

BL SERIES DISC PUMP

The Lee Company's award-winning disc pumps generate pressure and vacuum in a small, silent, vibration-free form factor and are available with or without integrated electronics for added simplicity. The disc pump family is differentiated into various product series, with this entry-level BL Series Disc Pump striking a balance between performance and cost. Designed for highly precise, ultra smooth, gas and liquid⁷ flow control, our ultrasonic piezoelectric micropumps deliver unrivaled pneumatic performance and enable innovation wherever precision control of small volumes is critical. Their applications span medical, scientific, and industrial sectors, including:

- Microfluidics
- Point-of-care diagnostics
- Breathomics
- Compression therapy
- Patient monitoring
- Gas detection & analysis
- Medical training simulators

- True pulsation-free flow
- Silent: sound level <10 dB³
- Vibration-free operation
- Ultra fast millisecond response
- Lightweight: 5 g
- Compact size: 29 mm diameter
- Control precision⁴ less than 0.1%
- Infinite turndown ratio⁵
- Operating temperature range: 41°F to 104°F (5°C to 40°C)
- Humidity range⁶: 0 to 95% RH
- Pumping medium⁷: air. Liquids can be controlled indirectly



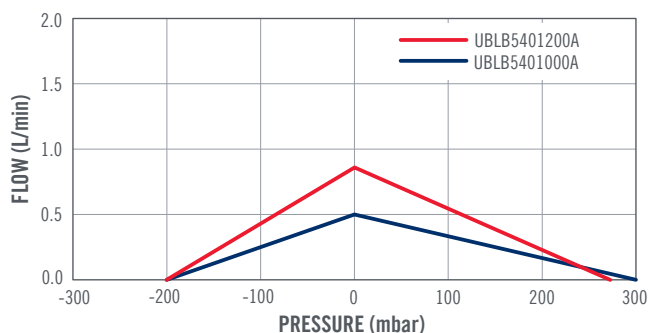
Our disc pumps are RoHS compliant, and their long life allows for maintenance-free system design. The Lee Company is actively developing higher performance

pump designs; if the performance listed is not sufficient for your application, please contact us to discuss your requirements.

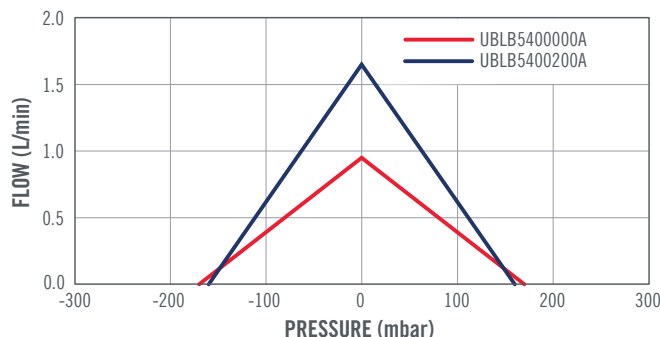
PART NUMBER*	CONFIGURATION	STALL PRESSURE ^{1,2}	FREE FLOW ^{1,2}	STALL VACUUM ^{1,2}
UBLB5401000A	Series	300 mbar	0.50 L/min	200 mbar
UBLB5401200A	Series	270 mbar	0.80 L/min	200 mbar
UBLB5400000A	Parallel	170 mbar	0.95 L/min	170 mbar
UBLB5400200A	Parallel	160 mbar	1.65 L/min	150 mbar

*Pump part number only. To specify a pump with the Smart Pump Module (which includes an integrated pressure sensor and electronics), replace the fourth character of the part number with a "C". See PDS 196 for more information.

