

LEWA odourizing systems

for natural gas, biogas and liquefied gas



- **reliable**
- **safe**
- **economical**

For a wide range of applications: odourizing systems designed to meet your requirements



Odourization of LPG (Liquefied Petroleum Gas) during ship loading



Odourization for propane and butane and other technical gases



Odourization for oxygen and other technical gases

Customized solutions

Consumer protection is the prime concern in terms of odourizing city gas in distribution networks or oxygen odourizing in shipyards. LEWA not only supplies its customers with reliable odourizing systems but also supports them as a competent partner with extensive know-how in odourization.

The development of LEWA odourizing systems is based on over 30 years of comprehensive, worldwide studies conducted on requirements and regulations. Our systems meet national and international regulations and are noted for simple and safe operation and maintenance.

Covering a wide range of gases

LEWA offers standard odourizing systems as well as customized odourizing systems for odourizing the following gases and gas mixtures:

- natural gas (methane)
- liquefied gas (propane, butane)
- biogas
- technical gases (gas mixtures)
oxygen, nitrogen and others

Economical metering of odourants

LEWA odourizing systems allow for safe and economical flow-proportional metering of all current sulphurous and sulphur-free odourants, e.g.:

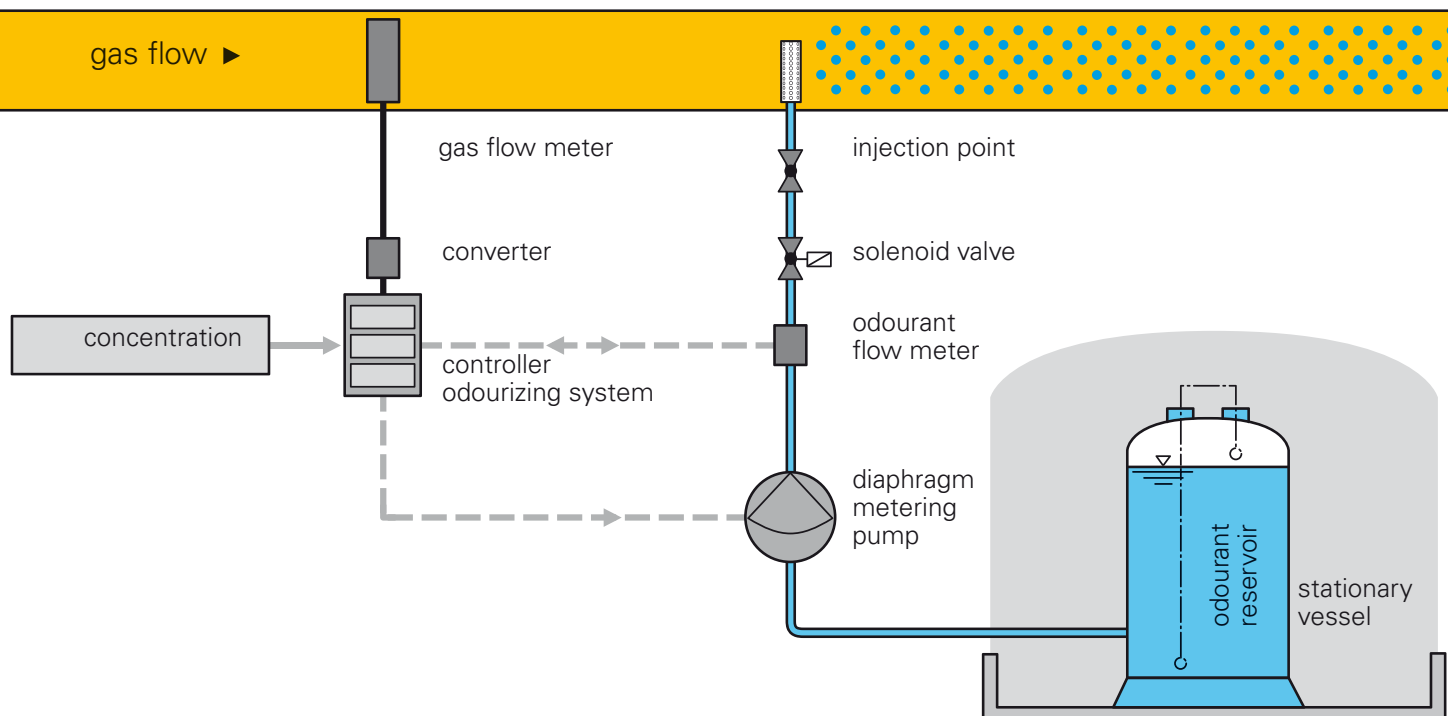
- thioethers (Tetrahydrothiophene, Dimethylsulfide)
- thioles (Mercaptane, Mercaptane mixtures)
- acrylates (low-sulphur and sulphur-free)



