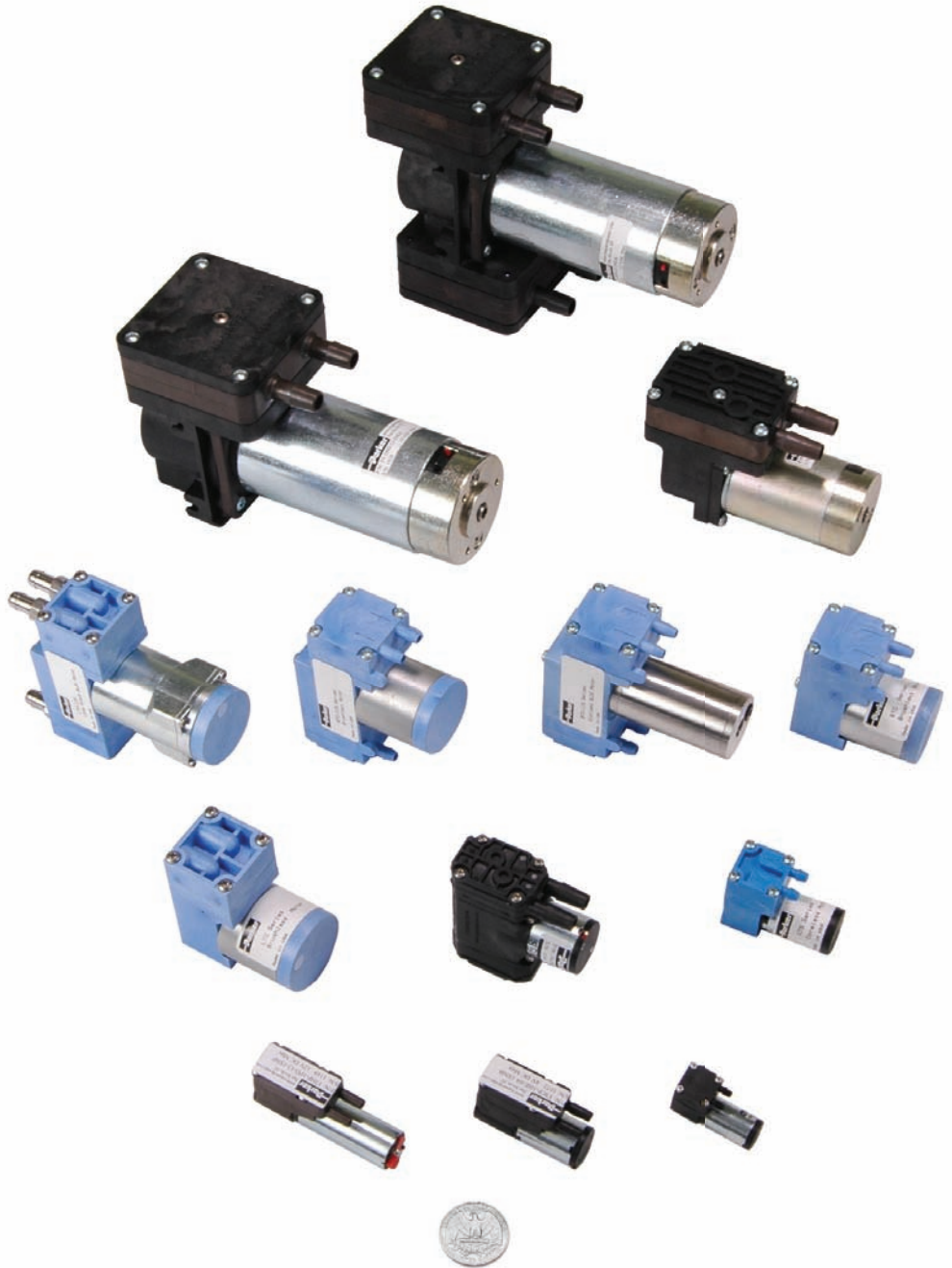


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climate control  
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**fluid & gas handling**  
hydraulics  
pneumatics  
process control  
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# Miniature Diaphragm Pumps

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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.



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# T2-05

## Micro Pumps (air/gas)

Up to 650 mLPM Free Flow



Designed to fit where other pumps can't, the T2-05 DC motor-driven pump's extra small size and high efficiency reduce footprints and extend battery life. The motor, pump head, and valve combination provide reliable, long life operation. Our smallest pump was designed for applications where low power, small size, and light weight are critical. Unique valve design minimizes leakage to maximize flow.

### Features

- **High Efficiency**

The valve design has been optimized to provide the highest flowrates available with the lowest power draw. Low power leads to longer battery life and smaller instrument size.

- **Long Life**

The wear components of these pumps have been designed to provide maximum life. Many applications for these pumps require 10,000+ hours of operation.

- **Small Size and Lightweight**

The pumps fit into the extremely tight spaces demanded of today's handheld instruments, such as portable gas detectors. The lightweight design keeps instrument weight minimized.

- **Intrinsic Safety Capability**

The high efficiency ironless core motor can satisfy intrinsic safety requirements. It has been proven in applications for sampling of hazardous gases, vapors, and aerosols in a range of fixed and portable instruments.

### Typical Applications

- Industrial Hygiene
- Medical Instruments
- Air over Liquid Control
- Combustion Analyzers
- Trace Detection

### Performance Data

#### Physical Properties

<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Wetted Material:</b>
EPDM (Diaphragm/Valves), ABS (Head)

#### Electrical

<b>Motor Type:</b>
Hi-efficiency Ironless Core
<b>Nominal Motor Voltages (DC):</b>
3.3, (other options available)
<b>Max Power at Nominal Voltage:</b>
.36 (watts)
<b>Electrical Termination:</b>
5.9" Wire Leads

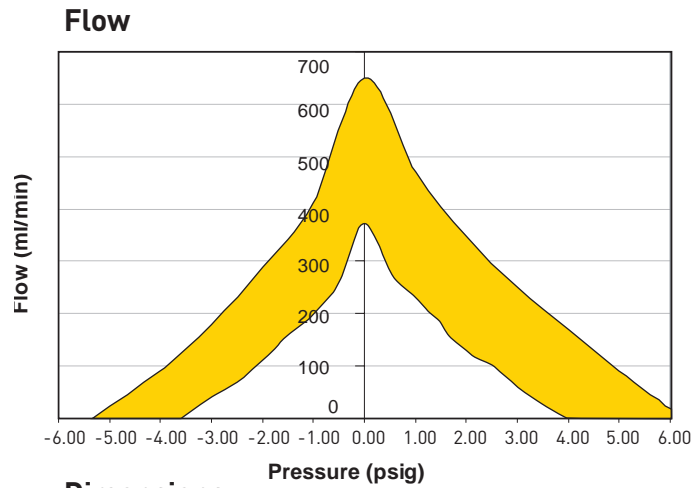
#### Pneumatic

<b>Head Configuration:</b>
Single
<b>Max Flow:</b>
0.65 lpm
<b>Max Intermittent Pressure:</b>
6.2 psi (430 mbar)
<b>Max Continuous Pressure:</b>
2.0 psi (138 mbar)
<b>Max Intermittent Vacuum:</b>
10.8 in Hg (365 mbar)
<b>Max Continuous Vacuum:</b>
4.1 in Hg (138 mbar)

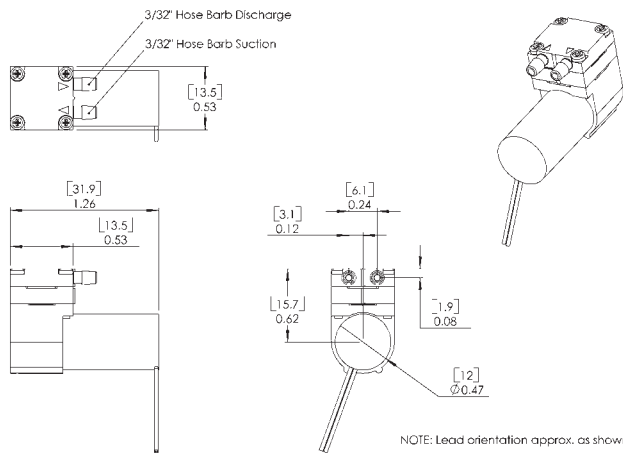
NOTE: All performance data is typical based on standard conditions: 70°F and 14.7 psia

# T2-05

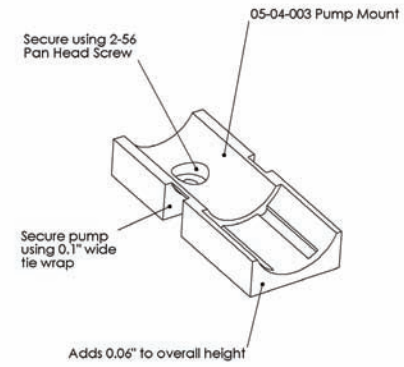
## Micro Pumps (air/gas)



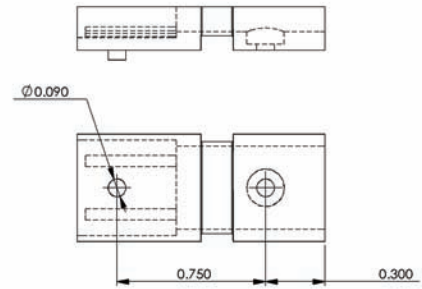
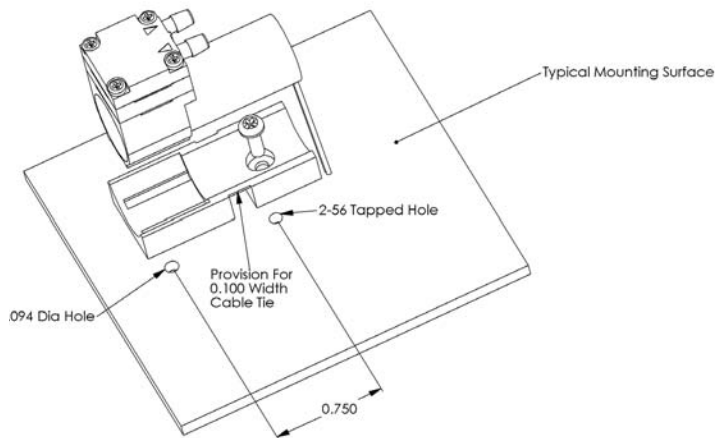
### Dimensions



### Optional Mounting Bracket



### Detailed View



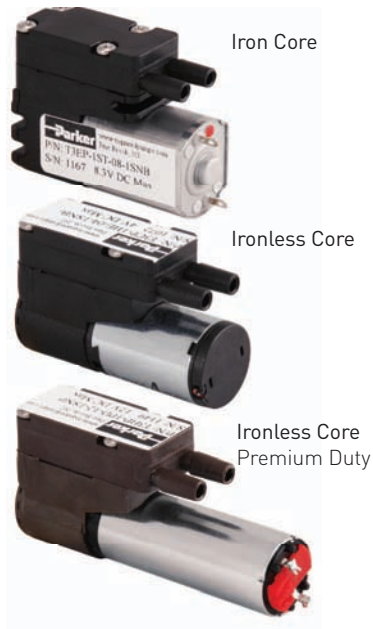
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# T2-03

Up to 2.5 LPM Free Flow



## Typical Applications

- Industrial Hygiene
- Medical Instruments
- Aerosols and Particle Analysis
- Air over Liquid Control
- Combustion Analyzers
- Trace Detection
- Fixed Gas Detectors

## Micro Pumps (air/gas)

The T2-03 DC motor-driven pump line is a miniature powerhouse ideal for use in portable air and gas applications. The pump head and patented valve design provide reliable, highly efficient, long life operation. Size and power draw are minimized. The pumps are available in “Compact” (high efficiency ironless core motor), “eCompact” (iron core brush motor), and “HP” (premium duty brush motor). Motor choice is driven by application requirements.

