

MicroFab Technologies, Inc.

www.microfab.com

CT-PT4 User's Manual

© MicroFab Technologies
1104 Summit Avenue, Suite #110
Plano, Texas 75074
Phone 972.578.8076 • Fax 972.423.2438

Introduction

MicroFab's CT-PT4 Pneumatics Controller Box can house up to 4 CP-01 pneumatics channels that have been designed to provide a stable back pressure to up to 4 of MicroFab's jetting devices. Positive and negative purge pressures are also provided for filling and emptying the devices quickly.

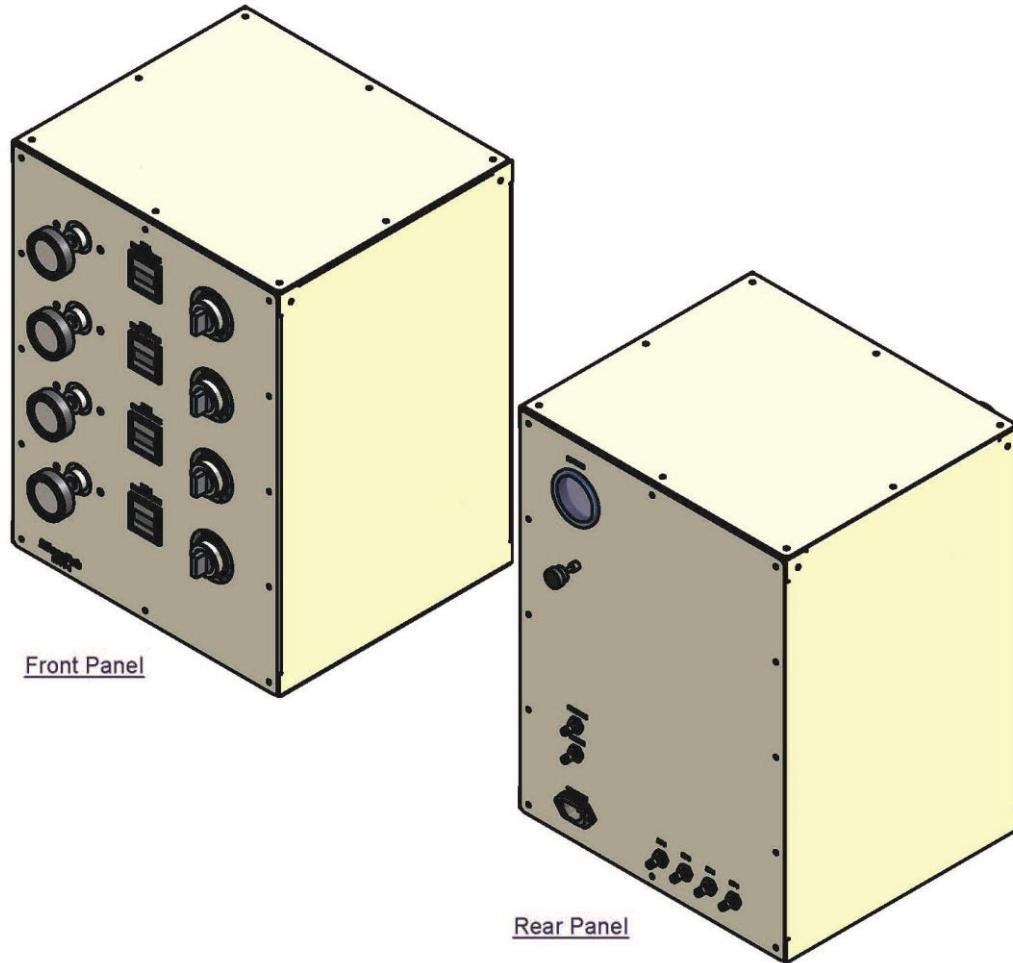


Figure 1 CT-PT4 shown with 4 CP-01 pneumatics channels

