

P-8000, T-5312, T-8000, and T-8020 Controllers Installation Instructions

The following instructions are for installing P-8000, T-5312, T-8000, and T-8020 controllers. Included are the instructions for installing the accessory items.

Surface Mounting

Mounting of the P-8000, T-5312, and T-8000 controllers may be done on any type of surface using #8 screws. It is recommended that the surface be smooth.

The T-8020 is designed for direct mounting in the wall of a tank, or in a pipe tee, using a separable well. The separable

well is ordered separately to facilitate installation, and has a 1/2 in. NPT.

External Adjustment Knob Kit

The External Adjustment Knob Kit (T-8000-17) consists of a clear plastic knob and screw. To assemble, remove the clear plastic window from the lower left of the cover. Insert the knob through the cover and attach it to the dial using the screw provided. See Figure 2 for a completed assembly.



Fig. 2: External Adjustment Knob Kit

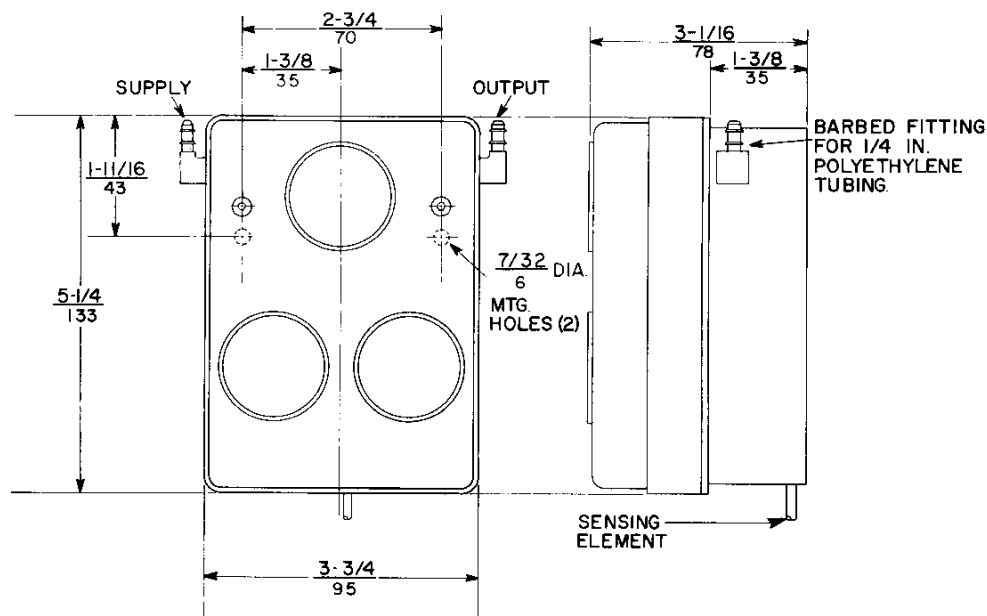


Fig. 1: Dimensions $\frac{\text{in.}}{\text{mm}}$

External Pilot Orifice Kit

The External Pilot Orifice Kit (T-8000-16) is designed for use when an 8000 series controller is required to operate if its input supply pressure drops below 5 psig (35 kPa) (the drop-off point of the relay). The following procedure should be used to install the kit:

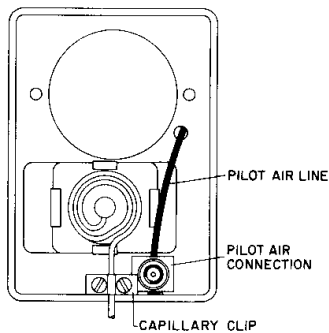


Fig. 3: Back of Instrument

1. Loosen capillary clip and rotate away from element.
2. Attach pilot air connection and insert pilot air line into hole provided in the back of the instrument.
3. Reposition capillary clip and screw in securely.
4. Connect the pilot air line to the pilot air connection and thread the tubing through the hole in the instrument.
5. Remove the tubing between the orifice holder and the tee.
6. Attach the pilot air line to the tee and cap the prong of the orifice holder.
7. Install the appropriate in-line restrictor and fitting to match the type of tubing selected for the particular application. (See Fig. 4).

