

Syringe Pump

User's Guide



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Syringe Pump

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Flow Rates

Calibrated in mL/minute						
1cc	2cc	5cc	10cc	20cc	30cc	50cc
0.11256	N/A	0.73454	1.06376	1.85425	2.38255	3.61482
Syringe cross section area (cm ²)						
0.173	N/A	1.129	1.635	2.85	3.662	5.556

Specifications

Size Dimensions (LWH): 9.0 x 6.0 x 5.0 in (22.9 x 15.2 x 12.7 cm)
Weight: 3.25 lbs (1.47 kg)

Motor DC Stepper Motor with micro-step precision

Power Input: 100 – 240 VAC, 50/60 Hz
Output: 12 VDC, 2.0 A, regulated power supply

Operate Active low, shunt to Common

Connector RJ12 6P6C

Calibration Calibration is based on ideal conditions and Plastipak syringes manufactured by Becton-Dickinson.

Users should confirm calibration with their own supplied syringes, tubing, and delivery port.

The flow can be calculated from: For ml/min = 0.6506 x syringe cross-section in cm²

Wiring Connections

Connecting to ABET 81409, 81408, or 81508 I/O modules

Connect the supplied RJ12 cable from the ABET Connection on the pump to one of the modular connections on the I/O module connection block.

The pump will use the first output of the three which correspond to that the specific modular connector. For example, if you connect the RJ12 cable to the first modular port, the pump will be controlled by *Output #1* in the ABET software. If connected to the third modular port, the operate line would then be *Output #7*.

The other two outputs on the modular connector can still be used via the appropriate screw terminal location on them main terminal block.

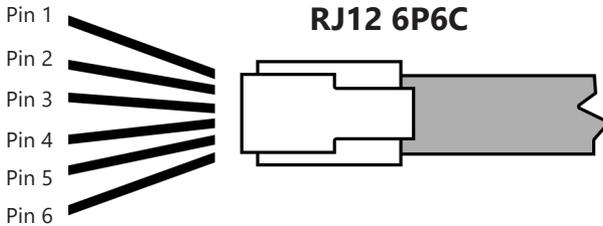
Connecting pump to 81425E Interface or third-party system

Connect one side of the RJ12 cable from the ABET Connection on the pump. The other side of the cable should either be stripped and tinned or a separate breakout board for an RJ12 connector used.

Only two wires from the connector need to be connected for proper functionality.

- Pin 2 should be connected to the ground on the controlling interface
- Pin 5 should be connected to the operate/signal line of the controlling interface.

An active low or shunt to Common signal is needed to operate the syringe pump. The pump will remain on for the duration of the low signal.



RJ12 - 6 PIN Modular

Pin	Description
1	Output 3
2	GND
3	Output 2
4	GND
5	Output 1*
6	+28VDC

* Default output to control 80203NE syringe pump

Syringe Pump

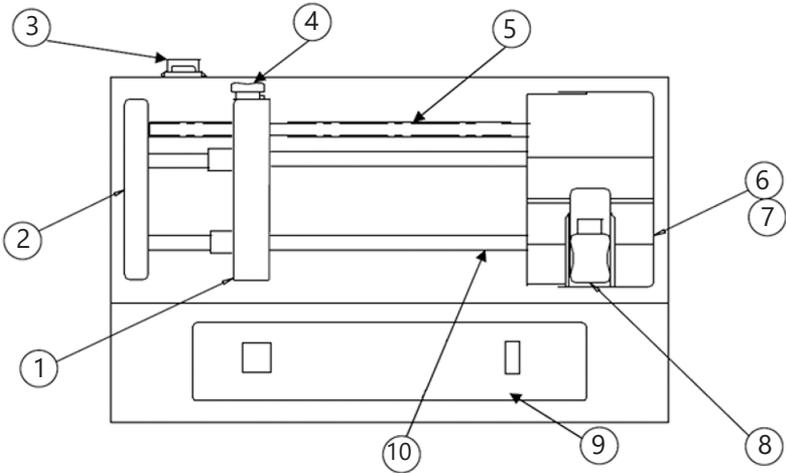
Loading Syringes

The syringe is loaded by securing the barrel and the pusher flange as follows:

1. Press in fully the white drive-nut button on the pusher block, releasing the block. Taking care not to drag the drive-nut on the drive-screw, slide the block away from the syringe holder, providing sufficient space for the loaded syringe. Then release the white button.
2. Lift the syringe clamp above the syringe holder block. Turn it 1/4 turn and then lower it onto the syringe holder block. The syringe clamp should be out of the 'V' slot.
3. Load the syringe with the barrel over the syringe holder and the syringe plunger towards the middle of the pump. Place the barrel on the syringe holder, in the 'V' slot, with the barrel flange to the left of the syringe holder block.
4. Lift the syringe clamp to slightly above the height of the syringe barrel and then turn the syringe clamp 1/4 turn back to its original position and lower it onto the syringe barrel.
5. Press the white drive-nut button to slide the pusher block against the syringe plunger. Release the white drive-nut button.

