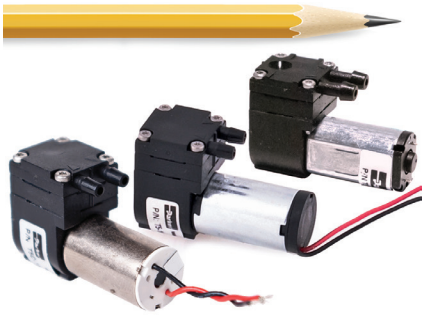
T2-05

Micro Diaphragm Pumps (air/gas)

Up to 800 mLPM Free Flow



Parker's T2-05 13.5 mm wide micro diaphragm pump is designed to fit where other pumps cannot due to its small, compact package size. The T2-05 flow path is optimized to deliver high flow with high efficiency resulting in extended battery life. The pump's low power, small size, and light weight play a critical role in portable gas detection and medical applications. The T2-05 pump HE and LI pump models enable intrinsic safety capabilities for sampling of hazardous gases, typical of industrial and mining operations. The T2-05 IC pump is designed for compact and wearable medical devices that require less than 1500 hours of pump life. The T2-05 VBIC model is ideal for vacuum only medical applications that benefit from improved sound quality, such as wound therapy.

Typical Markets

- Safety
- Patient Therapy
- Patient Monitoring

Typical Applications

- Portable Gas Detection
- Gas Sampling
- Medical Instruments
- Trace Detection
- Sidestream CO_2
- Negative Pressure Wound Therapy

Features

- The valve design has been optimized to provide the highest flow rates available with the lowest current draw, allowing for longer battery life and smaller instrument size.
- The T2-05 model pump life ranges up to 10,000 rated hours depending on motor (HE, LI and IC) options
- The pump fits into the extremely tight spaces demanded of today's handheld instruments, such as portable gas detectors and portable negative pressure wound therapy devices for patient mobility. The lightweight design minimizes instrument weight.
- RoHS compliant.

Product Specifications*

Physical Properties

Operating Environment[1]:
-4 to 122°F (-20 to 50°C)

Storage Environment:
-4 to 122°F (-20 to 50°C)

Media:
Air, Argon, Helium, Nitrogen, Oxygen, and other non-reacting gases

Humidity:
Most non-condensing gases
5-95% Relative Humidity

Noise Level[2]:
As low as 45dB

Pump Assembly Rated Life[3]:
Coreless Motor-Pump (HE):
Up to 10,000 hours
Coreless Motor-Pump (LI):
Up to 6,000 hours
PMDC Iron Core-Pump (IC):
Up to 1,500 hours

Weight:
0.5 oz (14 g) HE and LI
0.4 oz (11 g) IC

Electrical

Motor Type (DC):
High Efficiency Coreless Brush (HE)
Low Inductance Coreless Brush (LI)
PMDC Iron Core Brush (IC)

Nominal Motor Voltages (DC)[4]:
3.3 VDC

Max Power at Nominal Voltage:
0.36 Watts

Electrical Termination:
HE: Wire Leads
LI: Wire Leads
IC: Solder Tabs

Current Range[5]:
34 - 105 mA

Inductance[6]:
HE: 0.28 mH maximum @ 1kHz/50mV
LI: 0.05 mH maximum @ 1kHz/50mV
IC: 4.07 mH maximum @ 1kHz/50 mV

Pneumatic

Head Configuration: Single

Maximum Flow:
HE, LI: 800 smlpm, IC: 700 smlpm

Maximum Intermittent Pressure[7]:
6.2 psi (430 mbar)

Maximum Continuous Pressure:
2.0 psi (138 mbar)

Maximum Intermittent Vacuum[7]:
10.8 in Hg (274 mm Hg)

Maximum Continuous Vacuum:
4.1 in Hg (104 mm Hg)

