

BTX-Connect

Miniature Diaphragm Pump



ENGINEERING YOUR SUCCESS.

BTX-Connect Miniature Diaphragm Pump

Up to 11 LPM Free Flow



Parker's BTX-Connect pump product line combines best-in-class diaphragm pump design, innovative "connected" brushless motor technology, ultra-low vibration, and advanced manufacturing techniques to bring a next generation solution to next generation device needs. The BTX-Connect pump is designed to provide high performance with superior quality and reliability. The options for Motor Control, 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 team.

Applications

- Point of Care Diagnostics
- Negative Pressure Wound Therapy
- Compression Therapy
- Medical Simulation
- Scent Dispersion

Features

- "Connected" brushless motor design with digital communication control and monitoring available
- Fail-safe design with over-current, over-voltage, and over-temperature shut down
- Optimized pump balancing for ultra-low vibration
- RoHS, REACH, and CE compliant



Product Specifications

Physical Properties

Operating Environment¹:

41 to 122°F (5 to 50°C)

Storage Environment:

-4 to 212°F (-20 to 100°C)

Media:

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

Humidity:

0 - 80% Relative Humidity
Non-condensing

Noise Level²:

As low as 45 dB @ 12 in (30 cm)
Muffler recommended for additional noise reduction (see accessories)

Pump Assembly Rated Life³:

Brushless Motor up to 15,000 Hours

Weight:

Compact BLDC Single Head 4.4 oz (125 g)
Compact BLDC Dual Head 5.8 oz (165 g)
Slotless BLDC Single Head 7.4 oz (209 g)
Slotless BLDC Dual Head 8.4 oz (240 g)

Wetted Materials

Diaphragm:

Long Life - Advanced EPDM

Valves:

EPDM, Advanced EPDM

Pump Head:

PBT

Other materials available upon request

Electrical

Motor Type (DC):

Brushless Slotted, Brushless Slotless

Nominal Motor Voltages⁴:

12 or 24 VDC

Electrical Termination:

Mating Connector: JST PAP-06V-S

Pin 1: Tachometer Speed (Blue)
Pin 2: PWM or 0-5V Input (White)
Pin 3: +DC Voltage Input (Red)
Pin 4: -Ground (Black)
Pin 5: Digital UART Rx (Brown)
Pin 6: Digital UART Tx (Purple)

Pneumatic

Maximum Unrestricted Flow:

Single Head: Up to 6 LPM
Dual Head: Up to 11 LPM

Pressure Range:

Continuous Duty:
Up to 15 PSIG (1 Bar)

Vacuum Range:

Continuous Duty:
Up to -22 inHg (-558 mmHg)

Filtration:

40 microns - recommended

Connect Features

Speed Control Options:

On/Off Control, Factory Set Speed
PWM
0-5V Analog
Serial UART

On/Off only, PWM input, and 0-5 VDC are factory set, see ordering table.

Standard on/off configuration only requires DC power and Ground

Current Limit Shut Down:

Compact BLDC 12V - 1 Amp
Compact BLDC 24V - 0.5 Amp
Slotless BLDC 12V - 2 Amp
Slotless BLDC 24V - 1 Amp

Temperature Limit Shut Down:

Compact BLDC: 90°C
Slotless BLDC: 90°C
Time before shut down: <1 second

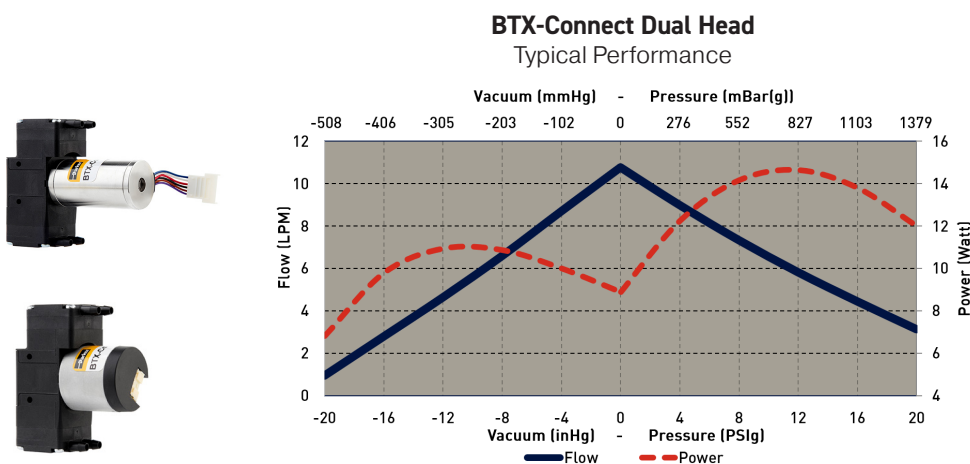
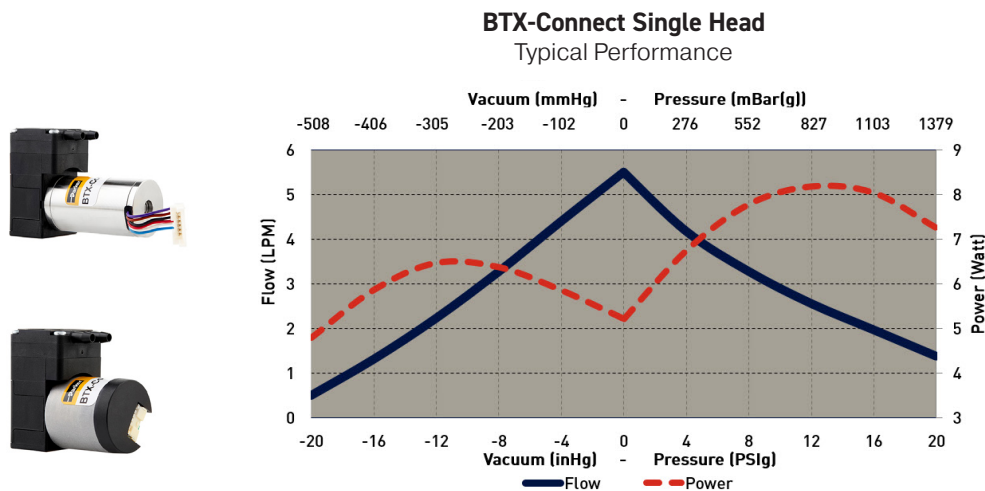
Temp and current limits are factory adjustable

