

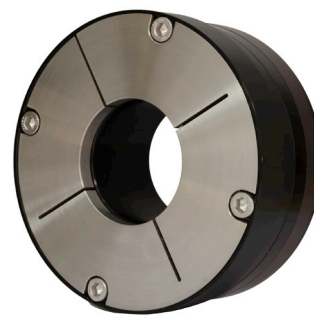
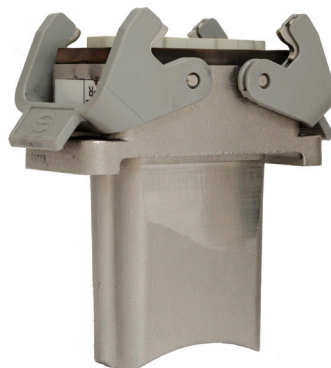
NorthStar™ brand

NRTK RIM Tach Upgrade Kit

Wheel and Sensor NexGen Upgrade Kit for Legacy RIM Tach 8500 and RIM Tach 1250 Models

Key Features

- New Sensor Provides up to 0.075" of Air Gap, Over 50% More Than Competitive Models
- “Best in Class” Durable Replacement Wheel Options
- Protective Magnetic Wheel Edge Guard
- Stainless Steel Sensor Modules
- Higher Resolutions up to 4096 PPR



CE
EN 61326-1

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS

Code: Incremental, Magnetic
Pulses per Revolution: 60 to 4096 PPR
Phasing Sense: A leads B for Counter-Clockwise rotation (CCW) viewing male C-face end
Quadrature Phasing: 90° ± 45°
Symmetry: 50% ±15%
Number of Output Modules: Single or Dual

ELECTRICAL

Input Power Requirements: 5-26VDC, 95mA typical per sensor module, plus line driver load
Output Signals: IC-WE Differential Line Driver: 150mA, sink or source
Frequency Response: 0 - 180kHz Data & Index
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Reverse polarity and short circuit protected
Connector: 10 pin industrial duty latching, sealed NEMA 4 & 12, IP65. Optional MS3102 10 pin, Pigtail Cable, or Latching connector on cable extension

MECHANICAL

NexGen RIM Tach RT8 (RIM Tach 8500):
Bore Sizes: 5/8" to 5.0"
Mounting Configuration: 8.5" 180 C-Face Mount for NEMA MG1 Standards
Shaft Length Required: 2.5" min

NexGen RIM Tach RT1 (RIM Tach 1250):
Bore Sizes: 5/8" to 2-7/8"
Mounting Configuration: 12.5" C-Face Mount for NEMA MG1 Standards
Shaft Length Required: 2.88" min

Shaft Speed: 7,000 RPM, max.
Radial Air Gap:
1200 PPR or lower:
0.075", +0.015" / -0.070"
Above 1200 PPR:
0.050", +0.015" / -0.040"
Allowable Shaft End-Play: ±0.150"
Allowable Shaft Runout: 0.005" TIR
Acceleration Rate: 3600 rpm/sec max
Sensor Module Material: Stainless Steel

ENVIRONMENTAL

Operating Temperature Range: -40°C to +100°C
Storage Temperature Range: -40°C to +125°C
Shock: 200 G's Min.
Vibration: 18 G's @ 5-2000 Hz spectrum
Humidity: Up to 98% (non-condensing)

ELECTRICAL CONNECTIONS

Signal	Connector Pin	Pigtail Cable	MS 3102E18-IT#
Common	1	Black	A
B	2	Green	E
A	3	Blue	D
Z*	4	Violet	C
Alarm †	5	n/a	F
Vcc (5-24 VDC)	6	Red	B
B	7	Yellow	H
A	8	Gray	G
Z*	9	Orange	I
Shield	10	Braid	J

* Index (Z) optional. See Ordering Information

† Alarm not available with Pigtail cable. See Ordering Information

CONTENTS

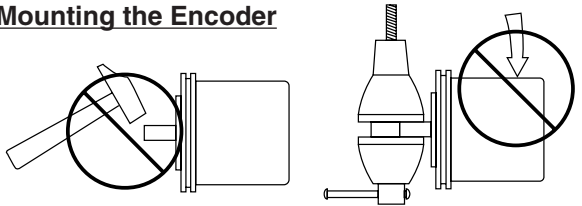
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IMPORTANT INSTALLATION INFORMATION

GENERAL GUIDELINES

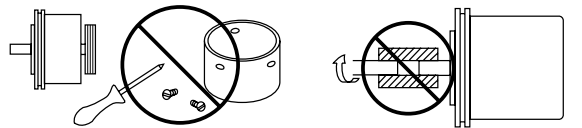
Encoders provide quality measurements and long life when common sense, care, and accurate alignments are provided during installation. The following general guide-lines will help to ensure a trouble-free installation.