Odourizing of natural gas



Very important for the consumer:
proper injection rate of odour-
ants when it comes to perceiving
smells



Reliable and economical: LEWA odourizing systems

We offer standard and customized odourizing systems which are backed by more than 30 years of experience. Most of the components are modular in design thus enabling requirements for new upgrades to be met. Metering pumps, volume flow measuring system (odourant) and electronic components are from a single source.

Tanks in different sizes

We offer systems for stationary vessels and returnable tanks from 25 l to 1000 l and upon request, even tank sizes of up to 10,000 l.

Visible level indicator control

The visual level indicator can also be used for calibration purposes. Odourant low level indicators and control mechanisms to prevent overfilling according to TRbF (German regulation for the handling of combustible liquids) are installed in systems with a local tank as a standard.

Electronic controls

The controlling device provides flow-proportional odourization dependent on gas flow and is available in various designs.



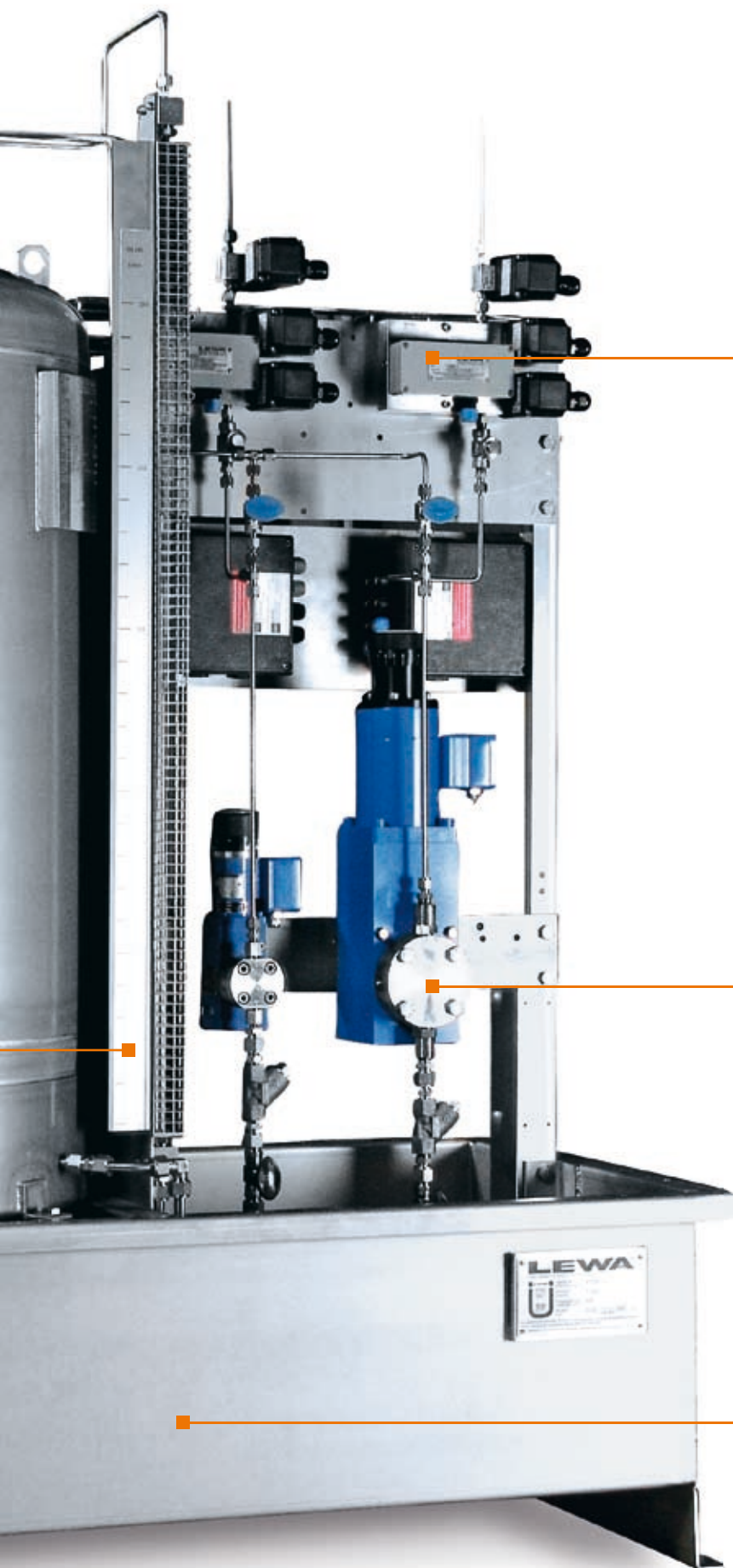


Photo: Odourizing system type OD 240

High degree of measuring accuracy

The flow meter monitors the odourant's metering flow. Depending on the size of the system and the design of the metering pump, we offer flow meters with a measuring accuracy of $\pm 1\%$ to meet the individual local requirements.

Precise metering

LEWA diaphragm pumps are hermetically tight, provide for an extremely long service life and easy maintenance. The diffusion-tight metal diaphragm is hydraulically actuated thus minimizing wear and tear while considerably increasing reproducibility and reliability.

Leakproof

