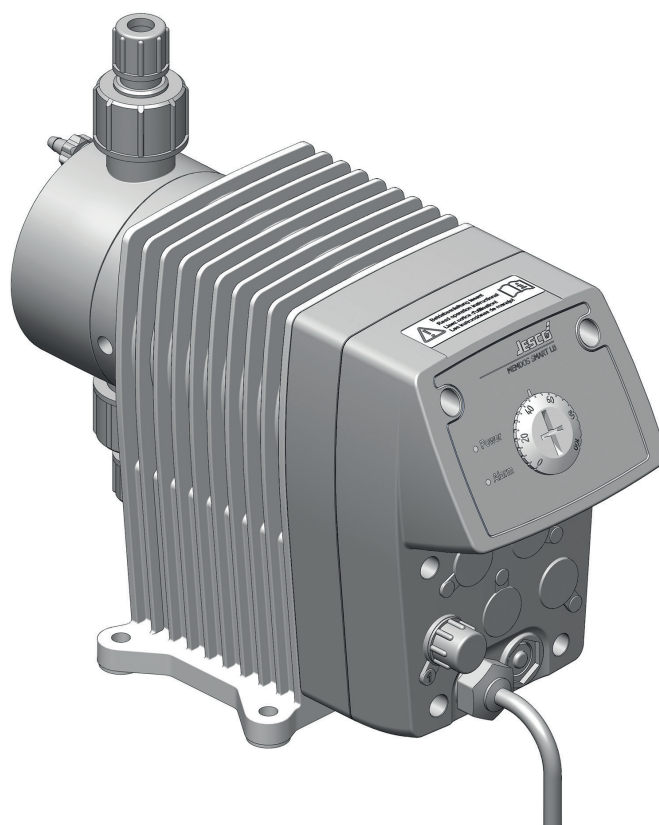


Stepper Motor-driven Diaphragm Dosing Pump

MEMDOS SMART LB

Operating Instructions



Read the operating instructions!

The user is responsible for installation and operation related mistakes!

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1 Notes to the Reader

These Operating instructions contain information and behaviour rules for safe and designated operation of the dosing pump MEMDOS SMART LB.

Follow these principles:

- Read the entire Operating instructions prior to commissioning the unit.
- Ensure that everyone who works with or on the dosing pump has read the operating instructions and follows them.
- Keep the operating instructions for the entire service life of the dosing pump.
- Pass on the operating instructions to any subsequent owner of the dosing pump.

1.1 General non-discrimination

In these operating instructions, only the male gender is used where grammar allows gender allocation. The purpose of this is to make the text easy to read. Men and women are always referred to equally. We would like to ask female readers for understanding of this text simplification.

1.2 Explanations of signal words







Different signal words in combination with warning signs are used in these Operating instructions. Signal words illustrate the gravity of possible injuries if the risk is ignored:

Signal word	Meaning
DANGER!	Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.
WARNING	Refers to a potentially hazardous situation. Ignoring this sign might lead to death or the most serious injuries.
CAUTION	Refers to a potentially hazardous situation. Ignoring this sign may lead to light injuries or damage to property.
NOTICE	Refers to a danger which, if ignored, may compromise the unit or its function.

Tab. 1: Explanations of signal words

1.3 Explanations of warning signs

Warning signs represent the type and source of a danger:

Warning sign	Type of danger
	General danger zone
	Danger of electric shock
	Danger of caustic or other burns.
	Danger of explosions
	Danger of automatic start up
	Danger of damage to machine or compromised function.

Tab. 2: Warning signs explanation

1.4 Identification of warnings

Warnings are intended to help you recognise risks and avoid negative consequences.

This is how warnings are identified:

Warning sign	SIGNAL WORD
Description of danger. Consequences if ignored. ⇒ The arrow signals a precautionary measure to be taken to eliminate the danger.	

1.5 Identification of instructions for action

This is how pre-conditions for action are identified:

- ✓ Pre-condition for action which must be met before taking action.

This is how instructions for action are identified:

- ➔ Separate step with no follow-up action.

1. First step in a series of steps.
2. Second step in a series of steps.
 - ▶ Result of the above action.


- ✓ **Action completed, aim achieved.**


2 Safety


2.1 General warnings


The following warnings are intended to help you to eliminate the dangers that can arise while handling the dosing pump. Risk prevention measures always apply regardless of any specific action.


Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-chapters.


	DANGER
<p>Danger to life due to electric shock</p> <p>Wrongly connected or located cables or damaged ones can injure you.</p> <ul style="list-style-type: none"> ⇒ Connect the device only to a socket outlet with earthing contact protected by a ground fault circuit interrupter (GFCI). ⇒ Replace damaged cables without delay. ⇒ Do not use extension cables. ⇒ Do not bury cables. ⇒ Secure cables to avoid being damaged by other equipment. 	


	DANGER
<p>Danger to life through explosions!</p> <p>When using dosing pumps without ATEX certification in a potentially explosive area, explosions can occur that result in fatal injuries.</p> <ul style="list-style-type: none"> ⇒ Never use the MEMDOS SMART LB dosing pump in potentially explosive areas. 	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>After connecting the mains supply, residual dosing media in the dosing head can spray out.</p> <ul style="list-style-type: none"> ⇒ Before connecting the mains supply, connect the dosing lines. ⇒ Check that all the screw connections have been tightened correctly and are leak-proof. 	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>While working on the dosing head, valves and connections, you may come into contact with dosing media.</p> <ul style="list-style-type: none"> ⇒ Use sufficient personal protective equipment. ⇒ Rinse the dosing pump with a liquid (e.g. water) which does not pose any risk. Ensure that the liquid is compatible with the dosing medium. ⇒ Release pressure in hydraulic parts. ⇒ Never look into open ends of plugged pipelines and valves. 	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>The materials of the dosing pump and hydraulic parts of the system must be suitable for the dosing medium that is used. Should this not be the case, the dosing media may leak.</p> <ul style="list-style-type: none"> ⇒ Make sure that the materials you are using are suitable for the dosing medium. ⇒ Make sure that the lubricants, adhesives, sealants, etc. that you use are suitable for the dosing medium. 	

	CAUTION
<p>Increased risk of accidents due to insufficient qualification of personnel!</p> <p>Dosing pumps and their accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will raise the risk of accidents.</p> <ul style="list-style-type: none"> ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons. 	

	CAUTION
<p>Danger of personal injury and material damage!</p> <p>Changing dosing media can lead to unpredictable reactions.</p> <ul style="list-style-type: none"> ⇒ Thoroughly clean the dosing pump and appropriate sections of the plant to avoid chemical reactions. 	

2.2 Hazards due to non-compliance with the safety instructions

Failure to observe the safety instructions can pose a risk not only to the personnel, but consequentially to the environment and the unit.

The specific consequences can be:

- failure of vital functions of the dosing pump and the system,
- failure of required maintenance and repair methods,
- danger for individuals through dangerous dosing media,
- danger to the environment through substances leaking from the system.

2.3 Safe operation

Besides the safety instructions specified in these Operating instructions, further safety rules apply and must be followed:

- Accident prevention regulations,
- safety and operating provisions,
- safety provisions for handling dangerous substances (mostly the safety data sheets to dosing media),
- environmental protection provisions,
- applicable standards and legislation.

2.4 Personal protective equipment

Based on the degree of risk posed by the dosing medium and the type of work you are carrying out, you must use corresponding protective equipment. Read the Accident Prevention Regulations and the Safety Data Sheets to the dosing media find out what protective equipment you need.

As a minimum, the following protective equipment is recommended:



Protective clothing



Protective gloves



Goggles

Corresponding protective equipment must be used during these tasks:

- Commissioning,
- working on the dosing pump while running,
- decommissioning,
- maintenance work,
- disposal.

- Knowledge of safety equipment and the way this equipment functions,
- Knowledge of these Operating instructions, particularly of safety instructions and sections relevant for the job,
- Knowledge of fundamental regulations regarding health and safety and accident prevention.

All persons must generally have the following minimum qualification:

- Training as specialists to carry out work on the dosing pump unsupervised,
- Sufficient training that they can work on the dosing pump under the supervision and guidance of a trained specialist.

These Operating instructions differentiate these user groups:

2.5.1 Specialist staff

Specialist staff are able, thanks to their professional training, knowledge and experience as well as knowledge of the respective provisions, to do the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

2.5.2 Trained persons

Trained persons have been trained by the operator into the tasks they are supposed to perform and into the dangers stemming from improper behaviour.

In the table below you can check what qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Tasks
Specialist staff	<ul style="list-style-type: none"> ■ Assembly ■ Hydraulic installations ■ Electrical installation ■ Maintenance ■ Repairs ■ Commissioning ■ Decommissioning ■ Disposal ■ Fault rectification
Trained persons	<ul style="list-style-type: none"> ■ Storage ■ Transportation ■ Control ■ Fault rectification

Tab. 3: Personnel qualification

2.5 Personnel qualification

Any personnel who work on the dosing pump must have appropriate special knowledge and skills.

Anybody who works on the dosing pump must meet the conditions below:

- Attendance at all the training courses offered by the owner,
- Personal suitability for the respective job,
- Sufficient qualification for the respective job,
- Training in handling of the dosing pump,

3 Appropriate and intended use

3.1 Notes to Product warranty

Any non-designated use of the product can compromise its function or intended protection. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- The dosing pump is operated in a manner which is not consistent with these operating instructions, particularly the safety and handling instructions and the chapter entitled "Appropriate and intended use".
- If people operate the product who are not adequately qualified to carry out their respective activities,
- No original spare parts or accessories of Lutz-Jesco GmbH are used,
- Unauthorised changes are made to the device by the user,
- The user uses different dosing media than those indicated in the order,
- The user does not use dosing media under the conditions agreed with the manufacturer such as modified concentration, density, temperature, contamination, etc.

3.2 Intended purpose

The MEMDOS SMART LB dosing pump is intended for the following purpose: the conveying and dosing of liquids.

3.3 Device revision

This operating manual applies to the following devices:

Device	Month / year of manufacture
MEMDOS SMART LB	03/2015 onwards

Tab. 4: Device revision

3.4 Principles

- Before delivery, the manufacturer inspected the dosing pump and operated it under specific conditions (with a specific dosing medium with a specific density and temperature, with specific pipe dimensions, etc.) Since these conditions vary at every installation location, you must calibrate the dosing pump after delivery. For information on the calibration procedure refer to Chapter "Calibrating the dosing pump" (see page 31). For details on the approximate values and the capacity of the dosing pump, refer to the chapter entitled "Delivery characteristic curves" (see page 40).
- Information on the usage and environment (see „Technical specifications“ on page 12) applies.
- Any restrictions regarding the viscosity, temperature and density of dosing media must be followed. You must only use dosing media at temperatures above freezing point or below the boiling point of the respective medium.
- The materials of the dosing pump and hydraulic parts of the system must be suitable for the dosing medium that is used. In this connection, note that the resistance of these components can change in dependence on the temperature of the media and the operating pressure.



