

# Accessories



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# Magnetic Pickups & Gears

## Passive Speed Pickups

**Models: 7121-0000, 7125-0000, 7130-0500, 7131-0001**

### Description

High Output sensors are designed for use in applications where higher output voltages are needed. They perform best at low to medium speeds with medium to high impedance loads. Front-End Sealed versions are available for use where the sensor is exposed to fluids, lubricants or adverse environmental conditions. Passive Magnetic Speed sensors are simple, rugged devices that do not require an external voltage source for operation. A permanent magnet in the sensor establishes a fixed magnetic field. The approach and passing of a ferrous metal target near the sensor's pole piece (sensing area) changes the flux lines of the magnetic field, dynamically changing its strength. This change in magnetic field strength induces a current into a coil winding which is attached to the output terminals. The output signal of the sensor is an ac voltage that varies in amplitude and wave frequency as the speed of the monitored device changes, and is usually expressed in peak to peak voltage (Vp-p). One complete waveform (cycle) occurs as each target passes the sensor's pole piece. If a standard gear were used as a target, this output signal would resemble a sine wave if viewed on an oscilloscope.



### Potential Applications

- Engine RPM (revolutions per minute) measurement on aircraft, automobiles, boats, buses, trucks and rail vehicles
- Process speed measurement on food, textile, paper, woodworking, printing, tobacco and pharmaceutical industry machinery
- Motor speed measurement of electrical generating equipment
- Speed measurement of pumps, blowers, mixers, exhaust and ventilating fans
- Flow measurement on turbine meters
- Gear speed measurement

### Features

- Self-powered operation
- Direct conversion of actuator speed to output frequency
- Simple installation, No moving parts
- Designed for use over a wide range of speeds
- Adaptable to a wide variety of configurations
- Customized VRS products for unique speed sensing applications
- Housing materials/styles: stainless steel threaded or smooth
- Output voltages: 8 Vp-p to 190 Vp-p

# Magnetic Pickups & Gears

## 7121-0000 Specifications

- Diameter: 15,9 mm [0.625 in]
- Available Metric Thread: M16
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 20 DP [Module 1.27], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 190 Vp-p
- Pole Piece Shape and Size: Round; 2,69 mm [0.106 in] Diameter
- Operating Temperature: -55 °C to 120 °C [-67 °F to 250 °F]
- Gear Pitch Range: 24 DP (Module 1.06) or Coarser
- Operating Frequency: 15 kHz
- Inductance: 450 mH
- Coil Resistance: 910 Ohm to 1200 Ohm
- Surface Speed: 0,25 m/s [10 in/s]
- Optimum Actuator: 20 DP (Module 1.27) Ferrous Metal Gear
- Mounting Thread: 5/8-18 UNF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded
- Housing Length: 56 mm [2.20 in]
- Termination: MS3106 Connector
- Weight: 70 g [2.5 oz]

## 7125-0000 Specifications

- Diameter: 15,9 mm [0.625 in]
- Available Metric Thread: M16
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 20 DP [Module 1.27], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 190 Vp-p
- Pole Piece Shape and Size: Round; 2,69 mm [0.106 in] Diameter
- Operating Temperature: -55 °C to 120 °C [-67 °F to 250 °F]
- Gear Pitch Range: 24 DP (Module 1.06) or Coarser
- Operating Frequency: 15 kHz
- Inductance: 450 mH
- Coil Resistance: 910 Ohm to 1200 Ohm
- Surface Speed: 0,25 m/s [10 in/s]
- Optimum Actuator: 20 DP (Module 1.27) Ferrous Metal Gear
- Mounting Thread: 5/8-18 UNF-2A
- Vibration: MIL-STD 202F, Method 204D

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- Material: Stainless Steel Threaded
- Housing Length: 130 mm [5.10 in]
- Termination: MS3106 Connector
- Weight: 98 g [3.5 oz]
- Series Name: High Output

