

## FAQ Note

### “FA 4” Error Message, Models 1270, 1271, & 1275

**Problem:**

There is a persistent “FA 4” error message on the display.

**Explanation:**

The 1270, 1271, and 1275 instruments interface to an MTS Temposonics Linear Position Sensor, which works something like a sonar system. The instrument sends out an “interrogation” pulse, which energizes the shaft of the sensor with a magnetic field. When this magnetic field interacts with the field of the moveable magnet, a sonic “echo” pulse is generated, which travels up the shaft towards the head of the sensor. The echo pulse is picked up in the head and amplified, and retransmitted to the instrument. The time between the interrogation pulse and the echo pulse is proportional to the distance between the moving magnet and the head of the sensor.

When the instrument displays “FA 4” it is saying that it never received the echo pulse. This can be caused by several factors (or a combination of any of these):

1. Moving Magnet is missing or in “Dead Zone”
2. Interrogation Pulse is the wrong polarity
3. Power to the Sensor, from the instrument is faulty
4. Wiring error
5. Linear Position Sensor failure or weakness (low Echo Pulse amplitude)
6. Input circuitry failure in the Instrument

The “FA 4” condition is NEVER caused by a programming error and can not be cured by programming.

**Solution:**

To diagnose this condition, you will need to methodically check the six factors listed above:

1. Make sure the moving magnet is more than 3 inches from the the tip of the sensor shaft. There is a “Dead Zone” at the extreme end of the sensor, where the moving magnet can not be detected. Move the magnet to the center of the sensor shaft. In rare cases the magnet itself may be defective. Try another magnet (any magnet will work).
2. The Interrogation Pulse polarity can be reversed by a slide switch (SW1) located on the top circuit board in the instrument. It is visible through the slot in the right side of the case, about 3.5 inches from the front. Slide this switch forward or backwards. Wait a few seconds to see if the “FA 4” condition goes away. This switch should be in the FORWARD position when the sensor is wired as shown in the table below.
3. With a DC Voltmeter, check the power supply outputs to the sensor:
  - a. Measure +15 VDC +/-0.7V from Terminal B (ground) to Terminal A
  - b. Measure -15 VDC +/-0.7V from Terminal B (ground) to Terminal D
  - c. Measure +12 VDC +/-0.7V from Terminal B (ground) to Terminal F

# Application Bulletin

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4. Double check wiring per the following table:

Connect to:	Function	Tempo I (Very Old)	Tempo II (Old)	Tempo II (New)
<b>B</b>	Ground	Black	<b>1</b> White/Blue Stripe	<b>1</b> White
<b>B</b>	Ground		<b>2</b> Blue/White Stripe	<b>2</b> Brown
Do Not Connect	Not Used		<b>3</b> White/Orange Stripe	<b>3</b> Grey
Do Not Connect	Not Used		<b>4</b> Orange/White Stripe	<b>4</b> Pink
<b>A</b>	+15V Power	Green	<b>5</b> White/Green Stripe	<b>5</b> Red
<b>D</b>	-15V Power	Blue	<b>6</b> Green/White Stripe	<b>6</b> Blue
<b>B</b>	Echo Pulse Gnd.		<b>7</b> White/Brown Stripe	<b>7</b> Black
<b>C</b>	Echo Pulse	Brown or Orange	<b>8</b> Brown/White Stripe	<b>8</b> Violet
<b>E</b>	- Interrogation	White	<b>9</b> White/Grey Stripe	<b>9</b> Yellow
<b>B</b>	+ Interrogation		<b>10</b> Grey/White Stripe	<b>10</b> Green
<b>F</b>	+12V Power	Red	No Connection	No Connection

5. & 6. There is no way to field test these items without an oscilloscope and a known good sensor. If all previous troubleshooting fails, call INCON Tech Service (800-872-3455) for an RMA to return the Instrument and/or the Sensor for factory analysis.