wire source	Vcc-200 min	25	-40 to 125	-40 to 125	300	60	Alum (red)	20 AWG x 1m BBB	
MP100701	4.75 to 24	12	3-wire sink	700	25	-40 to 125	-40 to 125	300	60	Alum (black)	20 AWG x 1m BBB	

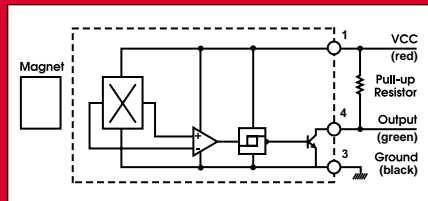
MP1013 Snap-Fit Proximity Sensor



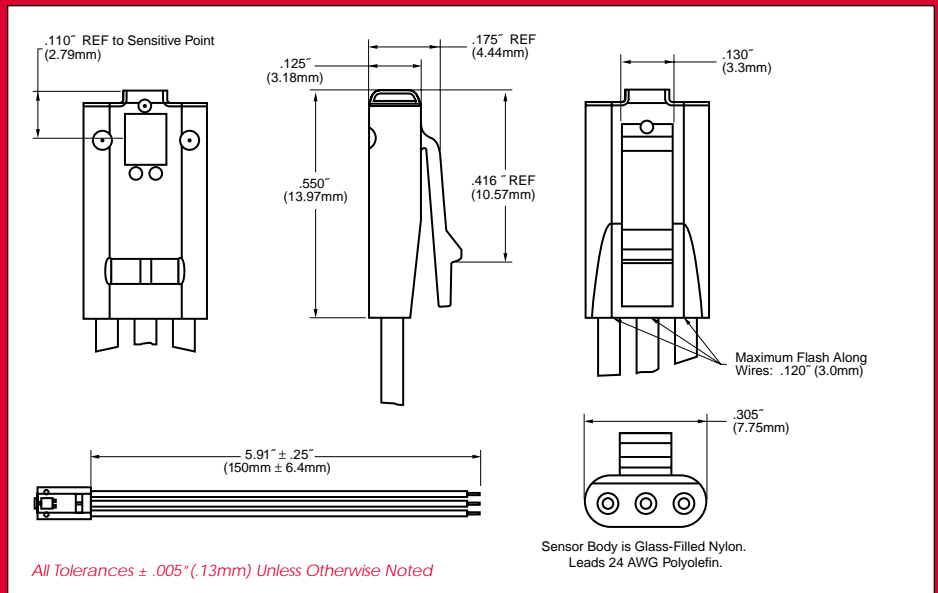
Hall effect proximity sensor with convenient snap-fit mounting.

- Solid State Reliability
- Excellent Temperature Stability
- Immune to Dirt, Dust, Moisture, etc.
- Reliable and Repeatable
- No Mechanical Contacts to Wear Out
- Digital Output Compatible With all Logic Families
- Operate From 4.5 to 24Vdc
- Reverse Battery Available

Open Collector Sinking Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Operate Point, Gauss (max.)	Release Point, Gauss (min.)	Reverse Battery Protection
MP101301	4.75 to 24	12	3-wire sink	700	25	-40 to 85	-40 to 105	300	60	-24
MP101302	4.75 to 24	12	3-wire sink	700	25	-40 to 125	-40 to 125	300	60	-24
MP101303	3.5 to 24	12	3-wire sink	700	25	-40 to 85	-40 to 105	45	-45 (latch)	None
MP101304	3.5 to 24	12	3-wire sink	700	25	-40 to 125	-40 to 125	45	-45 (latch)	None

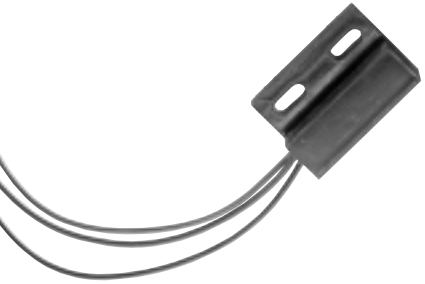
MP Series Notes

A: For sensors with integral connectors, mating cordsets are available from Cherry. Request Part Number AS000203 for a straight female connector or AS000204 for a right-angle female connector.

B: For further information, visit www.cherrycorp.com.

C: See page 14 for interface recommendations.

