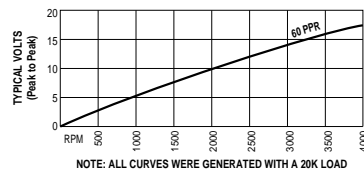




- **Speed Range: typically 50 RPM min. to 4000 RPM max.**
- **Sine wave output**
- **Passive, no external power source required**
- **Compact 3/8" & 5/8" diameter packages**
- **Rugged, mill-duty construction**

These variable reluctance, magnetic sensors are the simplest, most economical form of speed sensing. Motion and speed are sensed without mechanical couplings, bearings, linkages or an external power source. A sinewave alternating voltage signal is generated synchronously in the presence of gear teeth made of carbon steel, magnetic stainless steel, or iron (ferrous metal). Output voltage and frequency start at zero with zero target speed, and both increase with the increasing speed of a passing target.

These sensors are typically used in conjunction with a variety of instruments (including Dynapar MAX Tach, MAX Speed with a PM28S module, and the MAXjr Tach indicator) for indicating or controlling speed, flow rate, etc. Advantages of magnetic pickups include the ability to generate a wide range of error-free speed signals for many applications at a moderate price. Reliable operation with little protection required from wet, dirty, high temperature environments has made magnetic pickups a popular selection for many industrial, military, and commercial applications.

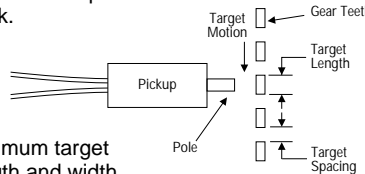


NOTE: ALL CURVES WERE GENERATED WITH A 20K LOAD
Typical Output Voltages vs. RPM

Application Guidelines

Characteristics required for proper selection and application of variable reluctance sensors include:

1. Target speeds of interest must be greater than approximately 180 in./min. (60 tooth gear operation: 50 to 4000 RPM), and will generate operational voltage levels typically 0.5 to 2 volts peak-to-peak.
2. Minimum target length and width dimensions should be greater than and centered on the diameter of the pole tip.
3. Target spacing must be at least three times the length of the target.
4. The gap between the target and the tip of the pickups pole should be as small as possible (output voltage is optimized at a gap of 0.005").



Recommended Dynapar brand Gears

Gear	Dia.	Bore	Pitch	PPR	50	52BH
16002070081	3-1/10"	3/8"	20	60	X	
16002070083	3-7/8"	1/2"	16	60	X	
16002070216	5-1/2"	1-1/8"	11	60	X	X
16002070217	5-1/2"	1-3/8"	11	60	X	X
16002070218	5-1/2"	1-5/8"	11	60	X	X
16002600314	5-1/2"	1-7/8"	11	60	X	X
16002600315	5-1/2"	2"	11	60	X	X
16002600316	5-1/2"	2-1/8"	11	60	X	X
16002600317	5-1/2"	2-1/4"	11	60	X	X
16002600318	5-1/2"	2-3/8"	11	60	X	X
16002600319	5-1/2"	2-1/2"	11	60	X	X
16002600320	5-1/2"	2-7/8"	11	60	X	X

SPECIFICATIONS

Operating Temperature: 0° to 170°F

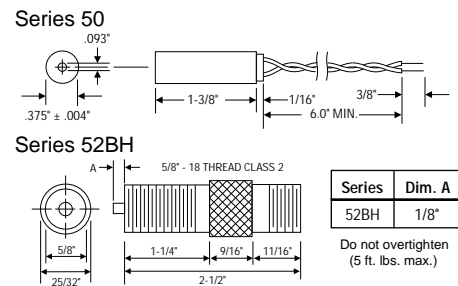
Recommended Gap: .005 inch

Output: Greater than .5 volt peak (2K ohm load) above 3 in./sec.

Cable Length: Maximum recommended cable length is 100 feet, but can be extended to 300 feet with minimum speeds above 300 RPM. Line amplifiers are available for longer line lengths. Consult factory.