## Features

### • High Efficiency

The patented valve design has been optimized to provide the highest flow-rates available with the lowest power draw. Lower power results in longer battery life and smaller instrument size. A

### • Long Life

The wear components of these pumps have been designed to provide maximum life. Many applications for these pumps require 10,000+ hours of operation.

### • Small Size and Lightweight

The pumps fit into the extremely tight spaces demanded of today’s handheld instruments, such as portable gas detectors. The lightweight design keeps instrument weight minimized.

### • Intrinsic Safety Capability

The motors used in the ‘Compact’ and ‘HP’ pumps can satisfy intrinsic safety requirements. They have been proven in applications for sampling of hazardous gases, vapors, and aerosols in a range of fixed and portable instruments.

## Performance Data

### Physical Properties

<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Media:</b>
Most non-condensing gases
<b>Humidity:</b>
5 - 95% RH
<b>Wetted Material:</b>
Neoprene, EPDM, FKM
<b>Valves:</b>
Silicone, FKM
<b>Pump Head:</b>
ABS, PPS

### Electrical

<b>Motor Type (DC):</b>
Iron Core, Ironless Core, Premium Duty
<b>Nominal Motor Voltages:</b>
4, 5.6, 8.3, 12.4 VDC
<b>Current Range:</b>
18 mA - 400 mA*
*Dependent on motor type, voltage, pressure/vacuum and flow requirement
<b>Motor Control:</b>
2-wire (Analog or PWM) Brush Solder Tabs (Analog or PWM)

### Pneumatic

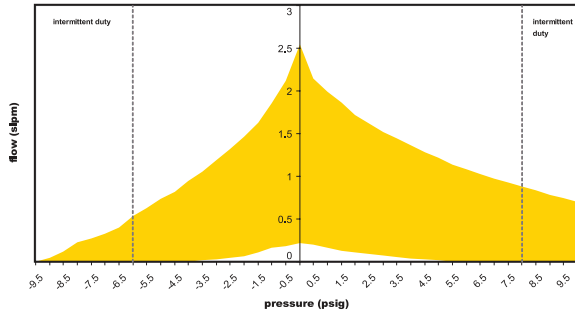
<b>Head Configuration:</b>
Single
<b>Max Unrestricted Flow:</b>
2.5 LPM*
<b>Pressure Range:</b>
0 - 12 PSI*
<b>Vacuum Range:</b>
0 - 24 in Hg*
*Varies depending on pump configuration

# T2-03

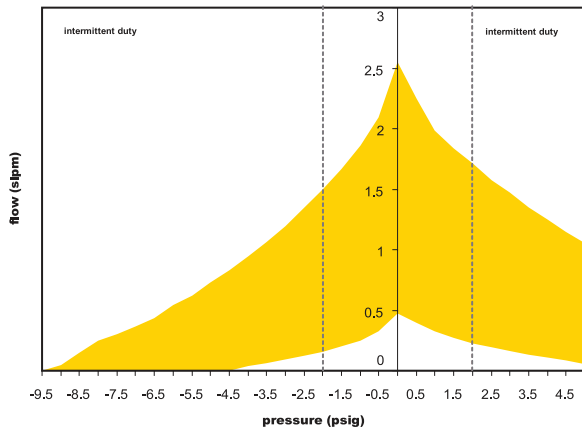
## Micro Pumps (air/gas)

### Flow

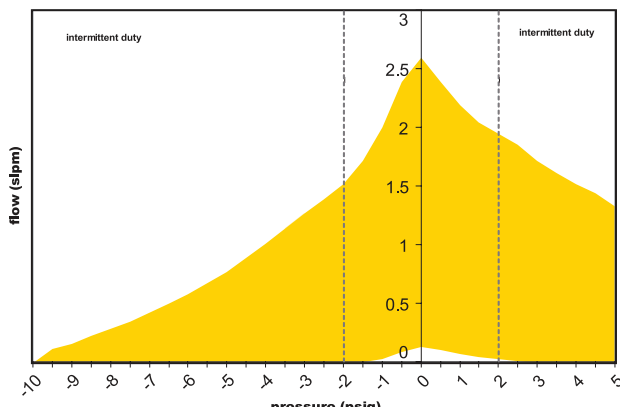
#### T2-03 HP



#### T2-03 Compact

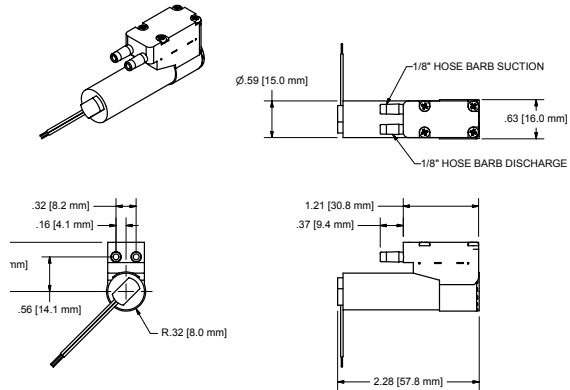


#### T2-03 e-Compact

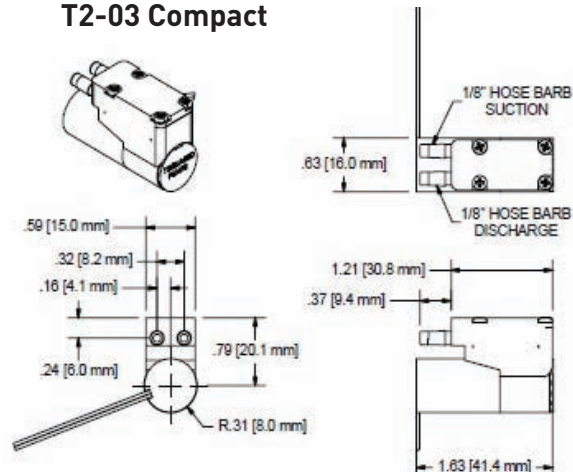


### Dimensions

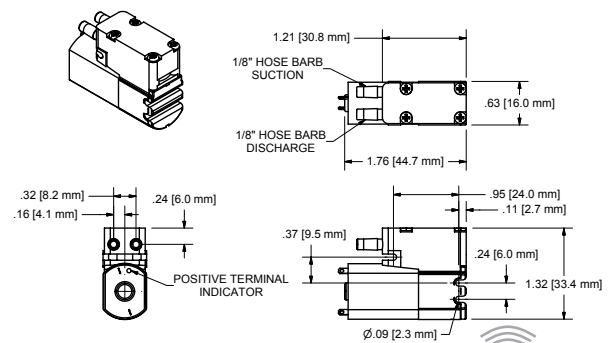
#### T2-03 HP



#### T2-03 Compact



#### T2-03 e-Compact



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# CTS Series

2.5 LPM Free Flow



CTS coreless motor shown

## Typical Applications

- Gas Analyzers
- Patient Monitoring
- CO2 Monitors

## Micro Pumps (air/gas)

CTS Micro Diaphragm Pumps and Compressors are a series of brushless, brush and coreless D.C. motor-driven pumps tailored to meet the specific performance requirements of your applications.

### Features

- **Longevity:**

The CTS Series pump sets the highest benchmark for service free life expectancy, with our advanced proprietary diaphragm elastomer. Brushless DC motors are selected for long life; brush motors for low cost; and coreless motors for maximum energy efficiency.

- **Lightweight, Compact Size:**

The CTS Series pump design has a unique compact configuration.

- **Contamination-Free:**

Parker takes the necessary steps in manufacturing to assure that our 100% oil free pump and compressor designs maintain the purity of your system. Parker pumps and compressors are commonly used in FDA-approved systems.

- **Dynamically Balanced:**

The CTS Series pump design is uniquely balanced to minimize noise and maximize life.

## Performance Data

### Physical Properties

<b>Operating Environment:</b>
41 to 122°F (5 to 50°C)
<b>Media:</b>
Most Gases
<b>Humidity:</b>
0 – 95% RH
<b>Wetted Material:</b>
Diaphragm/Valves: EPDM, AEPDM
Head: PSU
Screw: 18-8 Stainless

### Electrical

<b>Motor Type (DC):</b>
Brush, Brushless, Coreless
<b>Nominal Motor Voltages:</b>
6, 9, 12 VDC
Other voltages available upon request
<b>Current Range:</b>
50 mA - 500mA*
*Dependent on motor type, voltage, pressure/vacuum and flow requirement.