Mounting the Encoder



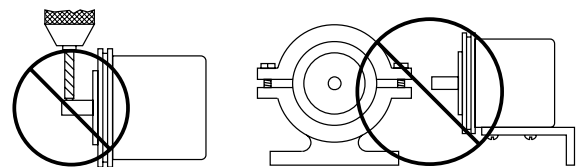
Do not shock the encoder.

Do not subject the encoder to axial or radial shaft stresses.



Do not disassemble the encoder.

Do not use a rigid coupling.



Do not tool the encoder or its shaft.

Do not use makeshift techniques to mount the encoder.

Wiring the Encoder

- Never connect or disconnect the encoder connector or wiring while power is ON. Doing so may damage the encoder.
- Power should always be connected to the + side of DC power.
- Common should always be connected to the - side of DC power.
- Never connect A, B, or Z to the + or - side of DC power.

ELECTRICAL CONNECTIONS

Cable - The use of shielded cable is recommended for all encoder installations. When a Dynapar brand encoder is ordered, the type of termination is generally defined (usually the last selectable code in Ordering Information). If a code for a cable was indicated, the encoder was manufactured to include a shielded cable. If any other type of termination was selected or if selection of termination type was not requested, a cable assembly must be ordered. (The cable assembly easily hooks onto the encoder's connector making it ready for wiring).

To determine which cable assembly to order, refer to the Electrical Connections table (in the encoder's manual).

ELECTRICAL CONNECTIONS (cont.)

In some cases, there may be more than one table or the table may be broken into sections due to different output types. If so, refer to the information listed for the output type selected for the encoder (in Ordering Information).

Wiring should be run through dedicated conduits or harnesses (not shared with any other wiring) which are spaced at least 12 inches apart. This protects the cable from physical damage while providing a degree of electrical isolation. Also, do not run cable in close proximity to other conductors which carry current to heavy loads such as motors, motor starters, contactors, or solenoids. Doing so could result in electrical transients in the encoder cable which cause undesired signal pulses.

NOTE: Never connect or disconnect the encoder connector or wiring while power is ON. Doing so may damage the encoder.

GROUNDING

DO NOT ground the encoder through both the machine and the cable wiring. Connect the shield at the input device only. **NOTE: If the shield is connected at both ends, grounding problems that degrade system performance may result.**

For European-based applications requiring CE compliance, cable length must not exceed 30m. Connect the shield to building ground on either the Encoder or Controls end. CE compliant products are tested to EN61326 EMC.

FEATURES

All encoders have the following electrical features:

- Power (+DC)
- Common
- Output Signal(s)

Power (also referred to as supply, power source, and power +V/VCC) is always +DC for encoders. **Therefore, power should always be connected to the positive (+) side of DC power.** In addition, encoder power should be regulated to within $\pm 5\%$ at the encoder and should be free of induced transients. Common (also referred to as Com, supply common, and ground) is generally a black wire (verify via Electrical Connections table). Common should always be connected to the negative (-) side of DC power.

All encoders have at least one output signal (A); however, it is common for encoders to have three signals A, B, Z (may also be referred to as C, X, or index). The outputs should each be connected to the receiving device at the appropriate terminal. **NOTE: Never connect A, B, or Z to the + or - side of DC power.**

IMPORTANT INSTALLATION INFORMATION

FEATURES (cont.)

When encoders have a differential line driver, there are two signals for each of the outputs. Each signal (A, B and Z) has a compliment or inverse (\bar{A} , \bar{B} and \bar{A}) referred to as A not, B not, and Z not). The signal and its compliment (i.e. A and \bar{A}) are separate outputs. Connect each output to a separate input.