DC Resistance: 500 to 650 ohms

Approximate Dimensions (in inches)



Electrical Connections

Function	Series 50 Wire Color Code	Series 52BH Pin No.	Dyn.#14002030010* Cable Acc'y Color Code
Signal Out	WHT	A	RED
Common	BLK	B	BLK

Note: Wire with 2-conductor shielded cable, such as Belden 8737 should be insulated at sensor and grounded at the instrument.

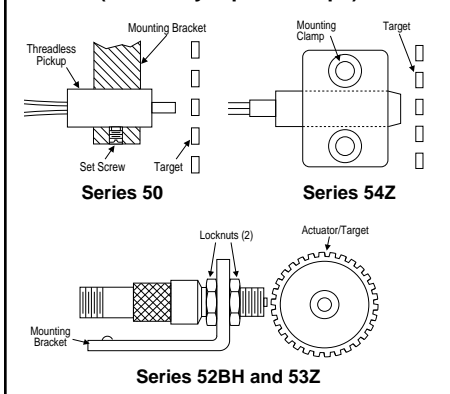
*This is a cable assembly described in the Encoder Accessories section of this catalog. (A mating connector is also available.) Color-coding information is provided here for reference.

Ordering Information

Output Waveform	Termination	Tip Length	Model No.
	6" leads	—	50
	Pin connector	1/8"	52BH

Note: For slower speed applications, refer to Series 53Z magneto-resistive pickups.

Typical Installation Methods (For All Dynapar Pickups)

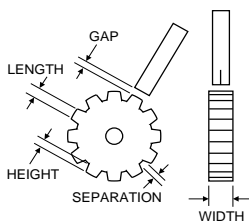




- **Speed Range: zero speed to 20 kHz**
- **Squarewave digital outputs**
- **Rugged, mill-duty construction**
- **Compact 5/8" diameter package**

Series 53Z and 53ZK pickups provide a squarewave digital output that is generated by the alternating presence and absence of a ferrous metal target. The 53Z is used with gear teeth. The 53ZK's commonly used targets include gear teeth, slotted discs, shafts with keyways, etc. made of carbon steel, iron, or magnetic stainless steel. These sensors provide constant amplitude pulses down to zero speed. Reliable operation in wet, dirty, high temperature environments makes magnetic pickups a popular selection for many industrial and commercial applications.

Typical Application



Remember to rotate the pickup so that the line on the side is parallel to gear travel.

Electrical Connections

Function	Series 53Z & 53ZK Pin No.	Dyn.#14003340010* Cable Acc'y Color Code
5-15 VDC	A	RED
Signal	B	WHT
Common	C	BLK

*This is a mating connector/cable assembly described in the Encoder Accessories section of this catalog. Color-coding information is provided here for reference.

Applications

- Speed sensing
- Inputs for PLC's, instruments, electronic counters, etc. •

Note: For ease of installation and optimum performance, a keyway is provided so that the sensor may be visually aligned with the target's direction of travel.

SPECIFICATIONS

Power Requirements: 5-15 VDC, 15 mA plus load

Weight: 2 oz.

Operating Temperature: -25° to +80°C

Mating Connector: MS3106A-10SL-3S or Dynapar Part No. MCN-N2

Recommended Cable: Belden #9770 or Dynapar Part No. 16002160022

Note: Series 53Z's and 53ZK's are not proximity detectors.

53Z (gear pickup) Target:

- Pitch:** 20 to 32
- Gap:** 0.005 to 0.015" (0.127 to 0.381 mm)
- Length:** 0.049 to 0.081" (1.24 to 2.06 mm)
- Separation:** 0.049 to 0.081" (1.24 to 2.06 mm)
- Width:** 0.25" (6.35 mm) min.
- Height:** 0.035" (.889 mm) min.

53ZK (keyway pickup) Target:

- Pitch:** 20 max.
- Gap:** 0.005 to 0.030" (0.127 to 0.762 mm)
- Length:** 0.081" (2.057 mm) min.
- Separation:** 0.081" (2.057 mm) min.
- Width:** 0.375" (9.525 mm) min.
- Height:** 0.081" (2.057 mm) min.

Note: The target can be a ferrous gear that falls within minimum dimensions.

