PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

DSO Series

Gear Tooth Speed Sensors

- Hall Effect Technology sensor for gear target detection
- Detects 0-32 pitch gears
- Resolves speed to a Digital Single Output
- Detects Ferrous Targets and Pitch Between Teeth
- Easy to install Flange mount and threaded options available

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Number Example: M12-18ADSO-5KSA5

Housing	Sensor Type & Function	Electrical Option	Connection Type
See page 2-4	DSO	See page 5-6	See page 7-8

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

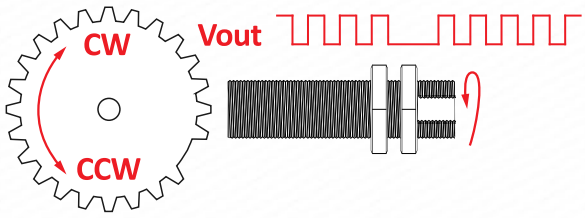
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

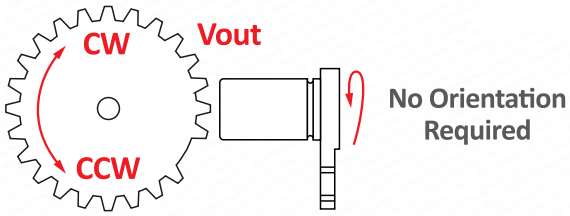
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

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

'Target Tracker' No Orientation Required





FEATURES

- Non-contact
- Easy to install
- Temperature stable
- Shock and vibration resistant
- Solid-state (no wearing parts)
- Near zero speed operation
- Dynamic, self-calibrating
- Detect non-standard steel targets
- Harsh environment durability
- Large detection gap (custom air gap ranges available)

APPLICATIONS

- Shaft and gear speed in agricultural equipment
- Measure speed in conveyor systems
- Speed resolution in automation equipment
- Cam and Crank shaft timing
- Resolving engine RPMs
- Resolve speed of industrial and agricultural attachments
- Provide count feedback of parts in production and testing
- Measure crane / winch feed rate
- Measuring vehicle/wheel speed
- Monitoring gears in transmissions

MARKETS

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

+1 970.879.9900 | sensorsales@standexelectronics.com

DSO Series
Gear Tooth Speed Sensors

HOUSING TYPES AND CUSTOMIZATION OPTIONS

The DSO 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
- Flange Mount
- High Pressure

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

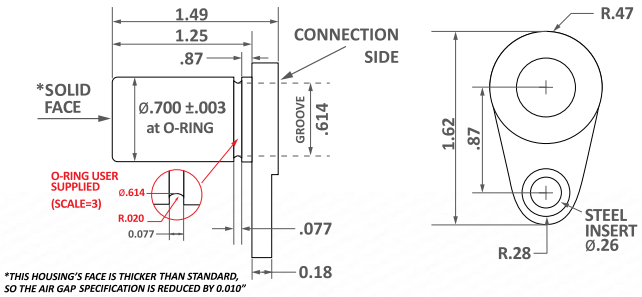
Plastic Glass Fill Nylon (150°C)

PART NUMBER EXAMPLE

M12-37A **DSO**-5KSA5 — CONNECTION

HOUSING | ELECTRICAL

MFM7-37A Flange Mount

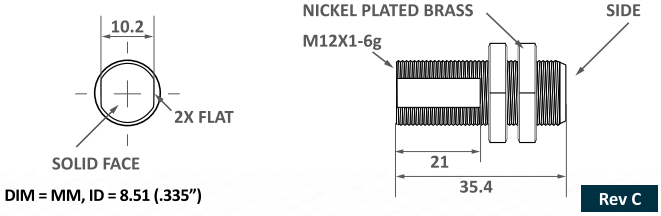


*THIS HOUSING'S FACE IS THICKER THAN STANDARD, SO THE AIR GAP SPECIFICATION IS REDUCED BY 0.010"

DIM = INCH, ID = .500"

Rev D

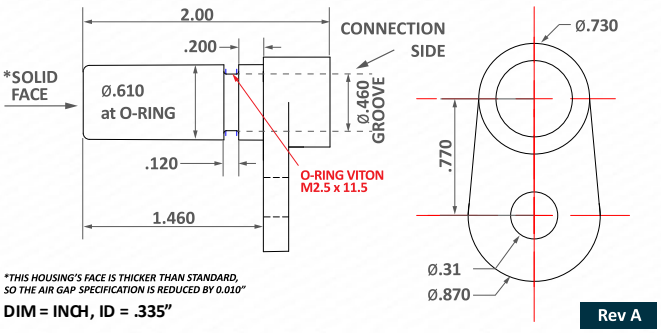
M12-18A Thread Mount M12x1mm, 35mm



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

Rev C

MFM610-18A Flange Mount



*THIS HOUSING'S FACE IS THICKER THAN STANDARD, SO THE AIR GAP SPECIFICATION IS REDUCED BY 0.010"

DIM = INCH, ID = .335"

Rev A

Molded Housing to Gear Air Gap

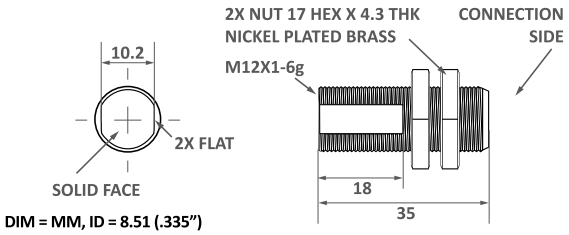
		-37A	-18A
Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"	.150"
8 (.393") Tooth to Tooth	.000 to .125"	.180"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"	.075"
16 (.196") Tooth to Tooth	.000 to .050"	.070"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.055"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.040"	.030"
32 (.098") Tooth to Tooth	.000 to .008"	.020"	.020"
Typical Output Duty Cycle	40 to 60%		
Alignment Skew Angle	360 Degrees		

DSO Series
Gear Tooth Speed Sensors

303 Stainless Steel

PART NUMBER EXAMPLE M12-37A **DSO** - 5KSA5 — CONNECTION
HOUSING | ELECTRICAL

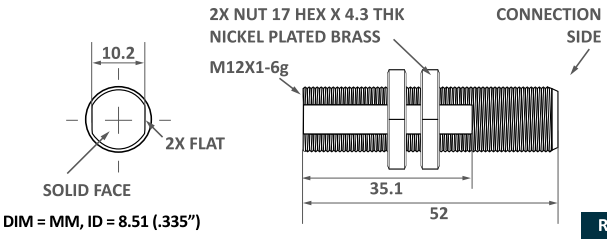
S12-18A Thread Mount M12x1mm, 35mm



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

Rev C

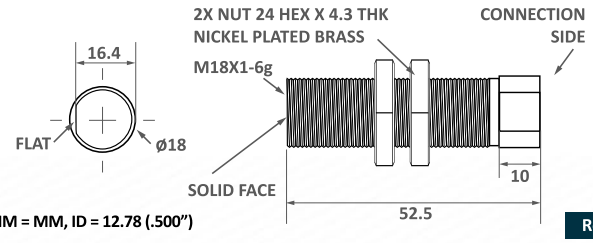
S12H-18A Thread Mount M12x1mm, 52mm



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

Rev B

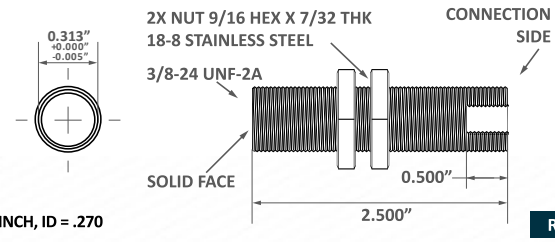
S18-37A Thread Mount M18x1mm, 53mm



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

Rev E

S38J-22A Thread Mount 3/8-24, 2.5in



DIM = INCH, ID = .270

Rev B

Steel Housing to Gear Air Gap

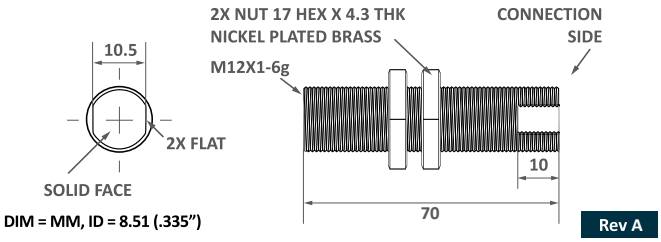
	-37A		-18A		-22A	
Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap	Air Gap Range	Typ. Max Gap	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"	.000 to .120"	.150"	.000 to .100"	.125"
8 (.393") Tooth to Tooth	.000 to .125"	.180"	.000 to .085"	.110"	.000 to .060"	.100"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"	.000 to .055"	.075"	.000 to .045"	.075"
16 (.196") Tooth to Tooth	.000 to .050"	.070"	.000 to .035"	.050"	.000 to .030"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.055"	.000 to .030"	.040"	.000 to .025"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.040"	.000 to .020"	.030"	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .008"	.020"	.000 to .012"	.020"	.000 to .010"	.020"
Typical Output Duty Cycle	40 to 60%					
Alignment Skew Angle	360 Degrees					

DSO Series
Gear Tooth Speed Sensors

Aluminum Black Anodized

PART NUMBER EXAMPLE M12-37A **DSO**-5KSA5 — CONNECTION
HOUSING | ELECTRICAL

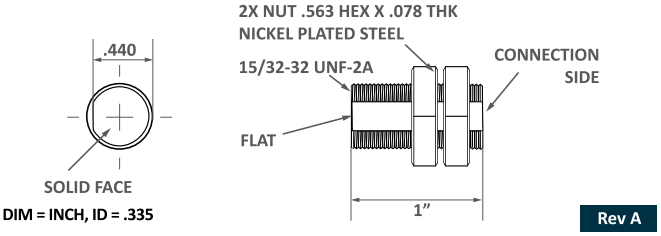
A12F-18A Thread Mount M12x1mm, 70mm



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

Rev A

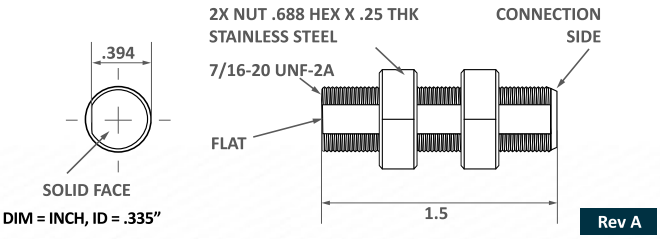
A47-18A Thread Mount 15/32-32, 1in



DIM = INCH, ID = .335

Rev A

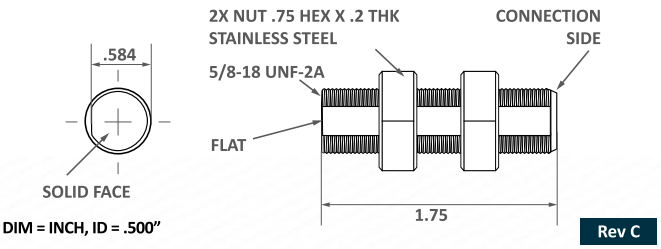
A44-18A Thread Mount 7/16, 1.5in



DIM = INCH, ID = .335"

Rev A

A63-37A Thread Mount 5/8



DIM = INCH, ID = .500"

Rev C

Aluminum Housing to Gear Air Gap

	-37A		-18A		-22A	
Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap	Air Gap Range	Typ. Max Gap	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"	.000 to .120"	.150"	.000 to .100"	.125"
8 (.393") Tooth to Tooth	.000 to .125"	.180"	.000 to .085"	.110"	.000 to .060"	.100"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"	.000 to .055"	.075"	.000 to .045"	.075"
16 (.196") Tooth to Tooth	.000 to .050"	.070"	.000 to .035"	.050"	.000 to .030"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.055"	.000 to .030"	.040"	.000 to .025"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.040"	.000 to .020"	.030"	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .008"	.020"	.000 to .012"	.020"	.000 to .010"	.020"
Typical Output Duty Cycle	40 to 60%					
Alignment Skew Angle	360 Degrees					

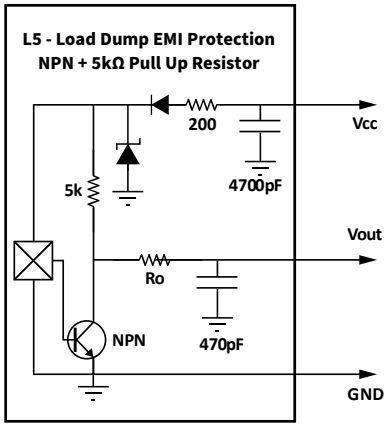
+1 970.879.9900 | sensorsales@standexelectronics.com

DSO Series
Gear Tooth Speed Sensors

Electrical Output Logic Options

PART NUMBER EXAMPLE M12-37A**DSO**-5KSA5 — CONNECTION
HOUSING | ELECTRICAL

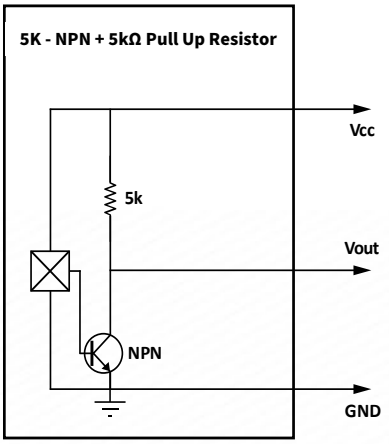
L5



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.5	+28	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rload >100k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rload >100k	0.0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Resistance Ro	0.25 watts	290	310	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

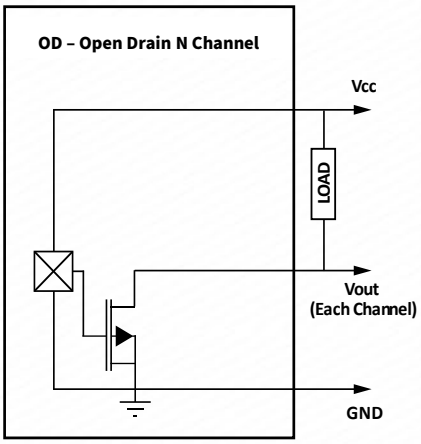
5K



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink=20mA	0	0.6	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Rise Time 10-90%	C < 100pF	-	3.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

OD



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current	Into Vcc	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink = 20 mA	0	0.6	Volts
Output Leakage Current	Output high	0	10	µA
Output Rise Time 10-90%	R pu =1 k,C < 100pF	-	2.0	µS
Output Fall Time 90-10%	R pu = 1k,C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

* T max = 150°C is available, contact factory.
** CMOS IC is static sensitive. Rev E

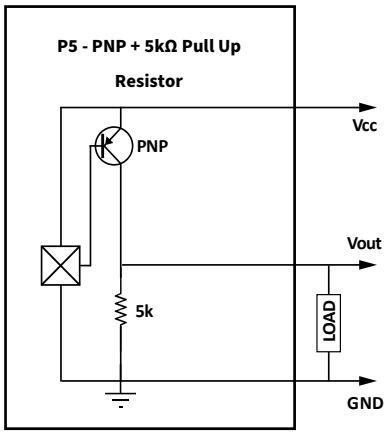
+1 970.879.9900 | sensorsales@standexelectronics.com

DSO Series
Gear Tooth Speed Sensors

Electrical Output Logic Options

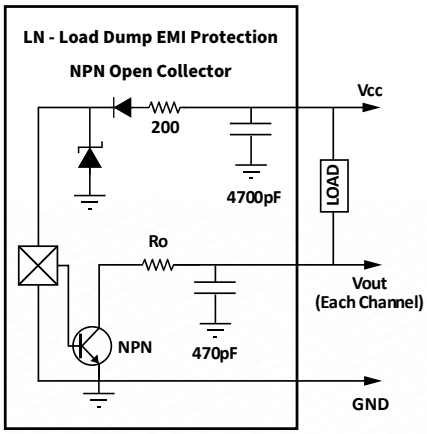
PART NUMBER EXAMPLE M12-37A**DSO**-5KSA5 — CONNECTION
HOUSING | ELECTRICAL

P5



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+5	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rpu >10k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rpu >10k	0.1	0.5	Volts
Internal Pull Up Resistor	Vcc to Vout	none	none	kohms
Output Resistance Ro	0.25 watts	48	52	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M
* T max = 150°C is available, contact factory.				Rev B

LN



Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+5	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rpu >10k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rpu >10k	0.1	0.5	Volts
Internal Pull Up Resistor	Vcc to Vout	none	none	kohms
Output Resistance Ro	0.25 watts	48	52	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M
* T max = 150°C is available, contact factory.				Rev B

DSO Series
Gear Tooth Speed Sensors

CONNECTION TYPES AND CUSTOMIZATION OPTIONS

The DSO 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 M12-37A**DSO**-5K**SA5** — CONNECTION