### Pneumatic

<b>Head Configuration:</b>
Single
<b>Max Unrestricted Flow:</b>
2.5 LPM
<b>Pressure Range:</b>
0 - 24 psig (165 kPa)
<b>Vacuum Range:</b>
0 - 20 in Hg (508 mmHg)

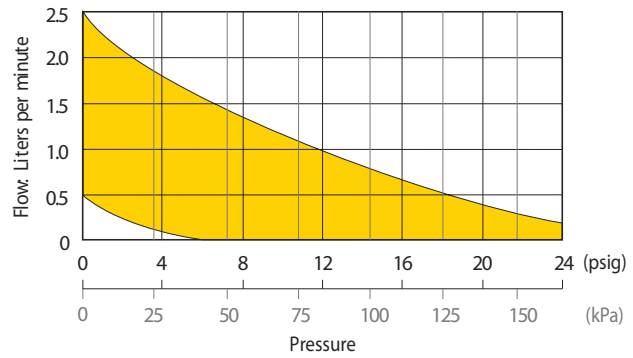
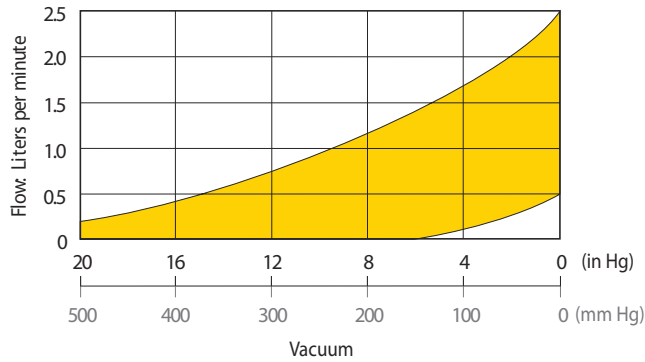


# CTS Series

## Micro Pumps (air/gas)

### Single Head Micro Diaphragm Pump and Compressor

#### Flow

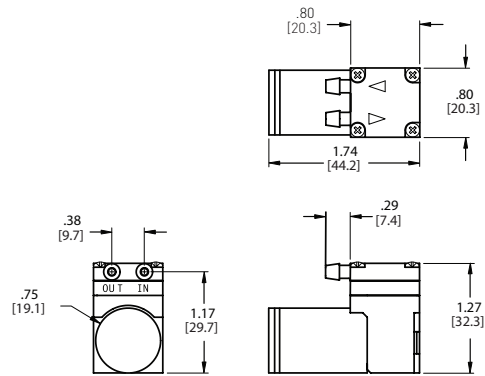
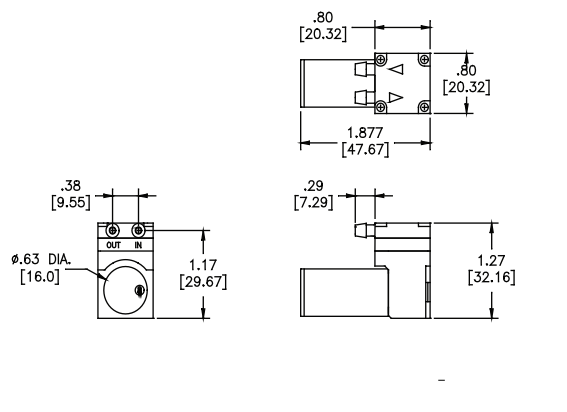


The above performance range illustrates overall performance for all CTS single-headed pumps handling air. Performance may vary depending on altitude. Consult factory with you specific requirements.

#### Dimensions

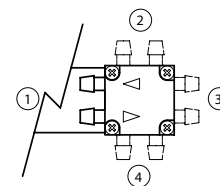
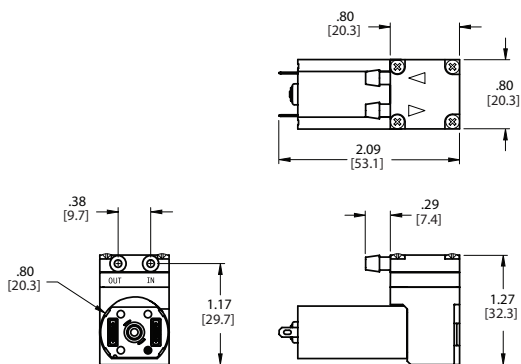
Brushless Motor  
 (Pump Mass- 1.6 oz<sub>m</sub> [45 gms])

Coreless Motor  
 (Pump Mass- 1.6 oz<sub>m</sub> [45 gms])



Brush Motor  
 (Pump Mass- 1.7 oz<sub>m</sub> [48 gms])

Head Configuration  
 (#1 Head Configuration Standard)



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# BTC Series

Up to 6 LPM Free Flow



BTC brushless motor shown

## Typical Applications

- Gas Analysis
- Anesthesia Monitor
- CO2 Monitors
- Patient Monitoring
- Wound Therapy
- Urinalysis

## Performance Data

### Physical Properties

<b>Operating Environment:</b>
41 to 158°F* (5 to 70°C*)
*Duty dependent. Consult factory for high temperature applications over 50° C
<b>Media:</b>
Most Gases and Liquids
<b>Humidity:</b>
0 – 95% RH
<b>Noise Level:</b>
As low as 45 dB
<b>Wetted Material:</b>
EPDM, AEPDM, Fluorocarbon, Teflon/EPDM Laminate
<b>Valves:</b>
EPDM, AEPDM, Perfluoro, Fluorocarbon
<b>Pump Head:</b>
Vectra (Liquid Crystal Polymer)

## Mini Pumps (air/gas)

BTC Miniature Diaphragm Pumps and Compressors are a series of brush and brushless DC motor driven pumps designed to handle air and gases. The innovative, compact design incorporates leading edge technologies that allow it to operate harder, hotter, quieter and longer than existing pump designs. The BTC Series offers multiple component configurations allowing them to be used for either vacuum operation, pressure operation, or alternating vacuum and pressure operations.

### Features

- **Highest Performance/Size Ratio:**  
innovative and efficient engineering designs enable the BTC Series to push the performance envelope in a lightweight, compact size.
- **Runs in Hotter Environments:**  
Selection of advanced materials and our proprietary elastomer diaphragms and valves allow our pumps to operate in increased temperature environments up to 158°F (70°C).
- **Performs Quieter:**  
Optimized head, chamber, and flow path reduce noise without compromising performance.
- **Lasts Reliably Longer:**  
Using our proprietary advanced diaphragm elastomer and superior brushless motor design sets the highest benchmark for service-free operation that exceeds 10,000 hours.
- **Installs Easily:**  
Incorporating the lightweight EZ Mount facilitates simple system assembly while dampening vibration and reducing noise levels.

### Electrical

<b>Motor Type (DC):</b>
Brush, Brushless
<b>Nominal Motor Voltages (DC):</b>
6, 12, 24 VDC
Other voltages available upon request
<b>Current Range:</b>
50 mA - 900 mA*
*Dependent on motor type, voltage, pressure/vacuum and flow requirement.
<b>Motor Control:</b>
2-wire (Analog or PWM) Brush
2-wire, 3-wire (Analog or PWM)

### Pneumatic

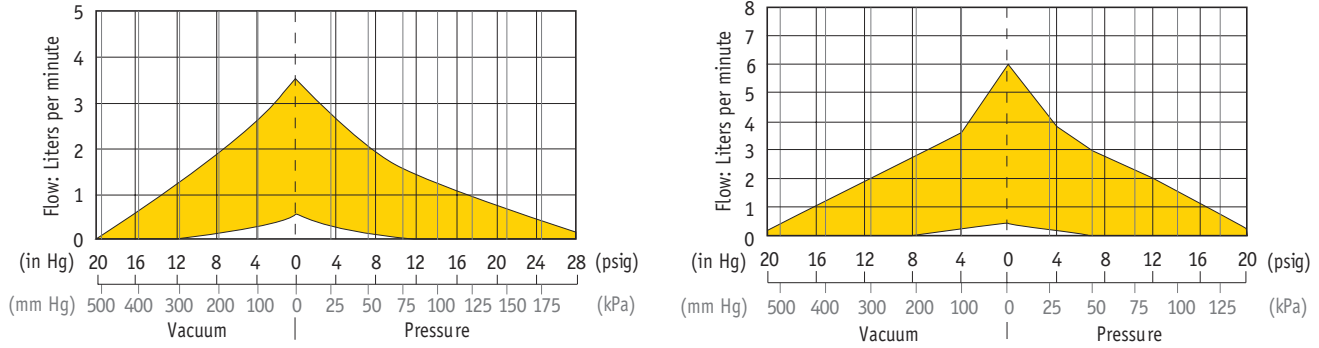
<b>Head Configuration:</b>
Single
<b>Max Flow:</b>
3.5 LPM (Flat diaphragm)
6 LPM (Convolute diaphragm)
<b>Pressure Range:*</b>
0 - 30 psig (0-193 kPa) Flat
0 - 20 psig (0-138) Convolute
<b>Vacuum Range:*</b>
0 - 23 in Hg (0-584 mmHg) Flat
0 - 20 in Hg (0-580 mmHg) Convolute
* Extended pressure and vacuum capabilities available upon request.

# BTC Series

## Mini Pumps (air/gas)

### Single Head Micro Diaphragm Pump and Compressor

#### Flow

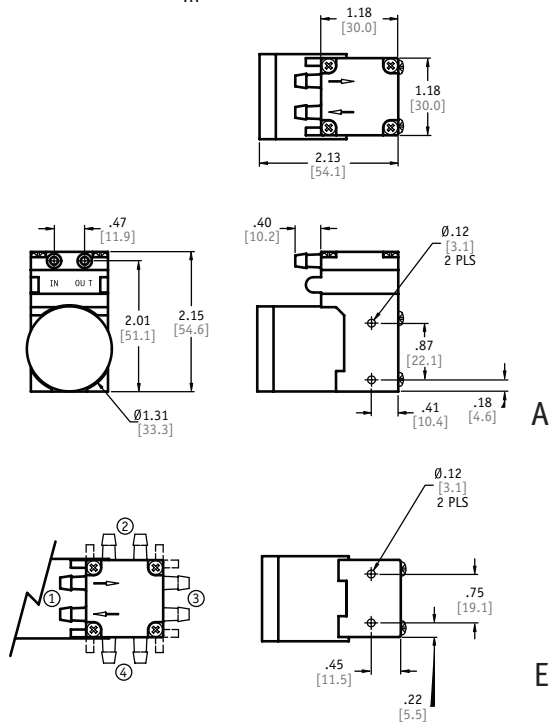


The above performance graph illustrates the overall performance of the BTC handling air at 800 feet (244 m) above sea level at 75° F [24°]. Performance will vary depending on barometric pressure and media temperature. Consult factory with your specific requirements.

#### Dimensions

##### Brushless Motor

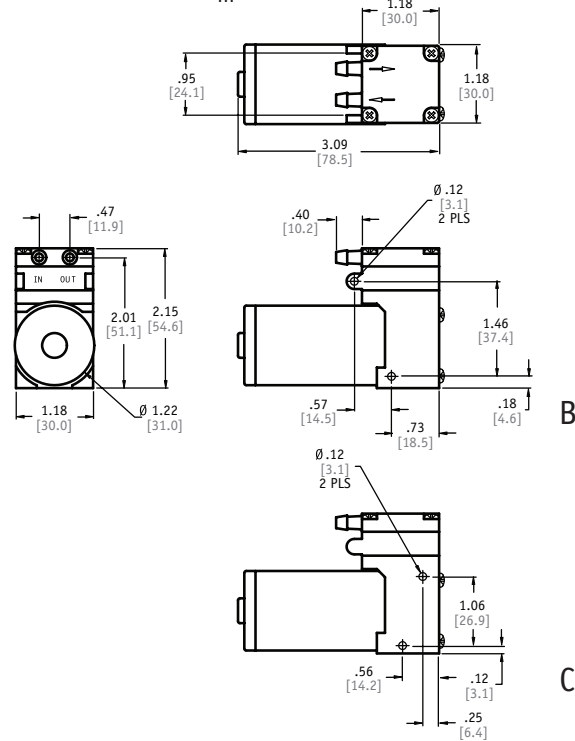
(Pump Mass - 4.5 oz<sub>m</sub> [128 gms])



Head Configuration (#1 Head Configuration is Standard)

##### Brush Motor

(Pump Mass - 6.5 oz<sub>m</sub> [184 gms])



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# T2-04

Up to 7.5 LPM Free Flow



## Mini Pumps (air/gas)

The T2-04 is a twin head pump with single set of ports that is ideal for higher suction flows in portable gas sampling systems. A unique double diaphragm design minimizes losses inside the pump. With flows up to 7.5 LPM, the efficiency of this pump is without equal. The motor, pump head, and valve combination provide reliable, long life operation. The pump was designed for higher flow suction applications where low power, small size, and light weight are critical.