UART Reported Values:

Pump Speed: 1 RPM Resolution, <60 RPM reported as 0
Motor Temperature: 1°C Resolution, Max = 100°C, Accuracy= +/- 5°C
Hysteresis = 5°C
Motor Current: 1mA Resolution, Accuracy= +/- 50mA or 5% whichever is higher



BTX-Connect Miniature Diaphragm Pump Typical Flow Curve



- Dual head performance shown with B2H configuration and pump heads connected in parallel
- 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
- Detailed performance specification sheets are available for each part number

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 Parker, its subsidiaries, and authorized distributors.

The above graphs represent an example of performance for the pump series handling air at 800 feet (244 m) above sea level at 75°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-Connect Miniature Diaphragm Pump Sizing and Selection



BTX-Connect Single Head
Compact BLDC Motor

B1C



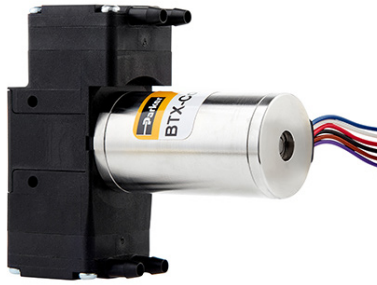
BTX-Connect Single Head
Slotless BLDC Motor

B1S



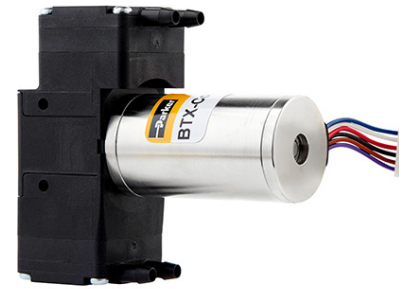
BTX-Connect Dual Head
Compact BLDC Motor

B2C



BTX-Connect Dual Head
Slotless BLDC Motor

B2S



BTX-Connect Dual Head
High Performance Slotless
BLDC Motor

B2H

Efficiency	Better	Best	Best
Flow Rate	Good	Better	Best
Control	On/Off, Digital, PWM, 0-5V	On/Off, Digital, PWM, 0-5V	On/Off, Digital, PWM, 0-5V
Protection	Reverse Polarity, Temp, Current	Reverse Polarity, Temp, Current	Reverse Polarity, Temp, Current
Cost	Better	Good	Good

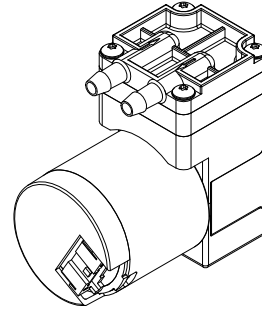
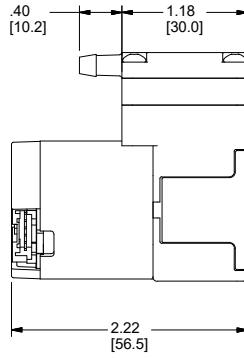
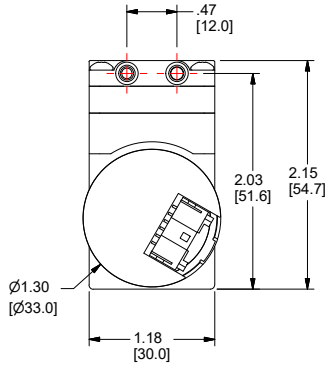
Mounting Guidelines:

- Bracket options available for mounting consideration (See *EZ Mount catalog pages*).
- 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).

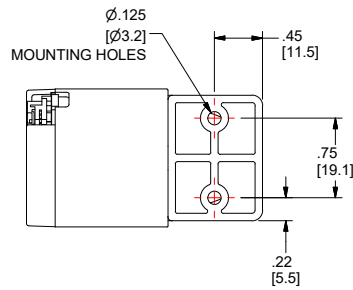
Port Connections:

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

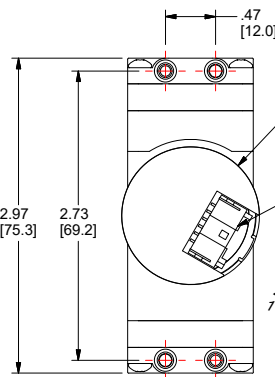
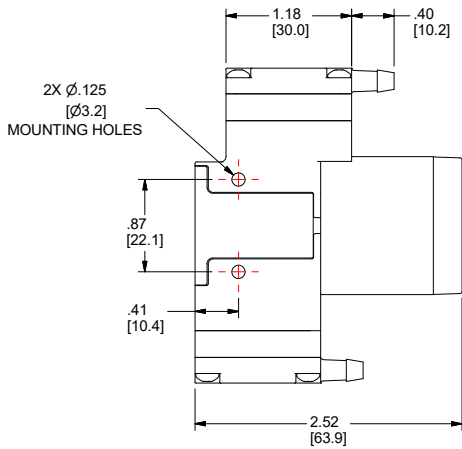
BTX-Connect Miniature Diaphragm Pump Mechanical Drawings



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



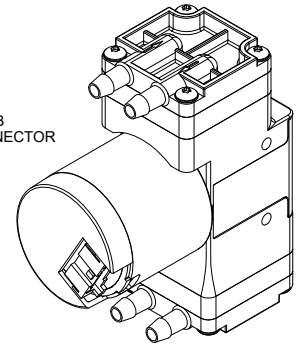
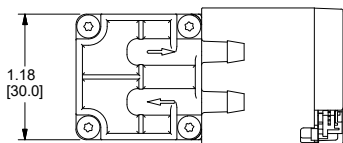
UNITS
IN [mm]



