PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

AH5 Series

Analog Hall Sensor

- **Polarity sensitive analog output that changes in relation to the magnetic field strength, 2.5V offset**
- **5.0 mV/G gain**
- **Non-contact, solid-state design with no moving parts**
- **Ideal for speed, position, and proximity sensing in mobile and industrial systems**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: M12-AH5-5KSA5

Housing	Series	Electrical Option	Connection Type
See page 2-3	AH5	See page 4	See page 5-6

Modify, update, or enhance any sensor with our modular features and functionality.

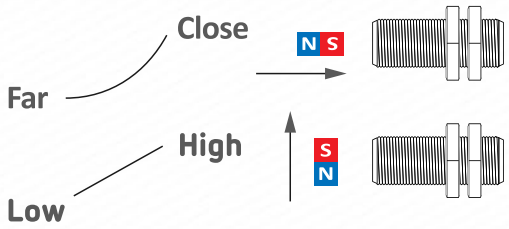
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

Need a Custom Sensor Solution?... Send us your application specific requirements

Analog Output Proportional to Field Strength, Gap or Height



FEATURES

- Non-contact
- Easy to install
- Internal hysteresis
- Temperature stable
- Shock and vibration resistant
- Solid-state (no wearing parts)
- True zero speed operation
- Detect non-standard steel targets
- Harsh environment durability
- Flexible electrical options: NPN or PNP outputs
- Easy installation with threaded or flange mount housings

APPLICATIONS

- Alignment or proximity of manufacturing bins/carts/trays
- Count feedback of production and testing components
- Resolve speed of industrial and agricultural attachments
- Shaft and gear speed in agricultural equipment
- Monitors speed in conveyor systems and assembly lines
- Speed of automation equipment
- Measure cranes/winch feed rate
- Resolving engine RPMs
- Measuring vehicle/wheel speed
- Pulley systems in manufacturing
- Monitoring gears in transmissions
- Cam and Crank shaft timing

MARKETS

- Aerospace & Defense
- Medical Devices
- Agricultural Machinery
- Marine & Transportation
- Automotive & Heavy Equipment
- Power Generation Systems
- Consumer Electronics
- Manufacturing & Industrial Automation

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AH5 Series
Analog Hall Sensor

HOUSING TYPES AND CUSTOMIZATION OPTIONS

The AH5 Series offers a wide range of housing styles, mounting types, and material options to cover a variety of application environments. If the housing style you need is not shown, Standex can work with you on your custom housing needs to fulfill your application requirements.

HOUSING MATERIALS
- Aluminum
- Plastic (Glass Filled Nylon)
- Stainless Steel

MOUNTING TYPE
- Threaded Barrel
- High Pressure

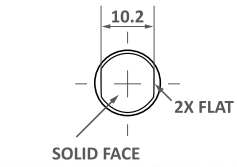
THREAD PITCH
- 1/2-20
- 15/32-32
- 3/4-20
- 5/8-18
- 7/16-20
- M12x1
- M18x1

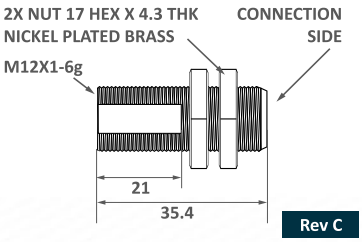
Plastic Glass Fill Nylon (150°C)

PART NUMBER EXAMPLE

M12 - AH5 - 5KSA5 — CONNECTION
HOUSING ELECTRICAL

M12 Thread Mount M12x1mm, 35mm

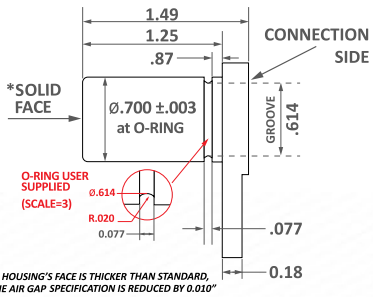


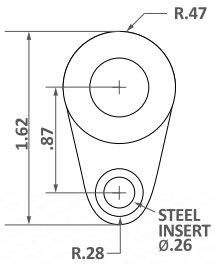


DIM = MM, ID = 8.51 (.335")

Rev C

MFM7 Flange Mount



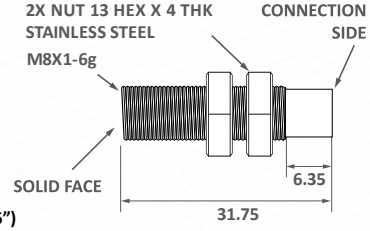


DIM = INCH, ID = .500"

Rev D

303 Stainless Steel

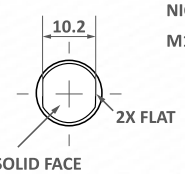
S8Thread Mount M8x1mm, 32mm

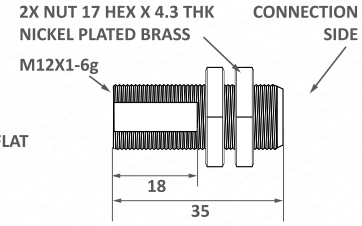


DIM = MM, ID=5.74 (.226")

Rev A

S12 Thread Mount M12x1mm, 35mm





DIM = MM, ID = 8.51 (.335")

Rev C

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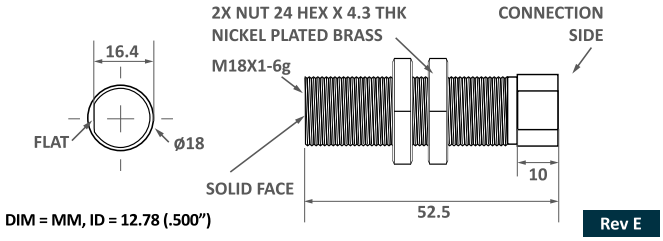
AH5 Series
Analog Hall Sensor

303 Stainless Steel

PART NUMBER EXAMPLE

M12 - **AH5** - 5K SA5 — CONNECTION
HOUSING | ELECTRICAL

S18 Thread Mount M18x1mm, 53mm



DIM = MM, ID = 12.78 (.500")

Rev E

AH5 Series
Analog Hall Sensor

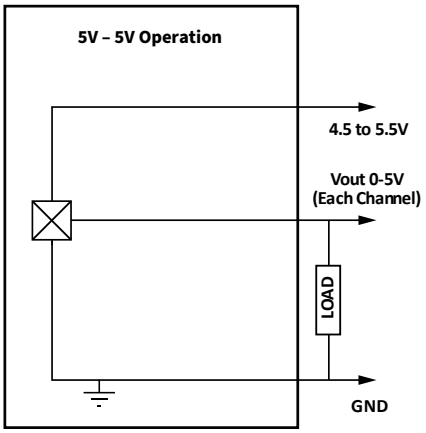
Electrical Output Logic Options

PART NUMBER EXAMPLE

M12 - **AH5** - 5K SA5 — CONNECTION

HOUSING | ELECTRICAL

5V

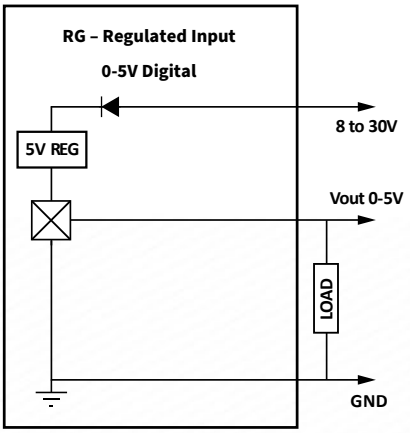


Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.5	+5.5	Volts DC
Supply Current	Into Vcc	(typ 7)	+10	mA
Output Current	Continuous	-1	+1	mA
Load Capacitance	Cable and Load	n/a	+1.0	µF
Frequency Range **	Std Programmable	0	500	Hz
Frequency Range **	Max Programmable	0	2000	Hz
Digital Voltage Low Vol	I sink < 1.0 mA	0	(typ 0.2)	Volts
Digital Voltage High Voh	I source < 1.0 mA	(typ 4.8)	Vcc	Volts
Output Rise Time 10-90%	Ro=10k, C<100 pF	-	5	µS
Output Fall Time 90-10%	Ro=10k, C<100 pF	-	5	µS

* T max = 150°C is available, contact factory.