HOUSING | ELECTRICAL

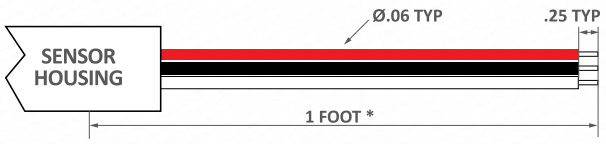
P21, Free End PVC 22 AWG Wires

Connections

Red = Vcc White = Digital 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 = Digital 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

DSO Series
Gear Tooth Speed Sensors

Cable Harness & Connector Options

PART NUMBER EXAMPLE M12-37A **DSO** - 5K SA5 — CONNECTION
HOUSING | ELECTRICAL

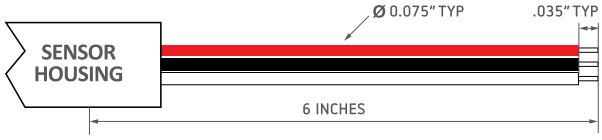
X0B, Free End XLPE 20 AWG Wires

Connections

Red = Vcc White = Digital 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

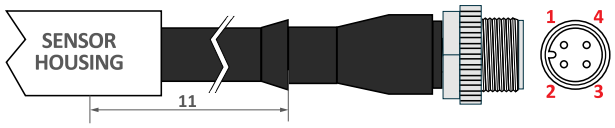
Rev A

CB1E, 4 Pin Male 12mm Micro Connector w/11" Pur Cable

Connections

Pin 1 = Vcc Pin 2 = n/c Pin 3 = Ground Pin 4 = Vout

CONNECTOR: 4 PIN MALE M12 STRAIGHT OVERMOLD
CABLE: 22AWG, STRANDED, PUR JACKET & INSULATION



DIM = INCH

Rev A

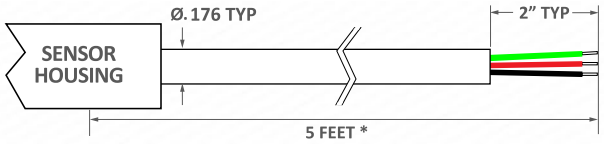
JA5, Jacketed 3 Wire PVC 22 AWG Wires

Connections

Red = Vcc Green = Digital 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

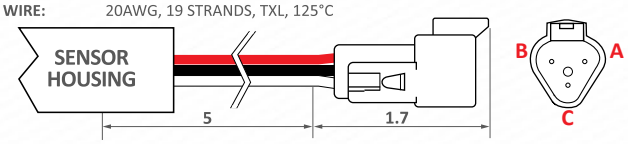
CD3, 3 Pin Deutsch DT03 TXL 20 AWG Wires

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

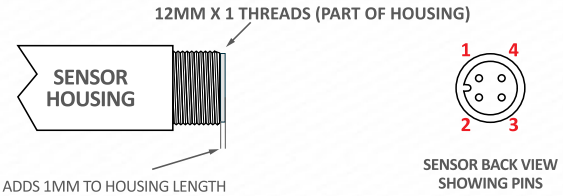
Rev D

CB2, Integral 4 Pin Male 12mm Micro Connector

Compatible with Housings – S12, S12H, M12 Only

Connections

Pin 1 = Vcc Pin 2 = n/c Pin 3 = Ground Pin 4 = Vout



Rev A

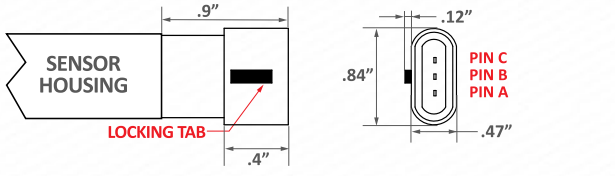
CP13, Integral 3-Way Metri Pack Male Connector

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



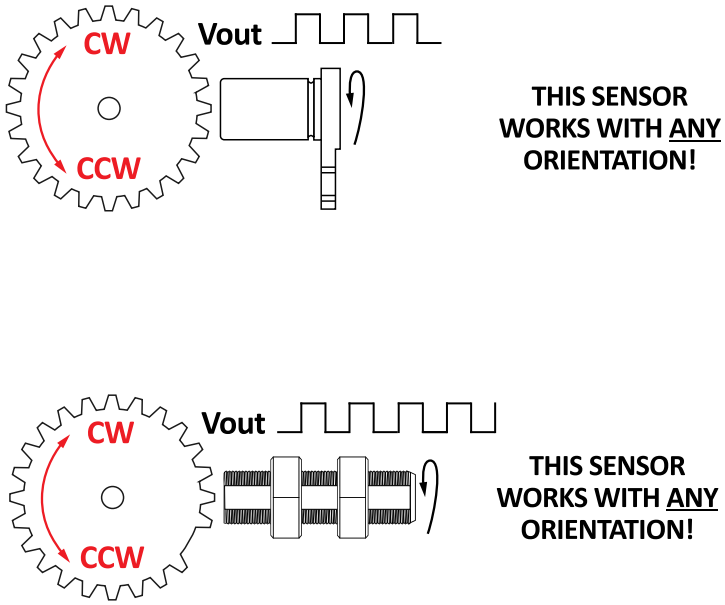
DIM = INCH

Rev A

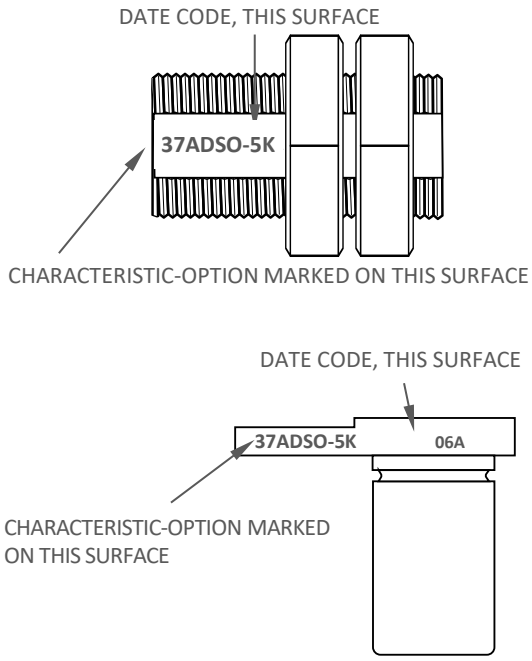
DSO Series
Gear Tooth Speed Sensors

Environmental & Performance Specifications

Sensor Function



Marking

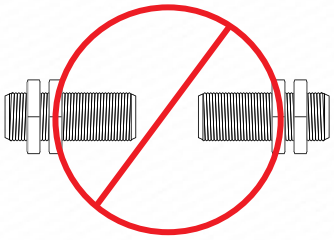


Environmental Specifications

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

Handling Instructions

DO NOT CONTACT FACE TO FACE

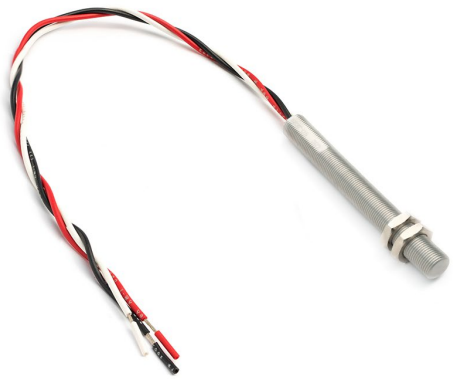


CONTACT WITH OTHER MAGNETS MAY REDUCE THE MAXIMUM OPERATING GAP

A12F-18ADSO-ODP23

Hall Effect Gear Tooth Speed Sensor

- Dynamic Speed Sensor
- No Orientation Required
- N channel open drain output
- Aluminum M12 x 1mm x 70mm housing
- Free end PVC 22 AWG wires (3 foot length)



CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A12F-18ADSO-ODP23

Housing	Sensor Type & Function	Electrical Option	Connection Type
Aluminum M12 x 1mm 70mm Long	Digital Single Output Gear Tooth Sensor	OD, Open Drain N Ch	P23 = Free End PVC 22AWG Wires

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

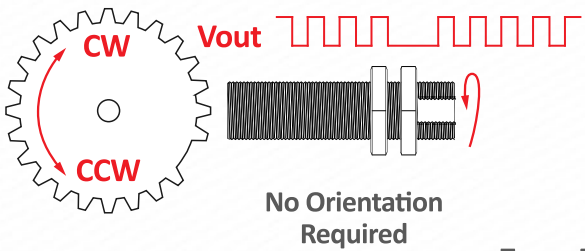
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present, external pull up resistor required.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

A12F-18ADSO-ODP23

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current	Into Vcc	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink = 20 mA	0	0.6	Volts
Output Leakage Current	Output high	0	10	µA
Output Rise Time 10-90%	R pu =1 k,C < 100pF	-	2.0	µS
Output Fall Time 90-10%	R pu = 1k,C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

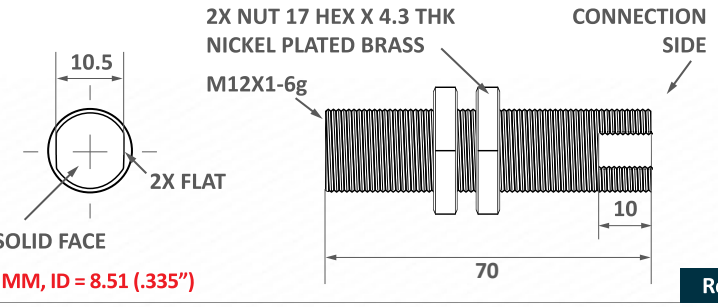
* T max = 150°C is available, contact factory.
** CMOS IC is static sensitive.

Rev E

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc at 25°C	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Current into Output	-	30	mA
Load Capacitance	-	0.01	µF
Current out of Output	-	n/a	mA
Load Dump, 40 mS Rs = 20	-	60	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 Continuous
Mechanical Shock	100 G's, 11 mS

A12F Housing, Aluminum, M12x1, 70mm Long



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

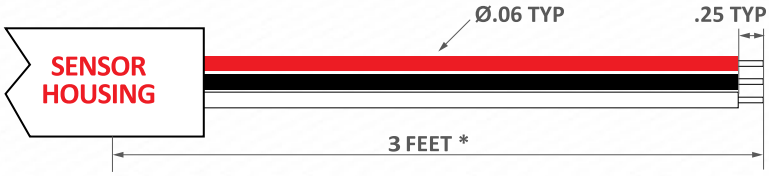
Rev A

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .120"	.150"
8 (.393") Tooth to Tooth	.000 to .085"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .055"	.075"
16 (.196") Tooth to Tooth	.000 to .035"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .012"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

P23, 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

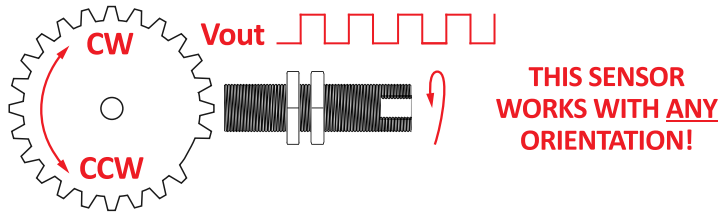
Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P23-18ADSO			

+1 970.879.9900 | sensorsales@standexelectronics.com

A12F-18ADSO-ODP23

Hall Effect Gear Tooth Speed Sensor

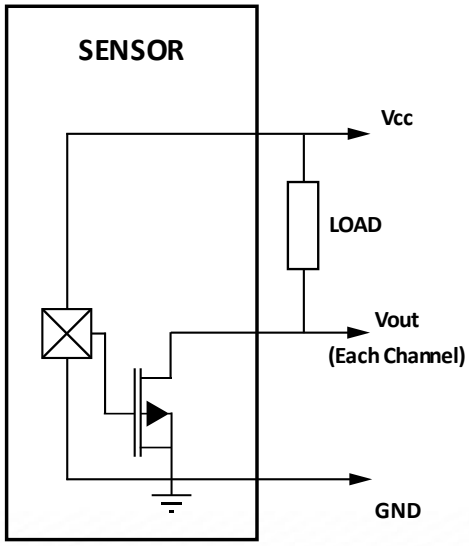
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

A12F-18ADSO

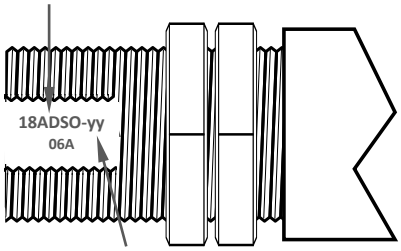
OD, Open Drain N Channel



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

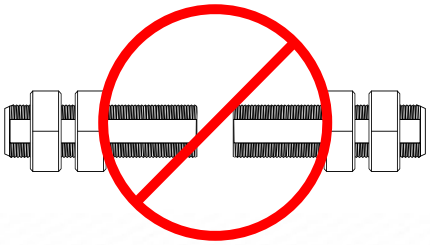
DATE CODE, THIS SURFACE



CHARACTERISTIC-OPTION MARKED ON THIS SURFACE YY = OPTION

Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

A44-18ADSO-P5P21

Single Ch-Target Tracker Gear Tooth Sensor

- **Dynamic Speed Sensor**
- **No Orientation Required**
- **PNP output with 5k resistor**
- **Aluminum 7/16-20 x 1.5" housing**
- **Free end PVC 22 AWG wires (1 foot length)**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A44-18ADSO-P5P21

Housing	Sensor Type & Function	Electrical Option	Connection Type
A = Aluminum Black Anodized 7/16-20x1.5"	Digital Single Output Gear Tooth Sensor	PNP, 5k Resistor	P21 = Free End PVC 22AWG Wires

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

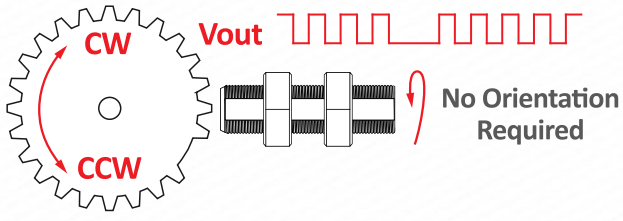
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- PNP goes high with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

A44-18ADSO-P5P21

Single Ch-Target Tracker Gear Tooth Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

These sensors power up with the output transistor OFF (Vout Low). This transistor turns ON (Vout High) for the first time on the approach of a tooth. After the first tooth, they will not miss a target.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current	Into Vcc, Vout Low	+2.5	+8	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Output Voltage Low, Vol	Vcc= 12, Rload=1k	0	0.1	Volts
Output Voltage High, Voh	Vcc= 12, Rload=1k	10.5	12.0	Volts
Pull Down Resistor	Internal Vout to Gnd	4.9	5.1	K Ohms
Output Rise Time 10-90%	Vcc=12,Cload<100pF	-	1.0	µS
Output Fall Time 90-10%	Vcc=12,Cload<100pF	-	7.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

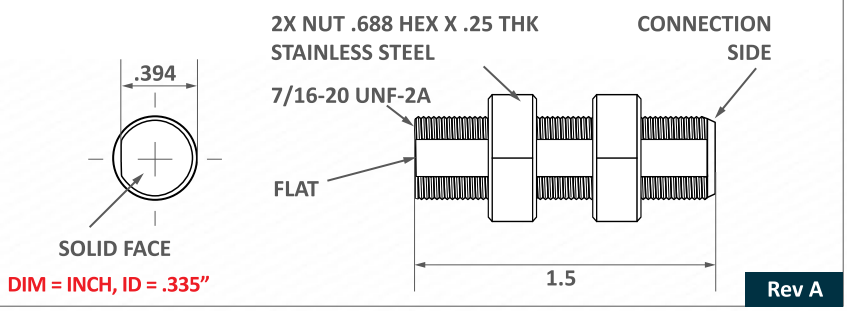
* T max = 150°C is available, contact factory.
** CMOS IC is static sensitive.