### Features

- **High Efficiency**

The double diaphragm and patented valve design have been optimized to provide the highest flowrates available with the lowest power draw, especially in vacuum applications. Low power leads to longer battery life and smaller instrument size.

- **Long Life**

The wear components of these pumps have been designed to provide maximum life while maintaining high efficiency.

- **Small Size and Lightweight**

The pumps fit into the tight spaces demanded of today's battery powered instruments. The lightweight design keeps instrument weight minimized. A single set of barbs provides twice the flow and eliminates tubing 'nests' in the system.

- **Intrinsic Safety Capability**

The high efficiency ironless core motor can satisfy intrinsic safety requirements. It has been proven in applications for sampling of medical gases, hazardous gases, particles, and aerosols in a range of fixed and portable instruments.

### Typical Applications

- Industrial Hygiene
- Medical Instruments
- Air over Liquid Control
- Trace Detection
- Fuel Cells
- Particle & Aerosol Sampling

### Performance Data

#### Physical Properties

<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Wetted Material:</b>
Neoprene Rubber, Silicone, Polyphthalamide (PPA)

#### Electrical

<b>Motor Type:</b>
High Efficiency Ironless Core
<b>Nominal Motor Voltages:</b>
6, 12 VDC
<b>Voltage:</b>
6, 12 VDC (other options available)
<b>Electrical Termination:</b>
5" Wire Leads

#### Pneumatic

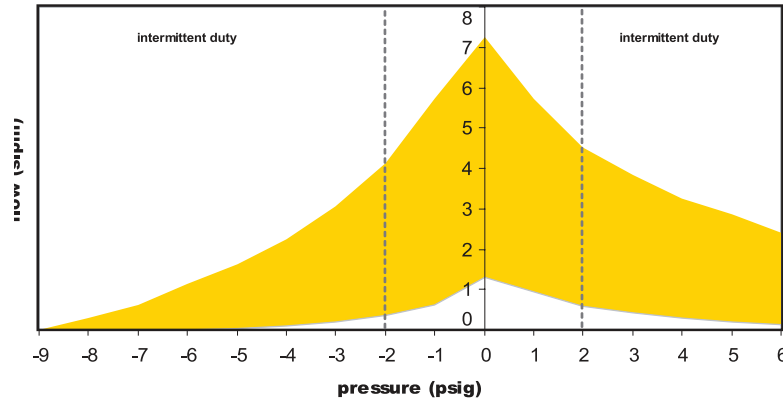
<b>Head Configuration:</b>
Twin
<b>Max Flow:</b>
7.5 lpm
<b>Max Intermittent Pressure:</b>
11.9 psi (820 mbar)
<b>Max Continuous Pressure:</b>
2 psi (138 mbar)
<b>Max Intermittent Vacuum:</b>
17.6 in Hg (596 mbar)
<b>Max Continuous Vacuum:</b>
4 in Hg (138 mbar)

T2-04

Mini Pumps (air/gas)

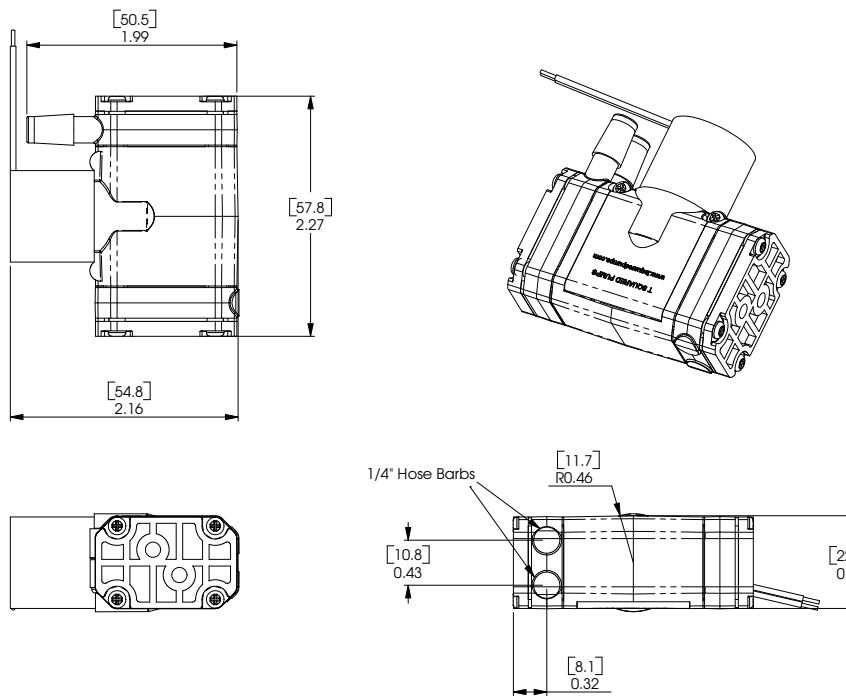
Typical Flow Curve

Flow



NOTE: All performance data is typical based on standard conditions: 70°F and 14.7 psia

Dimensions



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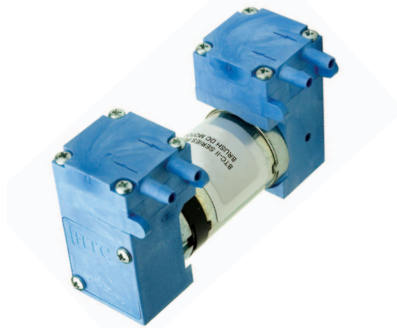
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# BTC-II Series

## Mini Pumps (air/gas)

6 or 11 LPM Free Flow



BTC-II brush motor shown

BTC-II Dual Head Miniature Diaphragm Pumps and Compressors are a series of brush DC motor-driven pumps tailored to meet the specific performance requirements of your applications. These pumps are designed to handle both gases and liquids.

### Features

- **Longevity:**

The BTC-II is configured with a dual ball bearing brush motor, along with our long life pump head technology. The pump will last the life of the motor, or up to 3,000 hours of high intermittent usage. For exceptional life performance with our BLDC motor, use the BTC-IIS.

- **Light Weight, Compact Size:**

The BTC-II Series pump design has a unique compact configuration allowing designers to minimize system weight and allotted space requirement for pumps and compressors.

- **Flexible Mounting Options:**

The BTC-II maximizes mounting flexibility by offering several ways to mount the pump, as well as four possible port orientations.

- **Contamination-Free:**

Parker takes the necessary steps in manufacturing to assure that our 100% oil-free pump and compressor designs maintain the purity of your system. Parker pumps and compressors are commonly used in FDA-approved systems.

- **Dynamically Balanced:**

The BTC-II Series pump design is uniquely balanced to minimize vibration and maximize life.

### Typical Applications

- Emissions Analyzer

### Performance Data

#### Physical Properties

<b>Operating Environment:</b>
41 to 158°F* (5 to 70°C*)
<b>Media:</b>
Most Gases and Liquids
<b>Humidity:</b>
0 – 95% RH
<b>Wetted Material:</b>
EPDM, AEPDM, Fluorocarbon, Teflon/EPDM Laminate
<b>Valves:</b>
EPDM, AEPDM, Perfluoro, Fluorocarbon
<b>Pump Head:</b>
Vectra (Liquid Crystal Polymer)

#### Electrical

<b>Motor Type (DC):</b>
Brush
<b>Nominal Motor Voltages:</b>
6, 12, 24 VDC
Other voltages available upon request
<b>Current Range:</b>
Varies from voltage, flow and pressure requirements.

#### Pneumatic

<b>Head Configuration:</b>
Dual
<b>Max Unrestricted Flow:</b>
6 LPM (Series)
11 LPM (Parallel)
<b>Pressure Range:*</b>
0 - 28 psig (193 kPa) Parallel
<b>Vacuum Range: *</b>
0 - 25 in Hg (635 mmHg) (Series)
0 - 20 in Hg (580mmHg) (Parallel)
* Extended pressure and vacuum capabilities available upon request.

# BTC-II Series

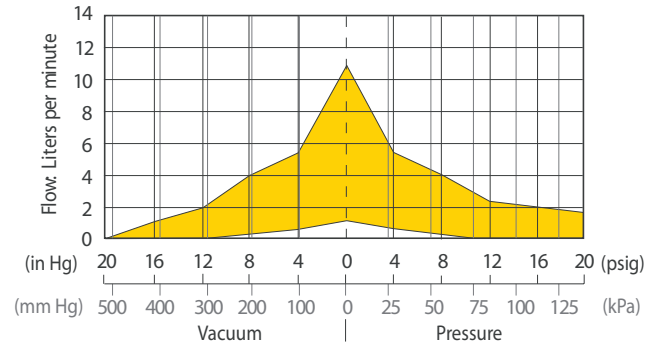
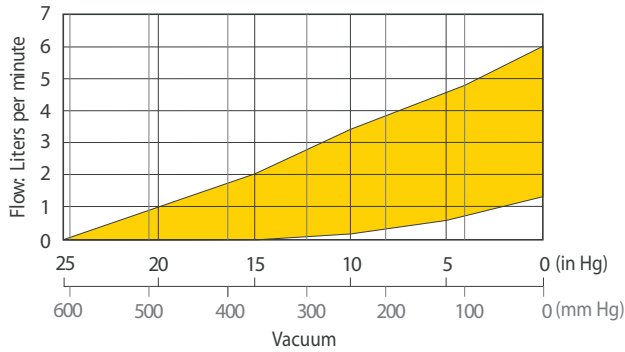
## Mini Pumps (air/gas)