## 7131-0001 Specifications

- Diameter: 15,9 mm [0.625 in]
- Available Metric Thread: M16
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 20 DP [Module 1.27], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 190 Vp-p
- Pole Piece Shape and Size: Round; 2,69 mm [0.106 in] Diameter
- Operating Temperature: -55 °C to 120 °C [-67 °F to 250 °F]
- Gear Pitch Range: 24 DP (Module 1.06) or Coarser
- Operating Frequency: 15 kHz
- Inductance: 450 mH
- Coil Resistance: 910 Ohm to 1200 Ohm
- Surface Speed: 0,25 m/s [10 in/s]
- Optimum Actuator: 20 DP (Module 1.27) Ferrous Metal Gear
- Mounting Thread: 5/8-18 UNF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded
- Housing Length: 156 mm [6.10 in]
- Termination: MS3106 Connector
- Weight: 128 g [4.5 oz]

# Magnetic Pickups & Gears

## Explosion Proof Speed Pickups

Models: 7120-0000, 7130-0000, 7131-0000, 7131-0503

### Description

Explosion proof speed sensors are designed for use in hazardous locations. All explosion proof sensors listed are of the same design, but with different dimensions. Passive Magnetic Speed sensors are simple, rugged devices that do not require an external voltage source for operation. A permanent magnet in the sensor establishes a fixed magnetic field. The approach and passing of a ferrous metal target near the sensor's pole piece (sensing area) changes the flux of the magnetic field, dynamically changing its strength. This change in magnetic field strength induces a current into a coil winding which is attached to the output terminals. The output signal of the sensor is an ac voltage that varies in amplitude and wave frequency as the speed of the monitored device changes, and is usually expressed in peak to peak voltage (Vp-p). One complete waveform (cycle) occurs as each target passes the sensor's pole piece. If a standard gear were used as a target, this output signal would resemble a sine wave if viewed on an oscilloscope.



### Potential Applications

- Engine RPM (revolutions per minute) measurement on aircraft, automobiles, boats, buses, trucks and rail vehicles
- Motor RPM on oil and gas drilling equipment and machinery
- Process speed measurement on food, textile, paper, woodworking, printing, tobacco and pharmaceutical industry machinery
- Motor speed measurement of electrical generating equipment in grain elevators, sawmills and other potentially explosive environments
- Speed measurement of pumps, blowers, mixers, exhaust and ventilating fans
- Gear speed measurement

### Features

- Self-powered operation
- Direct conversion of actuator speed to output frequency
- Simple installation
- No moving parts
- Designed for use over a wide range of speeds
- Adaptable to a wide variety of configurations
- Housing diameters: 3/4 in, 5/8 in
- Housing material/style: stainless steel threaded
- Output voltages: 30 Vp-p to 60 Vp-p

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## 7120-0000 Specifications

- Diameter: 19,5 mm [0.750 in]
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 8 DP [Module 3.17], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 60 Vp-p
- Pole Piece Shape and Size: Round; 4,75 mm [0.187 in] Diameter
- Operating Temperature: -73 °C to 93 °C [-100 °F to 200 °F]
- Gear Pitch Range: 12 DP (Module 2.11) or Coarser
- Operating Frequency: 40 kHz
- Inductance: 115 mH
- Coil Resistance: 191 Ohm to 280 Ohm
- Surface Speed: 0,38 m/s [15 in/s]
- Optimum Actuator: 8 DP (Module 3.17) Ferrous Metal Gear
- Mounting Thread: 3/4-20 UNEF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded
- Housing Length: 78 mm [3.05 in]
- Termination: 24 AWG PVC-Insulated Leads, 3000 mm [120 in]
- Weight: 294 g [10.5 oz]
- Series Name: Hazardous Location

## 7130-0000 Specifications

- Diameter: 19,5 mm [0.750 in]
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 8 DP [Module 3.17], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 60 Vp-p
- Pole Piece Shape and Size: Round; 4,75 mm [0.187 in] Diameter
- Operating Temperature: -73 °C to 93 °C [-100 °F to 200 °F]
- Gear Pitch Range: 12 DP (Module 2.11) or Coarser
- Operating Frequency: 40 kHz
- Inductance: 115 mH
- Coil Resistance: 191 Ohm to 280 Ohm
- Surface Speed: 0,38 m/s [15 in/s]
- Optimum Actuator: 8 DP (Module 3.17) Ferrous Metal Gear
- Mounting Thread: 3/4-20 UNEF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded