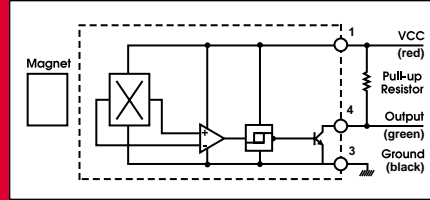
MP1021 Flange-Mount Proximity Sensor



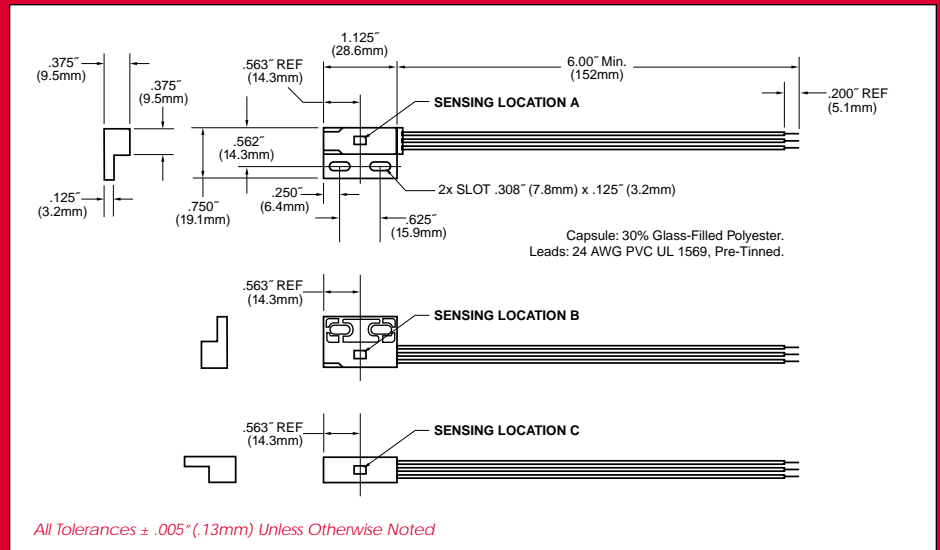
Digital Hall effect proximity sensor in plastic flange-mount housing.

- Virtually Unlimited Life
- Wide Operating Voltage Range
- 3 Different Sensing Orientations Available
- Suitable for High-Speed Switching
- Switch and Latch Versions Available
- Operated by North Pole of a Magnet
- Reverse Battery Protection Included

Open Collector Sinking Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Operate Temp. Range, °C	Function	Operate Point, Gauss (max.)	Release Point, Gauss (min.)	Sensing Location
MP102101	4.5 to 24	12	3-wire sink	500	-40 to 85	switch	300 (north)	195 (north)	A
MP102102	4.5 to 24	12	3-wire sink	500	-40 to 85	switch	300 (north)	195 (north)	B
MP102103	4.5 to 24	12	3-wire sink	500	-40 to 85	switch	300 (north)	195 (north)	C
MP102104	4.5 to 24	12	3-wire sink	500	-40 to 85	latch	60 (north)	60 (south)	A
MP102105	4.5 to 24	12	3-wire sink	500	-40 to 85	latch	60 (north)	60 (south)	B
MP102106	4.5 to 24	12	3-wire sink	500	-40 to 85	latch	60 (north)	60 (south)	C

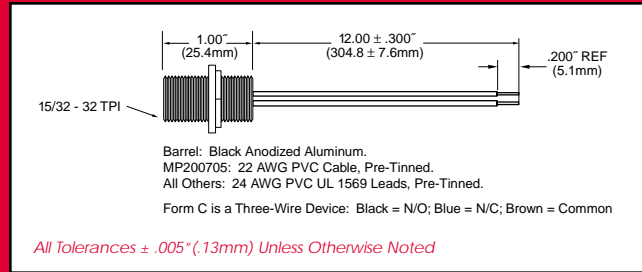
MP2007 Threaded Barrel Proximity Sensor



Reed-based magnetic proximity sensor in aluminum threaded barrel

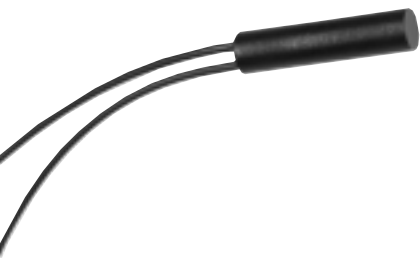
- Immune to hostile environments
- Zero power consumption
- Suitable for DC and AC circuits
- Hermetically sealed for long life

Dimensions



Part #	Contact Form	Power Rating, W Max	Switching Voltage, VDC Max	Breakdown Voltage, VDC Min	Switching Current, Amps Max	Contact Resistance, Ohms Max	Operate Temp. Range, °C	Operate Time, msec Typ.
MP200701	SPST-NO Form A	10	175	200	0.5	0.200	-40 to +105	0.6
MP200702	SPST-NC Form B	3	100	200	0.2	0.200	-40 to +105	1
MP200703	SPDT-CO Form C	3	100	200	0.2	0.200	-40 to +105	1
MP200705	SPST-NO Form A	10	175	200	0.5	0.200	-20 to +80	0.6

