



PARAGON
CONTROLS
INCORPORATED



DPT-4005

Differential Pressure Transducer

Operation & Maintenance Manual

*Engineered for accuracy, applicability,
durability and simplicity*

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1. INTRODUCTION

This user manual provides information on product features and guides you through all basic functions.

1.1. DESCRIPTION

The **DPT-4005** differential pressure transducer sensor operates on the capacitance principal and is capable of sensing ultra low differential pressures. In the capacitance cell, a very lightweight, responsive diaphragm deflects a small amount when pressure is applied. This deflection results in a change in capacitance, which is processed electronically into a filtered output signal linear to the differential pressure. The DPT-4005 can be configured as a Unipolar device (positive pressure only) or a Bipolar device (positive and negative pressures). An integral green Power Indicator illuminates when power is applied.

1.1.1. Specifications

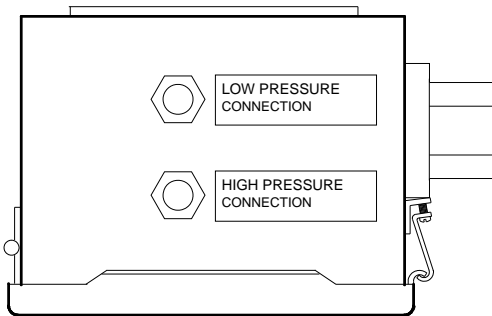
Power Requirements: 18 to 28VAC/DC (150mA)

Output Options: 0-10VDC / 4-20mA (500 max. load) Standard
 0-5VDC / 0-10VDC Optional

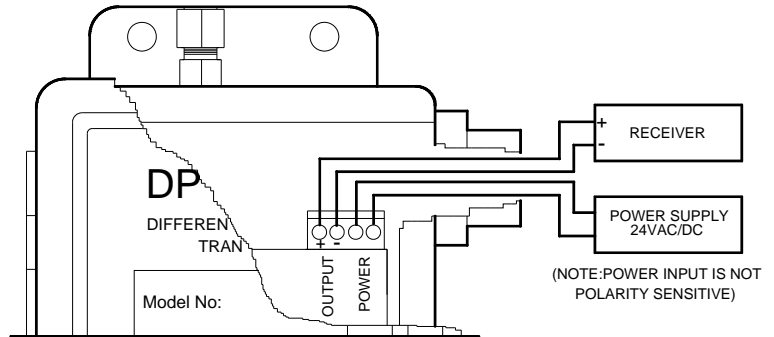
1.1.2. Installation Setup

Refer to figures below for pressure and electrical connections.

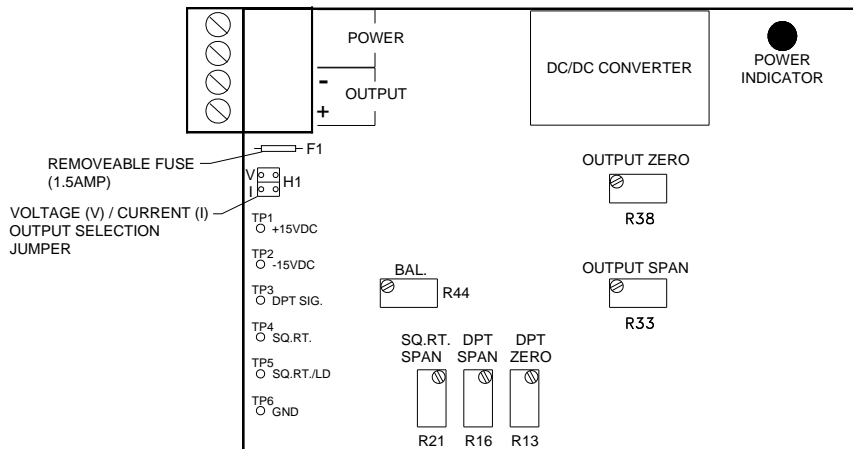
PRESSURE CONNECTIONS



ELECTRICAL CONNECTIONS



1.1.3. Component Locations



2. DPT CALIBRATION

It is recommended that the DPT ZERO Calibration be performed upon installation. Span Calibration is not affected by the Zero Calibration. The Span of the unit has been factory calibrated and should only be adjusted using high accuracy test equipment. **Refer to sections 1.1.2 and 1.1.3.**