Rev C

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc at 25°C	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Output Clamp (Short Circuit Protection) Current	40	65	mA
Output Short-Gnd, Vcc <28V	-	5	Minutes
Load Dump, 40 mS Rs = 20	-	60	Volts
Output Power, T= 25°C	-	730	mW

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	80 Inch-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

A44, Black Anodized Aluminum 7/16" x 1.5" Housing



DIM = INCH, ID = .335"

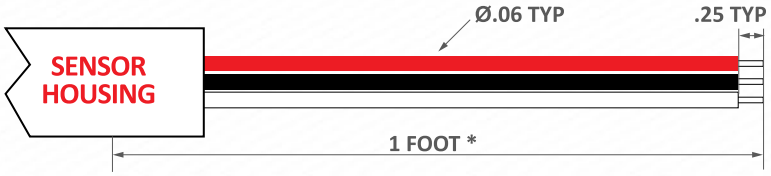
Rev A

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .120"	.150"
8 (.393") Tooth to Tooth	.000 to .085"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .055"	.075"
16 (.196") Tooth to Tooth	.000 to .035"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .012"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

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

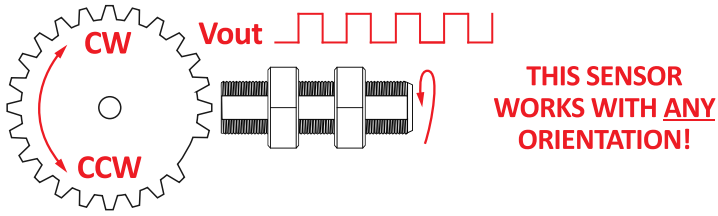
Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P21-18ADSO			

+1 970.879.9900 | sensorsales@standexelectronics.com

A44-18ADSO-P5P21

Single Ch-Target Tracker Gear Tooth Sensor

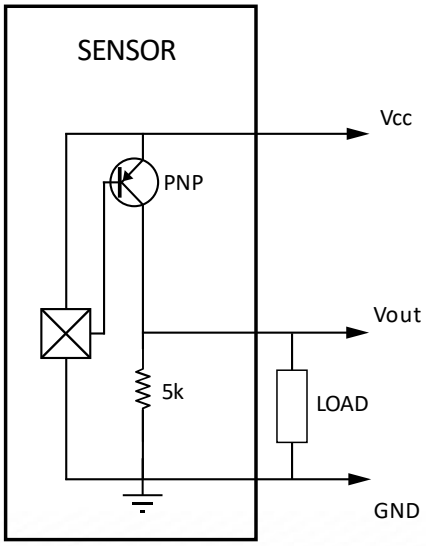
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

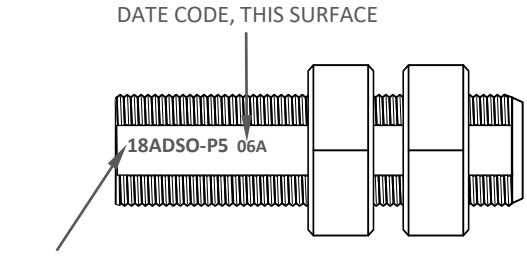
A44-18ADSO

P5, PNP with 5k Resistor



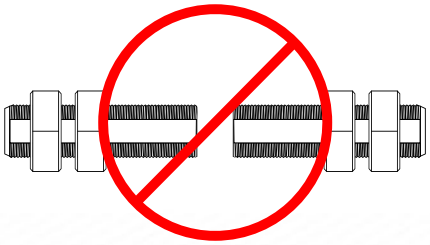
Date Code 'YYM' YY = YEAR, M = MONTH			
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

A47-18ADSO-ODP21

Hall Effect Gear Tooth Speed Sensor

- **Dynamic Speed Sensor**
- **No Orientation Required**
- **N channel open drain output**
- **Aluminum 15/32-32 x 1" housing**
- **Free end PVC 22 AWG wires (1 foot length)**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A47-18ADSO-ODP21

Housing	Sensor Type & Function	Electrical Option	Connection Type
Aluminum 15/32-32 x 1" Long	Digital Single Output Gear Tooth Sensor	OD, Open Drain N Ch	P21 = Free End PVC 22AWG Wires

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

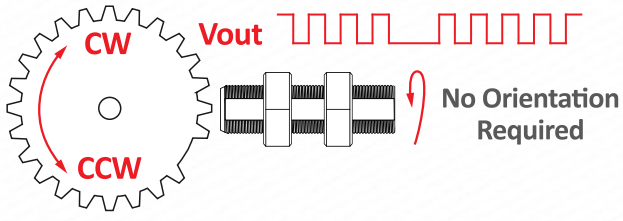
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present, external pull up resistor required.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

A47-18ADSO-ODP21

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current	Into Vcc	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink = 20 mA	0	0.6	Volts
Output Leakage Current	Output high	0	10	µA
Output Rise Time 10-90%	R pu =1 k,C < 100pF	-	2.0	µS
Output Fall Time 90-10%	R pu = 1k,C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

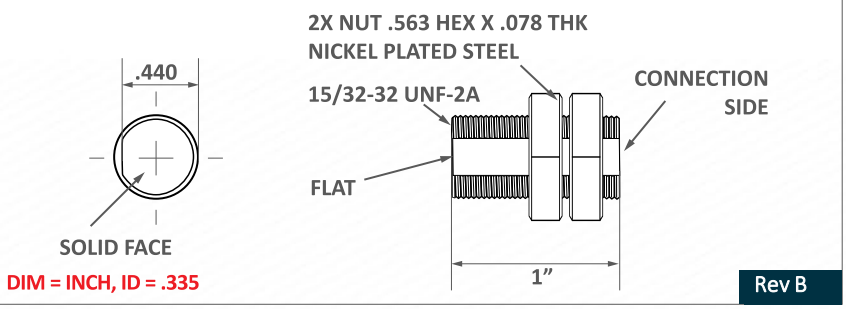
* T max = 150°C is available, contact factory.
** CMOS IC is static sensitive.

Rev E

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc at 25°C	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Current into Output	-	30	mA
Load Capacitance	-	0.01	µF
Current out of Output	-	n/a	mA
Load Dump, 40 mS Rs = 20	-	60	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 Continuous
Mechanical Shock	100 G's, 11 mS

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



DIM = INCH, ID = .335

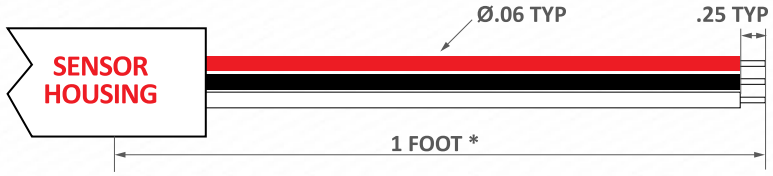
Rev B

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .120"	.150"
8 (.393") Tooth to Tooth	.000 to .085"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .055"	.075"
16 (.196") Tooth to Tooth	.000 to .035"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .012"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

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

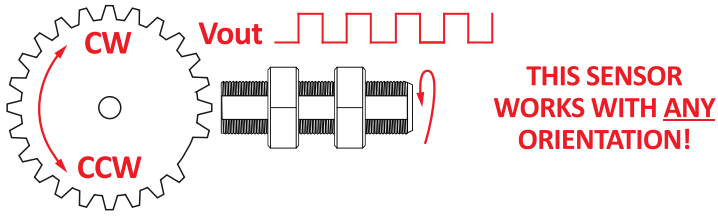
Connections Chart			
Red	Vcc	White	Digital Vout
Black	Ground		
P21-18ADSO			

+1 970.879.9900 | sensorsales@standexelectronics.com

A47-18ADSO-ODP21

Hall Effect Gear Tooth Speed Sensor

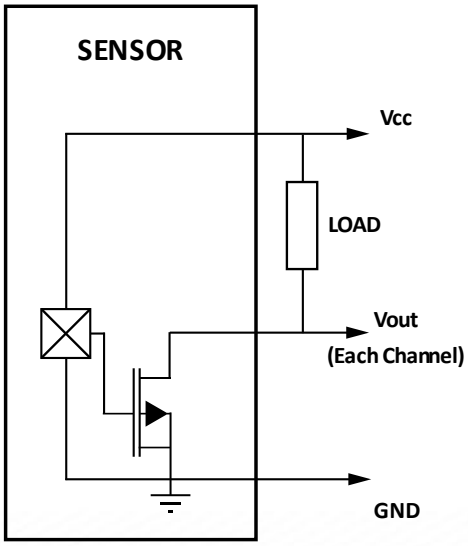
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

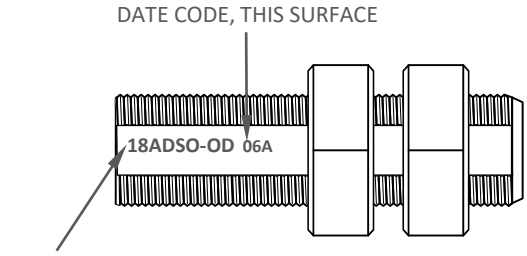
A47-18ADSO

OD, Open Drain N Channel



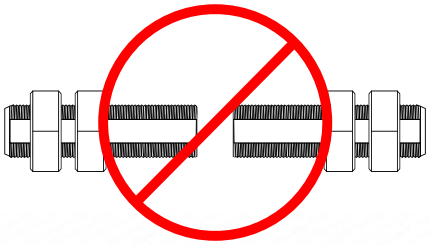
Date Code 'YYM' YY = YEAR, M = MONTH			
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

A63-37ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

- Dynamic Speed Sensor
- No Orientation Required
- NPN output with 5k pull up resistor
- Aluminum 5/8-18 x 1.75" housing
- Jacketed 3 wire 22AWG 80C PVC, 5 ft

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: A63-37ADSO-5KJA5

Housing	Sensor Type & Function	Electrical Option	Connection Type
A = Aluminum Black Anodized 5/8-18 x1.75"	Digital Single Output Gear Tooth Sensor	NPN, 5k Pull Up Resistor	Jacketed 3 wire 22AWG 80C PVC, 5 ft

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

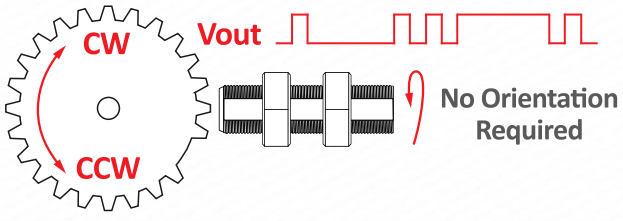
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN goes high with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

A63-37ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink=20mA	0	0.6	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Rise Time 10-90%	C < 100pF	-	3.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

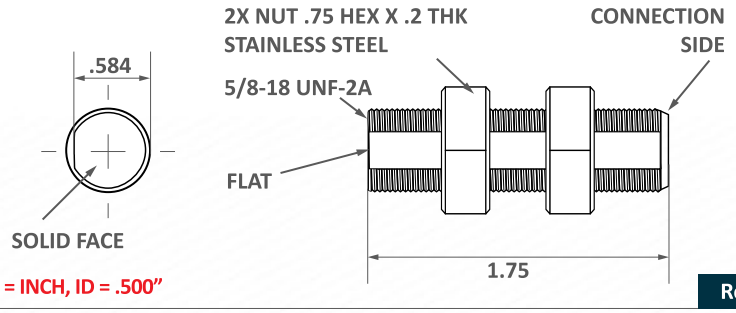
* T max = 150°C is available, contact factory.

Rev B

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Current into Output, T=25°C	-	30	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 20	-	60	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

A63, Black Anodized Aluminum 5/8" Housing



DIM = INCH, ID = .500"

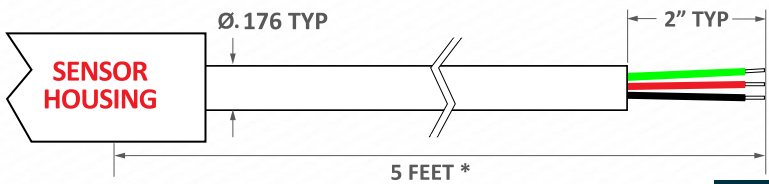
Rev C

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.160"
12 (.262") Tooth to Tooth	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

JA5, Jacketed 3 Wire 22AWG PVC

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

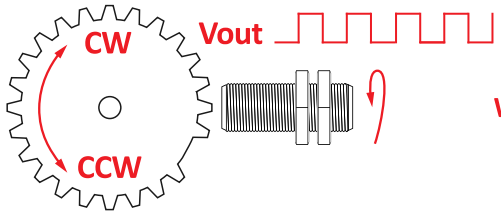
Connections Chart	
Red Vcc	Black Ground
Green Digital Vout	
JA5-37ADSO	

+1 970.879.9900 | sensorsales@standexelectronics.com

A63-37ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

Sensor Function



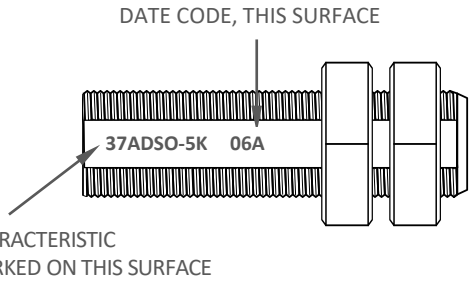
THIS SENSOR WORKS WITH ANY ORIENTATION!

A63-37ADSO

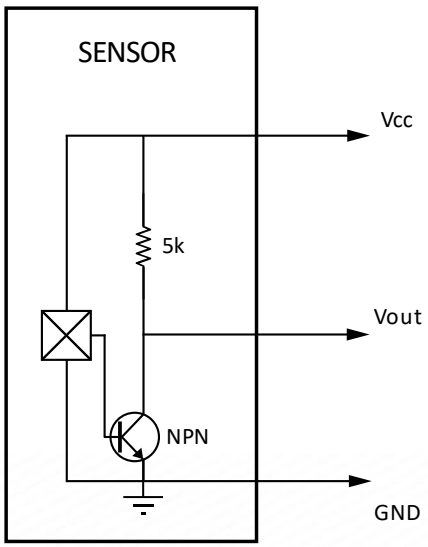
Date Code 'YYM' YY = YEAR, M = MONTH

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

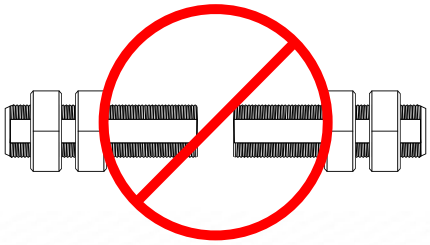


5K, 5k Pull-up Resistor



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM61O-18ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

- **Dynamic Speed Sensor**
- **No Orientation Required**
- **Load dump and EMI protection w/5k pull up**
- **Plastic .61" flange mount housing w/o-ring**
- **Integral 3-way Metri-Pack 150.2 male connector**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM61O-18ADSO-L5CP13

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.6" x 2" Long	Digital Single Output Gear Tooth Sensor	Surge Protected Input, NPN Output w/ 5k Pull up Resistor	Integral 3-way Metri-Pack 150.2 male

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

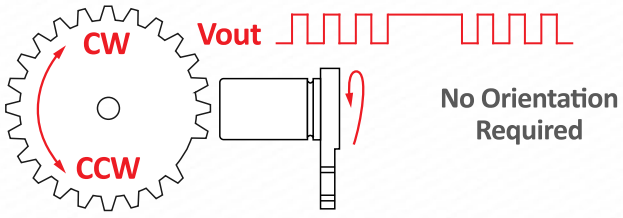
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM61O-18ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

These sensors power up with the output transistor OFF (Vout High). This transistor turns ON (Vout Low) for the first time on the approach of a tooth. After the first tooth, they will not miss a target.