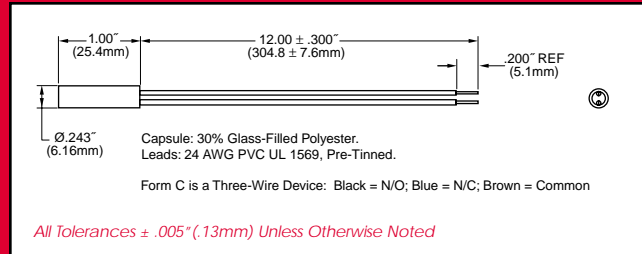
MP2017 Smooth Barrel Proximity Sensor



Reed-based magnetic proximity sensor encapsulated in plastic barrel

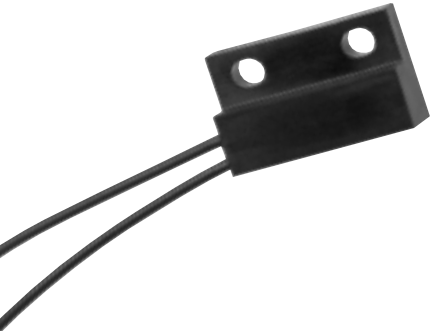
- Hermetically sealed for long life
- Resistant to moisture and dirt
- Available in a variety of standard contact configurations
- A standard magnetic actuator is available in the same package. Cherry part number AS201701

Dimensions



Part #	Contact Form	Power Rating, W Max	Switching Voltage, VDC Max	Breakdown Voltage, VDC Min	Switching Current, Amps Max	Contact Resistance, Ohms Max	Operate Temp. Range, °C	Operate Time, msec Typ.
MP201701	SPST-NO Form A	10	175	200	0.5	0.200	-40 to +105	0.6
MP201702	SPST-NC Form B	3	100	200	0.2	0.200	-40 to +105	1
MP201703	SPDT-CO Form C	3	100	200	0.2	0.200	-40 to +105	1

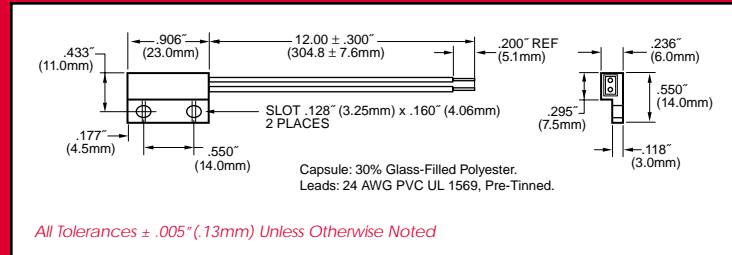
MP2018 Mini Flange-Mount Proximity Sensor



Reed-based magnetic proximity sensor encapsulated in plastic flange-mount package

- Resistant to moisture and dirt
- Operated by North or South pole
- Hermetically sealed for long life
- A standard magnetic actuator is available in the same package. Cherry part number AS201801

Dimensions



Part #	Contact Form	Power Rating, W Max	Switching Voltage, VDC Max	Breakdown Voltage, VDC Min	Switching Current, Amps Max	Contact Resistance, Ohms Max	Operate Temp. Range, °C	Operate Time, msec Typ.
MP201801	SPST-NO Form A	10	175	200	0.5	0.200	-40 to +105	0.6
MP201802	SPST-NC Form B	3	100	200	0.2	0.200	-40 to +105	1

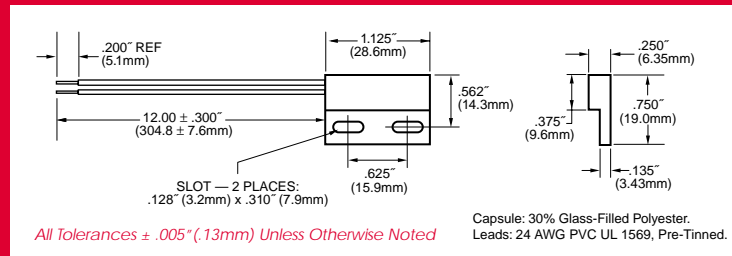
MP2019 Flange-Mount Proximity Sensor



Reed-based magnetic proximity sensor encapsulated in plastic flange-mount package

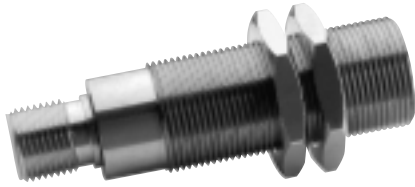
- Immune to hostile environments
- Hermetically sealed for long life
- Suitable for DC and AC circuits
- A standard magnetic actuator is available in the same package. Cherry part number AS201901

Dimensions



Part #	Contact Form	Power Rating, W Max	Switching Voltage, VDC Max	Breakdown Voltage, VDC Min	Switching Current, Amps Max	Contact Resistance, Ohms Max	Operate Temp. Range, °C	Operate Time, msec Typ.
MP201901	SPST-NO Form A	10	175	200	0.5	0.200	-40 to +105	0.6
MP201902	SPST-NC Form B	3	100	200	0.2	0.200	-40 to +105	1
MP201903	SPDT-CO Form C	3	100	200	0.2	0.200	-40 to +105	1

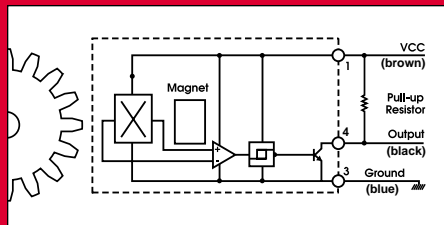
GS1001-1004 Industrial Grade



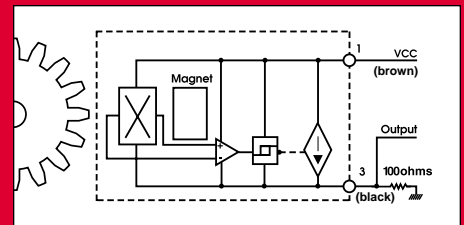
Industrial-grade, Hall effect geartooth speed sensor with adjustable stainless steel housing.