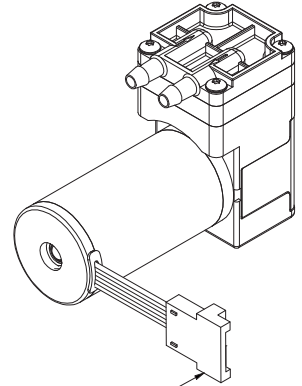
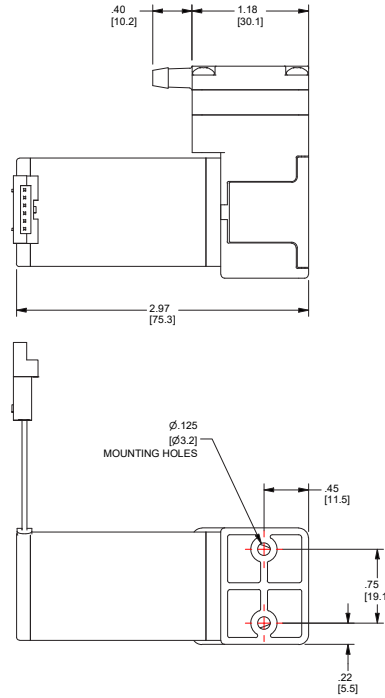
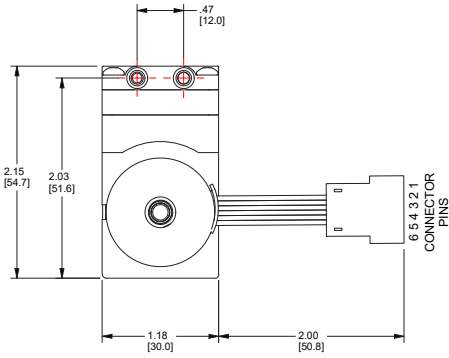
PIN OUT	
1	TACH
2	PWM / EVC
3	V+
4	GROUND
5	UART Rx
6	UART Tx

UNITS
IN [mm]

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



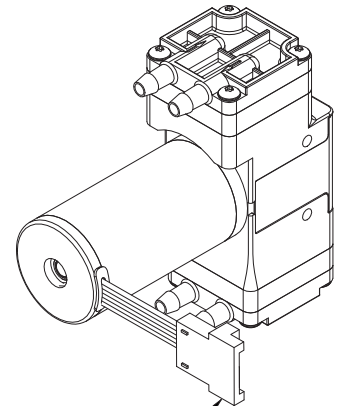
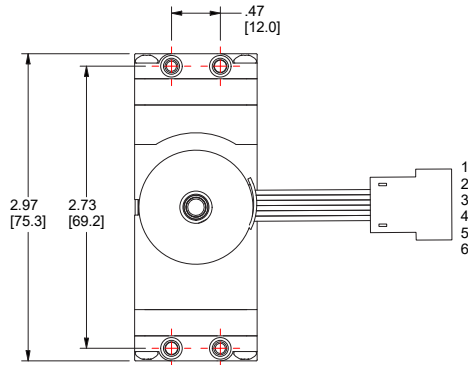
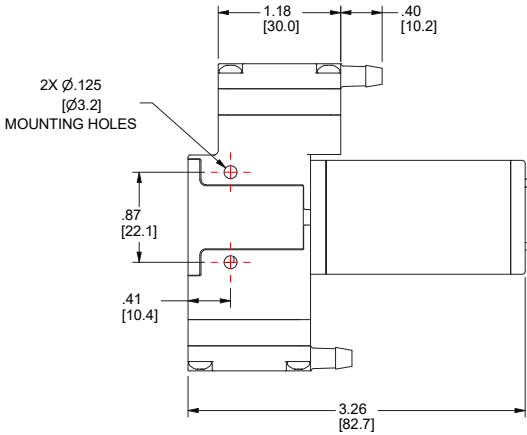
BTX-Connect Miniature Diaphragm Pump Mechanical Drawings



PALR-06VF
JST 6-PIN CONNECTOR

UNITS
IN [mm]

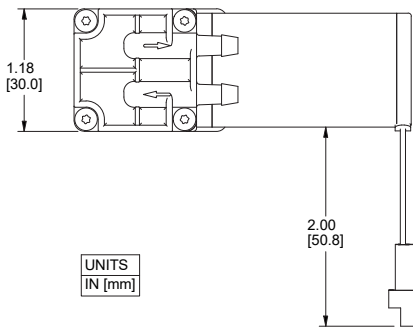
NOTES:
MOUNTING HOLES ARE DRILLED FOR #6-20 SELF-TAPPING SCREWS WITH 1/4" THREAD ENGAGEMENT. [torque to 4 in-lbs.]



PALR-06VF
JST 6-PIN CONNECTOR

PIN OUT	
1	TACH
2	PWM / EVC
3	V+
4	GROUND
5	UART Rx
6	UART Tx

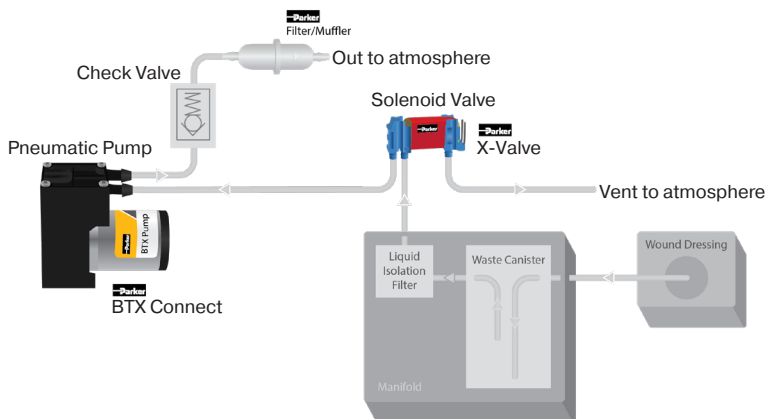
NOTES:
MOUNTING HOLES ARE DRILLED FOR #6-20 SELF-TAPPING SCREWS WITH 1/4" THREAD ENGAGEMENT. [torque to 4 in-lbs.]



