

MASTERflex[®]

Miniflex[®] **24V Panel-Mount** **Drives**

MFLX77222-00

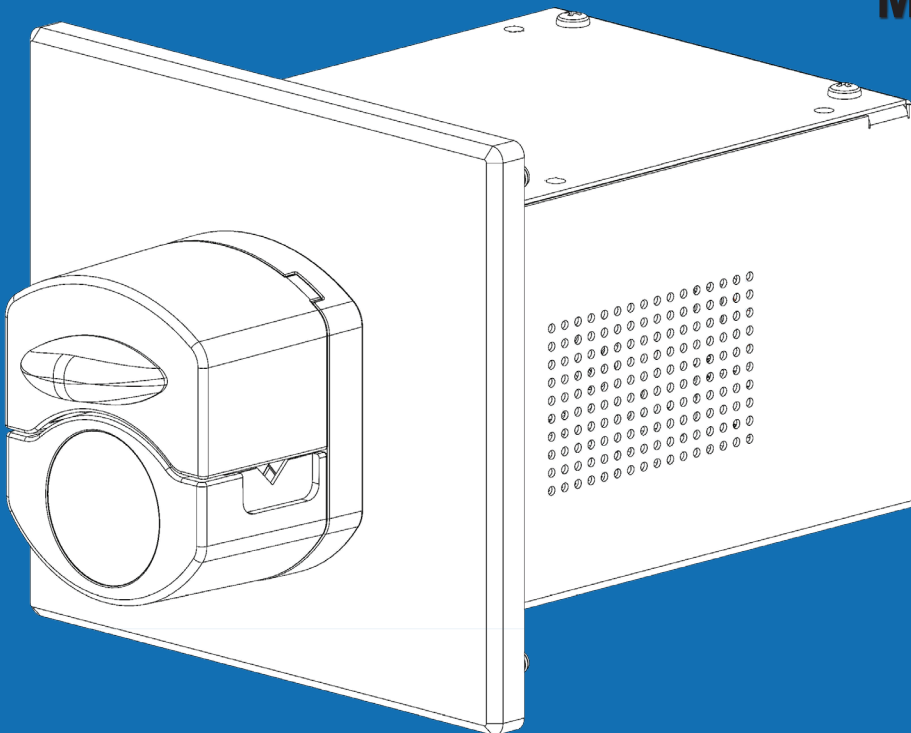
MFLX77222-02

Miniflex **Pump Heads**

MFLX77220-20

MFLX77220-30

MFLX77220-40



Miniflex 24V Panel-Mount Drives & Pump Heads

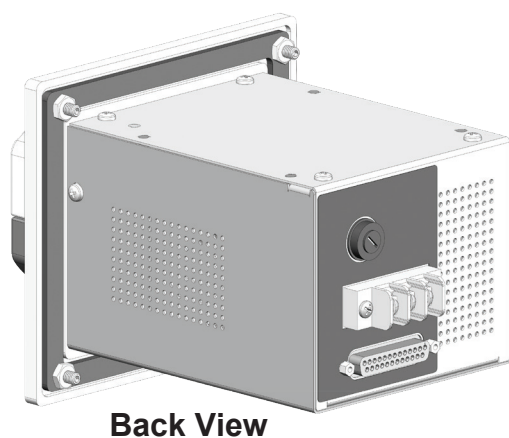
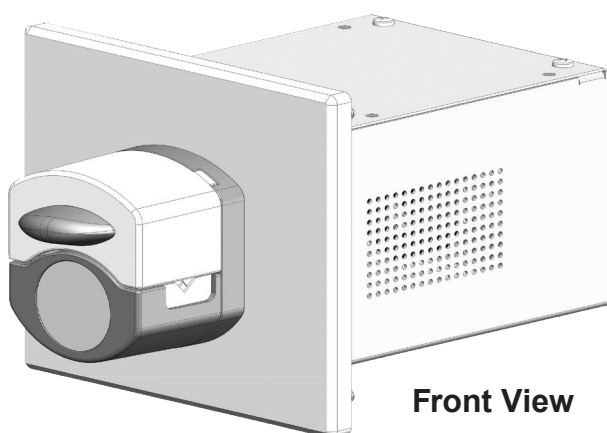
Designed to mount into
existing equipment

In the Box

- Miniflex Panel-Mount Drive
- Miniflex Pump Head (select models)
- 3-wire Power Supply Cable
- DB25 Data Control Cable
- Panel Nuts
- User Manual
- Warranty Card

Miniflex Panel-Mount Drive Features

- 24 VDC power supply
- Miniflex drive speed output: 3–300 RPM
- Speed accuracy (repeatability) @ 0.1%
- Brushless direct-current motor with encoder and gearbox power train
- Mounting plate adapts to 3- or 4-roller pump heads, designed specifically for Masterflex Silicone and PharMed[®] pump tubing
- Housing vent holes, DB25 back panel, and power supply connector
- Supports tube back pressure up to 15 psi