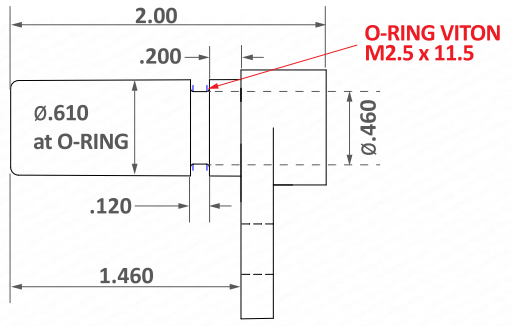
Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

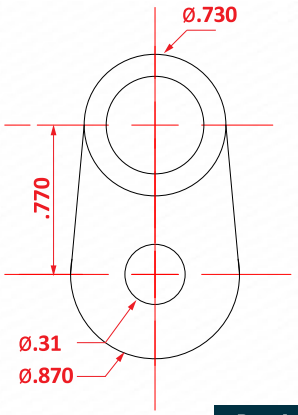
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.5	+28	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rload >100k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rload >100k	0.0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	K Ohms
Output Resistance Ro	0.25 watts	290	310	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M
* T max = 150°C is available, contact factory.				Rev A

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Shorted to Output 1 Minute Max	-20	+32	Volts
Current into Output, T=25°C	-	40	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 100 mS Rs = 5 per ISO 7637-2 24V Truck Spec	-	200	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM61O, Glass Filled Nylon (150°C) Flanged Housing





THIS HOUSING'S FACE IS THICKER THAN STANDARD, SO THE AIR GAP SPECIFICATION IS REDUCED BY 0.010"

DIM = INCH, ID = .335"

Rev A

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .120"	.150"
8 (.393") Tooth to Tooth	.000 to .085"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .055"	.075"
16 (.196") Tooth to Tooth	.000 to .035"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .012"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

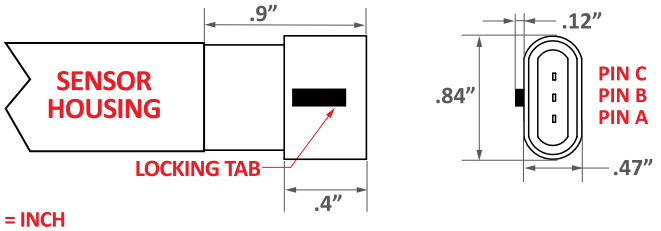
+1 970.879.9900 | sensorsales@standexelectronics.com

MFM61O-18ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

CP13, Integral 3-Way Metri Pack 150.2 Male Connector

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



DIM = INCH

Rev A

Connections Chart

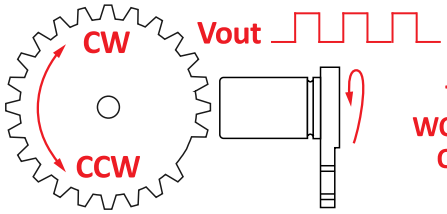
Pin A	Vcc	Pin C	Ground
Pin B	Vout		

CP13-18ADSO

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

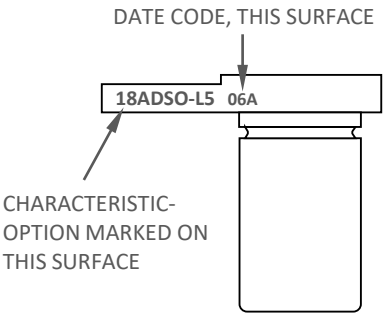
Sensor Function



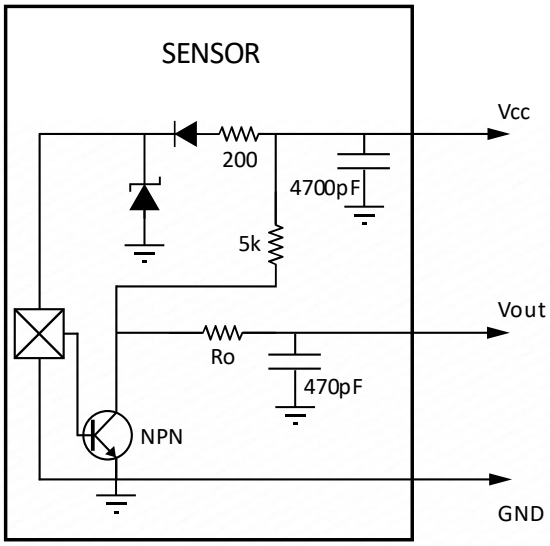
THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM61O-18ADSO

Marking

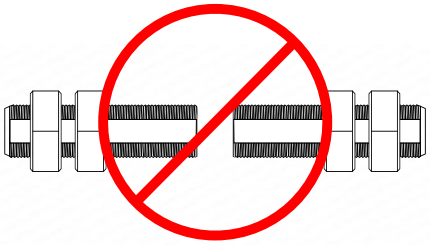


L5, NPN with 5k Pull Up, Protection & EMI Filter



Handling Instructions

DO NOT CONTACT FACE TO FACE



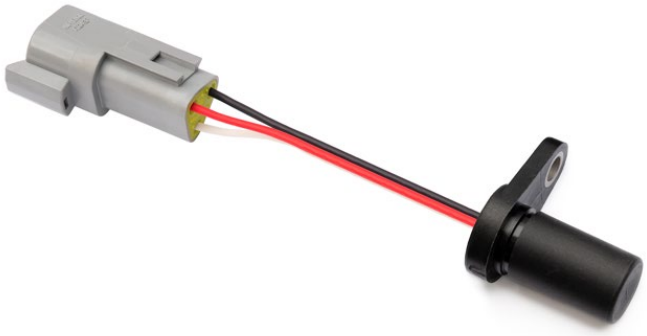
CONTACT WITH OTHER MAGNETS *MAY* REDUCE THE MAXIMUM OPERATING GAP

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CD3

Single Ch-Target Tracker Gear Tooth Sensor

- **Large Dynamic Speed Sensor**
- **No Orientation Required**
- **Load dump and EMI protection w/5k pull up**
- **Plastic .7" flange mount 1.5" long housing**
- **Deutsch DT 3 pin with 5" 20 AWG XLPE**



CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM7-37ADSO-L5CD3

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.7" x 1.5" Long	Digital Single Output Gear Tooth Sensor	Load Dump Protected Input, NPN Output w/ 5k Pull up Resistor	Deutsch DT 3 pin w/5" 20AWG XLPE

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

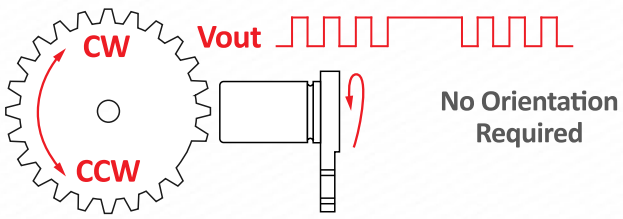
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Greater Air Gap Range
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CD3

Single Ch-Target Tracker Gear Tooth Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

These sensors power up with the output transistor OFF. This transistor turns ON for the first time on the approach of a tooth. After the first tooth, they will not miss a target.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

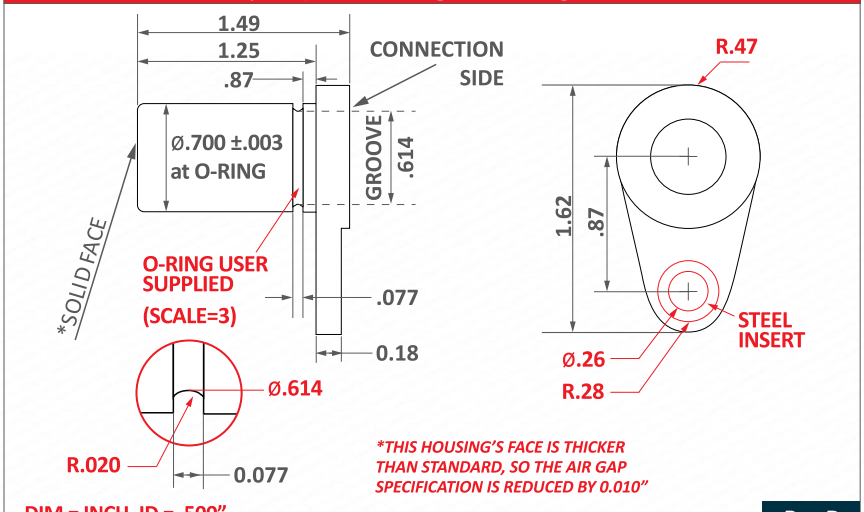
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.5	+28	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rload >100k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rload >100k	0.0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Resistance Ro	0.25 watts	290	310	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Shorted to Output 1 Minute Max	-20	+32	Volts
Current into Output, T=25°C	-	40	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 100 mS Rs = 5 per ISO 7637-2 24V Truck Spec	-	200	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM7, Glass Filled Nylon (150°C) Flanged Housing



Rev D

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.160"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CD3

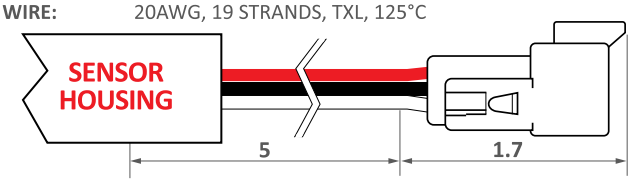
Single Ch-Target Tracker Gear Tooth Sensor

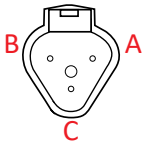
CD3, 3 Pin Deutsch DT03 with 20 AWG TXL

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

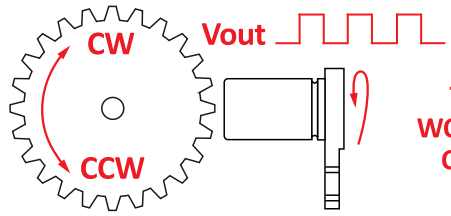
Connections Chart

Pin A (White)	Vout	Pin C (Black)	Ground
Pin B (Red)	Vcc		
CD3-37ADSO			

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

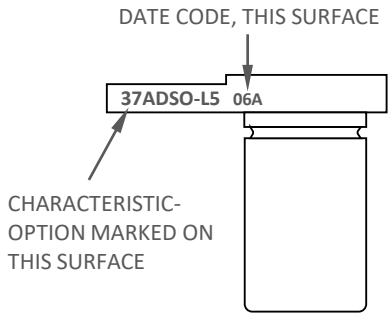
Sensor Function



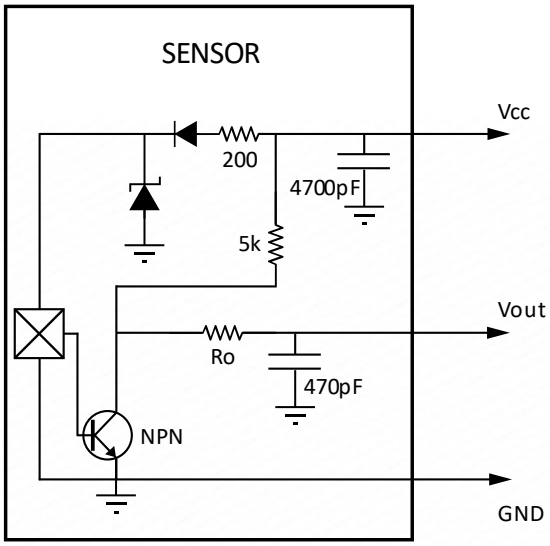
THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM7-37ADSO

Marking

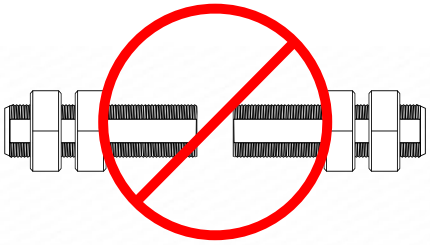


L5, NPN with 5k Pull Up, Protection & EMI Filter



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

- **Dynamic Speed Sensor**
- **No Orientation Required**
- **Load dump and EMI protection w/5k pull up**
- **Plastic .7" flange mount 1.5" long housing**
- **Integral 3-way Metri-Pack 150.2 male connector**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM7-37ADSO-L5CP13

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.7" x 1.5" Long	Digital Single Output Gear Tooth Sensor	Load Dump Protected Input, NPN Output w/ 5k Pull up Resistor	Integral 3-way Metri-Pack 150.2 male

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

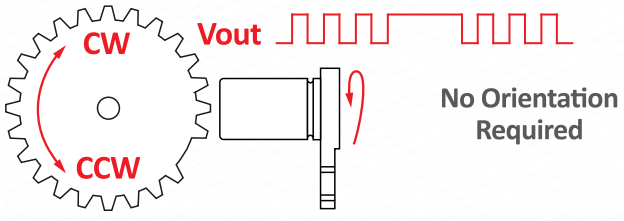
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

These sensors power up with the output transistor OFF (Vout High). This transistor turns ON (Vout Low) for the first time on the approach of a tooth. After the first tooth, they will not miss a target.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

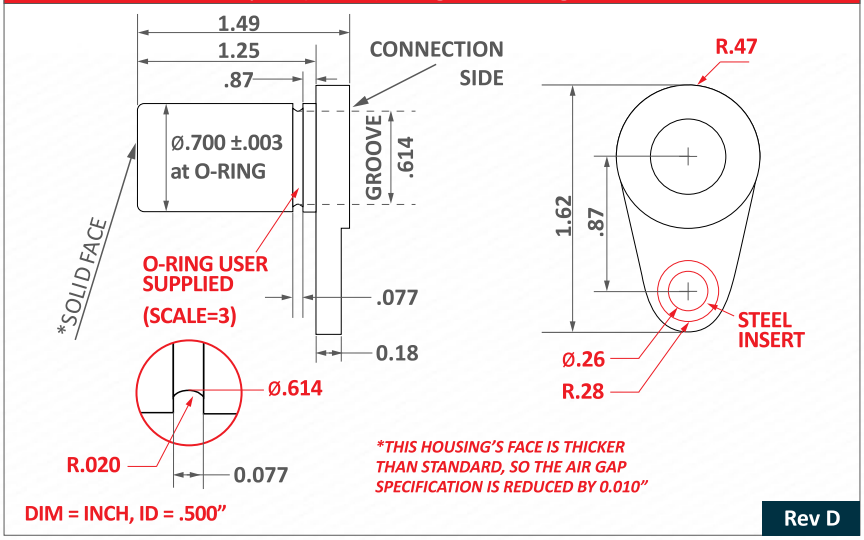
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.5	+28	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rload >100k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rload >100k	0.0	0.4	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Resistance Ro	0.25 watts	290	310	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-32	+32	Volts DC
Voltage Shorted to Output 1 Minute Max	-20	+32	Volts
Current into Output, T=25°C	-	40	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 100 mS Rs = 5 per ISO 7637-2 24V Truck Spec	-	200	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM7, Glass Filled Nylon (150°C) Flanged Housing



DIM = INCH, ID = .500" Rev D

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.180"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

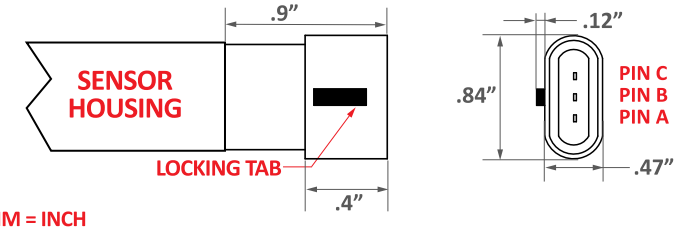
+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-L5CP13

Single Ch-Target Tracker Gear Tooth Sensor

CP13, Integral 3-Way Metri Pack 150.2 Male Connector

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



DIM = INCH

Rev A

Connections Chart

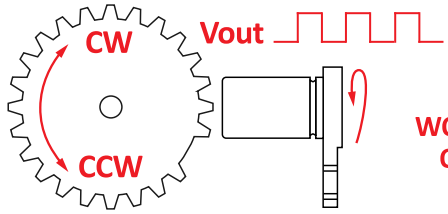
Pin A	Vcc	Pin C	Ground
Pin B	Vout		

CP13-37ADSO

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

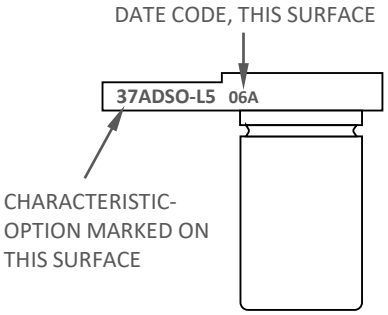
Sensor Function



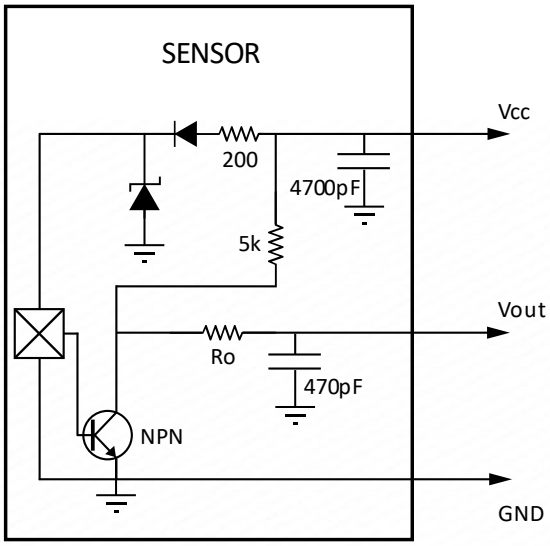
THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM7-37ADSO

Marking

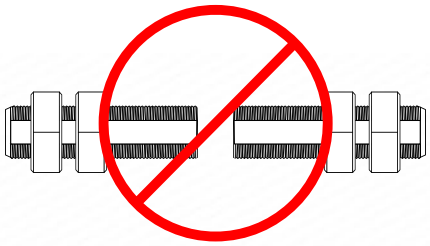


L5, NPN with 5k Pull Up, Protection & EMI Filter



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

MFM7-37ADSO-LNCP13

Hall Effect Gear Tooth Speed Sensor

- Dynamic Speed Sensor
- No Orientation Required
- Load dump and EMI protection w/NPN open collector
- Plastic .7" flange mount 1.5" long housing
- Integral 3-way Metri-Pack 150.2 male connector

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM7-37ADSO-LNCP13

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.7" x 1.5" Long	Digital Single Output Gear Tooth Sensor	Load Dump EMI Protected Input, w/ NPN Open Collector	Integral 3-way Metri-Pack 150.2 male

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

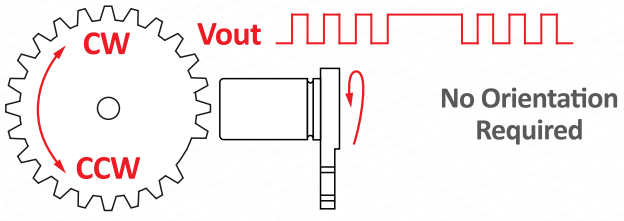
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present, external pull up resistor required.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-LNCP13

