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Company Profile

OUR STANDARDS

Most innovative dosing technology
Since founding telab over 30 years ago, we have specialised in the development and manufacture of small quantity and precision dosing devices. This development has been focussed on maximum chemical consistency together with a universal application for supply and volumetric dosing of liquids and gases.

We have achieved this by the consistent use of PTFE materials and the installation of pressure-controlled ventils in the technology for diaphragm dosing.

We are constantly improving our dosing machines, in order to maintain our leading position, both now and in the future, in precision and small quantity dosing for liquids and gases. Telab has FDA-approved modified PTFE materials available for special applications.
We integrate our dosing machines in complex mini-plants, plant or automation systems and adapt our machines to your requirements.
Custom implementations are available for special applications.

Maintenance-free and low wear and tear dosing technology
Our dosing machines are maintenance-free and suffer hardly any wear and tear. Their robust construction results in extremely long operation times. The dosing machines are not even damaged in the event of blocked or closed ventils. You have the benefit of both reliability and cost efficiency.

Flexibility and customer closeness
You should make use of our more than three decades of acquired know-how in very specialised diaphragm dosing and ventil technology in any of:
... laboratory use
... college of technology
... production
... completely automatic mini-plant technology
... process automation

telab premises

Test dosing machines will remove your last doubts. We are very happy to find solutions for special tasks in co-operation and close collaboration with you.

Access map

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Construction

Material

- Use of re-compacted PTFE (polytetrafluoroethylene)
- Custom applications with special FDA-approved TFM materials
- Sealing the PTFE cone valve against PTFE block copolymers
- No seals or other foreign materials
- Optimal bend fatigue behaviour of the operating diaphragm
- Extremely low PTFE - TFM diffusion behaviour

The heart of the telab diaphragm dosing device is the re-compacted PTFE block with operating diaphragm and cone valves. The incorporated pump chamber is connected to the ventil seats with drilled holes. The PTFE ventils close against the PTFE block.

Mechanism - ventil technology

- Diaphragm and ventils are force pilot operated by camshaft
- Self-attaching (via suction) up to 20 mbar
- Supply rates of 0.01 ml/min - 10 l/h (40 l/h for gases)
- Mixed gas dosing of 0.001 - 10,000 ppm
- Maintenance-free and motor protector
- No ventilation requirement
- High operating safety - can run for very long periods
- No pumping defect in the event of closed line or blocked ventil

Operating diaphragm and cone valves are force pilot operated via the synchronous drive motor and offset camshafts, and guarantee an absolutely reliable dosing. The ventil opening and closing times ensure, that the dosing device is not cleared and is constantly self-attaching (via suction). Short movement of the operating diaphragm (stroke lengths of 1 - 2 mm) and the angle of the offset make gentle cavitation-free suction phases possible.

Pump chamber, diaphragm, and ventils

Camshaft control

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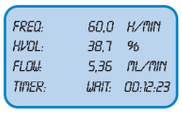
Microprocessor

The telab mini dosing device construction is completed with a user-friendly microprocessor control console.

Manual settings



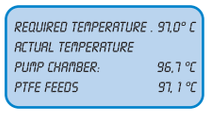
- Stroke frequency from 0 -30 or 0 - 60 strokes / min
- Cylinder head volume from 0 - 100 % in 1000 steps.
- Flow rate in µl/min or ml/min
- Calibration function
- Save several named calibration graphs for the supply medium
- Various timer functions
- Query the actual temperature for cooled dosing heads
- Required temperature setting for heated dosing heads
- Required temperature setting for external PTFE feeds
- Required and actual temperature display for both heating circuits

External settings

1. Connector
"Ext. Ctrl." 2 - 10 V or 4 - 20 mA

- Cylinder head volume
- Stroke frequency
- Single stroke control
- External switch (no voltage)
- Required temperature setting

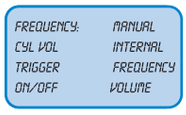
2. RS232 Connector



- Cylinder volume setting
- Stroke frequency setting
- Query cylinder volume
- Query stroke frequency
- Required temperature setting
- Query pump chamber actual temperature
- Query external PTFE feeds actual temperature

The external controls can be combined via an additional menu option.

e.g.: manual stroke frequency
cylinder volume 4 - 20 mA
internal frequency control
pump start at 1%
cylinder volume



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Pump-specific applications

Diaphragm dosing device with force pilot operated ventil technology

The way the dosing device works is based on the well-known principle of a change in chamber volume. The decisive constructive characteristic is, however, the force pilot operated ventil technology.
The pump chamber inlets and outlets are opened and closed with ventil diaphragm cones. The pump diaphragm and the ventil diaphragm cones are force pilot operated by camshafts, which themselves are driven by a synchronous motor. The pressure forces, generated via offset camshaft and backspring mechanics, on the ventils guarantee clearly-defined working conditions with precisely-set opening and closing times and thereby accurate dosing.