Zero Calibration Equipment Required:

- DMM (Digital Multi Meter)

Span Calibration Equipment Required:

- Low pressure air source (Paragon PS-100 or equivalent)
- Manometer for measuring low pressure
- DMM (Digital Multi Meter)

2.1. UNIPOLAR DPT ZERO CALIBRATION

The following zero calibration procedure can be performed without the need to perform a span calibration.

- Step 1. Apply power to the DPT-4005 transducer.
- Step 2. Verify the green power LED (LED1) is illuminated.
- Step 3. Verify zero pressure is applied to the transducer.
- Step 4. With the DMM, monitor the voltage between TP6 (GND) and TP3 (DPT SIG.). Adjust R13 (DPT ZERO) potentiometer for a reading of 0.0 ± 0.001 vdc.

2.2. BIPOLAR DPT ZERO CALIBRATION

The following zero calibration procedure can be performed without the need to perform a span calibration.

- Step 1. Apply power to the DPT-4005 transducer.
- Step 2. Verify the green power LED (LED1) is illuminated.
- Step 3. Verify zero pressure is applied to the transducer.
- Step 4. With the DMM, monitor the voltage between TP6 (GND) and TP3 (DPT SIG.). Adjust R13 (DPT ZERO) potentiometer for a reading of 5.0 ± 0.001 vdc.

2.3. UNIPOLAR DPT SPAN CALIBRATION

- Step 1. Apply power to the DPT-4005 transducer.
- Step 2. Connect the DMM between TP6 (GND) and TP3 (DPT SIG.).
- Step 3. Apply full scale pressure (Value shown on the transducer label) to the **High** Pressure port and adjust R16 (DPT SPAN) potentiometer for a reading of $10 \pm .01$ vdc.

2.4. BIPOLAR DPT SPAN CALIBRATION

- Step 1. Apply power to the DPT-4005 transducer.
- Step 2. Connect the DMM between TP6 (GND) and TP3 (DPT SIG.).
- Step 3. Apply full scale pressure (Value shown on the transducer label) to the **High** Pressure port and adjust R16 (DPT SPAN) potentiometer for a reading of $10 \pm .01$ vdc.

3. OUTPUT CALIBRATION

3.1. DPT OUTPUT CALIBRATION

Check the transducer label to determine the output signal type (0-5vdc, 0-10vdc or 4-20mA) and perform the appropriate output procedure.

Note: Section 2 DPT Calibration must be completed before performing an Output Calibration.

Equipment Required

- Low pressure air source (Paragon PS-100 or equivalent)
- Manometer for measuring low pressure
- DMM (Digital Multi Meter)

3.1.1. 0-5vdc Unipolar Output Procedure

(Note: If 0-5vdc option is installed, output selects are 0-5vdc & 0-10vdc only)

- Step 1. Connect the DMM to the output terminals and configure the DMM to measure voltage.
- Step 2. Apply power to the DPT-4005 transducer.
- Step 3. With no pressure applied, adjust R38 (OUTPUT ZERO) potentiometer for a reading of $0.0\text{vdc} \pm 0.01\text{vdc}$.
- Step 4. Apply full scale pressure (Value shown on the transducer label) to the **High** Pressure port and adjust R33 (OUTPUT SPAN) potentiometer for a reading of $5 \pm 0.01\text{vdc}$.