Filtration:
40 micron recommended

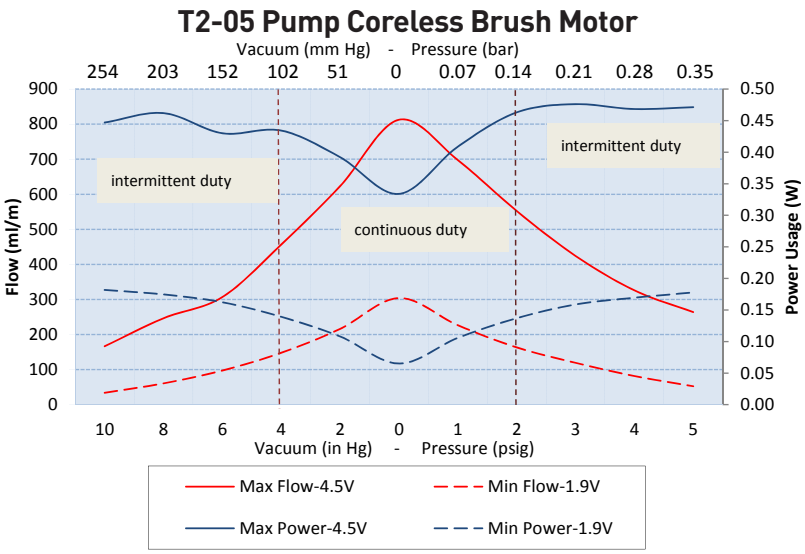
Efficiency at Free Flow[8]:
LPM/Watt: 4.66 @ 1.9 VDC
(*P/N T5-1HE-03-1EEB*)
LPM/Watt: 4.08 @ 1.9 VDC
(*P/N T5-1LI-03-1EEB*)
LPM/Watt: 3.12 @1.9 VDC
(*P/N T5-1IC-03-1EEP*)

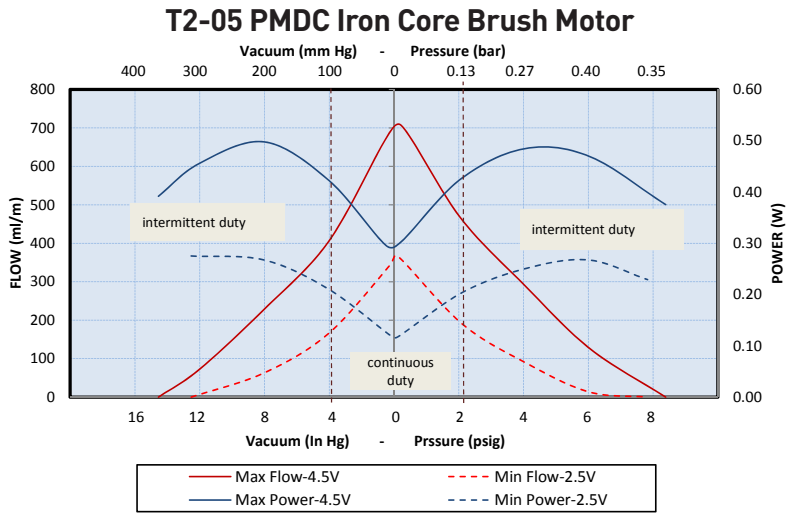
Wetted Materials

Diaphragm: EPDM | **Valves:** EPDM | **Pump Head:** ABS (HE, LI), PBT (IC)

* See Appendix A for details.

Performance Specifications



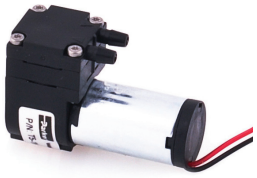
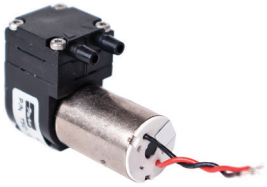
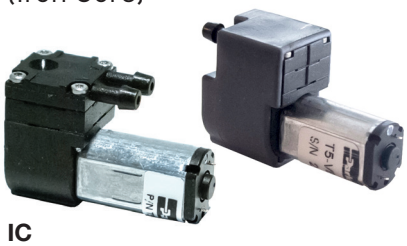


The above graphs represent examples of performance for the pumps series handling air at 800 feet (244M) above sea level at 75° F (24° C). Performance will vary depending on barometric pressure and media temperature. Curves are representative of standard pump configurations. Pump configurations could be customized for higher or lower flows, depending on specific customer requirements.

Please contact Parker Precision Fluidics Applications Engineering for other considerations

T2-05 Micro Diaphragm Pumps (air/gas)

Sizing and Selection

T2-05 Series	Coreless Brush Motor (High Efficiency)	Coreless Brush Motor (Low Inductance)	PMDC Iron Core Motor (Iron Core)
			
	HE	**LI**	**IC**
Inductance[6]	Better	Best	N/A
Efficiency at Free Flow[8]	Best	Best	Better
Life[3]	Best	Better	Good
Cost	Good	Better	Best

Mounting Guidelines:

- Parker recommends using a nylon cable tie with a length of at least 4" (100 mm).

