

MPPI-2 Pressure Injector Manual

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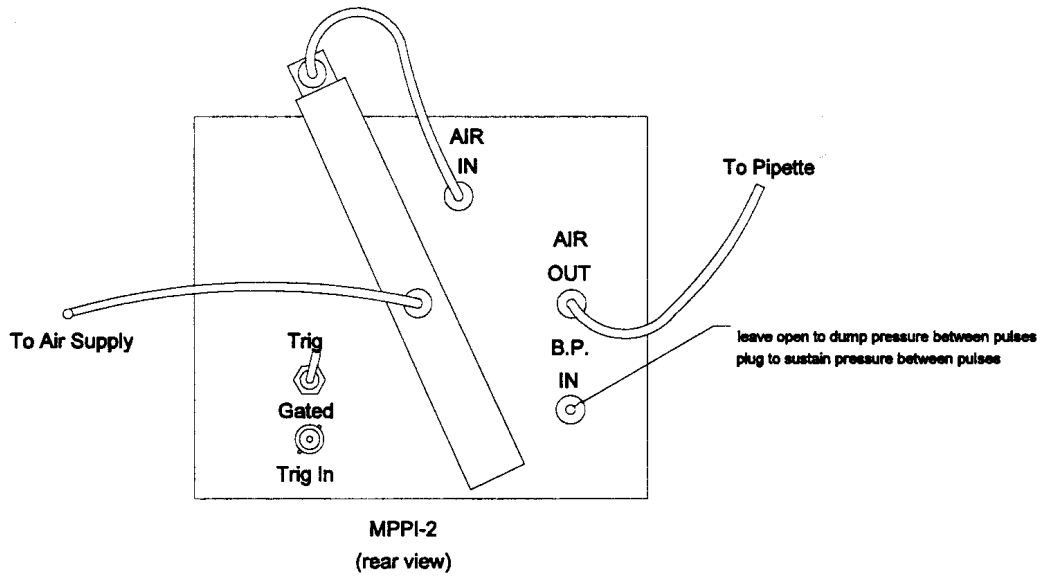
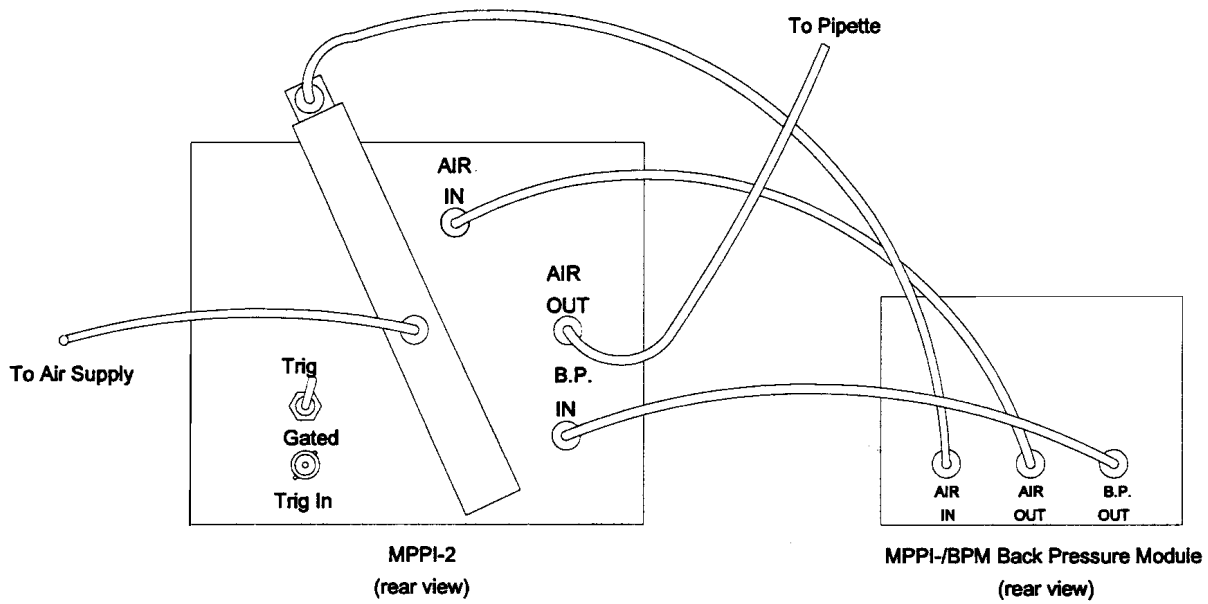
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REAR VIEW OF MPPI-2



