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**Parker  
LM-Pro**

*Wide Linear Control Range  
Low Power Consumption  
Cleaned for Oxygen Service*

# Parker LM-Pro

Miniature Linear Motor Proportional Valve



ENGINEERING YOUR SUCCESS.

# Innovative solutions for health care success



## ENGINEERING **YOUR** SUCCESS.

When you partner with the global leader in motion and control technologies, expect to move your business and the world forward. From miniature solenoid valves to highly integrated automation systems, our innovations are critical to life-saving medical devices and scientific instruments used for drug discovery and pathogen detection. Not to mention, critical to decreasing time to market and lowering your overall cost of ownership. So partner with Parker, and get ready to move, well, anything.



[www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics) 1 603 595-1500



# THIS IS COMPLETE CONTROL

**Parker  
LM-Pro**

*Wide Linear Control Range  
Low Power Consumption  
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The Parker LM-Pro proportional valve uses a Patent Pending Linear Motor actuation technology that provides exceptional resolution over a longer stroke and lower power consumption than traditional solenoid or voice coil actuation. The LM-Pro proportional valve controllable range allows flow for all ventilator platforms. This new product further solidifies Parker Precision Fluidics market offering for the Respiratory and Anesthesia market.



For more visit: [solutions.parker.com/LM-Pro](https://solutions.parker.com/LM-Pro)  
[ppfinfo@parker.com](mailto:ppfinfo@parker.com) 603 595 1500

ENGINEERING YOUR SUCCESS.



# Parker LM-Pro

## Miniature Proportional Valve

### Linear Motor Proportional Valve



The Parker LM-Pro miniature proportional valve provides unparalleled flow control capabilities to meet your OEM application needs. The LM-Pro uses a Patent Pending Linear Motor actuation technology that provides exceptional resolution over a longer stroke and lower power consumption than traditional solenoid or voice coil actuation. With a linear controllable flow range from 0.5 to 540 slpm, pressure capability up to 100PSI (6.9 Bar), and typical power consumption of less than 2 Watts, the LM-Pro is a true, one-size-fits-all proportional valve. This unrivaled performance capability combined with the simplicity of a face-mounted/ported design make the LM-Pro valve an ideal solution for your dynamic flow control needs.

#### Markets

- Respiratory
- Anesthesia
- Patient Therapy

#### Typical Applications

- Ventilators (Gas Blending & Delivery)
- Insufflators
- Anesthesia Delivery
- Pressure and Flow Control

#### Features

- Large linear flow control range spanning 70% of the controllable current rating enabling accurate low and high flow rate control.
- Low power consumption: Typical operation under 2 Watts.
- Proven performance: Life cycle rated to 100 million cycles.
- Face mount porting and optional integrated filter simplifies integration and reduces manifold complexity.
- Cleaned for Oxygen Use per ISO15001:2010 and meets ISO10993 Biocompatibility
- Reach and RoHS compliant.



## Product Specifications

### Physical Properties

<b>Valve Type:</b>
2-Way Normally Closed
<b>Media:</b>
Air, Oxygen, Nitrous Oxide, Carbon Dioxide, Heliox and other medical gases
<b>Operating Environment:</b>
32 to 131°F (0 to 55°C)
<b>Storage Temperature:</b>
-40 to 158°F (-40 to 70°C)
<b>Length:</b>
1.57 in (39.9 mm)
<b>Width:</b>
0.72 in (18.3 mm)
<b>Height:</b>
1.44 in (36.5 mm)
<b>Porting:</b>
Face Seal to Manifold with integrated FKM seal and optional inlet filter
<b>Weight:</b>
1.29 oz (36.6 g)

### Electrical

<b>Power:</b>
2.0 Watt Typical 3.0 Watt Maximum
<b>Voltage:</b>
5, 12 and 24 VDC See Table 2
<b>Electrical Termination:</b>
Latching Receptacle JST SM02B-PASS-TB

### Wetted Materials

<b>Valve Element:</b>
Aluminum FKM Elastomer Fluorosilicone Elastomer Stainless Steel
<b>Regulatory:</b>
Compliant with RoHS directive (2002/95/EC), REACH EC 1907/2006, ISO 15001:2010 and ISO 10993:2010

