

BTX-Brush

Miniature Diaphragm Pump



ENGINEERING YOUR SUCCESS.

Innovative solutions for health care success



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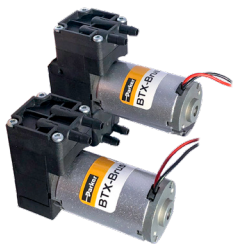
When you partner with the global leader in motion and control technologies, expect to move your business and the world forward. From miniature solenoid valves to highly integrated automation systems, our innovations are critical to life-saving medical devices and scientific instruments used for drug 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.



www.parker.com/precisionfluidics 1 603 595-1500

BTX-Brush Miniature Diaphragm Pump

Up to 6 LPM Free Flow



Parker's BTX-Brush pump product line combines best in class diaphragm pump design, ultra-low vibration, and advanced manufacturing techniques to bring a next-generation solution to next-generation device needs. The BTX-Brush Pump is designed to provide high performance with superior quality and reliability. The options for Single Head, Dual Head, Pressure only, Vacuum only, and Pressure/Vacuum configurations offer a wide range of solutions with the support of Parker's Global Teams.

Applications

- Point of Care Diagnostics
- Gas Generator
- Compression Therapy
- Water Quality Monitoring
- Patient Monitoring

Features

- Low noise dual ball bearing motor design
- Optimized pump balancing for ultra-low vibration
- Isolation mounts available for simple mounting
- RoHS, REACH, and CE compliant



Product Specifications

Physical Properties

Operating Environment¹:

41 to 122°F (5 to 50°C)

Media:

Air, Nitrogen, Oxygen, and other non-reacting gases

Humidity:

0 - 80% Relative Humidity non-condensing

Pump Assembly Rated Life³:

Dual Ball Bearing Brush Motor
Up to 3,000 Hours

For life up to 15,000, see BTX-Connect datasheet

Compact BLDC Single Head

Weight

Single Head
6.8 oz (193 g)

Dual Head
8 oz (226 g)

Pneumatic

Maximum Unrestricted Flow:

Single Head: Up to 5.8 LPM

Dual Head: Up to 6.1 LPM

Pressure Range:

Continuous Duty:
Up to 20 PSIG (1.4 Bar)

Vacuum Range:

Continuous Duty:
Up to -21 inHg (-533 mmHg)

Filtration:

40 microns - recommended

Electrical

Motor Type (DC):

Dual Ball Bearing, Iron Core Brush

Nominal Motor Voltages⁴:

6, 12, or 24 Vdc

Electrical Termination:

22 AWG Insulated Wire Leads
10 Inch Length (254 mm)

Wetted Materials

Diaphragm:

Long Life - Advanced EPDM

Valves:

EPDM

Pump Head:

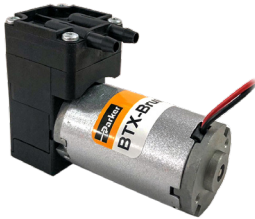
PBT

Other materials available upon request

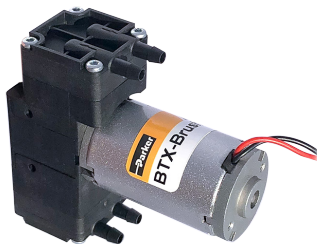
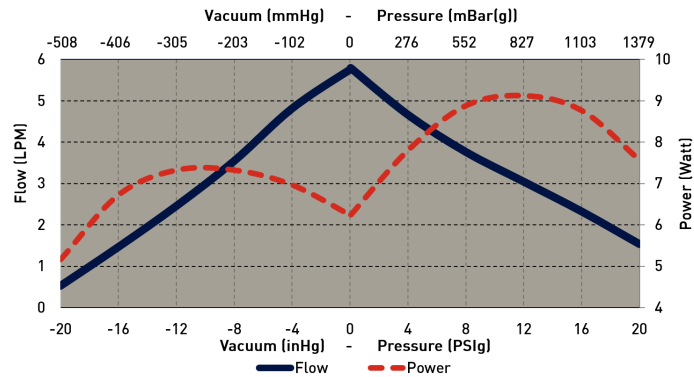
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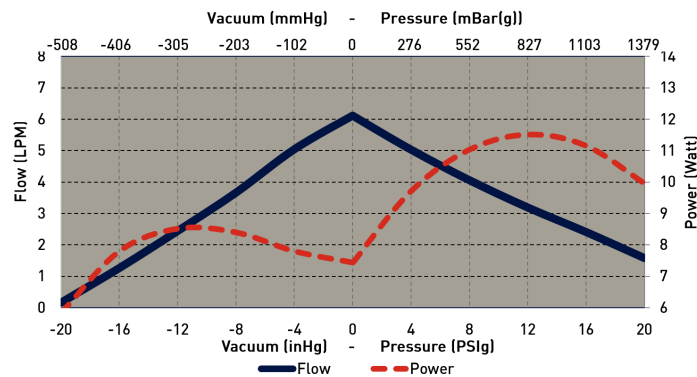
BTX-Brush Miniature Diaphragm Pump Typical Flow Curve