Safety Precautions



WARNINGS:

- Tubing breakage may result in fluid being sprayed from pump. It is recommended to use appropriate measures to protect operator and equipment
- Turn the drive off before removing or installing tubing—fingers or loose clothing can get caught in the pump-drive mechanism
- Do not operate the pump-drive in a manner not specified in the documentation. Misuse of the pump-drive may result in a hazard and may compromise the safety protections built into the pump-drive. If the pump-drive is damaged, turn it off and do not use it until service-trained personnel verify its safety
- Any obvious damage to the pump-drive enclosure (from a drop or fall) should be checked by service-trained personnel for loose or damaged parts inside



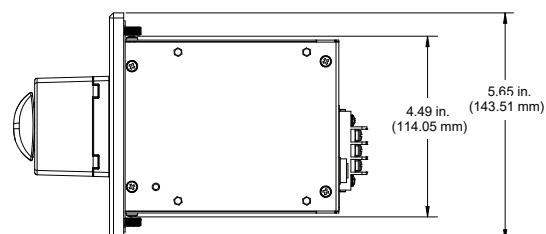
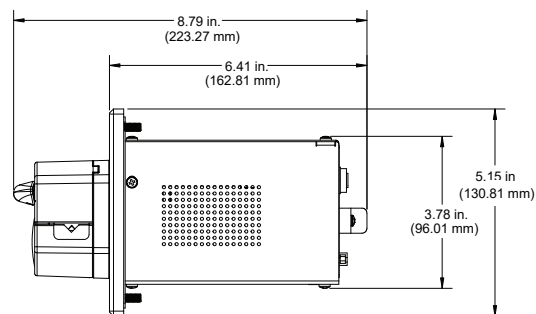
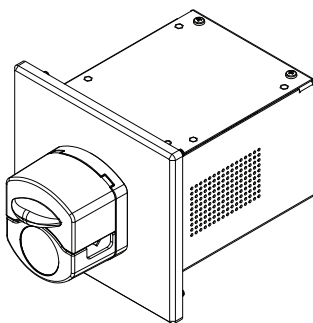
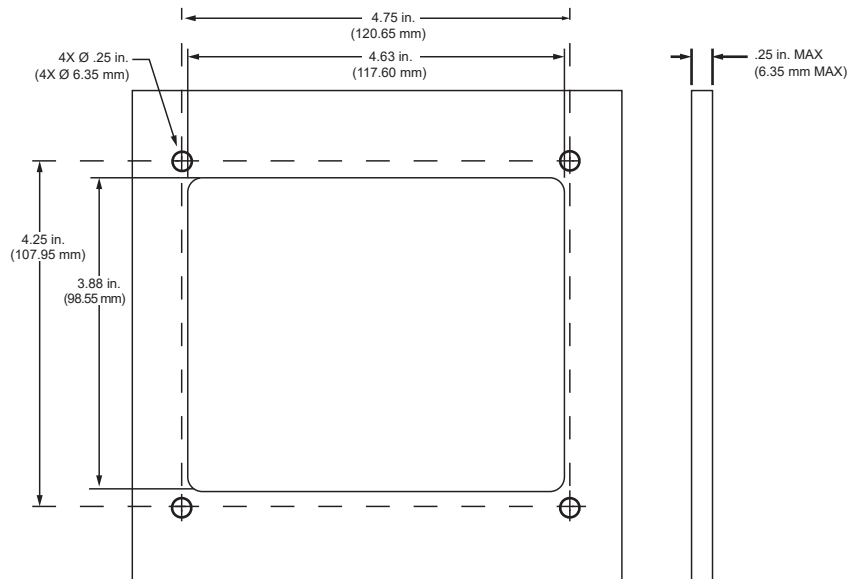
CAUTIONS:

- Power must be disconnected before connecting the external remote-control cable to prevent damage to the drive
- When using hazardous chemical and biological agents take all suitable protective measures such as wearing protective glasses and gloves resistant to the substances used and follow local and national regulations for safe operation and maintenance of the system