Information on the suitability of materials combined with different dosing media can be found in the Chemical Resistance List of Lutz-Jesco GmbH.

The information in this resistance list is based on information from the material manufacturers and on expertise obtained by Lutz-Jesco from handling the materials.

As the durability of the materials depends on many factors, this list only constitutes initial guidance on selecting material. In all cases, test the equipment with the chemicals you use under operating conditions.

- The dosing pump is not intended for outdoor use unless appropriate protective measures have been taken.
- Avoid leaks of liquids and dust into the casing and avoid direct exposure to sunlight.
- You must never operate dosing pumps in a potentially explosive atmosphere if they do not have corresponding nameplates or an appropriate EC Declaration of Conformity for potentially explosive atmospheres.

3.5 Prohibited dosing media

The dosing pump must not be used for these media and substances:

- Gaseous media,
- radioactive media,
- solid substances,
- combustible media,
- all other media that are not suitable for delivery using this dosing pump.

3.6 Foreseeable misuse

Below, there is information about the applications of the dosing pump or associated equipment that are not considered to be intended use. This chapter is intended to allow you to detect possible misuse in advance and to avoid it.

Foreseeable misuse is assigned to the individual stages of the product lifetime:

3.6.1 Incorrect assembly

- Unstable or unsuitable bracket
- Dosing pump bolted wrongly or loosely

3.6.2 Incorrect hydraulic installation

- Suction and pressure lines dimensioned incorrectly
- Unsuitable connection of the pipes due to wrong material or unsuitable connections.
- Suction and pressure lines mixed-up
- Damage to threads due to them being tightened too much
- Bending of pipelines
- No free return flow of the pressure relief valve
- Excessive demand due to the pressure differences between the suction and discharge valves

- Through-suction at installation without back-pressure valves
- Damage due to undamped acceleration mass forces
- Exceeding the admissible pressure on the suction and discharge sides
- Using damaged parts

3.6.3 Incorrect electrical installation

- Connecting the mains voltage without a protective earth
- Unsecured mains or one that does not conform to standards
- Not possible to immediately or easily disconnect the power supply
- Wrong connecting cables for mains voltage
- Protective earth removed

3.6.4 Incorrect commissioning

- Commissioning with damaged plant
- Shut-off valves closed at commissioning
- Closed suction or pressure line, e.g. due to blockages
- Personnel was not informed before commissioning
- System was recommissioned after maintenance without all the protective equipment and fixtures, etc. being reconnected.
- Inadequate protective clothing or none at all

3.6.5 Incorrect operation

- Protective equipment not functioning correctly or dismantled
- Modification of the dosing pump without authority
- Ignoring operational disturbances
- Elimination of operational disturbances by personnel without adequate qualifications
- Deposits in the dosing head due to inadequate purging, particularly with suspensions
- Bridging the external fuse
- Operation made more difficult due to inadequate lighting or machines that are difficult to access
- Delivery of dosing media for which the system is not designed
- Delivery of particulate or contaminated dosing media
- Inadequate protective clothing or none at all

3.6.6 Incorrect maintenance

- Carrying out maintenance during ongoing operation
- Carrying out work that is not described in the operating instructions
- No adequate or regular inspection of correct functioning
- No replacement of damaged parts or cables with inadequate insulation
- No securing against reactivation during maintenance work
- Using cleaning materials that can cause reactions with the dosing media
- Inadequate cleaning of the system
- Unsuitable purging medium
- Unsuitable cleaning materials
- Cleaning materials left in system sections
- Using unsuitable cleaning equipment
- Using the wrong spares or lubricants
- Contaminating the dosing medium with lubricant
- Installing spares without following the instructions in the operating manual
- Blocking venting orifices
- Pulling off sections of the plant
- Contamination at installation without a dirt trap
- Mixing up the valves
- Mixing up the sensor lines
- Not reconnecting all the lines
- Damaging or not installing all the seals
- Not renewing seals
- Not paying attention to safety data sheets
- Inadequate protective clothing or none at all

3.6.7 Incorrect decommissioning

- Not completely removing the dosing medium
- Dismantling lines while the dosing pump is running
- Device not disconnected from the power supply
- Using the wrong dismantling tools
- Inadequate protective clothing or none at all

3.6.8 Incorrect disposal

- Incorrect disposal of dosing media, operating resources and other materials
- No labelling of hazardous substances

4 Product description

4.1 Properties

The MEMDOS SMART LB is a stepper motor-driven diaphragm dosing pump that is used when precise dosing results are required.

They are characterized by the following properties:

- Capacity range 2 – 20 l/h, up to 15 bar,
- Power supply 110 – 240 V, 50/60 Hz, IP65, 25 W,
- Microprocessor controlled drive,
- Integrated dosing head venting facility (only MEMDOS SMART LB 2, LB 5 and LB 10 with dosing head made of plastic),
- Suitable for wall and floor mounting,
- Material finishes PVC, PP, PVDF and stainless steel (1.4571),
- Infinitely adjustable stroke frequency from 0 – 100 %,
- Release input for external start/stop

4.2 Scope of delivery

Please compare the delivery note with the scope of delivery. The following items are part of the scope of delivery:

- Dosing pump MEMDOS SMART LB,
- One set each of hose clamping connections for the suction and discharge sides for hoses with diameters of 4/6 mm, 6/9 mm and 6/12 mm (made of PVC, PP and PVDF)
- Mains cable,
- Operating Manual,
- Inspection report and test certificate (optional),
- Accessory kit (optional).

4.3 Structure of the dosing pump

4.3.1 General Overview

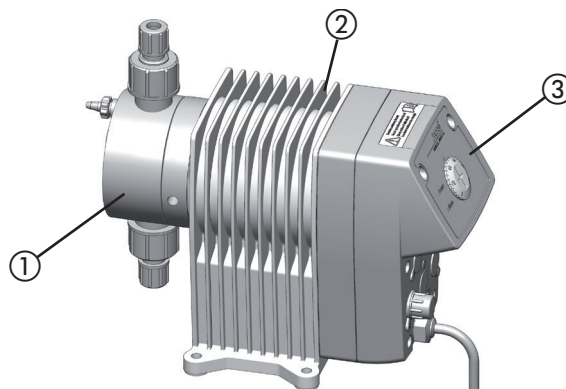


Fig. 1: Overview of MEMDOS SMART LB dosing pump

No.	Description
①	Dosing head
②	Drive unit
③	Control unit

4.3.2 Dosing head

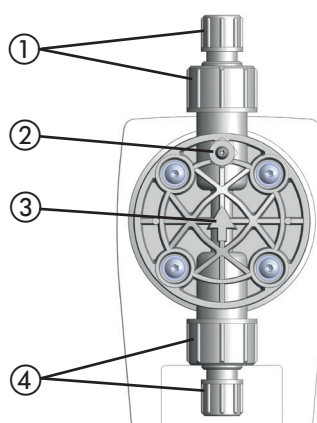


Fig. 2: Dosing head

No.	Description
①	Valve and connection on the discharge side
②	Integrated dosing head venting facility (only MEMDOS SMART LB 2, LB 5 and LB 10 with dosing head made of plastic)
③	Arrow indicating the direction of throughflow of the dosing medium (only MEMDOS SMART LB 5 and LB 10 with dosing head made of plastic)
④	Valve and connection on the suction side

4.3.3 Control elements

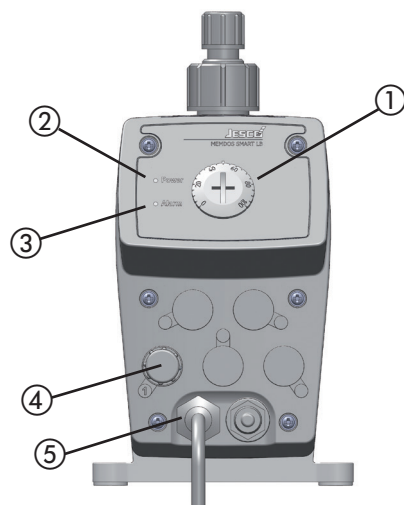


Fig. 3: Controller of MEMDOS SMART LB dosing pump

No.	Description
①	Stroke frequency setting
②	Power LED
③	Alarm LED
④	Release input for external start/stop
⑤	Mains cable for power supply

Tab. 5: Designation of components

4.4 Function description

Dosing pumps are positive displacement pumps. They are used if precisely defined delivery of a medium is necessary. A constant volume per stroke or time is delivered.

The system delivers or meters the dosing medium by means of a repeated sequence of suction strokes followed by pressure strokes. This results in a pulsing flow.

If the dosing pump is in the suction stroke phase, the diaphragm is pulled into the rear final position. Due to the resulting vacuum in the dosing head, the discharge valve closes, the suction valve opens and dosing medium flows from the suction line into the dosing head.

If the dosing pump is in the pressure stroke phase, the diaphragm is moved into the front final position. Due to the pressure in the dosing head, the suction valve closes and the dosing medium flows through the discharge valve from the dosing head into the pressurised pipe.

4.5 Rating plate (type label)

There is information on the equipment about safety or the product's way of functioning. The information must stay legible for the duration of the service life of the product.

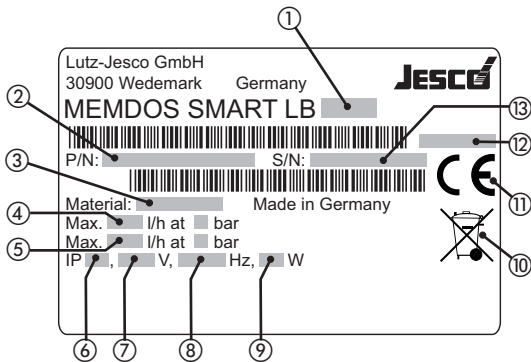


Fig. 4: MEMDOS SMART LB nameplate

No.	Description
①	Product, type, nominal size
②	Part number
③	Type of material of dosing head/ type of material of seals
④	Maximum delivery capacity at average pressure
⑤	Maximum delivery capacity at maximum pressure
⑥	Protection classification
⑦	Voltage supply
⑧	Frequency
⑨	Power consumption
⑩	WEEE label
⑪	Label showing conformity with applicable European directives
⑫	Month / year of manufacture
⑬	Serial number

Tab. 6: Ratings plate

4.6 Conveying characteristics

The MEMDOS SMART LB dosing pump is designed to run the pressure stroke and suction stroke at different speeds. For low supply rates, for example, the dosing pump performs the suction stroke at the maximum speed and adjusts the speed of the pressure stroke to match the desired supply rate. This produces a constant supply stream, which gives you a low-pulsation, smooth dosing.