### Dual Head Miniature Diaphragm Pump and Compressor

Flow

Series

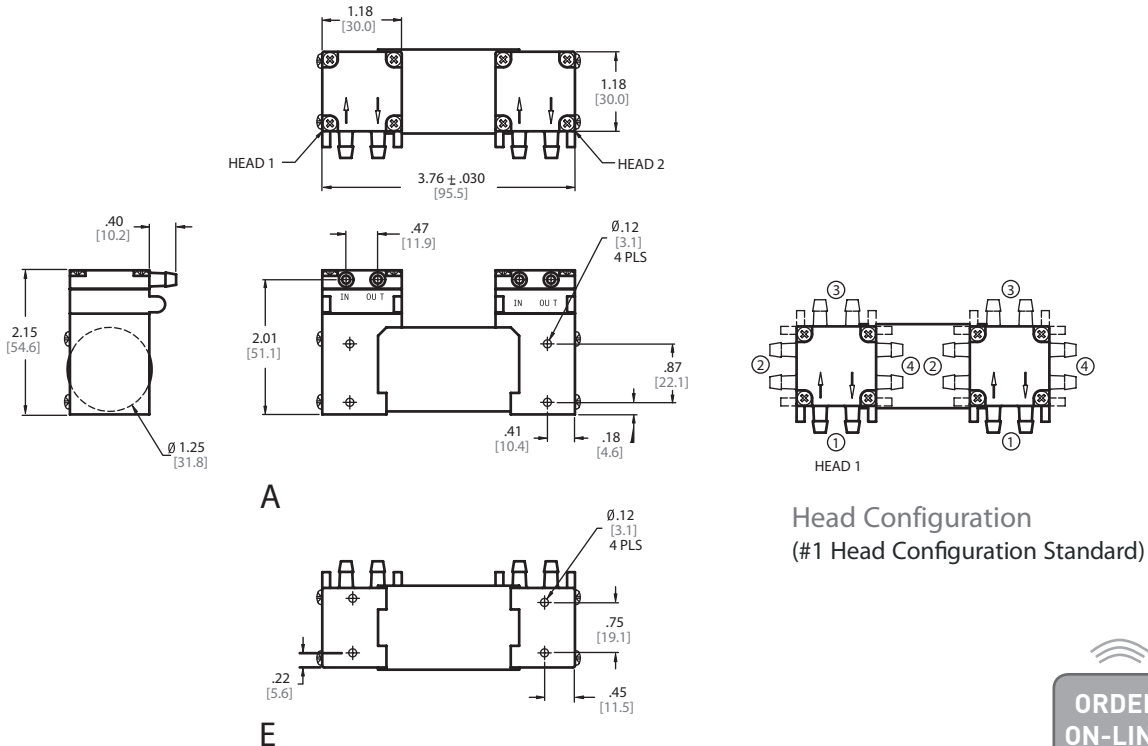
Parallel



The above performance graph illustrates the overall performance of the BTC-II handling air at 800 feet (244 m) above sea level at 75° F (24°). Performance will vary depending on barometric pressure and media temperature. Consult factory with you specific requirements.

### Dimensions

(Pump Mass - 9.1 oz<sub>m</sub> [258 gms])



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# BTC-IIS Series Mini Pumps (air/gas)

Up to 11 LPM Free Flow



BTC-IIS slotless motor shown

## Typical Applications

- Patient Monitoring
- Compression Therapy
- Hemodialysis
- Peritoneal dialysis
- Respiratory care
- Wound Therapy

BTC-IIS Single Body Dual Head Miniature Diaphragm Pumps and Compressors are a series of brush and brushless DC motor driven pumps which are tailored to meet the specific performance requirements of your applications. These pumps are designed to handle both gases and liquids.

## Features

### • Proportional Flow Control:

Three-wire motor available for external pulse width modulation.

### • Longevity:

The BTC-IIS Series pump sets the highest benchmark for service-free performance with our unique brushless DC motor design and advanced proprietary diaphragm elastomer.

### • Light Weight, Compact Size:

The BTC-IIS Series pump design has a unique compact configuration allowing designers to minimize system weight and allotted space requirement for pumps and compressors.

### • Versatile Head Configuration:

Each pump head can be configured to operate independently for a combination of pressure, vacuum and liquid applications. The heads can be configured in series or parallel to increase vacuum, pressure or flow performance.

### • Flexible Mounting Options:

The BTC-IIS maximizes mounting flexibility by offering several ways to mount the pump, as well as four possible port orientations.

### • Contamination-Free:

Parker takes the necessary steps in manufacturing to assure that our 100% oil-free pump and compressor designs maintain the purity of your system. Parker pumps and compressors are commonly used in FDA-approved systems.

## Performance Data

### Physical Properties

<b>Operating Environment:</b>
41 to 158°F* (5 to 70°C*)
<b>Media:</b>
Most Gases and Liquids
<b>Humidity:</b>
0 – 95% RH
<b>Wetted Material:</b>
EPDM, AEPDM, Fluorocarbon, Teflon/EPDM Laminate
<b>Valves:</b>
EPDM, AEPDM, Perfluoro, Fluorocarbon
<b>Pump Head:</b>
Vectra (Liquid Crystal Polymer)

### Electrical

<b>Motor Type (DC):</b>
Brush Dual Ball Bearings Brushless Dual Ball Bearings
<b>Nominal Motor Voltages:</b>
6, 12, 24 VDC Other voltages available upon request
<b>Current Range:</b>
200 mA - 1400 mA* *Dependent on motor type, voltage, pressure/vacuum and flow requirement.

### Pneumatic

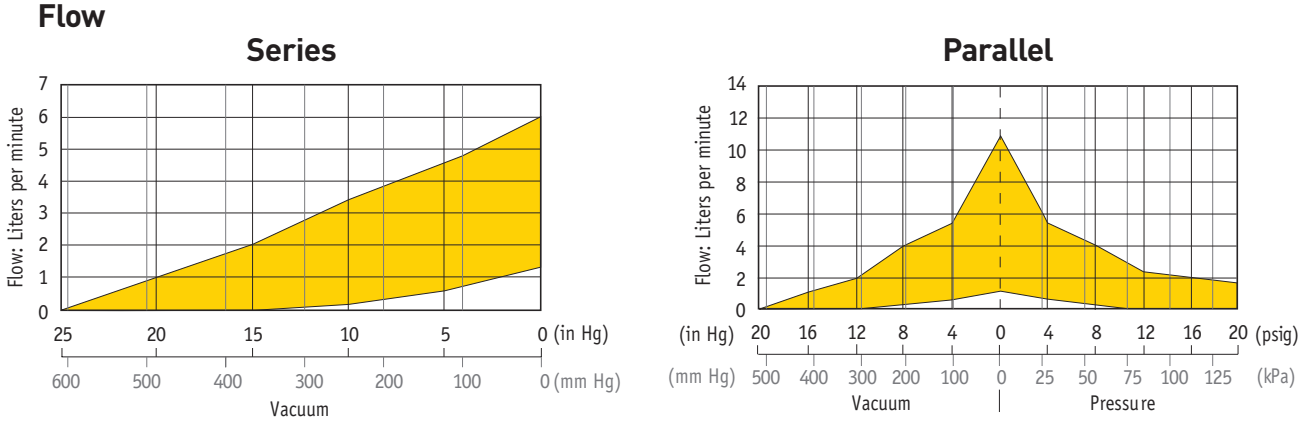
<b>Head Configuration:</b>
Dual
<b>Max Unrestricted Flow:</b>
6 LPM (Series) 11 LPM (Parallel)
<b>Pressure Range:*</b>
0 - 28 psig (193 kPa) Parallel
<b>Vacuum Range:*</b>
0 - 25 in Hg (635 mmHg) (Series) 0 - 20 in Hg (580mmHg) (Parallel) * Extended pressure and vacuum capabilities available upon request.



**BTC-IIS Series**

**Mini Pumps (air/gas)**

**Miniature Diaphragm Pump and Compressor**

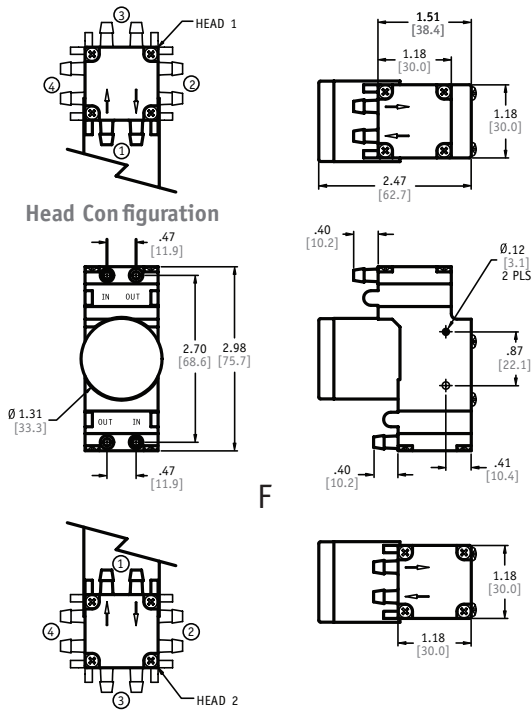


The above performance graph illustrates the overall performance of the BTC-IIS handling air at 800 feet (244 m) above sea level at 75° F (24°). Performance will vary depending on barometric pressure and media temperature. Consult factory with your specific requirements.

**Dimensions**

**Brushless Motor**

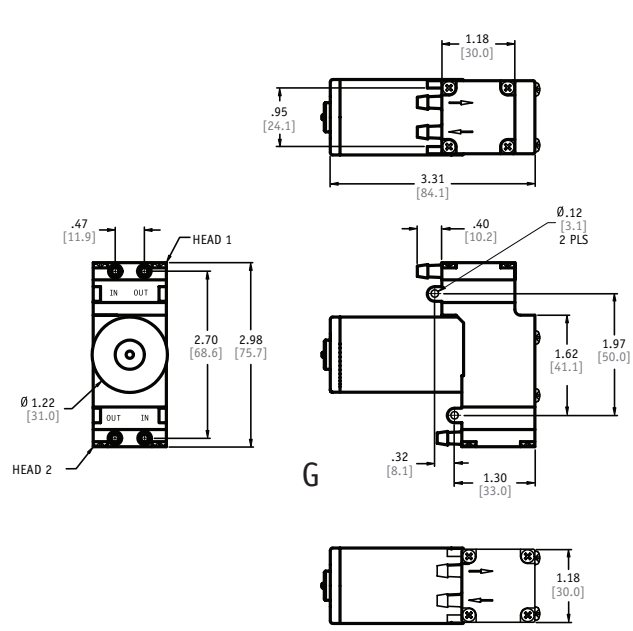
(Pump Mass - 6.0 oz<sub>m</sub> [170 gms])



Head Configuration (#1 Head Configuration Standard)

**Brush Motor**

(Pump Mass - 8.0 oz<sub>m</sub> [227 gms])



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# LTC Series

650 mLPM Free Flow



LTC Series brushless motor shown

## Typical Applications

- Large Format Printers
- Urinalysis
- Photo Processing Printers

## Mini Pumps (liquids)

LTC Series Liquid Pumps are offered in both brush and brushless DC motor drives that can be configured for your specific performance requirements. These pumps are designed to handle a wide range of liquid and gas media.