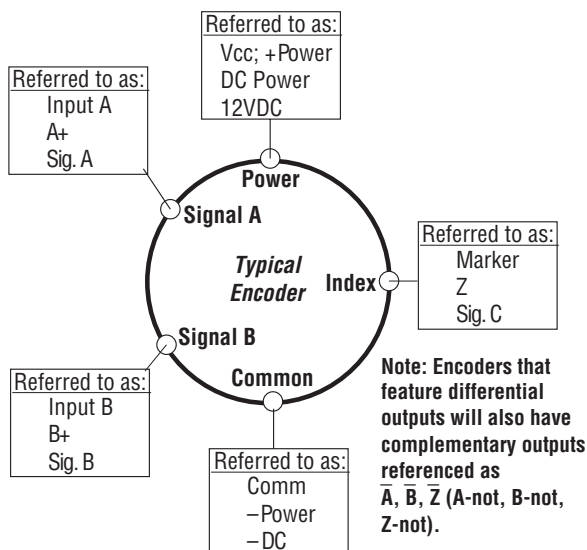
NOTE: Never connect these signals together or to the + or - side of DC power. Never connect differential signals to the same input.

CONNECTIONS

Obviously not all receiving devices are the same. However, connecting your encoder to one, no matter what type or brand it may be, is not difficult. As discussed in the previous section, all encoders have certain electrical features. Each of these features/functions are identified in the encoder's Electrical Connections table along with its corresponding pin and wire color. Each wire specified in the table must be connected to the receiving device.

Determining where to connect each wire is as easy as following the Electrical Connections table and matching each wire to the proper terminal on the receiving device. In general, no matter what type of receiving device you are using, the terminal strip is marked, indicating the proper location for each function/wire. These markings may either be numbers or text labels identifying functions. If they are numbers, the receiving device's manual should define what function corresponds to each number.

Since receiving devices are made by various manufacturers, not all text labels/references are the same. There are various ways to identify each function. Following are a few examples:



LED STATUS LIGHT:

A multicolor LED Status light will indicate to the user the overall condition of the encoder. The LED is built into the encoder and does not require any additional wiring or power to activate it. There are 4 basic status conditions for the light:

- 1) LED off:** No power to Encoder, Low supply voltage (<3.0VDC), Total Failure of Encoder
- 2) LED Green:** Correct Power to Encoder, Ready to operate, No wheel movement Detected
- 3) LED Flashing:** Unit operating, Unit sending pulses out
- 4) LED Flashing Red:** Low power to encoder (<4.5VDC), Line Driver Failure, Line Driver Over-Temperature (generally caused by external short circuit), Line Driver Logic Failure

FREQUENTLY ASKED QUESTIONS

There are additional colored wires which are not referred to in the Electrical Specifications table. What do I do with them?

Do not connect them to the receiving device. Any unused encoder signal wires must be individually insulated and tied back. They should NEVER be in contact with common, power sources, or other output signal lines.

The encoder is correctly connected to the receiving device per the Electrical Specifications table and the receiving device's terminal strip label; however, it's counting in the wrong direction. What's wrong?

In order to reverse the counting direction, the output signal connections must be switched. If the encoder has a single ended output, swap A and B. If the encoder has a differential line driver, swap A and \bar{A} .

I've connected the encoder and it doesn't work (No Outputs). What can I do?

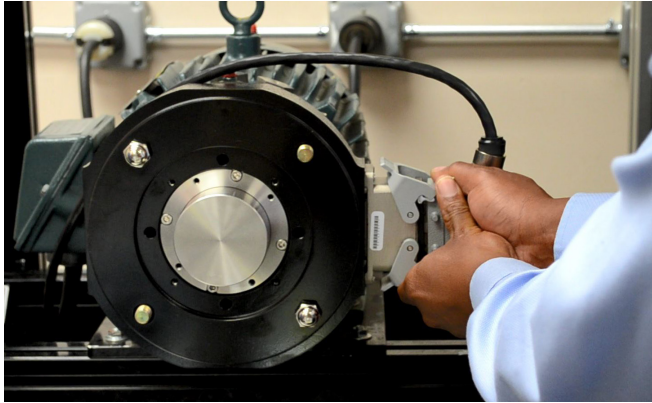
Many encoders have internal protection circuits which shut down the encoder to prevent damage if the input power is not correct or the outputs are overloaded. Check the following: Input Voltage (is it too high?); Input Polarity (is it reversed?); and Output Wiring (are they wired properly?).

