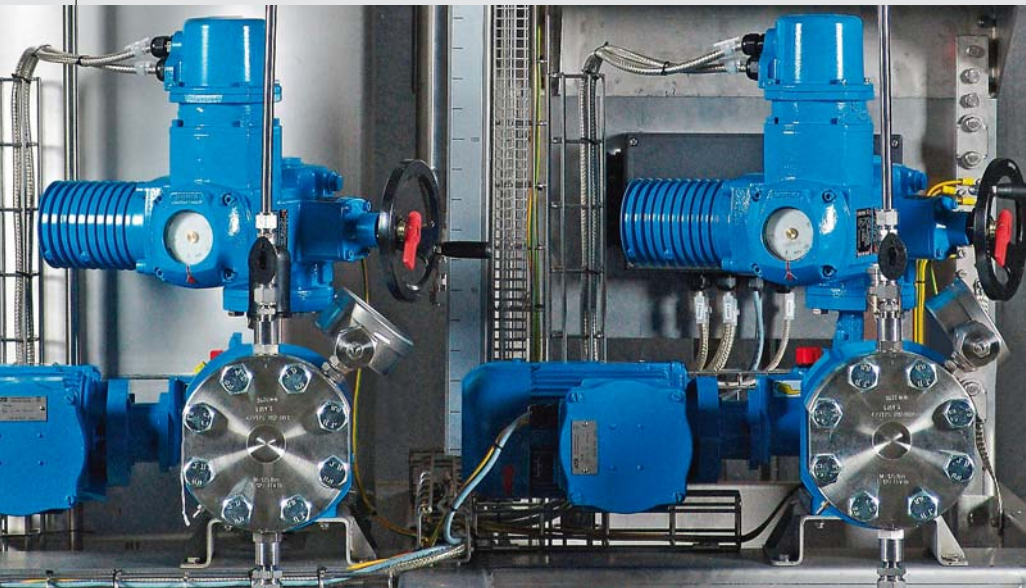


LEWA Metering Systems

Closed loop fluid metering
for automated processes



- **safe and reliable**
- **precise**
- **individual**
- **complete**

motralec

4 rue Lavoisier . ZA Lavoisier . 95223 HERBLAY CEDEX
Tel. : 01.39.97.65.10 / Fax. : 01.39.97.68.48
Demande de prix / e-mail : service-commercial@motralec.com
www.motralec.com

For universal applications: Modular LEWA metering systems



Highest safety:
LEWA metering systems are self-monitoring



Economical and precise:
all components are matched to each other



LEWA metering pumps are a practice-proven
basic component for odorization systems

Self-monitoring metering systems offering high reliability

A properly matched combination of electronics and proven system components assures the highest reliability of LEWA's self-monitoring metering systems. Their modular design allows optimum adaptation and integration to individual applications in process technology but also in the laboratory and research plants.

Perfect know-how from the metering pump to the turn-key package

LEWA will also solve your metering requirements, from the basic metering pump to a metering and mixing package ready to operate. The sound foundation for this is the competent selection and combination of all system components and their respective properties. Basic components frequently are proven LEWA metering pumps, providing the most important functions for metering technology:

extreme reliability and high accuracy. Precisely defined and reproducible stroke volume and a continuous adjustment via stroke length and / or stroke frequency are essential features. If, for safety reasons, the metered flow needs to be monitored by an additional flow meter this is the first step towards a system. A further addition in the connection is a micro-processor connecting the corresponding components in the best way possible electronically and considering the characteristics of the corresponding pump.