** Frequency, Detection and Hysteresis are Factory Programmable. Rev D

RG



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+8.0	+30	Volts DC
Supply Current, Output Off	Into Vcc	(typ 8)	+12	mA
Output Current	Continuous	-1	+1	mA
Load Capacitance	Cable and Load	n/a	+1.0	µF
Frequency Range **	Std Programmable	0	500	Hz
Frequency Range **	Max Programmable	0	2000	Hz
Digital Voltage Low Vol	I sink < 1.0 mA	0	(typ 0.2)	Volts
Digital Voltage High Voh	I source < 1.0 mA	4.60	5.5	Volts
Output Rise Time 10-90%	Ro=10k, C<100 pF	-	5	µS
Output Fall Time 90-10%	Ro=10k, C<100 pF	-	5	µS

* T max = 150°C is available, contact factory.

** Frequency, Detection and Hysteresis are Factory Programmable. Rev D

AH5 Series
Analog Hall Sensor

CONNECTION TYPES AND CUSTOMIZATION OPTIONS

The AH5 Series offers a wide range of connection configurations to meet diverse installation and environmental requirements. Whether you need rugged connectors for industrial environments or flexible wiring for compact assemblies, Standex provides tailored solutions:

CONNECTOR OPTIONS

- Deutsch & Amphenol: Industry-standard sealed connectors for harsh environments
- Other Brands Available: Custom connector integration upon request
- Integral Connectors: Built directly into the sensor housing for streamlined installation
- Pigtail Connectors: Short lead wires with pre-installed connectors for plug-and-play use

FREE-END WIRE OPTIONS

- Free-End Jacketed: Durable, protective outer layer for added mechanical strength
- Free-End Ribbon Cable: Flat, flexible cable ideal for tight spaces
- Free-End Shielded: EMI-resistant for electrically noisy environments
- Free-End Wires: Standard stripped leads for direct wiring
- Wire Specifications
- Wire Gauges: 20 AWG and 22 AWG standard
- Lengths: Available in 0–6", 1–4', 5–9', or custom lengths to suit your application

INSULATION MATERIALS

- PVC: Economical and flexible
- Teflon: High-temperature and chemical-resistant
- XLPE: Cross-linked polyethylene for enhanced thermal and abrasion resistance
- High-Temp Options: For extreme operating conditions

Cable Harness & Connector Options

PART NUMBER EXAMPLE M12 - **AH5** - 5K SA5 — CONNECTION

M12 — HOUSING; 5K — ELECTRICAL

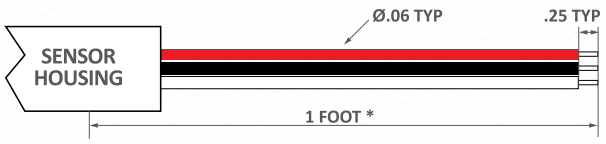
P21, Free End PVC 22 AWG Wires

Connections

Red = Vcc White = Vout Black = Ground

FREE END WIRE LEADS
22 AWG, 7/30, PVC 80°C
3 WIRES SHOWN. THE NUMBER OF WIRES AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 6", 2', 5', 10', AND 20'



DIM = INCH

Rev A

P23, Free End PVC 22 AWG Wires

Connections

Red = Vcc White = Vout Black = Ground

FREE END WIRE LEADS
22 AWG, 7/30, PVC 80°C
3 WIRES SHOWN. THE NUMBER OF WIRES AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 6", 2', 5', 10', AND 20'

DIM = INCH

Rev A

AH5 Series
Analog Hall Sensor

Cable Harness & Connector Options

PART NUMBER EXAMPLE M12 - AH5 - 5K SA5 — CONNECTION
HOUSING | ELECTRICAL

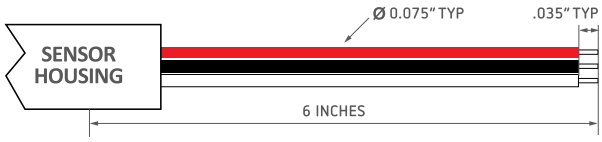
X0B, Free End XLPE 20 AWG Wires

Connections

Red = Vcc White = Vout Black = Ground

FREE END WIRE LEADS
20 AWG, XLPE, 125˚C, 19/32
3 WIRES SHOWN. THE NUMBER OF WIRES AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 1', 2', 5', 10' AND 20'



DIM = INCH

Rev A

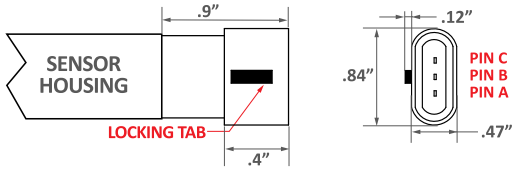
CP13, Integral 3-Way Metri Pack Male Connector

Compatible with Housings – MFM7, MFM610 Only

Connections

Pin A = Vcc Pin B = Vout Pin C = Ground

CONNECTOR: METRI-PACK 150.2, 3-WAY MALE
MATES WITH DELPHI-APTIV HOUSING 12162280 AND TERMINAL 12124075



DIM = INCH

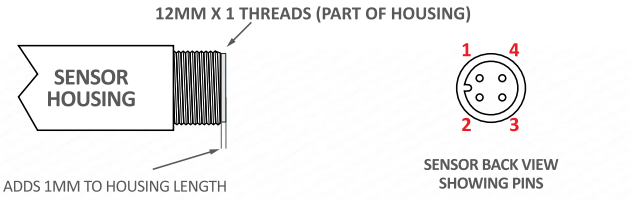
Rev A

CB2, Integral 4 Pin Male 12mm Micro Connector

Compatible with Housings – S12, S12H, M12 Only

Connections

Pin 1 = Vcc Pin 2 = Vout Pin 3 = Ground Pin 4 = Program, Leave Open



Rev A

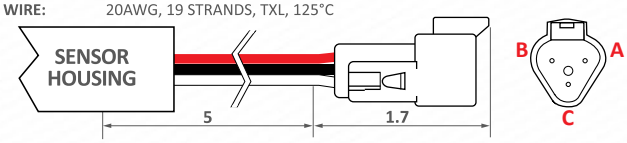
CD3, 3 Pin Deutsch DT03 TXL 20 AWG Wires

Connections

Pin A (White) = Vout Pin B (Red) = Vcc Pin C (Black) = Ground

CONNECTOR: AMPHENOL AT04-3P-RD01 BODY OR
DEUTSCH DT04-3P-C015 BODY
DEUTSCH 060-16-0622 TERMINALS
DEUTSCH W3P WEDGELOCK
WIRE: 20AWG, 19 STRANDS, TXL, 125°C

A = WHITE
B = RED
C = BLACK



DIM = INCH

Rev D

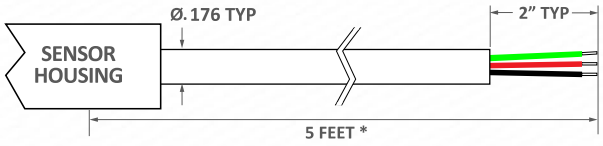
JA5, Jacketed 3 Wire PVC 22 AWG Wires

Connections

Red = Vcc Green = Vout Black = Ground

FREE END JACKETED 3 WIRE PVC, 22 AWG
7/30, RED, BLK, GRN, 80°C

*OTHER STANDARD LENGTHS:
1', 2', 10', AND 20'



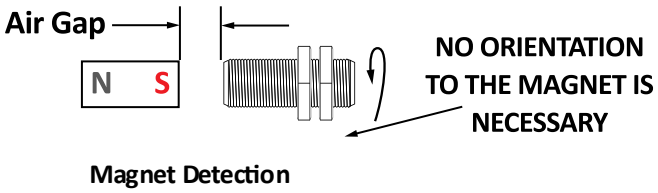
DIM = INCH

Rev C

AH5 Series
Analog Hall Sensor

Environmental & Performance Specifications

Sensor Function



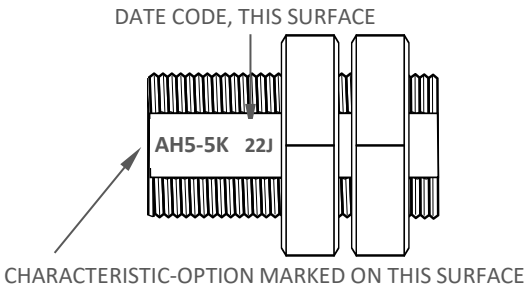
Magnet Detection

Magnetic Characteristics	Min	Typ	Max	Units
Quiescent Vo (0 Gauss, Vcc=5, T=25°C)	2.4	2.5	2.6	Volts
Change in Q-Vo Over Temp	-.030	0	+.030	Volts
Sensitivity at Vcc = 5, T = 25°C	4.5	5.0	5.5	mV/G
Change in Sensitivity at T = 150°C	-2.5	+2.5	+7.5	%
Change in Sensitivity at T = -40°C	-9	-1.3	+1	%

Environmental Specifications

Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	13 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Continuous
Mechanical Shock	100 G's, 11 mS

Marking



Please note: All technical specifications on this series datasheet refer to the standard product range. Modifications in the sense of technical progress are reserved. For general information only. For more specific information, please consult the product datasheet, available upon request.