Ordering Information

Output Waveform	Termination	Model No.
Unidirectional for gear A	MS Pin Connector	53Z
Unidirectional for keyway A	MS Pin Connector	53ZK

Recommended Dynapar brand Gears

Gear	Dia.	Bore	Pitch	PPR	53Z	53ZK
16002070081	3-1/10"	3/8"	20	60	X	X
16002070083	3-7/8"	1/2"	16	60		X
16002070216	5-1/2"	1-1/8"	11	60		X
16002070217	5-1/2"	1-3/8"	11	60		X
16002070218	5-1/2"	1-5/8"	11	60		X
16002600314	5-1/2"	1-7/8"	11	60		X
16002600315	5-1/2"	2"	11	60		X
16002600316	5-1/2"	2-1/8"	11	60		X
16002600317	5-1/2"	2-1/4"	11	60		X
16002600318	5-1/2"	2-3/8"	11	60		X
16002600319	5-1/2"	2-1/2"	11	60		X
16002600320	5-1/2"	2-7/8"	11	60		X
16002070219	5-1/2"	1-1/8"	22	120	X	
16002070220	5-1/2"	1-3/8"	22	120	X	
16002070221	5-1/2"	1-5/8"	22	120	X	
16002600307	5-1/2"	1-7/8"	22	120	X	
16002600308	5-1/2"	2"	22	120	X	
16002600309	5-1/2"	2-1/8"	22	120	X	
16002600310	5-1/2"	2-1/4"	22	120	X	
16002600311	5-1/2"	2-3/8"	22	120	X	
16002600312	5-1/2"	2-1/2"	22	120	X	
16002600313	5-1/2"	2-7/8"	22	120	X	
Key / Keyway				1		X

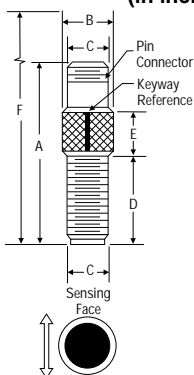
Gears (For All Dynapar Pickups)



For use with series 50, 52BH, 53Z, and 53ZK pickups. Designed for customer boring and mounting.

Part No.	No. of Teeth	Pitch Dia.	Pitch	Rough Hole Bore	Largest Hole Bore Possible
16002070081	60	3.00"	20	3/8"	1.00"
16002070083	60	3.750"	16	1/2"	1.00"

Approximate Dimensions (in inches/mm)



53Z & 53ZK

- A. 2-9/16" (65.08mm)
 - B. 3/4" (19.05mm)
 - C. 5/8" (15.9mm)
 - D. 1-1/8" (28.6mm)
 - E. 9/16" (14.3mm)
 - F. 4-1/8" (104.8mm)
- Length with mating connector
Mounting Thread 5/8-18
DO NOT OVERTIGHTEN
(5 ft. lbs. max.)

Arrows indicate direction of metallic target or gear teeth movement relative to keyway position and mark on barrel.

Electrical Output Ratings

Outputs	Voltage Range	Sink (mA)	Source (mA)	Operating Speed
Current Sink (open collector w/2.0 kΩ pull-ups)	5-15 VDC	25	0.8 mA @ 3.5V output	20 kHz max.



- **Low Cost Pickup**
- **Compact Design**
- **Simple Installation**
- **Wide Operating Range**

The Series 54 pickups offer new levels of economy, performance and convenience to sensing devices. The Series 54 sensors operate over a wide range of air gaps, making them suitable for parts counting and speed sensing applications. The wide operating voltage makes them compatible with most counters, indicators or controllers. The Series 54 does not require a minimum target speed, and can operate from zero up to 20,000 targets per second. Commonly used targets include gear teeth, slotted discs, shafts with keyways, etc. made of carbon steel, iron, or magnetic stainless steel. This low cost sensor offers reliable operation in wet, dirty and high temperature environments.

Applications

- Parts counting
- Speed sensing
- Sensor for PLC's and indicators

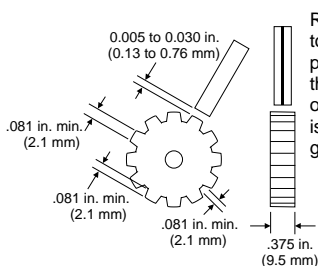
Application Guidelines:

For ease of installation and optimum performance, a keyway is provided so that the sensor may be visually aligned with the target's direction of travel.