I've read and followed the technical manual and these guidelines and the encoder still doesn't work properly. Help!?

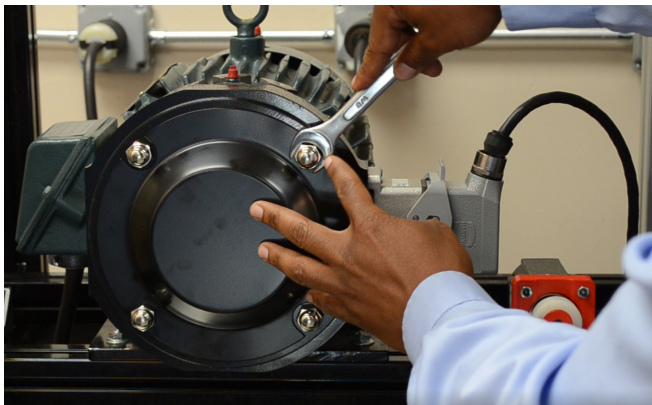
Calm down - help is at your fingertips! Simply pick up the phone and dial our Applications Engineering Department at 1-800-234-8731 (US & Canada) or 847-662-2666 from 8:00 AM to 4:45 PM (Central time) Monday - Friday. One of our engineers will gladly help you solve the problem.

MECHANICAL INSTALLATION

1. Remove the power to the sensor module by disconnect the latching connector

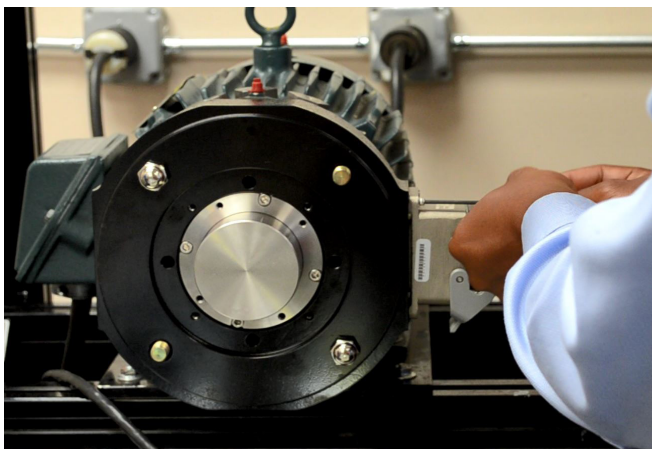


2. Remove the cover if installed by removing (2) 1/2"-13 UNC Acorn Nuts

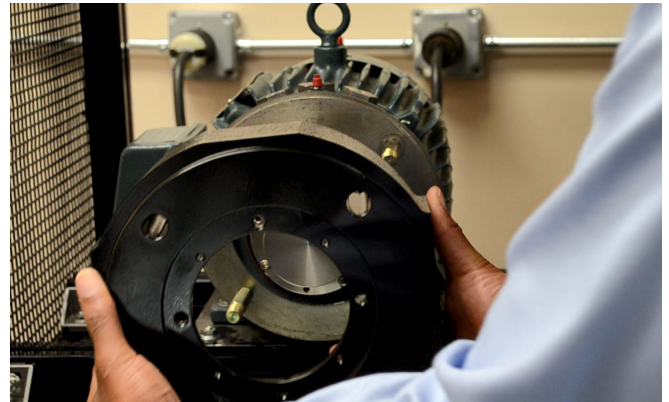


3. Remove the Sensor module

- a. Use the wrench for #6 X 32 UNC screws (provided)