Drip pans meet the regulations for local systems for storing substances hazardous to waters. They conform to the WHG (Water Resources Act) and the VAwS (Land ordinances on storing, filling and transporting substances harmful to water) including all required documentation.

For tightness and safety: LEWA pump technology



Magnetically driven pump Type MAH



Magnetically driven pump Type MBH



Magnetically driven pump Type MLM

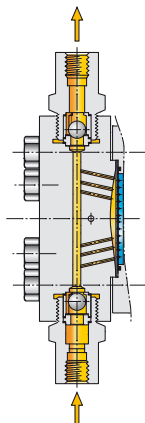


Motor-driven pump Type ecoflow LDB

LEWA diaphragm pumps are precise, hermetically tight, provide an extremely long service life and are easy to maintain.

The diffusion-tight metal diaphragm is odour proof. The diffusion-tight metal diaphragm is hydraulically actuated thus minimizing wear and tear while considerably increasing reproducibility and reliability. All wetted parts are made of corrosion-resistant stainless steel.

Depending on the type of application, magnetically driven, pneumatically driven or electrically driven pumps are used.



Type LEWA ecoflow

Overview technical data

Magnetically driven pumps in the MAH series							
Plunger diameter	3	5	8				
Pump capacity [l/h]	0.175 - 0.2	0.4 - 0.5	1.0 - 1.3				
Pressure [bar]	20 - 30	10 - 16	4 - 5				
Magnetically driven pumps in the MBH series							
Plunger diameter			8	10			
Pump capacity [l/h]			1.5 - 1.8	2.4 - 2.5			
Pressure [bar]			25 - 50	25 - 40			
Magnetically driven pumps in the MLM 15 series							
Plunger diameter	3	5	8	10	12		
Pump capacity [l/h]	0.3	1	2.8	5	7.5		
Pressure [bar]	300	80	30	20	10		
Magnetically driven pumps in the MLM 40 series							
Plunger diameter	3	5	8	10	12	16	
Pump capacity [l/h]	0.3	1	2.8	5	7.5	15	
Pressure [bar]	560	200	80	50	30	20	
Motor-driven pumps in the LEWA ecoflow LDB series							
Plunger diameter			8	10	12	16	20
Pump capacity [l/h]			5	9	12.5	25	35
Pressure [bar]			350	250	170	95	60