**BTX-Brush Single Head
Typical Performance**



**BTX-Brush Dual Head
Typical Performance**



- Single head curve shows maximum flow capability with a 0.090" pump offset, which are vacuum or pressure only Pumps capable of alternating pressure and vacuum are available with 0.050" pump offset or less. See ordering table below for a list of available standard options
- Dual head performance shown with pump heads connected in parallel with 0.050" pump offset.
- Detailed performance specification sheets are available for each part number
- Contact Parker Precision Fluidics Applications Engineering team for other performance options

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from a Parker or its subsidiaries or authorized distributor.

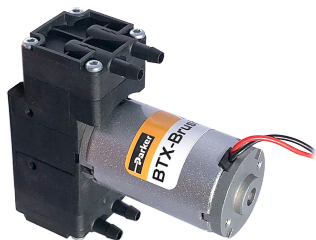

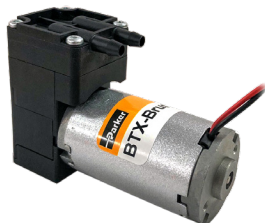


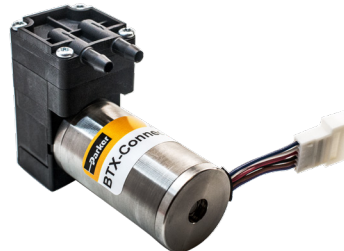
The above graphs represent an example of performance for the pump series handling air at 800 feet (244 m) above sea level at 75 degree F (24 C). Performance will vary depending on barometric pressure and media temperature. A variety of configurations can be accommodated to meet application requirements.

Curves are representative of standard pump configurations. Pump configurations could be customized for higher or lower flows depending on specific customer requirements.

Please contact Parker Precision Fluidics Applications Engineering for other considerations.



BTX-Brush Miniature Diaphragm Pump BTX Family Selection

BTX-Brush		BTX-Connect	
BTX-Brush Dual Head Dual Ball Bearing Brush Motor B2B		BTX-Connect Dual Head Compact BLDC Motor B2C	
			
BTX-Brush Single Head Dual Ball Bearing Brush Motor B1B		BTX-Connect Dual Head Slotless BLDC Motor B2S and B2H	
			
BTX-Connect Single Head Compact BLDC Motor B1C		BTX-Connect Single Head Slotless BLDC Motor B1S and B1H	
			

Efficiency	Good	Better	Best
Flow Rate	Up to 6.1 L/min	Up to 9.5 L/min	Up to 11L/Min
Life	Up to 3,000 Hours	>15, 000 Hours	>15, 000 Hours
Control	On/Off, PWM	On/Off, Digital, PWM, 0-5V	On/Off, Digital, PWM, 0-5V
Protection	-	Reverse Polarity, Temp, Current	Reverse Polarity, Temp, Current
Cost	Best	Better	Good