** To unload the syringe, reverse the instructions for syringe loading.

Pump Parts: Terminology



- | | |
|-----------------------------------|---|
| 1. Pusher Block | 7. 'V' Slot (on Syringe Holder Block) |
| 2. End Plate | 8. Syringe Clamp |
| 3. Power On/Off Switch / DC Input | 9. User Interface: <ul style="list-style-type: none">• ABET I/O Connection (LEFT)• Remote/Prime Switch (RIGHT) |
| 4. Drive-Nut Button | 10. Guide Rod (2 guide rods) |
| 5. Drive-Screw | |
| 6. Syringe Holder Block | |

Syringe Pump

Pump Operation

Priming

Using the Prime/Remote Switch

The toggle switch when set to Prime will run the pump at a higher speed for 10 seconds to prime or purge the fluid connection. For additional priming toggle the switch back to Remote and then back to Prime to get 10 more seconds of priming.

Using the ABET II Environment Test Panel

Set the Prime/Remote switch to Remote position, in ABET Environment Test turn ON the pump output to prime the delivery tube and port. This will drive the pump at the normal operating speed. The pump will continue run until the user turns OFF the pump output or closes the Environment Test Panel.

Bolus Delivery

Determine flow rate via calculation method or empirical testing of set up. Determine bolus amount to be delivered per pulse of the Pump Operate line in milliseconds then use the ABET II Pulse command with the desired milliseconds.

Example: Target delivery bolus is 0.5 mL, using a syringe with 2.85 cm² cross sectional area (20 cc syringe). Pulse time = $0.5 \text{ mL} \times 60000 \text{ msec./min} / (0.6506 \times 2.85) \text{ ml/min} = 4363 \text{ msec.}$

Setting up the ABET II Pulse Command

Set pulse time (to Constant) in milliseconds. This is ideal for most Reward Dispensers or other pulsed devices. ABET II times a single pulse with no additional action needed. Other options include Pulse to a Variable value or a List value.

Warning

Attempting to use the pump over its force limit will cause the unit to skip and damage the drive nut. Damage to the drive nut will reduce the force limit of the pump, requiring replacement of the drive nut for proper function of the pump. If skipping occurs power the unit off immediately and adjust your set up to reduce the amount of force needed to drive the syringe plunger. This can be done in a number of ways, including reducing the length of the tubing, increasing the bore of the needle, or reducing the size of the syringe. The pressure in the system must be reduced to bring the driving force below the maximum limit of the pump. **Damage to the drive nut due to improper use is not covered under warranty.**

User Notes

Write any user notes here for your convenience.

Terms and Conditions

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Phone, Fax, Email or Mail-in Orders

All orders need to be accompanied by a hard copy of your purchase order. All orders must include the following information:

- Quantity
- Part Number
- Description
- Your purchase order number or method of pre-payment
- Your tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Signature and typed name of person authorized to order these products
- Your telephone number
- Your email address
- Your FAX number

Domestic Terms

There is a \$50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

International Payment Information

There is a \$50 minimum order. Payment must be made in advance by draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

Exports

If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a "C" suffix.

Quotations

Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

Cancellations

Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

Exchanges and Refunds

Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a completed Return Form. A copy of the Return Form or your assigned Return # (you will receive this via email after submitting the form) **must be included with the returned goods**. The merchandise should be packed well and fully insured. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Returned products must be in saleable condition, and credit is subject to inspection of the merchandise.

Repairs

Instrumentation may not be returned without prior authorization by Lafayette Instrument Company and a completed Return Form. When you

complete the Form, or call Lafayette Instrument, you will receive a Return #. Your Return # number will be good for 30 days. Address the shipment to:

Lafayette Instrument Company
3700 Sagamore Parkway North
Lafayette, IN 47904, USA.

Shipments cannot be received at the LIC PO Box. Items should be packed well, insured for full value, and returned along with a copy of the Return Form or the Return #. An estimate of repair will be given prior to completion ONLY if requested in an enclosed cover letter. We must have a completed purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

Damaged Goods

Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

Limited Warranty

Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation. All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

Limited Obligations Covered by this Warranty

1. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and/or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
5. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
6. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

Export License

The U.S. Department of Commerce requires an export license for any polygraph system shipment with an ULTIMATE destination other than: Australia, Japan, New Zealand or any NATO Member Countries. It is against U.S. law to ship a Polygraph system to any other country without an export license. If the ultimate destination is not one of the above listed countries, contact us for the required license application forms.