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

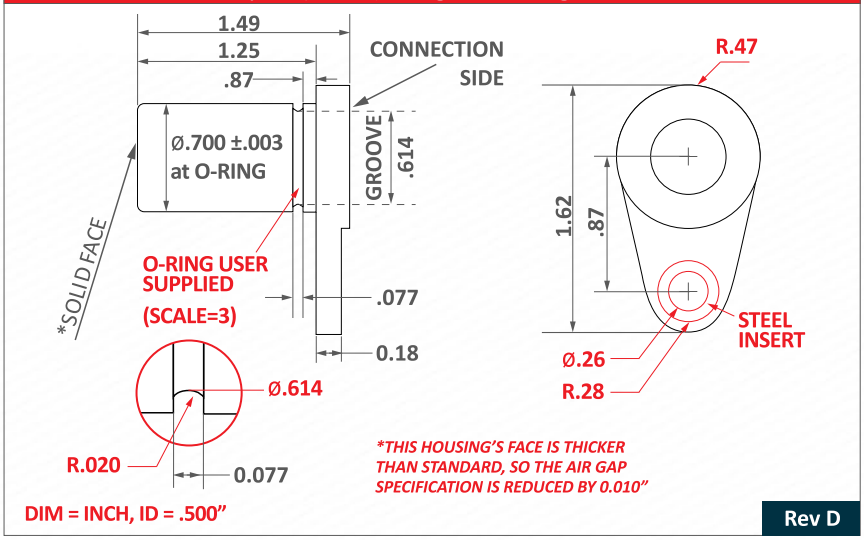
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+5	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rpu >10k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rpu >10k	0.1	0.5	Volts
Internal Pull Up Resistor	Vcc to Vout	none	none	kohms
Output Resistance Ro	0.25 watts	48	52	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-28	+28	Volts DC
Voltage Shorted to Output 1 Minute Max	-12	+28	Volts
Current into Output, T=25°C	-	40	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	n/a	mA
Load Dump, 100 mS Rs = 5 per ISO 7637-2 24V Truck Spec	-	200	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM7, Glass Filled Nylon (150°C) Flanged Housing



Rev D

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.180"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

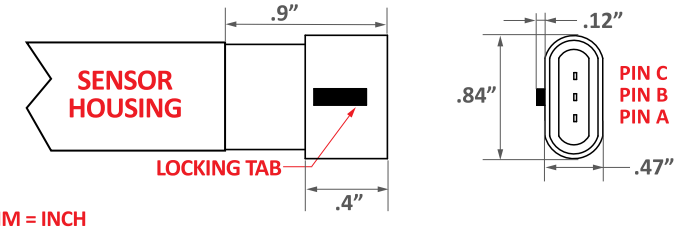
+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-LNCP13

Hall Effect Gear Tooth Speed Sensor

CP13, Integral 3-Way Metri Pack 150.2 Male Connector

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



DIM = INCH

Rev A

Connections Chart

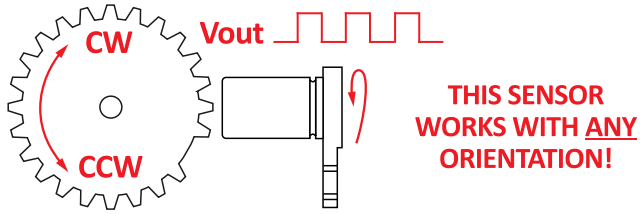
Pin A	Vcc	Pin C	Ground
Pin B	Vout		

CP13-37ADSO

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

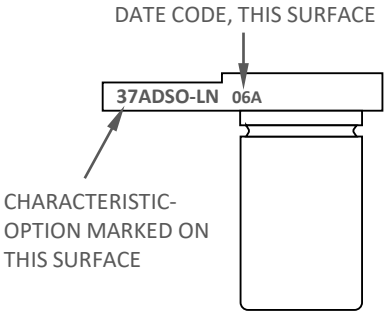
Sensor Function



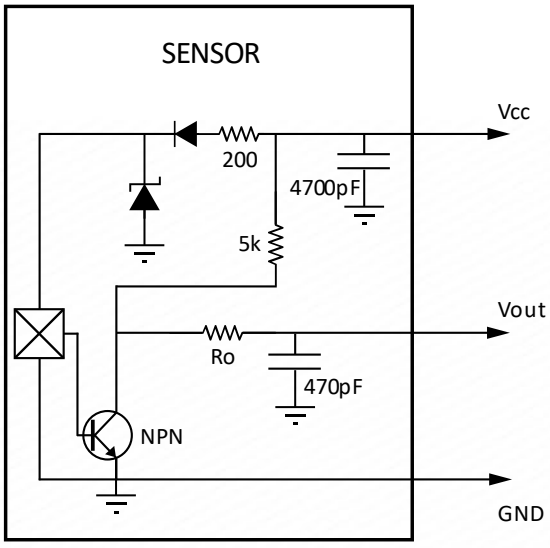
THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM7-37ADSO

Marking

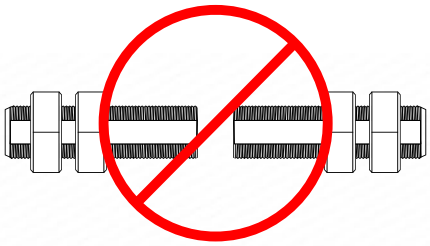


LN, NPN Open Collector with Protection & EMI Filter



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

MFM7-37ADSO-ODX0B

Hall Effect Gear Tooth Speed Sensor

- Large Dynamic Speed Sensor
- No Orientation Required
- N channel open drain output
- Plastic .7" flange mount 1.5" long housing
- Free end XLPE 20 AWG wires, 6 inches

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM7-37ADSO-ODX0B

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.7" x 1.5" Long	Digital Single Output Gear Tooth Sensor	N Channel, Open Drain Output	Free End XLPE 20 AWG wires, 6 inches

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

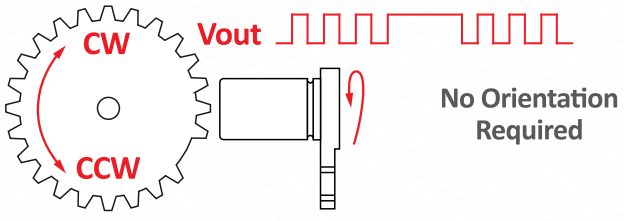
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present, external pull up resistor required.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-ODX0B

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink = 20 mA	0	0.6	Volts
Output Leakage Current	Output high	0	10	µA
Output Rise Time 10-90%	R pu = 1k, C < 100pF	-	2.0	µS
Output Fall Time 90-10%	R pu = 1k, C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

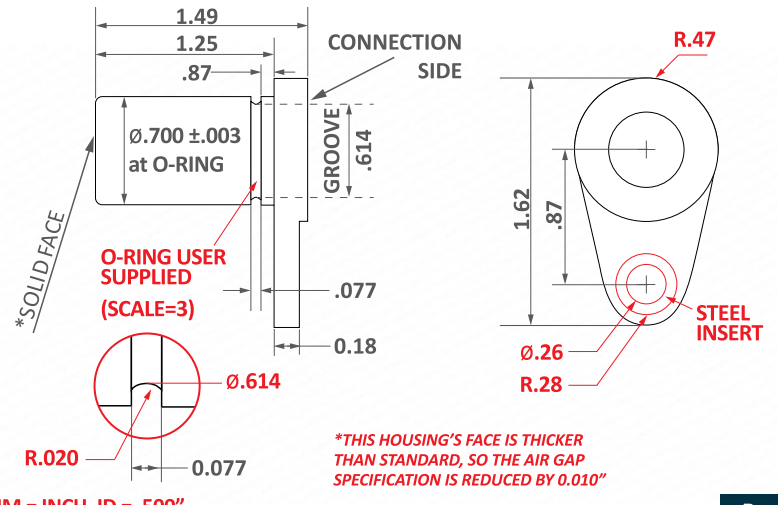
* T max = 150°C is available, contact factory. **CMOS IC is static sensitive
***Non contacting

Rev D

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-30	+30	Volts DC
Voltage Shorted to Output 1 Minute Max	-0.3	+30	Volts
Current into Output, T=25°C	-	30	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	n/a	mA
Load Dump, 40 mS Rs = 20	-	60	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM7, Glass Filled Nylon (150°C) Flanged Housing



Rev D

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.160"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

+1 970.879.9900 | sensorsales@standexelectronics.com

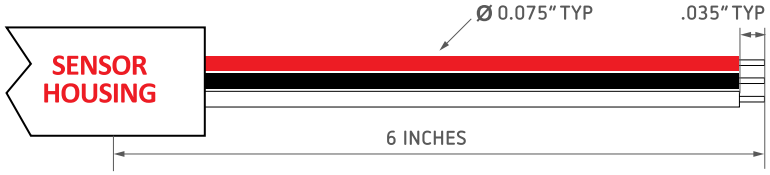
MFM7-37ADSO-ODX0B

Hall Effect Gear Tooth Speed Sensor

X0B, Free End XLPE 20 AWG Wires

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

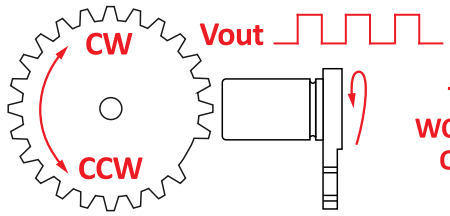
OTHER STANDARD LENGTHS:
3", 1', 2', 5', 10' AND 20'



DIM = INCH

Rev A

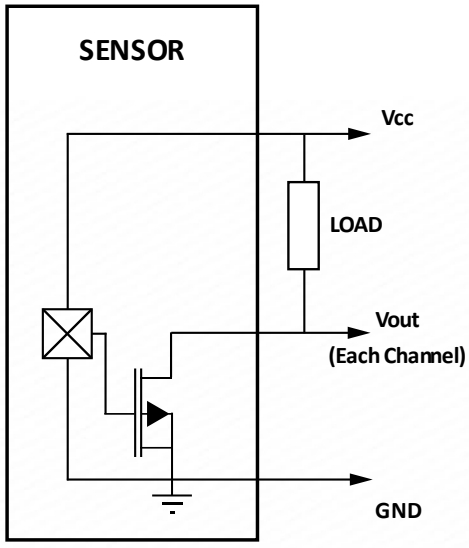
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM7-37ADSO

OD, Open Drain N Channel



Connections Chart

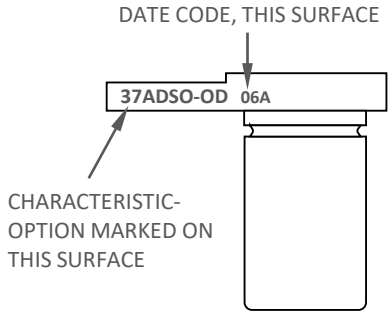
Red	Vcc	Black	Ground
White	Vout		

X0B-37ADSO

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

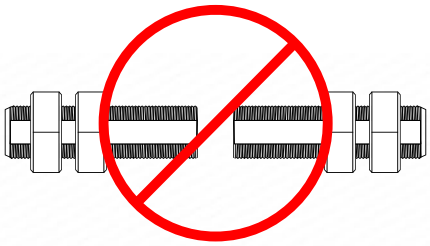
A JAN	D APR	H JUL	L OCT
B FEB	E MAY	J AUG	M NOV
C MAR	G JUN	K SEP	N DEC

Marking



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-P5P21

Hall Effect Gear Tooth Speed Sensor

- Dynamic Speed Sensor
- No Orientation Required
- PNP output with 5k resistor
- Plastic .7" flange mount 1.5" long housing
- Free end PVC 22 AWG wires (1 foot length)

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: MFM7-37ADSO-P5P21

Housing	Sensor Type & Function	Electrical Option	Connection Type
Glass Filled Nylon Flange Mount Ø.7" x 1.5" Long	Digital Single Output Gear Tooth Sensor	PNP, 5k Resistor	P21 = Free End PVC 22AWG Wires

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

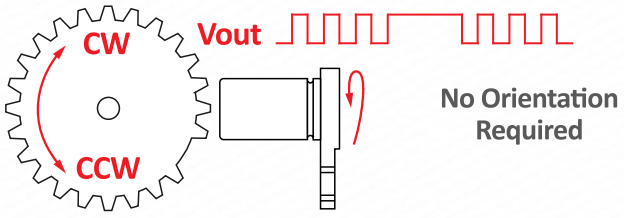
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- PNP goes high with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- Easy install Flange mount design sets gap relative to target face

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

MFM7-37ADSO-P5P21

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

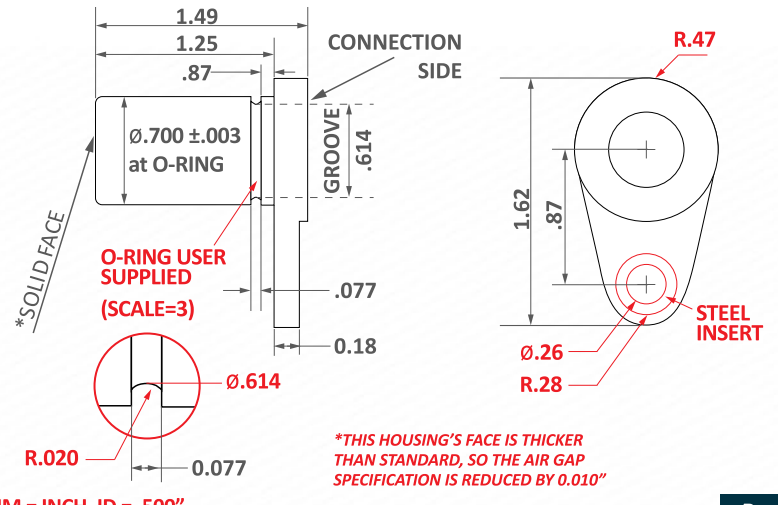
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+5	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage High	Vcc = 24V, Rpu >10k	23.5	24	Volts
Saturation Voltage Low	Vcc = 24V, Rpu >10k	0.1	0.5	Volts
Internal Pull Up Resistor	Vcc to Vout	none	none	kohms
Output Resistance Ro	0.25 watts	48	52	Ohms
Output Rise Time 10-90%	Co < 100pF	-	8.0	µS
Output Fall Time 90-10%	Co < 100pF	-	2.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-28	+28	Volts DC
Voltage Shorted to Output 1 Minute Max	-12	+28	Volts
Current into Output, T=25°C	-	40	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	n/a	mA
Load Dump, 100 mS Rs = 5 per ISO 7637-2 24V Truck Spec	-	200	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	15 Foot-Pounds Maximum
Enclosure	Nema 1,3,4,6,13 & IEC IP67
Vibration	10 G's 10 to 2000 Hz Sinusodal
Mechanical Shock	50 G's, 11 mS Half-Sine

MFM7, Glass Filled Nylon (150°C) Flanged Housing



Rev D

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .180"	.240"
8 (.393") Tooth to Tooth	.000 to .125"	.180"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .070"	.105"
16 (.196") Tooth to Tooth	.000 to .050"	.070"
20 (.157") Tooth to Tooth	.000 to .030"	.055"
24 (.131") Tooth to Tooth	.000 to .020"	.040"
32 (.098") Tooth to Tooth	.000 to .008"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

+1 970.879.9900 | sensorsales@standexelectronics.com

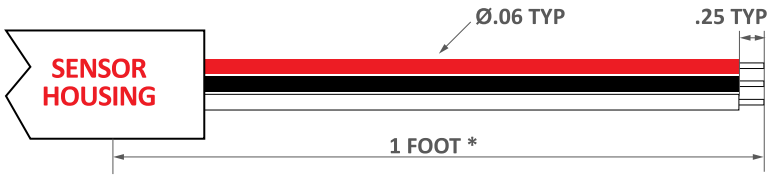
MFM7-37ADSO-P5P21

Hall Effect Gear Tooth Speed Sensor

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

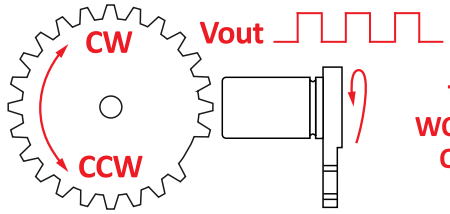
Pin A	Vcc	Pin C	Ground
Pin B	Vout		

P21-37ADSO

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

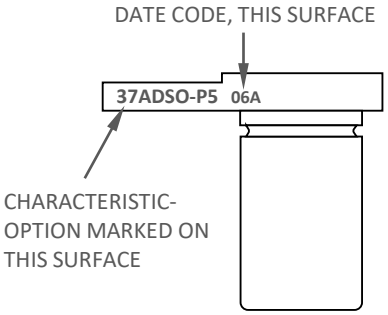
Sensor Function



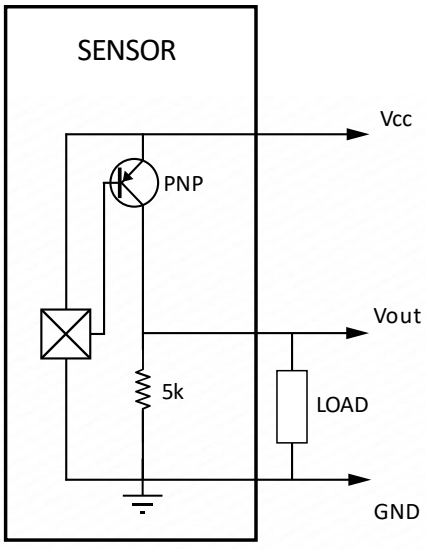
THIS SENSOR WORKS WITH ANY ORIENTATION!