- almost 100 % safety for precise metering
- large performance range
- highly economical
- very broad application range
- all components match each other
- dialogfähige Programmierung
- dialogue-capable programming
- high metering accuracy
- prerequisite for optimum process guidance in automation



Accurate setting
via stroke length
and/or speed



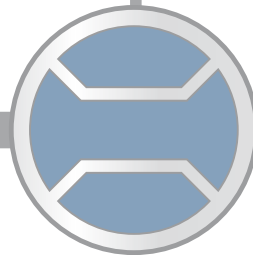
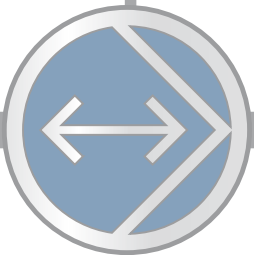
Perfect closed loop control:
LEWA FIS-DIALOG micro-processor

Performance table

Pressure	up to 1,200 bar
Flowrate	from 0.01 l/h – 1,500 l/h per pump head
Temperature	up to 200°C
Viscosity	5,000 mPas (higher viscosity on request)



Reliable and economical
metering: LEWA metering
systems operate in a closed
control loop



Precision from the start:
LEWA metering pumps



Monitoring of metered
flow: different flow meters
can be used

For economy and safety: Automated processes



High operational safety:
from minute to high volume flows

Plausibility check as safety aspect

The most basic metering system is a metering pump monitored by a flow meter. Optimum monitoring for this system however is provided by the FIS-Dialog micro-processor which was specially developed for such duties. It compares the adjusting value of the metering pump and the measuring signal of the flow meter and checks them for plausibility. Each deviation is recorded and signalled immediately. As the possibility of both signals failing at the same time is negligible these metering systems are extremely safe.

The components

Basically the flexibility and function of the FIS-DIALOG micro-processor allows the use of any pump type. Because of a series of convincing advantages however, specially for demanding applications, LEWA diaphragm metering pumps are being used preferably.

Advantages of the metering pump technology are the stable output characteristics even when temperature, viscosity and pressure fluctuate heavily as well as a series of additional, convincing features:

- flowrates can be adjusted precisely over a wide adjustment range
- easy flowrate adjustment via stroke length and stroke frequency
- very pressure-firm characteristics
- hermetically tight, zero leakage
- nearly unlimited dry operation
- nearly zero back-flow

The flow meters

They pick up volume- or mass flow and transmit the actual value determined to the controller. The flow meters most suitable for metering systems are shown in the table on page 6, special solutions are available on request.

- measuring range from 0,01 l/h up to 180 m³/h

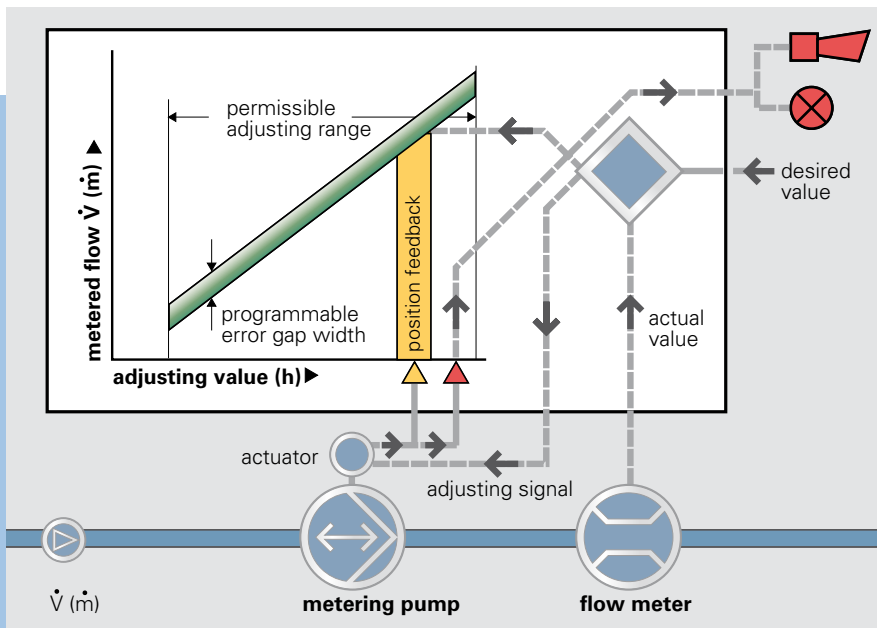


Precise, reliable and economical:
LEWA metering pumps

The FIS-DIALOG micro-processor

A compact micro-processor specially developed for the requirements of fluid metering by LEWA. All functions required for a specific application can be selected freely in a dialogue. Process parameters are entered via the user friendly front display. In operation the FIS-DIALOG micro-processor carries out a plausibility check and, at the same time, compares the pump characteristics with the signal of the flow meter. For this it must know the adjusting characteristics of the metering pump exactly. The FIS-DIALOG micro-processor software allows easy programming of the pump characteristics with its permissible error gap width and the control range required by entering a few parameters.