For precise adjustment and monitoring: electronic controls



modular design in
19" rack



modular design in
wall casings



OKR 7 in 19" racks



OKR 7 in control cabinet
for mounting on walls

For all installation sites: The electronic components specially designed for the open and closed loop control of LEWA Odourizing systems can be mounted in 19" assemblies or in housings with IP66 protection class and EExd protection class for hazardous areas.

LEWA odourization systems are open and closed loop controlled and monitored (optional) by specially developed electronic components.

Most of the components have a modular design in order to meet requirements for new systems and upgrades from proportional control through to monitored and closed loop odourization.

Standard models: modular control

- safe and easy to operate
- IP 66 protective class
- casing available in 19" assembly racks or for wall mounting
- supply voltage of 100–240 V AC or 24 V DC

Flexibly upgradable: electronic regulation with OKR

- safe and easy to operate
- monitoring and closed loop control target/actual values
- indicator for odourant concentration (target/actual)
- IP 66 or EExd protection classes
- casing available in 19" assembly racks or for wall mounting
- supply voltage of 100–240 V AC or 24 V DC
- compatible with all pump drives
- available with RS 232, RS 485 or MODBUS interfaces (RTU)
- compatible with all current gas flow meters
- connectable to a solar energy system
- accessible and adjustable via Internet (option: LEWA Netport@I)
- compatible with all approved volume flow measuring systems (odourants)
- batch odourization optionally possible



OECD for installation in hazardous areas

For local filling: systems with stationary vessels



Odourizing system OD450 series with 2 x MBH and 2 x MAH pumps



Odourizing system type OD240 with MAH and MBH pump



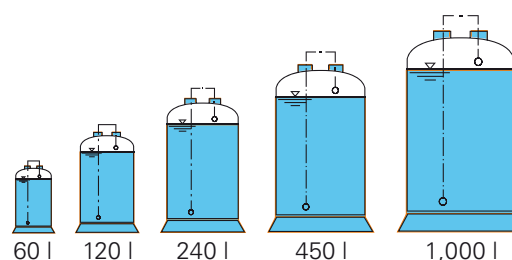
Odourizing system type OD60 with MAH pump

Standard systems for special applications

These systems are used for odourizing oxygen, nitrogen and combustion gases. They are available as a compact system and come with metering pumps, measuring devices and electronic components. Also optionally available in a lockable, stainless steel cabinet.

Standard systems with stationary vessels

- stationary vessels in sizes 60 l, 120 l, 240 l, 450 l, 1000 l
- filling of vessels on site at the system from disposable barrels, semi-bulk containers, tank cars
- the vessels are certified explosion pressure resistant
- models optionally available with suction pressure



Specifications of system type and odourant vessel size for systems with stationary vessels

stationary vessel size [litre]	Maximum odourizable gas flow [Nm ³ /h] with an odourant concentration of 20 µl/Nm ³						
	10,000	20,000	30,000	70,000	100,000	200,000	500,000
60	X	X					
120	X	X	X				
240		X	X	X			
450			X	X	X		
1,000				X	X	X	

Larger odourant storage vessels available upon request.