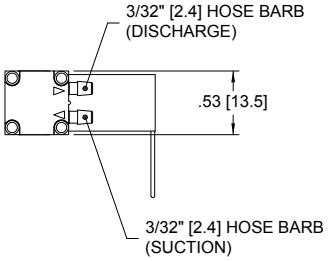
Port Connections:

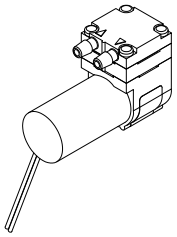
- **HE** & **LI**: 3/32" ID tubing
- **IC**: 1/8" ID tubing

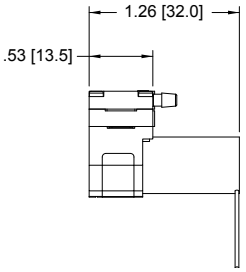
Mechanical Integration

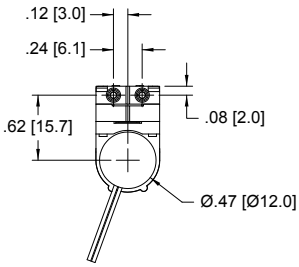
Dimensions

Coreless Brush/HE Version



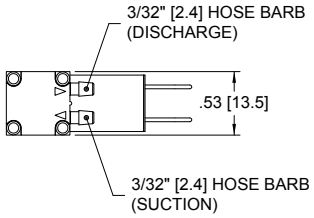


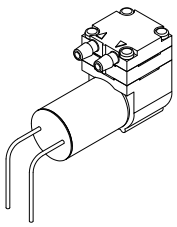




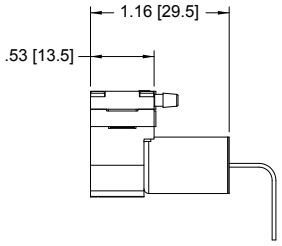
Mechanical Integration

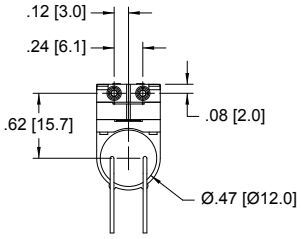
Dimensions





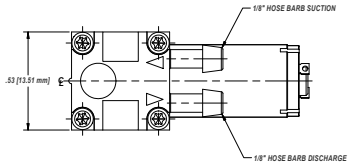
Coreless Brush/LI Version

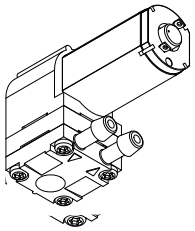


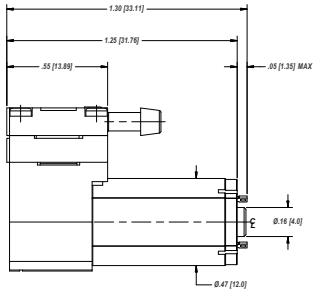


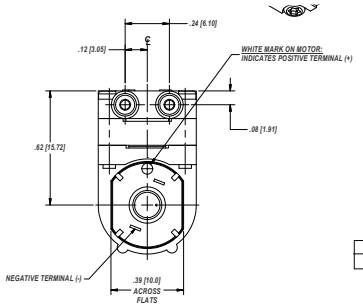
Units
IN. (mm.)

PMDC Iron Core/IC Version



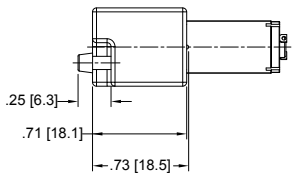


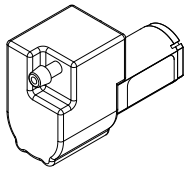


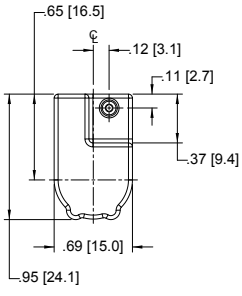


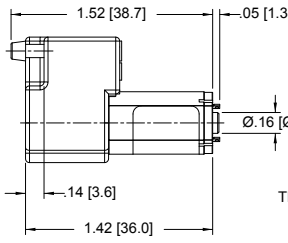
Units
IN. (mm.)

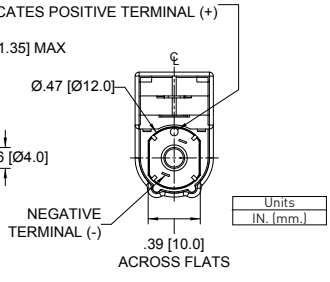
PMDC Iron Core/IC Version Improved Sound Configuration*











Units
IN. (mm.)

