xavitech®
INTELLIGENT PUMPS

MICROPUMPS

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GAS PUMPS

- ***Long Life-Time***
- ***Calibrated flow***
- ***Customized functions***
- ***System savings***

> CONCEPT

Principle of operation The micro-pumps from Xavitech are based on the principle of the oscillating displacement pump. The motor causes an internal axle to move back and forth. This action is transferred to the elastic diaphragm which, in cooperation with the non-return valve, produces the pumping effect.

> X-LIFE™ MOTOR

The patented pump technology from Xavitech is unique in several aspects. Thanks to the X-life™ motor design, problems associated with other electro-magnetic pumps are simply eliminated. The axle motion is friction-less and it avoids striking into the magnet. As a consequence, the lifetime is long, the operation is safe, free of sparks, and reliable. In addition, the pump is oil-less and free of maintenance.

> INTELLIGENT

The Xavitech pumps are also characterized by the built-in intelligence, offered by the internal microprocessor and the patented positioning system that displays the location and motion of the axle. This opens up vast new possibilities. For example, the axle motion reveals information of the working conditions (e.g. stroke frequency, flow, and pressure). By processing this information, the pump can automatically take necessary measures – in real-time – to adjust its performance according to any condition changes.

KEY BENEFITS

Serial control
Pressure measuring capabilities
Flow and pressure regulating capabilities
Constant flow regardless of battery voltage
LCD control capabilities
Programmable frequency
Contol capabilities of external components

APPLICATIONS

Gas analysis
Pressure / vacuum holding
Picking machines
Blood pressure
NPWT pump
Aneastetic delivery

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STANDARD GAS PUMPS

GENERAL DATA V1500/P1500

- ***Motor type:*** *X-Life™ motor*
- ***Permissible amb. temp.:*** *0°C to 55°C*
- ***Medium temp.:*** *0°C to 55°C*
- ***Weight:*** *105 grams*
- ***Dimensions (L*H*W):*** *57*31*31 mm*
- ***Tube connectors:*** *4 mm in diameter*

	V1500-GAS-12V	V1500-GAS-24V	P1500-GAS-12V	P1500-GAS-24V
Voltage*	5-12V	12-24V	5-12V	12-24V
Max flow	800 ml/min	1000 ml/min	1000 ml/min	1000 ml/min
Max vacuum	350 mbar	350 mbar	110 mbar	110 mbar
Max pressure	110 mbar	110 mbar	350 mbar	350 mbar
Wetted parts	PPS & EPDM	PPS & EPDM	PPS & EPDM	PPS & EPDM
Minimum supply Capacitator	470µF, 10V @ 5V supply	1000µF, 25V @ 12V supply	470µF, 10V @ 5V supply	1000µF, 25V @ 12V supply
	470µF, 25V @ 12V supply	1000uF, 35V @ 24V supply	470µF, 25V @ 12V supply	1000µF, 35V @ 24V supply

*) Each pump can be run at a lower voltage than the specified maximum, but this will then reduce the performance.

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STANDARD GAS PUMPS

GENERAL DATA V200/P200

- ***Motor type:*** *X-Life™ motor*
- ***Permissible amb. temp.:*** *0°C to 55°C*
- ***Medium temp.:*** *0°C to 55°C*
- ***Weight:*** *39 grams*
- ***Dimensions (L*H*W):*** *37*21*21 mm*
- ***Tube connectors:*** *3 mm in diameter*

	V200-GAS-5V	V200-GAS-12V	P200-GAS-5V	P200-GAS-12V
Voltage*	3.2-5V	5-12V	3.2-5V	5-12V
Max flow	300 ml/min	350 ml/min	300 ml/min	350 ml/min
Max vacuum	300 mbar	350 mbar	70 mbar	150 mbar
Max pressure	70 mbar	150 mbar	350 mbar	350 mbar
Wetted parts	PPS & EPDM	PPS & EPDM	PPS & EPDM	PPS & EPDM
Minimum supply Capacitator	47µF, 6.3V @ 3.3V supply	100µF, 10V @ 5V supply	47µF, 6.3V @ 3.3V supply	100µF, 10V @ 5V supply
	47µF, 10V @ 5V supply	100uF, 16V @ 12V supply	47µF, 10V @ 5V supply	100µF, 16V @ 12V supply

*) Each pump can be run at a lower voltage than the specified maximum, but this will then reduce the performance.