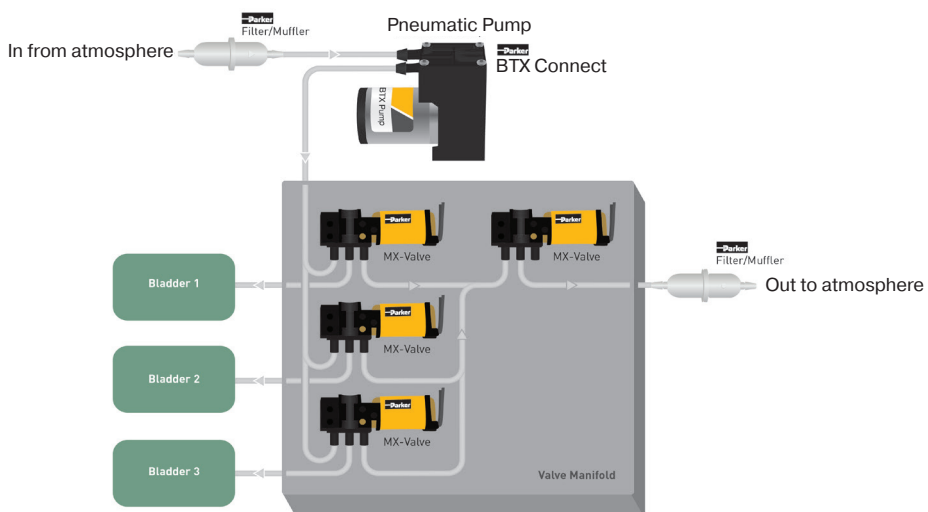
UNITS
IN [mm]

BTX-Connect Miniature Diaphragm Pump Typical Flow Diagrams

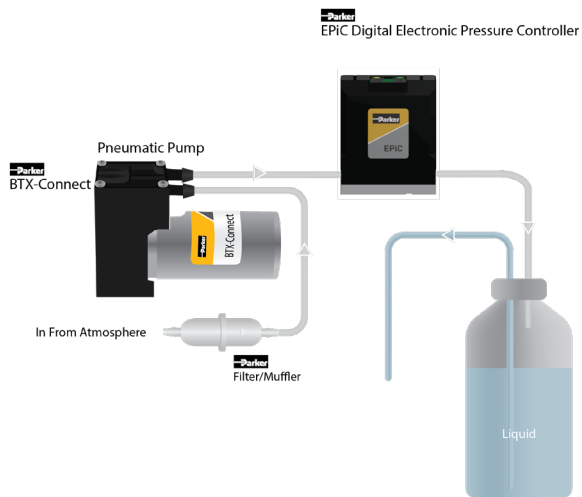
Negative Pressure Wound Therapy (NPWT)



Compression Therapy (DVT Prevention)



Air-Over-Liquid Flow Control



BTX-Connect Miniature Diaphragm Pump CE Compliant

Reference Number	Title of Standard	Year	Amendment/ Version
EN 61000-4-2	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	2008	Ed 2.0
EN 61000-4-3	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency electromagnetic field immunity test	2020	Ed 4.0
EN 61000-4-4	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test	2012	Ed 3.0
EN 61000-4-8	Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test	2009	Ed 2.0
EN 61000-6-1	Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial, and light-industrial environments	2016	Ed 3.0
EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic Standards – Emission standard for equipment in residential environments	2020	Ed 3.0
EN 60601-1-2	Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirements and tests	2020	Ed 4.1

Electrical Integration and Motor Control

Motor Electrical Connection

Integrated Electrical Connector	Male pin JST PALR - 06VF
Recommended Mating Connector	Manufacturer ~ JST Housing Part Number: PAP-06V-S Terminal Part Number: SPHD-001T-P0.5
Recommended Wire	22 AWG Stranded Wire

Power Supply Requirements

Voltage Range	6-30 VDC
Current Level	2.3A Max, firmware current limit setting will override.
Voltage Rise Time	Minimum: 50µs for 24V , 25µs for 12V
Quiescent Current	~20mA
Power Sequence	Do not connect motor electrical connector harness while power is applied (Hot Plugging).

BTX- Connect Speed Control Options

The motor speed control feature is factory selected between 4 speed control settings: On/Off control, PWM input, 0-5VDC input or UART Serial port control. All external speed control inputs affect the set-point of the internal master duty cycle, they are not directly controlling the motor speed. These modes are described in detail in the sections below. The Tachometer signal is always enabled and is configurable as detailed below.

*The controller utilizes the on-board micro-controller clock, it is not a real time clock.