### Performance Characteristics

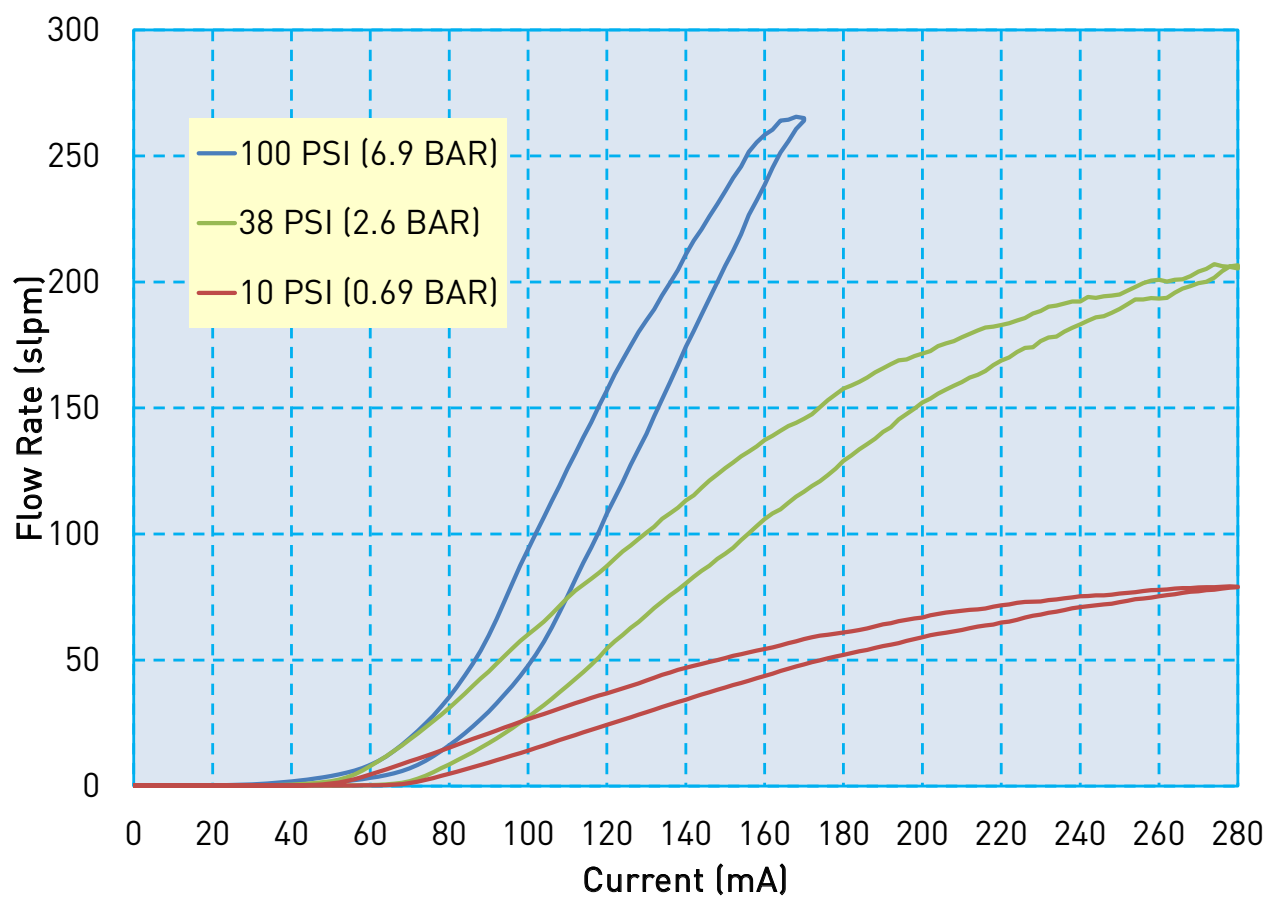
<b>Leak Rate: *</b>
Internal: 1 SCCM External: 1 SCCM <i>* The leakage shall not exceed the above values with Air at a differential pressure of 100 psid (6.9 Bar).</i>
<b>Operating Pressure:</b> See Table 1
0 - 100 psig (6.9 Barg)
<b>Vacuum:</b>
0 - 27 in Hg (0-686 mm Hg)
<b>Proof Pressure:</b>
150 psi (10.39 Bar)
<b>Orifice Sizes:</b>
0.200 in (5.08 mm) 0.121 in (3.07 mm) effective
<b>Hysteresis:</b>
10% of full scale current (Typical) 15% of full scale current (Maximum)
<b>Optional Filtration:</b>
400 µm
<b>Response time:</b>
<10 ms Typical at 20°C
<b>Reliability:</b>
100 Million Cycles at rated pressure and 20°C 0.95 Reliability Factor 95% Confidence Interval



Parker is a registered trademark of Parker Hannifin Corporation.  
Patent pending with the United States Patent and Trademark Office (USPTO).