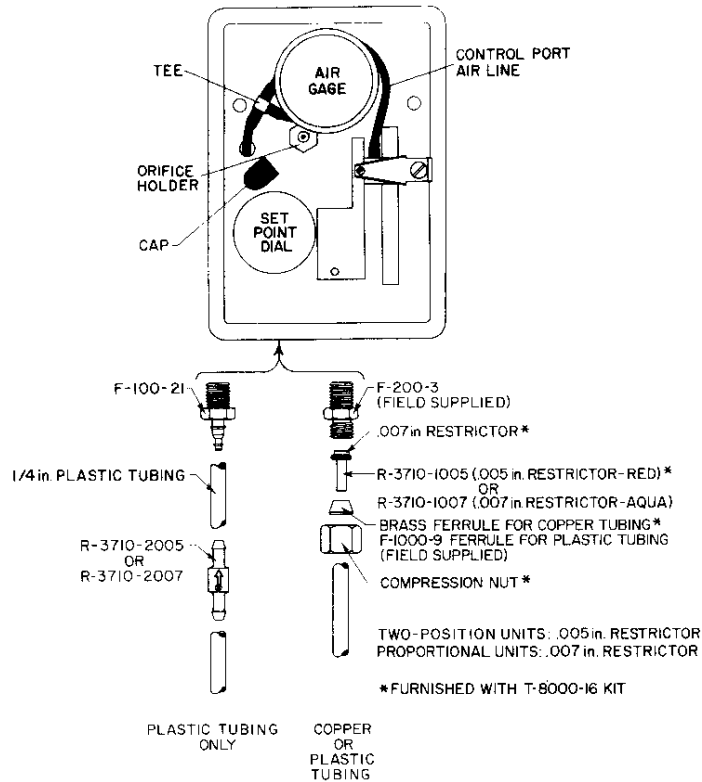


Fig. 4: Front of Instrument

Adjusting Instructions; Proportional Instruments

These proportional instruments have been factory calibrated and should require no additional calibration. The T-8000 and T-8020 have been adjusted to approximately 8 psig (56 kPa) output pressure at 70F (21°C), with a sensitivity of 1 PSI/F° (1 kPa/C°). The P-8000 has been factory adjusted for 8 psig (56 kPa) output pressure at 60 psig (420 kPa) on the high pressure model, and 12 psig (84 kPa) on the low pressure model (both with 1 PSI/PSI (1 kPa/kPa) sensitivity). The T-5312 is factory set at 9 psig (63 kPa) output pressure and 9 psig (63 kPa) input pressure, with an 8:1 gain. However, the temperature or pressure setting must be made in accordance with the job specifications. It may be necessary to change the sensitivity.

Sensitivity or Gain Adjustment

The controller can be made to function as a direct or reverse acting instrument by changing the position of the sensitivity slider. Moving the slider upward (Direct Acting) or downward (Reverse Acting) from the midpoint increases the sensitivity. The slider is held securely in place by a slotted screw. Set the sensitivity or gain as high as possible without producing excessive hunting or cycling.

Dial Adjustment

The set point dial has ranges on both sides. If it is necessary to use the range on the opposite side, place the non-graduated portion of the dial in the same quadrant as it was originally.

1. Note the ambient temperature or pressure at the element.
2. Turn the dial post until the output pressure is in the middle of the spring range of the controlled device, if not already there.
3. Loosen the dial screws without moving the dial post. Turn the dial to indicate the temperature or pressure at the measuring element, and tighten the dial screws. (For T-5312, center the dial. See Table 1 below for set point dial graduations).
4. Turn the dial to the desired temperature or pressure set point.

**Table 1:
Set Point Dial Graduations**

Transmitter Span	Graduations Represent
25C Degrees	1/2C Degree
50F or C Degrees	1F or C Degree
100F or C Degrees	2F or C Degrees
200F Degrees	4F Degrees

Adjusting Instructions; Two-Position Instruments

The two-position T-8000 has been factory adjusted to a differential of 4F° (2C°). The two-position P-8000 differential has been factory adjusted for 1 PSI (7 kPa) on the low pressure model, and 10 PSI (70 kPa) on the high pressure model. The two-position T-5312 is set for a differential of 0.25 PSI (2 kPa).

These two-position controllers have been factory calibrated and should require no additional calibration. However, if the factory adjustments are not the desired differentials, or if the instrument shows evidence of tampering, it may be necessary to make further adjustments.

Differential Adjustment

The controller can be made to function as a director or reverse acting instrument by changing the position of the differential slider. Moving the slider upward (Direct Acting) or downward (Reverse Acting) from the

midpoint decreases the differential. The slider is held securely in place by a slotted screw.

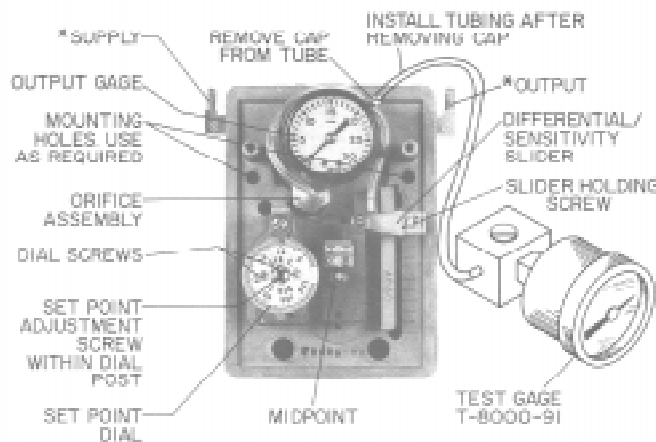
Checking Differential

In order to determine the differential, the switching of the relay must be noted. This will occur between 3.5 and 8.5 psig (24 and 59 kPa) pilot pressure to the relay.