SERIES CONFIGURATION



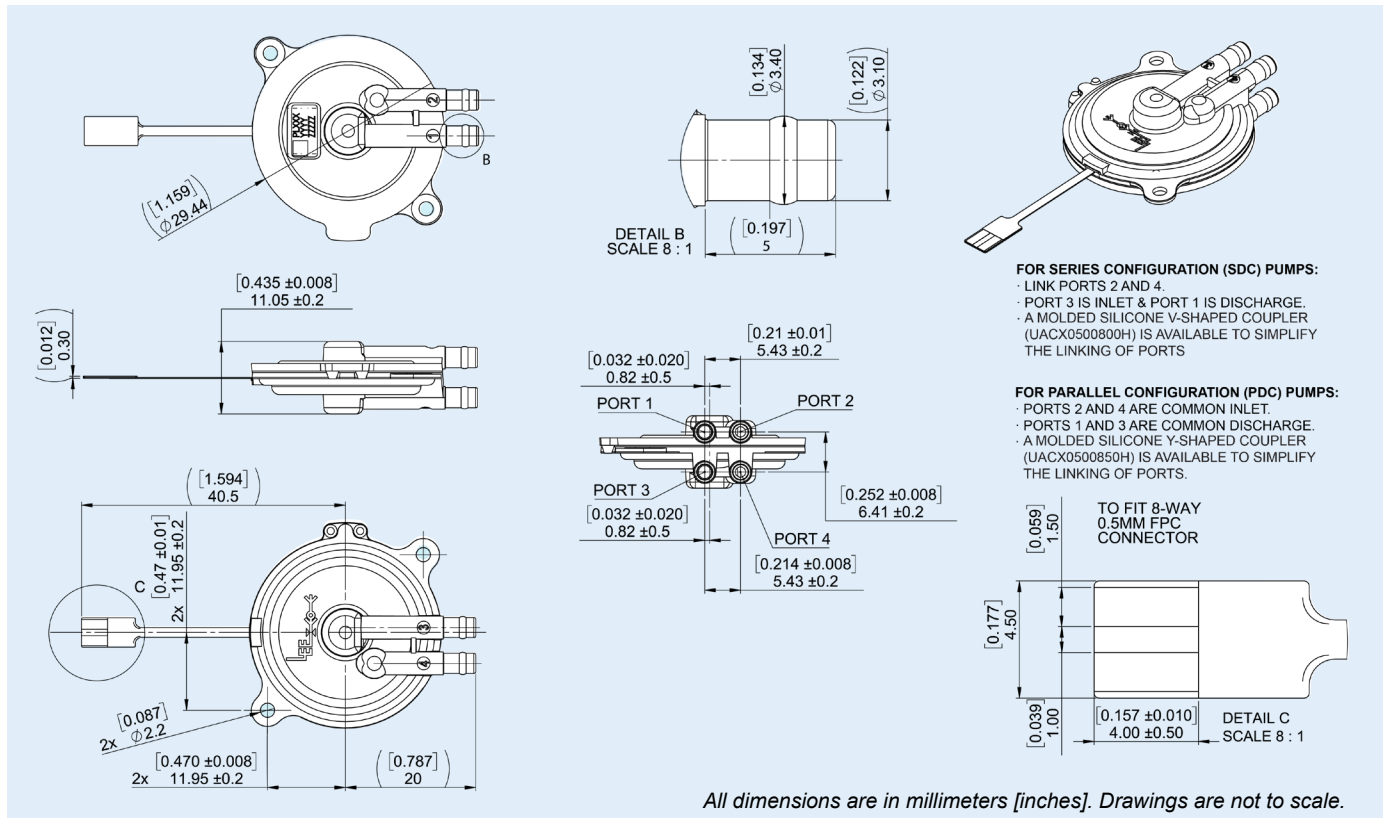
PARALLEL CONFIGURATION



See dimensional drawings on reverse.



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MOUNTING GUIDANCE

Mount in any orientation using compliant materials. If using mounting eyes on pump body, it is recommended to use a compliant O-ring (e.g. 1.42 mm ID x 1.78 mm CS nitrile 70 Shore A), a nylon M2 bolt, and a 4.35 mm x 5 mm threaded mounting stud. This mounting scheme isolates high frequency vibration and prevents audible noise. Note that metal bolts are not recommended for this reason.

ELECTRICAL OPERATION

- Typical driver requires 3.5 to 5.5 V supply
- Pump requires AC drive waveform of 20 to 22 kHz
- Pump drive voltage must not exceed 48 Vrms (where a typical square-wave drive Vrms \approx Vpk)
- Power: 0 to 1 W (continuous)
- Pump efficiency is application dependent
- Drive PCB and evaluation electronics available
- Reference circuits and firmware available to support product integration

FILTRATION

The use of an inlet filter with a pore size of 3 μ m or less is strongly recommended to prevent the ingress of particulates that might otherwise limit the lifetime of the pump.

Notes

1. Continuous operation at 1 W drive power (into the pump).
2. Performance data presented collected under normal temperature and pressure and ambient humidity conditions. Performance under other conditions may vary. In particular, note that performance decreases with altitude and may decrease at elevated temperature.
3. Per ISO 226:2003 and related studies; 30 cm equivalent measurement distance.
4. Pressure and flow: requires pump under closed-loop control with suitable sensor and drive electronics.
5. The disc pump's piezoelectric drive actuator has no stall speed. The pump can be controlled continuously between 0 and 100% maximum output.
6. Non-condensing; ingress of liquid-phase water will halt pump operation.
7. Liquid may be pumped indirectly in a "pressure driven flow" / "air displacement" regime.

The information presented herein is based on engineering data and test results of nominal preliminary units. It is believed to be accurate and reliable and is offered as an aid to guide in the selection of Lee products. It is the responsibility of the customer to determine the suitability of the product for the intended use and the customer assumes all risk and liability whatsoever in connection therewith. The Lee Company does not warrant, guarantee, or assume any obligation or liability in connection with this information. Product specifications may change without notice.

DEVELOPMENT KIT

This versatile plug and play kit (part number UEKA0500300A) enables control of solenoid valves and up to five disc pumps. With a user-friendly GUI, easily accessible software, onboard pressure sensors, and integrated valve drivers, the kit offers advanced fluidic control and allows you to quickly create functional prototypes for a wide range of applications, from microfluidic and liquid handling systems to medical devices and industrial instruments.



Pump(s) and valves sold separately. Contact your local Lee Sales Engineer, or visit our website at theleeco.com/devkit to learn more.