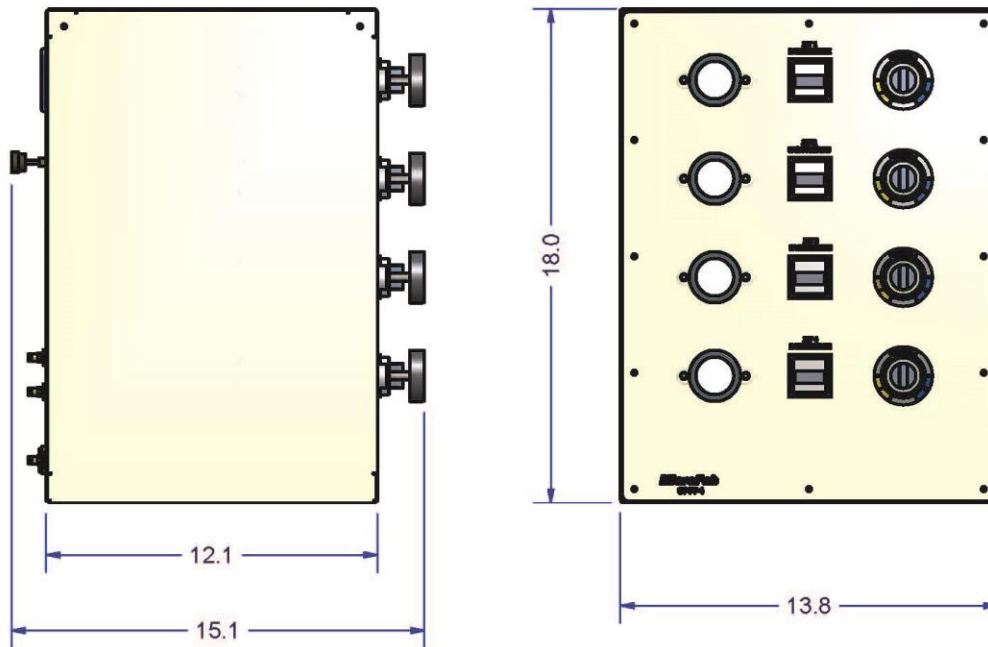


Figure 2 Physical Dimensions in inches

Facility Requirements

Power Requirements

- Required power – 100 – 240 VAC; 0.25A max; 50/60 Hz;
- Power cord included

Pneumatics

- Input Pressure: 60 PSIG / 3102 mmHg MAX pressure from house compressed air or bottle gas
- Vacuum Input: 20 inHg / 507 mmHg recommended

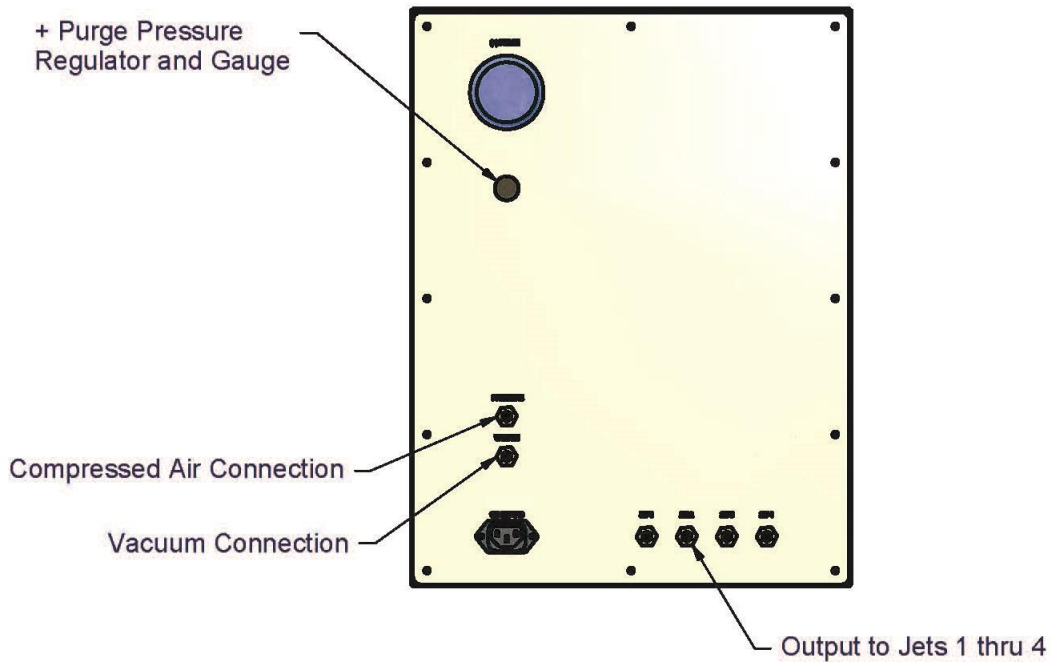


Figure 3 Rear Panel Connections

The purge adjust pressure regulator is set to ~15 PSIG / 775mmHg for shipping purposes; The MAXIMUM input pressure to the Pneumatics Controller should be \leq 60 PSIG / 3102 mmHg.

