

# HF PRO High Flow Proportional Valve

## Miniature High Flow Proportional Valve




### Typical Applications

- Ventilators
- O<sub>2</sub> Concentrators/Conservers
- Anesthesia Delivery
- Patient Monitors
- Pressure & Flow Control

The HF PRO is a miniature 2-way normally closed (NC) high flow proportional valve that controls gas flow proportionally to input current with flow rates up to 60 slpm at 50 psig. The valve can be controlled with either DC current or pulse width modulation along with closed loop feedback to deliver optimal system performance. The HF Pro miniature proportional valve is an ideal choice for applications that require repeatable pressure and flow control such as respiratory and patient monitoring applications.

### Features

- Capable of controllable flow rates of up to 60 slpm and pressures of 50 psig
- Provides repeatability across its operating range for improved accuracy
- Available Oxygen Service use clean
- Proven performance tested to 35 million life cycles
- RoHS compliant 

## Product Specifications

### Physical Properties

<b>Valve Type:</b>	2-Way Normally Closed
<b>Media:</b>	Air, argon, helium, hydrogen, methane, nitrogen, oxygen, & others
<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>	1.785 in (45.3 mm)
<b>Width:</b>	0.625 in (15.88 mm)
<b>Height:</b>	0.67 in (17.0 mm)
<b>Porting:</b>	1/4" Barbs, Manifold Mount
<b>Weight:</b>	2.2 oz (62.9 grams)

### Physical Properties

<b>Internal Volume:</b>	0.031 in <sup>3</sup> (0.508 cm <sup>3</sup> )
<b>Filtration:</b>	43 micron
<b>Flow Direction:</b>	Inlet Port      Port 2 Outlet Port      Port 1
<b>Oxygen and Analytically Clean:</b>	Standard

### Electrical

<b>Power:</b>	3.0 Watts maximum
<b>Voltage:</b>	See Table 2
<b>Electrical Termination:</b>	18 in Wire Leads

### Wetted Materials

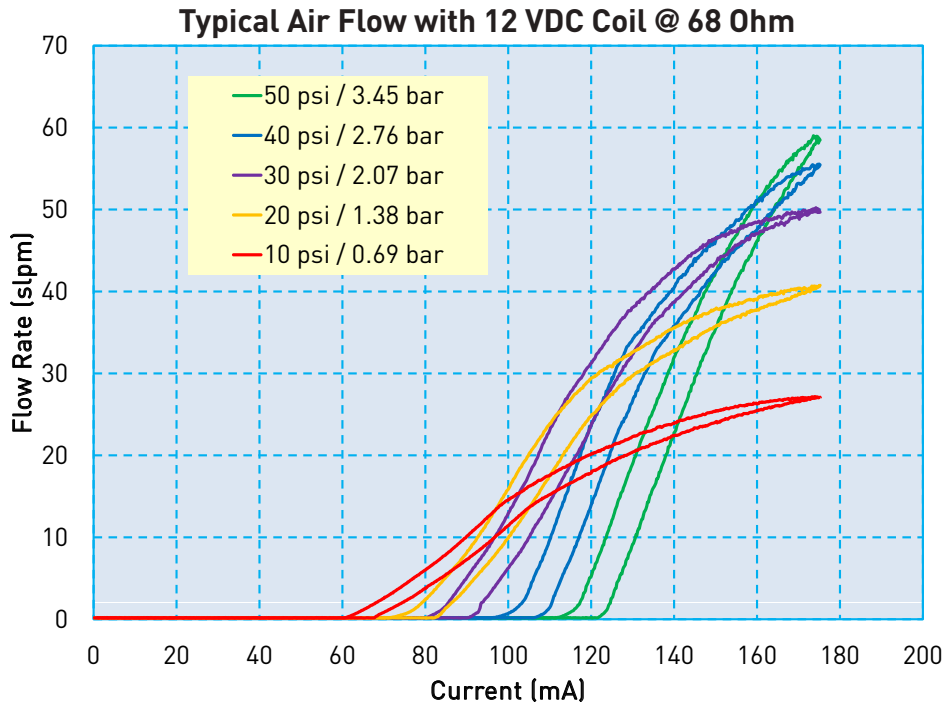
<b>Body:</b>	360 HO2 Brass
<b>Stem Base:</b>	430 FR Stainless Steel and Brass 360 HT
<b>All Others:</b>	FKM; 430 FR Stainless Steel; 300 Series Stainless Steel

