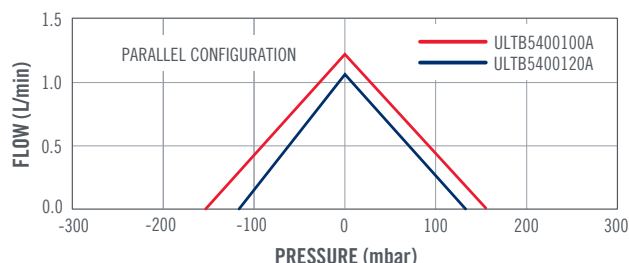
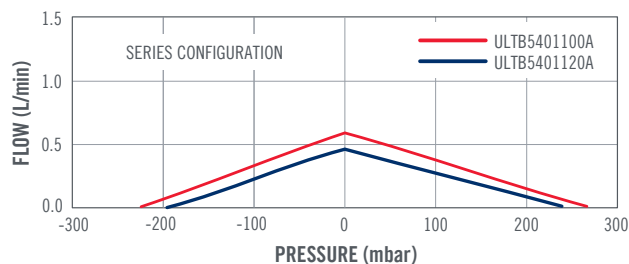


## LT SERIES DISC PUMP

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 the LT Series designed for conditions that maximize pump life. The entry-level LT Series models strike a balance between performance, life, and cost, while the enhanced performance models offer the longest life, higher flow, and higher-pressure capability.

Unlike traditional motor driven pump technologies, the disc pumps very rarely suffer catastrophic failures that cause them to stop pumping. Our enhanced performance models can deliver in excess of 17,000 hours<sup>8</sup> of continuous operation before the onset of performance degradation. Since the piezo actuator driving the pumping motion is far more robust than any motor, the life of the pump is referred to as the time it takes for the pump's performance to drop by a figure roughly 10% below the production level test acceptance criteria. Designed for highly precise, ultra smooth, gas and liquid<sup>5</sup> flow control applications our ultrasonic piezoelectric micropumps span medical, scientific, and industrial sectors, including:

- Air quality monitoring
- Compression therapy
- Point-of-care diagnostics
- Gas detection & analysis
- Leak detection
- Microfluidics
- Liquid handling
- Inkjet pressure control



See dimensional drawings on reverse.

- Long service life
- True pulsation-free flow
- Ultra fast response
- Silent: sound level <10 dB<sup>3</sup>
- Lightweight: 5 g
- Compact size: 29 mm diameter
- Exceptional power efficiency
- Humidity range<sup>4</sup>: 0 to 95% RH
- Pumping medium<sup>5</sup>: air. Liquids can be controlled indirectly.
- Control precision<sup>6</sup> less than 0.1%
- Infinite turndown ratio<sup>7</sup>

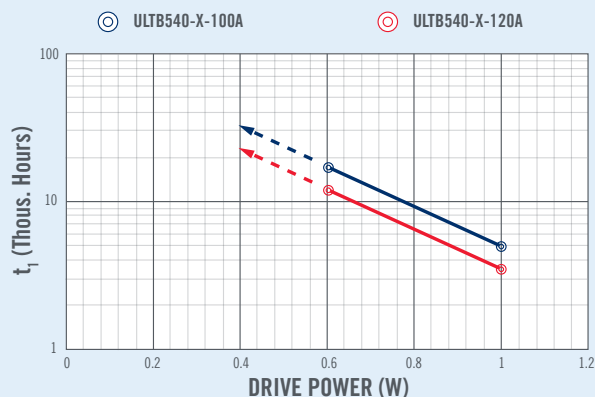


PART NUMBER*	CONFIGURATION	STALL PRESSURE <sup>1,2</sup>	FREE FLOW <sup>1,2</sup>	STALL VACUUM <sup>1,2</sup>	OPERATING TEMPERATURE RANGE
ULTB5401100A	Series	270 mbar	0.55 L/min	220 mbar	-13°F to 104°F (-25°C to 40°C)
ULTB5401120A	Series	240 mbar	0.49 L/min	197 mbar	41°F to 104°F (5°C to 40°C)
ULTB5400100A	Parallel	150 mbar	1.20 L/min	150 mbar	-13°F to 104°F (-25°C to 40°C)
ULTB5400120A	Parallel	133 mbar	1.07 L/min	116 mbar	41°F to 104°F (5°C to 40°C)