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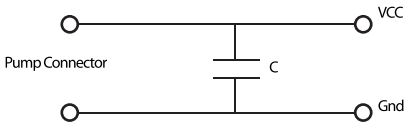
TECHNICAL NOTES

> TECHNICAL NOTE – INSTALLATION/OPERATION

Power supply
All pumps are of diaphragm type and require a regulated DC voltage. This DC voltage is internally applied to a built-in intelligent motor controller which regulates the pump motion.

The motor in the pump causes a ripple on the supplied DC voltage. Therefore it is required to use an external capacitor. The minimum required capacitor is specified for each pump in this document and the connection scheme is shown below. The ripple can be further decreased by an increase of the capacitance. Keep in mind that specified voltage over capacitor must be higher than the peak of the voltage ripple.

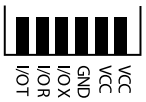


Vacuum and pressure control The voltage range specified for each pump in this document can be used to control vacuum or pressure. Using V-pumps you can control vacuum with voltage and for P-pumps you can control the pressure. In general, the higher voltage, the higher maximum vacuum/pressure is possible. In addition, a higher voltage results in a higher flow due to a slightly increased stroke frequency.

Frequency adjustment via analog input The stroke frequency, and thus the flow, can be changed independently of the applied voltage. This is an important feature that enables flow control independently of supply voltage and thus a lower flow can be achieved without reducing maximum vacuum/pressure. In addition, this enables the users to minimize the current consumption and it suppresses the need of flow restrictors. Consequently, this allows the users to be both cost-effective and power efficient.

Please note that

- *Missing external capacitor can damage the pump.*
- *Incorrect lead connection can damage the pump.*
- *To insure lifetime, air filters should be used in order to prevent contaminations like dust to enter the pump.*
- *The connector is 7ff10.1 mm wide and 0.3ff10.05 mm thick. 70-75 mm long.*
- *Recommended connector: Molex 0526100672 FFC/FPC.*
- *Connection scheme:*



PIN	DESCRIPTION	VOLTAGE RANGE
VCC	Supply voltage	See each pump
GND	Ground	Ground
I/O X	Default frequency (max) Voltage controlled freq. range Pump stop	=0-0.05 =0.05-2.75 =2.8-3,3
I/O R	Serial receive connector with 10k internal pull-up	Logic Hi=1,71-3,3 Logic Lo=0-0,85
I/O T	Serial transmit connector with 10k internal pull-up	Logic Hi=2,85 Logic Lo=0

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MOUNTING FOR 200 & 250 PUMP

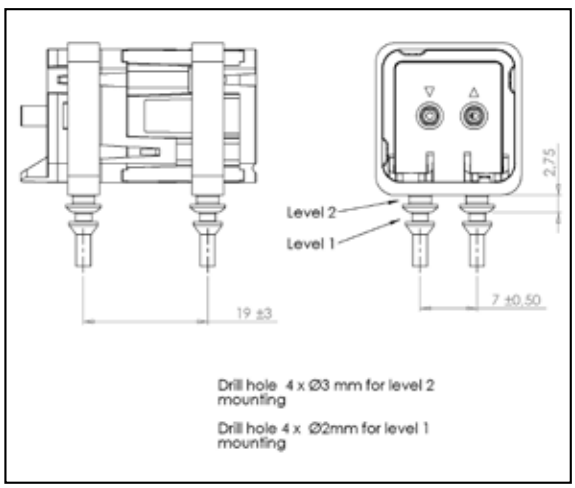
- ***TPE material***
- ***Absorbs vibration***
- ***Mounts on PCB or sheet drill holes***
- ***Optional mounting height***

> INTRODUCTION

Customers have been asking for a low cost mounting solution which can be used on PCBs or drilled holes in steel sheets or plastic housings. Xavitech can now offer a ready to use solution for this to meet customer demands.

> THE SOLUTION

The solution is based on moulded parts in soft TPE material for pull through quick mount. It is resistant to ageing and has a broad temperature range of -20 to 70 degrees celcius. By press fitting two soft holders, one from each side of the pump, you get 4 soft arrow like pins underneath the pump. Theese pins you can pull through holes and they will expand on the other side of a PCB and thus create a lock. There are two arrows on each pin so you can mount the pump at two diffrent levels. At level 1 the pump will be elevated 2.75mm and enables you to have electrical components underneath the pump. When pump is mounted on PCB, excessive parts of the pin underneath the PCB can be cut away.