The T-8000-91 Test Gage must be used to obtain the reading. The T-8000-91 consists of one 1/8 in. NPT x 1/8 in. barbed adapter fitting, 1/8 in. O.D. polyurethane tubing, and one 0 to 30 psig (0 to 210 kPa) gage.

Insert the gage into the adapter fitting, and connect the 1/8 in. tubing to the 1/8 in. barb on the adapter fitting. Remove the cap from the proper tube on the existing tee fitting. Connect the tubing from the gage as shown in Fig. 5. Pilot pressure to the relay may now be read on the test gage. After the instrument has been adjusted, remove the test gage and tubing, and recap the proper tube of the tee fitting.

1. Set the differential slider to the desired differential. Table 2 shows the sensitivity divisions in comparison to the differential produced by the controller. When setting the differential for the Direct Acting or Reverse Acting instrument, align the bottom of the slider with the sensitivity division. Table 2 shows the minimum and practical maximum differentials which are identical for direct or reverse acting controllers. Practical maximum values are obtained with the slider approximately 1/32 in. (0.8 mm) from the pivot.
2. Turn the set point dial very slowly until the pilot pressure increases or decreases to its minimum or maximum value, respectively.



*SUPPLY AND OUTPUT CONNECTION FOR 1/4 in. O.D. POLYTUBING UNITS TAPPED 1/8 in. NPT.

Fig. 5

- Note the pressure or temperature settings on the dial.
- Rotate the dial very slowly in the opposite direction and note when the switch point of the relay switches the output to the opposite value of that found in Step 1.
- Note the reading on the dial.
- The difference between the two dial readings is the exact differential. If this is not the desired differential, the differential slider should be positioned closer to the midpoint to increase, or away from the midpoint to

decrease the differential. Repeat Steps 2 through 6 until the desired differential is obtained.

Set Point Dial Adjustments

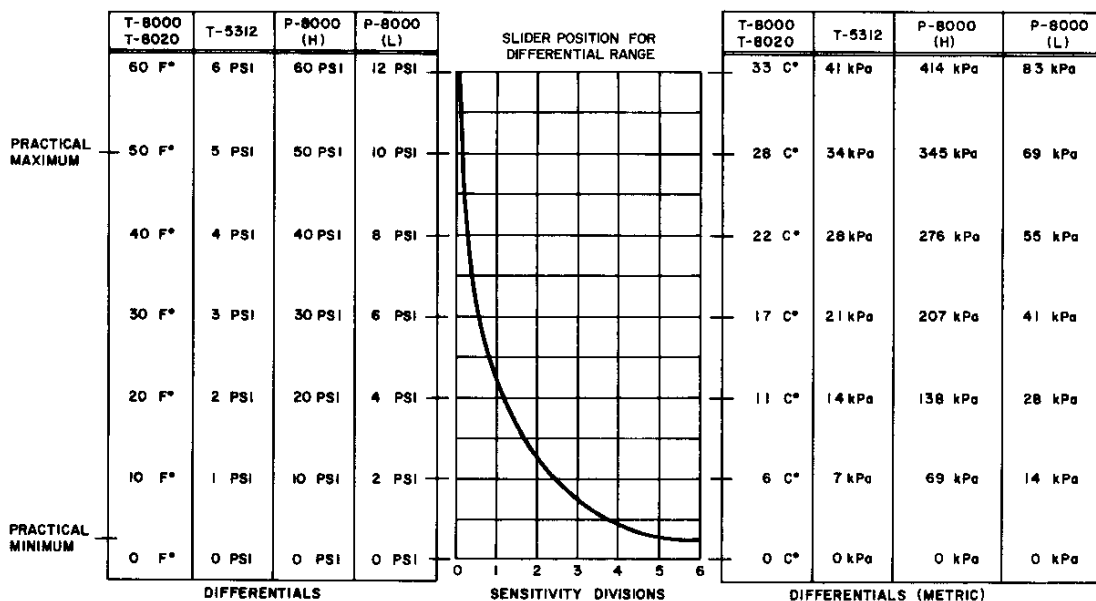
- Note the pressure or temperature at the measuring element.
 - Loosen the dial face.
- If the controller is Direct Acting:
- Turn the adjusting screw very slowly until the control pressure switches to maximum, 15 or 20 psig (105 or 140 kPa).

- Retighten the dial to the temperature or pressure at the element.
- Set the dial at the higher temperature or pressure switch point.

If the controller is Reverse Acting:

- Turn the adjusting screw very slowly until the control pressure switches to 0 psig (0 kPa).
- Retighten the dial to the temperature or pressure at the element.
- Set the dial at the higher temperature or pressure switch point.

Table 2



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