Installation

Installation Preparation

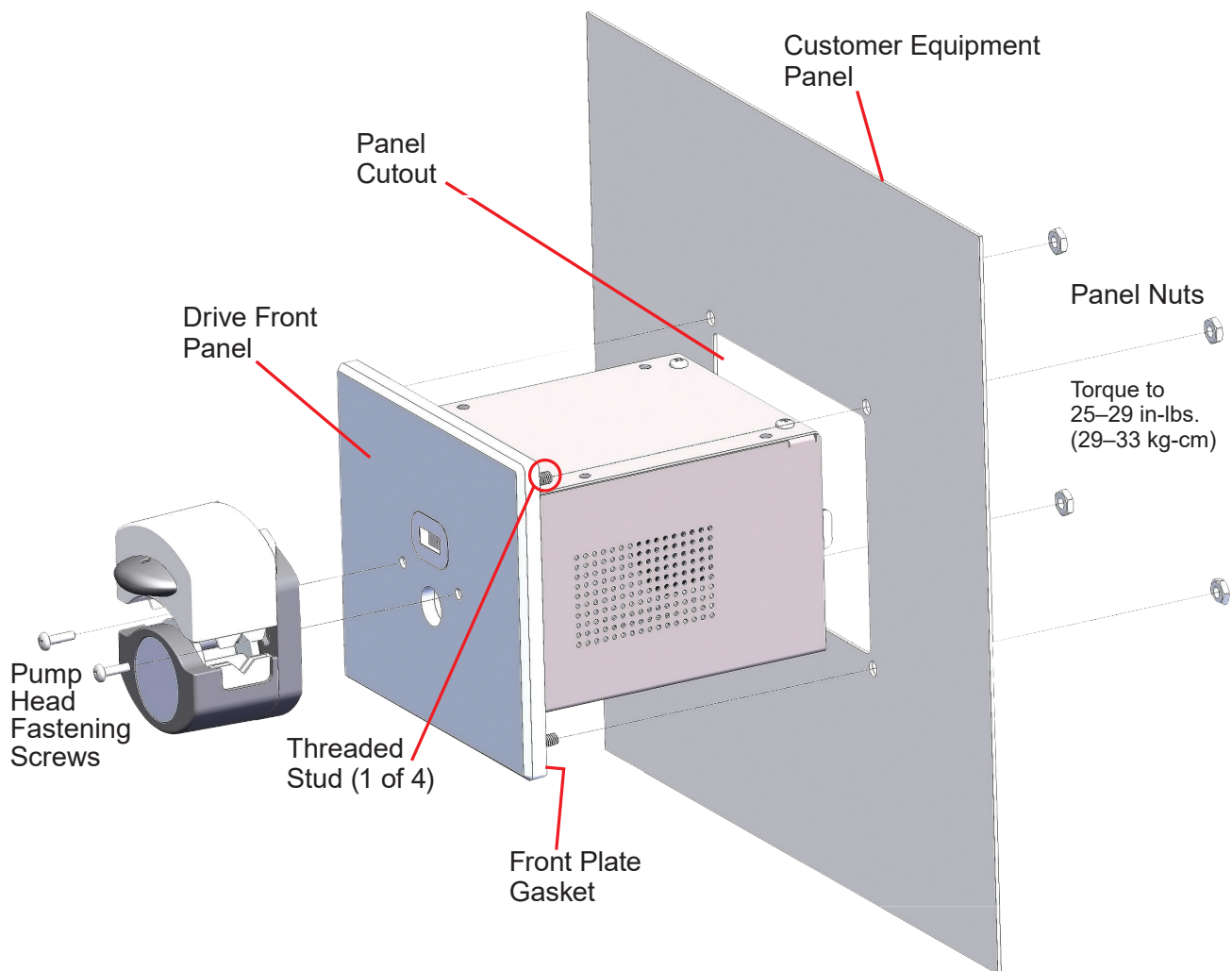
- Cut the opening on the customer panel for drive insertion according to the drawing dimension (below), with assumed panel thickness
- Drill the 4 holes as shown in the drawing



Installation (Cont.)

