**Installation Instructions for Timken THS25 Encoder Tether**

**Step 1**
Ensure mating parts line up, bolt thread pitches and lengths are appropriate and tools are the correct type and size. Please refer to any additional motor manufacturer's installation instructions, as there may be some critical measurements required hardware.

**Step 2**
Check and remove burrs on the mating shaft and measure to ensure the shaft length is correct for the encoder. Firmly attach the slotted hole. Make sure it is in the proper orientation relative to the tether pin to the encoder body and slide the assembly onto the mating shaft. Do not tighten the shaft clamp on the encoder yet.

**Step 3**
Rotate the tether arm until it is at the correct orientation and is aligned with the mounting feature on the shaft housing. Use the appropriate hardware to secure the tether arm in position. Check and remove burrs on the mating shaft and measure to ensure the shaft length is correct for the encoder. The shaft should engage the encoder beyond the shaft clam by 1/4 in. or more. Attach the tether to the encoder body and slide the assembly onto the mating shaft. Do not tighten the shaft clamp on the encoder yet.

**Step 4**
Using a dial indicator on the outside of the encoder body, check the runout as you rotate the shaft by hand. If it exceeds the maximum allowable 0.005 in., the encoder will need to be re-installed or adjusted. The installation is complete.

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**Installation Instructions for Timken THS25 Encoder using Block and Pin**

**Step 1**
Ensure mating parts line up, bolt thread pitches and lengths are appropriate and tools are the correct type and size. Please refer to any additional motor manufacturer's installation instructions, as there may be some critical measurements required hardware.

**Step 2**
Drill a hole in the casing to accept the tether pin. Follow the motor manufacturer's instructions for diameter, depth and location of the hole. Make sure it is in the proper orientation relative to the tether pin to the encoder body and slide the assembly onto the mating shaft. Rotate the encoder body engaging the pin into the tether. Tighten the shaft clamp on the encoder as shown in Fig. A.

**Step 4**
Using a dial indicator on the outside of the encoder body check the runout as you rotate the shaft by hand. If it exceeds the maximum allowable 0.005 in., the encoder will need to be re-installed or adjusted. The installation is complete.

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**Electrical Connection Information**

Proper wiring and grounding are essential for the longevity and proper operation of your Timken THS25. In addition, electrical noise must be minimized to prevent improper counts and damage to the electronic components.

Because a Timken THS25 can be used with a wide variety of input devices (PLC's, counters, servo controllers, etc.), from many different manufacturers, it is important to determine proper wiring and connections before. Please review the Wiring Table included in these instructions before installation.

**Common Signals**

Timken THS25 encoders have the following electrical connections:
- **Power, Common or Ground, and one or more Output Signals.**
- **Power** (Also called supply, power source, encoder power, +V, or +VDC)
  - Always use a direct current (DC) voltage.
  - Attach power to the positive (+) side of the power source.
- **Common** (Always at least one, but may be as many as six)
  - The common are A, B, and Z. with open collector configuration encoders with a Line Driver output have the complement (A and A', B and B', etc.) as separate outputs. These are used to provide differential signals for reduced noise and greater drive capability.
- **Output Signals** (Always at least one, but may be as many as six)
  - The common are A, B, and Z, with open collector configuration
  - Encoders with a Line Driver output have the complement (A and A', B and B', etc.) as separate outputs. These are used to provide differential signals for reduced noise and greater drive capability.

**NOTE**
To avoid disabling or damaging the encoder, the use of surge protection is highly recommended.

**Connections**
- Verify and match up pin numbers, wire colors, or terminal blocks with the input device.
- Be aware, identification terminology may not always be identical.
- Once proper wiring is determined, document it for future reference.

**Cable Routing**
- Cable length should be minimized by using the shortest route possible.
- All cabling should be installed in dedicated metal conduits, or located at least 12 in. away from other wiring.
- Route cables away from high current conductors to minimize pulses caused by electrical transients.
- Signal wire continuity should be maintained from the encoder to the controller/counter. Avoid junctions and splices, if possible.

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**Recommended Bolt Torques**

**THS25 Clamp Bolt**
- #6-32 Socket Head Cap Screw
- 10 to 15 lb-in. 7/32 in.

**Block and Pin**

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**CAUTION**

Failure to observe the following cautions could cause property damage.

Excessive runout will cause premature bearing failure.
Radiated Electrical Noise

• Ensure all equipment is properly grounded. (Motors, drives, shafts, etc.)
• Connect encoder cable shield to ground at controller/counter end, leaving the end near the encoder unconnected. Connecting the shield at both ends can cause ground loops, and improper operation.
• If possible, use differential line driver outputs with high quality shielded, twisted pair cable. (Complementary signals greatly reduce common mode noise levels, as well as signal distortion resulting from long cable lengths.)

Troubleshooting

No Output/No Counts

• If there is no mechanical movement, there will be no output. Therefore, verify that the Timken THS25 is rotating.
• Check to make sure the proper supply voltage is present. It is best to do this at the Timken THS25 end, if possible.
• Verify all wiring between the Timken THS25, the counter/controller, and the power supply.
• Make sure the proper signal type (OC, LD) is being used for the application.
• Verify all wiring between the Timken THS25, the counter/controller, and the power supply.
• Make sure the proper signal type (OC, LD) is being used for the application.
• Verify the counter/controller is properly installed and operational. Consult the appropriate counter/controller User’s Manual if necessary.
• If another Timken THS25 is available, try it to determine if the encoder is the problem.

Typical Electrical Hook-Ups

Output Circuit Diagrams

- Differential Line Driver
- Open Collector
- Line Driver
- Common
- Encoder

Wiring Table

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<tr>
<th>Function</th>
<th>Lead Cable Wire Color</th>
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<th>8-pin M12</th>
<th>10-pin M5</th>
<th>7-pin MS LD</th>
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Enclosed Connector Cable Assembly Wiring

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*Only on specified cordsets

Cases

- Green
- Green
- Green
- Green
- Orange
- Orange
- Orange
- Orange
- Green
- Green
- Green
- Green
- Bare*
- Bare*

Every reasonable effort has been made to ensure the accuracy of the information contained in this writing, but no liability is accepted for errors, omissions or for any other reason.

Erratic Output/Missing or Extra Counts

• Electrical: Check for loose wiring connections, ground loops, encoder outputs incompatible with the counter/controller, a noisy power supply, electrical noise, proper termination of shields, or a combination of these problems.
• Mechanical: Check for improper alignment or loose coupling. Counts indicate wrong direction
• Check for reversed wiring of the quadrature signals. Reverse if needed.
• If differential signals are being used, make sure both sides are properly wired.

Counts In Only One Direction

• Make sure the counter/controller is capable of, and programmed for, bi-directional counting.
• On quadrature units, both channels (A and B) must be present and operational. Check by using a dual channel oscilloscope.
• Make sure the input selection type programmed into the counter/controller, matches the Timken THS25. If there is a mis-match, the system may not work properly.

Index Pulse Not Working

• The index pulse occurs only once per revolution, and can be difficult to check with a volt meter. Check index pulses with an oscilloscope.
• The counter/controller may not be capable of detecting the index pulse at higher RPM’s. Slowing down the rotation may allow for detection of the index pulse.
• Verify wiring.