- Sense Motion of Ferrous Geartooth Targets
- Near-Zero Speed Sensing Capability
- Immune From Hostile Environments
- Not Subject to Rotational Orientation
- High-Speed Capability
- Reverse Battery Protection to -24VDC
- Wide Operating and Storage Temperature Range
- M12 Integral Connector Meets IEC60947-5-2
- Meet all IEC (International Electrotechnical Commission) Requirements for Heavy Industrial Environments, Assuring Immunity From:
 - Electrostatic Discharge
 - Electrical Transients
 - Radiated Electric Field
 - Conducted Energy
 - Magnetic Field Energy

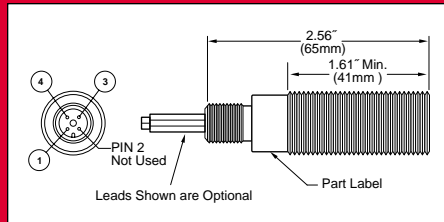
Open Collector Sinking Block Diagram



2-Wire Interface Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Thread	Barrel Length	Cable	Connector
GS100101	4.5 to 24	6	sink	700	25	-40 to 105	-40 to 105	M12-1	65mm		12mm circular
GS100102	4.5 to 24	6	sink	700	25	-40 to 125	-40 to 125	M12-1	65mm	22 AWG x 1m BBB	
GS100201	4.5 to 24	6	sink	700	25	-40 to 105	-40 to 105	M18-1	65mm		12mm circular
GS100202	4.5 to 24	6	sink	700	25	-40 to 125	-40 to 125	M18-1	65mm	22 AWG x 1m BBB	
GS100203	5 to 24	20	2-wire leads	—	—	-40 to 125	-40 to 125	M18-1	65mm	20 AWG x 1m BBB	
GS100301	4.5 to 24	6	sink	700	25	-40 to 105	-40 to 105	5/8" - 18	2.56"		12mm circular
GS100302	4.5 to 24	6	sink	700	25	-40 to 125	-40 to 125	5/8" - 18	2.56"	20 AWG x 1m BBB	
GS100303	5 to 24	20	2-wire leads	—	—	-40 to 125	-40 to 125	5/8" - 18	2.56"	20 AWG x 1m BBB	
GS100401	4.5 to 24	6	sink	700	25	-40 to 105	-40 to 105	3/4" - 16	2.56"		12mm circular
GS100402	4.5 to 24	6	sink	700	25	-40 to 125	-40 to 125	3/4" - 16	2.56"	22 AWG x 1m BBB	
GS100403	5 to 24	20	2-wire leads	—	—	-40 to 125	-40 to 125	3/4" - 16	2.56"	20 AWG x 1m BBB	

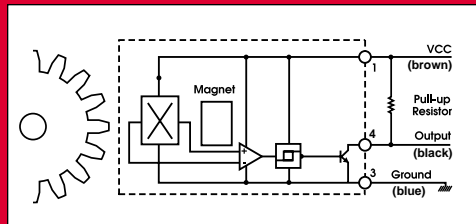
GS1005-1009
Commercial-Grade



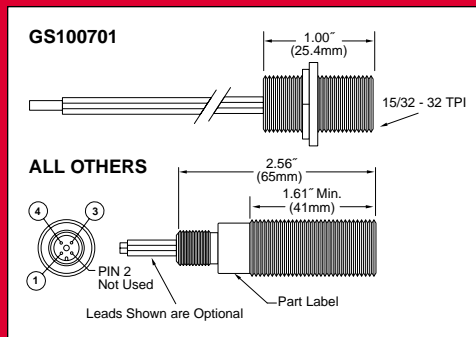
Commercial-grade, Hall effect geartooth speed sensor with adjustable aluminum housing.