### Performance Characteristics

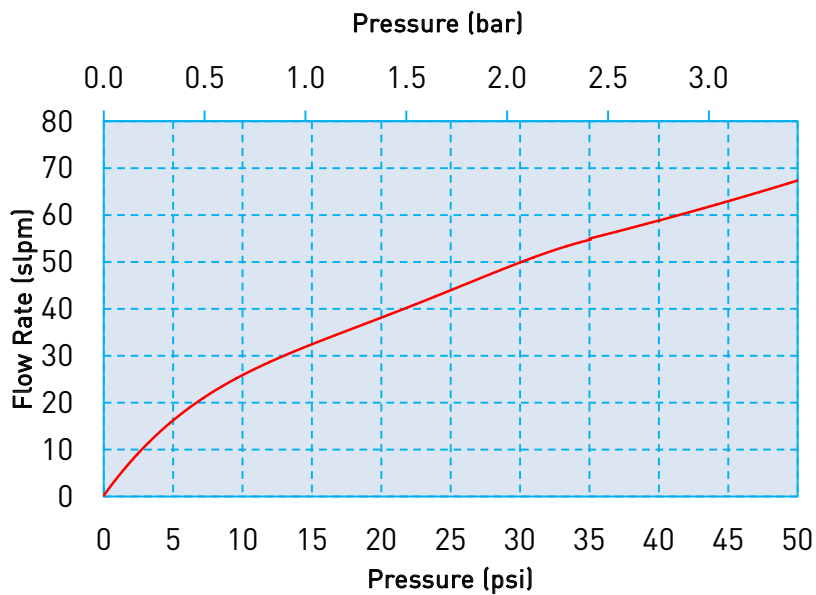
<b>Leak Rate:</b>	The leakage shall not exceed the following values: Internal 0.5 SCCM of N <sub>2</sub> External 0.016 SCCM of N <sub>2</sub>
<b>Pressure:</b>	0 to 50 psi (3.45 bar) See Table 1
<b>Vacuum:</b>	0-27 in Hg (0-686 mm Hg)
<b>Orifice Size:</b>	0.070" (1.8 mm) effective
<b>Hysteresis:</b>	7% of full scale current (Typical) 15% of full scale current (Max)

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## Typical Flow Curve



### HF Pro - 0.070" (1.8 mm) Orifice Pressure vs Flow Curve



## Pressure and Flow Capabilities

Table 1

Orifice Diameter	Maximum Operating Inlet Pressure	Maximum Operating Pressure Differential
0.070 in (1.8 mm)	150 psig (10.34 bar)	50 psid (3.45 bar)