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- Housing Length: 122 mm [4.80 in]
- Termination: 24 AWG PVC-Insulated Leads, 3000 mm [120 in]
- Weight: 322 g [11.5 oz]
- Series Name: Hazardous Location

## 7131-0503 Specifications

- Diameter: 15,9 mm [0.625 in]
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 8 DP [Module 3.17], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 60 Vp-p
- Pole Piece Shape and Size: Round; 4,75 mm [0.187 in] Diameter
- Operating Temperature: -73 °C to 93 °C [-100 °F to 200 °F]
- Gear Pitch Range: 12 DP (Module 2.11) or Coarser
- Operating Frequency: 40 kHz
- Inductance: 115 mH
- Coil Resistance: 191 Ohm to 280 Ohm
- Surface Speed: 0,38 m/s [15 in/s]
- Optimum Actuator: 8 DP (Module 3.17) Ferrous Metal Gear
- Mounting Thread: 5/8-20 UNF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded
- Housing Length: 78 mm [3.05 in]
- Termination: 18 AWG PVC-Insulated Leads, 3000 mm [120 in], Conduit Mount
- Weight: 280 g [9.0 oz]

## 7131-0000 Specifications

- Diameter: 15,9 mm [0.625 in]
- Test Condition Specifications: Surface Speed = 25 m/s [1000 in/s], Gear = 8 DP [Module 3.17], Air Gap = 0.127 mm [0.005 in], Load Resistance = 100 kOhm
- Output Voltage (Peak to Peak) Min.: 60 Vp-p
- Pole Piece Shape and Size: Round; 4,75 mm [0.187 in] Diameter
- Operating Temperature: -73 °C to 93 °C [-100 °F to 200 °F]
- Gear Pitch Range: 12 DP (Module 2.11) or Coarser
- Operating Frequency: 40 kHz
- Inductance: 115 mH
- Coil Resistance: 191 Ohm to 280 Ohm
- Surface Speed: 0,38 m/s [15 in/s]

# Magnetic Pickups & Gears

- Optimum Actuator: 8 DP (Module 3.17) Ferrous Metal Gear
- Mounting Thread: 5/8-20 UNF-2A
- Vibration: MIL-STD 202F, Method 204D
- Material: Stainless Steel Threaded
- Housing Length: 122 mm [4.80 in]
- Termination: 18 AWG PVC-Insulated Leads, 3000 mm [120 in], Conduit Mount
- Weight: 366 g [10.0 oz]

## High Output Speed Pickups Models: 7131-0004

### 7131-004 Specifications

- Diameter: 0.140 in
- Test Condition Specifications: 276 Hz, 8 pitch Gear, 0.016 Gap., And 270 Ohm Load
- Output Voltage (Peak to Peak) Min.: 9.2 Vp-p
- Operating Temperature: -65 °F to 220 °F
- Inductance: 87 mH Typical
- Coil Resistance: 190 - 210 Ohm
- Mounting Thread: 5/8-18 UNF-2A
- Material: Stainless Steel Threaded
- Thread Length: 4.0 in
- Housing Length: 5.093 in
- Weight: 128 g [4.5 oz]

# Magnetic Pickups & Gears

## Ordering Information

### Model Number

### Description

#### **Magnetic Pickups**

7121-0000	Magnetic Pickup, Standard - 5/8-18 x 2.218" (1.125" thrds)
7125-0000	Magnetic Pickup, Long Reach – 5/8-18 x 5.093" (4.00" thrds)
7131-0001	Magnetic Pickup, Standard, 5/8-18 x 6.107" (5" thrds)
7130-0500	Magnetic Pickup, Standard
7120-0000	Explosion Proof Pickup, Standard -3/4-20 x 3.125" (1.875" thrds)
7130-0000	Explosion Proof Pickup, Long Reach – 3/4-20 x 4.75" (3.5" thrds)
7131-0000	Explosion Proof Magnetic Pickup, 5/8-18 x 9.75" (8.5" thrds)
7131-0503	Explosion Proof Magnetic Pickup 5/8-18 x 3.050" (1.8" thrds)
7131-0004	High Output Pickup – 5/8-18 x 5.093" (4.0" thrds)
9732-0500	Cable and Connector