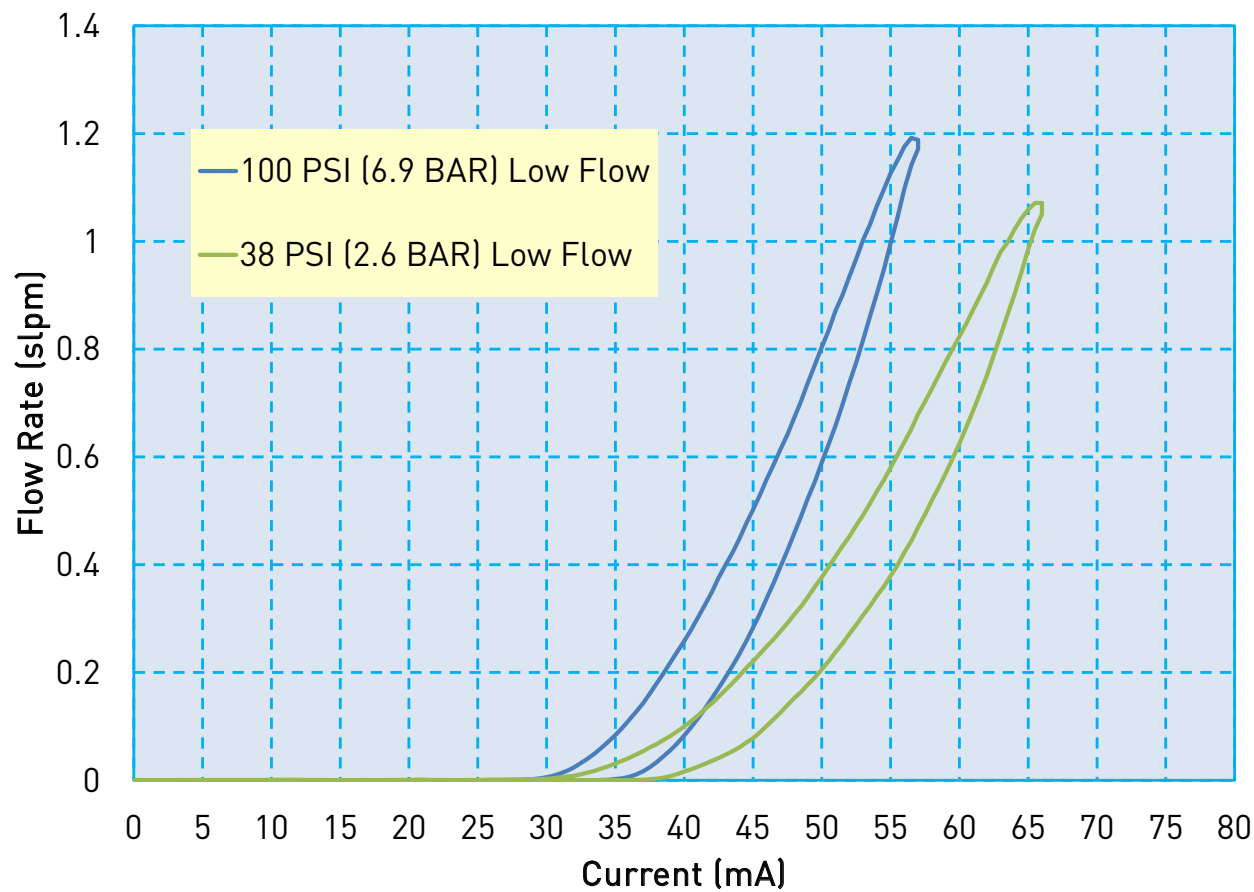
## Parker LM-Pro Linear Motor Proportional Valve Typical Flow Curve

