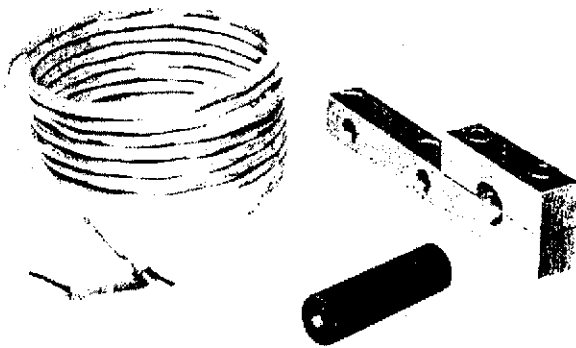


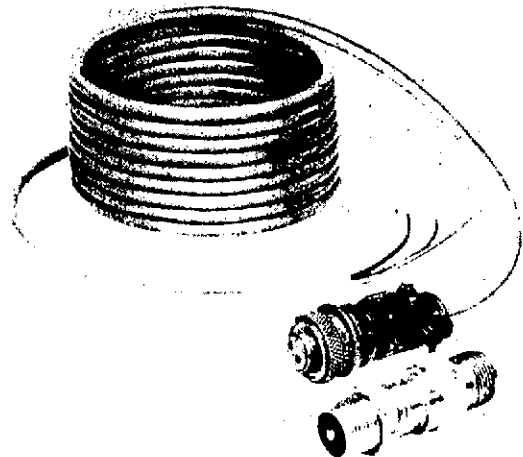


SERIES 7143 MAGNETIC SENSORS

Manual No. 576013-065



714300-001



714300-002

1. INTRODUCTION

A. GENERAL. The Series 7143 Magnetic sensors are non-contact transducers primarily used for gear-tooth sensing with Veeder-Root's Digital Tachometers. Operation is over a speed range of 100 to 10,000 rpm.

When a vertical bar **|** appears adjacent to text or illustrations, information has been added or changed at the last issue date.

Consult Veeder-Root on any unusual application, installation or possible modification of this basic design.

The sensor is made from a shell, coil, pole piece and permanent magnet. The coil is placed around the pole piece which conducts a magnetic path from the magnet, creating an external magnetic field in front of the sensor. When a gear tooth disrupts this magnetic field, the flux change induces an AC voltage in the coil. This signal is generated each time a gear tooth or other ferrous discontinuity passes the pole piece. The amplitude of this signal is roughly proportional to the speed of tooth passage and inversely proportional to the square of the gear-to-pole piece spacing. The signal's frequency is exactly proportional to the revolutions per minute of the gear.

Two versions of the Series 7143 are available and differ only in the composition of the external shell. The electrical characteristics and functional application considerations are identical for both versions. Mating cables and mounting hardware are included with the sensors.

B. APPLICATIONS. Series 7143 Sensors are ideal for monitoring rpm of any shaft when mated with a Veeder-Root Digital Tachometer and combined with a 60 tooth, 16-pitch,

ferrous gear. They are well suited for industrial production machinery applications as well as test-stand and laboratory installations.

2. SPECIFICATIONS

A. STANDARD SPECIFICATIONS

Output Voltage: 25 volts minimum peak to peak (into 100 k ohm load) with 16-pitch gear, 1000 rpm, 0.01" gap. Output directly proportional to speed, inversely proportional to the square of the air gap. Certain operating conditions (high rpm, close gap) may produce output voltage in excess of 100 volts peak-to-peak. Care should be taken when interfacing with circuitry to assure compatibility with voltage of this magnitude.

DC Resistance: 1200 ohms max.

Inductance: 400 mH max.

Temperature Range: -55°C to +105°C (-67°F to +210°F).

Materials:

Form No. 714300-001: Plastic shell, stainless steel pole piece.

Form No. 714300-002: Stainless steel shell and pole piece.

Mounting:

Form No. 714300-001: Aluminum mounting bracket supplied (P/N 614973-001). Refer to dimensional drawings.

Form No. 714300-002: Threaded body and locknuts, supplied.

Connections: Cable assembly included with sensor (10 feet long).

For Form No. 714300-001: Cable assembly P/N 614974-001.

For Form No. 714300-002: Cable assembly P/N 614975-001.