BTX-Connect Miniature Diaphragm Pump

Application Notes

Stored Speed Setting

On/Off Control	With this configuration, the pump speed is factory set, only ground and input voltage must be supplied. The speed can only be adjusted using UART command with this mode and will reset to internal setting after a power-cycle.
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PWM Speed Control

PWM Input	A PWM signal is provided on the speed input wire to change pump speed.
Frequency Range	1 - 20 kHz; 15-20 kHz Recommended
Duty Cycle Range	0-100%; setting is a % of full scale. <5% is off, 5% represents 0.1% of full scale; >95% is 100% full scale. See Connect Speed Control Scheme for visual.
PWM Signal Voltage	5Vdc Signal; Minimum 4.5V peak-to-peak
Response Time	Response time to set point changes will be 50ms maximum

External Voltage Speed Control

Voltage Range Low Side	0V to .248V +/- 3% = 0% of Full Scale Voltage Range
Voltage Range High Side	4.75V to 5V +/- 3% = 100% of Full Scale
Response Time	Response time to set point changes will be 50ms maximum

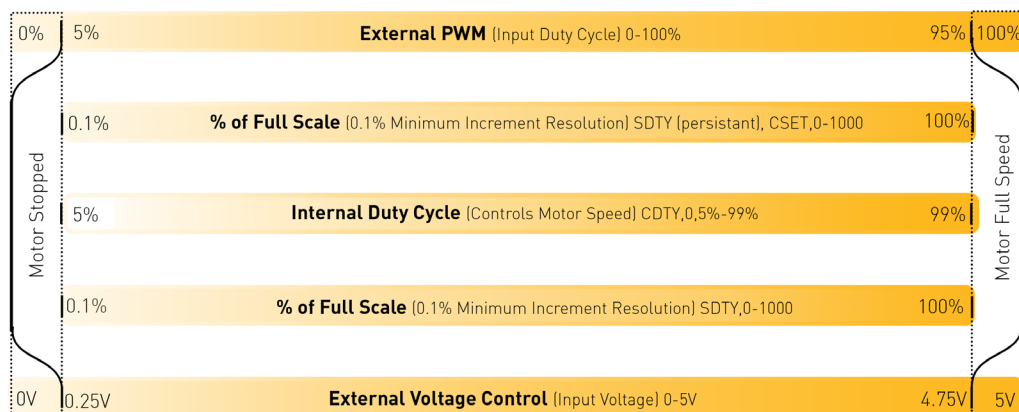
UART Speed Control

Motor Operation	Motor will wait for a \$CMDS,CDTY_Setpoint_# command, where Setpoint range is 0-1000 representing 0.1% increments of Full Scale Range.
Motor Start/Stop	\$CMDS,CDTY,0# = Motor Stop; Any non-zero CMDS,CDTY command will start the motor at the given duty cycle.

Tachometer Output

Speed Signal Output	The feature is always on, regardless of speed control mode
Compact BLDC Signal	4 Pulses per rotation of the pump, configurable.
Slotless BLDC Signal	1 Pulse per rotation of the pump, configurable.
On Board Motor Circuit	0 to 5 VDC rectangular signal Low signal will be < 0.5VDC, High will be > 4.5VDC

CONNECT Speed Control



BTX-Connect Miniature Diaphragm Pump Serial UART Details

The BTX with Connect technology includes a UART Serial port that is available regardless of speed control mode. Communication with the pump allows a user to monitor pump performance and pump health. This provides more detail to the host's system for more integrated pump management and error handling.

UART Configuration

Electrical Signal	5 VDC TTL Level*
Baud Rate	115200 bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Timing	Allow > 20ms delay between messages

*For integration with RS232 or USB, a transceiver/converter is required.

UART Syntax

Description	Starting Flag	Command Type	Comma Selector	Command	Ending Flag
Char Length	1 Byte	4 Bytes	1 Byte	4 Bytes	1 Byte
Example	\$	GETS	,	TACH	#

Description	Starting Flag	Command Type	Comma Selector	Command	Comma Separator	Input Parameter	Ending Flag
Char Length	1 Byte	4 Bytes	1 Byte	4 Bytes	1 Byte	1-4 Byte	1 Byte
Example	\$	CMDS	,	CSET	,	500	#

*Each message from the motor will end with a carriage return (0x 0D)

UART Command Set

	Command Sent to Motor	Response from Motor	Description
Pump Heartbeat Message	No Command Required	\$HBN#	\$HBN# - Normal (Pump will report a heartbeat message over UART every 30 seconds)
Invalid Message Response	Incorrect Command or Syntax	Various	See Response Syntax Table below

Control Commands	Command Sent to Motor	Response from Motor	Description
Set Pump Speed	\$CMDS,CSET,505#	\$ACKN,CMDS,CSET,505#	Set Motor Duty Cycle, <1-100%>, 505 = 50.5%
Stop Pump	\$CMDS,CSET,0#	\$ACKN,CMDS,CSET,0#	Can use \$CMDS,CSET,0# to stop motor
Restart Pump	\$CMDS,CSET,xxx#	\$ACKN,CMDS,CSET,xxx#	Can use \$CMDS,CSET,xxx# with preferred set point to start motor

History Command

	Command Sent to Motor	Response from Motor	Description
Read Pump History	\$GETS,LOGS#	\$STAT,LOGS,1,1,0,0,0,0,1#	Log counters output (maximum output length: 58 characters): -Controller Boot-Ups -Startup Count -Over Temp Count -Over Current Count -Over Power Count -Over Voltage Count -Operational Minutes (counter is active when motor is operational)

BTX-Connect Miniature Diaphragm Pump Serial UART Details

Status Commands	Command Sent to Motor	Response from Motor	Description
Read Motor Current	\$GETS,CURR#	\$STAT,CURR,1100#	Pump reports average motor current, reported in mA
Read Motor Temp.	\$GETS,TEMP#	\$STAT,TEMP,50#	Pump reports temperature on the board to within +/- 5°C, measurement is taken from a discrete temperature sensor circuit, the in-chip temp sensor is not used
Read Measured Speed	\$GETS,TACH#	\$STAT,TACH,3200#	Measured motor speed between -60 and +60 RPM are reported as zero
Read Pump Health	\$GETS,HLTH#	\$STAT,HLTH,0x00#	Motor health Hex bitfield: 0x00 - No health issues 0x01 - Over Current 0x02 - Over Temp 0x04 - Over Voltage 0x08 - Under Voltage 0x10 - Over Power 0x20 - Hall Sequence Error 0x40 - Incorrect Hall State 0x80 - EEPROM Error
Read Input Voltage	\$GETS,VOLT#	\$STAT,VOLT,12#	Pump reports voltage input measurement
Read Duty Cycle Setpoint	\$GETS,SDTY#	\$STAT,SDTY,500#	Get persistent duty cycle setpoint
Read Current Duty Cycle Input Setpoint	\$GETS,CSET#	\$STAT,CSET,500#	Get active duty cycle setpoint
Read Current Internal Duty Cycle Setting	\$GETS,CDTY#	\$STAT,CDTY,500#	Get active duty cycle setting
Read Pump Part Number	\$GETS,PRTN#	\$STAT,PRTN,B1C-050F12AN-00#	Pump reports pump part number
Read Pump Serial Number	\$GETS,SRNR#	\$STAT,SRNR,ABC-1000#	Pump reports pump serial number