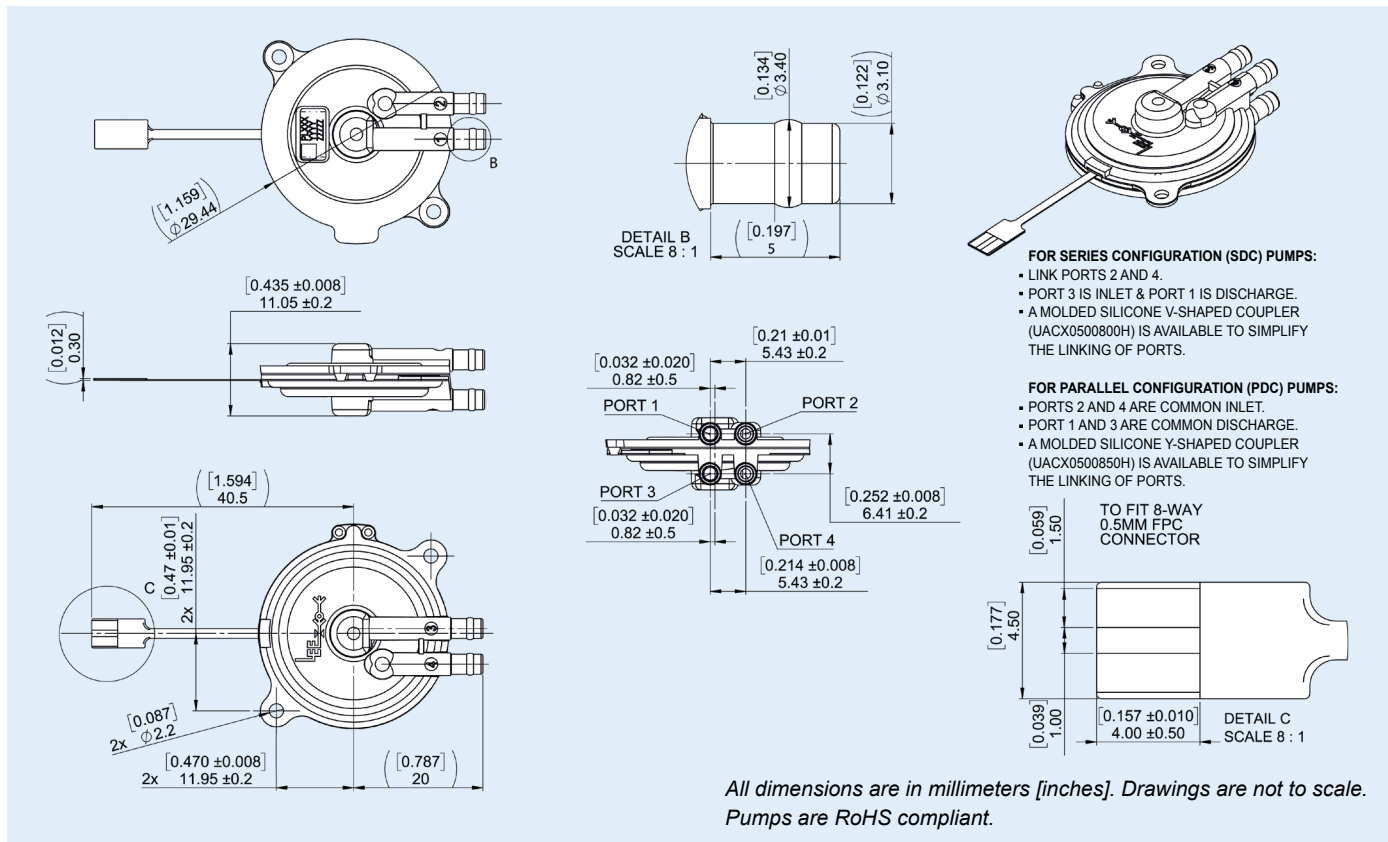
\*Pump part number only. To specify a pump with the Smart Pump Module (which includes an integrated pressure sensor and electronics), replace the fourth character of the part number with a "C". See PDS 196 for more information.

### TYPICAL LIFETIME CHARACTERISTICS

The LT Series Disc Pump has no prevalent sudden failure mode. Instead, beginning at a time defined as  $t_1$ , operational wear processes in the pump contribute to a reduction in peak pressure, capacity, and efficiency. The pump often continues to meet application requirements beyond  $t_1$ , which varies with drive power (amongst other operational parameters). If the performance listed is not sufficient for your application, please contact your local Lee Sales Engineer to discuss your requirements.



# LT SERIES DISC PUMP



## 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), 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  $V_{rms} \approx V_{pk}$ )
- 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  $\mu$ 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. Non-condensing; ingress of liquid-phase water will halt pump operation.
5. Liquid may be pumped indirectly in a "pressure driven flow" / "air displacement" regime.
6. Pressure and flow: requires pump under closed-loop control with suitable sensor and drive electronics.
7. The disc pump's piezoelectric drive actuator has no stall speed.
8. The pump will continue to operate beyond this point at a reduced performance level. Reference Technical Guide TG005 Disc Pump Wear Characteristics for more information.

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), valves, and power supply sold separately. Contact your local Lee Sales Engineer or visit [theleeco.com/devkit](http://theleeco.com/devkit) to learn more.