MFM7-37ADSO

Marking

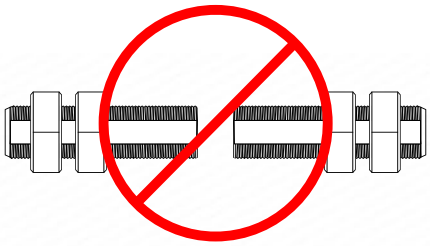


P5, PNP with 5k Resistor



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

Standex Electronics

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12-18ADSO-5KCB2

Single Ch-Target Tracker Gear Tooth Sensor

- **Dynamic Speed Sensor**
- **No Orientation Required**
- **NPN output with 5k pull up resistor**
- **Stainless 12x1mm x 35mm housing**
- **Integral 4 pin male 12mm micro connector**

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12-18ADSO-5KCB2

Housing	Sensor Type & Function	Electrical Option	Connection Type
S = Stainless Steel, Thread Pitch M12x1, 35mm Long	Digital Single Output Gear Tooth Sensor	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.

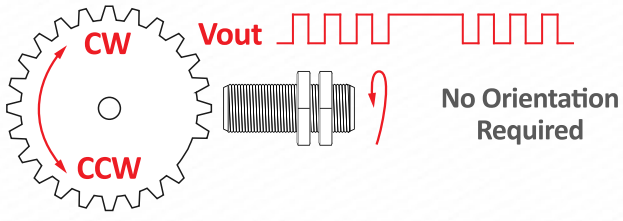
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN output goes low with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target
- No orientation required. Use lock nuts to set air gap within range of target

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

S12-18ADSO-5KCB2

Single Ch-Target Tracker Gear Tooth Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

These sensors power up with the output transistor OFF (Vout High). This transistor turns ON (Vout Low) for the first time on the approach of a tooth. After the first tooth, they will not miss a target.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current, Output Off	Into Vcc	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low, Vol	I sink = 20 mA	0	0.6	Volts
Output Voltage High, Voh	Vcc = 12,Rload>100Ω	105	120	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	K Ohms
Output Rise Time 10-90%	C < 100pF	-	3.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	20	V / M

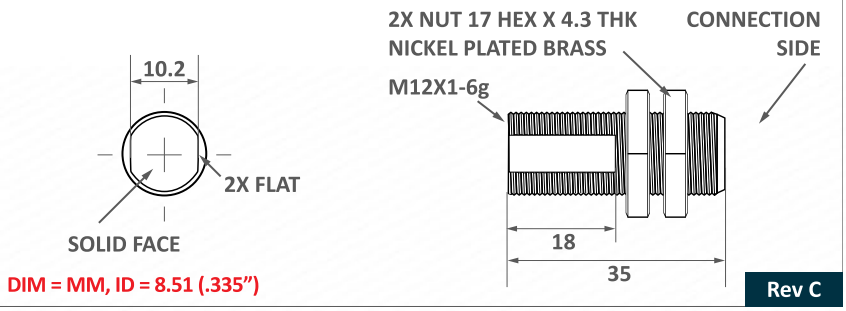
* T max = 150°C is available, contact factory.
** CMOS IC is static sensitive.

Rev B

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc at 25°C	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Current into Output	-	30	mA
Load Capacitance	-	0.01	uF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 20	-	60	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

S12 Housing, 303 Stainless Steel, M12X1, 35mm Long

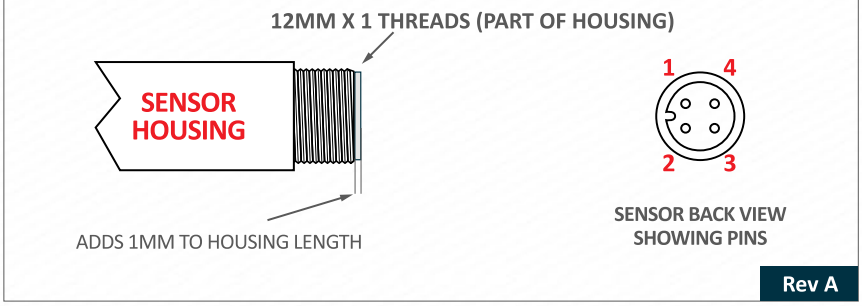


DIM = MM, ID = 8.51 (.335")

Rev C

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .120"	.150"
8 (.393") Tooth to Tooth	.000 to .085"	.110"
12 (.262") Tooth to Tooth 100% tested before shipping	.000 to .055"	.075"
16 (.196") Tooth to Tooth	.000 to .035"	.050"
20 (.157") Tooth to Tooth	.000 to .030"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .012"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

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
CB2-18ADSO			

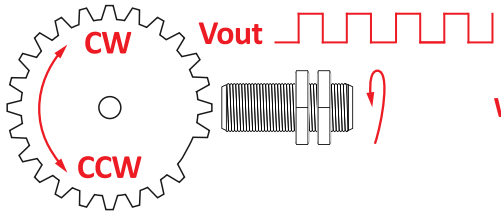
OTHER MATING CONNECTORS AND CABLE SETS AVAILABLE

+1 970.879.9900 | sensorsales@standexelectronics.com

S12-18ADSO-5KCB2

Single Ch-Target Tracker Gear Tooth Sensor

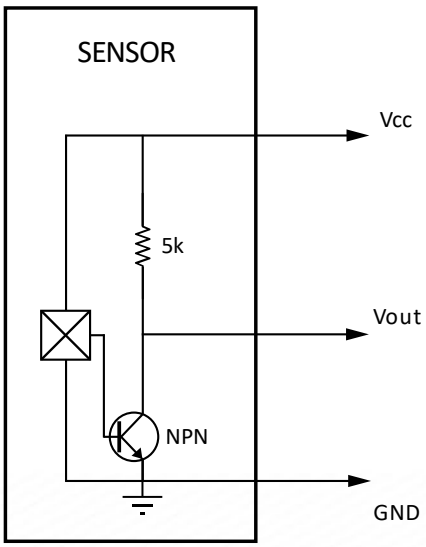
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

S12-18ADSO

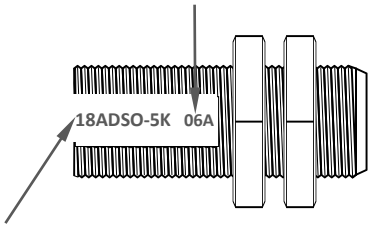
5K, 5k Pull-up Resistor



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

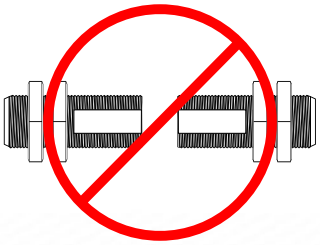
DATE CODE, THIS SURFACE



CHARACTERISTIC-OPTION MARKED ON THIS SURFACE

Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12H-SSTDSO-R5CB2-001

Gear Tooth Speed Switch

- Speed Switch
- Transistor output-ferrous target activated
- Regulated input, NPN with 5k pull-up
- Stainless 12x1mm x 52mm housing
- Integral 4 pin male 12mm micro connector

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12H-SSTDSO-R5CB2-001

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 52mm Long	Speed Switch Gear Tooth & Ferrous Targets	Regulated Input NPN w/5k Pull up	CB2 = Integral 4 Pin Male 12mm Micro Connector	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*

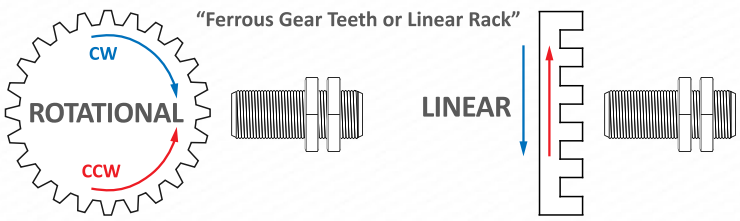
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

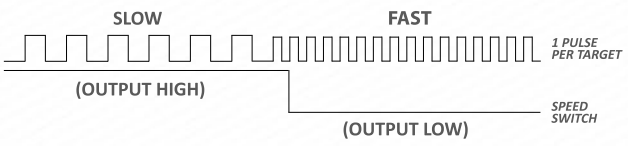
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'Steel Gears & Ferrous Target 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 gears and other ferrous targets using Hall Effect Technology
- Capable of detecting 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- 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 - SSG

+1 970.879.9900 | sensorsales@standexelectronics.com

S12H-SSTDSO-R5CB2-001

Gear Tooth Speed Switch

OTHER OPTIONS

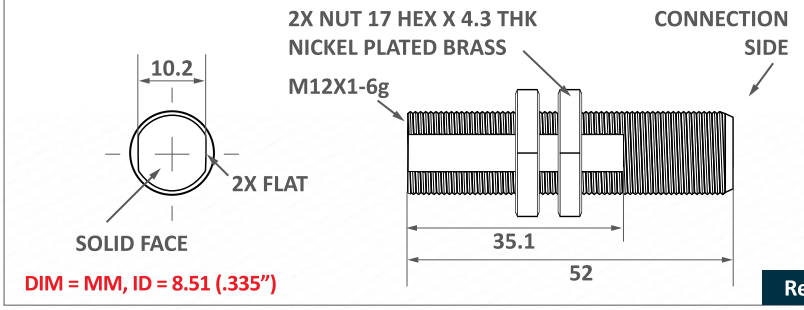
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

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, Vcc=12V	5	16	mA
Internal Pull up Resistor	Vcc to Vout	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	0.98	1.01	Hz
Underspeed Release Freq.	Output goes high below	0.94	0.97	Hz
ESD (like product qualified)	Nondestructive	-	2000	Volts
EMI (like product qualified)	20k to 1 G Hz	-	20	V / M

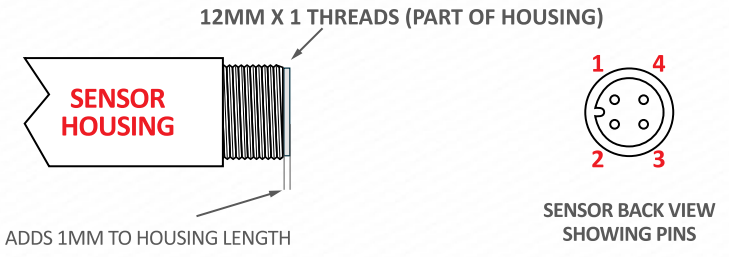
Rev D

S12H Housing, 303 Stainless Steel, M12X1, 52mm Long



Rev B

CB2, Integral 4 Pin Male 12mm Micro Connector



Rev A

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	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

Output State at 0 Speed: High (Transistor Off)

Air Gap Range, Targets	Min	Typ	Max
.22" wide, .65" apart, .30" deep:	.000"	.070"	.140"*
.12" wide, .29" apart, .25" deep:	.000"	.045"	.090"*
.10" wide, .17" apart, .17" deep:	.000"	.028"	.055"*
.06" wide, .10" apart, .10" deep:	.000"	.015"	.030"*
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 less than MAX GAP.**
**** 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 20-tooth target produces 20 pulses, so N=20.

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

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

Connections Chart			
Pin 1	Vcc	Pin 3	Ground
Pin 2	1 Pulse per Target	Pin 4	Speed Switch Output
CB2-SSTDSO			

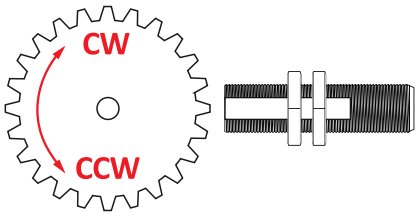
OTHER MATING CONNECTORS AND CABLES AVAILABLE

+1 970.879.9900 | sensorsales@standexelectronics.com

S12H-SSTDSO-R5CB2-001

Gear Tooth Speed Switch

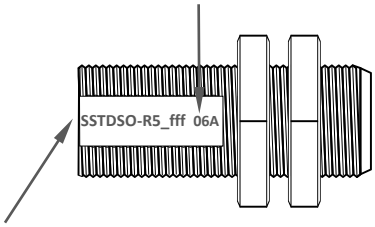
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

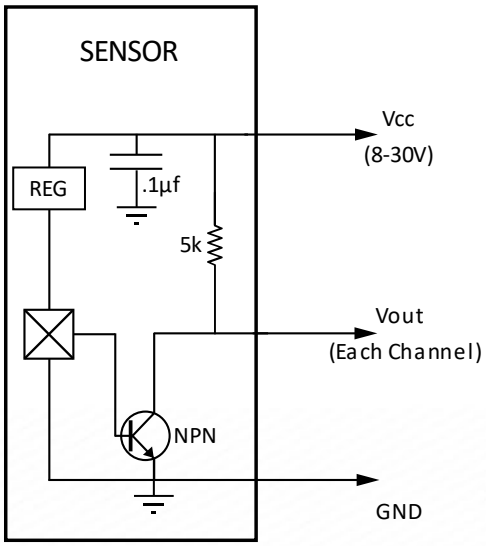
S12H-SSTDSO

Marking



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

R5, Regulated, 5k Resistor

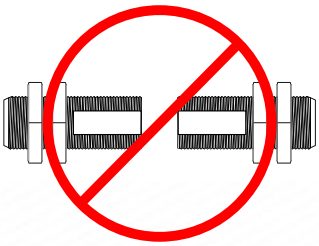


Date Code 'YYM' YY = YEAR, M = MONTH

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

Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12H-SSTDSO-R5CB2-500

Gear Tooth Speed Switch

- Speed Switch
- Transistor output-ferrous target activated
- Regulated input, NPN with 5k pull-up
- Stainless 12x1mm x 52mm housing
- Integral 4 pin male 12mm micro connector

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12H-SSTDSO-R5CB2-500

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 52mm Long	Speed Switch Gear Tooth & Ferrous Targets	Regulated Input NPN w/5k Pull up	CB2 = Integral 4 Pin Male 12mm Micro Connector	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*

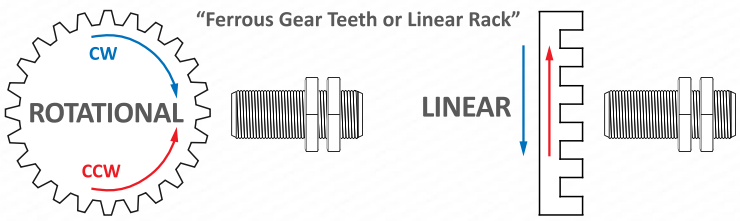
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

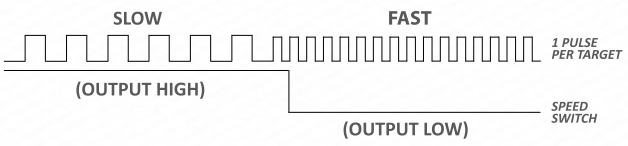
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'Steel Gears & Ferrous Target Actuated Speed Switch with Transistor Output'

Overspeed, Underspeed, Zero-Speed



OUTPUTS



DESCRIPTION

- Speed switch output turns on/off dependent on factory programmed frequency.
- 500 Hz switch point indicates if sensor is seeing more or less than 500 "teeth" per second.
- Single channel digital square wave output for resolving actual speed.
- Detects gears and other ferrous targets using Hall Effect Technology
- Capable of detecting 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- 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 - SSG

+1 970.879.9900 | sensorsales@standexelectronics.com

S12H-SSTDSO-R5CB2-500

Gear Tooth Speed Switch

OTHER OPTIONS

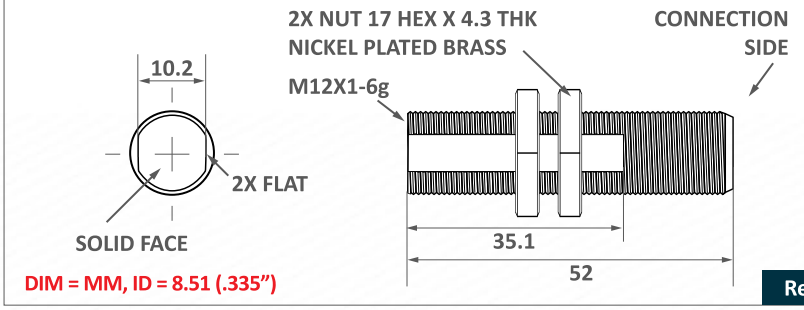
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

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, Vcc=12V	5	16	mA
Internal Pull up Resistor	Vcc to Vout	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	490	505	Hz
Underspeed Release Freq.	Output goes high below	470	485	Hz
ESD (like product qualified)	Nondestructive	-	2000	Volts
EMI (like product qualified)	20k to 1 G Hz	-	20	V / M

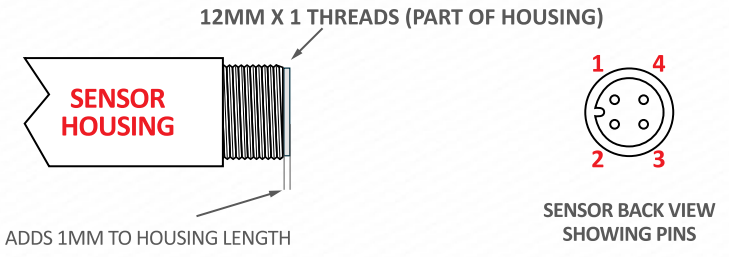
Rev D

S12H Housing, 303 Stainless Steel, M12X1, 52mm Long



Rev B

CB2, Integral 4 Pin Male 12mm Micro Connector



Rev A

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	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

Output State at 0 Speed: High (Transistor Off)

Air Gap Range, Targets	Min	Typ	Max
.22" wide, .65" apart, .30" deep:	.000"	.070"	.140"*
.12" wide, .29" apart, .25" deep:	.000"	.045"	.090"*
.10" wide, .17" apart, .17" deep:	.000"	.028"	.055"*
.06" wide, .10" apart, .10" deep:	.000"	.015"	.030"*
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 less than MAX GAP.**
**** 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 20-tooth target produces 20 pulses, so N=20.