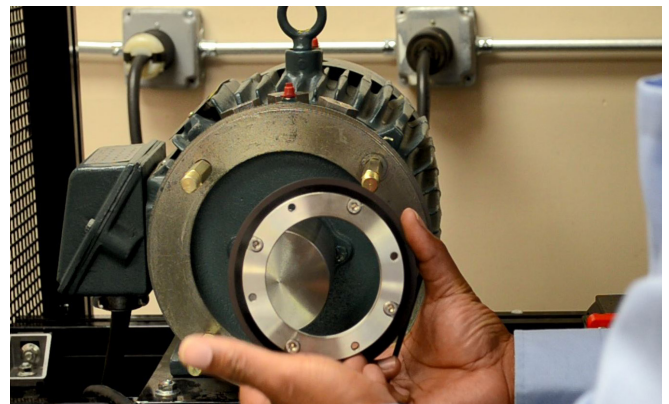


4. Remove the housing by removing other (2) 1/2"-13 UNC Acorn Nuts



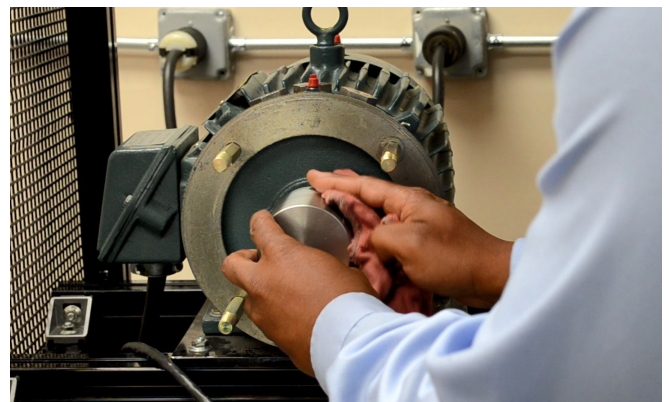
5. Remove the installed wheel

- a. Use Allen wrench to remove (4) M5 X .08 screws (provided)
- b. If the wheel is difficult to remove, use the bearing/gear puller to pull the wheel out



6. Clean the motor shaft (optional)

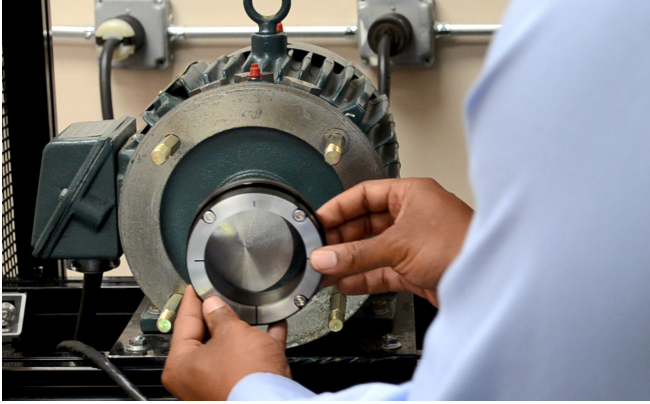
- a. Remove shaft rust and burrs before installing the pulse wheel



MECHANICAL INSTALLATION

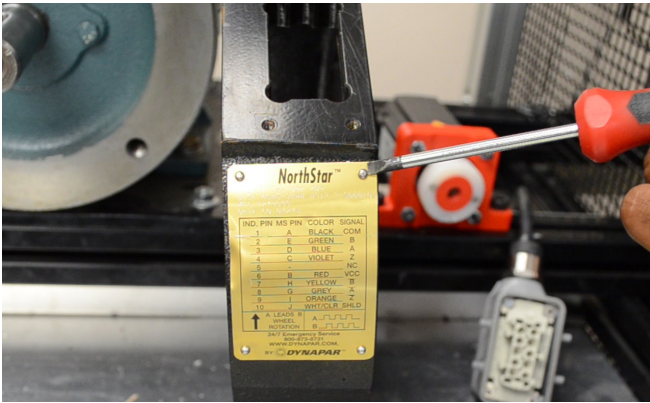
7. Insert the pulse wheel assembly

- Slide the pulse wheel onto the shaft. Leave it loose at this time
- Anti-seize may be used on the shaft & C-face to reduce future corrosion



8. Remove the old metal nameplate

- Note the orientation of the existing Nameplate so that the new Nameplate can be installed properly.

