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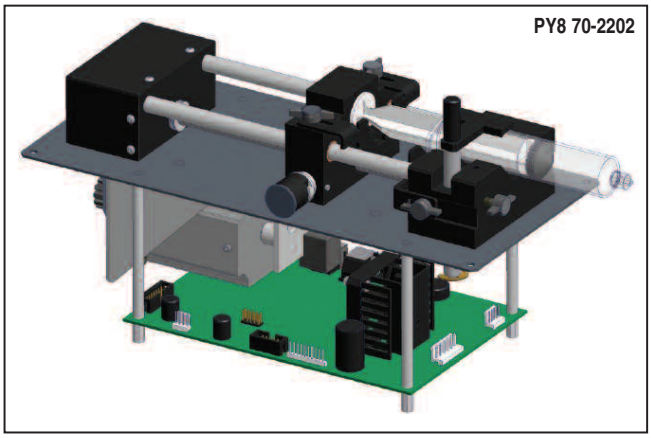
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High Pressure Syringe Pump Module



- Easy to incorporate legendary syringe pump technology into your equipment
- Ideal high force syringe pump for do-it-yourselfers and OEM equipment designers
- Precisely dispenses volumes at high pressure
- Smooth flow
- Nonvolatile memory
- Three modes of operation:
  - Constant flow rate
  - Volume dispense
  - Programmable

The High Pressure Syringe Pump Module employs a microcontroller which controls a small step angle motor that drives a leadscrew and Pusher Block. Microstepping techniques are employed to further reduce the step angle, eliminating flow pulsation. Data can be entered via computer using the RS-232 connector located on the micro controller. The microcontroller calculates the cross-sectional area of the syringe selected and calibrates the flow rate and volume accumulation. The numerous features of the High Pressure Pump Module result from the use of microprocessor technology.

The High Pressure Programmable Pump Module model provides full programmability along with Infuse/Withdraw capability. This unit is designed to operate inside an enclosure, cabinet, or on top of a bench. The board may be removed for "remote" operation.

Pressure and Speed

The High Pressure Pump Module can deliver up to 220.82ml/minute with a single 140ml syringe. Maximum pressure is dependent on syringe size. Drive produces >200 lbs linear force.

Infusion and Refill Rates

Specify independent rates for infusing and refilling. This allows a slow infusion rate then a fast refill.

Target Volume

Specify the volume that is to be infused or refilled. The pump will run at the rate specified until this volume has been delivered when in the Volume mode.

Auto Fill

Auto Fill automatically activates an externally attached solenoid and refills the syringe when it is empty. This permits infusions to be virtually independent of syringe capacity.

Modes of Operation

(Default is pump mode, can be changed thru RS-232)

Pump: Runs continuously in the infuse or refill directions until stopped.

Volume: Runs until a specified volume has been pumped or refilled.

Program: Pump operates according to specified sequence of instructions.

(Note: All modes interact with Auto Fill)

External Connections User I/O

Allows pump operations to be synchronized with external devices or by a person at a distance from the pump. Connector pins are available to control direction of pump travel, to control an external valve for refilling, and for general use. A simple contact closure to ground or TTL level signals may be used for inputs.

RS-232

Dual RS-232 ports allow multiple pumps to be 'daisy chained' together and remotely controlled from a computer or any device communicating via RS-232.

Up to 100 pumps can be addressed independently using internal reference addresses from 00 to 99. Default setting is 00. Please let us know if you would like your pumps addressed. Addresses need to be factory set unless you have a keypad.

A scale can be connected, enabling the pump to infuse by weight instead of by volume.

A printer can be connected to record final volumes or weights whenever the pump stops. In addition the program entered for the program mode can be listed on a connected printer. Both a scale and a printer may be connected simultaneously.

Non-Volatile Memory

All operational data entered into the pump from a computer will be stored, including the program.

Stall Detection

An optical detector is used to verify expected movement of the motor. If the motor is prevented from turning due to jamming or excessive back pressure, the pump will stop.