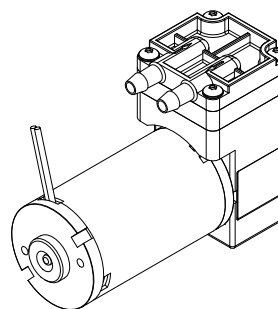
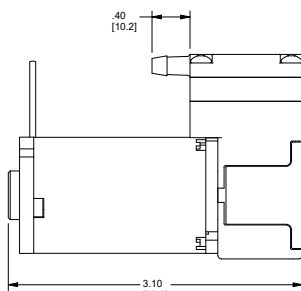
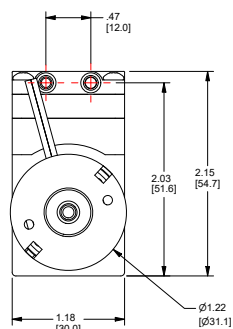
Mounting Guidelines:

- Bracket options available for mounting consideration (See *EZ Mount catalog pages*).
- Hole in the center of the bottom housing is for manufacturing only—not to be used for mounting.
- Mounting holes are drilled for #6-20 self-tapping screws with 1/4" (6 mm) thread engagement torque to 4 in-lbs (0.45 N-m).

Port Connections:

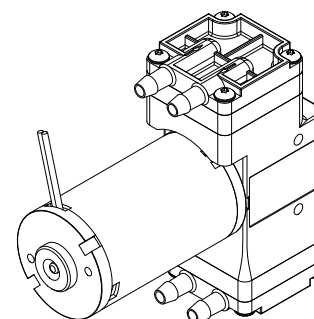
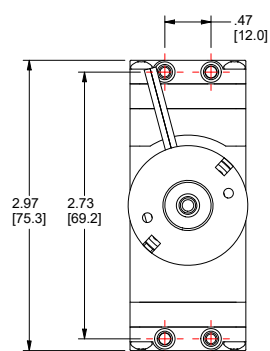
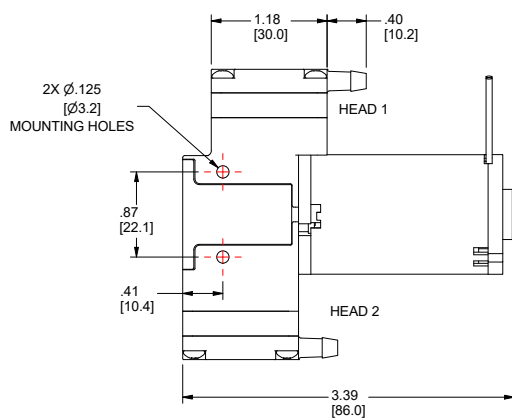
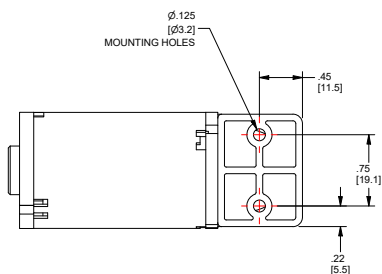
- Barbs are sized for 1/8" (3 mm) ID tubing, 70-80 durometer recommended.
- Flow direction is marked on the pump head with arrows.

BTX-Brush Miniature Diaphragm Pump Mechanical Drawings



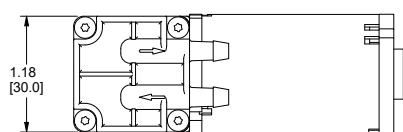
UNITS
IN [mm]

NOTES:
MOUNTING HOLES ARE DRILLED FOR
#6-20 SELF-TAPPING SCREWS WITH
1/4" THREAD ENGAGEMENT.
[torque to 4 in-lbs.]