Settings

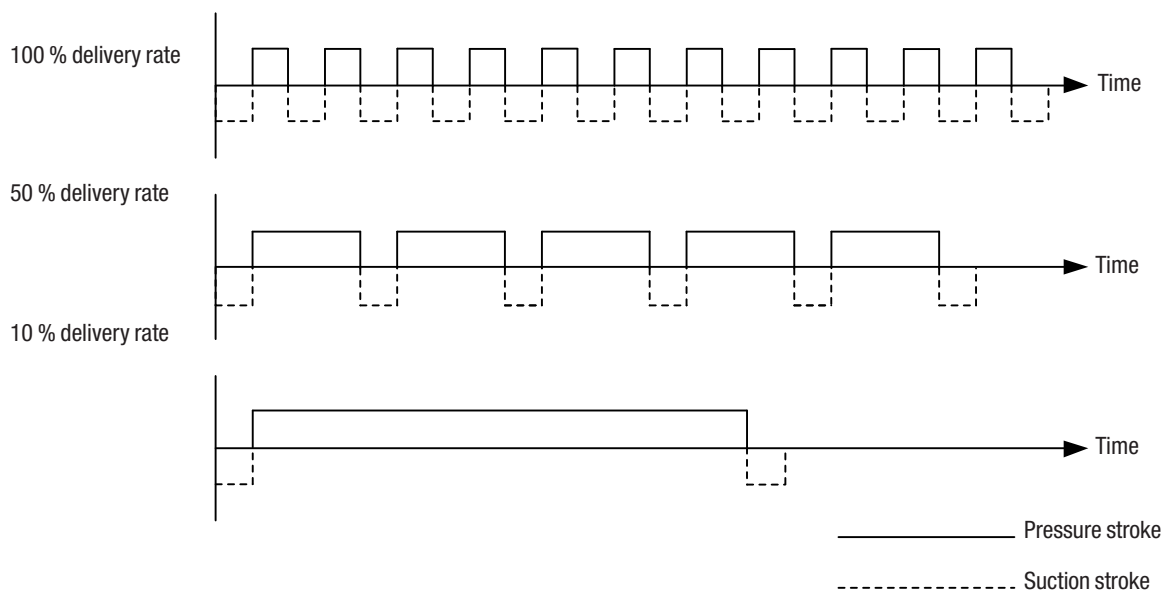


Fig. 5: Selection of available dosing programs

5 Technical specifications

5.1 Delivery capacity data

Please note that some of this data only represents guide values. The actual capacity of a dosing pump depends on various factors. For approximate values of the delivery capacity at different pressures, refer to Chapter "Delivery characteristic curves" (see page 40).

Information	Value	MEMDOS SMART LB Size				
		2	5	10	15	20
Delivery capacity at max. back pressure	l/h	2,4	5.3	10.8	14.2	19.2
	ml/stroke	0,22****	0.59	1.20	1.58	2.13
Max. back pressure	bar	20	15	9	5	4
Delivery capacity at average back pressure	l/h	2,6	6	11.3	14.7	19.7
	ml/stroke	0,28	0.67	1.26	1.63	2.19
Average back pressure	bar	10	8	5	3	2
Max. stroke frequency	RPM	150				
Suction height for non-gassing media	mWS	3				

Tab. 7: Output data

5.2 Operating conditions and limits

Information	Value	MEMDOS SMART LB Size
		2 – 20
Permitted ambient temperature	°C	0 – 45 (0 – 40 with PVC parts)*
Relative humidity	%	Max. 90
Max. sound pressure level	dB(A)	51 – 56
Max. supply pressure	mbar	800
Viscosity limits	mPas	300** / 1000***
Adjustable dosing range	%	0 – 100

Tab. 8: Operating conditions and limits

* Use of dosing pumps at ambient temperatures of under 5 °C has to be checked individually. In those cases please contact the manufacturer.

** With a viscosity of ~300 mPas and above, you must use spring-loaded valves.

*** If the viscosity is above 1000 mPas, this must be checked individually.

**** Only for LK 2 with PVDF or stainless steel dosing head, otherwise max. 16 bar counterpressure.

5.2.1 Permitted media temperatures

Information	Value	MEMDOS SMART LB (all sizes)
Dosing head made of PVC	°C	0 – 35
Dosing head made of PP	°C	0 – 60
Dosing head made of PVDF	°C	0 – 80
Dosing head made of stainless steel (1.4571)	°C	0 – 80

Tab. 9: Permitted media temperatures

5.3 Electrical data

Information	Value	MEMDOS SMART LB (all sizes)
Voltage supply		110 - 240 V, -10% / +5%. 50/60 Hz
Power consumption	W	25

Tab. 10: Electrical specifications

5.4 Other data

Information	Value		MEMDOS SMART LB Size			
		2	5	10	15	20
Weight (with dosing head made of PVC, PP or PVDF)	kg	~ 2.2				
Weight (with dosing head made of stainless steel (1.4571))	kg	~ 3.3				
Diameter of diaphragm	mm	33	39		54	
Electrical cable	m	1.8 m (with mains plug)				
Protection class		IP65 (with covering caps on the connections)				
Insulation class		F				
Valve connection		G 5/8 male				
Valve size		DN3	DN4			

Tab. 11: Other data

6 Dimensions

6.1 MEMDOS SMART LB 2, 5, 10

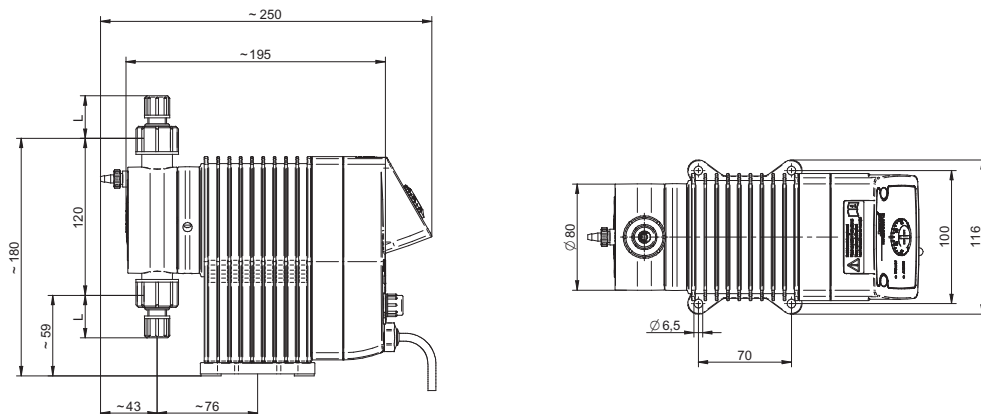


Fig. 6: Dimensioned drawing of MEMDOS SMART LB 2, 5, 10 with dosing head made of PVC, PP or PVDF (all dimensions in mm)

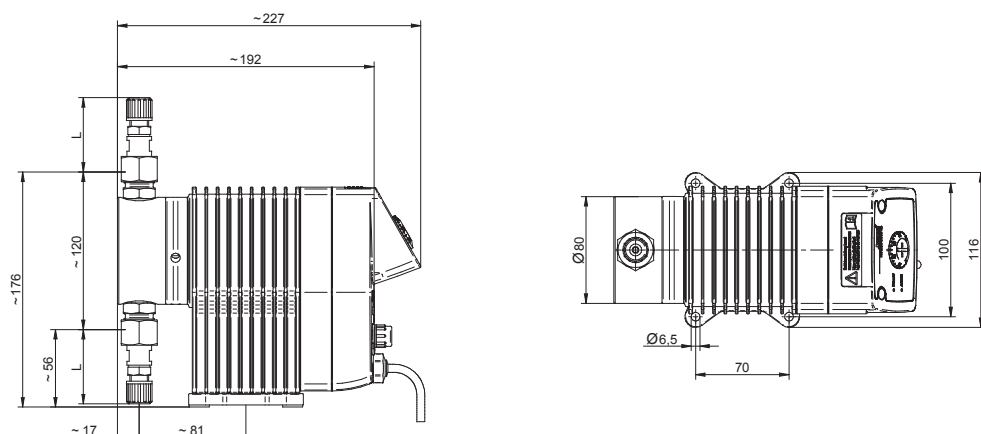


Fig. 7: Dimensioned drawing of MEMDOS SMART LB 2, 5, 10 with dosing head made of stainless steel (1.4571) (all dimensions in mm)

Hose clip	Material	Size	Nominal diameter	L
LB 2	PVC / PP / PVDF	4/6 mm	DN3	31
	Stainless steel	4/6 mm	DN3	54
LB 5, 10, 15, 20	PVC / PP / PVDF	4/6 mm	DN4	31
		1/4x3/8"	1/4"	34
		6/9 mm	DN6	34
		6/12 mm	DN6	15
	Stainless steel (1.4571) / PVDF	4/6 mm	DN4	50
		6/9 mm	DN6	54

6.2 MEMDOS SMART LB 15, 20

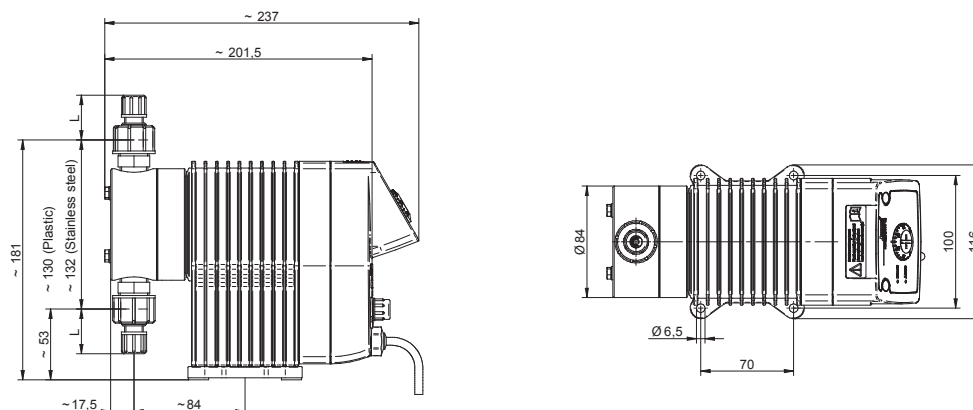


Fig. 8: Dimensioned drawing of MEMDOS SMART LB 15, 20 with dosing head made of PVC, PP, PVDF or stainless steel (1.4571) (all dimensions in mm)

Connection	Material	Size	Nominal diameter	L
Hose clip	PVC / PP / PVDF	4/6 mm	DN4	31
		1/4x3/8"	1/4"	34
		6/9 mm	DN6	34
		6/12 mm	DN6	15
	Stainless steel (1.4571) / PVDF	4/6 mm	DN4	50
		6/9 mm	DN6	54

7 Installing the Dosing Pump



DANGER

Danger to life due to electric shock!