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

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

Connections Chart

Pin 1	Vcc	Pin 3	Ground
Pin 2	1 Pulse per Target	Pin 4	Speed Switch Output
CB2-SSTDSO			

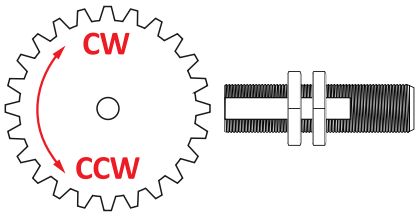
OTHER MATING CONNECTORS AND CABLES AVAILABLE

+1 970.879.9900 | sensorsales@standexelectronics.com

S12H-SSTDSO-R5CB2-500

Gear Tooth Speed Switch

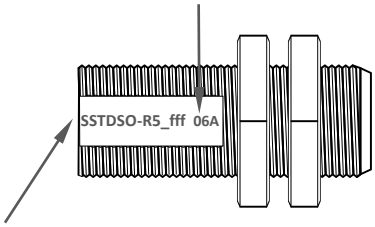
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

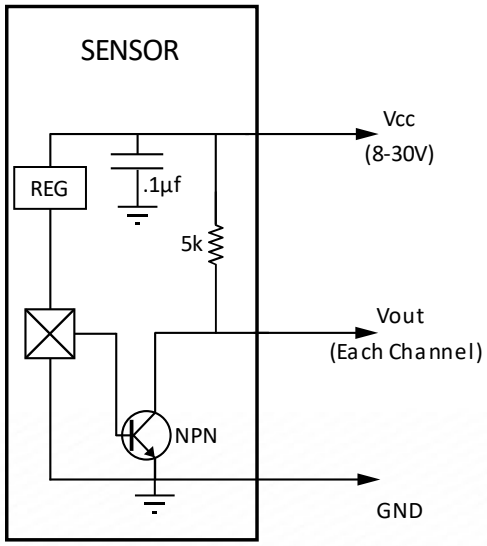
S12H-SSTDSO

Marking



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

R5, Regulated, 5k Resistor

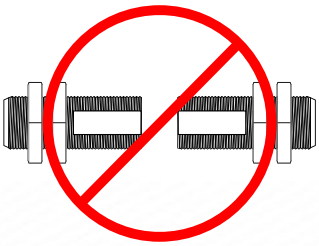


Date Code 'YYM' YY = YEAR, M = MONTH

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

Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12R-SSRDSO-NCSL5-001

Gear Tooth Speed Switch

- Ferrous target activated Speed Switch
- 8 to 32V DC Powered
- 150 VAC Normally Closed Form B Relay
- Stainless 12x1mm x 45mm housing
- Shielded 2 pair 22 AWG 105°C PVC, 5 foot

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12R-SSRDSO-NOSL5-001

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 45mm Long	Speed Switch Gear Tooth & Ferrous Targets	Relay Output Normally Closed	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*

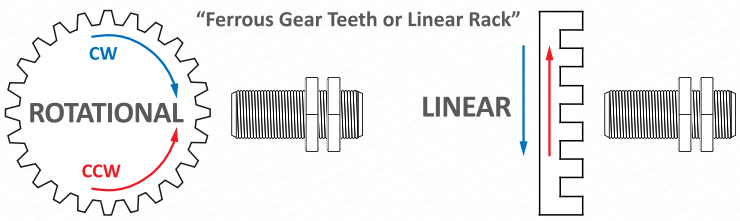
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

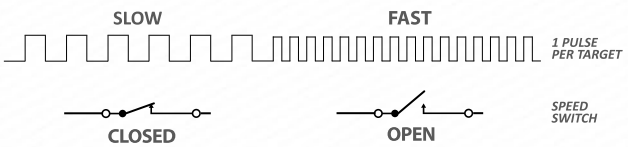
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'Steel Gears & Ferrous Target Actuated Speed Switch with Relay 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 gears and other ferrous targets using Hall Effect Technology
- Capable of detecting 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- 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 - SSG

+1 970.879.9900 | sensorsales@standexelectronics.com

S12R-SSRDSO-NCSL5-001

Gear Tooth Speed Switch

OTHER OPTIONS

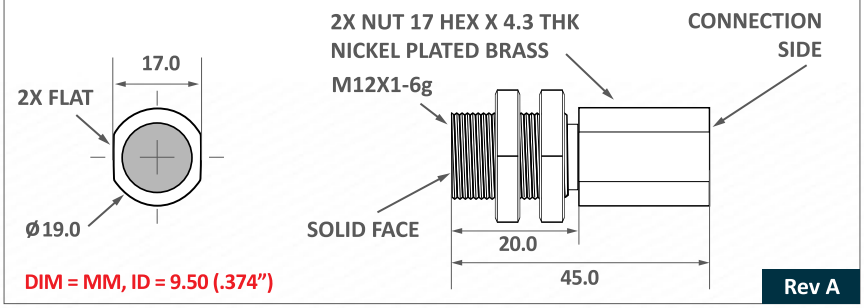
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

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	+32	Volts DC
Supply Current	Into Vcc	6	24	mA
Contact Resistance	Initial	-	0.10	Ohms
Overspeed TRIP Frequency 100% Final Tested at factory	Relay opens	0.98	1.01	Hz
Underspeed Release Freq. 100% Final Tested at factory	Relay closes	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



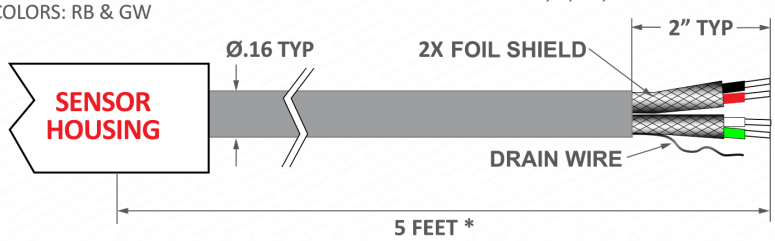
DIM = MM, ID = 9.50 (.374")

Rev A

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

SHIELDED 2 PAIR, 22 AWG, 7/30, 105C
CABLE: GREY PVC
COLORS: RB & GW

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



DIM = INCH

Rev A

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc-Gnd	-16	+32	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

Output State at 0 Speed: Relay Closed

Air Gap Range, Targets	Min	Typ	Max
Large >1/4"wide and >1/4" apart	.000"	.070"	.140"*
Med. >1/8" wide and >1/8" apart	.000"	.045"	.080"*
Small >1/16"wide and >1/8" apart	.000"	.028"	.030"*
8 Pitch Gear (.393" tooth to tooth)	.000"	.015"	.085"*
TRIP Frequency Accuracy, Relay OPEN	.98%	1.0%	1.01%*
RELEASE Frequency Accuracy, Relay CLOSED	.99%***	1.0%	1.02%
STOP DETECT TIME, Relay closes after sudden stop	1 second (Typ.)		

*** Gap the sensor less than MAX GAP.**
**** Relay is guaranteed OPEN if teeth are passing by faster than 1.02 * Trip Frequency.**
*****Relay is guaranteed CLOSED 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-tooth 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

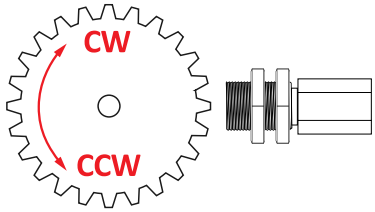
SL5-SSRDSO

OTHER MATING CONNECTORS AND CABLES AVAILABLE

S12R-SSRDSO-NCSL5-001

Gear Tooth Speed Switch

Sensor Function

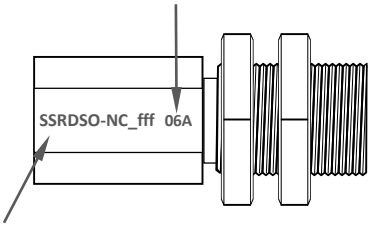


THIS SENSOR WORKS WITH ANY ORIENTATION!

S12R-SSRDSO

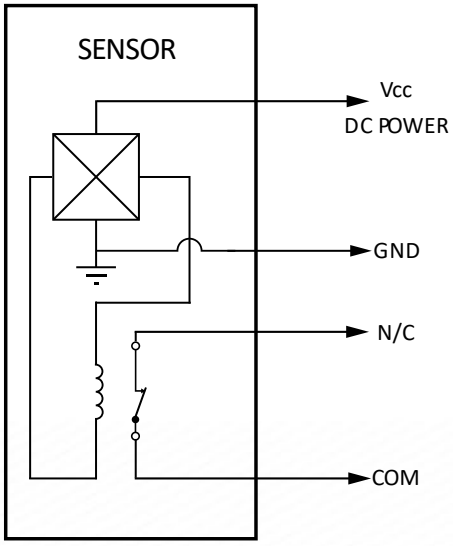
Marking

DATE CODE, THIS SURFACE



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

NC, Relay Output

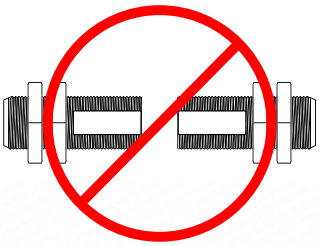


Date Code 'YYM' YY = YEAR, M = MONTH

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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12R-SSRDSO-NOSL5-001

Hall Effect Gear Tooth Speed Switch

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

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S12R-SSRDSO-NOSL5-001

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 45mm Long	Speed Switch Gear Tooth & Ferrous 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*

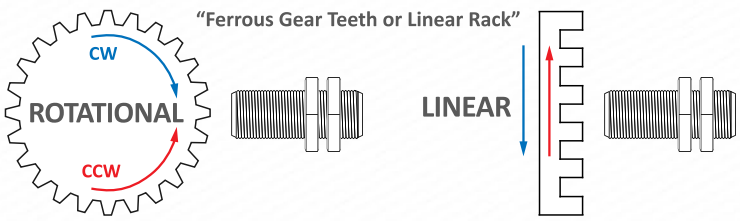
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

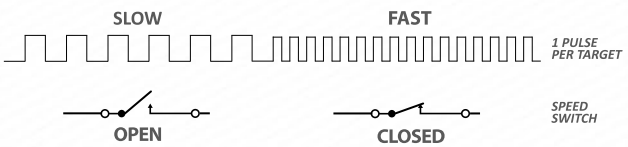
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'Steel Gears & Ferrous Target Actuated Speed Switch with Relay 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 gears and other ferrous targets using Hall Effect Technology
- Capable of detecting 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- 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 - SSG

+1 970.879.9900 | sensorsales@standexelectronics.com

S12R-SSRDSO-NOSL5-001

Hall Effect Gear Tooth Speed Switch

OTHER OPTIONS

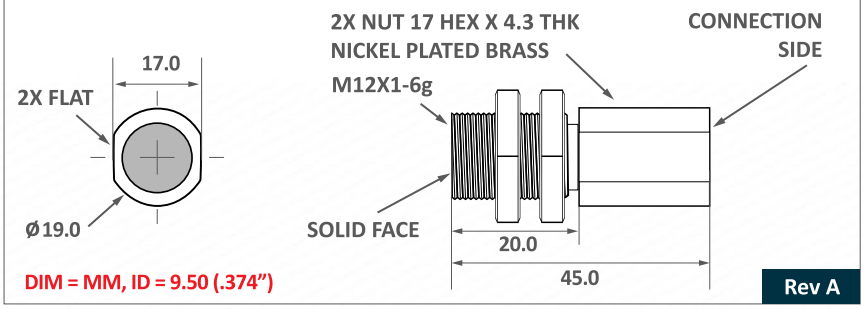
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

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	+32	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

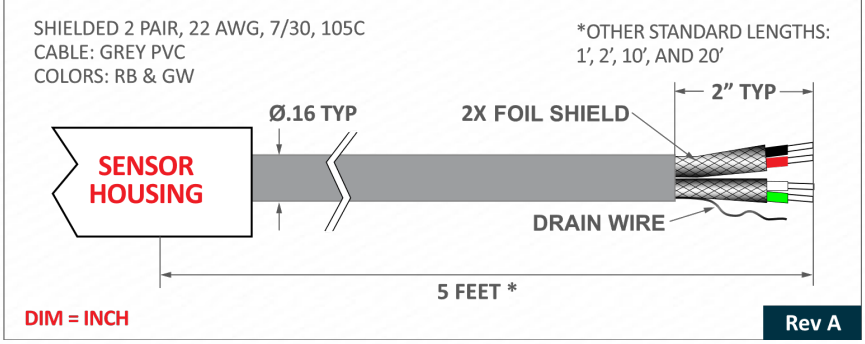
S12R, Housing, 303 Stainless Steel, M12x1, 45mm Long



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

Rev A

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



DIM = INCH

Rev A

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc-Gnd	-16	+32	Volts
Voltage at Relay	-	150	Volts AC
Voltage at Relay	-	120	Volts DC
Switching Current, T = 25C	-	1	Amp
Switching Current, T = 70C	-	.45	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

Output State at 0 Speed: Relay Open

Air Gap Range, Targets	Min	Typ	Max
Large >1/4"wide and >1/4" apart	.000"	.070"	.140"*
Med. >1/8" wide and >1/8" apart	.000"	.045"	.080"*
Small >1/16"wide and >1/8" apart	.000"	.028"	.030"*
8 Pitch Gear (.393" tooth to tooth)	.000"	.015"	.085"*
TRIP Frequency Accuracy, Relay CLOSED	.98%	1.0%	1.01%*
RELEASE Frequency Accuracy, Relay OPEN	.99%***	1.0%	1.02%
STOP DETECT TIME, Output returns high after sudden stop	1 second (Typ.)		