LM-Pro Model 2  
Typical Air Flow with 12 VDC Coil



**Parker LM-Pro** Linear Motor Proportional Valve  
**Typical Flow Curve**

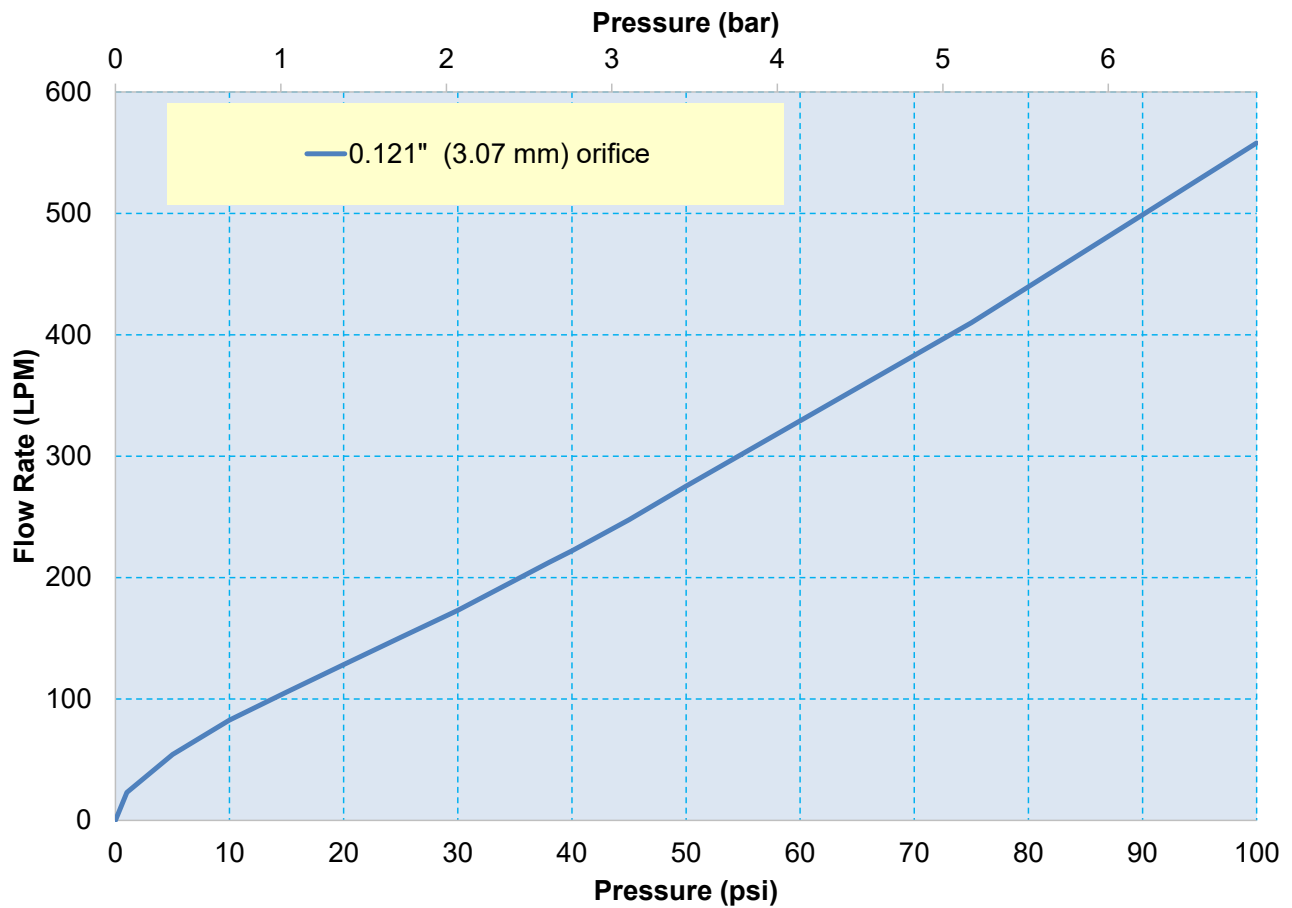
**LM-Pro Model 2**  
**Typical Low Flow Control with 12 VDC Coil**



## Parker LM-Pro Linear Motor Proportional Valve Typical Flow Curve

### Pressure vs Flow Curve

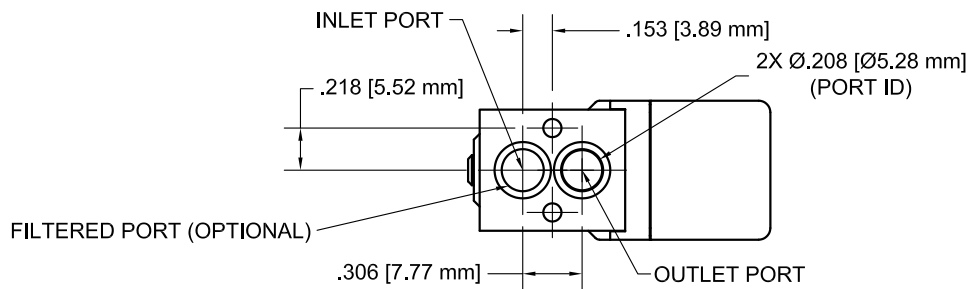
The curve below shows the typical output flow rate at maximum rated current as a function of inlet pressure.