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## Pneumatic Interface

**HF PRO  
Manifold Mount**



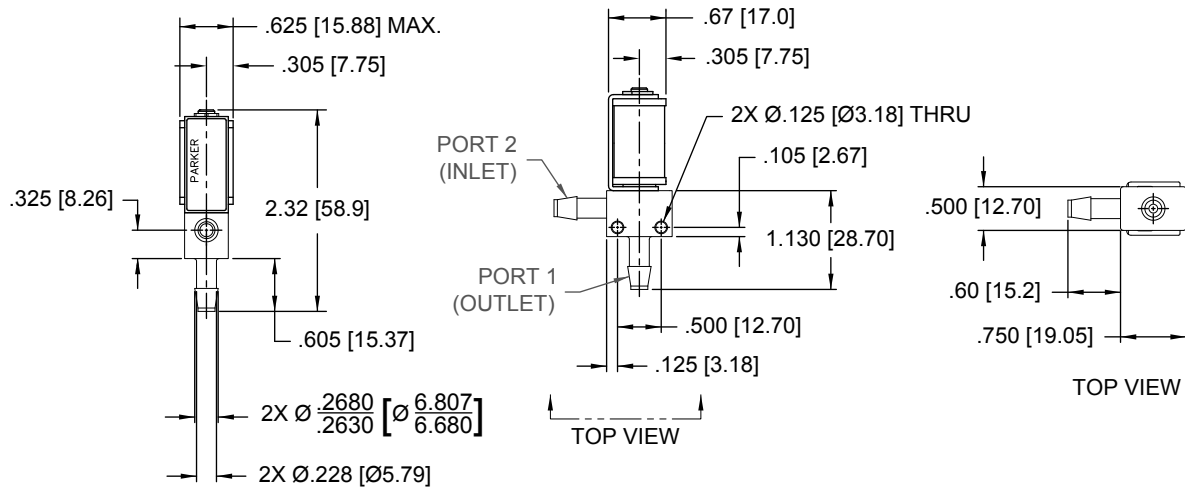
**HF PRO  
Barbed**



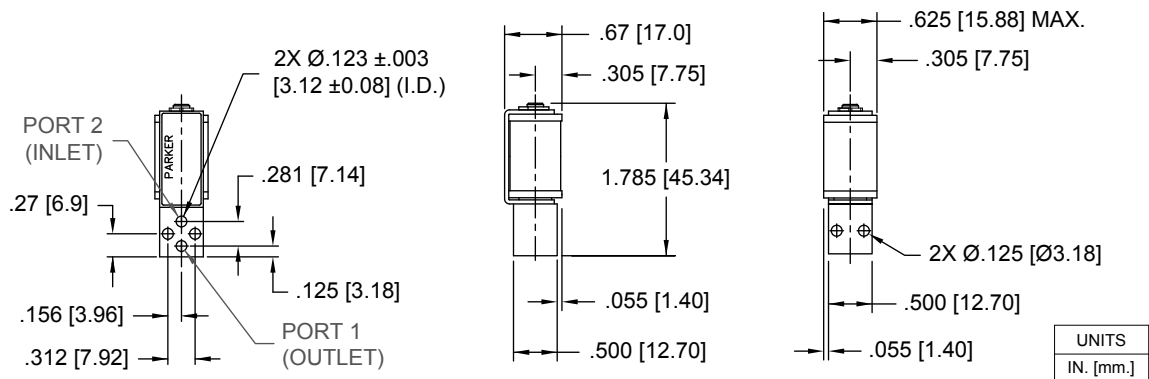
## Mechanical Integration

### Dimensions

**HF PRO Barb Mount Basic Valve Dimensions**



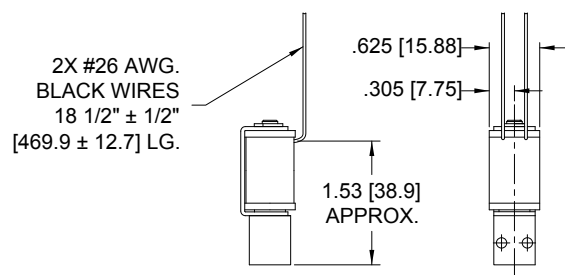
**HF PRO Manifold Mount Basic Valve Dimensions**



# HF PRO Miniature High Flow Proportional Valve

## Electrical Interface

Coil Type: 18" Wire Lead



## Electrical Requirements

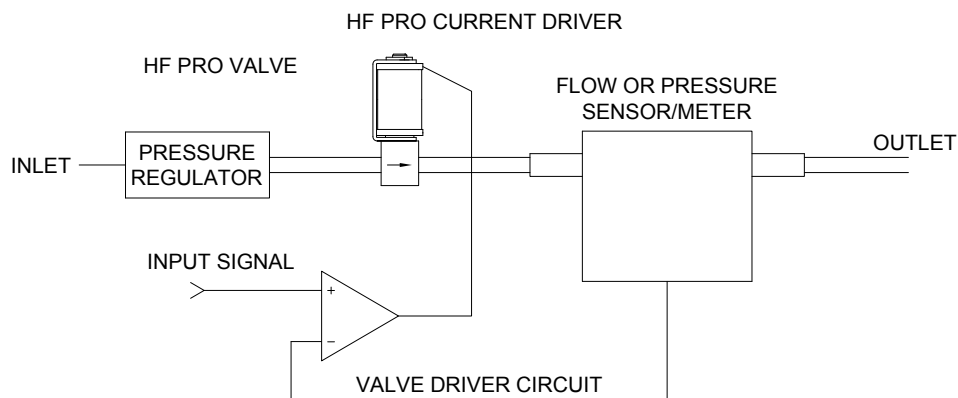
Table 2

Minimum Available Voltage (VDC)	Nominal Coil Resistance @ 20°C (Ohms)	Input Current for Full Flow (mA)
5	11.9	435
12	68	175
24	274	87