Install drive to customer equipment panel

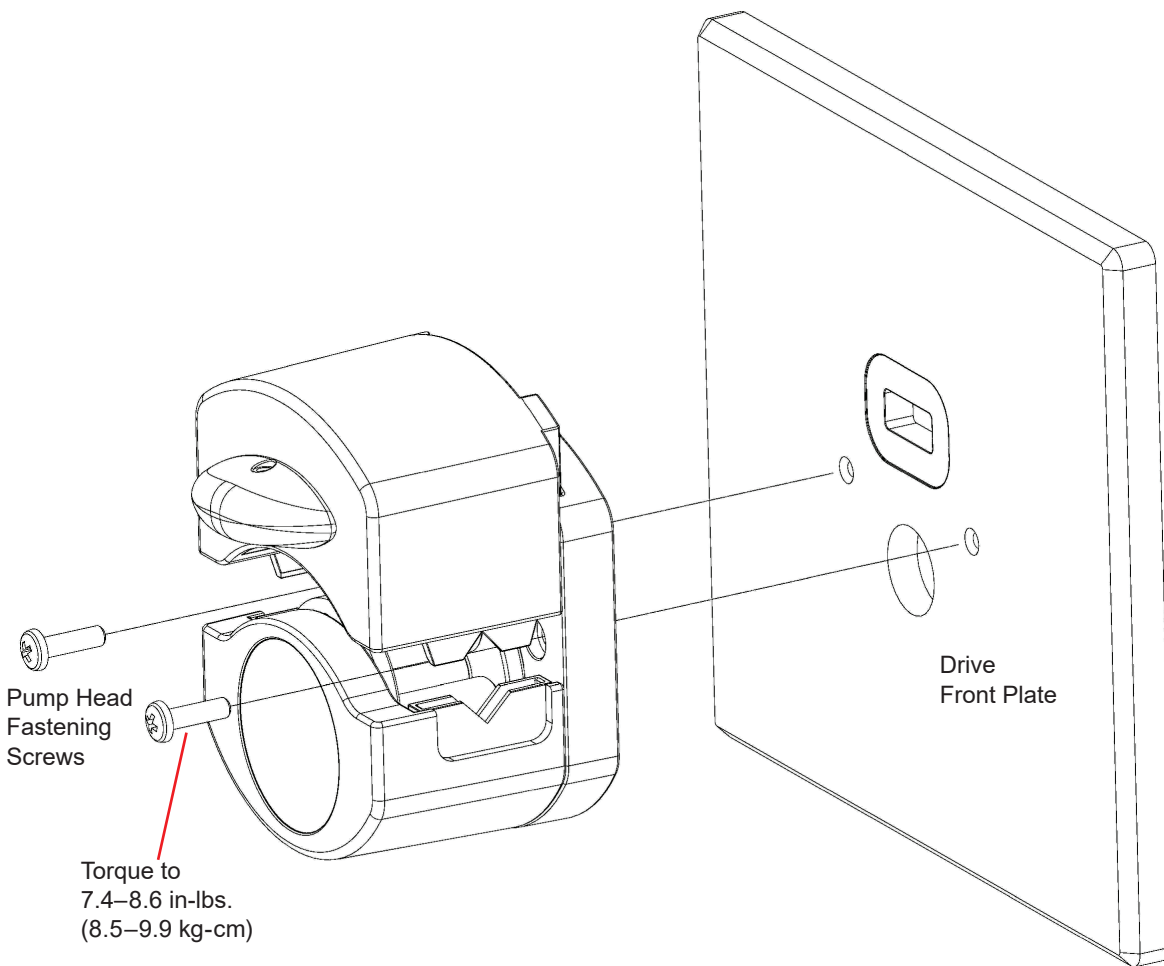
- Carefully remove the drive from its packaging
 - Orient the drive front plate to position the sensor screen above the drive shaft hole (see below)
 - Align the drive's 4 threaded studs to the 4 holes on the customer equipment panel and carefully insert the drive
 - Locate the 4 panel nuts from the packaging
 - Put the panel nuts onto the 4 threaded studs and torque to 25–29 in-lbs. (29–33 kg-cm)
- Ensure the drive front gasket is properly compressed against the customer equipment panel



Installation (Cont.)

Pump Head Installation

- Verify you have the correct replacement pump head
- Remove the pump head from its packaging and inspect it for any obvious damage
- Using a Phillips screwdriver, insert and tighten the pump head fastening screws to the drive front plate to 7.4–8.6 in-lbs. (8.5–9.9 kg-cm)



Installation (Cont.)

Pump Head Replacement

If necessary, a Miniflex pump head can be replaced. Contact the Masterflex sales team to order an appropriate replacement pump head (see back cover for contact details).

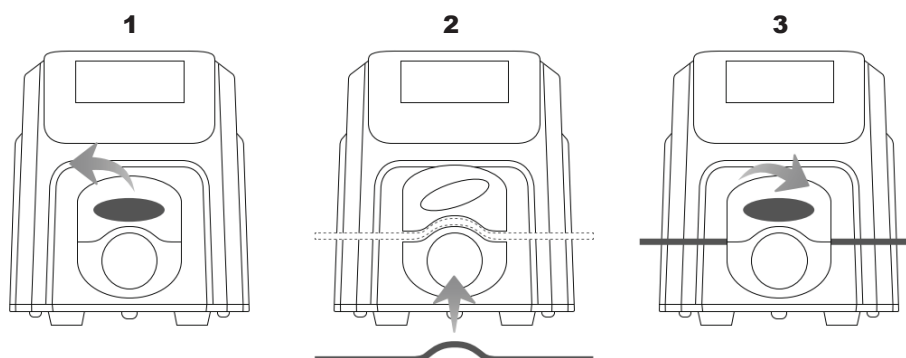
Description	Part Number
Miniflex Single-Channel Pump Head	MFLX77220-20
Miniflex Dual-Channel Pump Head	MFLX77220-30
Miniflex 4-Roller Single-Channel Pump Head	MFLX77220-40