*** Gap the sensor less than MAX GAP.**
**** Relay is guaranteed CLOSED if teeth are passing by faster than 1.02 * Trip Frequency.**
*****Relay is guaranteed 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-tooth 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
SL5-SSRDSO			

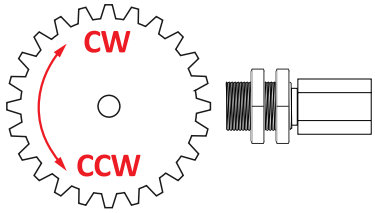
OTHER MATING CONNECTORS AND CABLES AVAILABLE

+1 970.879.9900 | sensorsales@standexelectronics.com

S12R-SSRDSO-NOSL5-001

Hall Effect Gear Tooth Speed Switch

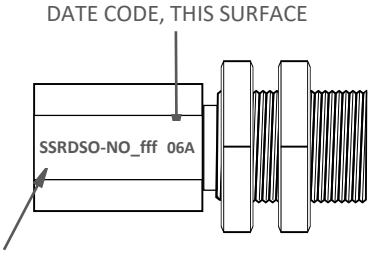
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

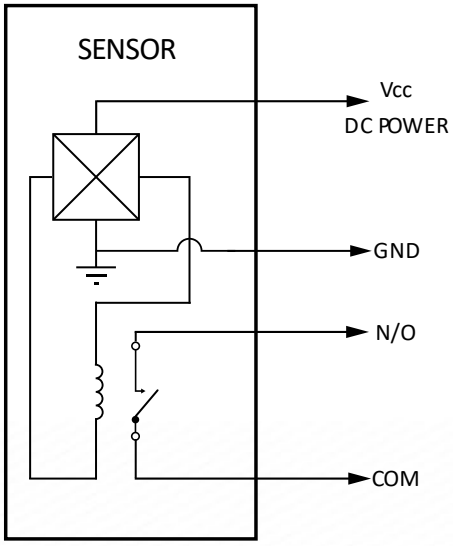
S12R-SSRDSO

Marking



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

NO, Relay Output

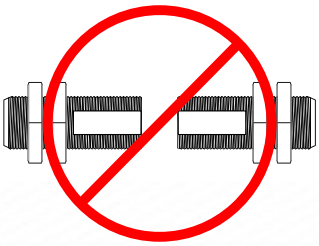


Date Code 'YYM' YY = YEAR, M = MONTH

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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S12R-SSRDSO-NOSL5-500

Gear Tooth Speed Switch

- Ferrous target 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-SSRDSO-NOSL5-500

Housing	Sensor Type & Function	Electrical Option	Connection Type	User Defined Frequency
S = Stainless Steel, Thread Pitch M12x1, 45mm Long	Speed Switch Gear Tooth & Ferrous 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*

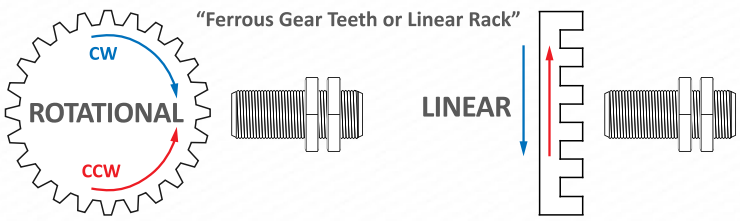
ELECTRICAL *- Every sensor function available in various electrical options (NPN, PNP, TTL, etc.)*

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

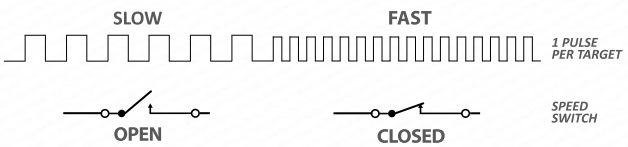
Need a Custom Sensor Solution?... Send us your application specific requirements at *sensorso.com*

'Steel Gears & Ferrous Target Actuated Speed Switch with Relay Output'

Overspeed, Underspeed, Zero-Speed



OUTPUTS



DESCRIPTION

- Speed switch output turns on/off dependent on factory programmed frequency.
- 500 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 gears and other ferrous targets using Hall Effect Technology
- Capable of detecting 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- 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 - SSG

+1 970.879.9900 | sensorsales@standexelectronics.com

S12R-SSRDSO-NOSL5-500

Gear Tooth Speed Switch

OTHER OPTIONS

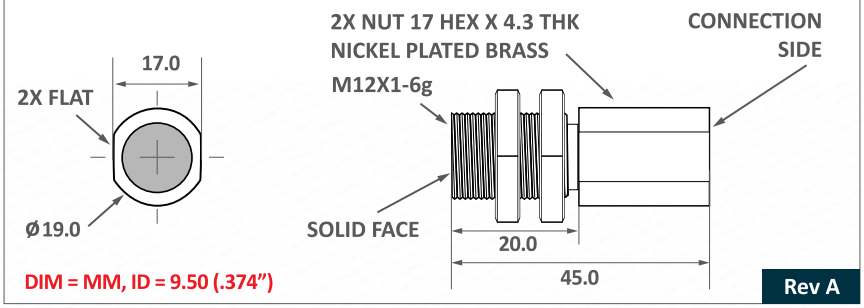
As well as these Ferrous Target Speed Switches, we offer Magnet / Magnet Tape activated Speed Switches, and Gear Tooth Speed Switches designed to work with standard gears. We have options for relay outputs, NPN outputs, and TTL outputs.

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	+32	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	490	505	Hz
Underspeed Release Freq. 100% Final Tested at factory	Relay opens	470	485	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

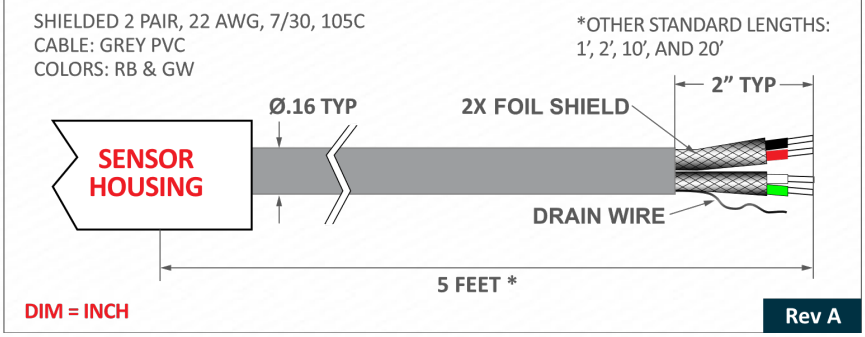
S12R, Housing, 303 Stainless Steel, M12x1, 45mm Long



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

Rev A

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



DIM = INCH

Rev A

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc-Gnd	-16	+32	Volts
Voltage at Relay	-	150	Volts AC
Voltage at Relay	-	120	Volts DC
Switching Current, T = 25C	-	1	Amp
Switching Current, T = 70C	-	.45	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

Output State at 0 Speed: Relay Open

Air Gap Range, Targets	Min	Typ	Max
Large >1/4"wide and >1/4" apart	.000"	.070"	.140"*
Med. >1/8" wide and >1/8" apart	.000"	.045"	.080"*
Small >1/16"wide and >1/8" apart	.000"	.028"	.030"*
8 Pitch Gear (.393" tooth to tooth)	.000"	.015"	.085"*
TRIP Frequency Accuracy, Relay CLOSED	.98%	1.0%	1.01%*
RELEASE Frequency Accuracy, Relay OPEN	.99%***	1.0%	1.02%
STOP DETECT TIME, Output returns high after sudden stop	1 second (Typ.)		

*** Gap the sensor less than MAX GAP.**
**** Relay is guaranteed CLOSED if teeth are passing by faster than 1.02 * Trip Frequency.**
*****Relay is guaranteed 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-tooth 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
SL5-SSRDSO			

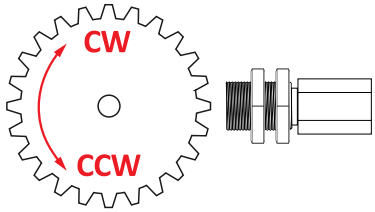
OTHER MATING CONNECTORS AND CABLES AVAILABLE

+1 970.879.9900 | sensorsales@standexelectronics.com

S12R-SSRDSO-NOSL5-500

Gear Tooth Speed Switch

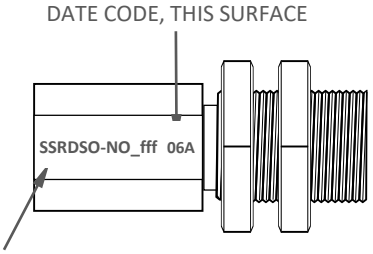
Sensor Function



THIS SENSOR WORKS WITH ANY ORIENTATION!

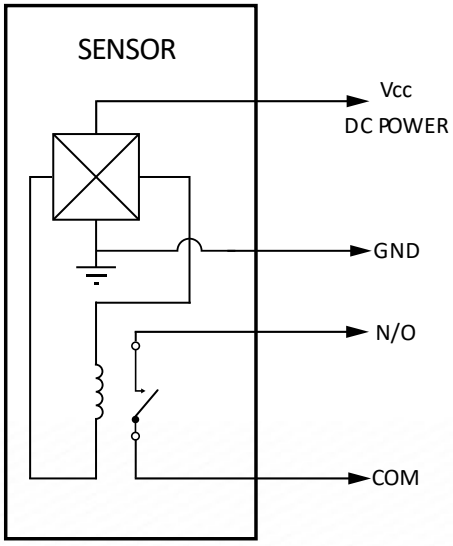
S12R-SSRDSO

Marking



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

NO, Relay Output

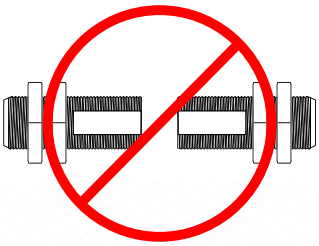


Date Code 'YYM' YY = YEAR, M = MONTH

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

+1 970.879.9900 | sensorsales@standexelectronics.com

PARTNER | SOLVE | DELIVER

Datasheet

standexelectronics.com

S38J-22ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

- Tiny Dynamic Speed Sensor
- No Orientation Required
- NPN output with 5k pull up resistor
- Stainless Steel 3/8-24 x 2.5" housing
- Jacketed 3 wire 22AWG 80C PVC, 5 ft

CUSTOMER FOCUSED ENGINEERING + MODULAR DESIGN

Part Description: S38J-22ADSO-5KJA5

Housing	Sensor Type & Function	Electrical Option	Connection Type
Stainless Steel 3/8-24 x 2.5" Long	Digital Single Output Gear Tooth Sensor	NPN, 5k Pull Up Resistor	Jacketed 3 wire 22AWG 80C PVC, 5 ft

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

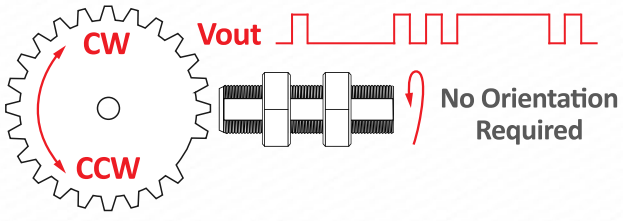
HOUSING *- Aluminum, stainless steel, plastic, threaded, flange mount, customer specific*

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*

'Target Tracker'
No Orientation Required



Type - DSO

DESCRIPTION

- Hall Effect Technology sensor for gear/ferrous target detection
- Detects 0-32 pitch gears, bolt heads, holes in steel plates, and other ferrous targets
- Single channel digital square wave output can resolve speed or count. For directional speed sensors, contact us.
- NPN goes low with ferrous metal present.
- Self-calibrating output reacts to both the leading and falling edge of any ferrous metal target

FEATURES

- Internal Hysteresis, Bounce Free
- Solid State (Nothing to wear out!)
- Temperature Stable
- Near 0 Speed Operation
- Dynamic, Self-Adjusting

Sensor Solutions
A STANDEX ELECTRONICS COMPANY

+1 970.879.9900 | sensorsales@standexelectronics.com

S38J-22ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

TARGET SPECIFICATIONS NOTICE

Target Specifications are for detecting an end-sensed, 14.5 pressure angle, steel spur gear. The presence of ferrous metals or strong magnetic fields near the sensor's internal magnet may invalidate the specifications. Engineers are available to assist in target design and applications with non-standard targets. Custom target specifications can only be guaranteed when the customer supplies a target along with any additional components that may affect sensor output, and the customer has validated function in the finished application.

Note: for NPN sensors, off is a high signal, while PNP sensors off is a low signal. Additional gear tooth sensors are available. Check our website or contact us to compare all our gear tooth and single channel speed sensor options.

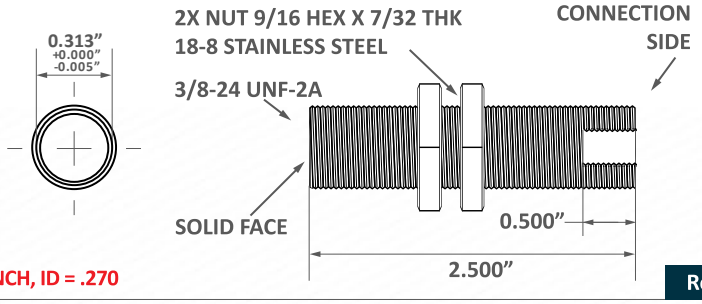
Electrical Specifications	Conditions	Min	Max	Unit
Temperature Range*	Operating	-40	+110*	Deg C
Supply Voltage, Vcc	Over temperature	+4.2	+24	Volts DC
Supply Current, Output Off	Into Vcc, Vcc = 24V	+1.5	+5	mA
Frequency Range	Near zero speed	0.1	15k	Hz
Saturation Voltage Low	I sink=20mA	0	0.6	Volts
Internal Pull Up Resistor	Vcc to Vout	4.9	5.1	kohms
Output Rise Time 10-90%	C < 100pF	-	3.0	µS
Output Fall Time 90-10%	C < 100pF	-	1.0	µS
ESD **	Nondestructive	-	2000	Volts
EMI **	20k to 1 G Hz	-	100	V / M

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

Absolute Max Limits	Min	Max	Unit
Supply Voltage, Vcc	-30	+30	Volts DC
Voltage Applied to Output	-0.3	+30	Volts
Current into Output, T=25°C	-	30	mA
Load Capacitance	-	0.01	µF
Current Out of Output	-	Vcc/5k	mA
Load Dump, 40 mS Rs = 20	-	60	Volts

Environmental Specifications	
Corrosion Resistance	500 hours salt spray ASTM B-117
Installation Torque	100 Inch-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

S38J, Housing, 303 Stainless Steel, 3/8-24, 2.5" Long



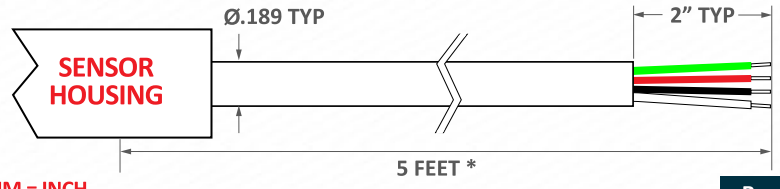
DIM = INCH, ID = .270 Rev B

Target Performance Gear Pitch ~ (#Teeth / Dia. in Inches)	Air Gap Range	Typ. Max Gap
4 (.785") Tooth to Tooth	.000 to .100"	.125"
8 (.393") Tooth to Tooth	.000 to .060"	.100"
12 (.262") Tooth to Tooth 100% Tested before shipping	.000 to .045"	.075"
16 (.196") Tooth to Tooth	.000 to .030"	.050"
20 (.157") Tooth to Tooth	.000 to .025"	.040"
24 (.131") Tooth to Tooth	.000 to .020"	.030"
32 (.098") Tooth to Tooth	.000 to .010"	.020"
Typical Output Duty Cycle	40 to 60%	
Alignment Skew Angle	360 Degrees	

JA5, Jacketed 3 Wire 22AWG PVC

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

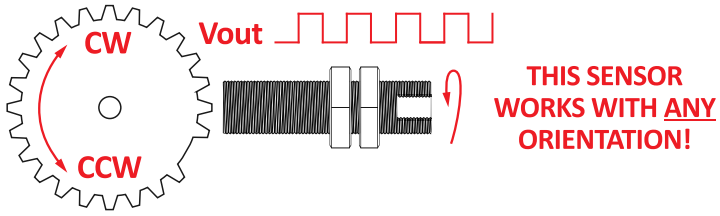
Connections Chart	
Red Vcc	Black Ground
Green Digital Vout	
JA5-37ADSO	

+1 970.879.9900 | sensorsales@standexelectronics.com

S38J-22ADSO-5KJA5

Hall Effect Gear Tooth Speed Sensor

Sensor Function



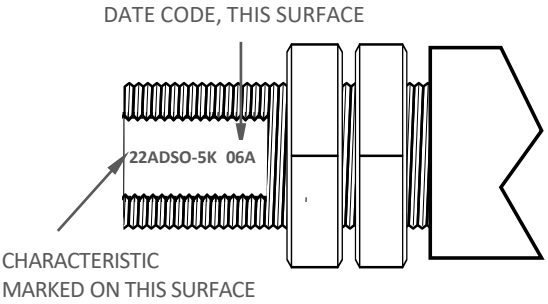
THIS SENSOR WORKS WITH ANY ORIENTATION!

S38J-22ADSO

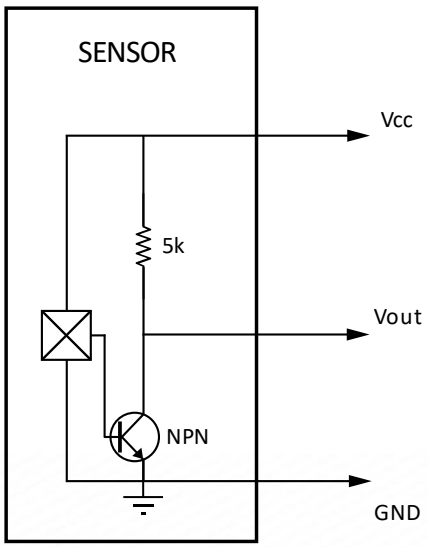
Date Code 'YYM' YY = YEAR, M = MONTH

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

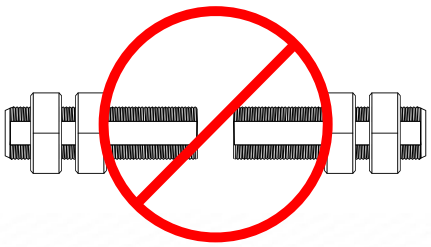


5K, 5k Pull-up Resistor



Handling Instructions

DO NOT CONTACT FACE TO FACE



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

+1 970.879.9900 | sensorsales@standexelectronics.com