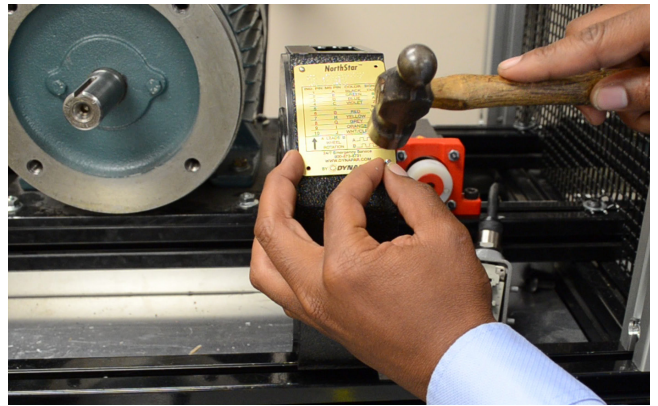
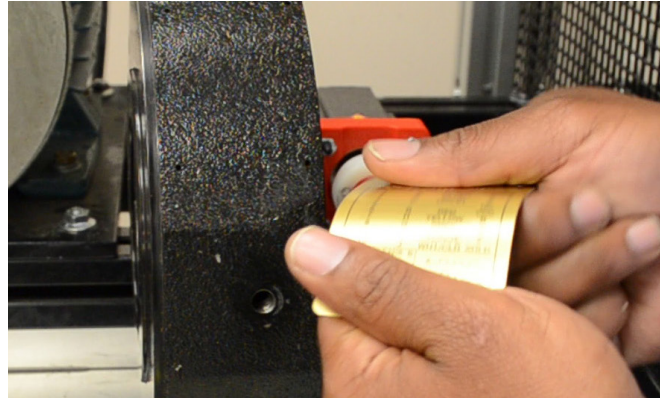


9. Remove the rivets (no picture available)

- Use the Nail Puller with the Hammer to remove the (4) Rivets from the existing Nameplate
- If any of the rivets heads shear off during the removal process, they will have to be drilled out with the #44 Drill Bit.

10. Install new Nameplate

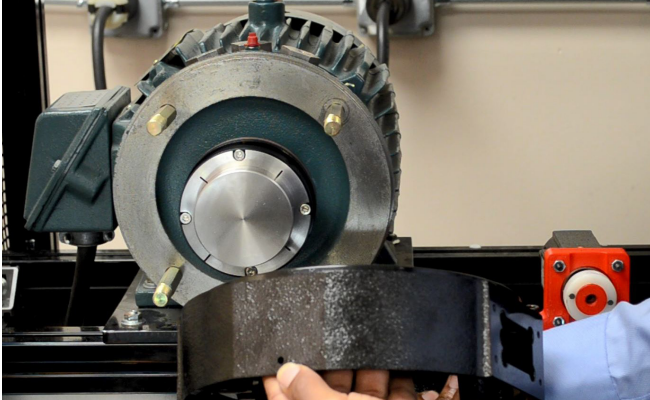
- Place the new bent Nameplate on the Housing and secure with the (4) new rivets from the kit. Partially install all (4) Rivets with the Hammer to ensure the holes line up properly. Then finish by pounding all the Rivets flush.



MECHANICAL INSTALLATION

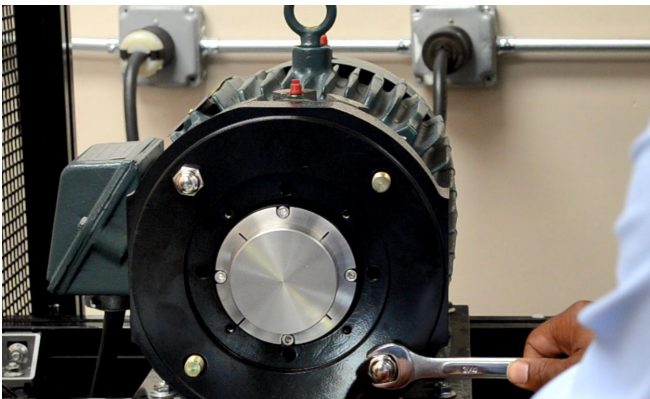
11. Install the housing

- Slide housing on to Studs and seat onto 8.5" C-Face. Make sure the drain hole is pointing at the bottom.
- A rubber mallet may be used to seat the housing fully on to the C-face



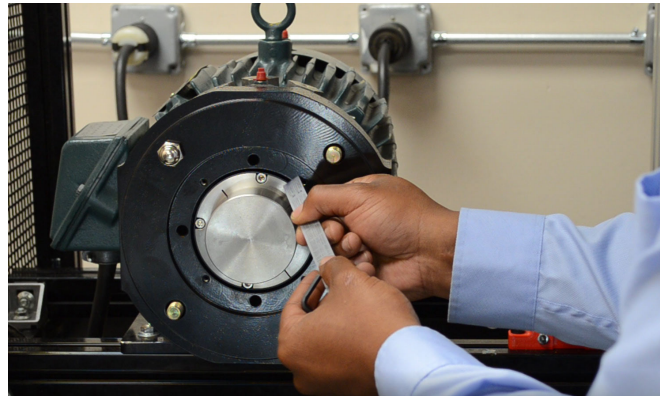
12. Tighten two nuts on the opposite side

- Install (2) 1/2"-13 UNC Acorn Nuts onto the studs. Tighten to a nominal 50 ft-lbs.