To replace a pump head do the following

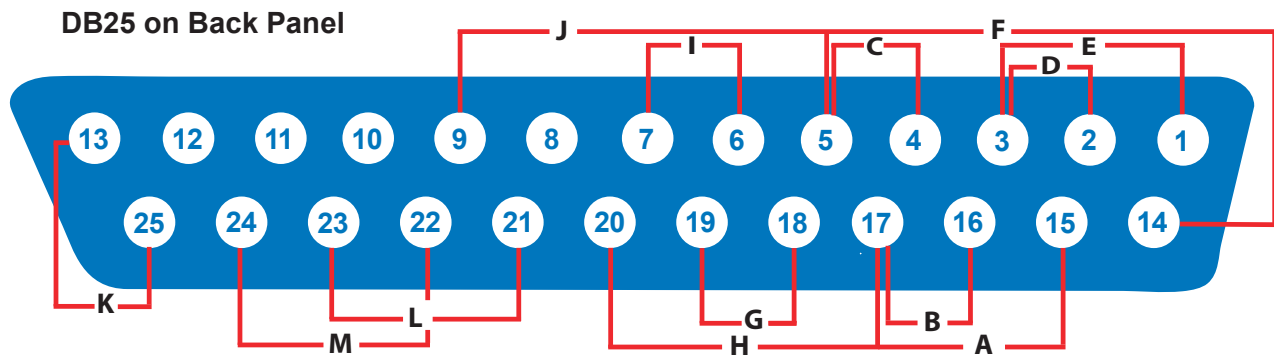
- Turn the pump head handle counterclockwise to raise the upper section of the pump head
- Remove the two fastening screws on the pump head's back plate and carefully remove the pump head
- Replace the new pump head securely onto the Miniflex drive-pump
- Replace the two fastening screws to secure the new pump head to the drive front panel according to defined torque
- Load tubing, run dispense calibration, verify the new pump head is operating correctly

Tube loading Instructions

1. Turn the pump head handle counterclockwise raising its upper section (see below).
 - Place the tube into the opening
 - Verify the tube is completely inside the pump head
 - Verify the tube is seated over the roller-head
2. Verify the tube is sitting in the V-shaped grooves located on either side of the pump head.
3. Turn the pump head handle clockwise to close it.



DB25 Pin Configuration



A	Start/Stop	H	Prime
B	CW/CCW	I	Motor Running N.O. (1A @ 24V)
C	Output 4-20 mA	J	Open Head Sensor Enable/Disable (input)
D	Input 4-20 mA	K	24V (150 mA max.)
E	Input 0-10V	L	General Alarm N.O. (1A @ 24V)
F	Output 0-10V	M	Open Head Sensor Open/Closed status (output)
G	Tach Output		

NOTE: Pins 5, 13, 17, and 18 are at earth ground, all are suitable for use with Start/Stop, Prime, CW/CCW, Tach Output as well as Current and Voltage Outputs.

NOTE: Tach Output is open an drain, requires an external pull-up to 24V.



CAUTION: Power must be turned off before connecting the external remote control cable to prevent damage to the drive motor.

(Continued)

DB25 Pin Configuration (Cont.)

Pin	Description
1	Analog (Speed Control) Voltage Input (0–10V)
2	Analog (Speed Control) Current Input (0–20 mA)
3	Speed Control Input Ground Return
4	Speed Signal Current Output (0–20 mA)
5	Speed Signal Output Ground Reference
6	Motor Running Relay (N.O.)
7	Motor Running, Relay Common
8	Reserved, Not Used
14	Speed Signal Voltage Output (0–10V)
15	Remote Start/Stop Input
16	Remote CW/CCW Input
17	Ground Reference (Start/Stop, CW/CCW, Prime)
18	Tach Ground Reference
19	Tach Output (open drain)
20	Remote Prime Input
9	Open Head Sensor Enable/Disable
10	Reserved, Not Used
11	Reserved, Not Used
12	Reserved, Not Used
21	General Alarm Relay Common
22	Open Head Sensor Open/Closed Indicator Relay Common
23	General Alarm Relay
24	Open Head Sensor Open/Closed Indicator
25	Aux 24V + (150 mA)
13	Aux 24V - (150 mA)

Operation

Operations

Intended Use

Masterflex Miniflex panel-mount drive-pumps provide accurate, low-shear, aseptic fluid transfer and dispensing where needed for incorporating into original equipment manufacturer (OEM) designs as well as production drive-pump skids.

Drive-pumps can provide precise flow control and highly accurate fluid dispensing. They are ideal for pumping highly-viscous and shear-sensitive liquids as well. Drive-pumps are also ideally suited for use where sterile conditions and purity are required. Toxic and hazardous fluids can be pumped with the proper tubing selection because fluid contacts only the tubing and not the pump.