* Improved sound configuration released with IC configuration for vacuum applications. Contact factory for use with HE or LI configurations for either vacuum or pressure applications

Electrical Integration and Motor Control

Coreless Brush Motor (HE, LI)

2 Wire	Red (+), Black (-)
Wire specification	28 AWG 5.7" (145 mm) Wire Leads

PMDC Iron Core Brush Motor (IC)

Tabs	Standard solder tabs for electrical connection

Key Things to Remember

5.7" (145 mm) flying Leads are the standard electrical connection method to the pump. Contact Parker Engineering for other connection requirements.

Pump life is highly dependent on operating conditions. It is not recommended to run the pump continuously, 100% duty cycle, at higher than 2 psig.

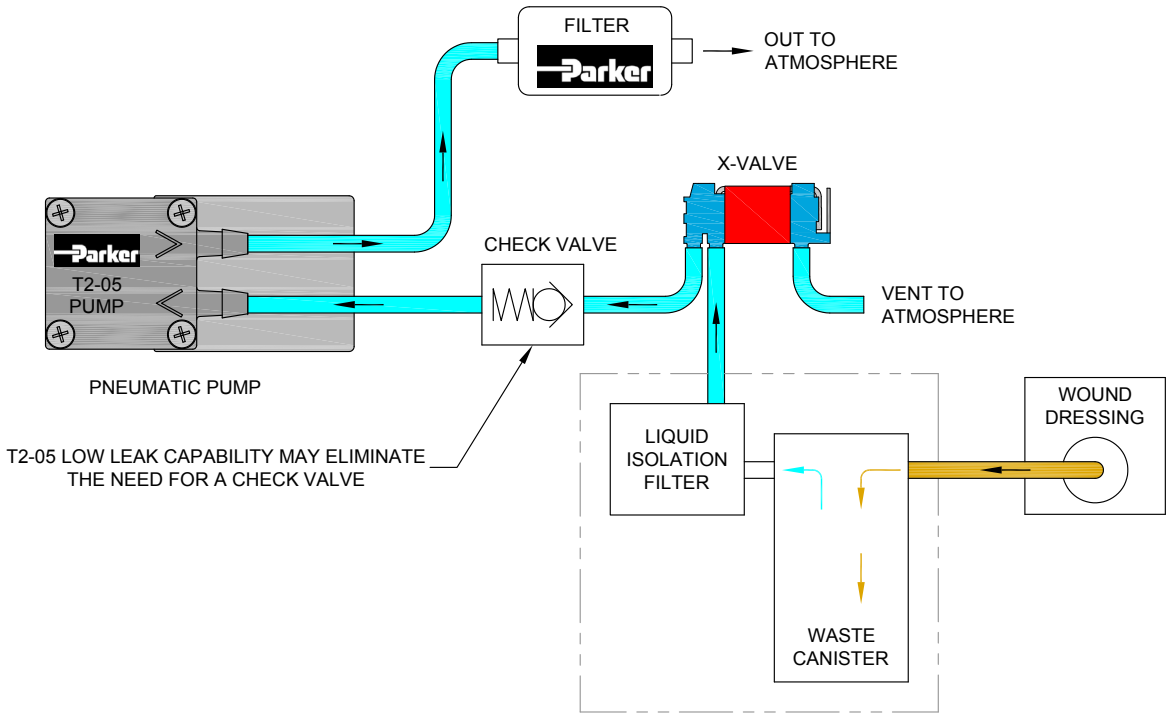
The pump flow and pressure can be controlled by adjusting the input voltage from zero to maximum rated voltage.

The pump is not a pressure holding device. An external check valve is recommended, if there is a pressure holding requirement.

Pump orientation does not affect performance or life.