Installation

Shipment Contents

- CT-PT4 4-channel Pneumatics Controller
- Power Supply Cord
- 1/8" OD Pneumatic Tubing (PTFE)
- 2 x 1/4" and 1/8" NPT:Quick Connect Fittings
- Keyence Instruction Manual

Setup

- Connect the Power Cord to the CT-PT4 Power Inlet and connect to an appropriate outlet.
- Connect the 1/8" Pneumatic Tubing to the Compressed Air Connection at the rear panel and to a pressure source.
- Connect the 1/8" Pneumatic Tubing to the Vacuum Connection at the rear panel and to a vacuum source.
- The Keyence displays on the front panel are set to display in mmHg units and can be changed as described in the Keyence manual included in this shipment; this unit will be activated as long as power is supplied. There is no external power switch.
- Connect the 1/8" Pneumatic tubing between the Output to Printhead / reservoir connection at the rear panel and the printhead reservoir for each printhead in use. If all pneumatics channels are not in use, set the unused channel's Pressure Mode Selector to "Control" and set the matched Backpressure Regulator to neutral back pressure. Neutral backpressure is indicated when the Keyence display shows 0.
- Prepare your printheads / reservoirs according to their specification before dispensing.
- To change the purge pressure from the factory set 15psig, turn one of the Pressure Mode Selector on the front panel to "Positive" (*the other channels set to neutral points between "Control" and "Positive"*), insert the provided plug into the Outlet to Printhead/reservoir connection for the channel you selected, and turn the Purge Adjust Pressure Regulator on the back panel. Turning the pressure regulator knob counterclockwise will lower the purge pressure output. You can watch the Keyence display to determine the pressure output in mmHg. A display of "FFF" is not a malfunction; the pressure output is simply outside the range of the Keyence pressure monitor. Remember the total pressure input to the CT-PT-21 must be ≤ 60 PSIG / 3102 mmHg before making any adjustments or using the Pneumatics Controller. The recommended starting purge setting is 15psi.

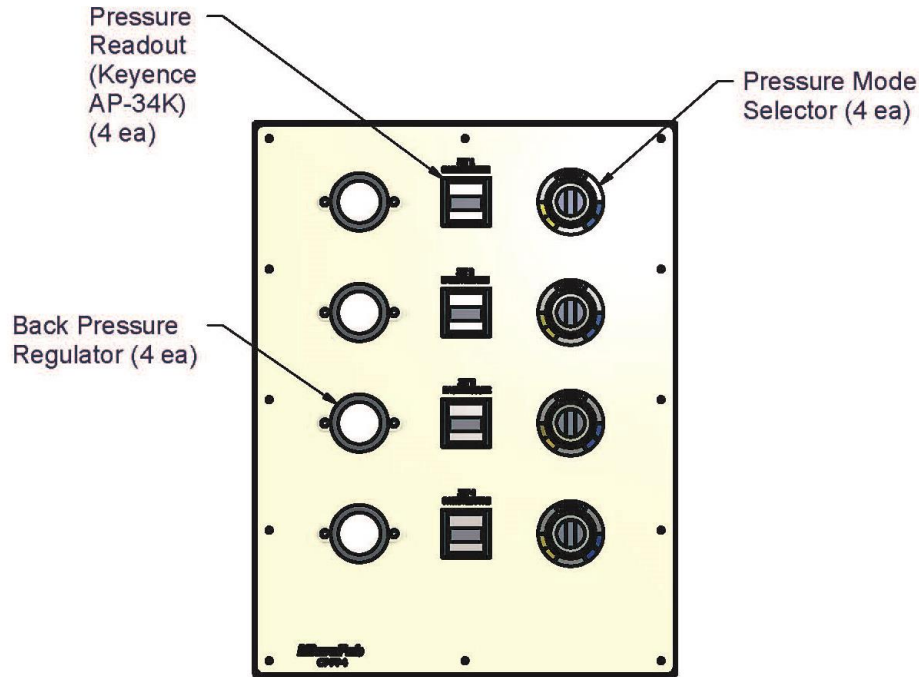


Figure 4 Front Panel Controls

Normal Operation

MicroFab's CT-PT4 Pneumatics Controller Box can house up to 4 CP-01 pneumatics channels that have been designed to provide a stable back pressure to up to 4 of MicroFab's jetting devices. Positive and negative purge pressures are also provided to assist in filling and emptying the device. The Pneumatics Controller channels can be set between control and purge modes by switching the Pressure Mode Selector.