Dynapar, Veeder Root, and Eagle Signal Brands:

Sales, Repair, and Application Support:
1675 Delany Rd.
Gurnee, IL. 60031
847-662-4150 Sales/Order Entry Fax
847-782-5277 Applications Support Fax
800-873-8731 Sales/Order Entry
800-234-8731 Applications Support

NorthStar Brand:

Sales, Repair, and Application Support:
1675 Delany Rd.
Gurnee, IL. 60031
847-782-5288 Sales/Order Entry Fax
847-782-5277 Applications Support Fax
800-326-6216 Sales/Order Entry
800-326-6216 Applications Support

Partlow, West, Rustrak, and LFE Brands:

Sales, Repair, and Application Support:
1675 Delany Rd.
Gurnee, IL. 60031
847-662-4150 Sales/Order Entry Fax
847-782-5277 Applications Support Fax
800-873-8731 Sales/Order Entry
800-866-6659 Applications Support

Please disregard all phone numbers and addresses in this manual. The phone numbers and address on this page are the correct phone number and addresses to use for sales, repair, and application support.

B. STANDARD MODELS

Form Number	Includes
714300-001	Plastic probe, bracket, cable assembly.
714300-002	Stainless steel probe, cable assembly.

3. INSTALLATION

WARNING: IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH THE NATIONAL ELECTRICAL CODE; FEDERAL, STATE AND LOCAL CODES; AND ANY OTHER APPLICABLE SAFETY CODES. IN ADDITION, TURN OFF POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE, AND REPAIR TO PREVENT PERSONAL INJURY AND EQUIPMENT DAMAGE.

A. GENERAL. The sensor may be installed in almost any nonexplosive environment free from severe vibration, extreme temperatures and excessive relative humidity and/or airborne contamination.

WARNING: IF INSTALLATION IS TO BE IN A VOLATILE, COMBUSTIBLE OR EXPLOSIVE ATMOSPHERE, THIS PRODUCT MUST BE HOUSED IN AN APPROPRIATE ENCLOSURE AS REQUIRED FOR USE IN SUCH ATMOSPHERE BY NATIONAL ELECTRICAL CODE AND ANY LOCAL APPLICABLE STANDARDS.

B. MOUNTING. The Series 7143 may be mounted in any attitude that will permit the proper spacing between the tip and the standard gear. See Figure 1 for appropriate mounting dimensions and Paragraph C for positioning instructions.

C. SELECTING THE PROPER GEAR. When using Series 7143 and a Vecor-Root Digital Tachometer for revolutions per minute applications, it is vital 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.

See Figure 2 for 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.

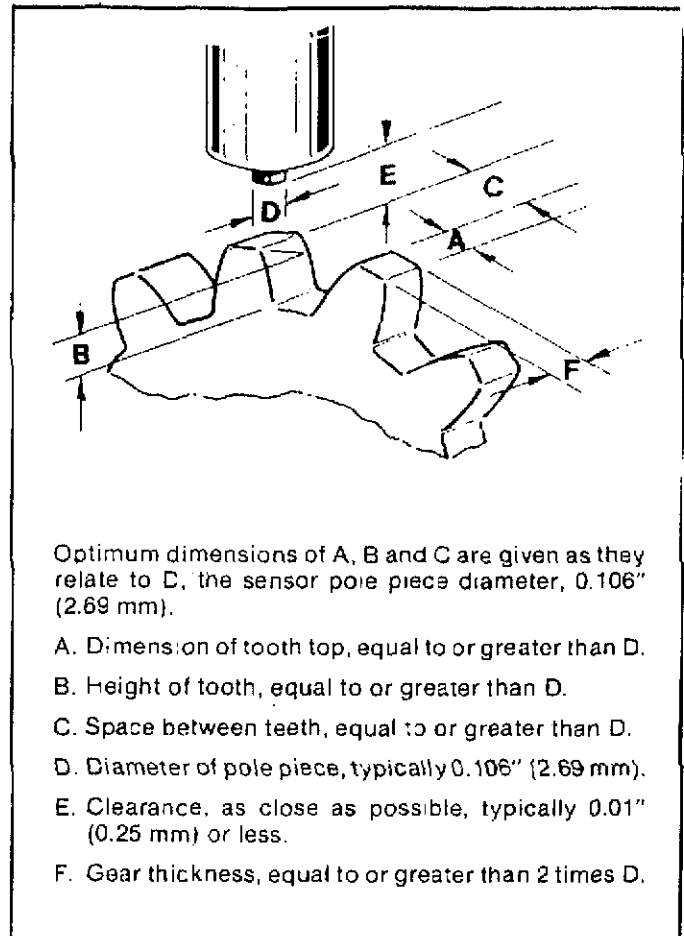


Figure 2. Typical Gear Requirements.

