THE LEE COMPANY

ELECTRO-FLUIDIC SYSTEMS

PRODUCT DATA SHEET

XP 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 XP Series Disc Pump offering the highest performing, most power efficient design and the widest operating temperature range. Designed for highly precise, ultra smooth, gas and liquid[6] 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

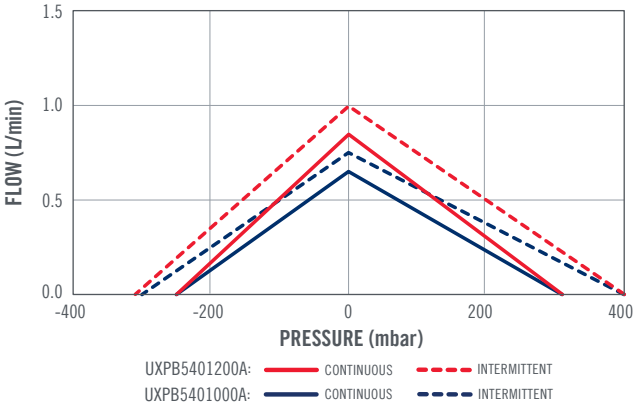
Our pumps are RoHS compliant and their long life allows for maintenance-free system design. The Lee Company is actively developing higher performance pump designs; if the performance listed is not sufficient for your application, please contact us to discuss your requirements.

- Exceptional power efficiency
- Operating temperature range: -13°F to 131°F (-25°C to 55°C)
- True pulsation-free flow
- Silent: sound level <10 dB[4]
- Vibration-free operation
- Ultra fast millisecond response
- Lightweight: 5 g
- Compact size: 29 mm diameter
- Humidity range[5]: 0 to 95% RH
- Pumping medium[6]: air. Liquids can be controlled indirectly
- Control precision[7] less than 0.1%
- Infinite turndown ratio[8]

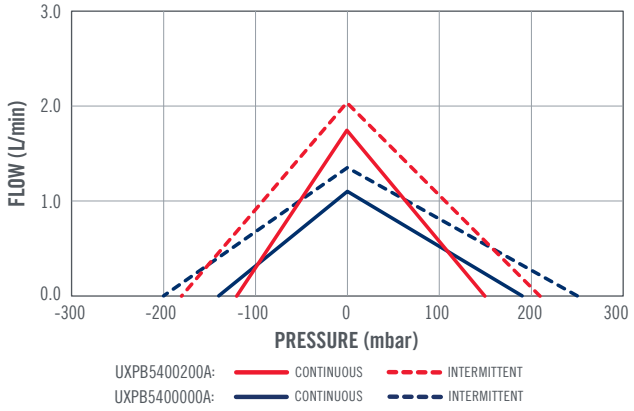
PART NUMBER	CONFIGURATION	OPERATION	STALL PRESSURE	FREE FLOW	STALL VACUUM
UXPB5401000A	Series	Intermittent[1,3]	400 mbar	0.75 L/min	300 mbar
		Continuous[2,3]	310 mbar	0.65 L/min	250 mbar
UXPB5401200A	Series	Intermittent[1,3]	400 mbar	0.96 L/min	295 mbar
		Continuous[2,3]	310 mbar	0.83 L/min	250 mbar
UXPB5400000A	Parallel	Intermittent[1,3]	250 mbar	1.35 L/min	200 mbar
		Continuous[2,3]	190 mbar	1.10 L/min	140 mbar
UXPB5400200A	Parallel	Intermittent[1,3]	210 mbar	2.00 L/min	180 mbar
		Continuous[2,3]	150 mbar	1.70 L/min	120 mbar

For fourth letter in part number: B = pump only, C = pump mounted on Smart Pump Module (SPM). For more information on the SPM, please see PDS 196.

SERIES CONFIGURATION



PARALLEL CONFIGURATION



See dimensional drawings on reverse.