This series datasheet could contain technical inaccuracies or typographical errors. Changes are periodically made to the information herein. These change will be incorporated in future revisions.

For deviating values, most current specifications and products please contact your nearest sales office.

A47-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

- Sensitive S-pole hall switch
- 55 gauss operate
- NPN w/5k pull up resistor
- Aluminum 15/32-32 x 1" housing
- Free end PVC 22 AWG wires (1 foot length)

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A47-HS1-5KP21

Housing	Sensor Type & Function	Electrical Option	Connection Type
Aluminum 15/32-32 x 1" Long	Hall Switch 1 Digital Output Sensitive S-Pole	NPN, 5k Pull Up Resistor	P21 = Free End PVC 22AWG Wires

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

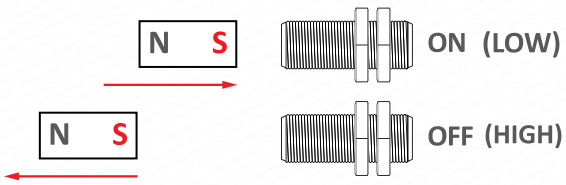
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'1 Digital Output' Sensitive S-Pole Hall Switch Sensor

Digital Output Switches On and Off with a Magnet



Type - HS

DESCRIPTION

- Sensor triggers ON (LOW) when a South Pole magnet field is present and turns OFF (HIGH) when the South Pole magnetic field retracts.
- Sensor does not respond to North Pole magnetic fields. Contact Sensor Solutions for alternative sensors.
- No orientation required. Use lock nuts to set air gap within range of target magnets.
- Square wave output pulses can be used to detect speed, position, proximity, or count.
- Note: Operate and release gaps are dependent on the size, material, grade, and temperature of the target magnet.

FEATURES

- Internal Hysteresis
- Lower Gauss Operation than Standard HS Sensor
- Solid State (Nothing to wear out!)
- Temperature Stable

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

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A47-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

In addition to the HS1, we offer a variety of South Pole and Either pole Hall Effect and Magnetoresistive sensors including multiple programmable sensors, North and South Pole output sensors, latching sensors, and sensors with speed/count and direction outputs.

Note: Check our website or contact us to discuss all of our magnetic speed, count, and position detection sensors.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+150	Deg C
Supply Voltage, Vcc	Over temperature	+3	+24	Volts DC
Supply Current, Output Off	Into Vcc @ Vcc=12	+2	+7	mA
Chopper Frequency	Typical	333	800	kHz
Frequency Range	8x over sample	0	12	kHz
Saturation Voltage High 100% Tested at 20°C before shipping	Vcc = 12 V	11.5	12	Volts
Saturation Voltage Low 100% Tested at 20°C before shipping	Vcc = 12 V	0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	k Ohms
Output Rise Time 10-90%	C < 100pF	-	2.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD (Human Body Model)	Nondestructive	-	8000	Volts
EMI (Human Body Model)	20k to 1 G Hz	-	100	V / M

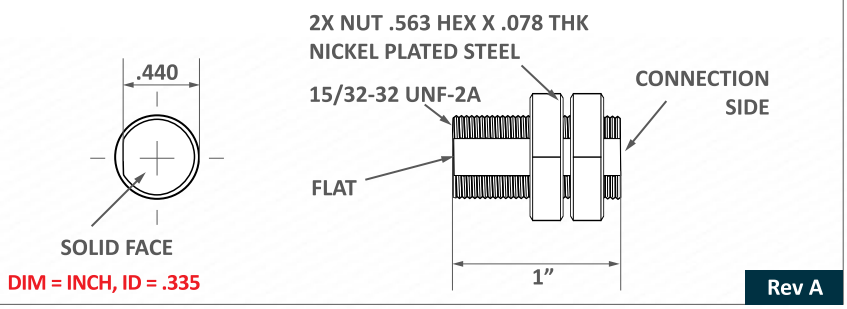
Rev C

Absolute Max Limits T < 5 minutes	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Applied to Output	-32	+32	Volts
Current Into Output	-	60	mA
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 100 Ω	-	40	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	13 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

Magnetic Characteristics	Min	Typ	Max
Operate Point Over Temp 100% Tested at 20°C before shipping	15 G	55 G	76 G
Release Point Over Temp	5 G	35 G	57 G
Hysteresis Over Temp	5 G	20 G	28 G

A47, Housing, Anodized Aluminum, 15/32-32, 1" Long



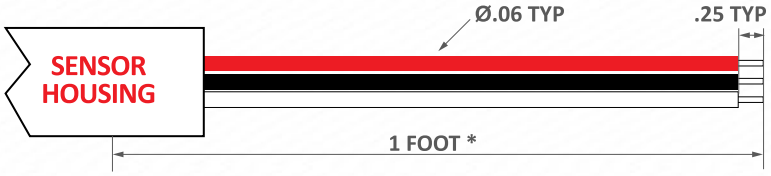
DIM = INCH, ID = .335

Rev A

P21, Free End PVC 22 AWG Wires

FREE END WIRE LEADS
22 AWG, 7/30, PVC 80°C
3 WIRES SHOWN. THE NUMBER OF WIRES
AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 6", 2', 5', 10', AND 20'



DIM = INCH

Rev A

Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P21-HS1			

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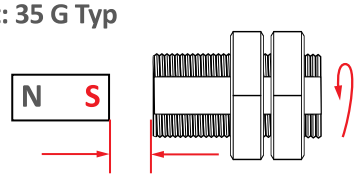
A47-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

Sensor Function

HS1 Operate Point: 55 G Typ
Release Point: 35 G Typ

EXAMPLE MAGNET
P/N RM-01-020

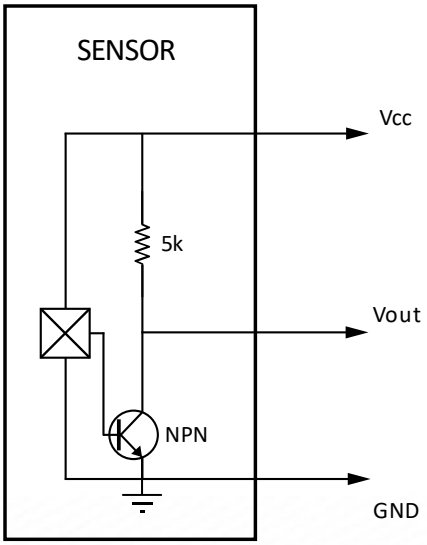


NO ORIENTATION REQUIRED

.60 TYP DETECT GAP
1/4"Ø NEO MAGNET

DIM = INCH

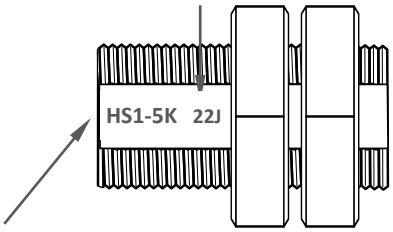
5K, 5k Pull-up Resistor



Date Code 'YYM' YY = YEAR, M = MONTH			
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking

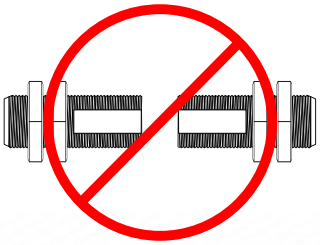
DATE CODE, THIS SURFACE



CHARACTERISTIC-OPTION MARKED ON THIS SURFACE

Handling Instructions

DO NOT CONTACT
FACE TO FACE



CONTACT WITH OTHER MAGNETS ***MAY***
REDUCE THE MAXIMUM OPERATING GAP

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A47-HS1-P5P21

Hall or Magneto Resistive Switch Sensor

- Sensitive S-pole hall switch
- 55 gauss operate
- PNP output with 5k resistor
- Aluminum 15/32-32 x 1" housing
- Free end PVC 22 AWG wires (1 foot length)

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A47-HS1-P5P21

Housing	Sensor Type & Function	Electrical Option	Connection Type
Aluminum 15/32-32 x 1" Long	Hall Switch 1 Digital Output Sensitive S-Pole	PNP, 5k Resistor	P21 = Free End PVC 22AWG Wires

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

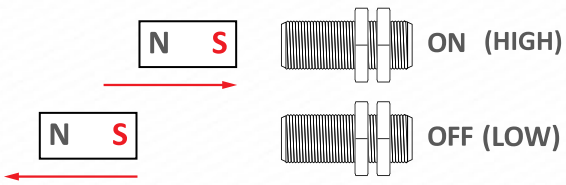
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'1 Digital Output' Sensitive S-Pole Hall Switch Sensor

Digital Output Switches On and Off with a Magnet



Type - HS

DESCRIPTION

- Sensor triggers ON (HIGH) when a South Pole magnet field is present and turns OFF (LOW) when the South Pole magnetic field retracts.
- Sensor does not respond to North Pole magnetic fields. Contact Sensor Solutions for alternative sensors.
- No orientation required. Use lock nuts to set air gap within range of target magnets.
- Square wave output pulses can be used to detect speed, position, proximity, or count.
- Note: Operate and release gaps are dependent on the size, material, grade, and temperature of the target magnet.