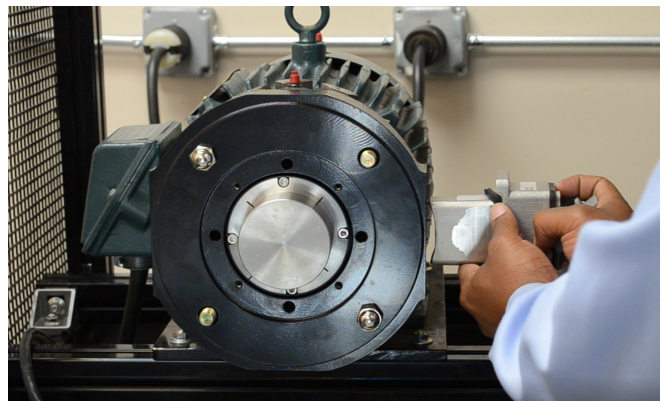
13. Align the wheel

- Position the pulse wheel to its correct position under the sensor modules by sliding it along the shaft until the front face is flush with the cover surface of the housing
- The clamp screws may need to be loosened to allow easy sliding
- Tighten (4) M5 X .08 screws in a star pattern (nominal 35 in-lbs.) to secure the wheel in the correct position



14. Install the sensor module

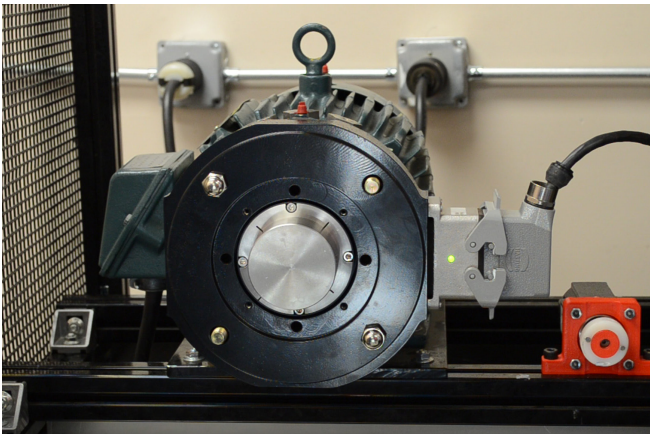
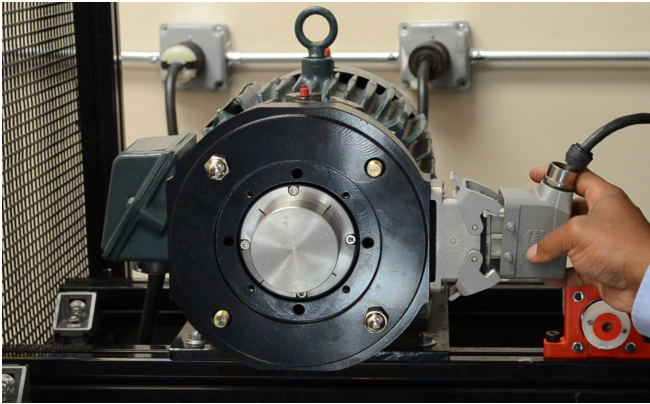
- Secure the Sensor Module with (4) #6 X 32UNC screws. Tighten to a nominal 5in-lbs.