3.1.2. 0-5vdc Bipolar Output Procedure

Note: If 0-5vdc option is installed, output selects are 0-5vdc & 0-10vdc only)

- Step 1. Connect the DMM to the output terminals and configure the DMM to measure voltage.
- Step 2. Apply power to the DPT-4005 transducer.
- Step 3. Verify maximum pressure value (see label located on side of transducer to determine maximum DPT pressure value).
Example: Pressure Range = ± 0.10 "w.c., DPT maximum pressure value would be $+0.1$ "w.c..
- Step 4. Apply maximum pressure to the **Low** Pressure port and adjust R38 (OUTPUT ZERO) potentiometer for a reading of $0.0\text{vdc} \pm 0.01\text{vdc}$.
- Step 5. Apply maximum pressure to the **High** Pressure port and adjust R33 (OUTPUT SPAN) potentiometer for a reading of $5 \pm 0.01\text{vdc}$.
- Step 6. Due to Zero and Span adjustment interaction, repeat steps 3 thru 5 until no further adjustment is required to meet accuracy specifications.

3.1.3. 0-10vdc Unipolar & Bipolar Output Procedure

- Step 1. Connect the DMM to the output terminals and configure the DMM to measure voltage.
- Step 2. Apply power to the DPT-4005 transducer.
- Step 3. With no pressure applied, adjust R13 (DPT ZERO) potentiometer for a reading of $0.0 \pm .01$ vdc.
- Step 4. Apply full scale pressure (Value shown on the transducer label) to the **High** Pressure port and adjust R16 (DPT SPAN) potentiometer for a reading of $10 \pm .01$ vdc.

3.1.4. 4-20mA Unipolar Output Procedure

(Note: 4-20mA output not available with 0-5vdc option)

- Step 1. Connect the DMM to the output terminals and configure the DMM to measure current.
- Step 2. Apply power to the DPT-4005 transducer.
- Step 3. With no pressure applied, adjust R38 (OUTPUT ZERO) potentiometer for a reading of 4.0 ± 0.01 mA.
- Step 4. Apply full scale pressure (Value shown on the transducer label) to the High Pressure port and adjust R33 (OUTPUT SPAN) potentiometer for a reading of $20 \pm .01$ mA.
- Step 5. Due to Zero and Span adjustment interaction, repeat steps 3 and 4 until no further adjustment is required to meet accuracy specifications.

3.1.5. 4-20mA Bipolar Output Procedure

(Note: 4-20mA output not available with 0-5vdc option)

- Step 1. Connect the DMM to the output terminals and configure the DMM for current readings.
- Step 2. Apply power to the DPT-4005 transducer.
- Step 3. Verify maximum pressure value (see label located on side of transducer to determine maximum DPT pressure value).
Example: Pressure Range = ± 0.10 "w.c., DPT maximum pressure value would be $+0.1$ "w.c..
- Step 4. Apply maximum pressure to the **Low** Pressure port and adjust R38 (OUTPUT ZERO) potentiometer for a reading of 4.0 ± 0.01 mA.
- Step 5. Apply maximum pressure to the **High** Pressure port and adjust R33 (OUTPUT SPAN) potentiometer for a reading of $20 \pm .01$ mA.
- Step 6. Due to Zero and Span adjustment interaction, repeat steps 3 thru 5 until no further adjustment is required to meet accuracy

4. TROUBLESHOOTING GUIDE

TROUBLESHOOTING TABLE	
SYMPTOM	SOLUTION
1. Power indicator not illuminated	1. Verify power to device is within specifications.
	2. Remove Power and verify F1 fuse with a DMM (See section 1.1.3).
	3. Contact Factory Service Department.
2. Incorrect output signal reading	1. Verify correct H1 output jumper selection (See section 1.1.3).
	2. Verify Low Pressure and High Pressure signal lines are connected correctly (See section 1.1.2).
	3. Verify receiving device is configured correctly.
	4. Measure Input Differential Pressure with a manometer and verify the correct pressure.
	5. Contact Factory Service Department.