- Sense Motion of Ferrous Geartooth Targets
- Near Zero Speed Sensing Capability
- Immune From Hostile Environments
- Not Subject to Rotational Orientation
- High-Speed Capability
- Operate From 5 to 24Vdc
- Reverse Battery Protection to -24Vdc
- Wide Operating and Storage Temperature Range

Open Collector Sinking Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Housing	Thread	Barrel Length	Leads	Connector
GS100501	4.5 to 24	6	sink	400	25	-40 to 105	-40 to 105	Alum. (red)	M12-1	65mm		12mm circular
GS100502	4.5 to 24	6	sink	400	25	-40 to 125	-40 to 125	Alum. (red)	M12-1	65mm	20 AWG x 1m BBB	
GS100601	4.5 to 24	6	sink	400	25	-40 to 105	-40 to 105	Alum. (red)	M18-1	65mm		12mm circular
GS100602	4.5 to 24	6	sink	400	25	-40 to 125	-40 to 125	Alum. (red)	M18-1	65mm	20 AWG x 1m BBB	
GS100701	4.5 to 24	6	sink	400	25	-40 to 125	-40 to 125	Alum. (black)	15/32"-32	1.00"	20 AWG x 1m BBB	
GS100801	4.5 to 24	6	sink	400	25	-40 to 105	-40 to 105	Alum. (black)	5/8" - 18	2.56"		12mm circular
GS100802	4.5 to 24	6	sink	400	25	-40 to 125	-40 to 125	Alum. (black)	5/8" - 18	2.56"	20 AWG x 1m BBB	
GS100901	4.5 to 24	6	sink	400	25	-40 to 105	-40 to 105	Alum. (black)	3/4" - 16	2.56"		12mm circular
GS100902	4.5 to 24	6	sink	400	25	-40 to 125	-40 to 125	Alum. (black)	3/4" - 16	2.56"	20 AWG x 1m BBB	

GS Series Notes

A: For sensors with integral connectors, mating cordsets are available from Cherry. Request Part Number AS000203 for a straight female connector or AS000204 for a right-angle female connector.

B: For further information, visit www.cherrycorp.com.

C: See page 14 for interface recommendations.

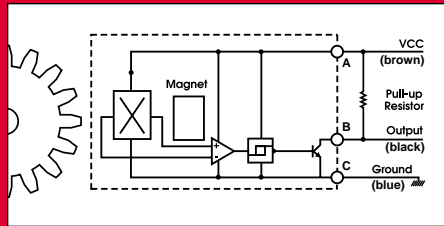
GS1012 Plastic Housing With Mounting Flange



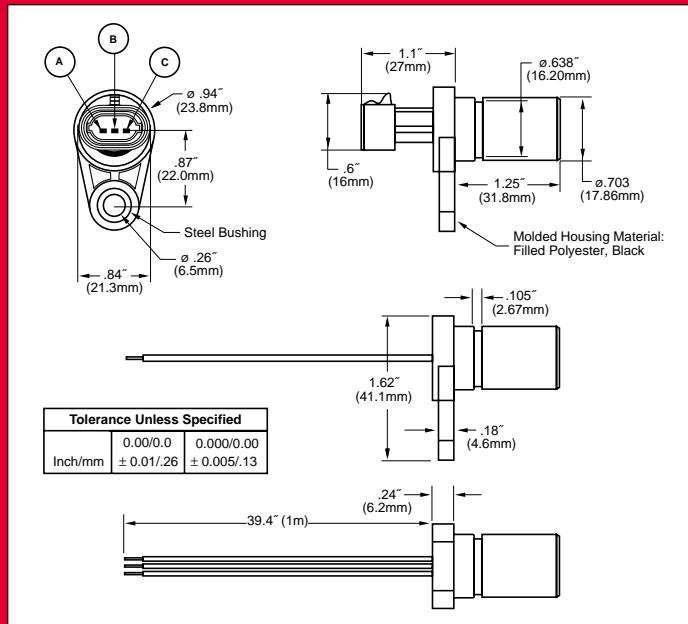
Hall effect geartooth speed sensor with flange-style plastic housing.

- Sense Motion of Ferrous Geartooth Targets
- Near-Zero Speed Sensing Capability
- Immune From Hostile Environments
- Not Subject to Rotational Orientation
- High-Speed Capability
- Operate From 5 to 24Vdc
- Reverse Battery Protection to -24Vdc
- Wide Operating and Storage Temperature Range
- Meet all IEC (International Electrotechnical Commission) Requirements for Heavy Industrial Environments, Assuring Immunity From:
 - Electrostatic Discharge
 - Electrical Transients
 - Radiated Electric Field
 - Conducted Energy
 - Magnetic Field Energy

Open Collector Sinking Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Leads	Connector
GS101201	5 to 24	6	sink	400	25	-40 to 125	-40 to 125		Delphi*
GS101202	5 to 24	6	sink	400	25	-40 to 125	-40 to 125	22 AWG x 1m BBB	

*Metripak 150 series. Mates with Delphi 12162280 and 12162279. A mating connector assembly with one meter of wire is available from Cherry. Request part number AS000101.