## Parker LM-Pro Linear Motor Proportional Valve

### Pneumatic Interface

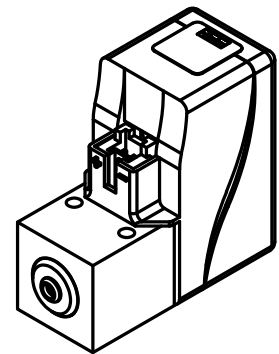
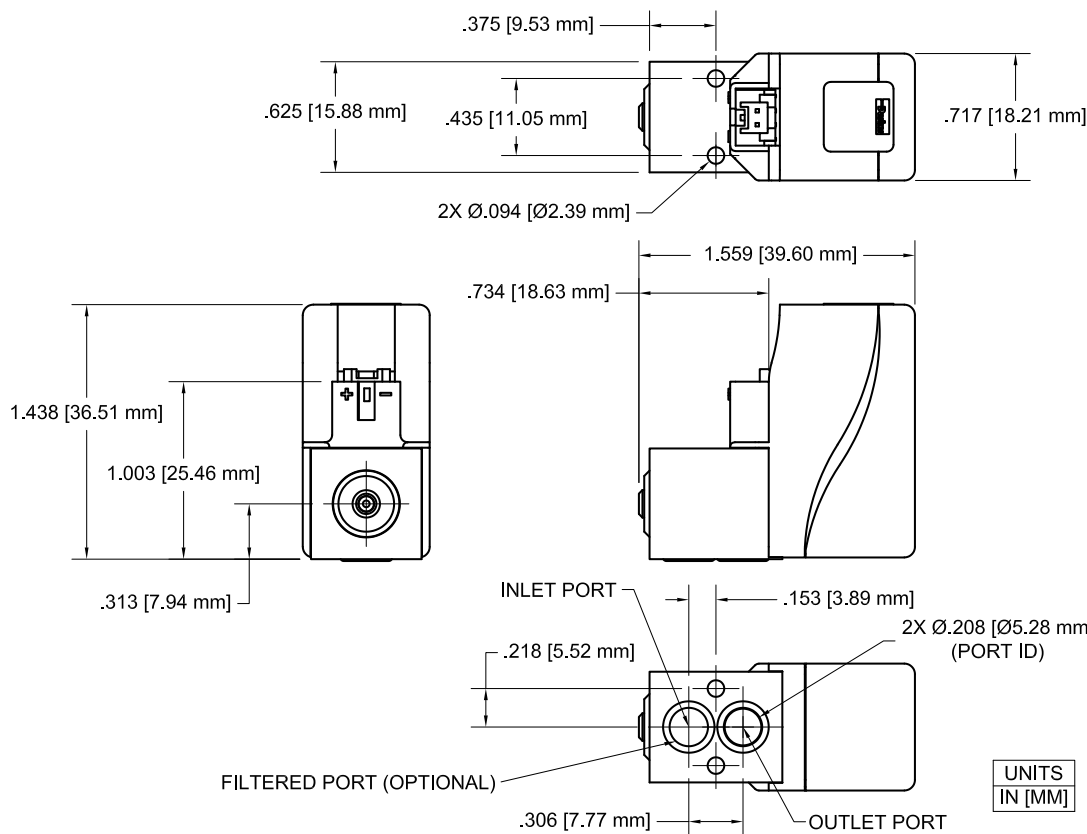
#### Parker LM-Pro Manifold Mount



## Mechanical Integration

### Dimensions

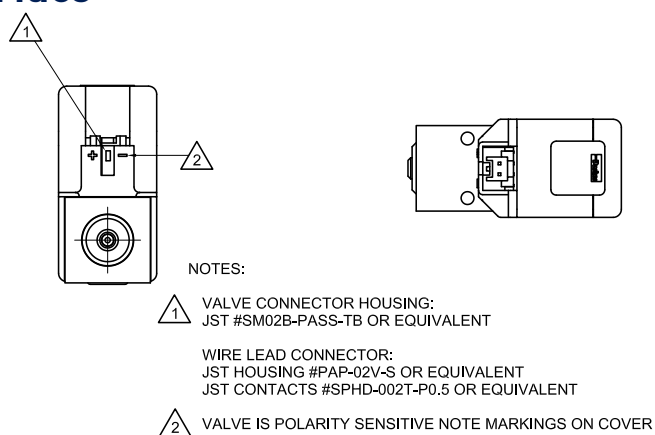
#### Parker Parker LM-Pro Basic Valve Dimensions



UNITS
IN [MM]



## Parker LM-Pro Linear Motor Proportional Valve Electrical Interface



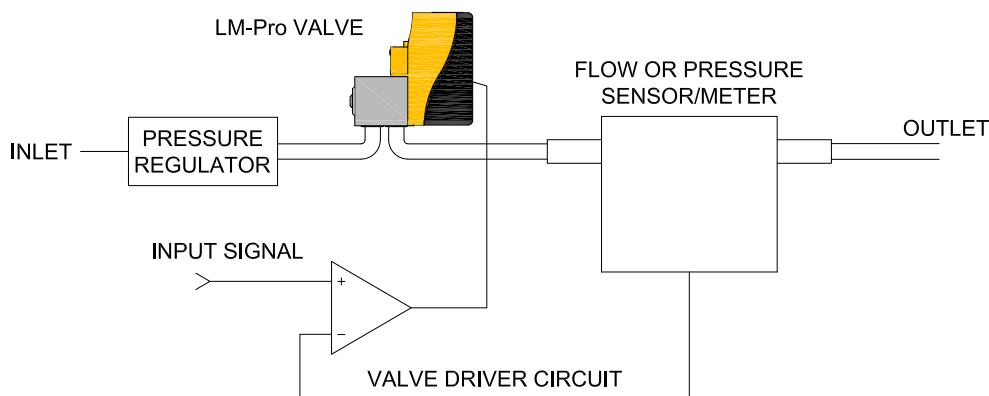
## Electrical Requirements

Table 2

Rated Voltage	Nominal Coil Resistance at 20°C	Control Current at Maximum Flow
5 VDC	6 $\Omega$	555 mA
12 VDC	24 $\Omega$	280 mA
24 VDC	148 $\Omega$	115 mA

## Installation and Use

### Typical Valve Set-up



### Valve Electrical Control

#### Basic Control:

The Parker LM-Pro valve can be controlled by either voltage or current; however, it is highly recommended that current control be employed to ensure the most repeatable valve flow performance.