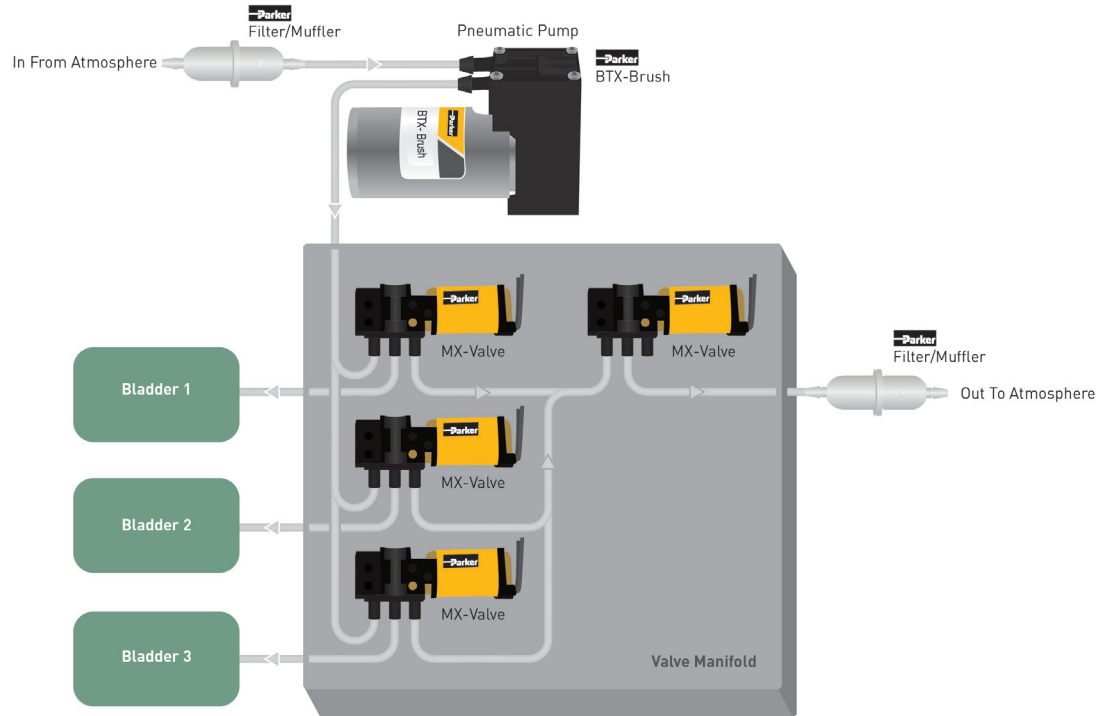
UNITS
IN [mm]

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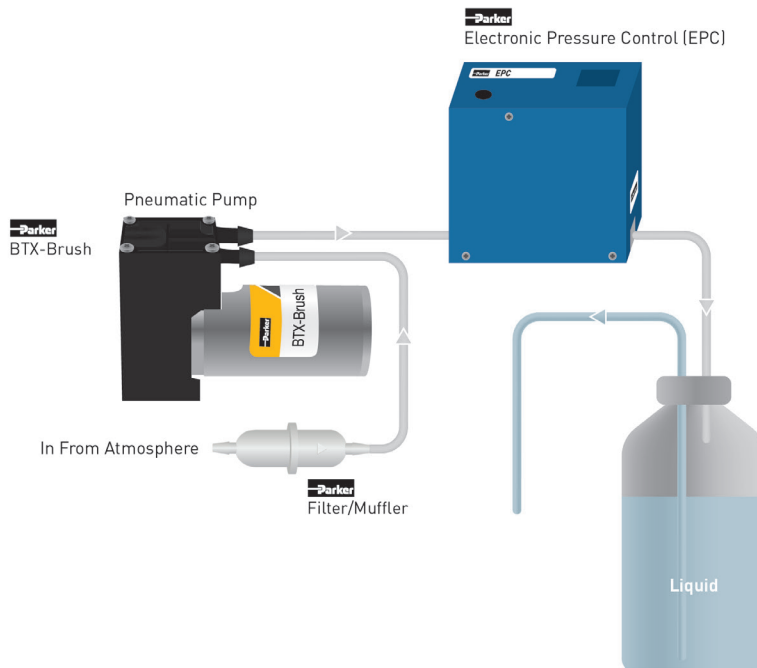


BTX-Brush Miniature Diaphragm Pump Typical Flow Diagram

Compression Therapy Prevention (DVT)



Air-Over-Liquid Flow Control



BTX-Brush Miniature Diaphragm Pump Application Notes

Chemical Compatibility Chart*

BTX-Connect		
Chemical Compatibility of Wetted Path Materials		
Chemical	AEPDM	PBT
Air	1	1
Ozone (1000 ppm)	1	1
Oxygen	1	1
Ethylene (Ethene)	1	1
Methane	4	2
Nitrogen	1	1
Carbon Dioxide	2	1
Acetone (Vapor/Cleaning)	1	1(5%), 3(100%)

Compatibility Legend

1. EXCELLENT
Minimal or no effect
2. GOOD
Possible swelling and/or loss of physical properties
3. LIMITED
Moderate or severe swelling and loss of physical properties
4. NOT RECOMMENDED
Severe effect and should not be considered

Note: Consult factory for other gases.