MECHANICAL INSTALLATION

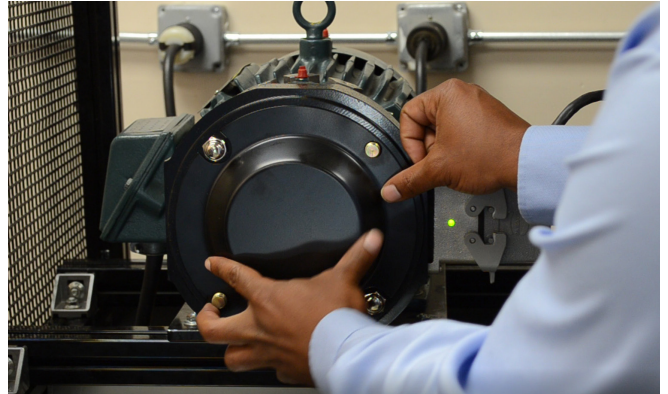
15. Reconnect the connector

- a. Note that once a good power is applied the LED should be solid Green and should blink Green when the shaft is rotated (this is a good way of checking for proper wheel installation)



16. Install the cover back

- a. Install (2) 1/2"-13 UNC Acorn Nuts onto the studs. Tighten to a nominal 50 ft-lbs.



Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Index	Code 4: Wheel Bore	Code 6: Termination
NRTK □	□ □ □ □	□	□ □ □	□
NRTKS Upgrade Kit for RIM Tach 8500 and 1250 Single Sensor Unit (Includes 1 Sensor & 1 Wheel) NRTKD Upgrade Kit for RIM Tach 8500 and 1250 Dual Sensor Unit (Includes 2 Sensors & 1 Wheel)	0060 0064 0075 0120 0128 0150 0240 0256 0300 0480 0512 0600 0960 1024 1200 1920 2048 2400 4096	L No Index Z With Index Signal Output	V04 5/8" CB4 16 mm V05 7/8" C36 24 mm V06 1.00" C29 25 mm V07 1-1/8" C31 30 mm V09 1-3/8" CA4 45 mm V10 1-1/2" C58 60 mm V11 1-5/8" C40 80 mm V12 1-3/4" V13 1-7/8" For additional bore sizes up to 5.00" maximum, please consult factory. V14 2.00" V15 2-1/8" V16 2-1/4" V17 2-3/8" V18 2-1/2" V20 2-5/8" V19 2-7/8" End Of Shaft F01 1-1/8" EOS F06 2-1/8" EOS F08 2-3/8" EOS F10 2-7/8" EOS 44 4400 Series Motors F47 4700 Series Motors F60 6000 Series Motors F68 680 Series Motors	C Latching Industrial Connector with 1/2" NPT F Latching Industrial Connector without Mating Connector M 10 pin MS Connector P 18" Pigtail (Not available with Alarm output) Q Latching industrial connector on 18" Cable R Latching Industrial Connector on 18" Pigtail Cable without Mating Connector

HOW TO CONFIGURE

When configuring an upgrade kit from a RIM Tach Series to the NexGen RIM Tach Series, please review the appropriate family data sheet and use the following methodology:

Use "NRTKS" for a single sensor kit or "NRTKD" for a dual sensor kit followed by Code 2 (PPR) & Code 3 (Index) & Code 4 (Bore Size) & Code 7 (Termination). All Single Sensor Upgrade Kits come with a 1 sensor and 1 wheel. All dual sensor upgrade kits come with 2 sensors and 1 wheel.

RIM Tach 8500 (R8) Part Number: R80512ZK111LC

Equivalent NexGen RIM Tach 8500 (RT8) Part Number: RT80512ZV111C

Single Sensor Upgrade Kit: NRTKS0512ZV11C

Dual Sensor Upgrade Kit: NRTKD0512ZV11C

RIM Tach 1250 (R1) Part Number: R10512ZK111LC

Equivalent NexGen RIM Tach 1250 (RT1) Part Number: RT10512ZV111C

Single Sensor Upgrade Kit: NRTKS0512ZV11C

Dual Sensor Upgrade Kit: NRTKD0512ZV11C

CONFIGURATION EXAMPLES

Product Family	Code 1 Model	Code 2 PPR	Code 3 Index	Code 4 Bore Size	Code 5 Output	Code 6 Electrical	Code 7 Termination
NorthStar RIM Tach 8500	R8	0512	Z	K11	1	L	C
NorthStar NexGen RIM Tach 8500	RT8	0512	Z	V11	-	1	C
NorthStar RIM Tach 1250	R1	0512	Z	K11	1	L	C
NorthStar NexGen RIM Tach 1250	RT1	0512	Z	V11	-	1	C
NRTKS Upgrade Kit	NRTKS	0512	Z	V11	-	-	C

Note: With the RIM Tach NexGen Series, the Output and Electrical have been combined into one ordering code.



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