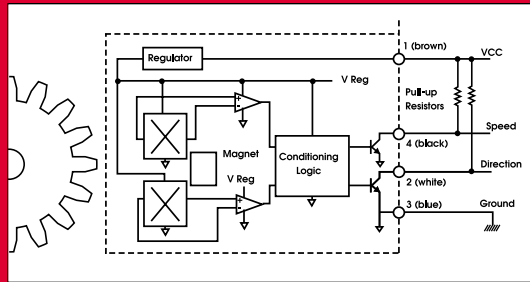
SD1002-1004 Speed and Direction Sensor



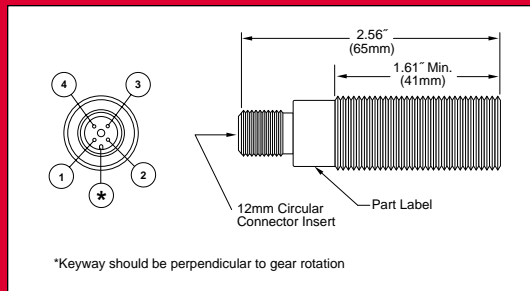
Hall effect geartooth speed and direction sensor with adjustable stainless steel housing.

- Sense Motion/Direction of Ferrous Geartooth Targets
- Separate Digital Outputs for Speed and Direction
- Immune From Hostile Environments
- High-Speed Capability
- Operate From 5 to 24Vdc
- Reverse Battery Protection to -24Vdc
- Wide Operating and Storage Temperature Range
- M12 Integral Connector Meets IEC60947-5-2
- Meet all IEC (International Electrotechnical Commission) Requirements for Heavy Industrial Environments, Assuring Immunity From:
 - Electrostatic Discharge
 - Electrical Transients
 - Radiated Electric Field
 - Conducted Energy
 - Magnetic Field Energy

Open Collector Sinking Block Diagram



Barrel Dimensions

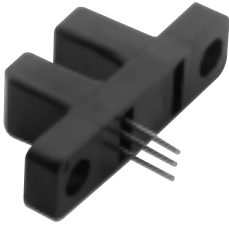


Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Housing	Thread	Barrel Length
SD100201	4.75 to 24	17	sink	400	25	-40 to 85	-40 to 105	SST	M18-1	65mm
SD100401	4.75 to 24	17	sink	400	25	-40 to 85	-40 to 105	SST	3/4" - 16	2.56"

GS and SD Series Notes

- A: For sensors with integral connectors, mating cordsets are available from Cherry. Request Part Number AS000203 for a straight female connector or AS000204 for a right-angle female connector.
- B: For further information, visit www.cherrycorp.com.
- C: See page 14 for interface recommendations.

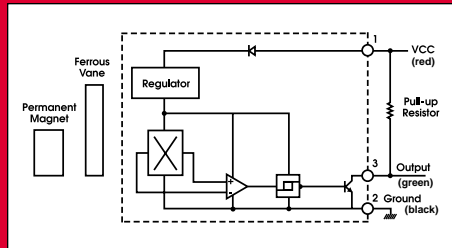
VN1015 Digital Vane Switch



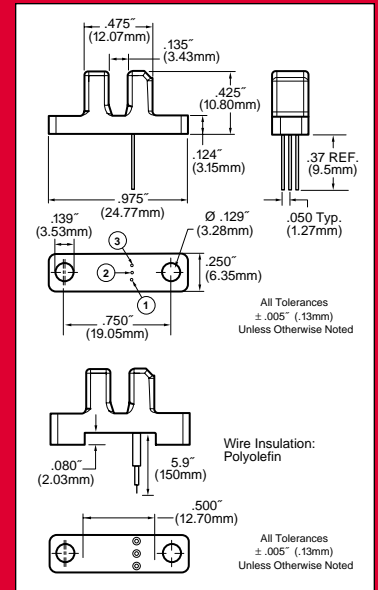
Magnetically-activated digital vane switch in a rugged, overmolded plastic housing with three pins or 3-wire harness.

- Available in Two Operating Temperature Ranges
- Immune From Moisture and Dust
- Reliable and Repeatable
- No Mechanical Contacts to Wear Out
- Operate From 5 to 24VDC
- Reverse Battery Protection to -24VDC
- Open Collector Output Compatible With All Logic Families
- Sensor Body Material: Glass-Filled Polyester
- Recommended Vane Parameters
 - Material: Low-carbon, Cold-rolled Steel
 - Minimum Dimensions: 0.40" Thick, 0.250" Wide
 - Vane should penetrate to a depth less than 0.120" from bottom of sensor slot.