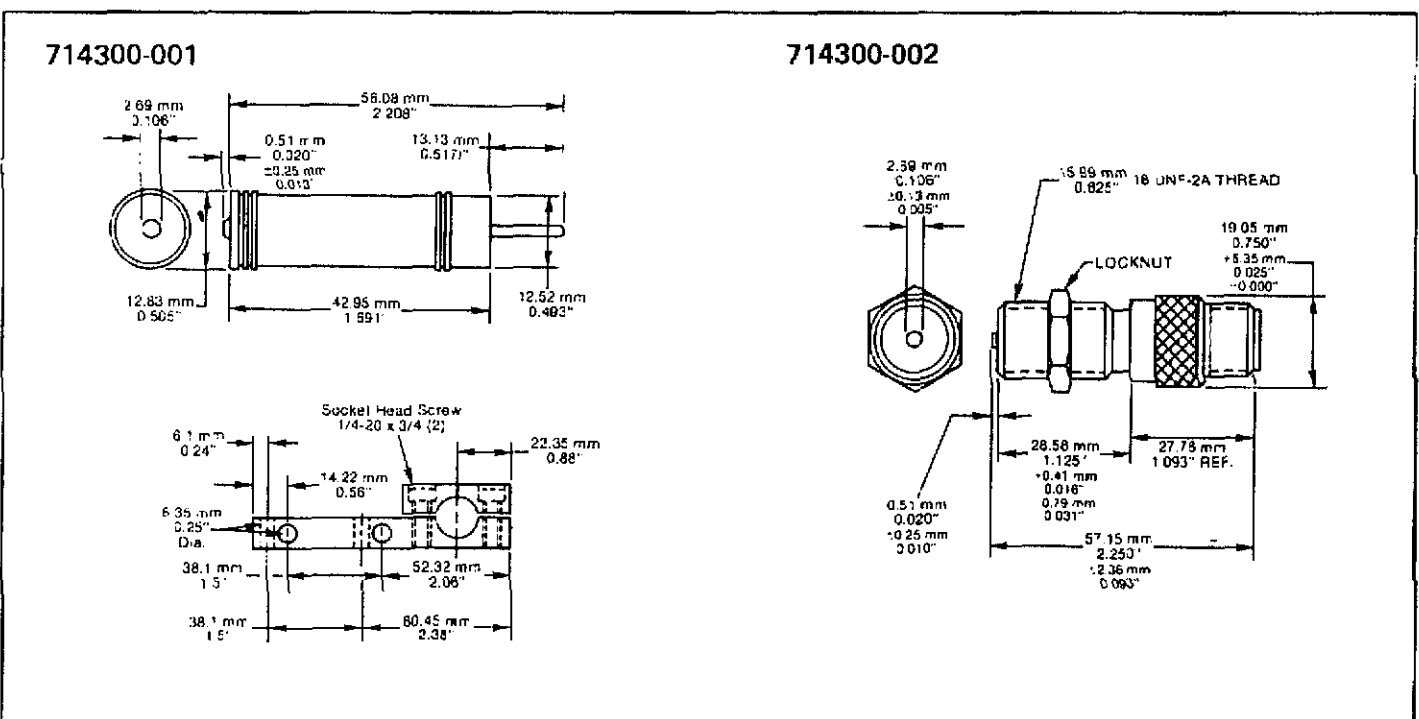


Figure 1. Mounting Dimensions.

D. GENERAL WIRING PRACTICE. Veeder-Root products compatible with Series 7143 Sensors utilize state-of-the-art MOS/LSI circuitry which characteristically has high immunity to the effects of electrical interference. Proper installation and electrical wiring practice will further reduce the probability of electrical interference; therefore, the following precautions should be observed.

CAUTION: USE ONLY ROSIN CORE SOLDER OR ROSIN FLUX. ACID CORE SOLDER OR FLUX WILL CAUSE CORROSION OF METAL PARTS AND COULD LEAD TO SYSTEM FAILURE. USE OF ACID FLUX WILL VOID THE WARRANTY.

1. Do not run input signal lines in the same conduit as power or control lines from relays, motor starters, etc.
2. Use shielded cable provided for inputs and observe conduit routing practice as outlined in step 1.
3. Tin all stranded wire before making connections. When making attachments to terminal blocks, spade lugs may be used on the wires.

E. WIRING. Do not attempt to make connections directly to the pins on the sensor connector. Connections to the sensor should be made by using the Sensor Cable. See Figure 3 for connector wiring diagrams.