### Features

- **Patented Fluid-Blok™ Advanced Sealing Technology\*:**  
Redundant sealing techniques eliminate leaks.
- **Self-Priming/Dry Running:**  
Monolithic diaphragm design allows for maximum suction/priming and continuous dry operation.
- **Longevity:**  
Unique brushless DC motor design and advanced proprietary diaphragm elastomer gives the highest benchmark for service-free life.
- **Low Power Consumption:**  
Advanced flow path and efficient valve system design allows for maximum flow with low power consumption.
- **Port Design:**  
Port design allows for top or bottom face seal and is molded for 1/4-28 UNF threaded fittings, as well as four head configurations.
- **Chemical Resistant:**  
Structured to be inert to a variety of media with selected wetted components.
- **Lightweight, Compact Size:**  
Compact configuration allowing designers to minimize system weight and space requirements.
- **Flexible Mounting Options:**  
Maximizes mounting flexibility by offering several mounting options.
- **FDA-Approved Materials:**  
Parker pumps and compressors are commonly used in FDA-approved systems.

## Performance Data

### Physical Properties

<b>Operating Environment:</b>
41 to 122°F (5 to 50°C)
<b>Media:</b>
Most Liquids and Gases
<b>Humidity:</b>
0 – 95% RH
<b>Wetted Material:</b>
EPDM, AEPDM, Fluorocarbon, Teflon/EPDM Laminate
<b>Valves:</b>
EPDM, AEPDM, Perfluoro, Fluorocarbon
<b>Pump Head:</b>
Vectra (Liquid Crystal Polymer)

### Electrical

<b>Motor Type (DC):</b>
Brush, Brushless
<b>Nominal Motor Voltages:</b>
6, 12, 24 VDC
Other voltages available upon request
<b>Current Range:</b>
390 mA - 1.1A*
*Dependent on motor type, voltage, pressure/vacuum and flow requirement.

### Pneumatic

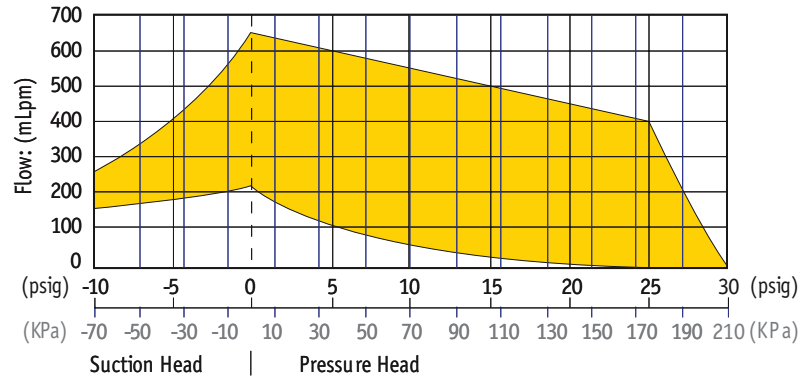
<b>Head Configuration:</b>
Single
<b>Max Unrestricted Flow:</b>
650 mL/min
<b>Pressure Range:</b>
0 - 30 psig (207 kPa)
<b>Vacuum Range:</b>
0 - 20 in Hg (508 mmHg)

# LTC Series

## Mini Pumps (air/gas)

### Single Head Miniature Liquid Diaphragm Pump

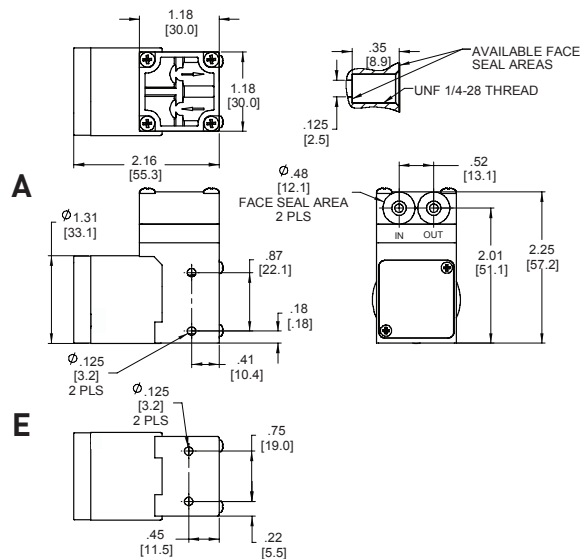
#### Flow



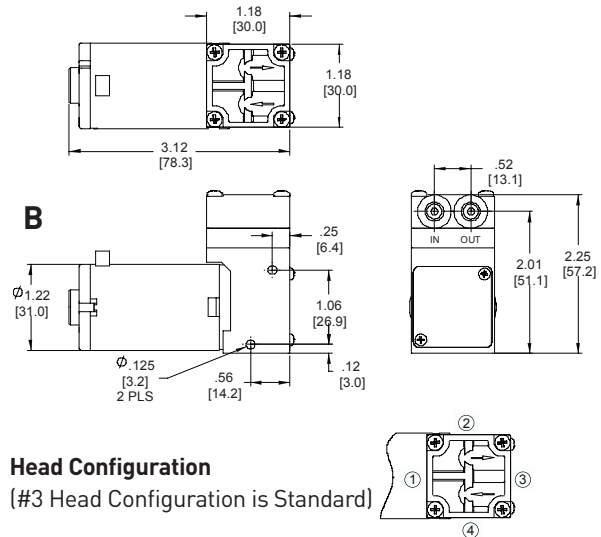
Performance ranges illustrate overall performance for all LTC pumps handling water at room temperature. Performance will vary depending on barometric pressure, media temperature, density, and viscosity.

#### Dimensions

**Brushless Motor**  
Weight - 5.0 oz (142 grams)



**Brush Motor**  
Weight - 7.0 oz (199 grams)



**Head Configuration**  
(#3 Head Configuration is Standard)



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# T2-02

## High Capacity Pumps (air/gas)

Up to 28.5 LPM Free Flow



The T2-02 is a high performance pump that features Parker's patented dynamic valve design. Remarkable performance and efficiency are achieved, particularly at lower loads. With flows up to about 28.5 LPM, this is the most compact, lightweight package in its class. The motor, pump head, and valve combination provide reliable, long life operation.

### Features

- **High Efficiency**

The design has been optimized to provide the highest flowrates available with the lowest power draw, especially in vacuum applications. Low power leads to longer battery life and smaller instrument size.

- **Long Life**

The wear components of these pumps have been designed to provide maximum life.

- **Small Size and Lightweight**

The pumps fit into the tight spaces demanded of today's battery powered instruments. The lightweight design keeps instrument weight minimized. Ideal for today's handheld systems that were not possible with yesterday's technology.

### Typical Applications

- Portable Aspirators
- Medical Instruments
- Fuel Cells
- Industrial Systems

### Performance Data

#### Physical Properties

<b>Operating Environment:</b>
32 to 122°F (0 to 50°C)
<b>Wetted Material:</b>
EPDM, CR, PPS+PTFE

#### Electrical

<b>Motor Type (DC):</b>
Heavy Duty Brush
<b>Nominal Motor Voltages (DC):</b>
12, 24 VDC (other options available)
<b>Electrical Termination:</b>
18" Wire Leads

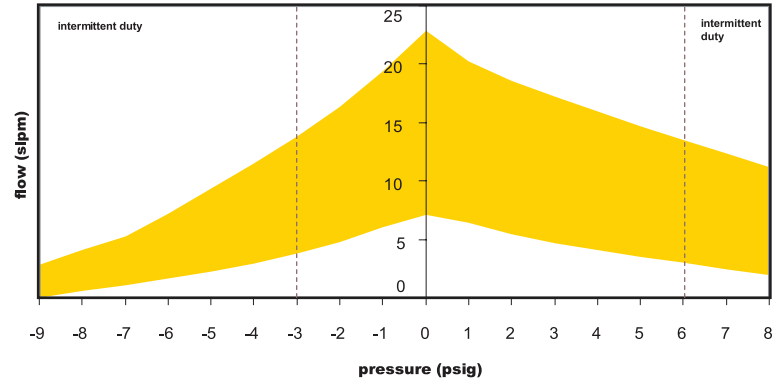
#### Pneumatic

<b>Head Configuration:</b>
Single
<b>Max Flow:</b>
12V: 24.2 lpm, 24V: 28.5 lpm
<b>Max Intermittent Pressure:</b>
12V: 20 psi (1380 mbar), 24V: 20.5 psi (1415 mbar)
<b>Max Continuous Pressure:</b>
12V & 24V: 2 psi (138 mbar)
<b>Max Intermittent Vacuum:</b>
12V: 21.8 in Hg (740 mbar) 24V: 24.3 in Hg (820 mbar)
<b>Max Continuous Vacuum:</b>
12V & 24V: 4.1 in Hg (138 mbar)

# T2-02

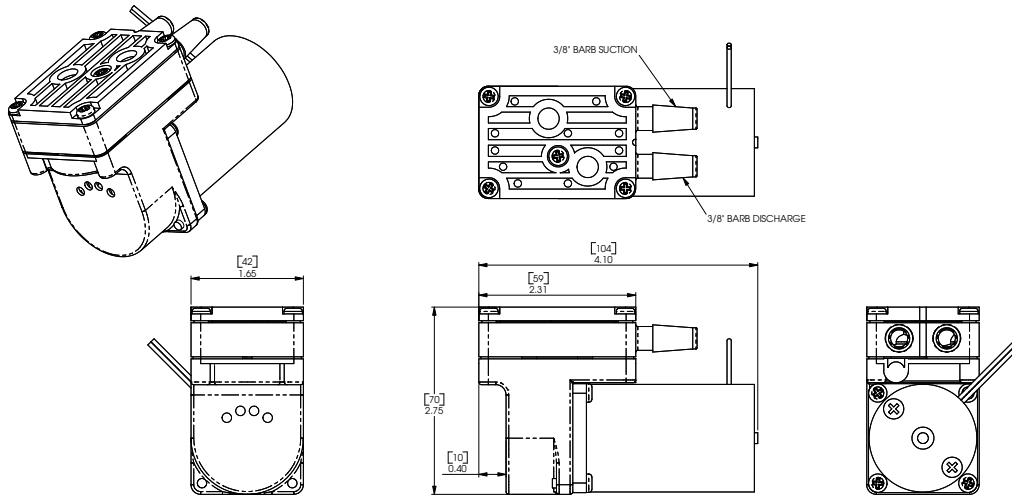
## High Capacity Pumps (air/gas)

### T20-02 Flow



NOTE: All performance data is typical based on standard conditions: 70°F and 14.7 psia

### Dimensions



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 Visit [www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)



# T2-01

Up to 66 LPM Free Flow



Twin Head

## High Capacity Pumps (air/gas)

The T2-01 high-performance pump, available in a single and twin head, features Parker's patented high-efficiency dynamic valve design and achieves remarkable performance and efficiency. With the most compact, lightweight package in its performance range, this pump is ideal for use in portable air and gas applications.