For interchangeable drums: systems with returnable tanks



OD 7 with MAH pump and 50 l returnable drum



OD 8 with MAH pump and 200 l returnable drum



OD 7 with MAH pump in stainless steel cabinet, system for odourizing oxygen

Standard systems for refillable vessels OD 7/OD 8

- standardized vessel sizes 25 l, 50 l, 100 l and 200 l
- filling performed centrally at the odourant supplier
- complete drainage via reserve vessel possible
- change of vessels without interruption during odourization
- tapered screwed fitting or quick release coupling

Specifications for the type of system and odourant vessel size for systems with returnable vessels

Returnable vessels		Maximum odourizable gas flow [Nm ³ /h] with an odourant concentration of 20 µl/Nm ³					
[in litre]		10,000	20,000	30,000	70,000	100,000	200,000
	25	OD 7					
	50	OD 7	OD 7				
	100		OD 7	OD 7			
	200		OD 8	OD 8	OD 8		

Larger odourant storage tanks available upon request.

Design of LEWA diaphragm pumps for both system types

Max. allowed gas pressure		Maximum odourizable gas flow [Nm ³ /h] with an odourant concentration of 20 µl/Nm ³					
[bar]		10,000	20,000	30,000	70,000	100,000	200,000
	5	MAH / 3	MAH / 5	MAH / 5	MAH / 8	MLM 15 / 8	MLM 15 / 10
	16	MAH / 3	MAH / 5	MBH / 8	MBH / 10	MLM 15 / 8	MLM 15 / 10
	30	MAH / 3	MBH / 8	MBH / 8	MBH / 10	MLM 15 / 8	MLM 40 / 10
	80	MLM 15 / 3	MLM 15 / 5	MLM 15 / 5	MLM 40 / 5	MLM 40 / 8	LDB 8
	150	MLM 15 / 3	MLM 40 / 5	MLM 40 / 5	MLM 40 / 5	LDB 8	LDB 8
	300	MLM 15 / 3	-	-	-	-	-

For gas flows between the above mentioned maximal values, the corresponding higher value must be taken into consideration for selecting pumps and systems.

For customer-specific requirements: individual LEWA odourizing systems



OD 240 with 2 x LEWA ecoflow LDB diaphragm pumps



Customized system with 250 l tank, MBH pump, transfer fittings for 200 l (55 gal) disposable drums



3000 l storage tank with LEWA ecoflow LDB diaphragm pump, control for non-hazardous areas



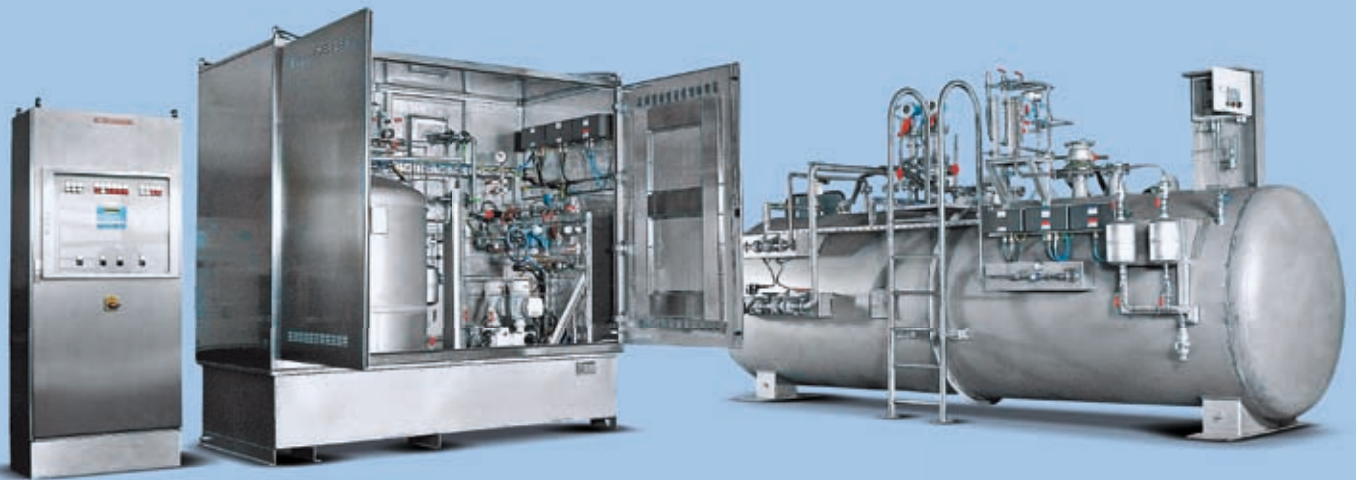
OD 240 in cabinet with heating unit and insulation, transfer from disposable drums, Ex controls suitable for hazardous areas.