Electrically conductive liquid can enter pump housings, cable screw connections and mains connectors.

- ⇒ Make sure that all protective measures comply at least with the requirements of protection class IP65.
- ⇒ Always set up the dosing pump such that water cannot enter the housing.



CAUTION

Danger of personal injury and material damage!

A dosing pump that is difficult to access represents a danger due to incorrect operation and faulty maintenance.

- ⇒ Install the dosing pump such that it is accessible at all times.

7.1 Set up information

When installing, follow the basic principles below:

- The valves must be vertical: Discharge valve at top, suction valve at bottom. In this connection, pay attention to the arrow on the dosing head. The dosing head must be aligned such that the arrow points vertically upwards.
- You should install the dosing pump at a convenient height for operation.
- It must not be installed under the ceiling.
- The frame of foundation for fixing the dosing pump must not be subjected to jolts. The pump must be vibration-free and stable.
- There must be enough free space in the area of the dosing head and the suction and discharge valves for these parts to be easily dismantled if required. The entire space requirement for installation and maintenance is approximately 1 m².
- The distance from the sides of the dosing pump to the wall or other dosing pumps or equipment must be at least 3 cm. There must be a guaranteed flow of circulating air.
- The maximum ambient temperature must be complied with, see "Operating conditions and limits" on page 12. If necessary, radiated heat from surrounding equipment must be screened.
- Avoid exposure to direct sunlight.
- The dosing pump is not intended for use out of doors unless appropriate protective measures have been taken to prevent dust and water from entering the housing.
- For the dimensions of the fastening holes, refer to Chapter "Dimensions" (see page 14).
- The tightening torque for the fastening bolts is 1.5 - 2 Nm.

7.2 Installation examples

7.2.1 Installation on a wall console

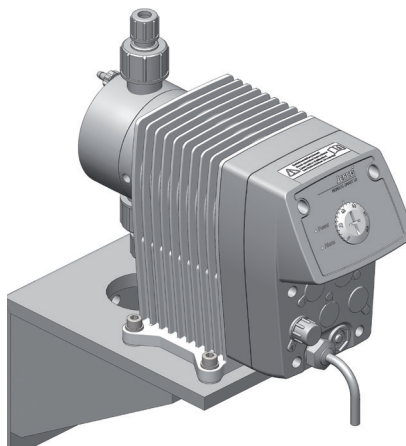


Fig. 9: Installation on a wall console

To reduce the structure-borne noise, the dosing pump is bolted to the wall bracket using rubber elements. The materials necessary for this are included with the wall bracket.

7.2.2 Installation on the wall

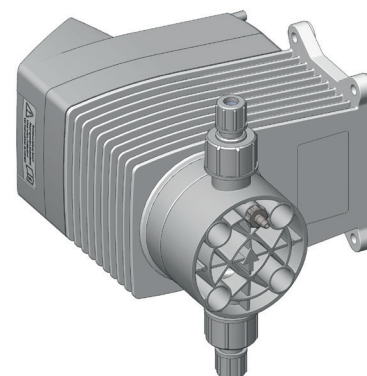




Fig. 10: Installation on the wall


The dosing pump can be mounted to the floor or directly to the wall without the need for additional elements. Turn the dosing head appropriately to ensure the flow direction of the medium through the dosing head.


8 Hydraulic installation


In this chapter, you will find information about the hydraulic parts of a system that you should install or that can install additionally. In many cases, you must install hydraulic accessories to be able to use all the functions that the MEMDOS SMART LB dosing pump offers, to guarantee functional safety or to achieve a high level of dosing precision.


	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>The materials of the dosing pump and hydraulic parts of the system must be suitable for the dosing medium that is used. Should this not be the case, the dosing media may leak. Depending on the type and hazardousness of the dosing medium, this can result in injury.</p> <p>⇒ Make sure that the materials you are using are suitable for the dosing medium.</p> <p>⇒ Make sure that the lubricants, adhesives, sealants, etc. that you use are suitable for the dosing medium.</p>	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>If there is a diaphragm rupture, the dosing medium can escape in an uncontrolled way. Depending on the type and hazardousness of the dosing medium, this can result in injury.</p> <p>⇒ Install a leakage drain.</p>	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>The dosing pump can generate a pressure that is many times the rated one. A blocked pressure line can lead to dosing medium escaping. Depending on the type and hazardousness of the dosing medium, this can result in injury.</p> <p>⇒ Install pressure relief valves.</p>	

	CAUTION
<p>Danger of personal injury and material damage!</p> <p>High peak pressures can lead to piping vibrating and cause them to snap. This can result in injury due to uncontrollable piping or escaping dosing media.</p> <p>⇒ Install pulsation dampeners.</p>	

	NOTICE
<p>Damage to drives due to overloading</p> <p>The pressure conditions between the suction and discharge sides must be balanced; otherwise, overloading can result. This can lead to uncontrolled dosing processes, damage to the plant pipework and to the dosing pump.</p> <p>⇒ Ensure that the pressure on the discharge side is at least 1 bar greater than on the suction side.</p>	

	NOTICE
<p>Locking of threads</p> <p>Stainless steel and plastic parts (particularly those made of PVC) that are bolted together in a detachable connection (e.g. the dosing head and the valves) can lock. This makes them difficult to release.</p> <p>⇒ Before bolting, grease the corresponding parts with a lubricant, e.g. PTFE spray). Ensure that the lubricant is compatible with the dosing medium.</p>	

8.1 Dimensioning of the system

- The dosing pump's technical data (see „Technical specifications“ on page 12) must be taken into account and the plant's layout must be set up appropriately (e.g. pressure loss when rating the lines with regard to their nominal diameter and length).
- You must design the entire plant and its integrated dosing pump such that escaping dosing medium due to the failure of wearing parts such as the diaphragm, or to burst hoses does not lead to permanent damage to parts of the system or the premises.
- The leakage opening of the dosing head must be visible so that you can detect a diaphragm rupture. It must be possible for the outflow from the leakage drain to be on a free downwards gradient.
- If you use hazardous dosing media, the installation must be designed such that no disproportionately high consequential damages arise due to dosing media escaping.
- To avoid dosing errors after the end of the process, the dosing pump must be locked hydraulically.
- To allow you to easily inspect the pressure conditions in the system, you should provide connections for pressure gauges close to the suction and discharge valves.

8.2 System piping

- The system piping must not exert any force on the connections and valves of the dosing pump.
- This means that steel piping should be connected to the dosing pump by means of flexible pipe sections.
- The nominal diameters of the pipework and the installed fittings should be rated the same as or greater than the nominal diameters of the dosing pump's suction and discharge valves.
- The suction line should be kept as short as possible.
- You should avoid intertwined hoses.
- Avoid loops, since air bubbles can collect.

8.3 Aligning the dosing head

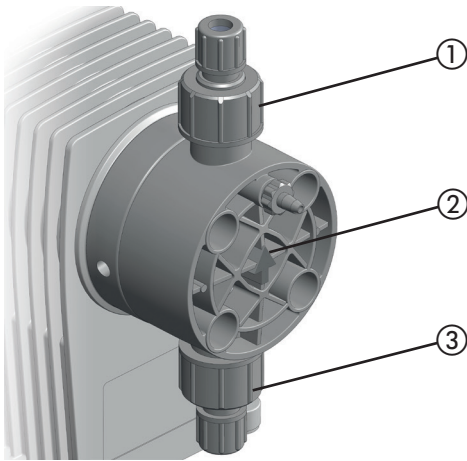


Fig. 11: Aligning the dosing head

When connecting the dosing lines to the dosing pump, you must observe the direction of through-flow (see arrow ②). The dosing head must be aligned vertically.

The suction valve ③ must always point downwards. Accordingly, arrow ② and pressure valve ④ always point upwards. This is irrespective of the positioning of the dosing head to the drive.

8.4 Hydraulic connections

8.4.1 Connecting hose clips

Choose the hose connection according to the condition of the hose (material, inner diameter, wall thickness) in order to ensure maximum pressure resistance.

8.4.1.1 Sizes 4.6 and 6.9

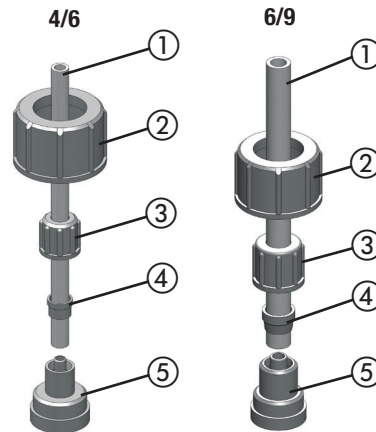


Fig. 12: Hose clips 4/6 and 6/9 (internal and external diameters in mm)

Perform the following working steps:

1. Cut the hose ① to length neatly and at an exact right angle.
2. Place a gasket that is suitable for the dosing medium between the connection ⑤ and the valve.
3. Screw the connecting piece ⑤ to the dosing pump's valve using the union nut ②.
4. Thread the union nut ③ and the clamping ring ④ onto the hose.
5. Plug the hose ① all the way in to the grommet of connection piece ⑤.
6. Push the clamping ring ④ onto the grommet of connection piece ⑤ and screw it to the union nut ③.
7. Carry out the same procedure with the connection to the dosing pump's other valve.

✓ **Hose clip connected.**

8.4.1.2 Size 6/12

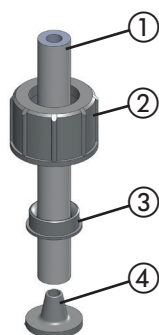


Fig. 13: Hose clip 6/12 (internal and external diameter in mm)

Size 6/12 hose clips only have a union nut. It clamps the hose onto the grommet of the connection piece and at the same time fastens on the dosing pump's valve.

Perform the following working steps:

1. Cut the hose ① to length neatly and at an exact right angle.
2. Place a gasket that is suitable for the dosing medium between the connection ④ and the valve.
3. Push the union nut ② and the cutting ring ③ over the hose ①.
4. Press the end of the hose ① onto the grommet of connection piece ④. You can do this more easily by moistening the end of the hose on the inside or applying some lubricant to the grommet in the cone area. You should push at least two thirds of the hose onto the grommet of the connection piece ④.
5. Push the cutting ring ③ over the hose ① into the cone area on the grommet of connection piece ④.
6. Screw the union nut ② onto the valve of the dosing pump.