Vacuum applications

A particular advantage of the dosing device is the possibility of letting both the suction and the pressure sides work in a vacuum, e.g. in order to feed from one fractionating column into another. It is thus possible to extract product streams or samples from one column with a below atmospheric pressure of 20 mbar and feed to other chemical engineering stages, e.g. to a fractionating column or to a samples process.
With special modifications to the ventil technology, it is even possible to send to thin film evaporators, short path distillators or microtubes where there is a vacuum of 0.001 mbar. The force pilot operated ventil technology ensures extraordinarily well-sealed ventil seats and also retains this vacuum in continuous operation.

Viscous and melts products dosing

The dosing of viscous (more than 1000 mPas) products is problematic, due to the small diameter of the connections, hoses, and drilled holes. Crystallised products are no less critical. Cold transmitters during the dosing process can affect the dosing head, couplings, or pipes.
The heated version of telab dosing devices has addressed these application areas. Separate heating and self-regulating cycles for the dosing head and the external heating hoses ensure precise temperature conditions from the feed to the reaction chamber.
With this special application, small quantities of melts can be dosed very precisely, consistently, and without being sensitive to interference. In conjunction with the already-mentioned vacuum-dosing possibilities, the universal application possibilities of telab dosing devices are very clear.

Gas dosing

The specific construction characteristics permit the dosing device to execute precise gas dosing. The force pilot operated ventils establish an exact chamber capacity and enable precise intake and expulsion of the gases for dosing by the operating diaphragm. In addition, the PTFE version can feed the dosing device with practically every non-inert gas. However, the physical effects factors of pressure and temperature in gas dosing must not be forgotten.
Cascade switches are available for the manufacture of gas mixtures in the ppm and ppb quantities. Very precise gas mixtures of 2 or 3 components can be manufactured easily with these. The primary component does not necessarily have to be an inert gas. Homogenisers, made of PTFE as well, support the mixing process and manufacture the correct mixture very quickly.

Hardware Applications

Vacuum, heating, FDA approval

BAYER AG uses the multiple application possibilities of telab dosing devices in very diverse research departments at all locations.

LS-Forschung Leverkusen relies on force pilot operated ventil technology modified for high vacuum applications, and with this technology achieves a constant discharge of 0.01 mbar in destillations apparatus with absolutely airtight vacuum.

High chemical consistency and operating safety are regarded highly in technology colleges.
New research possibilities can be developed with the use of high-purity, certified TFM with FDA approval.

In the *Uerdingen research laboratories*, phase generations in multiple applications are performed using telab dosing pumps. Gas dosing pumps with pump head at the correct temperature as well as liquid dosing devices for various pH rules in the following reactions are used for this.

Portable thin film equipment

WELLA AG uses the heatable and vacuum-capable features of telab dosing devices for the continuous and reproducible dosing of valuable intermediate products in a laboratory thin film apparatus.

The multi-purpose equipment consists of a thin film evaporator (evaporation surface 1 dm^2), a diaphragm vacuum and turbo-molecular pump, and a heated *telab* dosing pump. Fluids, melts, and viscous products up to a temperature of 100°C can be dosed with the telab dosing device in the thin film evaporator with variable vacuums up to 0.01 mbar.

Miniplants for process development and production of small quantities

QVF Pilot-Tec GmbH uses the flexible application and multi-purpose control possibilities of the telab dosing device for its complete range of miniplant technology, from process development and optimisation to small quantities manufacturing.

Catalytic debinding oven with HNO_3

GERO Hochtemperaturöfen GmbH relies on the highest chemical consistency, process and operating safety for the dosing of high-percentage nitrous acids.
telab dosing pumps perform the precise and consistent dosing of the highly-concentrated nitrous acids using their combined PTFE equipment and force pilot operated ventil technology. The many control options enable variable oven control and thus high quality.

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Test equipment and special testing plants

Weiss Umwelttechnik GmbH
relies on telab gas dosing pumps for robustness and process safety in the dosing of corrosive gases.