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MOUNTING FOR 1500 & 2500

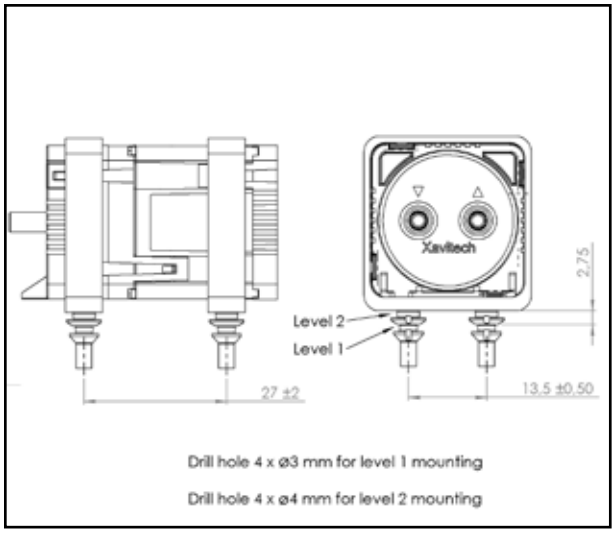
- ***TPE material***
- ***Absorbs vibration***
- ***Mounts on PCB or sheet drill holes***
- ***Optional mounting height***

> INTRODUCTION

Customers have been asking for a low cost mounting solution which can be used on PCBs or drilled holes in steel sheets or plastic housings. Xavitech can now offer a ready to use solution for this to meet customer demands.

> THE SOLUTION

The solution is based on moulded parts in soft TPE material for pull through quick mount. It is resistant to ageing and has a broad temperature range of -20 to 70 degrees celcius. By press fitting two soft holders, one from each side of the pump, you get 4 soft arrow like pins underneath the pump. Theese pins you can pull through holes and they will expand on the other side of a PCB and thus create a lock. There are two arrows on each pin so you can mount the pump at two diffrent levels. At level 1 the pump will be elevated 2.75mm and enables you to have electrical components underneath the pump. When pump is mounted on PCB, excessive parts of the pin underneath the PCB can be cut away.



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FLOW CALIBRATION UNIT

- ***Calibrate flow***
- ***Reduce power use***
- ***Shorten R&D process***
- ***Save money & time***

> CONCEPT

Xavitech® can supply calibrated pumps according to customer needs. Just as important, the customers can also adjust the pump performance themselves. This is really valuable during the design phase of a system since the user will be able to compensate for condition changes simply by reprogramming the pumps. Once the system layout is fixed the customer can inform Xavitech® on which pump setting was the best. Hereafter, Xavitech® can easily supply calibrated pumps according to the new requirements. Such a procedure implies a quick production transfer which saves time and costs for the user.

> FLOW CALIBRATION UNIT

The flow calibration unit will enable the user to adjust the flow through altering the pump frequency and store setting permanently into the pump memory.

KEY BENEFITS

Simple to use
Reduce power consumption
Minimize pump noise
Flexibility
Settings stored in pump
Speed up system tuning

APPLICATIONS

R&D for new product development
LAB

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PUMP FOR GAS ANALYSIS

- ***Small size***
- ***Market leading lifetime-cost performance***
- ***Excellent flow stability over time***
- ***Minimizes pressure oscillations***
- ***Syncronised strokes reduce sensor artifacts***
- ***Very long lifetime***

> GAS ANALYSIS

The Xavitech® pumps V200 and V1500 are excellent choices for gas analysis. First of all, the invented X-life motor implies a longer lifetime than brushless pumps, yet Xavitech® pumps have about the same price as brushed ones. In addition, Xavitech® pumps offer important features such as constant flow and small pressure oscillations.