FEATURES

- Internal Hysteresis
- Lower Gauss Operation than Standard HS Sensor
- Solid State (Nothing to wear out!)
- Temperature Stable
- Short circuit protection

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A47-HS1-P5P21

Hall or Magneto Resistive Switch Sensor

In addition to the HS1, we offer a variety of South Pole and Either pole Hall Effect and Magnetoresistive sensors including multiple programmable sensors, North and South Pole output sensors, latching sensors, and sensors with speed/count and direction outputs.

Note: Check our website or contact us to discuss all of our magnetic speed, count, and position detection sensors.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range	Operating	-40	+125	Deg C
Supply Voltage, Vcc	Over temperature	+3	+24	Volts DC
Supply Current	Into Vcc, Vout Low	+2	+12	mA
Chopper Frequency	Typical	333	800	kHz
Frequency Range	8x over sample	0	12	kHz
Output Voltage Low 100% Tested at 25°C before shipping	Vcc=12 V,Rload>100k	0	.1	Volts
Output Voltage High 100% Tested at 25°C before shipping	Vcc=12 V,Rload>100k	10.5	12.0	Volts
Internal Pull Down Resistor	Vout to Ground	4.9	5.1	kOhms
Output Rise Time 10-90%	Vcc=12 V,Cload>100pF	-	2.0	µS
Output Fall Time 90-10%	Vcc=12 V,Cload>100pF	-	7	µS
ESD **	Human body model	-	8000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

** Similar Product Qualified

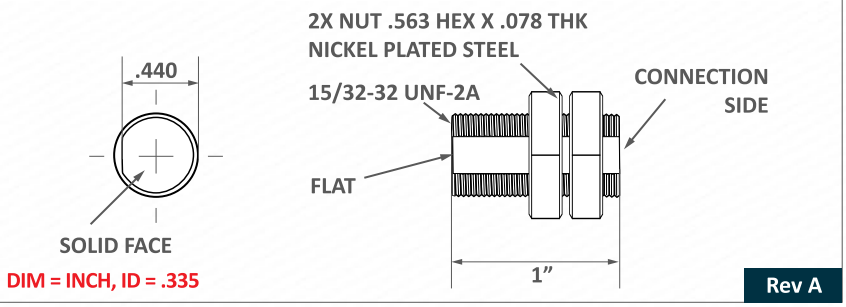
Rev D

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-12	+32	Volts DC
Voltage Applied to Output	-12	+32	Volts
Output Clamp (Short Crkt Protection) Current	40	65	mA
Output short to gnd, Vcc<28V	-	5	Minutes
Load Dump, 40 mS Rs = 20	-	40	Volts
Output Power, T=25C	-	730	mW

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	13 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

Magnetic Characteristics	Min	Typ	Max
Operate Point Over Temp 100% Tested at 25°C before shipping	15 G	55 G	76 G
Release Point Over Temp	5 G	35 G	57 G
Hysteresis Over Temp	5 G	20 G	28 G

A47, Housing, Anodized Aluminum, 15/32-32, 1" Long



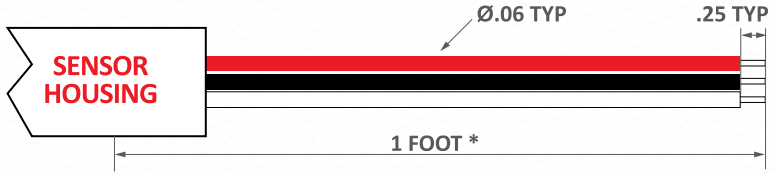
DIM = INCH, ID = .335

Rev A

P21, Free End PVC 22 AWG Wires

FREE END WIRE LEADS
22 AWG, 7/30, PVC 80°C
3 WIRES SHOWN. THE NUMBER OF WIRES
AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 6", 2', 5', 10', AND 20'



DIM = INCH

Rev A

Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P21-HS1			

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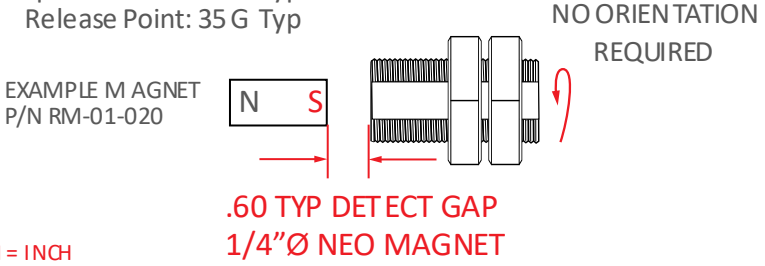
A47-HS1-P5P21

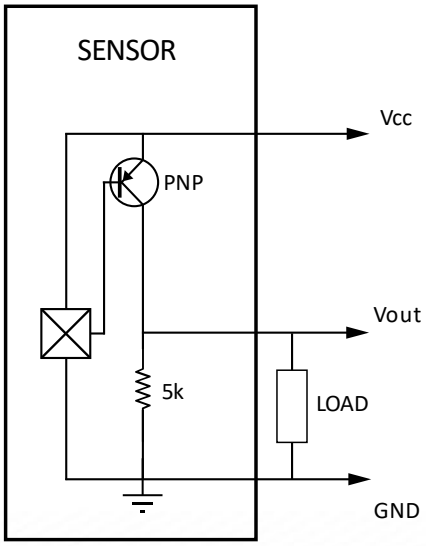
Hall or Magneto Resistive Switch Sensor

Sensor Function

HS1 Operate Point: 55 G Typ
Release Point: 35 G Typ

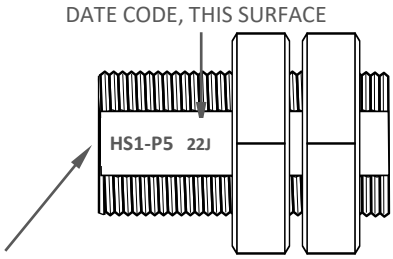


P5, PNP with 5k Resistor



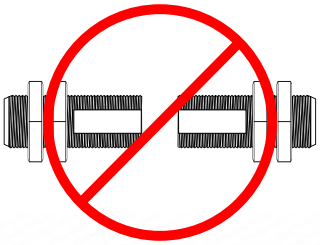
Date Code 'YYM' YY = YEAR, M = MONTH			
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking



Handling Instructions

DO NOT CONTACT FACE TO FACE



CONTACT WITH OTHER MAGNETS *MAY* REDUCE THE MAXIMUM OPERATING GAP

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M12-HS1-5KCB2

Hall or Magneto Resistive Switch Sensor

- Sensitive S-pole hall switch
- 55 gauss operate
- NPN w/5k pull up resistor
- Plastic 12x1mm x 35mm housing
- Integral 4 pin male 12mm micro connector

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: M12-HS1-5KCB2

Housing	Sensor Type & Function	Electrical Option	Connection Type
Plastic 12x1mm x 35mm Long	Hall Switch 1 Digital Output Sensitive S-Pole	NPN, 5k Pull Up Resistor	CB2 = Integral 4 Pin Male 12mm Micro Connector

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

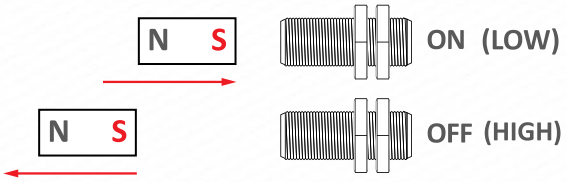
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'1 Digital Output'
Sensitive S-Pole Hall Switch Sensor

Digital Output Switches On and Off with a Magnet



Type - HS

DESCRIPTION

- Sensor triggers ON (LOW) when a South Pole magnet field is present and turns OFF (HIGH) when the South Pole magnetic field retracts.
- Sensor does not respond to North Pole magnetic fields. Contact Sensor Solutions for alternative sensors.
- No orientation required. Use lock nuts to set air gap within range of target magnets.
- Square wave output pulses can be used to detect speed, position, proximity, or count.
- Note: Operate and release gaps are dependent on the size, material, grade, and temperature of the target magnet.