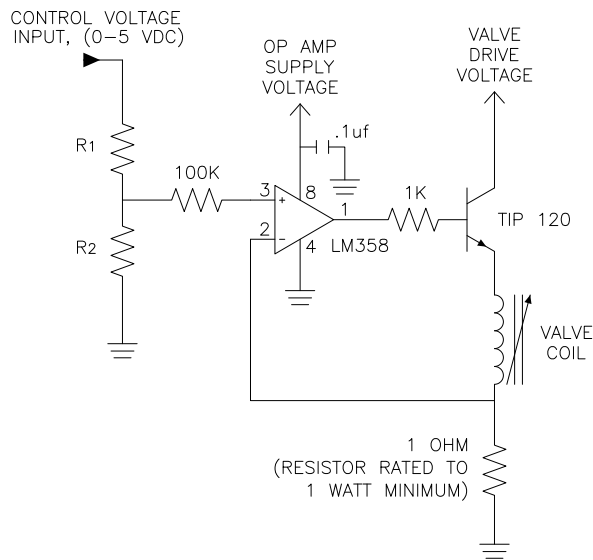
#### PWM Control:

For PWM control, the signal applied to the valve should have a frequency of 5 kHz or greater. Optimum frequency will be application dependent.

# Parker LM-Pro Linear Motor Proportional Valve

## Installation and Use

### Suggested Parker LM-Pro Current Driver Schematic



This simple current driver circuit draws only 1 mA at the input control (0-5VDC) and provides control for any LM-Pro valve configuration regardless of valve voltage or resistance.

Table 3 (below) describes the recommended R1 and R2 resistor values based upon the full shut-off current.

**Table 3: Selectable Resistor Values for a Low Current (1 mA)  
LM358-Based Current Driver**

Valve Drive Voltage Input (VDC)	Valve Coil Voltage, Resulting (VDC)	Nominal Coil Resistance @ 20° C (Ohms)	Input Current for Full Flow (mA)	R1 (Ohms)	R2 (Ohms)
5	7	6	555	3920	499
12	14	24	280	3920	237
24	26	148	115	4320	102



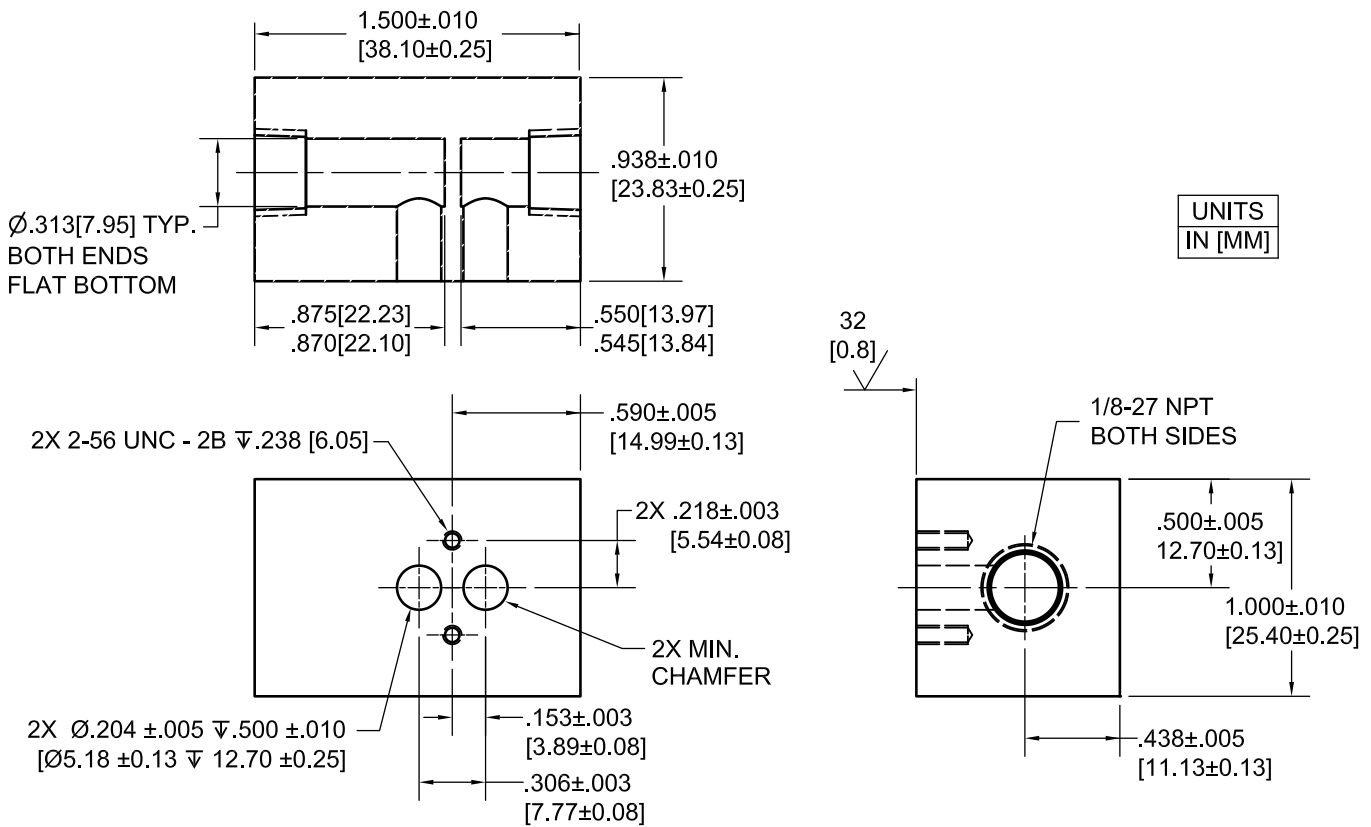
# Parker LM-Pro Linear Motor Proportional Valve