Open Collector Sinking Block Diagram



Dimensions

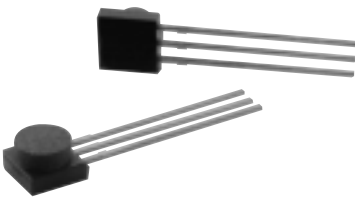


Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Termination
VN101501	4.5 to 24	6	3-pin sink	400	25	-40 to 85	-40 to 85	pins
VN101502	5 to 24	6	3-pin sink	400	25	-40 to 125	-40 to 125	pins
VN101503	4.5 to 24	6	3-wire sink	400	25	-40 to 85	-40 to 85	24 AWG x 150mm leads
VN101504	5 to 24	6	3-wire sink	400	25	-40 to 125	-40 to 125	24 AWG x 150mm leads

H E 3 1 3 5

LATCH ASSEMBLY

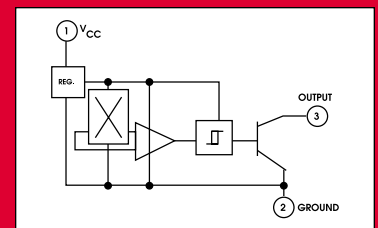
HE3135 Hall Effect Latch Assembly



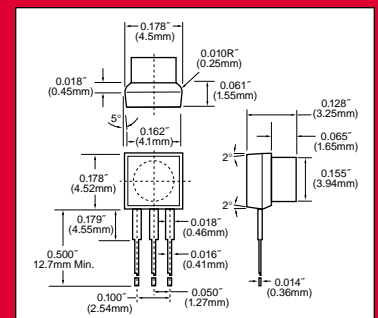
Magnetically-biased bipolar digital latch for use with multipole ring magnets.

- Offers Extreme Sensitivity
- Reliable — No Moving Parts to Wear Out
- Compact Size
- Output Compatible with All Digital Logic Families
- Symmetrical Output
- Latches in Presence of a South Pole and Unlatches in Presence of a North Pole

Sinking Block Diagram



Dimensions



Part #	Operating Voltage Range (VDC)	Supply Current, mA max	Output	Output Saturation Voltage, mV max	Output Current, mA max	Operate Temp. Range, °C	Storage Temp. Range, °C	Termination
HE313500	4.5 to 24	9	sink	400	25	-20 to 85	-40 to 105	Straight Terminals
HE313501	4.5 to 24	9	sink	400	25	-20 to 85	-40 to 105	Right-Angle Terminals

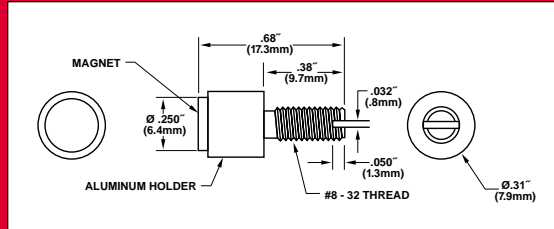
AS101001 Actuator Magnet



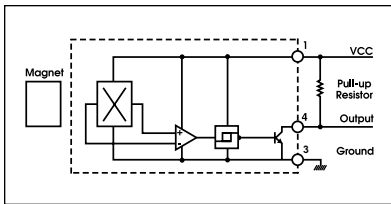
Easy-to-install actuator magnet with threaded aluminum holder.

- Rugged Aluminum Housing
- Adjustable Threaded Mounting Stud
- Operating and Storage Temperature: -40° to +150°C
- South Pole Facing Alnico Magnet

Dimensions



GENERAL NOTES

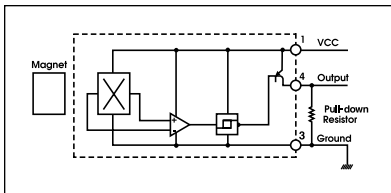


3-Wire Sinking Interface

Sinking outputs are often used in negative logic applications, where a low signal is required for an active state. Therefore, sinking outputs normally have current flowing into the device output lead when the device is active. Also called “open collector outputs,” sinking outputs are compatible with any logic family since a wide voltage range may be used for V_{CC} . Furthermore, the voltage level used to power the Hall effect assembly may differ from the pull-up resistor to which it is attached. The external pull-up resistor connected between the output and V_{CC} is required for proper operation. With the resistor connected as shown, the output will be “pulled up” to V_{CC} when off and (approximately) to ground when on.

Recommended pull-up resistor values are as follows:

Volts dc	5	9	12	15	24
Ohms	470	820	1.2K	1.5K	2.2K

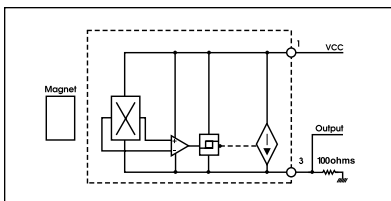


3-Wire Sourcing Interface

Sourcing outputs are often used in positive logic applications, where a high signal is required for an active state. Thus, sourcing outputs normally have current flowing out of the device output lead when the device is active. Because a pull-down resistor is required for proper operation, sourcing outputs are compatible with CMOS logic, but not with TTL components. With the pull-down resistor connected as shown, the output will be “pulled down” to ground when off and (approximately) to V_{CC} when on.