*The above is an Abbreviated Chemical Compatibility Chart. Please consult factory for details.

Pulse Width Modulation (PWM)

Pulse-width modulation is a commonly used technique for controlling DC motors.

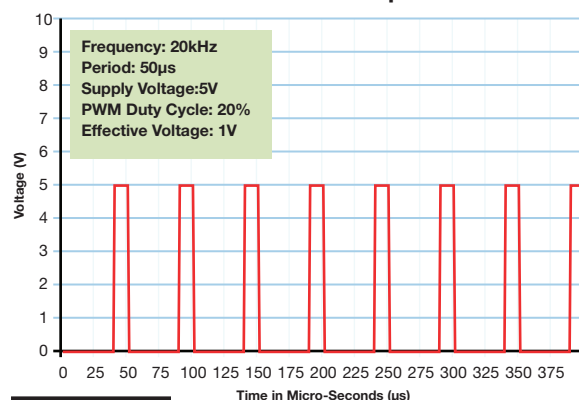
The average value of the voltage fed to the motor is controlled by turning a switch between the voltage supply and the motor on-and-off at a fast pace. The longer the switch is on compared to the off time, the higher the power supplied to the motor.

The PWM switching frequency varies for different types of devices, and is selected based on how it affects the device. For example, some applications require a faster switching frequency to prevent audible noise or electrical noise.

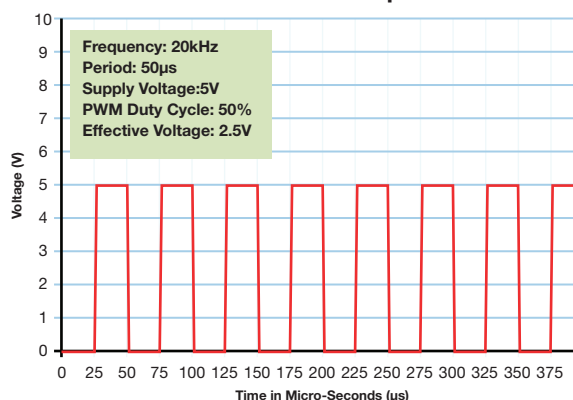
The term duty cycle describes the ratio of on-time to the period (one complete on-and-off cycle). Duty cycle is normally expressed as a percentage of on-time, 100% being full-power and 50% being half-power.

The advantage of PWM is the reduction of power-loss due to switching versus other control methods. Parker Hannifin recommends controlling the pump using 15kHz - 20 kHz frequency range.

20% PWM Example



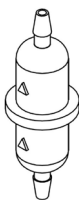
50% PWM Example



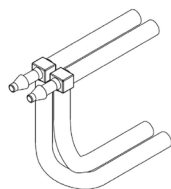
BTX-Brush Miniature Diaphragm Pump Accessories Information

A Filter-Muffler is always recommended in the air inlet or outlet to reduce noise and risk of debris that may affect pump performance.

Parker recommends 40 micron or better filtration to be used with this pump series.



P/N: 00492-15
(10 micron Filter)

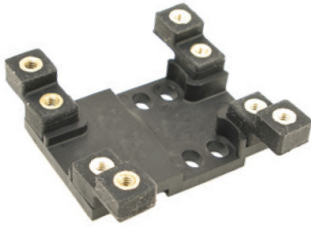
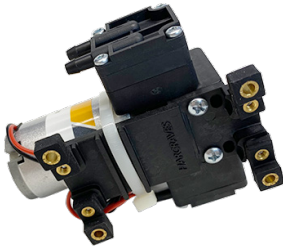


P/N: 01881-KT
(Parallel Tubing)



BTX-Brush Miniature Diaphragm Pump

EZ Mount available



EZ Mount provides ease of installation and effective control of vibration transfer. EZ Mount was designed to mount easily to the Precision Fluidic BTX Family of diaphragm pumps.