FEATURES

- Internal Hysteresis
- Lower Gauss Operation than Standard HS Sensor
- Solid State (Nothing to wear out!)
- Temperature Stable

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M12-HS1-5KCB2

Hall or Magneto Resistive Switch Sensor

In addition to the HS1, we offer a variety of South Pole and Either pole Hall Effect and Magnetoresistive sensors including multiple programmable sensors, North and South Pole output sensors, latching sensors, and sensors with speed/count and direction outputs.

Note: Check our website or contact us to discuss all of our magnetic speed, count, and position detection sensors.

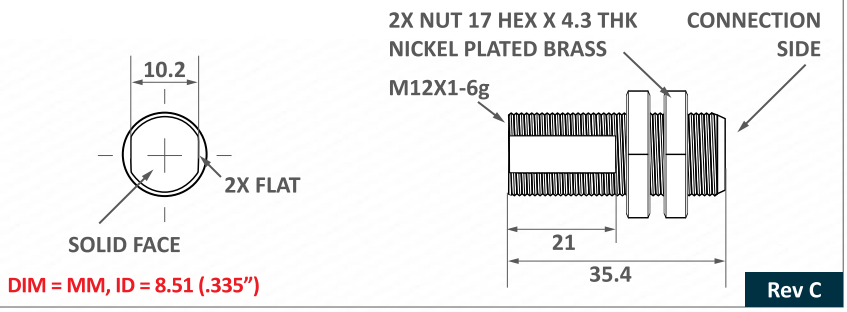
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+150	Deg C
Supply Voltage, Vcc	Over temperature	+3	+24	Volts DC
Supply Current, Output Off	Into Vcc @ Vcc=12	+2	+7	mA
Chopper Frequency	Typical	333	800	kHz
Frequency Range	8x over sample	0	12	kHz
Saturation Voltage High 100% Tested at 20°C before shipping	Vcc = 12 V	11.5	12	Volts
Saturation Voltage Low 100% Tested at 20°C before shipping	Vcc = 12 V	0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	k Ohms
Output Rise Time 10-90%	C < 100pF	-	2.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD (Human Body Model)	Nondestructive	-	8000	Volts
EMI (Human Body Model)	20k to 1 G Hz	-	100	V / M

Rev C

Absolute Max Limits T < 5 minutes	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Applied to Output	-32	+32	Volts
Current Into Output	-	60	mA
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 100 Ω	-	40	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	13 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

M12 Housing, Glass Filled Nylon (150°C) 12X1mm x 35mm Long

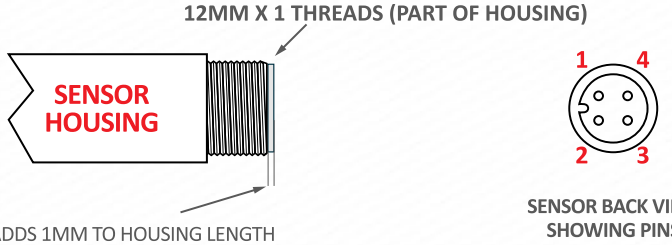


DIM = MM, ID = 8.51 (.335")

Rev C

Magnetic Characteristics	Min	Typ	Max
Operate Point Over Temp 100% Tested at 20°C before shipping	15 G	55 G	76 G
Release Point Over Temp	5 G	35 G	57 G
Hysteresis Over Temp	5 G	20 G	28 G

CB2, Integral 4 Pin Male 12mm Micro Connector



Rev A

Connections Chart			
Pin 1	Vcc	Pin 3	Ground
Pin 2	n/c	Pin 4	Digital Vout
CB2-HS1			

OTHER MATING CONNECTORS AND CABLES AVAILABLE

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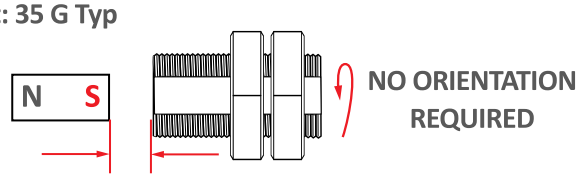
M12-HS1-5KCB2

Hall or Magneto Resistive Switch Sensor

Sensor Function

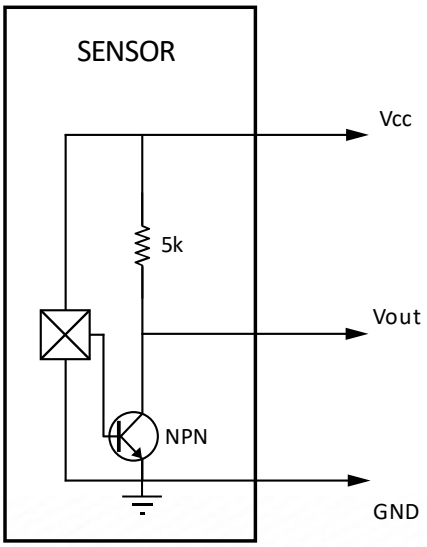
HS1 Operate Point: 55 G Typ
Release Point: 35 G Typ

EXAMPLE MAGNET
P/N RM-01-020



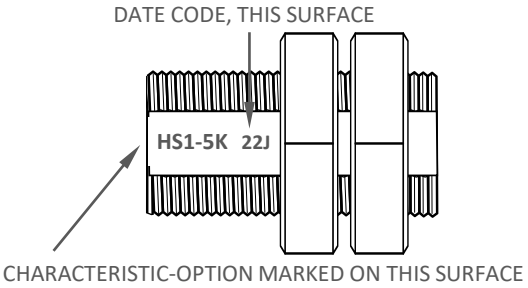
DIM = INCH

5K, 5k Pull-up Resistor



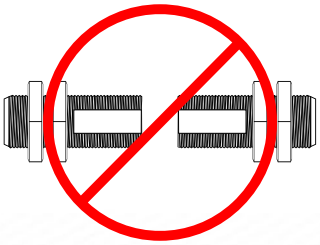
Date Code 'YYM' YY = YEAR, M = MONTH			
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking



Handling Instructions

DO NOT CONTACT FACE TO FACE



CONTACT WITH OTHER MAGNETS *MAY* REDUCE THE MAXIMUM OPERATING GAP

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S18-SSTHS1-R5SA5-30

Magnet Detecting Speed Switch

- **Moving Magnet Actuated Speed Switch, 55 Gauss sensitivity**
- **Transistor output for Over or Under Speed**
- **Regulated input, NPN with 5k pull-up**
- **Stainless 18x1mm x 53mm housing**
- **Shielded 4 wire 22 AWG 80°C PVC, 5ft**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S18-SSTHS1-R5SA5-30

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M18x1, 53mm Long	South Pole Magnet Actuated Speed Switch	Regulated Input NPN w/5k Pull up	SA Shielded 4 Wire 22 AWG 80°C PVC	Switch Frequency xxx in Hz

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

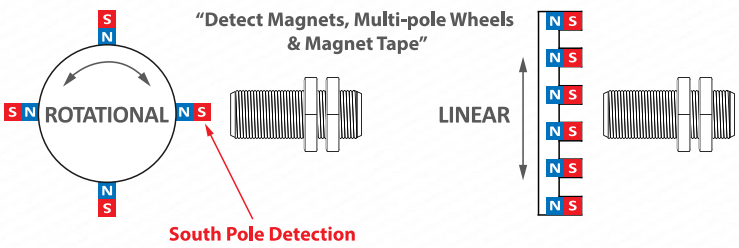
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

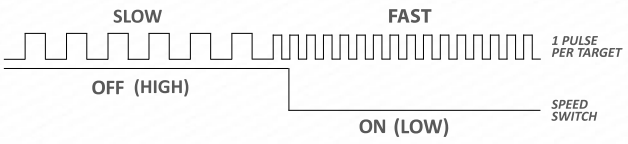
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'South Pole Magnet Actuated Speed Switch with Transistor Output'