✓ **Hose clip connected.**

8.4.2 Making the bonded connection

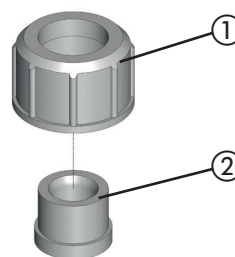


Fig. 14: Bonded connection

Perform the following working steps:

1. Cut the PVC tube to length.
2. Push the union nut ① onto the tube.
3. Stick the bonded coupling sleeve ② to the tube (follow the instructions of the adhesive manufacturer).
4. Screw the union nut ① onto the valve of the dosing pump. Use a gasket that is suitable for the dosing medium.

✓ **Bonded connection made.**

8.4.3 Making the cemented connection

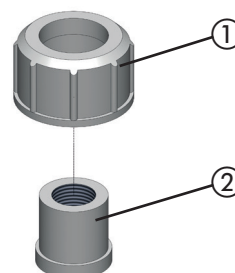


Fig. 15: Cemented connection

Perform the following working steps:

1. Cut the tube to length.
2. Cut the thread ② onto the end of the tube.
3. Push the union nut ① onto the tube.
4. Seal the thread ②. When choosing your sealing material, take into account its resistance to material, temperature and pressure.
5. Screw the union nut ① onto the valve of the dosing pump. Use a gasket that is suitable for the dosing medium.

✓ **Cemented connection made.**



Under normal conditions, you only need to screw the hydraulic connections finger-tight. However, due to the material settling, the pre-tension of the screw connection can slacken. This means that you must re-tighten the screw connection before carrying out commissioning.

8.5 Connecting a leakage drain

Lutz-Jesco GmbH dosing pumps are produced to the highest quality standards and have a long service life. However, some parts are subject to operational wear. This is the case particularly with the diaphragms that are continuously subjected to forces during the suction and discharge strokes and to the effects of the dosing medium.

If a diaphragm ruptures, the dosing medium starts to leak. This leakage is drained via the leakage opening. On the flange of the dosing head, there are three openings for this purpose. Depending on the alignment of the dosing pump, the leakage is drained via the downward opening.

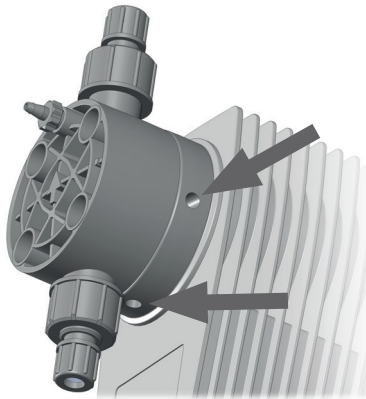


Fig. 16: Openings of the leakage drain



NOTICE

Damage to drives due to effervescent media

If a hose is connected to the leakage drain and it is routed back into the dosing tank, effervescent media can enter the drive and damage it.

- ⇒ Collect the leakage in a collecting pan.
- ⇒ As an alternative, you can route the leakage back to the dosing tank using a funnel. You should install the funnel at an adequate distance from the leakage opening.

8.6 Connecting the dosing head venting facility

The dosing heads of the MEMDOS SMART LB 5 and LB 10 have an integrated dosing head venting unit (except for dosing heads made of stainless steel).

For the procedure when venting, refer to “Venting the dosing pump” on page 31.

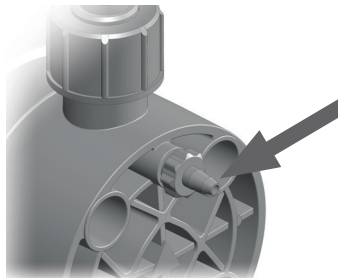


Fig. 17: Dosing head venting facility with hose connection

Perform the following working steps:

1. Connect a 4/6 hose to the dosing head venting facility.
2. Route the other end of the hose into the dosing tank or a collecting tank.



Dosing head venting facility connected.

8.7 Hydraulic accessories

The following chapter is intended to give you an overview of installation options.

Please note that these operating instructions are no substitute for the instructions supplied with the accessories in each case. The corresponding documentation supplied with the product applies to safety information and provides exact instructions on assembly.

8.7.1 Injection nozzle

If the pressure line enters a main line, it is advisable to install an injection nozzle.

Injection nozzles have three main functions:

- Dosing the medium into a main line,
- Preventing flowback into the pressure line through a non-return valve.

Notes on assembly:

- Double-ball injection nozzles must be installed into the main line vertically from the bottom. You can install hose and spring-loaded injection nozzles any way you like.
- With dosing media that tend to crystallize, it is advisable to carry out installation into the main line from the bottom. This prevents air bubbles from being trapped.
- Many dosing media tend to contaminate the injection nozzles, which can lead to blockages. In cases like this, it is advisable to install an injection nozzle that is easy to dismantle and block off.

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Pressure relief valve
④	Dosing tank
⑤	Pressure line
⑥	MEMDOS SMART LB dosing pump
⑦	Wall bracket
⑧	Shutoff valve
⑨	Suction line

Tab. 12: Designation of components

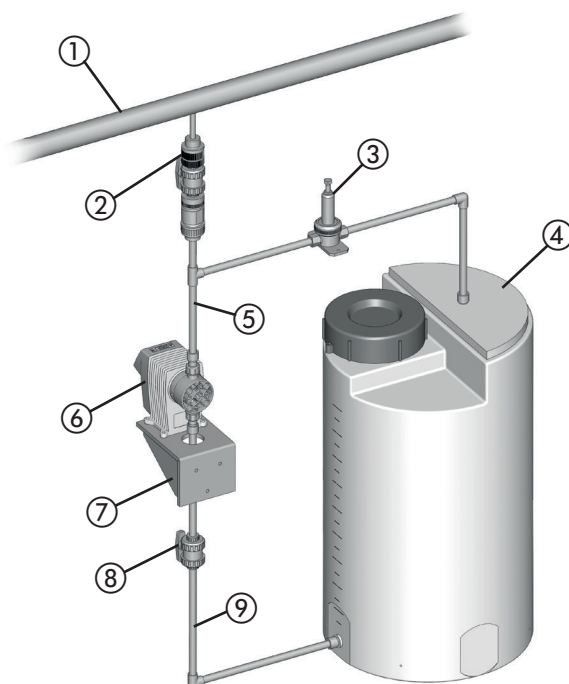


Fig. 18: Installation with an injection nozzle

8.7.2 Pressure relief valve

Pressure relief valves have an important safety function for protecting the dosing pump and the associated pipes and fittings. The dosing pump can generate a pressure that is many times the rated one. A blocked pressure line can lead to dosing medium escaping.

An improperly high pressure can occur if:

- the shut-off valves are closed even though the dosing pump is running,
- pipes block.

At an appropriate pressure, a pressure relief valve opens a bypass line and protects the system in this way from pressures that are too high.

Notes on assembly:

- The line for returning dosing medium from the pressure relief valve must be routed to the dosing tank or to a collecting pan.
- The pressure in the dosing tank must not be too high so that it is possible to accommodate the returned dosing medium.
- As an alternative, the system can return dosing medium into the suction line in front of the dosing pump. In this case, there must not be a non-return valve or a foot valve in the suction line.
- You should install the pressure relief valve as close as possible to the dosing head.

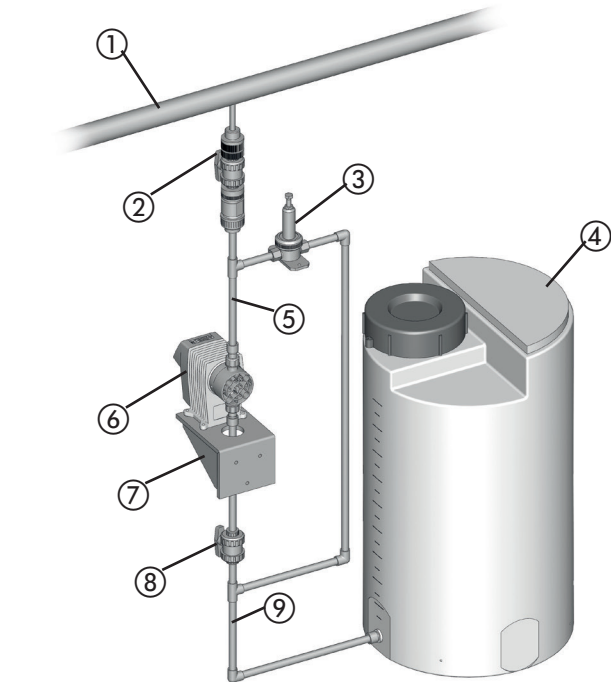


Fig. 19: Installation with pressure relief valve – returning to the suction line

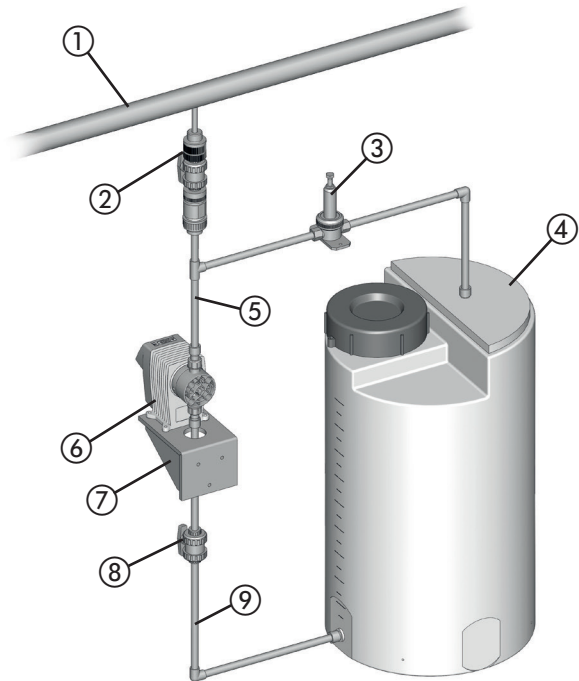


Fig. 20: Installation with pressure relief valve – returning to the dosing tank

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Pressure relief valve
④	Dosing tank
⑤	Pressure line
⑥	MEMDOS SMART LB dosing pump
⑦	Wall bracket
⑧	Shutoff valve
⑨	Suction line

Tab. 13: Designation of components

8.7.3 Back-pressure valve

Back-pressure control valves are necessary if:

- there are considerably fluctuating system pressures,
- the pressure on the suction side is higher than on the discharge side or if you intend to carry out dosing into depressurized lines.

In cases like this, if you do not use a back-pressure valve, imprecise dosing results will occur or overloading will result. The back-pressure valve solves these problems by generating a defined, constant back pressure.