### Features

- **High Capacity:**

The T2-01 pumps are capable of flow rates greater than 32 lpm with the single head and up to 66 lpm with the twin head.

- **Motor Options:**

T2-01 pumps are available with DC brush and DC brushless motors with integral controllers.

- **Mounting Capabilities:**

The pump body is specially designed with durable mounting ears.

- **Optimized Configuration:**

Parker can configure the pump to meet specific requirements.

- **Additional Features:**

- Oil Free/Contaminant-Free Operation
- Pneumatic Termination: 3/8" Hose Barb
- Electrical Termination: Wire Leads

### Typical Applications

- Portable Aspirators
- Medical Instruments
- Fuel Cells
- Industrial Systems

## Performance Data

### Physical Properties

<b>Operating Environment:</b>	32 to 122°F (0 to 50°C)
<b>Media:</b>	Most non-condensing gases
<b>Humidity:</b>	5% -95% RH
<b>Wetted Material:</b>	EPDM
<b>Valves:</b>	Neoprene
<b>Pump Head:</b>	PPS, PTFE

### Electrical

<b>Motor Type (DC):</b>	Brush, Brushless
<b>Nominal Motor Voltages:</b>	12, 24 VDC
<b>Current Range:</b>	.5 A-5.75 A*
	*Dependent on motor type, voltage, pressure/vacuum and flow requirement
<b>Motor Control:</b>	2-wire (Analog or PWM) Brush Multi-wire (Analog or PWM) Brushless

### Pneumatic

<b>Head Configuration:</b>	Single, Twin
<b>Max Unrestricted Flow:</b>	66 LPM *Varies depending on pump configuration
<b>Pressure Range:</b>	0 - 20 PSI
<b>Vacuum Range:</b>	0 - 24 in Hg

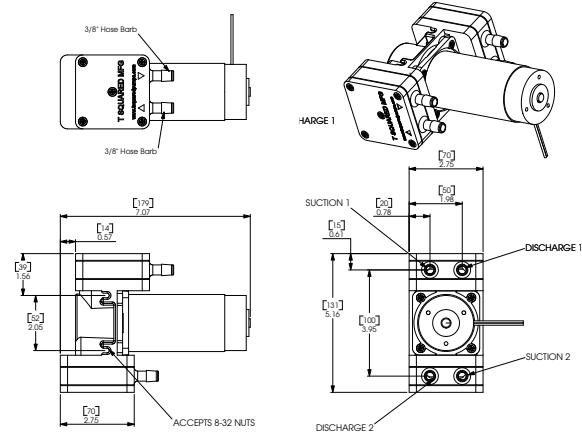
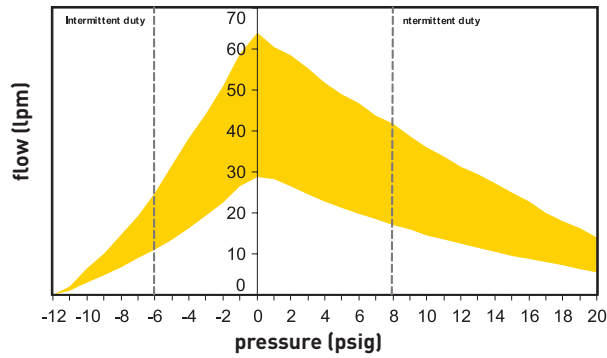
# T2-01

## High Capacity Pumps (air/gas)

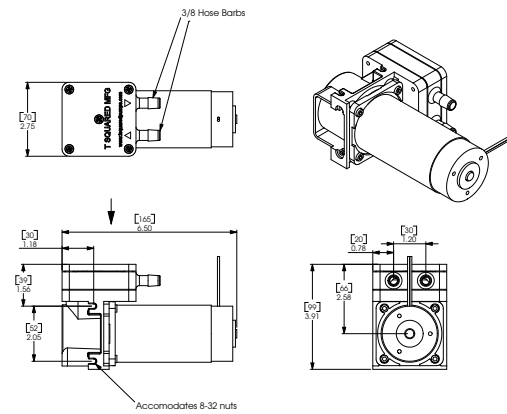
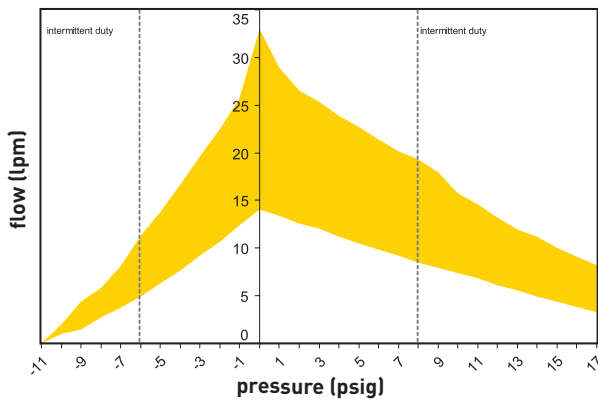
### Flow

### Dimensions

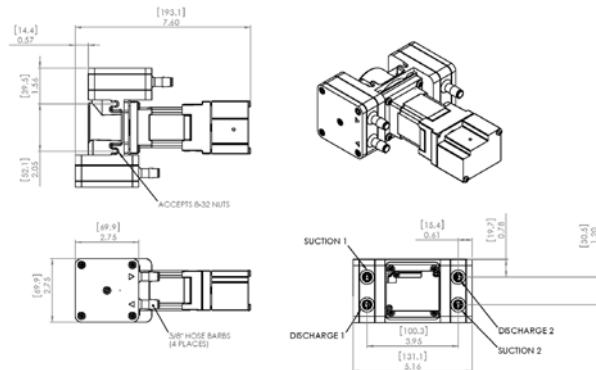
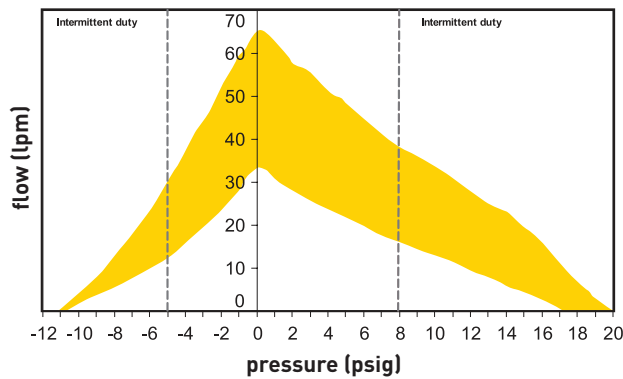
T2-01 TH Flow



T2-01 SH Flow



T2-01 TH Flow (BLDC)



ORDER ON-LINE

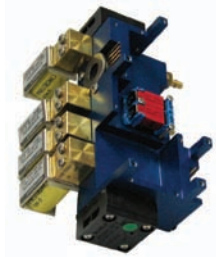
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# Value Added Application-Specific Solutions

## Gassing Control System



- Mixed gassing logic design includes VSO® proportional valves, X-Valve®, pressure switch, pressure sensors, and PCB interface

## Pneumatic Module



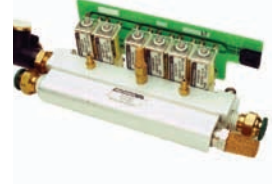
- Integrated valve manifold
- Compact design
- Single electrical connection
- Valves configured per specifications

## Vacuum Gas Control Module



- Tested to  $1 \times 10^7$  cc/sec/atm Helium
- Assembly tested on mass spectrometer

## 6 Position VSO® Proportional Pneumatic Manifold Assembly



- Quick connect fittings
- Circuit board with mass electrical termination

## Magnum Manifold Assembly



- Integrated circuit board with single connection
- Compact design
- Easily adaptable
- 2 way and 3 way designs

## 8 Position SRS Model Pneumatic Manifold



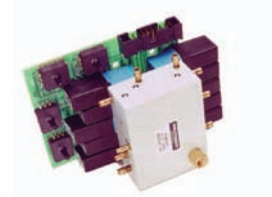
- Integrated pressure/vacuum sensors
- Mixed pneumatic logic design
- Ultem® manifold pressure/vacuum sensors

## 10 Position X-Valve® Pneumatic Manifold



- Mixed pneumatic logic design
- Ultra-miniature design with PCB for mass termination

## 10 Position SRS Model Pneumatic Manifold



- Integrated pressure/vacuum sensors
- Mixed pneumatic logic design
- Ultem® manifold pressure/vacuum sensors



## NOTES

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EPDM = Ethylene Propylene Diene Monomer, CR = Acrylonitrile Butadiene Styrene, PTFE = Polytetrafluoroethylene,  
PPS = Polyphenylene Sulfide  
AEDPM\* is an advanced proprietary elastomer developed by Parker to provide greater longevity than traditional diaphragm materials.

\*US Patent 7,401,543

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**PARKER-HANNIFIN CORP., PRECISION FLUIDICS TERMS AND CONDITIONS OF SALE, ORDER POLICIES & PRODUCT WARRANTY INFORMATION**

**1. APPLICABLE LAW:** This order shall be only subject to the terms and conditions set forth herein, notwithstanding any terms and conditions that may be contained in any order acknowledgment or other form of Buyer. Such terms and conditions of Buyer shall not bind the Seller unless accepted by it in writing whether or not they materially alter this order. This order shall be governed in all respects by the laws of the State of New Hampshire.

**2. TAXES:** Prices do not include Federal, State or local taxes, including without limitation, which taxes may at Seller's discretion be added to sales price or may be billed separately and which taxes will, in any event, be paid by Buyer unless Buyer provides Seller with a proper tax exemption certificate.

**3. TERMS OF PAYMENT:** Unless otherwise stated on Seller's invoices, terms of payment shall be Net 30 days from date of invoice. If at any time Seller in its sole discretion determines an alternative payment arrangement would be prudent, Seller may require Letter of Credit, Cash on Delivery, advance or other acceptable means of payment. If requirements of Seller are not met, Seller may cancel the order or any part thereof and receive reasonable cancellation fees.

**4. DELIVERY:** Seller shall not be liable for any delays in or failure of delivery due to acts of God or public authority, labor disturbances, accidents, fires, floods, extreme weather conditions, failure of any delays by carriers, shortages of material, delays of a supplier or any other cause beyond Seller's control. In no event shall the Seller be liable for consequential or special damages arising out of a delay in or failure of delivery. Buyer's requested delivery date or schedule shall be approximate and subject to Seller's acceptance.