Overspeed, Underspeed, Zero-Speed



OUTPUTS



Type - SSM

DESCRIPTION

- Speed switch output turns on/off dependent on factory programmed frequency.
- 30 Hz switch point will activate the output at any speed where 30 or more magnets pass the sensor within 1 second. Contact us for lower or higher switching speeds.
- Single channel digital square wave output for resolving actual speed.
- Detects the South Pole field from permanent magnets using Hall Effect Technology
- Detects south pole fields of 55 Gauss or more. Operate gap range dependent on magnet size/type
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Non-contact speed measurement
- No Orientation Required
- Add –xxx in Hz to End of PN – contact factory for custom switch point models

Sensor Solutions
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S18-SSTHS1-R5SA5-30

Magnet Detecting Speed Switch

OTHER OPTIONS

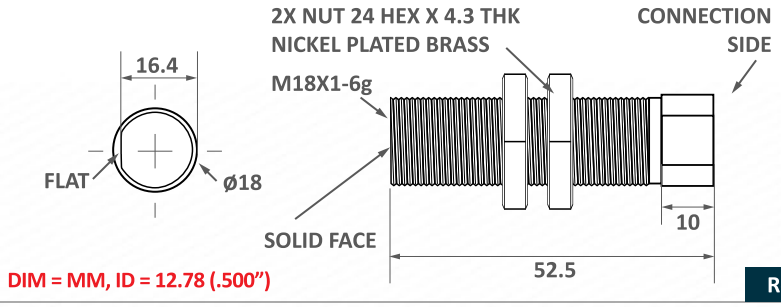
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

Note: Check our website or contact us to discuss any of our magnetic speed, count, and position detection sensors.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range	Operating	-40	+110	Deg C
Supply Voltage, Vcc	Over temperature	+8	+30	Volts DC
Supply Current	Into Vcc	2.5	12	mA
Internal Pull up Resistor	Vcc to +5V	4.9	5.1	kOhms
Vol, Low Level Vout	Vcc = 12V, Rload >100k	0.0	0.7	Volts
Voh, High Level Vout	Vcc = 12V, Rload >100k	11.75	12	Volts
Overspeed TRIP Frequency	Output goes low above	28	31	Hz
Underspeed Release Freq.	Output goes high below	24	27	Hz
ESD (like product qualified)	Nondestructive	-	2000	Volts
EMI (like product qualified)	20k to 1 G Hz	-	20	V / M

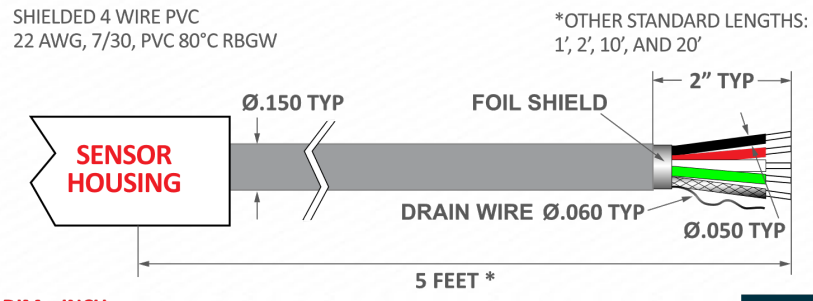
Grey shaded specs are 100% Final tested before shipping Rev C

S18 Housing, 303 Stainless Steel, M18X1, 53mm Long



DIM = MM, ID = 12.78 (.500") Rev E

SA5, Shielded 4 Wire 22 AWG 80°C PVC



DIM = INCH Rev D

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc-Gnd	-32	+32	Volts
Voltage at Output	-.3	30	Volts
Sink Current into Output	-	50	mA
Short Circuit Prot. Vout-Gnd	-	Indef.	Minutes
Short Circuit Prot. Vout-+Vcc	-	None	Minutes

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	60 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

Sensor Characteristics – S Pole Sensitive

Output State at 0 Speed: High (Transistor Off)

Operate Point Over Temp 100% Tested at 25°C before shipping	15 G	55 G	76 G
Release Point Over Temp	5 G	35 G	57 G
Hysteresis Over Temp	5 G	20 G	28 G
TRIP Frequency Accuracy, Output LOW	.98%	1.0%	1.01%*
RELEASE Frequency Accuracy, Output HIGH	.99%***	1.0%	1.02%
STOP DETECT TIME, Output returns high after sudden stop	10ms(Typical)		

*** Gap the sensor to make sure it sees >77 G when close, <17 G when far.**

**** Output is LOW if teeth are passing by faster than 1.02 * Trip Frequency.**

*****Output is HIGH if teeth are passing by slower than 0.99 * Release Frequency**

Convert RPM to Hz

Over/Under Speed Trip Points are in Hz, pulses per second.

To convert RPM (Revolutions per Minute) to Hz, you need to know the target's pulses per revolution, "N". A target with 2 S pole magnets will produce 2 pulses per revolution, so N=2.

Hz = RPM * (N / 60). Or RPM = Hz * (60 / N).

*Example: Using 2 magnets and a 30 Hz trip point, RPM = 30 * (60 / 2) so the output switches low at 900 RPM.*

Connections Chart

Red	Vcc	Black	Ground
Green	Pulse Vout	White	Switch Vout
S18-SSTHS1			

OTHER MATING CONNECTORS AND CABLES AVAILABLE

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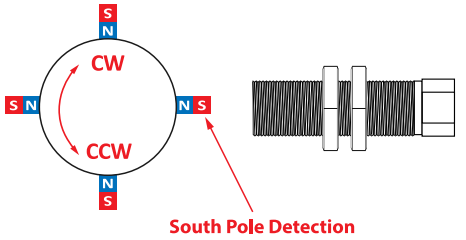
S18-SSTHS1-R5SA5-30

Magnet Detecting Speed Switch

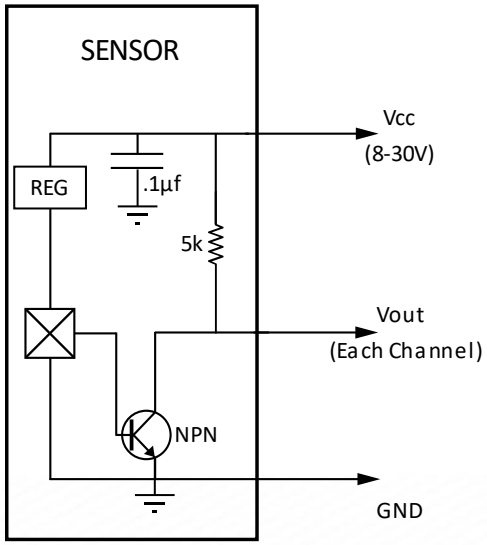
Sensor Function



ROTATIONAL AND LINEAR DETECTION

S18-SSTHS1

R5, Regulated, 5k Resistor

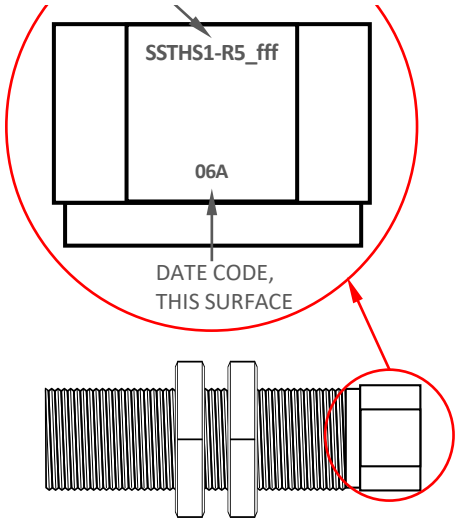


Date Code 'YYM' YY = YEAR, M = MONTH

A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

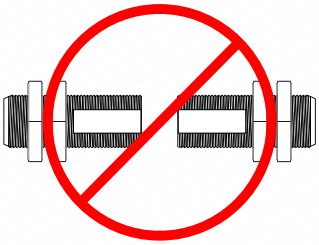
Marking

CHARACTERISTIC-OPTION_TRIP SPEED
MARKED ON THIS SURFACE
fff = SWITCH FREQUENCY IN Hz #



Handling Instructions

DO NOT CONTACT FACE TO FACE



CONTACT WITH OTHER MAGNETS *MAY* REDUCE THE MAXIMUM OPERATING GAP

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S12R-SSRHS1-NOSL5-100

Magnet Detecting Speed Switch

- South Pole magnet activated Speed Switch
- 8 to 32V DC Powered
- 150 VAC Normally Open Form A Relay
- Stainless 12x1mm x 45mm housing
- Shielded 2 pair 22 AWG 105°C PVC, 5 foot