In some circumstances, a back-pressure valve is unnecessary if you use a hose injection nozzle and if the back pressure that it generates is adequate.

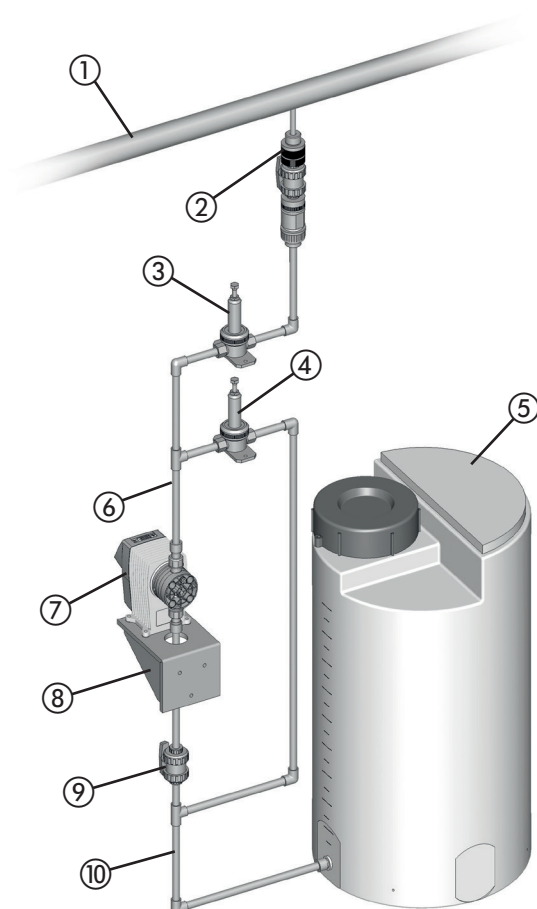


Fig. 21: Installation with a back-pressure valve

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Back-pressure valve
④	Pressure relief valve
⑤	Dosing tank

Tab. 14: Designation of components

No.	Description
⑥	Pressure line
⑦	Dosing pump MEMDOS SMART LB
⑧	Wall bracket
⑨	Shut-off valve
⑩	Suction line

Tab. 14: Designation of components

8.7.4 Pulsation dampener

Pulsation dampeners have the following functions:

- Damping pulsating delivery flows for processes that require low-pulsation dosing,
- Reducing the throughflow resistance with long pipelines.

When installed on the suction side:

- Damping of acceleration mass forces and with this reduction of wear on the dosing pump.
- Preventing cavitation (pull-off of the liquid column) due to too high acceleration.

However, pulsation dampeners also have important safety functions, since they prevent pressure peaks from arising that lead to piping vibrating and cause them to snap.

This problem can occur:

- with the high amplitudes of the vibrations,
- when using long pipes (the severity of the pulsation increases with the length of the pipe),
- when using rigid piping instead of elastic hoses.

Notes on assembly:

- You should carry out assembly in the direct vicinity of the location where you want to damp the pressure peaks (directly in front of the suction valve or directly behind the discharge valve).
- Pulsation dampeners should be installed with throttle valves or back-pressure valves installed directly behind them. By setting the valves appropriately, you can further-optimize damping of the pulsations.
- To prevent unnecessary pipe friction losses, you should lay the connecting line straight and in accordance with the rated width of the pulsation dampener.
- You must separately fasten relatively large pulsation dampeners and ones with hose connections.
- Pipelines must not transfer any mechanical tensions onto the pulsation dampener.

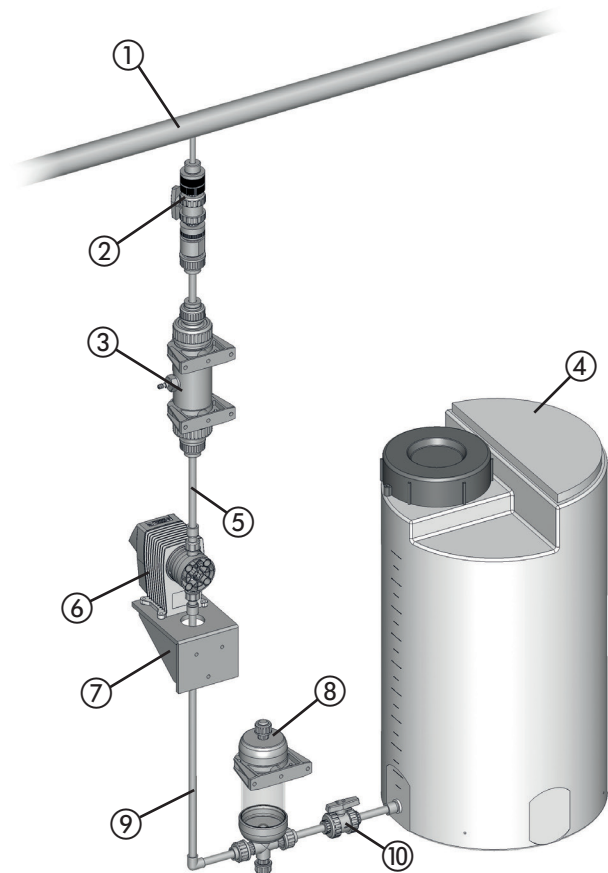


Fig. 22: Installation with a pulsation dampener

No.	Description
①	Main line
②	Injection nozzle with shutoff valve
③	Pulsation dampener
④	Dosing tank
⑤	Pressure line
⑥	MEMDOS SMART LB dosing pump
⑦	Wall bracket
⑧	Suction pulsation dampener
⑨	Suction line
⑩	Shutoff valve

Tab. 15: Designation of components

8.7.5 Priming aid

Priming aids are particularly advisable:

- in the case of dosing pumps with small volumetric displacements per stroke or with low stroke length settings,
- with high suction heads,
- with highly dense dosing media,
- at priming for the first time due to dry valves and air in the suction line and the dosing head,
- in dosing systems with frequent downtimes.

Further advantages resulting from priming aids:

- preventing cavitation in the suction line,
- gas removal,
- optical dosing control with small amounts,
- smoothing of the suction flow.

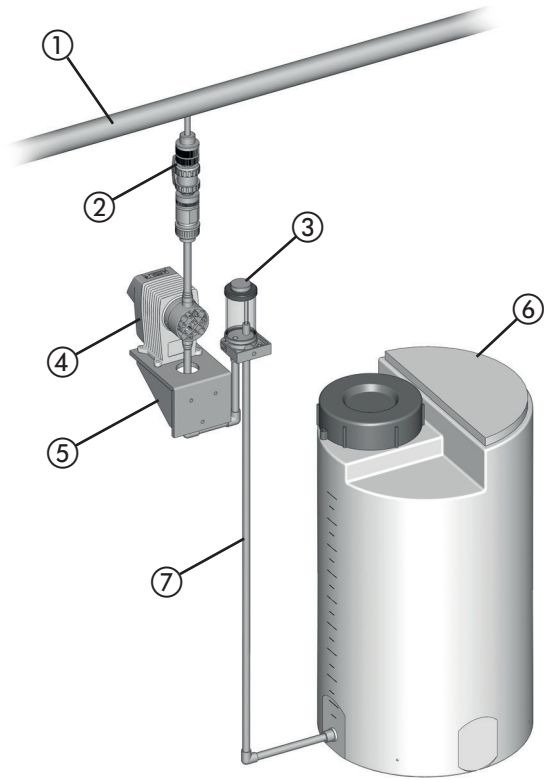


Fig. 23: Installation with a priming aid

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Priming aid
④	MEMDOS SMART LB dosing pump
⑤	Wall bracket

Tab. 16: Designation of components

No.	Description
⑥	Dosing tank
⑦	Suction line

Tab. 16: Designation of components

8.7.6 Level monitoring

Level monitoring of suction-side feeding of the dosing medium to prevent the tank being sucked dry and to ensure that it can be topped up again in good time.

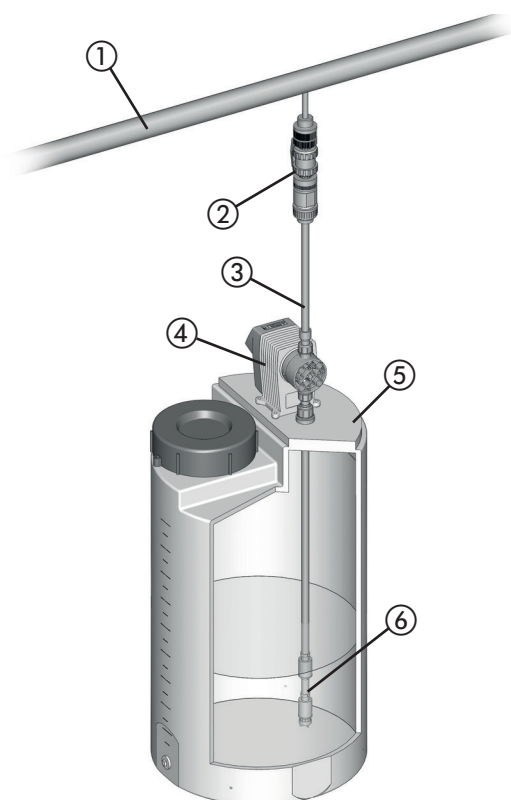


Fig. 24: Installation with a level monitoring system

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Pressure line
④	MEMDOS SMART LB dosing pump
⑤	Dosing tank
⑥	Suction line with level monitoring

Tab. 17: Designation of components

8.7.7 Dosing of suspensions

When dosing suspensions, the dosing head must be rinsed regularly to prevent depositing. To do this, you install a feed line for the rinsing medium (water) in the suction side installation.

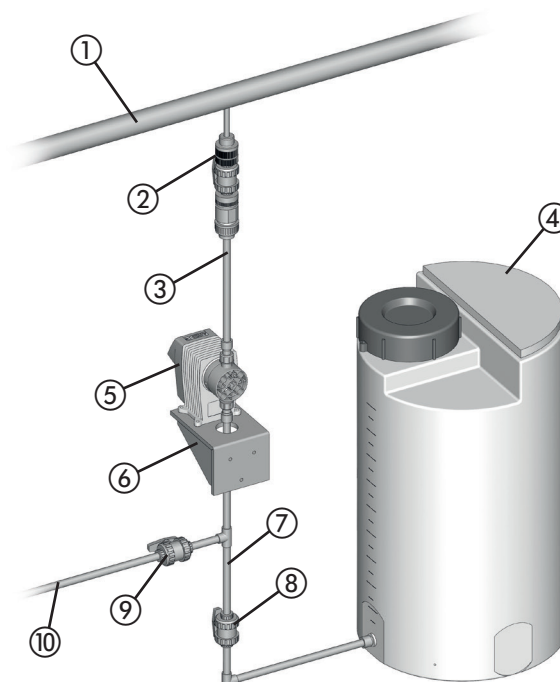


Fig. 25: Dosing of suspensions

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Pressure line
④	Dosing tank
⑤	MEMDOS SMART LB dosing pump
⑥	Wall bracket
⑦	Suction line
⑧	Shutoff valve
⑨	Shutoff valve
⑩	Line for rinsing the dosing head

Tab. 18: Designation of components

8.7.8 Suction pressure regulator

A suction pressure regulator may be necessary if the suction-side installation of the system demonstrates a varying suction pressure or supply pressure:

- Dosing pumps that are installed above dosing tanks deliver less as the tank empties, since the suction head increases.
- Dosing pumps that are installed below dosing tanks deliver less as the tank empties, since the positive delivery pressure reduces.