Pressure Mode Selector (identical for each CP-01 pneumatics channel)

The Pressure Mode Selector controls distribution of control pressure, vacuum purge, or positive pressure purge to the reservoir via the modes on the selector switch as described below:

- **Control:** This allows the operator to precisely control the balance of pressure and vacuum introduced to the reservoir via the Backpressure Pressure Regulator.
- **Positive:** This setting activates a positive purge to the reservoir. The pressure value is controlled via the Purge Adjust Pressure Regulator located on the back panel.
- **Negative:** This setting activates a vacuum purge to the reservoir. The vacuum pressure is regulated via the vacuum supplied to the Pneumatics Controller at the Vacuum Connection located on the back panel.
- **The grey areas between the control selections have no functions but are open to atmosphere**

Pressure Readout (Keyence)

The Pressure Readout displays the value of pressure (positive or negative) being supplied to the reservoir under any of pressure modes described above. The display is set to mmHg at MicroFab but may be changed according to the Keyence instructions supplied with the pneumatics controller.

Backpressure Regulator (Fairchild)

The Backpressure Regulator controls the balance of positive and negative pressure supplied to the reservoir when the Pressure Mode Selector is set to "Control". This balance allows fine control of the meniscus during dispensing as shown in **Figure 5**. Turning the knob clockwise increases positive pressure and decreases negative pressure, while turning the knob counterclockwise increases negative pressure and decreases positive pressure.

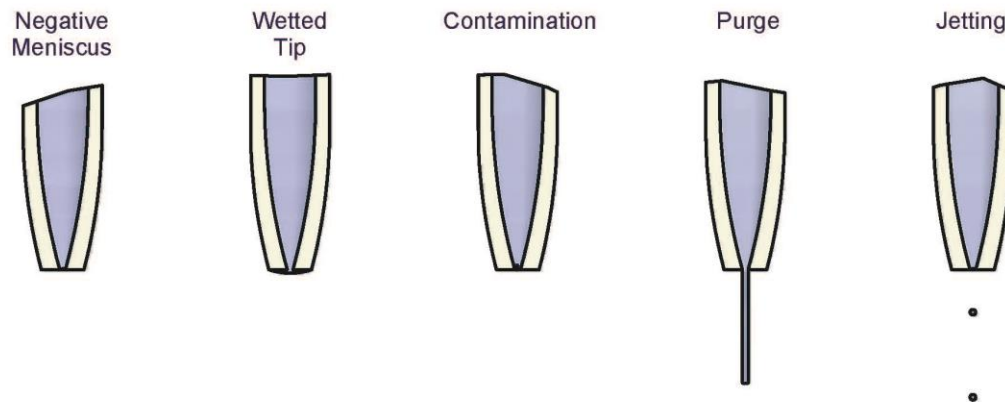


Figure 5 Examples of meniscus position at the orifice of a dispensing device

Dispensing with pneumatics management from the CT-PT4:

- **Filling the device with fluid from the reservoir:** To do this, turn the Pressure Mode Selector clockwise to the "Positive" position. This will provide positive pressure to the reservoir and fluid should flow through the device. Return the Pressure Mode Selector to the "Control" position to manage dispensing backpressure.
- **Controlling backpressure while dispensing:** Switch the Pressure Mode Selector from "Positive" to "Control" to transfer control to the Backpressure Regulator for fine pressure adjustment. Adjust the Backpressure Regulator until the fluid meniscus is flush with the device orifice. Often a lint free swab is useful in cleaning the front face of the orifice in order to verify the pressure level. **Figure 5** shows possible meniscus positions at the orifice.
- **Emptying the device of fluid back into the reservoir:** Switch the Pressure Mode Selector from "Control" to "Negative". This will provide negative pressure to the reservoir and fluid should flow from the device and back into the reservoir. Keep in mind that as fluid is drawn from the device into the reservoir, the atmosphere at the device tip is being drawn into the device. Take caution with fluids sensitive to ambient atmosphere or prone to drying when using this setting. The negative pressure purge is equal to the amount of vacuum provided to the vacuum connection at the rear panel. **Do not aspirate your dispensing fluid into the Pneumatics Controller.**

Factory Support

For any questions regarding the CT-PT4 Pneumatics Controller, or ink jet technology, contact

MicroFab Technologies

1104 Summit Avenue, Suite #110

Plano, Texas 75074

Phone 972.578.8076 • Fax 972.423.2438

or

scott.ayers@microfab.com