## Installation and Use

### Manifold & Dimensions & Design

Not shipped with valves.

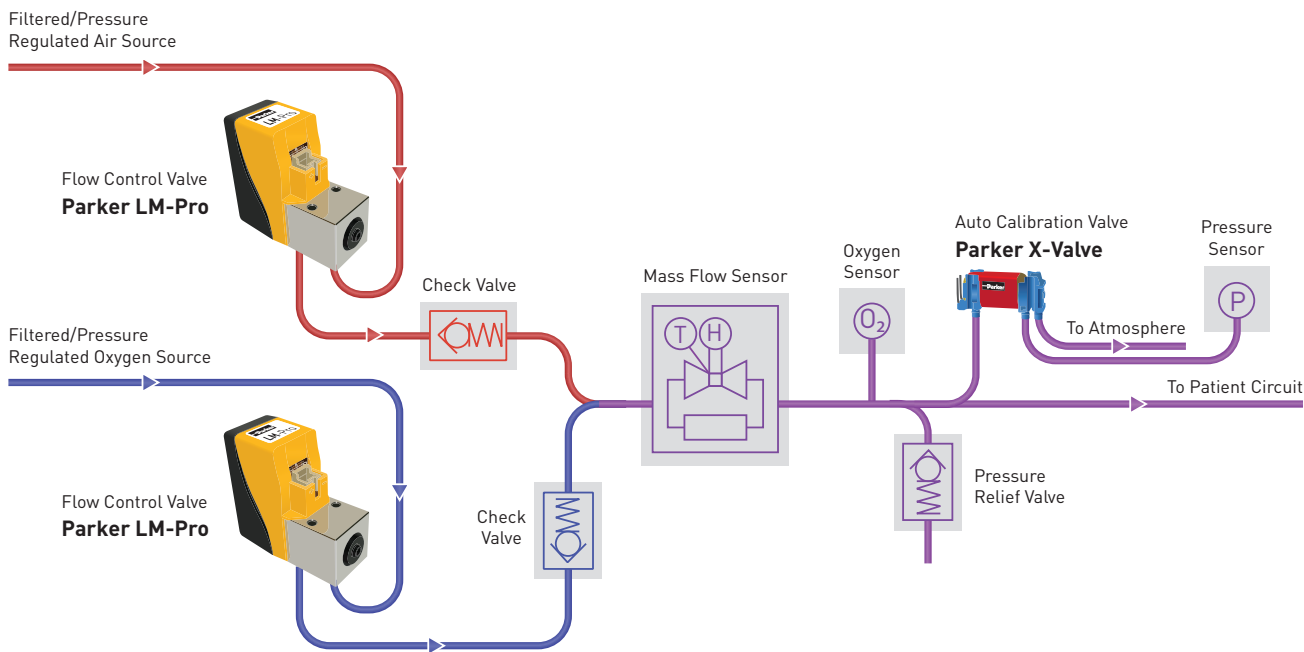
Parker Precision Fluidics recommends 24 in-oz (17 N-cm) of torque for the screws.