Further problems that can occur:

- Greater wear on the dosing pump, e.g. diaphragm rupture due to the effects of heavy forces with particularly high tanks and high-density dosing media.
- Idling of the dosing tank in the case of a diaphragm rupture or pipe breakage.
- Impermissibly high forces in the pump transmission that occur when dosing pumps receive the dosing medium directly from the pressure line.
- Reduced performance or destruction of fittings due to cavitation with long suction lines.

Installing a suction pressure regulator is a remedy for the problems above. The suction pressure regulator is opened by the dosing pump's suction pressure. This ensures that no dosing medium can flow if the dosing pump is not running or no vacuum can be generated following a pipe fracture.

Notes on assembly:

- When using a large suction pressure regulator, you should provide a pulsation dampener on the suction side.

No.	Description
①	Main line
②	Injection nozzle with shut-off valve
③	Pressure line
④	Dosing tank
⑤	MEMDOS SMART LB dosing pump
⑥	Wall bracket
⑦	Suction line
⑧	Suction pressure regulator
⑨	Shutoff valve

Tab. 19: Designation of components

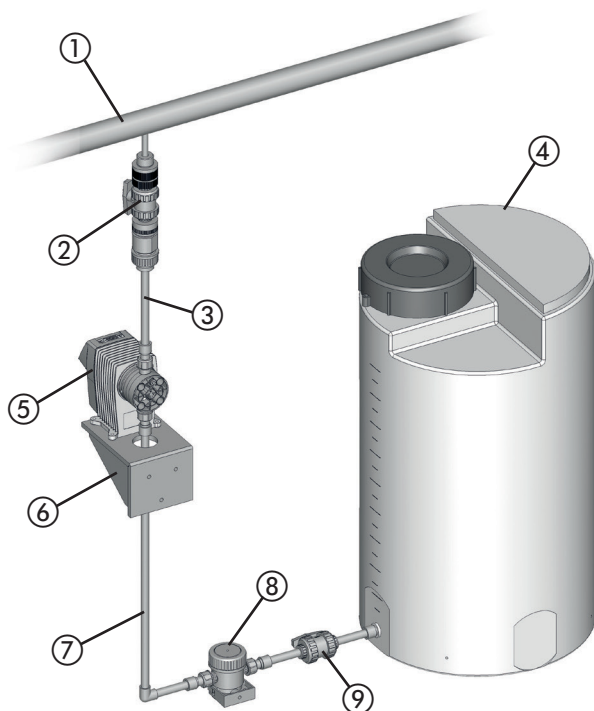



Fig. 26: Installation with a suction pressure regulator

9 Electrical installation




DANGER

Danger to life due to electric shock

If there is an electrical accident, you must disconnect the dosing pump from the mains as quickly as possible.

⇒ Install an emergency stop switch or integrate the dosing pump into the plant safety concept.




CAUTION

Danger of automatic start up!

The dosing pump does not have an ON/OFF switch and may start to pump as soon as it is connected to the mains supply. This means that dosing medium can escape. Depending on the type and hazardousness of the dosing medium, this can result in damage to property or to injury.

⇒ Install an emergency stop switch or integrate the dosing pump into the plant safety concept.




NOTICE

Damage due to wrong mains voltage

The dosing pump can be damaged if you connect it to the wrong mains voltage.

⇒ Observe the information on the mains supply that is given on the nameplate.



NOTICE


Insufficient electromagnetic compatibility

When you connect the dosing pump to a socket without an attached protective earth, it is not possible to guarantee the interference radiation and interference immunity according to EMC regulations.

⇒ Only connect the dosing pump to sockets with an attached protective earth.

9.1 Principles

- The dosing pump has a 110 - 240 V AC 50/60 Hz wide-range power supply unit
- The electrical connection comply with local regulations.
- The dosing pump must be plugged into a grounded power outlet.
- To avoid dosing errors at the end of the process, the dosing pump must be locked electrically.
- The dosing pump must not be operated by switching the mains voltage on or off.
- Signal cables must not be laid parallel to high-voltage current lines or mains cables. You must route supply and signal lines in separate channels. An angle of 90° is required at line crossings.



NOTICE

Compromised functions due to open contacts

MEMDOS SMART LB is delivered with a conductive rubber band connected in the connection socket 1. These conduct electricity and ensure that the contacts in the connection sockets remain closed when no cables are connected. If the conductive rubber band in the connection sockets is missing or is installed incorrectly and there is no cable connected to the socket, the dosing pump cannot be started.

⇒ Insert the conductive rubber band in connection socket 1 if you do not wire up the connection socket.

⇒ Ensure that the conductive rubber band is installed on the correct contacts (see instructions in following chapters).



Fig. 27: Removing the conductive rubber band

9.2 Description of the connection socket



Fig. 28: Connection socket

Input	Connection socket
Release input	1

Tab. 20: Description of the connection socket

9.2.1 Connection socket 1

9.2.1.1 Release input

Using the Release input, it is possible to start or stop the dosing pump externally.

- Potential-free contact
- Assignment of pin 3, 4

Pin	M12x1 (A-coded)	Assignments	Connection	Cable colour*	
1		-	-	Brown	BN
2		-		White	WH
3		Ground (GND)		Blue	BU
4		External On/Off		Black	BK

Tab. 21: Connection socket 1

* Applies to cable colours of cables from Lutz-Jesco GmbH. No liability is accepted for cables from other manufacturers.

Removing the conductive rubber band



Fig. 29: Conductive rubber band in connection socket 1

Remove the conductive rubber band before inserting the cable in the connection socket.

After the cable has been removed, the conductive rubber band must be reinserted in the connection socket. Insert it between pins 1, 2 and 3, 4 as shown in fig. 9-3.

10 Control

10.1 Stroke frequency setting

The desired supply rate of the dosing pump is set using the stroke frequency setting ③.

The stroke frequency can be adjusted while the pump is running or while it is turned off (in depressurized condition).

The scale of the stroke frequency setting shows the value of the setting in percent from 0% (stopped) to 100% (maximum possible stroke frequency).

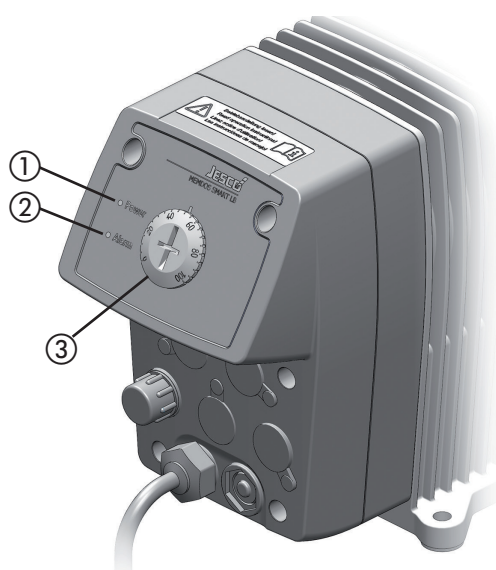


Fig. 30: Stroke frequency setting

Rotational direction*	Effect
<i>Clockwise</i>	Stroke frequency is reduced, supply rate decreases
Counter -clockwise	Stroke frequency is raised, supply rate increases


*In terms of the stroke frequency setting.


10.2 Indicator lights


The Power LED ① is lit permanently when the dosing pump is connected to the power supply. The Power LED flashes when the dosing pump performs a pressure stroke.


The Alarm LED ② is lit when a fault has occurred (see „Troubleshooting“ on page 36).


11 Operation


	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>After connecting the mains supply, residual dosing media in the dosing head can spray out.</p> <ul style="list-style-type: none"> ⇒ Before connecting the mains supply, connect the dosing lines. ⇒ Check that all the screw connections have been tightened correctly and are leak-proof. 	

	WARNING
<p>Caustic burns or other burns through dosing media!</p> <p>While working on the dosing head, valves and connections, you may come into contact with dosing media.</p> <ul style="list-style-type: none"> ⇒ Use sufficient personal protective equipment. ⇒ Rinse the dosing pump with a liquid (e.g. water) which does not pose any risk. Ensure that the liquid is compatible with the dosing medium. ⇒ Release pressure in hydraulic parts. ⇒ Never look into open ends of plugged pipelines and valves. 	

	CAUTION
<p>Danger of personal injury and material damage!</p> <p>Dosing medium can escape if you loosen connections on the dosing head, e.g. for venting, during operation.</p> <ul style="list-style-type: none"> ⇒ Follow the safety data sheet of the dosing medium. ⇒ Clean the dosing pump if dosing medium escapes. ⇒ Dispose of the dosing medium correctly. 	

	CAUTION
<p>Increased risk of accidents due to insufficient qualification of personnel!</p> <p>Dosing pumps and their accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will raise the risk of accidents.</p> <ul style="list-style-type: none"> ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons. 	

	CAUTION
<p>Danger of personal injury and material damage!</p> <p>Changing dosing media can lead to unpredictable reactions.</p> <ul style="list-style-type: none"> ⇒ Thoroughly clean the dosing pump and appropriate sections of the plant to avoid chemical reactions. 	

	CAUTION
<p>Danger of automatic start up!</p> <p>The dosing pump does not have an ON/OFF switch and may start to pump as soon as it is connected to the mains supply. This means that dosing medium can escape. Depending on the type and hazardness of the dosing medium, this can result in injury.</p> <ul style="list-style-type: none"> ⇒ Stop the dosing pump before disconnecting it from the mains supply. ⇒ Ensure that the dosing pump has been installed correctly before connecting it to the mains supply. 	