Return Syntax

Field Name	Field Length	Field	Description
Start Flag	1	\$	Beginning of packet marker
Response Syntax	3-4	CMND	Unrecognized Command
		DTER	Invalid or missing data
		ACKN	Acknowledge accepted message
		PARM	Unrecognized Parameter
		HBN	Heartbeat Message
		STAT	Returned data from a GETS command
Delimiter	1	,	Field Delimiter (comma)
Parameter	4	various	Parameters are provided in the SETP parameter tables
Delimiter	1	,	Optional delimiter based on command
Data	1 to 50	nnnn	Decimal value in ASCII format or ASCII string Optional based on command
End Flag	1	#	End of packet marker
End Packet	1	0x0D	Carriage Return

BTX-Connect Miniature Diaphragm Pump Application Notes

Chemical Compatibility Chart*

BTX-Connect Chemical	Chemical Compatibility of Wetted Path Materials	
	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

- EXCELLENT
Minimal or no effect
- GOOD
Possible swelling and/or loss of physical properties
- LIMITED
Moderate or severe swelling and loss of physical properties
- 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)

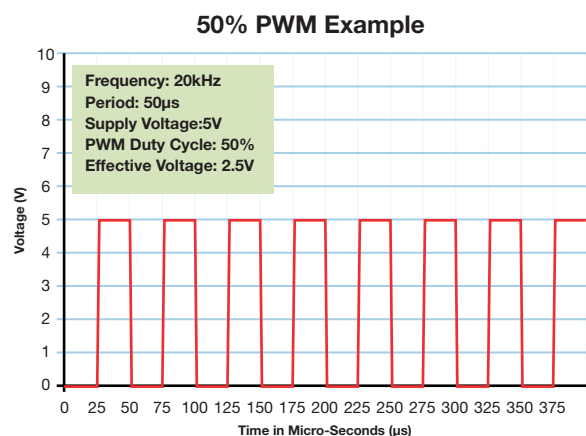
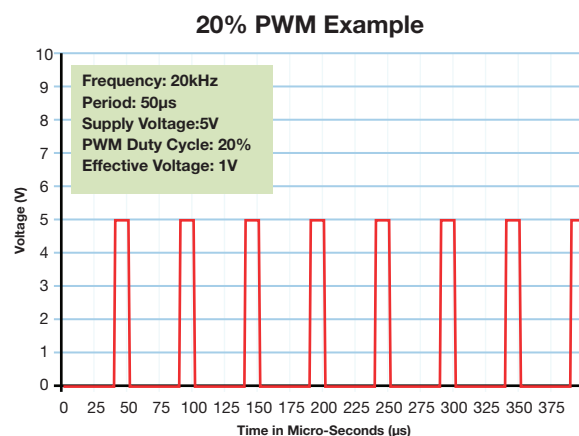
Pulse-width modulation is a commonly used technique for controlling DC motors.

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.

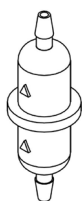


BTX-Connect Miniature Diaphragm Pump

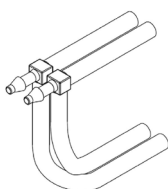
Accessories Information

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

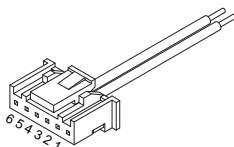
Parker recommends 40 micron or better filtration to be used with this pump series.



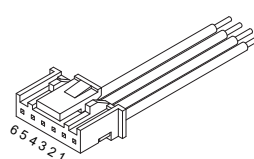
00492-15
(10 micron Filter)



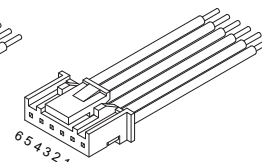
01881-KT
(Parallel Tubing)



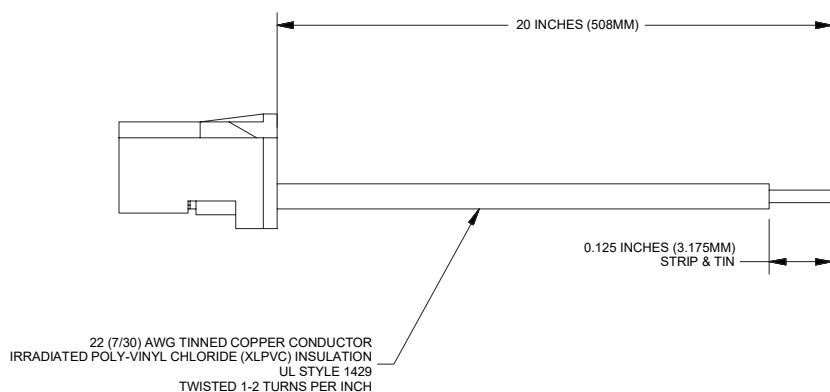
HRN-2-NN20
(2-Wire Harness)



HRN-4-PT20
HRN-4-AT20
(4-Wire Harness)



HRN-6-UT20
(6-Wire Harness)



Connector Pin-out

	Color	Function
1	Blue	Tachometer
2	White/Yellow	Speed Input
3	Red	Power V+
4	Black	Ground V-
5	Brown	UART Rx
6	Violet	UART Tx



