

LEWA MICROFLOW-METERING PUMPS M3, M5, M8:

Electronically controlled diaphragm metering pumps for the laboratory



- zero leakage
- accurate
- low-maintenance
- reliable
- SIP-able

LEWA microflow-metering pumps M3, M5 and M8 have been developed especially for critical laboratory applications and incorporate LEWA's many years of experience in diaphragm pump technology.

Proven metal diaphragm technology

LEWA microflow-metering pumps M3, M5 and M8 feature metal diaphragms which are designed fatigue-proof, for virtually unlimited service life. The problems of wetted plunger seals are completely eliminated.

Complete tightness

LEWA diaphragm pump heads are hermetically sealed in both directions, which fulfills the most important laboratory safety requirements and eliminated environmental hazards.

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Hydraulic diaphragm actuation

The metal diaphragm of LEWA M pumps is completely supported and actuated hydraulically. This design practically eliminates the influence of the operating pressure and pressure fluctuations on the accuracy of the metered flow – especially when compared to mechanically actuated elastomer diaphragms or peristaltic pumps.

All-metal pump heads

For reliability and long life, the LEWA M pump heads are offered as standard in 316 Ti stainless steel or Hastelloy C. Other materials are available on special order.

High precision valves

The pumps are equipped with precision valves of ceramics and ruby (rather than metal valves) for outstanding tightness and resistance to wear (silicon valves available on special request). The highest metering accuracy and repeatability is thereby achieved with clean fluids used in laboratory service.

Sterilizable

The diaphragm pump head can be sterilized with superheated steam up to 150 °C for 30 minutes.

Heatable or coolable

The pump heads have connections to pass through coolant or heat transfer fluid on the sides.

Predictable long-term metering accuracy

The minimum of parts subject to wear guarantees continuous, problem-free operation and low maintenance costs.

Flow ranges from 0 ml/h

The flow range is adjustable via the two actuating variables stroke frequency and stroke volume, each from 0 up to the maximum of the respective pump type.

Electronic controls

The electronics have been especially developed by LEWA. They are integral with the housing and offer a full range of internal and external control. The linear stroke length adjustment allows the operator to optimize the volume displaced per stroke and the stroke frequency to match the particular application. External signal inputs allow the integration of LEWA microflow-metering pumps into control loops and to follow remote signals.

“Internal” control

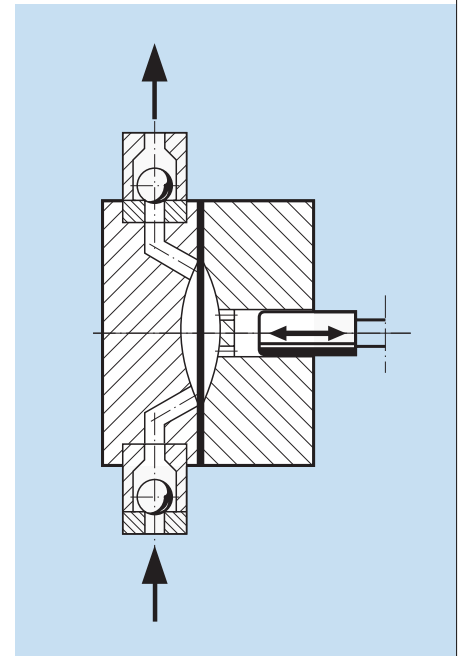
The stroke frequency knob on the front panel adjusts the pump’s linear frequency generator to control the stroking rate of the solenoid.

“Remote” analogous control

A remote guide signal of 4 to 20 mA adjusts the pump’s linear frequency generator to control the stroking rate of the solenoid.

“Remote” digital control

The closing of an external passive contact will cause the pump to produce one pumping stroke.



Function

LEWA MICROFLOW-METERING PUMPS M3, M5, M8:

Metered flow adjustment via stroke length

The displacer volume can be set at the unit accurately in percent and with linear characteristics. The stroke length adjustment allows optimization of stroke volume and stroke frequency to the corresponding application or, in the case of external frequency control, serves as additional ratio setter.

Simple operation

All controls and indicators are located on the front panel of the LEWA M pumps. The suction and discharge connections for the metered fluid as well as the ports for the heating/cooling liquid are readily accessible on the pump head at the front panel. The electronic assembly (plug-in printed circuit board) can be readily removed from the front side of the pump without tools after simply loosening the four knurled screws. This facilitates fast replacement, should service ever be necessary.

Space saving installation

LEWA pumps M3, M5 and M8 all have identical housings. As all controls, indicators and connections are on the front panel, a series of pumps can be installed in a small space either horizontally or vertically.

Quiet

The integral damping system makes the operation very quiet, thus maintaining the quality of a laboratory environment.

Accessories for safe operation

Recommendation: In the suction line "strainer with gas trap" (collecting contaminations and separating gas) and, in the discharge line "pressure retaining valve and start-up system" to prevent over-metering in low pressure applications and easy venting when starting-up against existing discharge pressure.

Technical Data

Pump type		M3	M5	M8
Metering flow	Q [ml/h]	0 to 250	0 to 250	0 to 1800
Operating pressure	$p_{r,min}$ [bar]	1	1	1
	$p_{r,max}$ [bar]	50	16	6
Suction pressure	$p_{s,min}$ [bar abs.]	1	1	1
	$p_{s,max}$ [bar]	25	15	5
Stroke volume	[ml]	0,022	0,063	0,16
Stroke frequency	[min ⁻¹]	0 to 185		

Adjustment of output via two variables:

- Stroke frequency 0 to maximum, manually adjustable, external control digital or analogous possible
- Stroke volume 0 to maximum, manually adjustable only

Metering accuracy at constant ambient conditions: +/- 1%

Wetted materials

	Standard	Hastelloy C
Diaphragm pump body	1.4571	2.4610
Diaphragm	1.4401 K	2.4610 K
Valve seats	Al ₂ O ₃ (OK1)	
Valve balls	Ruby	
Valve seals	PTFE, filled	
Valve springs	1.4571	2.4610

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Temperature limits

- Metered fluid: +10°C to +80°C
- Heating fluid: +100°C max
- Sterilization temperature: +150°C over 30 min

Connections

- Suction and discharge: ISO 228 G 1/8
- Heating / Cooling: ISO 228 G 1/8
- Purge (rear panel): 6mm ID hose [inert gas 20 mbar max.]

Power supply: 230 V/50 Hz/25 W max

External signals:

- Analogous: 0/4 to 20 mA, 250 Ohm load
- Digital: frequency 0 to 185/min
passive contact (closing)

Enclosure: IP 40

Dimensions H x W x D mm: 272 x 147 x 262

Weights:

- M3: 7,5 kg
- M5: 7,7 kg
- M8: 7,7 kg

Accessories supplied with pump:

- 1 m suction hose with ISO 228 G 1/8 fitting
- 1 set of valve seals
- 2 valve springs $\Delta p = 0,1$ bar
- 1 power supply cable