Drive-pump Control

Drive-pump variable-speed output is controlled by a customer-configured control device with analog current or voltage output. Other remote functions include Start/Stop, CW or CCW Flow Direction, Prime, Alarm, and Open Head Sensor (OHS) On/Off. Control signals are defined by the DB25 Pin Configuration.

Accurate motor speed control provides various fluid flow rates. The DEFAULT drive-pump control is set to a CURRENT input signal of 4-20 mA. In addition, stock drive-pumps can be configured to accept a voltage input signal of 0–10V as applications may require. System firmware ensures speed output accuracy within a user-defined range.

Operating Parameters

- MFLX77222-00 current input: 4-20 mA
- MFLX77222-02 voltage input: 0–10V
- Drive speed output: 3–300 RPM

Power Supply and DB25 Wiring

The Miniflex panel-mount drive requires an external power source (not included) to supply a minimum of 1.3 amps at 24 VDC. A 3-wire power supply cable is included for connecting to the drive back panel. Verify polarities are connected correctly. A ground wire connection is required.

An DB25 cable is included for remote control connection according to the DB25 Pin Configuration.

Remote Control Operation

About Panel Mount Miniflex Drive-Pump Remote Control

Users can operate the drive-pump remotely via a control device (such as a PLC controller). Remote control operations can include variable current input along with pump head Start/Stop, CW/CCW flows, Priming, Open Head Sensor Enable/Disable, and other functions. However, opening or closing the pump head when loading or changing different tubings are manual operations.

Open Head Sensor

A Panel-Mount Miniflex Drive-Pump comes with an open-head sensor which is a DEFAULT feature ensuring operation safety; however, this feature can be disabled with DB25 Pin-9.

When the open-head sensor is enabled, the drive-pump will NOT automatically run when a user closes the pump head after tube reloading or after opening the pump head. Instead, the customer controller can start the pump by sending a start signal to the drive. While the pump is running, opening the pump head will trigger the pump head to stop.

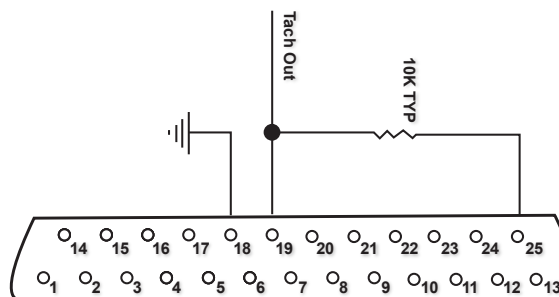
When the open-head sensor is disabled (via DB25 Pin-9), users can open or close the pump head while it is running; use caution when opening the pump head while it is running. However, when a pump head is running it is recommended to NOT open pump head. Instead, for safe pump head operation with a controller users can send a STOP signal to stop the drive.

Drive Input and Output

The Miniflex drive-pump is defaulted to accept current input of 4-20 mA via DB25 Pin-2 and output of 3–300 RPM for pump head speed. It also outputs a 4-20 mA current signal via DB25 Pin-4.