**5. TERMINATION OF CONTRACT:** Orders accepted by the Seller may be cancelled by Buyer only with the consent of Seller and upon payment of reasonable cancellation charges, determined by Seller in its sole discretion. Seller shall have the right without penalty or payment to cancel any order accepted or to refuse or delay the shipment thereof if (1) Buyer fails to make promptly any payment due, or to meet any other reasonable requirements established by Seller, (2) Buyer's act or omission to act delays Seller's performance, or (3) Buyer's credit becomes impaired, in the Seller's sole judgement. In such event, Seller shall be entitled to receive reimbursement for reasonable and proper cancellation charges.

**6. CHANGES IN SPECIFICATIONS OR DESIGN:** If Buyer requests changes in specifications or designs relating to any goods, delivery schedules shall be revised if necessary, and an equitable adjustment upward or downward shall be made in price if warranted.

**7. FREIGHT:** Carriers will be selected by the Seller unless the Buyer instructs otherwise in writing. All shipments will be F. O. B. Seller's plant. Standard freight charges for equipment repaired under warranty will be paid by Parker Precision Fluidics. Buyers request for alternatives means will be charged additional freight as required.

**8. CONSEQUENTIAL DAMAGES:** In no event shall Seller be liable for consequential or special damages arising out of delay in or failure of delivery, defects in material, or workmanship or arising out of a breach by Seller of any other term or obligation of the Seller under this contract.

**9. GOVERNMENT CONTRACTS:** If the products to be furnished under this contract are to be used in the performance of a United States Government Contract or sub-contract, the government contract number, priority rating and a statement to that effect shall appear on the Buyer's purchase order. If the Buyer's purchase order includes all of said information and if said order is accepted in writing by an authorized officer of Seller with knowledge of said information, then those clauses of the applicable government procurement regulations which are mandatorily required by Federal Statute or regulation to be included in this contract shall be incorporated herein by reference; in all other events said clauses shall not be incorporated herein by reference.

**10. PROPRIETARY INFORMATION:** Buyer represents that it has adopted reasonable procedures to protect proprietary information as defined hereafter including binding agreements with employees and consultants to prevent unauthorized publication, disclosure, or use of such information during or after the term of their employment by or services for Buyer. Buyer shall not use proprietary information except as expressly permitted hereunder, shall not disclose proprietary information of Seller to any third party and shall not transmit any documents or copies thereof containing proprietary information to any third party except as may be authorized in writing by Seller.

**11. PATENT INDEMNITY:** Seller shall have no liability for patent infringement unless the goods furnished hereunder, in an of themselves, constitute the infringement. If they do, and Seller is notified of the class of infringement within ten days after such claim is received by the Buyer and is permitted to settle or defend such claim, Seller will indemnify the Buyer against reasonable expense of defending suit and against any judgement or settlement to which Seller agrees. However, such indemnity will be limited to an amount not exceeding the price paid by Buyer to Seller for the infringing goods. If an injunction is issued against the further use of the goods, Seller will have the option of either procuring for the Buyer the right to use the goods, replacing them with non-infringing goods, modify them so that they become non-infringing, or refunding the purchase price. The foregoing constitutes Seller's entire warranty and liability as to patents. If the goods furnished hereunder are in accordance with a design furnished by the Buyer, the Buyer will defend and hold harmless Seller from all cost, expenses and judgements on accounts of any claim of infringement of any patent.

**12. WARRANTIES:** A. Equipment: Seller warrants that all equipment manufactured by it shall be free from defects in material or workmanship under normal use for a period of one (1) year from date of shipment to Buyer and upon examination of Seller determines to its satisfaction that such equipment is defective in material or workmanship and such defect was not caused by accident, misuse, neglect, alteration, improper adjustment, improper repair, improper application, or improper testing. Seller shall at its option repair or replace the equipment, shipment to Buyer prepaid. Seller does not recommend it's products for use in life support systems.

B. The foregoing are in lieu of all representations, warranties and covenants, express or implied, with respect to the products and any defects therein of any nature whatever, including without limitation, warranties of merchantability and fitness for a particular purpose. Seller's sole and exclusive liability, and Buyer's sole and exclusive remedy, for any nonconformity or defect in the products in tort (including negligence), contract, or otherwise, shall be as set forth in Section 12A.

**Pricing and Lead Time**

- Standard Prices and lead times are as indicated on the current published Standard Price List and Discount Schedule.
- Non-standard pricing (other than that contained in the published Price List) must be approved by Parker Precision Fluidics and a formal quotation must be submitted to the customer.
- Quantity discounts for similar product are as noted on the Standard Price List and Discount Schedule.
- All shipments are FCA factory (payable in US dollars).
- The Standard Price List and Discount Schedule are subject to change.
- All price quotations are valid for a period of 90 days.

**Payment and Credit Terms**

- Payment terms are 1% 10, 25 net 30 as noted below:
  - For invoices dated between the 1st and 15th, payments must be received by the 25th of the month.
  - For invoices dated between the 16th and 31st, payments must be received by the 10th of the following month.
- The above payment terms and discount are available to all customers with established credit. Otherwise, the following special terms exist:
  - COD for non-established domestic customers for orders greater than \$1,000. Cash in Advance for non-established foreign customers for orders greater than \$1,000.
  - Standard payment terms will be established upon corporate credit approval.
  - Credit card sales will be accepted from customers with established credit.

**Order Policies**

- A hard copy Purchase Order confirmation must be provided for all orders. This copy may be sent via fax or Internet e-mail provided it is signed by the authorized buyer.
- Minimum order/shipment is \$250.00 Net. All sales transactions totaling \$2,500 or less will be processed via credit card only.
- Distributor/Contract Mfg. Orders: All distributors and contract manufacturers are required to report end customer information at the time of order. Orders will not be processed by Parker Precision Fluidics until such information is provided.
- Blanket Orders: Orders consisting of multiple releases must be completed within a twelve (12) month (A.R.O.) period unless other terms have been agreed upon prior to acceptance of the order.
- Blanket Orders are subject to back billing (add billing) as indicated below:**
  - Standard Product: If at the end of the contract period the full quantity has not been released and shipped, the entire order will be re-priced at the applicable discount for quantity shipped.
  - Custom Product: If at the end of the contract period the full quantity has not been released and shipped, a charge will be assessed to cover the cost of any unique material plus an adjustment of discount on the entire order.
- Order Reschedules:**
  - Standard Product: A 20% reschedule fee will be incurred unless a formal change order is received at least thirty (30) days prior to scheduled shipment.
  - Custom Product: A 20% reschedule fee will be incurred unless a formal change order is received at least sixty (60) days prior to scheduled shipment due to unique component lead time.
- Order Expedites:**
  - Customers requesting an expedited delivery of two (2) weeks or less of the quoted standard lead time will be subject to a charge equal to 20% of the amount being expedited.
- Order Cancellations:**
  - Standard Product - A 20% cancellation fee will be incurred unless a formal change order is received at least thirty (30) days prior to scheduled shipment.
  - Custom Product - Cancellations of custom product are subject to a 20% cancellation fee plus the cost of all work in process and the cost of any material unique to that order

**Product Returns**

- Standard Product: - All returns of standard product are subject to prior approval from Parker Precision Fluidics and will incur a restocking charge of 20%. Credit will be issued based upon original invoice value. No material will be accepted for return without prior authorization from Parker Precision Fluidics. The Return Material Authorization (RMA) number should appear on all packages and accompanying paperwork.
- Custom Product: Return of custom product cannot be accepted.

**Warranties**

- Parker Precision Fluidics warrants its products against defective materials and workmanship under normal use for a period of one (1) year from the date of shipment to our customer. This warranty does not apply to any product that has been subjected to misuse, accident, improper installation, improper application, or improper operation, nor does it apply to any product that has been repaired or altered by other than an authorized factory representative. There are no warranties that extend beyond those herein specifically given.
- Miniature Diaphragm Pumps - Seller warrants to buyer that the products will be free, under normal use and maintenance, from defects in material and workmanship for a period of twelve (12) months from the manufacture date as noted by date code, serial number, or rated hours of operation which ever occurs first, unless otherwise stated.
- Warranty Repair: All products will be repaired at the factory, replaced at no charge throughout the warranty period, or a credit will be issued to reconcile the account. The balance of the warranty will remain in effect and no other warranty will be issued.
- Warranty items costing less than \$75 will no longer be repaired - credit will be issued upon receipt of item.
- Non-Warranty Repair Charges: Non-warranty repairs are not available. For a fee of \$500, a standard analysis which includes visual inspection, determination of cause, and failure analysis report will be performed. Additional charges may be imposed if the use of an outside lab is necessary.
- IOTA One Solenoid Valve Controllers and Picospritzer III Pressure Injection Systems manufactured more than five (5) years prior to the request date will not be accepted for repair. For a fee of \$250.00, an evaluation will be performed on non-warranty units less than five (5) years old and a quote will be prepared detailing the cost of all the repairs.

**Return Materials Authorizations**

- Hazardous Material: All products returned must be free of hazardous materials. Return of any product exposed to bio hazardous material will not be accepted.
  - You must obtain a Return Material Authorization (RMA) number from Parker Precision Fluidics in order that we may process your returned equipment. Material will not be accepted unless an RMA number is assigned and is clearly marked on all incoming packages and associated paperwork. RMA numbers expire 60 days after date of issue. Items returned without authorization or after 60 days of issuance will be returned to the customer freight collect.
  - This policy has been set for our mutual protection in that it greatly reduces the possibility of misplaced returns. Please call our Customer Service Department at 1-800-525-2857 to obtain an RMA number. **Be prepared to provide the following information when calling:**
    - Customer Name, Address & Phone Number
    - Contact Name
    - Ship-To and Bill-To Address
    - Reason for Return & Failure Symptoms if Applicable
    - Part Number, Quantity & Date Code
- Purchase Order Numbers (\*Note: A Purchase Order Number is necessary for products returned under warranty. P.O. number to be used as tracking Vehicle only.)  
Precision Fluidics Division will contact the customer with date of return shipment.

**Shipping:** Products that are shipped to the factory for Warranty repair will be shipped at the customer's expense and will be returned to the Customer at no charge via Precision Fluidics Division's standard shipping method. Products that are shipped to the factory on a freight collect basis will not be accepted. Customers may specify preferred method of shipment. Product will then be shipped back to the customer on a freight collect basis.

PARKER-HANNIFIN CORP., PRECISION FLUIDICS DIVISION 8/10/2009  
Standard terms and conditions are supplemented by this policy statement,  
which each apply to all orders from the division.





## 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.**

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

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Parker Hannifin Corporation  
**Precision Fluidics Division**  
26 Clinton Dr., Unit 103  
Hollis, NH 03049  
phone 603 595 1500  
fax 603 595 8080  
[www.parker.com/precisionfluidics](http://www.parker.com/precisionfluidics)