CAUTION: CERTAIN OPERATING CONDITIONS (HIGH RPM, CLOSE GAP) MAY PRODUCE OUTPUT VOLTAGE IN EXCESS OF 100 VOLTS PEAK-TO-PEAK. CARE SHOULD BE TAKEN WHEN INTERFACING WITH CIRCUITRY IN OTHER THAN RECOMMENDED VEEDER-ROOT PRODUCTS TO ASSURE COMPATIBILITY WITH VOLTAGE OF THIS MAGNITUDE.

Note: Wiring information for connecting the sensor to a particular product is contained in the instruction manual shipped with the product.

4. OPERATION

A. GENERAL. There are no user adjustments or controls associated with the sensor. If improper readings are encountered, check the wiring and sensor positioning per Section 3. Check the instruction manual for the product being used with the sensor for additional troubleshooting and operating instructions.

5. SERVICE

A. PERIODIC INSPECTION. Establish regular intervals for inspection. Periods should be based on operating time and environmental conditions. Inspect:

1. Security of sensor on mounting surface.
2. All leads and connectors. No looseness, chafing or wear is acceptable.
3. Check sensor for proper positioning per Paragraph C in Section 3.

B. REPAIR. NO attempt to repair the sensor should be made by users or their agents. We recommend that the sensor be returned to a Veeder-Root authorized electronic service center or the factory for repair or adjustment. See Paragraph D for instructions. Before returning sensor for service, check for proper mounting and positioning per Paragraph C in Section 3.

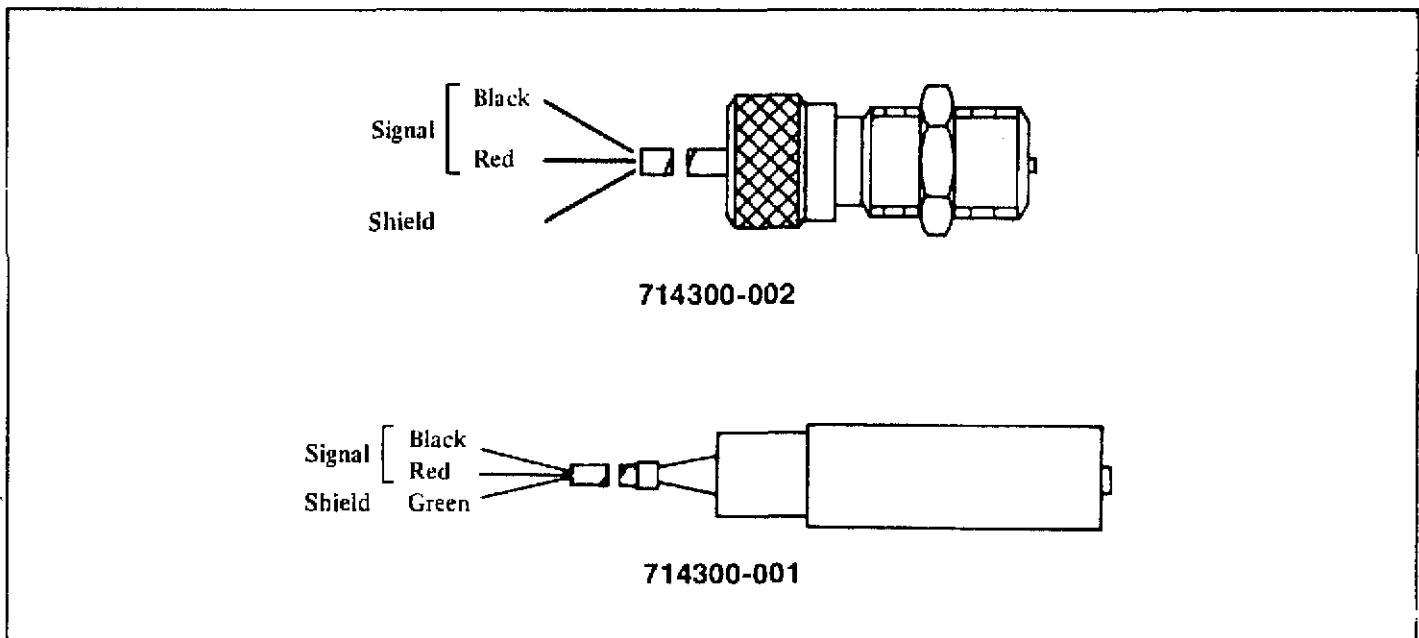


Figure 3. Output Designations.