LEWA also offers specific solutions tailor made to customers' applications in addition to its standard products.

In accordance to different national and international laws and regulations, these systems also take into account special operating data and those operating conditions on site. Using this data as a basis, LEWA builds and delivers systems worldwide which are tailored exactly to customers' requirements. The mechanical and electronic components are custom-made. This is a result of LEWA's extensive experience in the field of metering technology and package building.

Customized special design, such as:

- ATEX design
- ASME VIII compliant
- stainless steel pan
- electric stroke adjustment
- Promass flow meter
- monitored and controlled via Internet (option: LEWA Netport@I)
- integration into existing systems (possible)



10,000 l tank, double-walled, OD 1000 in cabinet with 2 x LEWA ecoflow LDB diaphragm pumps, control cabinet for outdoor installation



10,000l tank with 4 x EK 1 pumps, control cabinet with back-up battery for 3 hours. Use of 44 gal. disposable odour drums as supply tanks.

For guaranteed operating reliability: equipment and accessories

So that only odourized gas and not the odourizing system or its environment smells, we give top priority to quality. LEWA lives up to this high standard from construction to production and initial operation of its odourizing systems and meets the standards down to the last detail.



Drip pan 240 l with certified collecting pan



OD 240 in cabinet with 2 x LEWA ecoflow LDB diaphragm pumps and LFM 10 flow meter



Sight glass for fill level indicator and pump calibration

Pans

- optimally adapted to the size and type of system
- type tested with 3.1 B certification
- tightness test with dye penetration test
- includes all required documentation

Cabinets

LEWA offers a variety of stainless steel cabinets.

Level indicator

Burette for level indication in vessel for manual control to prevent overfilling according to TRbF (German regulation for the handling of combustible liquids) are installed in systems with a stationary vessel as a matter of course. A level indicator with evaluation unit (4–20 mA) is optionally available. Alternatively, a float switch may also be used to determine the reserve level.

Connecting parts

Pipe connections are delivered with double clamp ring screwed fittings as standard. They remain absolutely tight even after repeated assembly and disassembly. Hose connections also optionally come with a special safety coupling to reliably prevent odourant leakage when changing tanks.

Flushing system

Odourants are removed from the pump head and pipelines before maintenance work by the flushing systems, thus facilitating work and greatly reducing any obnoxious smell.

Pressurized preloading design for overlong storage of nitrogen (optional)

By protecting the vessels with safety valves, (adjustable pressure max 0.5 bar) the system remains below regulations for pressure devices and does not require any additional or separate inspections. Pressure charging devices prevent odourant gas emission in the suction lines, especially when handling odourants with high vapour pressure.

Flame arrester

LEWA odourizing systems optionally come with flame arrester.

Solenoid valves

For metering rates less than 400 Nm³/h a solenoid valve is required on all equipment to prevent backflow.



Oscillating plunger flow meter type LFM 10 with two filters

Precision down to the last detail:
Standard injection point with integrated non-return valve



Active charcoal filter

The active charcoal filter ensures an odour-free environment when the system is either being filled or maintained. An active charcoal filter for exhaust air treatment comes as standard in every odourizing system.