Target: Requirements

- Gap: 0.005 to 0.030 inch
- Length: 0.081 inch min.
- Separation: 0.081 inch min.
- Width: 0.375 inch min.
- Height: 0.081 inch min.
- Speed: 0 to 20,000 targets/sec. max.
- Pitch: 20 max

Target Requirements



Remember to rotate the pickup so that the line on the side is parallel to gear travel.

SPECIFICATIONS

Power Requirements: 5 to 18 VDC, 10 mA plus load

Weight: 2 oz.

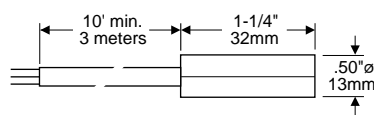
Operating Temperature: -40 to +105 °C (-40 to +220 °F.)

Cable: 105 °C, PVC insulation, 10 foot length

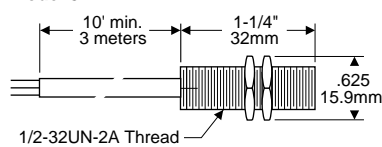
Material: Stainless 303 Steel

Approximate Dimensions

Model 54Z

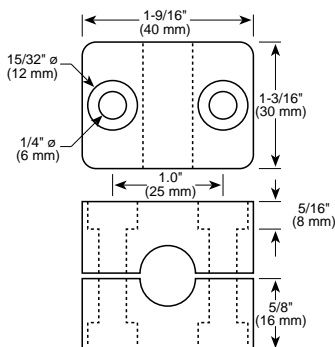


Model 54ZT

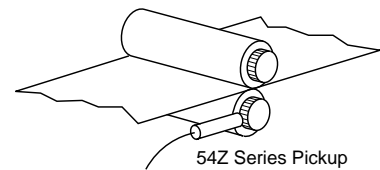


Mounting Clamp

(not required for model 54ZT)



Typical Application



54Z Series Pickup

Electrical Output Ratings

Outputs	Voltage Range	Sink (mA)	Source (mA)	Operating Speed
Current Sink (open collector w/2.2 kΩ pull-ups)	5 to 18 VDC	17	0.9 mA @ V _{CC} -2V output	20 kHz max.

Electrical Connections

Function	Series 54Z Wire Color Code
5 to 18 VDC	RED
Signal	WHT
Common	BLK

Recommended Dynapar brand Gears

Gear	Dia.	Bore	Pitch	PPR	54Z/54ZT
16002070081	3-1/10"	3/8"	20	60	X
16002070083	3-7/8"	1/2"	16	60	X
16002070216	5-1/2"	1-1/8"	11	60	X
16002070217	5-1/2"	1-3/8"	11	60	X
16002070218	5-1/2"	1-5/8"	11	60	X
16002600314	5-1/2"	1-7/8"	11	60	X
16002600315	5-1/2"	2"	11	60	X
16002600316	5-1/2"	2-1/8"	11	60	X
16002600317	5-1/2"	2-1/4"	11	60	X
16002600318	5-1/2"	2-3/8"	11	60	X
16002600319	5-1/2"	2-1/2"	11	60	X
16002600320	5-1/2"	2-7/8"	11	60	X
Key or Keyway				1	X

Ordering Information

Output Waveform	Description	Model No.
Unidirectional A	Pickup	54Z
	Threaded Pickup	54ZT
	Clamp for 54Z	605213



- **High output gear tooth sensor**
- **Requires no power Supply**
- **For low RPM measurement**

For monitoring the speed of any shaft when mated with a magnetic-input tachometer and positioned in alignment with the teeth of a ferrous material gear. Typically, 60-tooth, 16-pitch gears provide the optimum characteristics for RPM measurement, but other gear types can serve special application needs. They are well suited for industrial machinery as well as test stand and laboratory installations. Series 7143 is available in a plastic tube model, supplied with mounting bracket, or in threaded stainless-steel model. Both include a 10-foot shielded cable with mating connector.