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12R-SSRHS1-NOSL5-100

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 45mm Long	Speed Switch for S Pole Magnet Targets	Relay Output Normally Open	SL5 = Ind. Shielded 2 Pair 22AWG -20 to 105°C PVC	Switch Frequency xxx in Hz

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

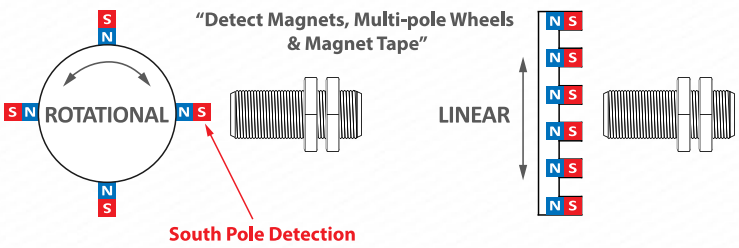
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

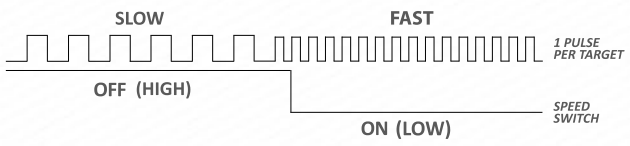
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'South Pole Magnet Actuated Speed Switch with Transistor Output'

Overspeed, Underspeed, Zero-Speed



OUTPUTS



DESCRIPTION

- Speed switch output turns on/off dependent on factory programmed frequency.
- 001 Hz switch point functions as "0 speed" indicator. For other switch speeds contact Sensor Solutions.
- Single channel digital square wave output for resolving actual speed.
- Detects magnetic South Pole fields using Hall Effect Technology
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Ferrous Target Speed Switch
- No Orientation Required
- Add –xxx in Hz to End of PN – contact factory for custom switch point models

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

Type - SSM

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S12R-SSRHS1-NOSL5-100

Magnet Detecting Speed Switch

OTHER OPTIONS

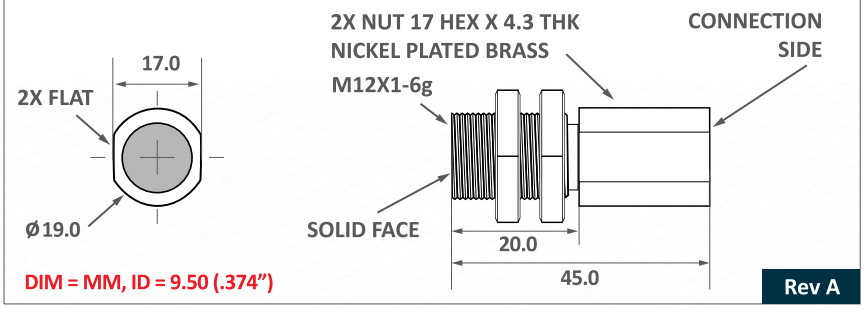
As well as these Magnet / Magnet Tape Speed Switches, we offer Ferrous Target activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

Note: Check our website or contact us to discuss any of our magnetic speed, count, and position detection sensors.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+8	+30	Volts DC
Supply Current	Into Vcc	+6	+24	mA
Contact Resistance	Initial	-	0.10	Ohms
Overspeed TRIP Frequency 100% Final Tested at factory	Relay closes	0.98	1.01	Hz
Underspeed Release Freq. 100% Final Tested at factory	Relay opens	0.94	0.97	Hz
Relay Closing Bounce Time	T=25C	-	3	mS
ESD (like product qualified)	Nondestructive	-	2000	Volts
EMI (like product qualified)	20k to 1 G Hz	-	20	V / M

Rev C

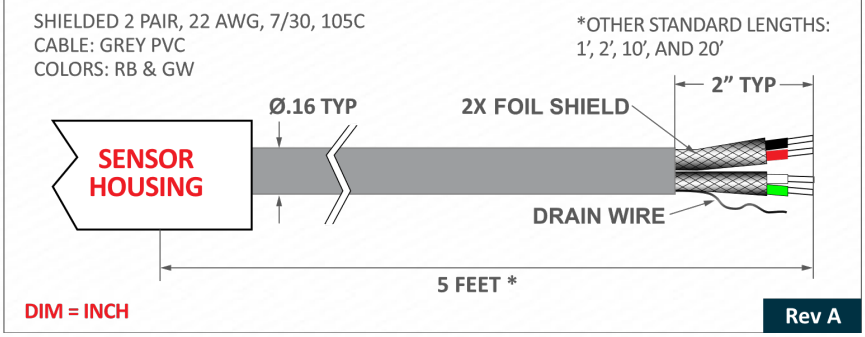
S12R, Housing, 303 Stainless Steel, M12x1, 45mm Long



DIM = MM, ID = 9.50 (.374")

Rev A

SL5, Ind. Shielded 2 Pair 22 AWG -20 to 105°C PVC



DIM = INCH

Rev A

OTHER MATING CONNECTORS AND CABLES AVAILABLE

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc-Gnd	-16	+30	Volts
Voltage at Relay	-	150	Volts AC
Voltage at Relay	-	120	Volts DC
Switching Current, T = 25C	-	1	Amp
Switching Current, T = 70C	-	.46	Amp
Switching Power, T = 25C	-	30	Watts
Isolation, Surge Voltage Between Supply and Relay	-	1.5	k Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	23 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

Sensor Characteristics – S Pole Sensitive

Output State at 0 Speed: Relay OPEN

Operate Point Over Temp 100% Tested at 25°C before shipping	32 G	55 G	77 G
Release Point Over Temp	17 G	35 G	54 G
Hysteresis Over Temp	9 G	20 G	28 G
TRIP Frequency Accuracy, NC Relay CLOSES (% Trip F)	.98%	1.0%	1.01%*
RELEASE Frequency Accuracy, NC Relay OPENS (% Rel F)	.99%***	1.0%	1.02%
STOP DETECT TIME, NC Relay opens after sudden stop (% Rel F)	1 / Rel F seconds		
# of Fast Pulses Ignored Before TRIP	0	2	499

* Gap the sensor to make sure it sees >77 G when close, <17 G when far.

** Relay is CLOSED if teeth are passing by faster than 1.02 * Trip Frequency.

***Relay is OPEN if teeth are passing by slower than 0.99 * Release Frequency

Convert RPM to Hz

Over/Under Speed Trip Points are in Hz, pulses per second.

To convert RPM (Revolutions per Minute) to Hz, you need to know the target's pulses per revolution, "N". A 20-tooth target produces 20 pulses, so N=20.

Hz = RPM * (N / 60). Or RPM = Hz * (60 / N).

*Example: For a 20-magnet target and 500 Hz trip point, RPM = 500 * (60 / 20) so the output switches low at 1500 RPM.*

Connections Chart

Red Vcc	Black Ground
White Relay Output	Green Relay Common
Slate If present Pulse Output	

SL5-SSRHS1

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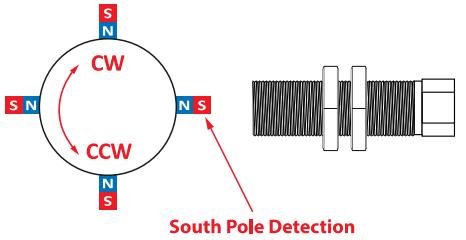
S12R-SSRHS1-NOSL5-100

Magnet Detecting Speed Switch

Sensor Function

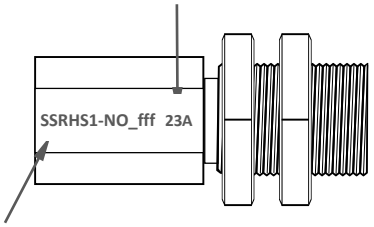


ROTATIONAL AND LINEAR DETECTION

S12R-SSRHS1

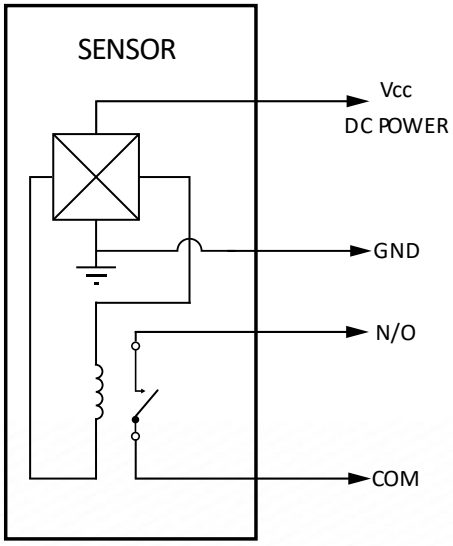
Marking

DATE CODE, THIS SURFACE



CHARACTERISTIC-OPTION_NO Relay Output
MARKED ON THIS SURFACE
fff = SWITCH FREQUENCY IN Hz #

NO, Relay Output

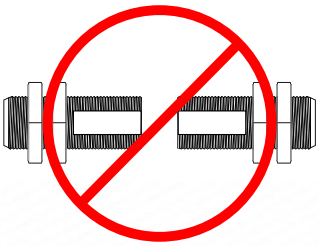


Date Code 'YYM' YY = YEAR, M = MONTH

A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Handling Instructions

DO NOT CONTACT
FACE TO FACE



CONTACT WITH OTHER MAGNETS *MAY*
REDUCE THE MAXIMUM OPERATING GAP

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S38-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