Tach Out Signal

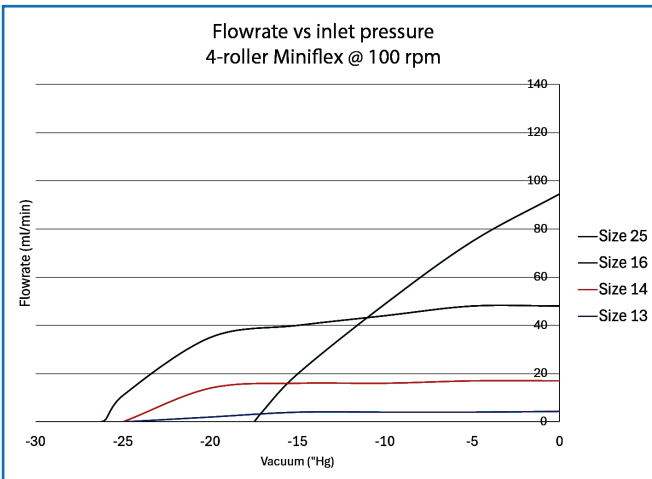
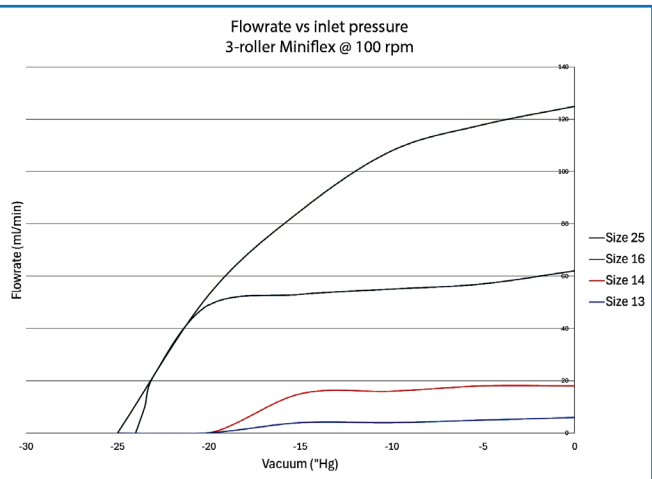
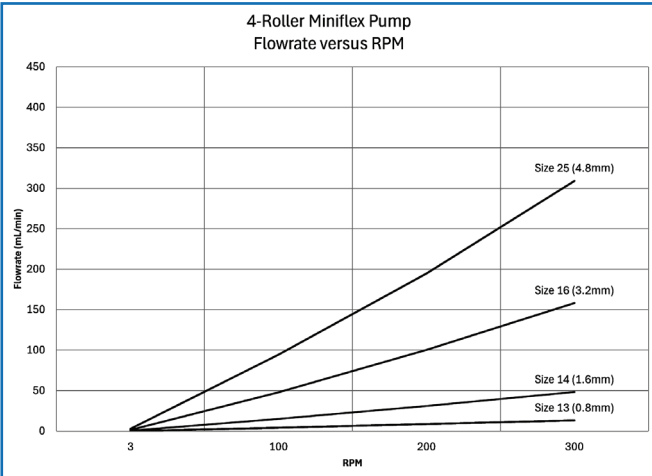
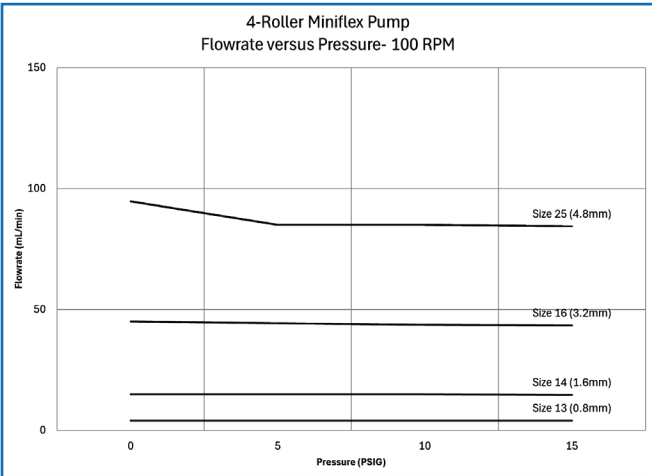
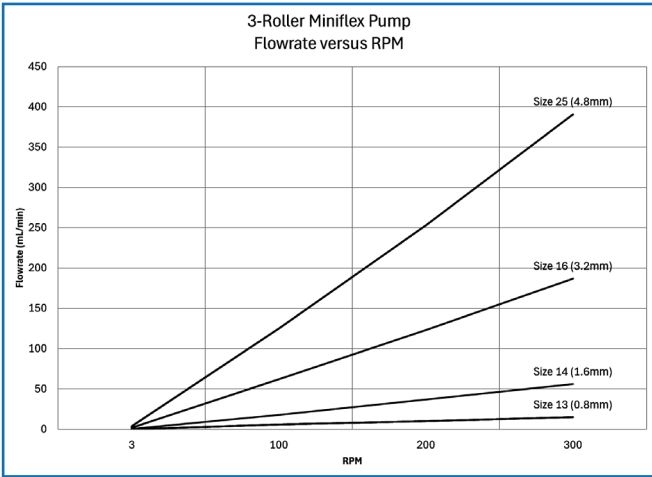
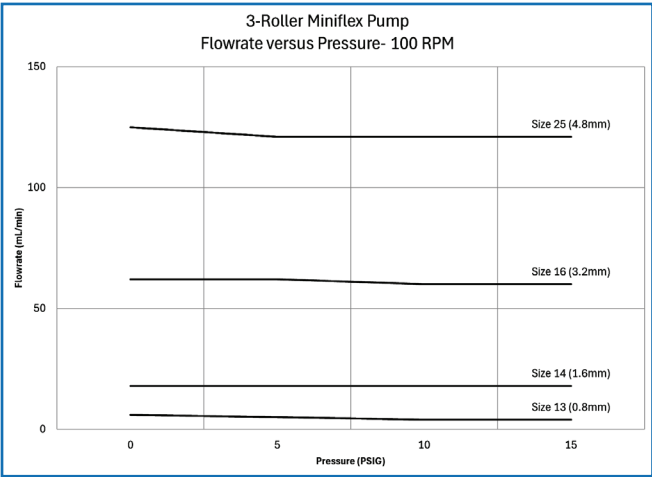
DB25 Pin-19 is pump speed output in the form of a frequency train ranging from 3–3000 Hz to represent 3–300 RPM pump speed.