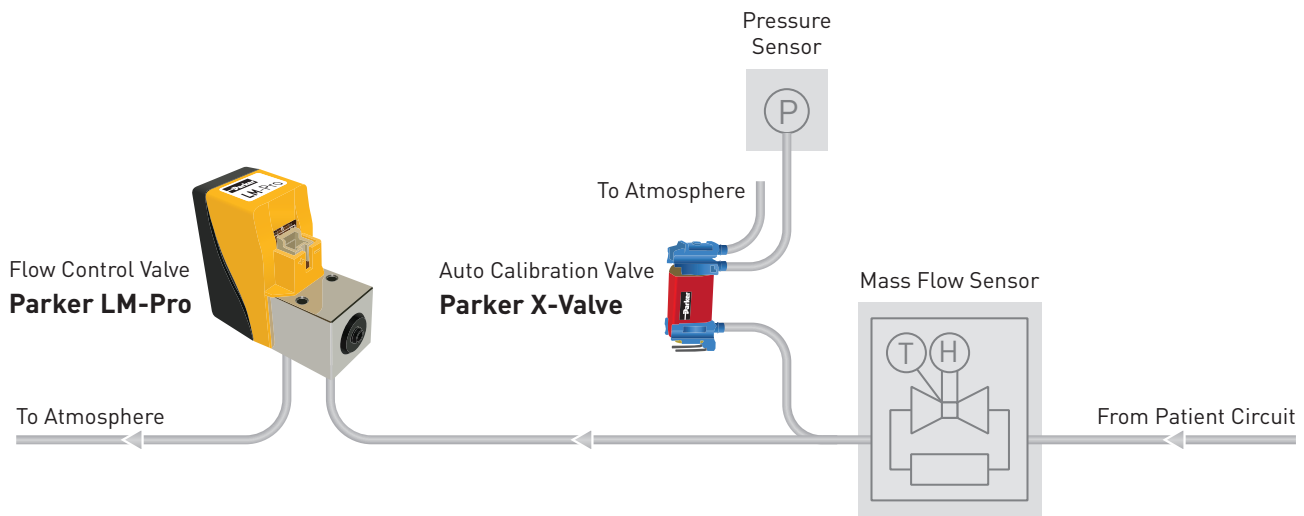
# Parker LM-Pro Linear Motor Proportional Valve

## Typical Application

### Ventilator Inspiratory Flow

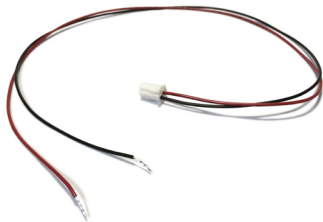


### Ventilator Expiratory Flow

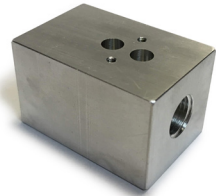


# Parker LM-Pro Linear Motor Proportional Valve Accessories

**12.5" Adapter Wire Leads**  
290-006061-004



**Single Station Manifold**  
890-001184-001



**Screw #2-56 x 3/4"**  
**Socket Head Cap Screw**  
191-000112-417

(see valve mounting recommendations above)



**Manifold O-Ring (FKM)**  
190-007063-001  
(supplied with valve)



**Optional Filter**  
195-000291-001



## Ordering Information

Sample Part ID	937	-	02	1	12	0	-	01	0
Description	Series	-	Model	Elastomer	Voltage	Body Material	-	Pneumatic Interface	Electrical Interface
Options	937	-	02: 200 SLPM at 38PSIG	1: FKM Poppet and Fluorosilicone Diaphragm	05: 5 VDC 12: 12 VDC 24: 24 VDC	0: Aluminum	-	00: Manifold Mount No Inlet Filter 01: Manifold Mount with Filter	0: No Wire Leads

Accessories	
290-006061-004: 12.5 in (317.5 mm) Wire Leads	** Not supplied with the valve
890-001184-001: Manifold, Single Station	** Not supplied with the valve
190-007063-001: Manifold O-Ring (FKM)	** Supplied with the valve.
191-000112-417: Screw #2-56 x 2/16, Socket Head Cap	** Not supplied with the valve. See Valve Mounting Recommendations above
195-000291-001: Optional Filter	** Supplied if selected option

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting Applications Engineering:

- Media, Inlet & Outlet Pressures
- Minimum Required Flow Rate
- System Supply Voltage
- Media & Ambient Temperature Range

Please click on the Order On-line button to configure your Parker LM-Pro Proportional Valve (or go to [www.parker.com/precisionfluidics/LM-Pro](http://www.parker.com/precisionfluidics/LM-Pro)). For more detailed information, visit us on the Web, or call and refer to Parker LM-Pro Performance Spec. 790-002627-001.

Parker Hannifin Precision Fluidics Division reserves the right to make changes. Drawings are for reference only.

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For more information call +1 603 595 1500 or email [ppfinfo@parker.com](mailto:ppfinfo@parker.com)  
Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)





## Parker LM-Pro Linear Motor Proportional Valve

**Serving a broad spectrum of life science, air quality, and process instrumentation OEM fluidic needs**



### Providing Pressure and Vacuum:

Broad range of diaphragm pumps for Gas and Liquid



### Gas Flow Control:

High to Low Flow Proportional Valves



### On/Off & Channel Selection Capabilities:

Gas and Liquid Solenoid Valves



### High Precision Thermal Flow Control:

Mass Flow Controllers and Meters



## **WARNING**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE.**

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