Recommended pull-down resistor values are as follows:

Volts dc	5	9	12	15	24
Ohms	470	820	1.2K	1.5K	2.2K



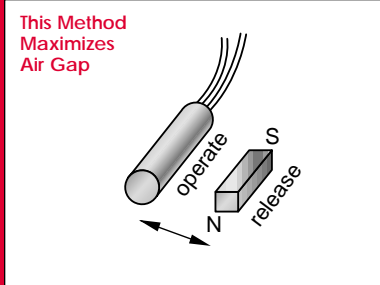
2-Wire Current Sourcing Interface

Some applications require the sensor have only two connections. To accommodate these situations, several Cherry sensor assemblies are equipped with a 2-Wire interface (which may be tested as shown in the block diagram). When the sensor is idle, current flowing into the device via Pin 1 and out via Pin 3 is limited to that needed to power the Hall effect device, a maximum of 6mA. When the sensor is active, the current flow will increase to a minimum of 10mA as the Hall effect device turns on the programmable current source. The voltage measured between the output and ground will therefore change by a minimum of 0.4 Vdc. If Pin 3 is connected to a comparator, the comparator output will switch in response to the change in voltage at Pin 3 of the sensor. Alternatively, Pin 3 can be connected directly to ground and a load placed between Pin 1 and V_{CC} . In this case, Pin 1 becomes the output lead to be connected to a comparator.

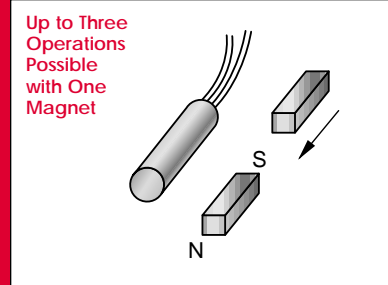
MP Series Reed Sensors

A Reed Sensor is an omnipolar, magnetically activated switch. It can be approached by a magnet from any angle, with either pole. Several possible operating methods are shown below.

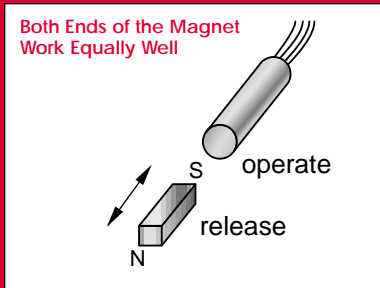
Perpendicular Magnet Travel



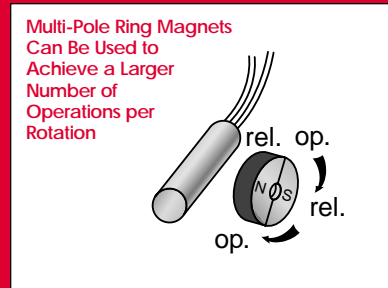
Parallel Magnet Travel



Nose-To-Nose Activation



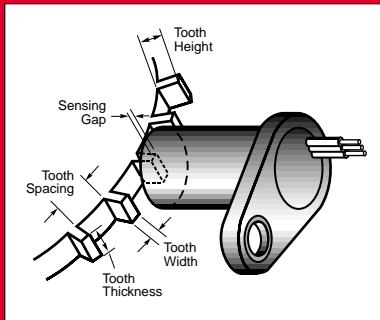
Rotational Magnet Travel



Operating a Speed Sensor

Although commonly called a gtear tooth sensor, a solid-state speed sensor can detect the motion of various ferrous objects with some type of discontinuous surface.

Solid-State Speed Sensor



Examples of appropriate targets include:

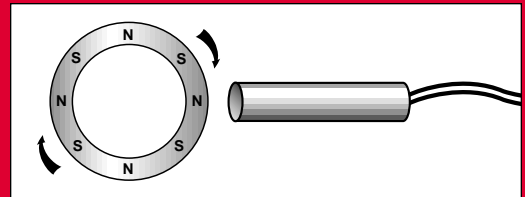
- Sprockets
- Bolt Heads
- Roller Chains
- Cavities in a Smooth Surface

For best results, we recommend targets made from low carbon cold rolled steel. Other factors that influence sensor performance include gear tooth height and width, space between teeth, shape of the teeth and thickness of the target. As a general guideline, consider a target with the following minimum parameters:

Tooth Height	Tooth Width	Distance Between Teeth	Target Thickness
.200"	.100"	.400"	.250"

Cherry's solid-state magnetic proximity sensors also make excellent speed sensors when coupled with a rotating ring magnet. Advantages of this approach include: lower sensor cost, larger airgaps and absolute zero-speed sensing.

Proximity Sensor with Ring Magnet



In addition to the speed and proximity sensors presented here, Cherry also offers a complete line of standard and semi-custom snap-action, selector and key switches. With over 10,000 product variations and complete design, prototype and production capabilities, Cherry has the right solution for all your electromechanical and electronic switching needs.

For complete technical information on all of our sensor and switch products, as well as our general purpose and advanced performance keyboards, contact Cherry today.



Cherry Electrical Products

Phone: 800-285-0773 (Sensors)
262-942-6500 (General)
Fax: 262-942-6566
Web: www.cherrycorp.com

Cherry Corporation disclaims any warranties of merchantability, fitness for a particular purpose or noninfringement. While Cherry Corporation intends for this information to be accurate, there may be inadvertent technical and typographical errors, for which Cherry Corporation assumes no liability.

CE1584-Rev1