REAR VIEW OF MPPI-2 CONNECTED TO BACK PRESSURE UNIT (BPU)



CONNECTING THE MPPI-2 AND BACK PRESSURE UNIT

SUMMARY OF OPERATION

The Milli-Pulse Pressure Injector, Model MPPI-2, is a self-contained device for producing gas pressure pulses to an injection pipette. The unit offers linear control of both pressure and pulse duration.

The MPPI-2 provides three different means of initiating pressure pulses:

- 1) a front panel push button
- 2) an external TTL signal input
- 3) an optional foot switch.

In addition to delivering a pulsed output, the MPPI-2 can also deliver continuous output or an output that is gated by an external TTL signal input.

The continuous output is useful for adjusting the rate of flow from the pipette tip prior to injecting and for clearing a clogged pipette. The gated output is useful for precisely controlling both pulse duration and repetition rate from an external source such as a stimulator or computer.

The MPPI-2 has an in-line air filter to exclude contaminants and guarantee the life of the solenoid valve. This filter is mounted to the rear panel for easy accessibility. The unit accepts a pressure source of up to 100 psi and has an output pressure range from 0 up to 100 psi.

An optional back pressure module is available in instances where precise control of leakage from the pipette tip is required. If the back pressure input is not utilized this port will act as an exhaust vent to spill the pressure between pulses. Optionally this port can be plugged to maintain some pressure between pulses.

FRONT PANEL CONTROLS

PRESSURE ADJUST Dial

This dial, in conjunction with the pressure gauge, sets the output pressure. The range of adjustment is 0 to 100 psi, dependent upon the available input pressure.

PULSE Push Button

This push button initiates the pressure pulse when the unit is in the pulse mode of operation.

PULSE DURATION Dial

This 10 turn dial precisely sets of the duration of the pressure pulse. A locking lever on the dial can be activated to prevent the setting from being disturbed.

PULSED/CONTINUOUS Switch

This switch sets the mode of operation to either pulsed or continuous. In pulsed mode, the unit delivers a precise pressure pulse in response to depressing the pulse pushbutton, depressing the foot switch or upon reception of an external TTL input pulse. In continuous mode, pressure will be continuously delivered.

FOOT SWITCH Jack

Connect the optional foot switch to this jack for hands free operation of the MPPI-2. A pressure pulse will be delivered for each depression of the foot switch.

POWER Switch

This switch turns the MPPI-2 on and off. A pilot lamp indicates when it is on.

REAR PANEL CONNECTIONS

FUSE

This is the line fuse for the device. It is a 125mA fast blow. If it fails, be sure to replace it with an identical one.

TRIG IN Connector

For external control, connect a TTL level signal to this BNC connector. The signal should switch between approximately 0 volts and approximately +5 volts. See TRIG/GATE switch below for the modes of control available via this input.

TRIG/GATE Switch

This switch sets the modes of operation for the external TTL input signal. When in the TRIG position, a pressure pulse will occur each time the signal makes a transition from approximately 0 volts to approximately +5 volts. The duration of the pulse is set by the front panel Pulse Duration dial. When the switch is in the GATE position, the pressure pulse will follow the external TTL input signal. That is, when the TTL signal is low (0 volts) no pressure will be delivered. When the TTL input is high (+5 volts), pressure will be delivered. This mode allows an external source such as a stimulator or computer to control both the repetition rate and the duration of pressure pulses.

AIR IN Barbed Hose Fitting

Please refer to the drawing on page 4 for the air line connections.

The output of the in-line filter connects to this hose fitting. Connect your pressure source to the input of the filter. The input to the filter is the barbed hose fitting on the side of it.

AIR OUT Barbed Hose Fitting

Connect your injection pipette to this hose fitting.

B.P. INPUT

Connect the optional back pressure unit (BPU) to this hose fitting. Alternatively leave it open or plug it. The optional BPU allows precise control of leakage from the pipette tip. **Please Note: That if the BPU is used then in between pulses you will have leakage from the pipette tip that is equal to the pressure setting on the BPU.** Leaving the port open allows the pressure between pulses to be vented at the ambient room pressure. Plugging the port allows some pressure to remain between pulses in instances where the preparation being injected has high hydrostatic pressure.