> REFERENCE & EXPERIENCE

Xavitech has supplied thousands of pumps every year since 2007 to medical capnography devices and other gas analysis instrument to happy customers.
Customers have measured up to ten times smaller pressure oscillations using Xavitech® pumps compared to available diaphragm pumps on the market for air sampling. The pumps can also synchronise with gas sensors such that they always make a pump stroke after a gas measure. This further removes the usual artefact of pressure oscillations. It is easy to integrate a Xavitech® pump in a system. Either the pump configuration is done by Xavitech® engineers or the customers use the flow calibration unit to set-up flow rate, vacuum power and input voltage themselves. The information from such a customer evaluation is then forwarded back to Xavitech®, thus providing a quick production transfer. Finally, it is important to notice that the allowed input voltage ranges from 3.2 to 26 volts without the use of voltage regulators. Thus, all the power loss in such a device is avoided.

> RECOMMENDED MODELS

- V200-GAS
- V1500-GAS

IF YOU ARE INTERESTED IN MORE INFORMATION ABOUT XAVITECH PUMPS OR NEED ASSISTANCE WITH THE DESIGN OF THE ELECTRONIC SYSTEM PLEASE FEEL FREE TO CONTACT US.

Product range folder gas 111026

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PUMP FOR NPWT

- ***Small size 21*21*37mm or 31*31*57mm***
- ***Programmable NPWT control system inside***
- ***Built-in alarm speaker & LED alarm control***
- ***Built-in vacuum sensing & control***
- ***Cost-effective longevity***
- ***Patented technology***

> OEM PUMP FOR NPWT

The Xavitech® pumps, P200 and P1500, are excellent choices for NPWT products. By merging NPWT product functionality into the microprocessor inside the pump and utilizing all the abilities of the pump, Xavitech has a truly integrated and miniaturized solution for the NPWT market.

> REFERENCE & EXPERIENCE

Xavitech has supplied thousands of pumps every year since 2007 to medical devices. The two pump models suitable for NPWT, P200 and P1500, are in production and used in many different applications.

Illustrated design presents a belt NPWT system containing a separate canister and a housing with user interface. The housing contains the P1500 pump from Xavitech and a battery.

> TECHNOLOGY

The pump technology is based on the patented X-life motor, which has very few moving parts. It does impress by being unique and simple. It is combined with a patented motion sensing and analysis system, which is integrated inside the pump. The system enables the pump to precisely sense vacuum without the use of any regular pressure sensor. The method it uses to sense vacuum is covered by patent. Moreover, the the pump has the ability to generate alarm sound using the pump membrane. At frequencies above frequencies that generate flow, the pump generates alarm tones. This allows the pump to give alarms such as low battery, canister full or leak. The pump also has the ability to estimate the amount of liquid inside a canister and thus give warning. Using the built-in microprocessor Xavitech can program the pump to control external LED indicators or displays. The pump regulates it's own power and can therefore be connected directly to almost any battery on the market. Since the pump is programmable it can be adjusted to the specification and interface requested by the market.

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> DESIGN CONCEPT

Presented here is an illustrated design based on the idea of a low-cost high-volume system to be sold for smaller wounds. The design is a wearble homecare device that has a separate disposable canister. The separate canister can also be of different sizes depending on the needs. The device illustrated would be the smallest one on the market but still housing our largest pump P1500 with one liter of flow.

> OUR OFFER

These pumps have the ability to become the next revolutionary miniaturized NPWT product. Xavitech is now looking for a partner that is willing to CE-mark and make the pump technology available to the market. Xavitech have developed concepts of housings and have the pump that would be used in them in full production. Functional pumps with NPWT software have been developed and are ready for demonstration. The partner should have good understanding of the wound care market.

> LEGAL DISCLAIMER

The pump P200 and V1500 or the design concepts presented are not finished CE marked medical devices. They are potential components for future medical devices and ideas.

> INTELLIGENT PUMPS INSIDE:

> P200-GAS

Motor type:	X-life motor
Supply voltage:	3.2 to 12 VDC
Wetted parts:	PPS and EPDM
Weight:	39 grams
Size:	21*21*37 mm
Flow:	450 ml/min
Vacuum:	125 mmHg

Direct battery operation

> P1500-GAS

Motor type:	X-life motor
Supply voltage:	3.2 to 12 VDC
Wetted parts:	PPS and EPDM
Weight:	105 grams
Size:	31*31*57 mm
Flow:	1 L/min
Vacuum:	150 mmHg

Direct battery operation

CONTACT INFORMATION

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