Features

- Isolation feet on the EZ mount can be rotated in any one of three ninety-degree planes and is designed for top-down or bottom-up mounting providing simple installation.
- EZ Mount was designed to minimize weight added to the pump assembly. Approximate weight is: 0.63 oz (18 g).
- Effectively absorbs vibration to minimize most vibration-induced noise and vibration transfer into an instrument.
- Designed to keep height and size to a minimum.
- All necessary hardware to attach to a BTX pump is included.

Physical Properties

Operating Environment:

41 - 158°F (5 - 70°C)

Humidity:

0 - 95% Relative Humidity

Base Plate:

Noryl GTX830

Feet:

Silicone

Feet Insert:

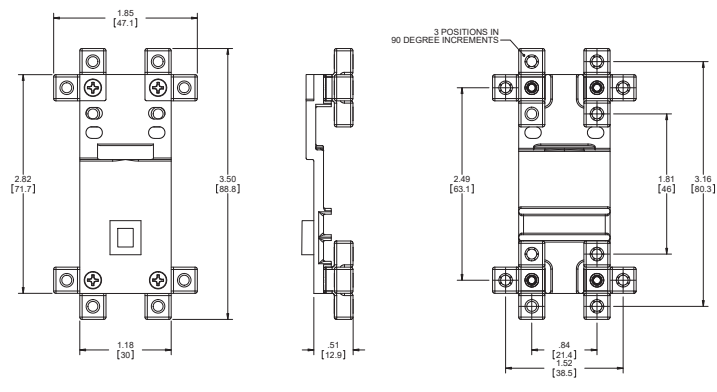
Brass

Hardware:

Zinc-Plated Steel

- Isolation Feet are available in either threaded or thru-hole clearance for standard #4-40 or #6-32 (M3 for clearance hole only).

Style B Dimensions





EZ Mount for BTX-Brush Single Head (B1B)

Part Number	Style	Feet Type
00329-10-A45S	B	#4-40 Threaded
00329-10-B45S	B	#4 Clearance
00329-10-D45S	B	#6-32 Threaded
00329-10-C45S	B	#6 / M3 Clearance

EZ-Mount for BTX-Brush Dual Head (B2B)

Part Number	Style	Feet Type
00332-10-A45S	B	#4-40 Threaded
00332-10-B45S	B	#4 Clearance
00332-10-D45S	B	#6-32 Threaded
00332-10-C45S	B	#6 / M3 Clearance

BTX-Brush Miniature Diaphragm Pump Ordering Information

Configuration	Voltage	Part Number	-16 inHg -406 mmHg	-12 inHg -305 mmHg	-8 inHg -203 mmHg	-4 inHg -102 mmHg	0 Free Flow	4 PSIg 276 mbar	8 PSIg 552 mbar	12 PSIg 827 mbar	16 PSIg 1103 mbar
B1B BTX-Brush Single Head 	6	B1B-050A06AN-00	0.9	1.5	2.2	2.9	3.7	3.1	2.6	2.2	1.7
	12	B1B-050A12AN-00	0.9	1.5	2.2	2.9	3.6	3.0	2.6	2.2	1.7
	24	B1B-050A24AN-00	0.8	1.4	2.1	2.8	3.6	3.0	2.5	2.1	1.6
	6	B1B-090P06AN-00	-	-	-	-	5.9	4.6	3.7	3.0	2.3
	12	B1B-090P12AN-00	-	-	-	-	5.9	4.6	3.7	3.0	2.3
	24	B1B-090P24AN-00	-	-	-	-	5.7	4.5	3.6	2.9	2.2
	6	B1B-090V06AN-00	1.5	2.5	3.6	4.8	5.7	-	-	-	-
	12	B1B-090V12AN-00	1.5	2.5	3.6	4.8	5.7	-	-	-	-
	24	B1B-090V24AN-00	1.4	2.4	3.5	4.7	5.6	-	-	-	-
B2B BTX-Brush Dual Head 	12	B2B-050A12AN-00	1.2	2.4	3.6	5.0	6.1	5.0	4.0	3.2	2.4