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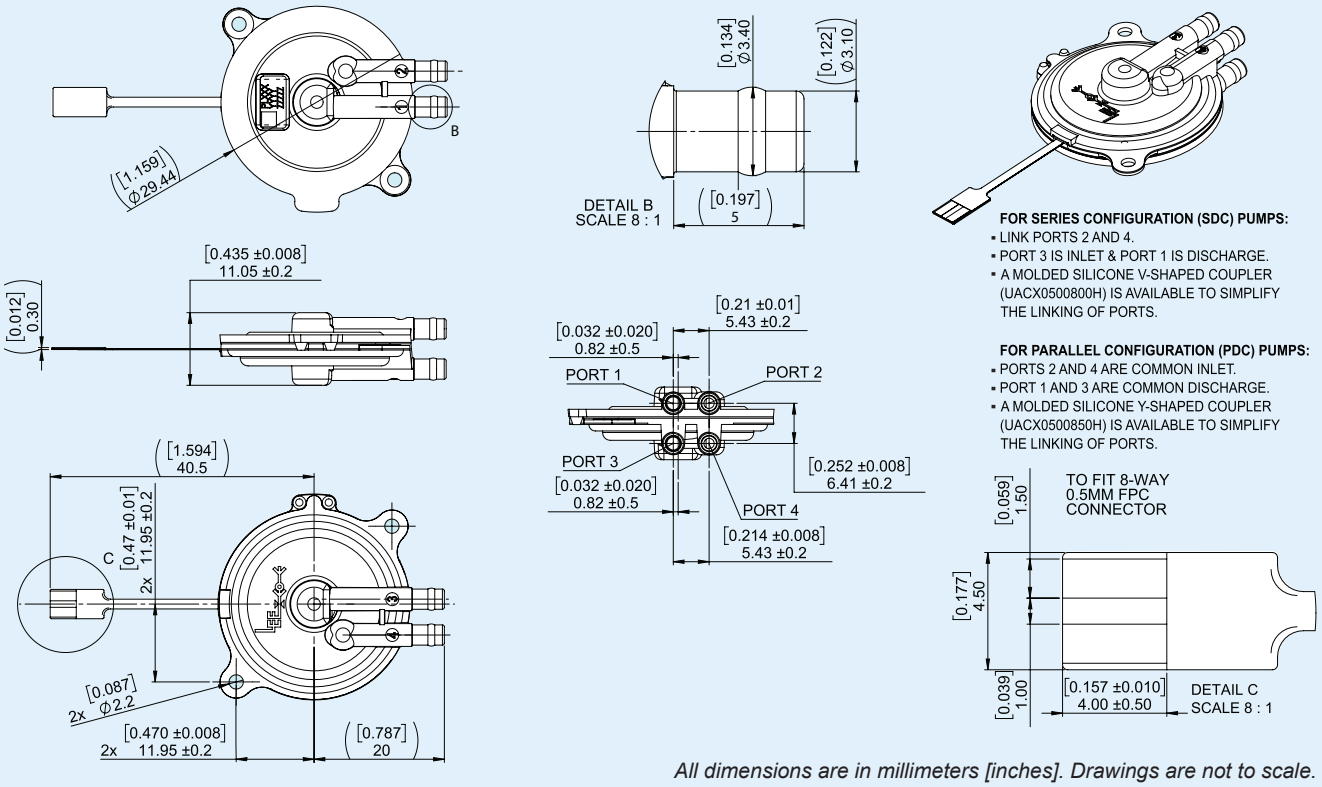
XP SERIES DISC PUMP



All dimensions are in millimeters [inches]. Drawings are not to scale.

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 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 ≈ 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 µm or less is strongly recommended to prevent the ingress of particulates that might otherwise limit the lifetime of the pump.

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.

Notes

1. Intermittent operation at 1.4 W drive power (into the pump). With intermittent operation, the mean power should be less than 1 W with a duty cycle period less than 20 s. Operational life may be shortened where mean pump drive power exceeds 1 W. **2.** Continuous operation at 1 W drive power (into the pump). **3.** 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. **4.** Per ISO 226:2003 and related studies; 30 cm equivalent measurement distance. **5.** Non-condensing; ingress of liquid-phase water will halt pump operation. **6.** Liquid may be pumped indirectly in a “pressure driven flow” / “air displacement” regime. Other gases / gaseous mixtures may be pumped, contact us for more information. **7.** Pressure and flow: requires pump under closed-loop control with suitable sensor and drive electronics. **8.** The disc pump's piezoelectric drive actuator has no stall speed. The pump can be controlled continuously between 0 and 100% maximum output.

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