Pressure gauge for the discharge line (optional)

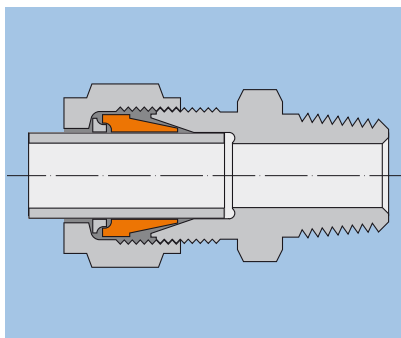
The use of a pressure gauge allows for a quick visual check of the pump function.

Flow meter

LEWA can connect all current flow meters to the control unit.

Injection point

Injection points with very large evaporation surfaces guarantee optimum distribution of odourants in the gas. A non-return and two shut-off valves prevent gas and odourant leakage during maintenance work.



Safety down to the last detail with double clamp ring screwed fitting



Active charcoal filter volume: 7.0 l for OD 450 and OD 1000



Safety is standard: all drip pans are tested and certified.



Pressure gauge also available as an option for the discharge line



LEWA flow meter type KMM1 with filter

For every occasion: The LEWA product range



LEWA micro-flow metering pumps

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	up to 0.04 m³/h
Discharge pressure	up to 560 bar



LEWA ecodos

For low pressures: LEWA ecodos metering pumps

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

Performance range

Flow rate	up to 1.5 m³/h per pump head
Discharge pressure	up to 20 bar



LEWA ecoflow

For medium to high pressures: LEWA ecoflow metering pumps

LEWA ecoflow offers the most advanced, safe, leak-free metering pumps for medium and high pressures.

Performance range

Flow rate	up to 10 m³/h per pump head
Discharge pressure	up to 1,200 bar



LEWA triplex process diaphragm pumps

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 m³/h
Discharge pressure	up to 1,200 bar

For closed control loops: LEWA metering systems

LEWA is the first point of contact in the market for high-performance yet economically designed metering systems. These are modular combinations of pumps, valves and controls for stroke length and speed, flow meters (volume or mass flow) and controllers. The metered flow is adjusted in a closed control loop.

For process automation: LEWA metering packages

LEWA metering and mixing packages for process automation are available either as standard variants ready for connection, or designed by LEWA specifically for the customer's request. LEWA can supply complete, ready to operate problem solutions. Our services range from engineering to commissioning – including individual package controls, process visualisation, logging of operational data and external interfaces to the process guiding system.



LEWA metering systems
and chemical injection packages

For sterile applications: LEWA Sanitary & Hygienic

LEWA supplies special sanitary and hygienic diaphragm pumps for metering tasks in hygienic, aseptic or sterile procedures, whether for food and beverages or for pharmaceuticals and personal care.

Performance range

Flow rate	up to 4.5 m³/h per pump head
Discharge pressure	up to 350 bar

For more information, please request our individual brochures.

For long-lasting operation: service, maintenance, training



Quick on-site: whether its support, maintenance or service, being close to customers is our main concern

For LEWA a partnership does not end after the purchase and initial operation of the odourizing system.

We offer comprehensive service packages which can be tailored to your requirements. Everything from a single source, everything from the manufacturer who knows his products best inside and out. Our specially trained and experienced service LEWA technicians are happy to carry out maintenance work on your systems. All maintenance work is performed according to local regulations and documented in the form of a service report. Taking advantage of a service contract with fixed maintenance intervals can reduce your costs, and therefore guarantee a high level of operational availability of your system.

We ensure the safe disposal of cleaning agents used during maintenance work and worn parts even for complete older systems or system parts. System support and service are carried out by LEWA's worldwide distribution network. This includes completely equipped vehicles with all necessary replaceable and spare parts on board available around the clock.

Practical seminars offered at LEWA or, if requested, at the customer's location, give your staff sound know-how at first hand and complete the comprehensive service programme provided by LEWA.



We offer practical seminars for operational staff as well as engineers and technicians through the LEWA Academy.