C. SHIPMENT. If the sensor must be returned to a Veeder-Root authorized electronic service center or factory for repair, perform the following steps:

1. Explain, in writing, the nature of the problem as accurately as possible. List the person(s) to be contacted in the event communication is required.
2. Place the letter along with the counter in its original packing material and container, or suitable substitutes.
3. Place in an overwrap box. Address to the nearest authorized Electronic Service Center or:

Service Department
VEEDER-ROOT LTD.
Kilspindie Road
Dundee DD2 3QJ
SCOTLAND
Tel: 382-833033
Telex: 76146
FAX: 328-832382

Service Department
VEEDER-ROOT
COMPANY
125 Powder Forest Drive
Simsbury, CT 06070-2003
Tel: (203) 651-2700
Telex: 277844 VROOT UR
FAX: (203) 651-2750

Service Department
VEEDER-ROOT
(Australia) PTY LTD.
82 Herald Street
Cheltenham, Victoria 3192
AUSTRALIA
Tel: 61 (3) 584-3800
FAX: 61 (3) 583-8450

Service Department
VEEDER-ROOT
OF CANADA LTD.
26 Fieldway Road
Etobicoke, Ontario M8Z 3L2
CANADA
Tel: (416) 239-3094
FAX: (416) 239-2653

4. All shipments must be prepaid.

6. DAMAGE CLAIMS WARRANTY AND CONDITIONS

A. DAMAGE CLAIMS

1. Thoroughly examine the enclosure as soon as it is received. If damaged, write on the face of the freight bill a complete and detailed description of the damage. Have the carrier's agent sign the description.

Note: Insist that the carrier's agent verify the inspection and sign the description.

2. Immediately notify the delivering carrier of damage or loss. This notification may be given either in person or by telephone. Written confirmation must be mailed within 48 hours. Railroads and motor carriers are understandably reluctant to make adjustments for damaged merchandise unless inspected and reported promptly.

3. Risk of loss of, or damage to merchandise remains with the Buyer. It is the Buyer's responsibility to file a claim with the carrier involved.

4. Immediately advise your Veeder-Root representative, distributor, or the factory so that we may assist you.

B. WARRANTY AND CONDITIONS

1. WARRANTY. We warrant that this product shall be free from defects in material and workmanship for a period of one year from the date of shipment thereof or the product's total rated life, whichever first occurs. Within the warranty period we shall repair or replace such products which are returned to us with shipping charges prepaid and which are determined by us to be defective. This warranty will not apply to any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions, or warnings; or modified or repaired by unauthorized persons; or improperly installed.

2. INSPECTION. You shall inspect the product promptly after receipt and shall notify us at our Simsbury office, in writing, of any claims, including claims of breach of warranty, within thirty days after you discover or should have discovered the facts upon which the claim is based. Your failure to give written notice of a claim within the time period shall be deemed to be a waiver of such claim.

3. LIMITATION OF REMEDY AND WARRANTY. The provisions of Paragraph 1 are our sole obligation and exclude all other remedies or warranties, express or implied, including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, whether or not purposes or specifications are described herein. We further disclaim any responsibility whatsoever to you or to any other person for injury to person or damage to or loss of property or value caused by any product which has been subjected to misuse, negligence, or accident; or misapplied; or used in violation of product manuals, instructions, or warnings; or modified or repaired by unauthorized persons; or improperly installed.

4. LIMITATION OF DAMAGES. Under no circumstances shall we be liable for any incidental, consequential or special damages, losses or expenses arising from this contract or its performance or in connection with the use of, or inability to use, our product for any purpose whatsoever.

5. LIMITATION OF ACTIONS. No action regardless of form arising out of this contract may be commenced more than one year after the cause of action has accrued, except an action for nonpayment.

6. COLLATERAL PROMISES. There are no representations, warranties, or conditions express or implied, statutory or otherwise except those herein contained, and no agreements or waivers collateral hereto shall be binding on either party unless in writing and signed by you and accepted by us at our Simsbury office.

7. INTERPRETATION. Rights and liabilities arising out of any contract with us shall be determined under the Uniform Commercial Code as enacted in Connecticut.

Warranty revised January 1, 1990

VEEDER-ROOT 
Digital Products

2100 W. Broad St., P.O. Box 368, Elizabethtown, NC 28337 TEL: (910) 862-2511. FAX: (910) 862-4835

AUSTRALIA: Cheltenham, Victoria • BRAZIL: Sao Paulo • CANADA: Etobicoke/Montreal/Vancouver
FRANCE: Pungis • SCOTLAND: Dundee • WEST GERMANY: Neuhausen/Filder