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## Installation and Use

### Typical Valve Set-up



### Valve Electrical Control

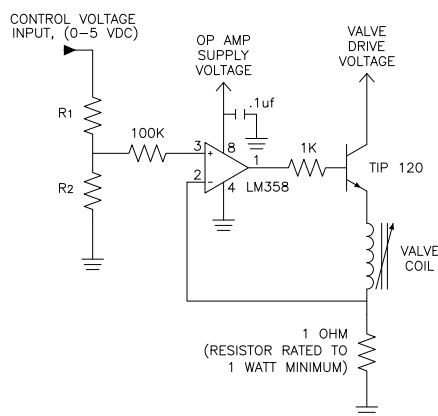
#### Basic Control:

The HF 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 between 5-12kHz. Optimum frequency will be application dependent.

### Suggested HF PRO Current Driver Schematic



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

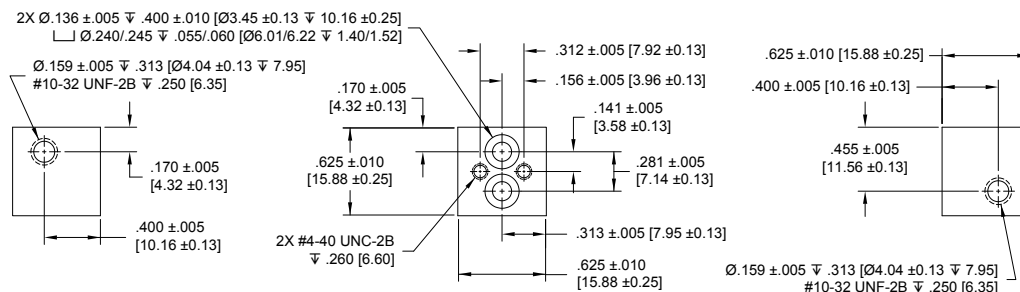
Table 3 (below) describes the recommended R1 and R2 resistor values based upon the full shut-off current.

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

Voltage Supplied to Valve Coil (Reference)	Valve Drive Voltage (VDC)	Nominal Coil Resistance @ 20°C (Ohms)	Input Current for Full Flow (mA)	R1 (Ohms)	R2 (Ohms)
5	7	11.9	435	1000	95.3
12	14	68	175	2260	33.6
24	26	274	87	4990	18.2

# HF PRO Miniature High Flow Proportional Valve Installation and Use

## Manifold & O-Ring Dimensions & Design Not shipped with valves.



## Ordering Information

Sample Part ID	HFPRO	7	V	A	F	8	O
Description	Series	Model Number: Maximum Operating Pressure / Orifice Size	Elastomer/ Body Material	Coil Voltage*	Electrical Interface	Pneumatic Interface	Cleaning
Options		7: 50 psi / 0.070" (1.78 mm)	V: FKM / Brass	A: 5 VDC D: 12 VDC F: 24 VDC  *Maximum voltage for continuous full flow, ambient temperature 55°C	F: Wire Leads, 18" (45.7 cm)	1: Manifold Mount 8: 1/4" (6 mm) Barbs	O: Oxygen Service

Accessories	
190-007024-002: O-ring, FKM, 0.114" ID x 0.070" Thick*	*Not supplied with the valve. Used as a seal between the valve body and manifold.
191-000115-010: Screw 4-40 x 5/8" Pan Head**	**Not supplied with the valve. Used to mount the valve to a manifold.



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 (or go to [www.parker.com/precisionfluidics/hfpro](http://www.parker.com/precisionfluidics/hfpro)) to configure your HF PRO Non-Thermally Compensated Proportional Valve. For more detailed information, visit us on the Web, or call and refer to Performance Spec. #790-002243-001 and HF PRO Barbed Drawing #890-003192-001 and HF PRO Manifold Mount Drawing #890-003191-001.