General Alarm

DB25 Pin-23 is General Alarm (relay) output when the system encounters an error.

Performance Data



Specifications

Component Details

Stop/Start, Prime, and CW/CCW Inputs	Operate through either an open contact closure or an open collector driver. An active low enables the function.
Guaranteed Values for Turning an Input On/Off	Input Voltage (High State) 4.8 to 5.1 VDC Input Voltage (Low State) 0.0 to 0.8 VDC Input Current (Low State) 5.1 mA max
Typical Switching Threshold Voltage	Approximately 2.2 VDC with no hysteresis
Remote Analog 4-20 mA Input	249 Ω typical input impedance referenced to signal ground 4.0–4.2 mA, Stop; 19.8–20.0 mA, full speed Analog current input/output default
Remote Analog 0–10V Input	10K Ω typical input impedance referenced to signal ground 0.0–0.1V, Stop; 9.9–10.0V, full speed Analog voltage input/output upon customer request
Pump Speeds Output	Miniflex drive 3–300 RPM
Pump Motor Control	Controller (such as PLC) Drive/motor/pump head Human operator
Torque Output Maximum	90 oz-in (6.5 kg cm), 270 oz-in starting
Speed Regulation	Line $\pm 0.1\%$ F.S., Load $\pm 0.1\%$ F.S., Drift $\pm 0.1\%$ F.S.
Remote Outputs	Voltage speed output: 0–10 VDC @ 1 K min. Current speed output: 0–20 mA @ 0–600 Ω Tach output: (3 to 3000 Hz, 50% duty cycle, 10 Hz/RPM) Alarm, Motor running output (N.O. Relay, 1A @ 24 VDC)
Input Supply Voltage Limits	24 VDC
Input Current (max. continuous)	1.3 amps
Remote Inputs	Stop/Start, CW/CCW, Prime Current Voltage input: 0–10 VDC @ 10K Ω Current input (4-20 mA @ 250 Ω) 10-bit resolution
Noise	65 dBA

Fuse Rating	3.15A 230VAC, 5x20 mm, Time-Delay
Enclosure	IP56 per IEC 60529 (front only, when mounted). Not tested by UL

Environment

Operating Temperature	0°C to 40°C (32°F to 149°F)
Storage Temperature	-25°C to 65°C (-13°F to 149°F)
Humidity (Non-Condensing)	10% to 90%
Altitude	Less than 2000 m
Pollution Degree	Pollution Degree 2 (indoor use, sheltered location)
Chemical Resistance	Exposed material is stainless steel and aluminum
Overvoltage Category	II

Compliance

	UL 61010-1, CAN/CSA-C22.2 No. 61010-1 (US/CAN)
	For CE mark:
	EN61010-1, Low Voltage Directive
	EN61326-1, EMC Directive
	EN IEC 63000, RoHS Directive
Pump Head	EN809, Machinery Directive

Accessories/Ordering

DB25 male connector, 3 ft. (~0.9 meter) cable with stripped wire ends. P/N MFLX77222-90.

24V power supply lead, 3 ft. (~0.9 meter) P/N MFLX77222-92.

How to order. Contact manufacturer's sales representative (contact details on back cover).

Cleaning

The Miniflex pump head housing is made of ABS plastic (acrylonitrile butadiene styrene). The Miniflex drive housing is made of aluminum and stainless steel. The recommended cleaning method is wetting a soft cloth with mild detergents and wiping housing surfaces.

Technical Assistance

If you have any questions about the use of this product, contact the manufacturer or authorized seller.

Product Returns

Drives and pumps contain components that will wear over a period of time. To limit shipping charges and delays, contact the seller or manufacturer for authorization and shipping instructions *before* returning the product, either within or outside of the warranty period.

When returning the product please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

Product Warranty Registration

Visit <https://us.vwr.com/cms/masterflex-product-warranty-registration> to register your product. For warranty details see the included warranty card.

Disposal

Please retain packaging materials until the product warranty ends. Afterwards please discard of any packaging materials in an environmentally-friendly manner and according to local regulations.

Once the useful life of the product has ended, please ensure proper disposal according to local laws. Plastic and electronic components should be disposed of at a recycling facility. Please refer to local regulations regarding proper disposal.



NOTES:

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Manufactured by Masterflex LLC

28092 W Commercial Avenue, Barrington, IL 60010 USA

USA & Canada Only

Toll-Free 1-800.MASTERFLEX | 1-800.637.3739

Outside USA & Canada 1-847.381.7050

EML: masterflex.tech@avantorsciences.com

WEB: www.avantorsciences.com/masterflex

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