- inputs for all volumetric and gravimetric flow measuring equipment
- outputs for the control of the adjusting elements in all signal shapes required
- in and output signals can be freely selected via a menu



Plausibility check for high safety: The FIS-DIALOG compares metering pump and flow meter signals



The specialist for metering pumps: the FIS-DIALOG micro-processor

- buffered memories protect the data against power loss
- Analog interface (0)4..20 mA to higher-level control system
- the programmed learning function, that is the adaptive closed loop control, allows easy and fast commissioning and adaptation to changing operating conditions
- important input data can be protected by passwords

The adjusting elements

The adjusting elements of LEWA metering systems – depending on the adjusting signal of the upstream controller, change the adjusting signals stroke length and / or speed. By direct adjustment of the desired value following the characteristic pump curve the metered flow can be balanced very fast.

Everything is perfectly matched to each other and supplied from a single source

Pumps, flow meters, controllers and adjusting elements must be matched exactly. This is a special competence

of LEWA. The selection of the components is carried out following economical and technical aspects. In addition to LEWA pumps a series of quality process technology products are available for this product range. Their proper interaction in the system is proven.

Alternative: PLC Control

As an alternative to FIS-DIALOG, a metering system can be equipped with a PLC control system and operator panel. All software functionalities of the FIS-DIALOG are mapped to the PLC.

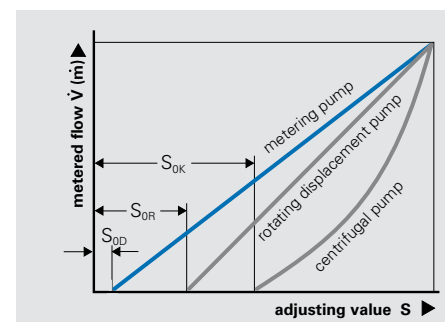
Additional capabilities:

- interfacing to a higher-level control system is possible via bus systems such as Profibus DP, CAN, MOD bus or Ethernet
- operator panel for use in explosion hazard zones I and II is also possible
- multiple metering pumps may be driven via a PLC and an operator panel
- may be used for both flow control and volumetric ratio control

- auxiliary sensors can be integrated, as can other control systems such as pressure control, regulation of pH-value, conductivity, etc.

Decades of experience

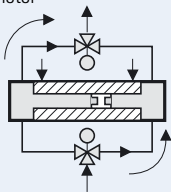
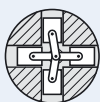
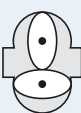
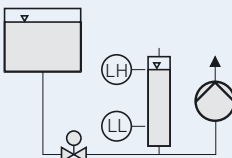
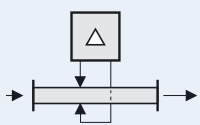
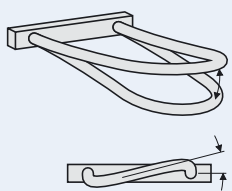
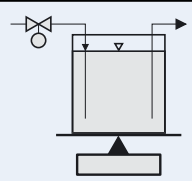
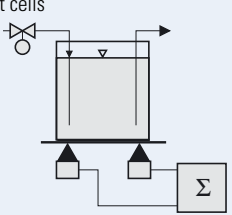
LEWA offers the total know-how and over 50 years of fluid metering experience to its customers. This adds essentially to an optimum economical and technical selection of LEWA metering systems.