#### **Shielded Cables/Connectors**

0086-5635	30" Shielded Leads
0093-2537	10' Shielded Leads

#### **Unshielded Cables/Connectors**

7123-0000	Connector for 7121 and 7125
85-3689	Connector w/ 30' Cable
85-3690	Connector w/ 50' Cable

#### **Gears**

0095-6178	5" 30 Tooth, Split
0097-6504	6" 60 Tooth
0086-5305	Speed Disk
0087-5676	3" 30 Tooth
0087-5675	5" 30 1/2" Bore
0087-5674	5" 60 1/2" Bore
0097-6504	6" 60 Tooth 1/2" Bore
0095-6178	Gear Split 5" 30 Tooth 1/2" Bore (Max Bore 2")

## Description

The linear variable differential transducer (LVDT) is a type of electrical transformer used for measuring linear displacement. Tri-Sen sells the LS Series of LVDTs to provide position feedback to a servo control loop.



## Features

- Various measurement lengths: 50 to 450mm (2" – 18")
- High accuracy: Linearity is  $\pm 0.2\%$  of full stroke, Suitable for governor control requiring high accuracy.
- Environment: Heavy duty specifications and high reliability.
  - ✓ Hermetically Sealed: Resists high humidity
  - ✓ Stainless steel casing: Excellent corrosion resistance
  - ✓ Anti-vibration: 490m/s<sup>2</sup>
  - ✓ Operating temperature range:  $-40$  to  $+150^{\circ}\text{C}$  (for terminal block type)
  - ✓ Built-in magnetic shield to eliminate the effect of external magnetic fields.

## Specifications

- Stroke: 50, 100, 150, 200, 250, 300, 350, 400, 450mm
- Excitation: 3kHz, 5 to 20Vrms
- Coil impedance:  $600\Omega + 100\Omega$  (3kHz)
- Linearity:  $\pm 0.2\%$  of 100% stroke,  $\pm 1.5\%$  of 110% stroke. (measured with the test circuit)
- Operating temperature:  $-40$  to  $+125^{\circ}\text{C}$  ( $-40$  to  $+248^{\circ}\text{F}$  REF.) (for connector type),  $-40$  to  $+150^{\circ}\text{C}$  ( $-40$  to  $+302^{\circ}\text{F}$  REF.) (for terminal block type), Insulation resistance  $10\text{M}\Omega$  min. at 500VDC between pins and case
- Insulation Resistance: More than  $10\text{M}\Omega$  at 500VDC (between pins and case)
- Dielectric strength: 500Vrms for one minute (between pins and case)
- Shock vibration: 490m/s<sup>2</sup> (50g REF.) at 2,000Hz
- Magnetic shielding: Internal magnetic shielding
- Standard cable: 3-Wire shielded cable with connector (5m, AWG No.20)

## Ordering Information

<u>Model Number</u>	<u>Description</u>
9934-0023	LS Series LVDT, 2" (+/-1")
9934-0022	LS Series LVDT, 4" (+/-2")
9934-0021	LS Series LVDT, 6" (+/-3")
9934-0020	LS Series LVDT, 8" (+/-4")
9934-0019	LS Series LVDT, 10" (+/-5")
9934-0018	LS Series LVDT, 12" (+/-6")
9934-0017	LS Series LVDT, 14" (+/-7")
9934-0016	LS Series LVDT, 16" (+/-8")
9934-0015	LS Series LVDT, 18" (+/-9")
9689-0045	LS Series Mating Connector, straight
9689-0105	LS Series Mating Connector, right angle