BTX-Connect 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

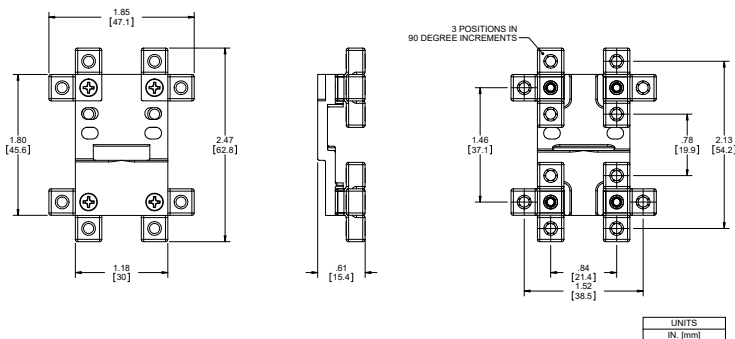
- Isolation feet on the EZ mount can be rotated in any one of three ninety-degree planes and is designed for top-down or bottom-up mounting providing simple installation
- EZ Mount was designed to minimize weight added to the pump assembly. Approximate weight is: 0.63 oz (18 g)
- Effectively absorbs 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

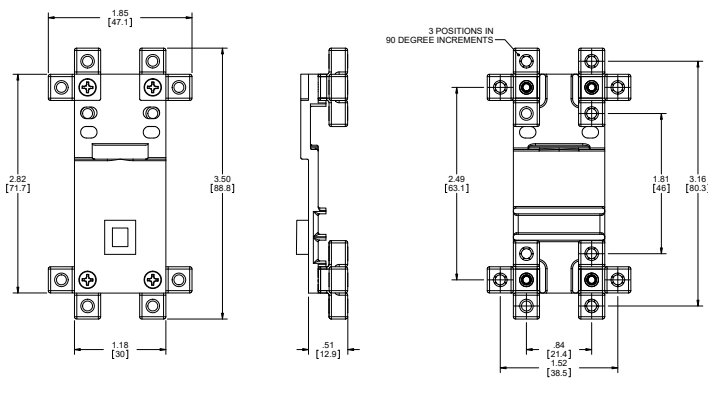
Operating Environment:
41 - 158°F (5 - 70°C)
Humidity:
0 - 95% Relative Humidity
Base Plate:
Noryl GTX830
Feet:
Silicone
Feet Insert:
Brass
Hardware:
Zinc-Plated Steel

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

Style A Dimensions



Style B Dimensions



EZ Mount for BTX with Compact Motor Single and Dual Head (B1C and B2C)

Part Number	Style	Feet Type
00328-10-A45S	A	#4-40 Threaded
00328-10-B45S	A	#4 Clearance
00328-10-D45S	A	#6-32 Threaded
00328-10-C45S	A	#6 / M3 Clearance

EZ Mount for BTX with Slotless Single Head (B1S and B1H)

Part Number	Style	Feet Type
01074-10-A45S	B	#4-40 Threaded
01074-10-B45S	B	#4 Clearance
01074-10-D45S	B	#6-32 Threaded
01074-10-C45S	B	#6 / M3 Clearance

EZ Mount for BTX with Slotless Dual Head (B2S and B2H)

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





BTX-Connect Miniature Diaphragm Pump

Ordering Information

Configuration	Voltage	Motor Control	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
B1C	12	On/Off	B1C-050F12AN-00	0.4	1.1	1.8	2.5	3.3	2.7	2.1	1.6	1.1
BTX-Connect Single Head with Compact BLDC	12	PWM	B1C-050F12AN-03	0.4	1.1	1.8	2.5	3.3	2.7	2.1	1.6	1.1
	12	On/Off	B1C-070P12AN-00	-	-	-	-	4.5	3.5	2.7	2	1.2
	12	0-5 VDC	B1C-070P12AN-02	-	-	-	-	4.5	3.5	2.7	2	1.2
	12	On/Off	B1C-090P12AN-00	-	-	-	-	5.5	4.5	3.5	2.8	2.2
	12	PWM	B1C-090P12AN-03	-	-	-	-	5.5	4.5	3.5	2.8	2.2
	12	On/Off	B1C-090V12AN-00	1.5	2.5	3.5	4.7	5.8	-	-	-	-
	12	0-5 VDC	B1C-090V12AN-02	1.2	2	3	4.1	5.2	-	-	-	-
	12	PWM	B1C-090V12AN-03	1.5	2.5	3.5	4.7	5.8	-	-	-	-
	12	UART	B1C-090V12AN-01	1.5	2.5	3.5	4.7	5.8	-	-	-	-
	24	On/Off	B1C-050F24AN-00	0.4	1.1	1.8	2.5	3.3	2.7	2.1	1.6	1.1
	24	0-5 VDC	B1C-050F24AN-02	0.4	1.1	1.8	2.5	3.3	2.7	2.1	1.6	1.1
	24	PWM	B1C-050F24AN-03	0.4	1.1	1.8	2.5	3.3	2.7	2.1	1.6	1.1
	24	On/Off	B1C-090P24AN-00	-	-	-	-	5.5	4.5	3.5	2.8	2.2
	24	0-5 VDC	B1C-090P24AN-02	-	-	-	-	6.1	4.9	4	3.2	2.5
24	PWM	B1C-090P24AN-03	-	-	-	-	6.1	4.9	4	3.2	2.5	
24	On/Off	B1C-090V24AN-00	1.5	2.5	3.5	4.7	5.8	-	-	-	-	
24	PWM	B1C-090V24AN-03	1.5	2.5	3.5	4.7	5.8	-	-	-	-	
B1S	12	On/Off	B1S-090P12AN-00	-	-	-	-	4.8	3.9	3.1	2.5	2.0
BTX-Connect Single Head with Slotless BLDC	24	On/Off	B1S-090P24AN-00	-	-	-	-	4.8	3.9	3.1	2.5	2.0
B2C	12	On/Off	B2C-050F12AN-00	0.4	1.7	2.6	3.8	5.1	4	3.2	2.3	1.1
BTX-Connect Dual Head with Compact BLDC	12	PWM	B2C-050F12AN-03	0.4	1.7	2.6	3.8	5.1	4	3.2	2.3	1.1
	12	On/Off	B2C-070P12AN-00	-	-	-	-	8.2	6	4.4	3	2
	12	On/Off	B2C-090V12AN-00	2.2	3.5	5.4	7.5	9.5	-	-	-	-
	12	PWM	B2C-090V12AN-03	2.2	3.5	5.4	7.5	9.5	-	-	-	-
	12	0-5 VDC	B2C-090V12AN-02	2.2	3.5	5.4	7.5	9.5	-	-	-	-
	24	On/Off	B2C-050F24AN-00	0.4	1.7	2.6	3.8	5.1	4	3.2	2.3	1.1
	24	PWM	B2C-050F24AN-03	0.4	1.7	2.6	3.8	5.1	4	3.2	2.3	1.1