MAINTENANCE

The MPPI-2, Milli Pulse Pressure Injector, has been designed and tested to provide years of reliable service. In order to insure that the unit operates as designed, use only **Nitrogen or clean dry compressed air** as the pressure source.

The design of the MPPI-2 requires little maintenance on the part of the user. In fact, there are only two areas that the user needs to be aware of. The first is to periodically check for moisture and other contaminants in the pressure source. The in-line filter that is attached to the back of the unit has a small needle valve located on the bottom. This valve should be depressed periodically to check for moisture from an improper source. If excessive moisture is noted both the pressure source and filter cartridge should be changed. To change the filter cartridge disconnect the air lines from the filter located on the back of the unit. Remove the filter from its holder and unscrew the long bottom portion from the machined flat top. Remove the old cartridge and install the replacement one in the same manner. Replacement filter cartridges can be ordered from ASI.

The second area of maintenance that the user should be aware of is the replacement of the fuse. In the event that the MPPI-2 fails to turn on, the line fuse located to the rear panel should be checked. If the fuse is blown, an exact replacement needs to be used. The MPPI-2 uses a 125mA fast blow fuse. If the fuse blows again after replacement, please contact AS for instructions on returning the unit for repair.

MPPI-2 SPECIFICATIONS

Input Pressure Range	-	0 to 100 psi
Output Pressure Range	-	0 to 100 psi (dependent on input pressure)
Output Pulse Range	-	Three factory-set ranges: 0 to 100ms, 0 to 1 second, 0 to 10 seconds These ranges can be changed by changing the factory-programmed microprocessor.
Minimum duration is limited by the pneumatic solenoid valve to approximately 5 ms		
Output Pulse Accuracy	-	0.4% of full scale (crystal controlled)
Output Pulse Repeatability	-	0.4% of full scale (1% over the life of the valve)
Valve Life Expectancy	-	100 million cycles
Output Pulse Setting	-	Via a front panel calibrated 10-turn dial
Modes of Operation	-	<ul style="list-style-type: none">•Continuous pressure•Pulsed pressure via pushbutton, external TTL pulse or via an optional foot switch•Gated pressure via external TTL level input
Pulsed Pressure Modes	-	<ul style="list-style-type: none">•Front panel push button switch•External TTL input signal•Optional foot switch
Output Pressure Gauge	-	Front panel analog gauge 0 to 100 psi
Power Requirements	-	120 volts AC 50/60 Hz 30 watt
Gas Input Fitting	-	1/8 inch barbed hose fitting
Gas Output Fitting	-	1/16 inch barbed hose fitting
Back Pressure Input Fitting	-	1/8 inch barbed hose fitting
Recommended Gas	-	Nitrogen or clean dry compressed air, an externally mounted input gas filter is provided
Size	-	Compact bench top unit measuring 5"x 4 3/4"x 3 1/16"

OPTIONAL ACCESSORIES

Micropipette Holder Option

Pipette holder. Mounts in your micromanipulator. Accepts standard 1mm O.D. glass pipettes.

Footswitch Option

Foot switch with 8 foot cord. Use for hands free activation of pressure pulses.

Back Pressure Unit Option

Back Pressure Unit. This small unit connects to the air line between the in-line filter and the MPPI-2 and attaches to the B.P. input. It has an adjustable pressure regulator and pressure gauge. Use for precise adjustment of leakage from the pipette tip.

Gas Filter Cartridge Option

Replacement Gas Filter Cartridge

Microprocessor Option

Optional replacement chip with different time durations 0 to 100ms, 0 to 1 second, 0 to 10 seconds

WARRANTY

Applied Scientific Instrumentation, Inc., hereafter referred to as ASI, guarantees its equipment against all defects in materials and workmanship to the original purchaser for a period of one (1) year from the date of shipment. ASI's responsibility to this warranty shall not arise until the buyer returns the defective product, freight prepaid, to ASI's facility. After the product is returned, ASI at its option, will replace or repair free of charge any defective component or device that it has manufactured. The warranty set forth above does not extend to damaged equipment resulting from alteration, misuse, negligence, abuse or as outlined below:

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