Advantage of the metering pump: the pressure stiff characteristics

S_{0K} : adjusting value metering pump
 S_{0R} : adjusting value rotating displacement pump
 S_{0D} : adjusting value centrifugal pump

For diverse requirements: A large selection of flow meters

measuring system	measuring principle	design	meas. range		pressure	viscosity	temperature	remarks
			\dot{V}_{\min} (\dot{m}_{\min})	\dot{V}_{\max} (\dot{m}_{\max})	p_{\max} bar	η_{\max} mPa·s	ϑ_{\max} °C	
volume flow meter	displacement measurement	linear piston meter 	10 ml/h	1000 ml/h	12	200	80	<ul style="list-style-type: none"> tight can be used on suction and discharge
		multi piston meter 	0,1 l/h	15 l/h	25	200	80	<ul style="list-style-type: none"> tight can be used on suction and discharge
		ovalwheel counter 	0,1 l/h	15 m³/h	3000	20 000	180	<ul style="list-style-type: none"> tight can be used on suction and discharge
	level measurement	measuring burette 	0,1 l/h	5 m³/h	0	5 000	80	<ul style="list-style-type: none"> venting required can be used on suction only
	induction measurement	inductive flow meter 	12 l/h	150 m³/h	40	50 000	120	<ul style="list-style-type: none"> tight can be used on suction and discharge conductivity > 5 µs/cm
mass flow meter	Coriolis force measurement	mass flow meter 	0,02 kg/h	100 t/h	400	10 000	260	<ul style="list-style-type: none"> tight insensitive to contamination and gas can be used on suction and discharge
	weight measurement	scale 	10 g/h	10 t/h	0	50 000	80	<ul style="list-style-type: none"> venting required can be used on suction only
		weight cells 	100 g/h	10 l/h	0	50 000	80	<ul style="list-style-type: none"> venting required can be used on suction only

Others are possible upon request

For every occasion: The LEWA product range

For laboratories & pilot plants: LEWA micro-flow pumps

These micro-flow metering pumps with hydraulically actuated metal diaphragms are primarily used in laboratories and for test procedures in pilot plants.

Performance range

Flow rate	bis 0.04 m ³ /h (10.6 USgph)
Discharge pressure	up to 560 bar (8,100 psig)

For low pressures: LEWA ecodos®

Standard diaphragm metering pumps for low pressure use, using a mechanically actuated PTFE quadruple diaphragm for multiple security. Can also be combined as a multiple pump.

Performance range

Flow rate	up to 1.5 m ³ /h per pump head (400 USgph)
Discharge pressure	up to 20 bar (300 psig)

For jobs requiring mechatronics & intelligence: LEWA intellidrive

LEWA intellidrive combines a proven product lineup with the latest advances in drive technology

For medium to high pressures: LEWA ecoflow®

LEWA ecoflow® offers the most advanced metering diaphragm pumps with leak-free safety for medium and high pressures – not least because of the unique Diaphragm Protection System (DPS).

Performance range

Flow rate	up to 10 m ³ /h per pump head (2,650 USgph)
Discharge pressure	up to 1,200 bar (17,400 psig)

For high pressures: LEWA process diaphragm pumps

The leak-free LEWA process diaphragm pumps for high flow rates are the tightness standard in high-pressure process technology. Using LEWA triplex® process diaphragm pumps, even critical, toxic or flammable liquids can be conveyed safely. Even extremely low viscous, non-lubricating fluids or abrasive suspensions can be handled successfully.

Performance range

Flow rate	up to 180 m ³ /h (790 USgpm)
Discharge pressure	up to 1,200 bar (17,400 psig)



LEWA micro-flow metering pumps



LEWA ecodos®



LEWA intellidrive



LEWA ecoflow®



LEWA triplex® process diaphragm pumps



LEWA Service

LEWA not only is a supplier but also a partner of its customers and offers comprehensive service activities from consulting to fluid evaluation and pipeline calculation, fast spare parts supply, maintenance and repair and training of customers personnel.

For more information, please request our individual brochures.

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Tel. : 01.39.97.65.10 / Fax. : 01.39.97.68.48

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