- Sensitive S-pole hall switch
- 55 gauss operate
- NPN w/5k pull up resistor
- Stainless 3/8-24 x 1.3" housing
- Free end PVC 22 AWG wires (1 foot length)

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S38-HS1-5KP21

Housing	Sensor Type & Function	Electrical Option	Connection Type
Stainless Steel 3/8-24 x 1.3" Long	Hall Switch 1 Digital Output Sensitive S-Pole	NPN, 5k Pull Up Resistor	P21 = Free End PVC 22AWG Wires

Modify, update, or enhance any sensor with our modular features and functionality.

HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

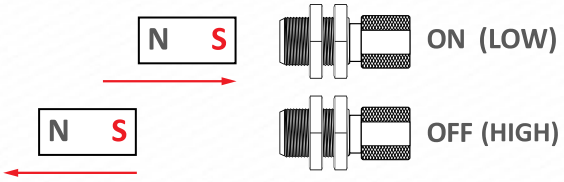
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

CONNECTION *- Deutsch, Amphenol, many other brands, free end wires, pigtails, any length*

Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'1 Digital Output'
Sensitive S-Pole Hall Switch Sensor

Digital Output Switches On and Off with a Magnet



Type - HS

DESCRIPTION

- Sensor triggers ON (LOW) when a South Pole magnet field is present and turns OFF (HIGH) when the South Pole magnetic field retracts.
- Sensor does not respond to North Pole magnetic fields. Contact Sensor Solutions for alternative sensors.
- No orientation required. Use lock nuts to set air gap within range of target magnets.
- Square wave output pulses can be used to detect speed, position, proximity, or count.
- Note: Operate and release gaps are dependent on the size, material, grade, and temperature of the target magnet.

FEATURES

- Internal Hysteresis
- Lower Gauss Operation than Standard HS Sensor
- Solid State (Nothing to wear out!)
- Temperature Stable

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S38-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

In addition to the HS1, we offer a variety of South Pole and Either pole Hall Effect and Magnetoresistive sensors including multiple programmable sensors, North and South Pole output sensors, latching sensors, and sensors with speed/count and direction outputs.

Note: Check our website or contact us to discuss all of our magnetic speed, count, and position detection sensors.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+150	Deg C
Supply Voltage, Vcc	Over temperature	+3	+24	Volts DC
Supply Current, Output Off	Into Vcc @ Vcc=12	+2	+7	mA
Chopper Frequency	Typical	333	800	kHz
Frequency Range	8x over sample	0	12	kHz
Saturation Voltage High 100% Tested at 20°C before shipping	Vcc = 12 V	11.5	12	Volts
Saturation Voltage Low 100% Tested at 20°C before shipping	Vcc = 12 V	0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	k Ohms
Output Rise Time 10-90%	C < 100pF	-	2.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD (Human Body Model)	Nondestructive	-	8000	Volts
EMI (Human Body Model)	20k to 1 G Hz	-	100	V / M

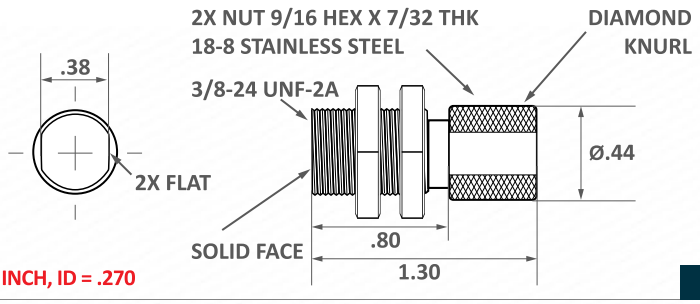
Rev C

Absolute Max Limits T < 5 minutes	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Applied to Output	-32	+32	Volts
Current Into Output	-	60	mA
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 100 Ω	-	40	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	100 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 2 to 2000 Hz Sinusodal
Mechanical Shock	100 G's, 11 mS Half-Sine

Magnetic Characteristics	Min	Typ	Max
Operate Point Over Temp 100% Tested at 20°C before shipping	15 G	55 G	76 G
Release Point Over Temp	5 G	35 G	57 G
Hysteresis Over Temp	5 G	20 G	28 G

S38, Housing, 303 Stainless Steel, 3/8-24, 1.3" Long



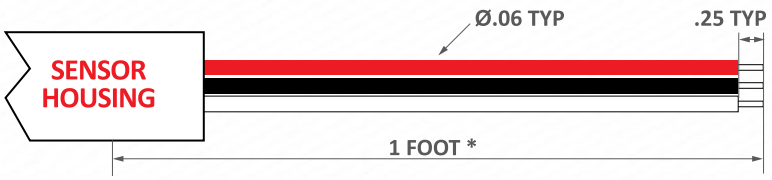
DIM = INCH, ID = .270

Rev B

P21, Free End PVC 22 AWG Wires

FREE END WIRE LEADS
22 AWG, 7/30, PVC 80°C
3 WIRES SHOWN. THE NUMBER OF WIRES AND COLORS WILL VARY PER SENSOR MODEL

OTHER STANDARD LENGTHS:
3", 6", 2', 5', 10', AND 20'



DIM = INCH

Rev A

Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P21-HS1			

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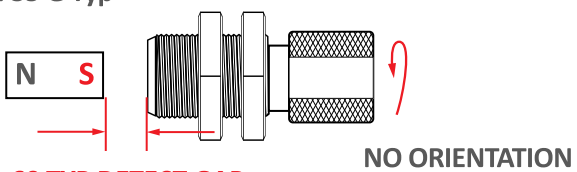
S38-HS1-5KP21

Hall or Magneto Resistive Switch Sensor

Sensor Function

HS1 Operate Point: 55 G Typ
Release Point: 35 G Typ

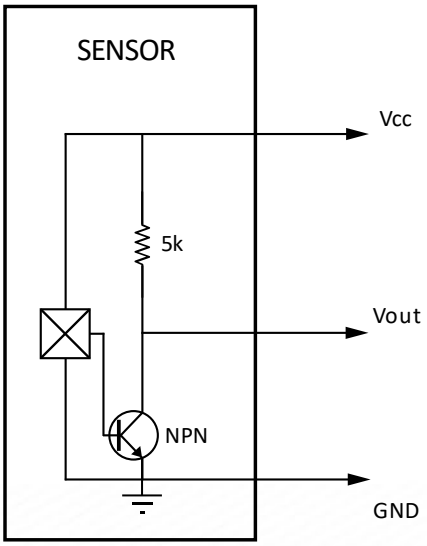
EXAMPLE MAGNET
P/N RM-01-020



.60 TYP DETECT GAP
1/4"Ø NEO MAGNET

NO ORIENTATION REQUIRED

5K, 5k Pull-up Resistor



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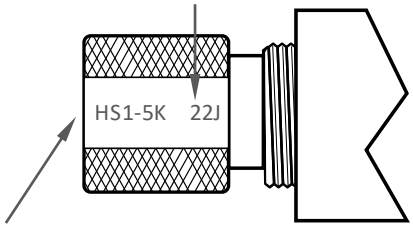
Marking

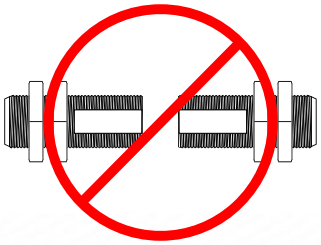
DATE CODE, THIS SURFACE



CHARACTERISTIC-OPTION MARKED ON THIS SURFACE
5k = OPTION

Handling Instructions

DO NOT CONTACT FACE TO FACE



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