For short distances: LEWA at your service worldwide

**Germany / Headquarter**■ **LEWA GmbH**

Ulmer Str. 10
71229 Leonberg
Phone +49 7152 14-0
Fax +49 7152 14-1303
lewa@lewa.de
www.lewa.de

Japan / Headquarter■ **NIKKISO CO. LTD.**

3-43-2, Ebisu, Shibuya-ku,
Tokyo 150-8677
Phone +81 3 3443-3711
Fax +81 3 3473-4963
www.nikkiso.com

Austria■ **LEWA Pumpen GmbH**

1150 Vienna
Phone +43 1 8773 040-0
info@lewa.at
www.lewa.at

Brazil■ **LEWA Bombas Ltda.**

09951-970 Diadema/SP
Phone +55 11 4075 9999
vendas@lewa.com.br
www.lewa.com.br

Bulgaria■ **LEWA – Technical Office Sofia**

1421 Sofia
Phone +359 2 8654088
lewa.bg@lewa.at
www.lewa.bg

China■ **LEWA Pumps (Dalian) Co., Ltd.**

11 6600 Dalian
Phone +86 411 8758-1477
sales@lewa.cn
www.lewa.cn

Czech Republic■ **LEWA Pumpen spol. s.r.o.**

602 00 Brno
Phone +420 5 432360-52
office@lewa.cz
www.lewa.cz

France■ **LEWA S.A.S.**

78500 Sartrouville
Phone +33 1 308674-80
info@lewa.fr
www.lewa.fr

Germany■ **LEWA HOV GmbH + Co KG**

71229 Leonberg
Phone +49 7152 6091-0
hov@hov.de
www.hov.de

Hungary■ **LEWA – Hungarian Representative**

2040 Budaörs
Phone +36 23 880 975
info@lewa.hu
www.lewa.hu

Italy■ **LEWA S.R.L.**

20017 Mazzo di Rho (Mi)
Phone +39 02 93468-61
info@lewa.it
www.lewa.it

Mexico■ **LEWA México – Technical Office**

01210 México D.F.
Phone +52 55 917292-10
info@lewa.es
www.lewa.es

Norway■ **LEWA AS**

4319 Sandnes
Phone +47 529091-00
info@lewa.no
www.lewa.no

Poland■ **LEWA Sp. z o.o.**

00-159 Warsaw
Phone +48 22 6358-204
info@lewa.pl
www.lewa.pl

Romania■ **LEWA Romania s.r.l.**

050579 Bucharest
Phone +40 21 4107-340
info@lewa.ro
www.lewa.ro

Singapore■ **LEWA PTE LTD**

Singapore 129808
Phone +65 686-17127
info@lewa.sg
www.lewa.sg

Singapore■ **Pump Alliance PTE LTD (J. V.)**

Singapore 129808
Phone +65 6468 6802
pbeddard@pumpalliance.com
www.lewa.sg

Spain■ **LEWA Hispania, S.L.**

08020 Barcelona
Phone +34 93 22477-40
info@lewa.es
www.lewa.es

Switzerland■ **LEWA Pumpen AG**

4153 Reinach 1
Phone +41 61 7179 4-00
info@lewa-pumpen.ch
www.lewa-pumpen.ch

U.A.E. / Dubai■ **LEWA GmbH (LEWA Branch)**

Dubai Airport Free Zone
Phone +971 4 2993969
lewa@lewa-dubai.ae
www.lewa.ae

Ukraine■ **LEWA Ukraine LC**

03039 Kiev
Phone +380 44 52796-31
office@lewa.kiev.ua
www.lewa.com.ua

USA / North- and Middle America■ **LEWA, Inc.**

Holliston, MA 01746
Phone +1 508 429-7403
sales@lewa-inc.com
www.lewa-inc.com

USA / Gulf Coast Sales & Service Center■ **LEWA, Inc**

Houston, TX 77086
Phone +1 713 577-5392
sales@lewa-inc.com
www.lewa-inc.com

■ **CPE Holdings, Inc.**

Houston, TX 77086
Phone +1 713 673-5161
rfletcher@capitalprocess.com
www.capitalprocess.com