BTX-Connect Miniature Diaphragm Pump

Ordering Information

Configuration	Voltage	Motor Control	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
B2S	12	On/Off	B2S-050F12AN-00	0.8	1.9	2.9	4.1	5.3	4.3	3.5	2.7	2
 BTX-Connect Dual Head with Slotless BLDC	12	On/Off	B2S-090P12AN-00	-	-	-	-	9	7.2	5.7	4.5	3.3
	12	PWM	B2S-090P12AN-03	-	-	-	-	9	7.2	5.7	4.5	3.3
	12	On/Off	B2S-090V12AN-00	2.2	3.8	5.7	7.6	9.3	-	-	-	-
	12	PWM	B2S-090V12AN-03	2.2	3.8	5.7	7.6	9.3	-	-	-	-
	24	On/Off	B2S-050F24AN-00	0.8	1.9	2.9	4.1	5.3	4.3	3.5	2.7	2
	24	On/Off	B2S-090P24AN-00	-	-	-	-	9	7.2	5.7	4.5	3.3
	24	On/Off	B2S-090V24AN-00	2.2	3.8	5.6	7.5	9.1	-	-	-	-
	24	PWM	B2S-090V24AN-02	2.2	3.8	5.6	7.5	9.1	-	-	-	-
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B2H	12	0-5 VDC	B2H-050F12AN-02	0.9	2.4	3.7	5.1	6.7	5.4	4.3	3.2	2.3
 BTX-Connect Dual Head with HP Slotless BLDC	12	On/Off	B2H-050A12AN-00	1.6	2.9	4.2	5.7	7.2	5.8	4.8	3.9	3
	12	On/Off	B2H-090R12AN-00	-	-	-	-	10.7	8.9	7.3	5.8	4.4
	12	On/Off	B2H-090V12AN-00	2.8	4.6	6.6	8.7	10.5	-	-	-	-

Accessories Ordering Table

Part No.	Description	Comments
HRN-2-NN20	2 Pin Wire Harness 20" (508mm) Long	2 Pin wire harness for on/off control only
HRN-4-PT20	4 Pin Wire Harness 20" (508mm) Long	4 Pin wire harness for speed control and tachometer output (Pin 2: White)
HRN-4-AT20	4 Pin Wire Harness 20" (508mm) Long	4 Pin wire harness for speed control and tachometer output (Pin 2: Yellow)
HRN-6-UT20	6 Pin Wire Harness 20" (508mm) Long	6 Pin wire harness required for UART
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)

B	1	C	-	090	P	12	A	N	-	00
Model	Pump Heads	Motor Type	Pump Offset	Diaphragm Configuration	Voltage	Material	Tubing	Special		
B - BTX	1 - Single Head	C - Compact	050 - 0.050" Offset	F - Universal Pressure & Vacuum	12 - 12 Vdc	A - 80D AEPDM Diaphragm & low noise Valves	N - None	00 - Factory set speed HRN-2-NN20 (Included)		
	2 - Dual Head	S - Slotless	070 - 0.070" Offset	P - Pressure Only	24 - 24 Vdc	B - 80D AEPDM Diaphragm & 80D Valves	P - Parallel (dual head only)	01 - Digital UART speed control HRN-6-UT20 (Included)		
		H - High Performance Slotless	090 - 0.090" Offset	V - Vacuum Only			S - Series (dual head only)	02 - Analog 0-5 Vdc HRN-4-AT20 (Included)		
				A - Universal Pressure & Vacuum (High Compression Chamber)				03 - PWM speed control HRN-4-PT20 (included)		
				R - Pressure Only (High Compression Chamber)						
				Y - Vacuum Only (High Compression Chamber)						



Miniature Pumps

BTX-Connect Miniature Diaphragm Pump Ordering Information

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

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.

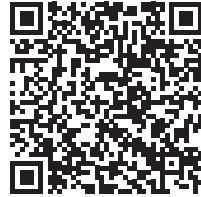
Appendix A

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-Connect Miniature Diaphragm Pump

Scan for more detailed information:



Parker Hannifin Precision Fluidics Division

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Miniature Solenoid Valves



For more information about our miniature solenoid valve offerings, [visit our website](#).

Miniature Liquid Valves



For more information about our miniature liquid valve offerings, [visit our website](#).

Miniature Proportional Valves



For more information about our miniature proportional valve offerings, [visit our website](#).

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For more information about our miniature pump offerings, [visit our website](#).

Pressure and Flow Control



For more information about our flow and pressure control offerings, [visit our website](#).

Customized Systems and Solutions

Our team of experienced engineers and technical support staff is dedicated to helping our customers find the right solutions for their specific needs. We work closely with our customers to understand their unique requirements and provide tailored solutions that meet their exact specifications.