- High output design for superior low velocity performance
- Two-wire, self generating output requires no power connection
- Economy plastic, or heavy-duty noncorrosive stainless steel models
- Supplied with all necessary mounting hardware and cable

Series 7143 features an extra strength permanent magnet pole-piece and high inductance coil. Gear teeth supply the motion within the magnetic field, so that the sensor/gear combination acts as an AC generator. Voltage output is directly proportional to velocity and closeness of the air gap.

Recommended Gears

Gear	Dia.	Bore	Pitch	PPR	7143
16002070083	3-7/8"	1/2"	16	60	X
16002070216	5-1/2"	1-1/8"	11	60	X
16002070217	5-1/2"	1-3/8"	11	60	X
16002070218	5-1/2"	1-5/8"	11	60	X
16002600314	5-1/2"	1-7/8"	11	60	X
16002600315	5-1/2"	2"	11	60	X
16002600316	5-1/2"	2-1/8"	11	60	X
16002600317	5-1/2"	2-1/4"	11	60	X
16002600318	5-1/2"	2-3/8"	11	60	X
16002600319	5-1/2"	2-1/2"	11	60	X
16002600320	5-1/2"	2-7/8"	11	60	X

SPECIFICATIONS

Output Voltage: 25 VDC minimum peak to peak (into 100 kΩ load) with 16-pitch gear, 1000 RPM, 0.01" gap

DC Resistance: 1200Ω maximum

Inductance: 400 mH maximum

Temperature Range: -100° to +225°F (-73° to +107°C)

Materials: Model Number 714300-001: Plastic shell, stainless steel pole piece; Model Number 714300-002: Stainless steel shell and pole piece

Mounting: Model Number 714300-001: Aluminum bracket (supplied); Model Number 714300-002: Threaded body with locknuts (supplied)

Connections: 10' cable assembly (supplied)

SELECTING THE PROPER GEAR

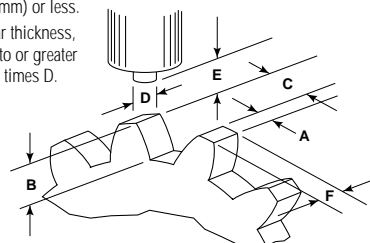
It is vital when using the Series 7143 for revolutions per minute applications that a 60-tooth, ferrous gear be properly selected. Optimum results relative to the sensing of low rpm, as well as high speeds will be achieved with gears having a pitch of 16 or less, and a gear-to-sensor gap of 0.01" or less. Sixty-tooth gears with up to 20 pitch and/or gear-to-sensor gaps of up to 0.05", will produce excellent results provided that operation below approximately 600 rpm is not required.

The following figure suggests typical requirements for gear configuration. Ideal dimensions may not be available in stock gears, but the figure serves as a guide for selection of the best stock gear available.

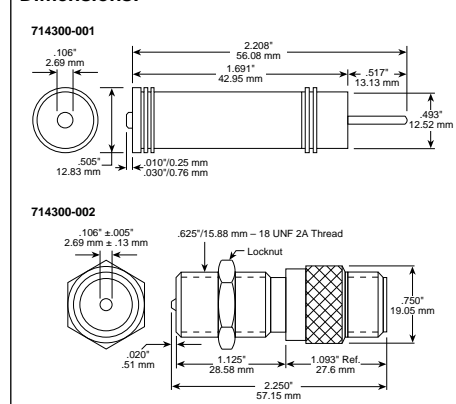
- A. Dimension of tooth top, equal to or greater than D.
- B. Height of tooth, equal to or greater than D.
- C. Space between teeth, equal to or greater than D.
- D. Diameter of pole piece, typically 0.106" (2.69 mm).

E. Clearance, as close as possible, typically 0.01" (0.25 mm) or less.

F. Gear thickness, equal to or greater than 2 times D.



Dimensions:



Model No.	Description
714300-001	1/2" diameter x 1-3/4" plastic probe, bracket, cable assembly
714300-002	5/8" diameter x 2-1/4" stainless steel probe, cable assembly