BTX-Brush Miniature Diaphragm Pump Ordering Information

Accessories Ordering Table

Part No.	Description	Comments
00492-15	Filter-Muffler	Filter to 10 microns. Not included with pump
01881-KT	Tubing Assembly	As needed for parallel flow. Not included with pump

BTX Part Number Description (see Appendix A comment 9)

<u>B</u>	<u>1</u>	<u>B</u>	-	<u>090</u>	<u>P</u>	<u>12</u>	<u>A</u>	<u>N</u>	-	<u>00</u>
Model	Pump Heads	Motor Type		Pump Offset	Diaphragm Configuration	Voltage	Material	Tubing		Special
B - BTX	1 - Single Head	B - Brush Motor, Dual Ball Bearing		050 - 0.050" Offset	P - Pressure Only	6 - 6 Vdc	A - 80D AEPDM Diaphragm & low noise Valves	N - None		00 - Factory Standard
	2 - Dual Head			090 - 0.090" Offset	V - Vacuum Only	12 - 12 Vdc				
					A - Universal Pressure & Vacuum (High Compression Chamber)					

BTX-Brush Miniature Diaphragm Pump Ordering Information

Please refer to sizing and selection chart for identifying which one will fit your application

Please click on the Order On-line button below (or go to www.parker.com/precisionfluidics/BTX-Brush) to configure your BTX-Brush Pump.

Serviceable – PPF products are designed for use through the rated life and Parker does not sell replacement parts, nor is it recommended to service these in the field

Note: In addition to Parker's innovative and flexible pump designs, we offer applications engineering expertise to our customers in order to configure and recommend the optimal pump for the application. Contact Parker Applications Engineering to discuss and configure alternate pump configurations to meet your specific application requirements. Providing information on the following requirements will assist us in developing an optimal solution for your application:

- Noise
- Operating Pressure / Vacuum
- Power Consumption
- Life Requirement
- Size
- Motor Control
- Media
- Voltage



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

Appendix A

All performance data is typical based on standard conditions: 70°F and 14.7 psia (21°C and 1 bar).

1. Duty Dependent. For operation above 122°F (50°C) consult factory
2. Noise is dependent on the configuration and operation of the pump in the application. Parker has the ability to tailor the pump configuration when noise is a critical criterion in the effort to meet the performance requirements of the application. Noise level is tested to Parker protocol P-105.
3. Life rating can vary depending on application and operating conditions.
4. Custom motor options available. Custom motors may require a significant application potential. The standard motors can be configured with a special winding to meet a particular operation point at a specified voltage
5. Current range is dependent on motor type, voltage, pressure/vacuum and flow requirement. Lower levels possible depending on application.
6. Inductance is an indicator of induced voltage with change in current and it is a key parameter to enable customers' low energy intrinsic safety systems
7. Maximum intermittent pressure/vacuum data is a pump capability guideline for applications that go beyond the maximum continuous levels for short periods of time. Please consult customer specific requirements with the factory or Applications Engineering.
8. Pump efficiency is a measure of the flow rate generated per unit of power consumed. Efficiency may change dependent on application and operating condition at free flow.
9. Part number description for reference only, not all configurations are available or configurable. Contact Parker Precision Fluidics Applications Engineering team for other performance options.

BTX-Brush Miniature Diaphragm Pump

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

Below are some common specifications that are helpful to have on hand to accelerate your product selection:

- Gas Type
- Maximum Flow Rate
- Inlet and Outlet Pressures
- Operating Temperature
- Standard Reference Conditions
- Process Connection Size and Type
- Set Point Signal
- Digital Communication Protocol Preferences

For more information call +1 603 595 1500 or email ppfinfo@parker.com

Visit www.parker.com/precisionfluidics

Recommendations on application design and material selection are based on available technical data and are offered as suggestions only. Each user should conduct their own tests to determine the suitability for their own use. Parker offers no express or implied warranties concerning the form, fit, or function of a product in any application.