Program Storage

Programmable model can store up to 4 sets of 10 program sequences for later selection.

Infuse Rate

The Infuse Rate is the rate of pumping while infusing in the Pump or Volume modes.

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OEM pumps

High Pressure Syringe Pump Module (continued)

Auto Fill

When set to 'ON', the syringe is assumed to be empty. Auto Fill continuously monitors the volume of the syringe according to the volume pumped. When the pump determines that the syringe is empty, the operation in progress is suspended and Auto Fill is activated. The pumping direction is then reversed and the pump runs at the refill rate.

Program Description

The programming functions of this pump provide powerful capabilities for advanced experiments. While in program mode this pump can perform the following tasks at a predetermined time or when prompted by a signal from an external device:

- **start or stop pumping**
- **change pumping direction (infuse-withdraw)**
- **change flow rates**
- **pump a precise volume and stop**
- **pause operation**
- **ramp up or down flow rates**

In program mode the above tasks can be linked together into powerful programs to simplify your automation projects.

Location Requirements for the Syringe Pump

This pump module was designed to operate inside an enclosure, cabinet, or on top of a bench/table. The circuit board may be removed to a "remote" location if desired.

- **A sturdy, level, clean and dry surface**
- **Minimum of one inch (2.5 cm) clearance around the pump**
- **Adequate power supply**
- **Operating temperature 0° to 35°C (32° to 95°F)**
- **Relative humidity 20% to 80%**

This Pump Module is supplied complete with the following components:

Component	Quantity
Syringe Pump Unit	1
Motor/Encoder Extension Cable, 6 ft.	1
DC Power Extension Cable, 6 ft.	1
RS-232 Cable	1
Symphony Program Diskettes	1
Grease, 6 oz. jar	1
User Documentation	1

**Note: Power supply not included. Must be purchased separately. Please call technical support for more information.*

Specifications

Type	Microprocessor single syringe, infuse/withdraw
Accuracy	±0.5%
Reproducibility	±0.1%
Syringe Size:	
Minimum	0.5 µl
Maximum	140 ml
Flow Rate:	
Minimum	0.001 µl/hr with 0.5 µl syringe
Maximum	220.82 ml/min with 140 ml syringe
Linear Force	200 lbs maximum
Drive:	
Motor	1.8° step angle motor
Control	Constant Current (Chopper) Drive, 2A per phase (max.), microstepping (from 1/2 to 1/32)
Pulley Ratio	2:1 (1:2 optional)
Leadscrew Pitch	24 threads per inch
Step Rate:	
Minimum	27.3 sec/step
Maximum	416.7 msec/step
Pusher Travel Rate:	
Minimum	0.18 mm/min
Maximum	190.676 mm/min
Display	Optional 2x20 Line VFD (p/n 2400-235)
Keypad	Optional (p/n 2400-252)
Interface	RS-232 with simple command language
Connectors:	
DC Power	4-pin Header (Friction Lock – Molex or AMP)
RS-232	4-pin RJ-11 Telephone Jack; dual RS-232 ports
User I/O	9-pin D-Sub Female
Power	+12 to +40VDC, ±5%, 75W (user supplied)
Environmental:	
Operating Temp.	0 to +35°C (natural convection cooling)**
Storage Temp.	-20 to +70°C
Humidity	20 to 80% RH non-condensing
Dimensions:	
Overall, H x W x D	16.8 x 14.0 x 30.2 cm (6.625 x 5.50 x 11.875 in)
Mounting	28.9 x 12.7cm (11.375 x 5.00 in), mounting holes for (4) #8 screws
Control Board Mounting	11.43 x 17.78 cm (4.50 x 7.00 in), mounting holes for (4) #6 screws
Weight	3.86kg (8.5 lbs)

*** Note: operating temperature may be extended with forced air cooling*

Order #	Product
PY8 70-2202	High Pressure Syringe Pump Module Without Power Supply

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