Air-conditioned test cabinets are used for the systematic examination of corrosion damage to materials, construction components, technical equipment etc caused by corrosive gases. Materials, construction components, and technical equipment are exposed, in controlled conditions, to a variable condensed water climate with SO_2 atmosphere in *salt spray test chambers*.

In both cases, telab dosing pumps are used to deliver the H_2S, SO_2, NO_x, CL_2, O_3.

Analysis technology for highly-corrosive chlorine gas applications

ABB Automation Products uses the telab volumetric dosing and mixing system for calibration and quality control of Caldos thermal conductivity analysers. The highest precision together with the highest chemical consistency is crucial for the manufacture of chlorine gas mixtures with 0 - 4 % by volume of N_2.

4-component mixed gas atmosphere for environment simulation

The **Siemens AG** Institute for Quality Engineering and Testing trusts the chemical consistency and process safety of telab gas dosing systems.
For typical mixed-gas atmospheres, e.g. in accordance with IEC 60068-2-60, corrosive gases such as SO_2, H_2S, or NO_x are reliably dosed using ppb measures.

Universal dosing pump programme

BASF AG Ludwigshafen gives its engineers, scientists, and laboratory assistants the opportunity to borrow telab dosing devices from its *laboratory equipment store* for their research and study in laboratories and technology colleges.

There are many advantages of universally-applicable dosing pumps:

- For laboratory assistants, practical benefits such as simple operation, no ventilation requirements, universal use, high operating safety
- For the researcher, the chemical engineering advantages such as the usage of high chemical consistency, dosing heads which can be heated or cooled, and vacuum suitability.
- For the electronics engineer, the numerous control possibilities in accordance with the NAMUR standards.
- For the staff in the laboratory equipment store, access to a central range of pumps with cost-efficient storage, effective training, and high know-how.

Technical Data

Self-priming diaphragm dosing devices BF 414

Dosing devices up to 30 strokes/min

Type BF 414	30	250	1.000	2.500	20.000
Supplies ml/min	0,01 - 0,9	0,02 - 5	0,3 - 15	0,6 - 40	6 - 300
Cylinder volume microlitre	0,33 - 30	0,66 - 166	10 - 500	20 - 1.333	200 -10.000
Max. input pressure. bar	10	10	5	3	0,2
Max. Output. pressure bar	10	3	1	1	0,2
Minimum absolute pressure. Input mbar	20	20	30	50	1.000
Minimum absolute pressure Output mbar	0	0	0	0	900
Stroke length mm	0 - 1	0 - 1	0 - 2	0 - 2	0 - 2
Stroke frequency	0 - 30	0 - 30	0 - 30	0 - 30	0 - 30
	BF 414/30 - BF 414/2.500 Gases or liquids				**Gas only**

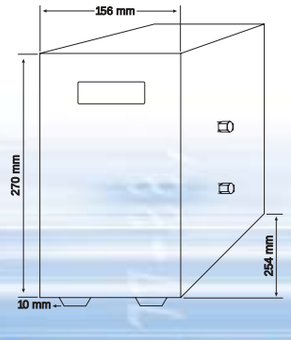
Dosing devices up to 60 strokes/min

Type BF 414	32	252	1.002	5.000	10.000	40.000
Supplies ml/min	0,02 - 1,8	0,04 - 10	0,6 - 30	1,2 - 80	2,4 - 160	12 - 600
Cylinder volume microlitre	0,33 - 30	0,66 - 166	10 - 500	20 - 1.333	20 - 1.333	200 -10.000
Max. input pressure. bar	10	10	5	3	3	0,2
Max. output. pressure bar	10	3	1	1	1	0,2
Minimum absolute pressure. Input mbar	20	20	30	50	100	1.000
Minimum absolute pressure Output mbar	0	0	0	0	0	900
Stroke length mm	0 - 1	0 - 1	0 - 2	0 - 2	0 - 2	0 - 2
Stroke frequency	0 - 60	0 - 60	0 - 60	0 - 60	0 - 2x60	0 - 60
	BF 414/32 - BF 414/10.000 Gases or liquids					**Gas only**

Connection possibilities

Swagelok / Gyrolok high-grade steel connection
GL 14 PTPE with sealing ring or cone
Other connections as you require

Gas dosing should be performed without pressure. Quoted pressures only for liquids. With highly viscous materials, suction side below atmospheric pressure applications and reduced pipelines will lower the quoted flow rate.



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Accessories

Please request our accessories catalogue.
Further information available on
www.telab.de!

Please visit us on the Web

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