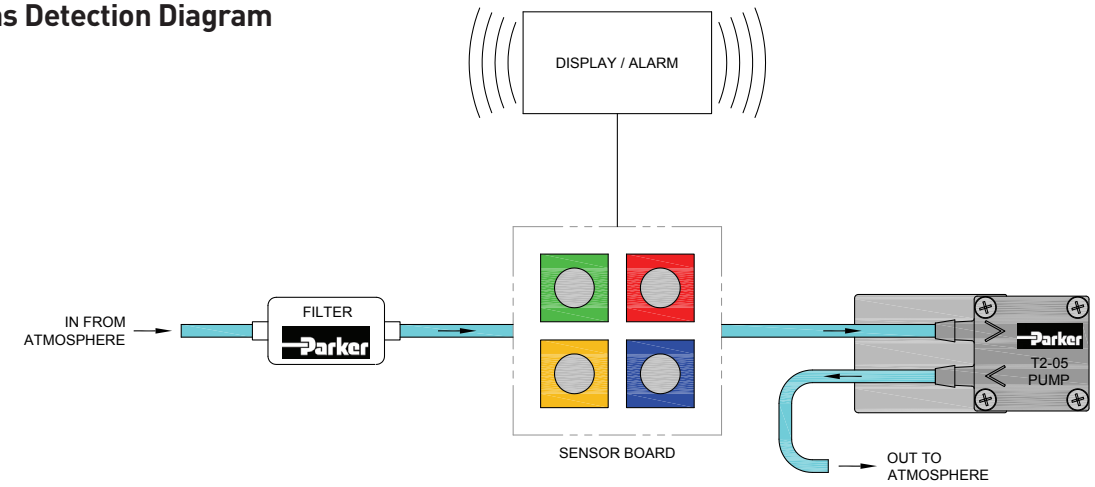
Typical Flow Diagram

Negative Pressure Wound Therapy Diagram

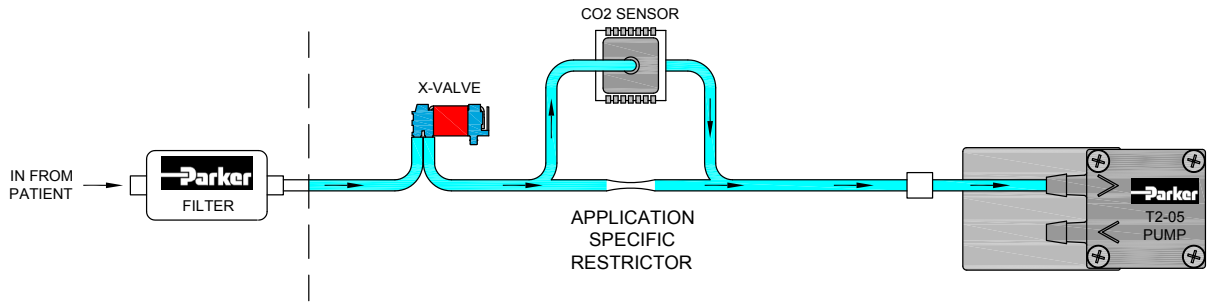


Typical Flow Diagram

Gas Detection Diagram



Side Stream Capnography Diagram



Chemical Compatibility Chart*

	Chemical Compatibility of Wetted Path Materials		
Chemical	**EPDM**	**ABS**	**PBT**
Air	1	1	1
Ozone (1000 ppm)	4	2	1
Oxygen	1	1	1
Ethylene (Ethene)	4	1	1
Acetylene	1	2	2
Propane	4	2	2
Methane	4	4	2
Nitrogen	1	1	1
Carbon Dioxide	2	2	1
Halothane (Up to 5%)	4	1	1

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

Compatibility Legend

1. EXCELLENT
   Minimal or no effect
2. GOOD
   Possible swelling and/or loss of physical properties
3. DOUBTFUL
   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.

T2-05 Micro Diaphragm Pumps (air/gas)

Ordering Information

Configuration	Vacuum: LPM @ Load			Free Flow	Pressure: LPM @ Load			Max				PCD*	Wetted Materials
	12 in Hg 305 mm Hg	8 in Hg 203 mm Hg	4 in Hg 102 mm Hg	0	2 psig 134 mbar	4 psig 276 mbar	6 psig 414 mbar	Vac in Hg	Press psig	Motor Type	VDC	mA	Diaphragm, Valves, Gasket
T5-1HE-03-1EEB		0.2	0.5	**0.8**	0.6	0.3		10.8	6.2	Coreless Brush	4.5	438	EPDM
T5-1LI-03-1EEB-1		0.2	0.5	**0.8**	0.6	0.3		10.8	6.2	Coreless Brush	4.5	438	EPDM
T5-1IC-03-1EEP		0.2	0.5	**0.7**	0.5	0.3		10.0	6.2	PMDC	4.5	240	EPDM
T5-VBIC-03-1EEP		0.2	0.5	**0.7**				10.0		PMDC	4.5	240	EPDM

*PCD: Peak Current Draw

The T5-VBIC-03-1EEP is a T2-05-IC Reduced Sound pump that uses a proprietary design to reduce noise and it is a recommended option in applications where sound quality is also a critical customer need.

T2-05-LI and HE model Sound Improvement options are also available, contact applications for more details. Applications Engineering can assist with sound quality evaluations given the complex relationship between system components and operational requirements of the customer's specific application.

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/t5) to configure your T2-05 Micro Diaphragm 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

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.

Parker Hannifin Corporation
Precision Fluidics Division
26 Clinton Dr., Unit 103
Hollis, NH 03049
phone: +1 603 595 1500
email: ppfinfo@parker.com
www.parker.com/precisionfluidics