11.1 Commissioning the dosing pump

Precondition for action:

- ✓ The dosing pump has been assembled and installed in accordance with Chapter "Installing the Dosing Pump" (see page 16), Chapter "Hydraulic installations" (see page 17) and Chapter "Electrical installation" (see page 27).
- ✓ All the mechanical fastenings have been inspected to ensure adequate load-bearing capacity.
- ✓ The dosing head screws have been tightened with the correct torque (see „Tighten dosing head bolts“ on page 35).
- ✓ All the hydraulic sections have been inspected to ensure they are adequately leak-proof and that the through flow direction is correct.
- ✓ Personnel have read all the operating instructions and understood them completely.



For initial commissioning, it is advisable to use water as the dosing medium to check that the system is leak-proof and that the dosing pump is functioning correctly. Check first whether undesirable reactions could occur between the actual dosing medium and the water.

At initial commissioning, it is advisable to prime the pump without back pressure. For this purpose, we recommend installing a relief valve on the discharge side of the dosing pump.

Perform the following working steps:

1. Open the shut-off valves on the suction and discharge sides if present.
2. Plug in the dosing pump's mains plug to the power supply.

3. Vent the dosing pump, (see „Venting the dosing pump“ on page 31).
4. Calibrate the dosing pump (see „Calibrating the dosing pump“ on page 31).
5. Turn the stroke frequency adjustment slowly counter-clockwise until the dosing pump draws in enough and dosing starts.

i If the dosing pump does not draw or draws insufficiently, the use of hydraulic accessories, such as priming aids, is recommended. See also “Hydraulic accessories” on page 21.

✓ **The dosing pump is commissioned.**

11.1.1 Venting the dosing pump

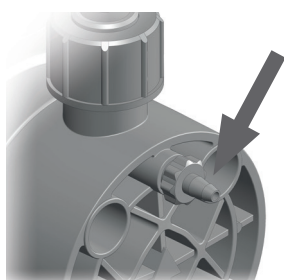


Fig. 31: Dosing head venting facility with vent screw

Precondition for action:

- ✓ The dosing head venting facility connected has been connected in accordance with the chapter entitled “Connecting the dosing head venting facility” (see page 20).

Perform the following working steps:

1. Open the vent screw (only MEMDOS SMART LB 5 and LB 10 with dosing head made of plastic) by one full turn (anti-clockwise facing the dosing head).
2. Set the stroke frequency to 100 %.
 - ▶ The dosing pump starts delivery at the highest stroke frequency.
3. Set the stroke frequency to 0 % as soon as there is a continuous throughflow from the dosing head venting unit, with no air bubbles.
 - ▶ The dosing pump stops delivery.
4. Close the vent screw.

✓ **The dosing pump is vented.**

i If you are using effervescent media, allow them to flow out continuously. Open the vent screw such that about one drop per 1- 3 strokes escapes.

11.1.2 Calibrating the dosing pump

In dependence on the dosing medium you are using and the existing delivery pressure, you must match the theoretical delivery capacity with that which is actually measured.

Precondition for action:

- ✓ The plant sections on the discharge side of the dosing pump have been installed correctly and are ready for operation.

Perform the following working steps:

1. Will the metering container with the dosing medium.
2. Hold the end of the dosing pump's suction line in the metering container.
3. Vent the dosing pump (see 11.1.1 “Venting the dosing pump”).
4. Set the stroke frequency to 0 %.

i The following steps must be performed without the defined time limit, otherwise calibration is not performed successfully and the dosing pump start in normal operating mode.

5. Connect the power supply to dosing pump and set the stroke frequency to 100 % within 5 s after 1 s.
6. Set the stroke frequency to 0 % within 5 s after 1 s.
7. Set the stroke frequency to the desired delivery rate within 5 s after 1 s.

i The required delivery rate can be calculated from the maximum delivery rate of the dosing pump. Example: If the maximum delivery rate of the dosing pump is 15 l/h and the desired delivery rate is 9 l/h, the value to be set is 60 %, i.e. $9/15 * 100 = 60$.

- ▶ The dosing pump starts to convey and stops automatically after 60 s.
8. Disconnect the dosing pump from the power supply.
 9. Determine how many litres have been conveyed from the calibration pot.

i Use this measured value to calculate the actual delivery rate as a % of the maximum maximum delivery rate. Example: The volume conveyed in 60 s is 0.18 l. The maximum delivery rate of the dosing pump is 15 l/h. $0.18 * 60/15 * 100$ is 72 %. This actual the value that you must set in step 13.

10. Set the stroke frequency to 0 %.
11. Connect the power supply to the dosing pump and set the stroke frequency to 100 % within 5 s after 1 s.
12. Set the stroke frequency to 0 % within 5 s after 1 s.
13. Set the stroke frequency to the calculated, actual delivery rate within 5 s after 1 s.
 - ▶ The dosing pump will calibrate automatically to the new value.

✓ **The dosing pump is calibrated.**

11.1.2.1 Delete calibration

1. Disconnect the dosing pump from the power supply.
2. Set the stroke frequency to 0 %.
3. Connect the power supply to the dosing pump and set the stroke frequency to 100 % within 5 s after 1 s.
4. Set the stroke frequency to 0 % within 5 s after 1 s.
5. Set the stroke frequency to 100 % within 5 s after 1 s.
 - ▶ The Power LED and the Alarm LED are lit permanently.
6. Disconnect the dosing pump from the power supply.

✓ **Calibration deleted.**

11.5 Storage

Storing the dosing pump correctly extends its service life. You should avoid negative influences like extreme temperatures, high humidity, dust, chemicals, etc.

Ensure ideal storage conditions where possible:

- the storage place must be cold, dry, dust-free and generously ventilated,
- Temperatures between + 2 °C and + 40 °C (with PP and PVDF dosing heads, between + 2 °C and + 60 °C),
- Relative humidity must not exceed 90%.

11.2 External On/Off via Release input

The MEMDOS SMART LB dosing pump can be started or stopped via an open or closed switching contact at the release input.

11.2.1 Starting the dosing pump

➔ Close the switching contact on the Release input.

✓ **Dosing pump has started.**

11.2.2 Stopping the dosing pump

➔ Open the switching contact on the Release input.

✓ **Dosing pump has stopped.**

11.3 Decommissioning the dosing pump

Perform the following working steps:

1. Unplug the dosing pump's mains plug from the power supply.
2. Disconnect all electrical connections.
3. Depressurize all the hydraulic parts in the system.
4. Unplug all the hydraulic connections on the dosing pump.
5. Empty the dosing head.
6. Remove any residual dosing medium from the dosing head by flushing the system with a washing agent. Ensure that the washing agent is compatible with the dosing medium.

✓ **Dosing pump is decommissioned.**

11.4 Shutting down in an emergency

- In an emergency, you must immediately disconnect the dosing pump from the mains supply or activate the Emergency Stop switch installed in the system.
- Depending on the type of incident, you must depressurized the hydraulic connections or locked to prevent dosing medium from escaping.
- You must follow the safety data sheet of the dosing medium.

11.6 Transportation

Perform the following working steps:

- The unit should be thoroughly cleaned. Any dangerous dosing media must be additionally neutralised and decontaminated.
- All accessories should be dismantled.
- All openings should be closed, so that no foreign objects can get into the system.
- The dosing pump must be suitably packed, preferably in the original packing, and transportation.


Should the unit be sent back to the manufacturer, please follow chapters "Declaration of harmlessness" (see page 42) and "Warranty application" (see page 44).

11.7 Disposal of old units

- The waste unit must be thoroughly cleaned. Any dangerous dosing media must be additionally neutralised and decontaminated.
- Any residual dosing media must be removed in a professional manner.
- The dosing pump must be disposed of in accordance with applicable local laws and regulations. The unit does not belong to household waste!
- As the disposal regulations may differ from country to country in the European Union, please consult your supplier if necessary.
In Germany, the manufacturer must provide free-of-charge disposal provided the unit has been sent in a safe manner.

12 Maintenance

Lutz-Jesco dosing pumps are produced to the highest quality standards and have a long service life. Nevertheless, some of their parts are subject to wear due to operation (e.g. diaphragms, valve seats, valve balls). This means that regular visual inspections are necessary to ensure a long operating life. Regular maintenance will protect the dosing pump from operation interruptions.




DANGER

Danger to life due to electric shock!

Live parts can inflict fatal injuries.

- ⇒ Before carrying out any maintenance work, always disconnect the dosing pump from the power supply.
- ⇒ Secure the dosing pump from accidental power-up.




WARNING

Caustic burns or other burns through dosing media!

While working on the dosing head, valves and connections, you may come into contact with dosing media.

- ⇒ Use sufficient personal protective equipment.
- ⇒ Rinse the dosing pump with a medium (e.g. water) which does not pose any risk.
- ⇒ Release pressure in hydraulic parts.
- ⇒ Never look into open ends of plugged pipelines and valves.




WARNING

Caustic burns or other burns through dosing media!

After connecting the mains supply, residual dosing media in the dosing head can spray out.

- ⇒ Before connecting the mains supply, connect the dosing lines.
- ⇒ Check that all the screw connections have been tightened correctly and are leak-proof.




CAUTION

Danger of personal injury and material damage!

The dosing pump can generate a pressure that is many times the rated one. The dosing medium can escape in the case of material failure or wear on the dosing head, the connection pipe or the seals that are used.

- ⇒ Carry out maintenance work at the recommended intervals.



CAUTION

Increased risk of accidents due to insufficient qualification of personnel!

Dosing pumps and their accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will raise the risk of accidents.

- ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.
- ⇒ Prevent access to the system for unauthorised persons.

12.1 Maintenance intervals

This table gives you an overview of maintenance work and the intervals at which you must carry it out. The next few chapters contain instructions for carrying out this work.

Maintenance work to be carried out	Frequency
Check that piping is seated firmly	Regularly
Check that suction and discharge valves are seated firmly	Regularly
Clean suction and discharge valves	Regularly
Check that electrical connections are not damaged	Regularly
Tighten up dosing head bolts	<ul style="list-style-type: none"> ■ Regularly ■ Before initial commissioning ■ After each diaphragm change
Check diaphragm for leakage due to rupture	Regularly
Check that the installed accessories are functioning correctly	Regularly
Check the dosing pump for unusual noises during operation, unusual temperatures or smells	Regularly
Replace parts that are subject to wear (diaphragms, valves, seals, etc.)	When unacceptable levels of wear are detected
Rinse out and clean the dosing pump	<ul style="list-style-type: none"> ■ Before changing diaphragms ■ Before taking out of service for a long period of time ■ After feeding aggressive, sticky, crystallising or contaminated liquids

Tab. 22: Maintenance information and maintenance intervals

12.2 Tighten up dosing head bolts

➔ Tighten the dosing head bolts in diagonally opposite sequence with a torque wrench.

The necessary torque is 180 Ncm.

12.3 Change the diaphragm

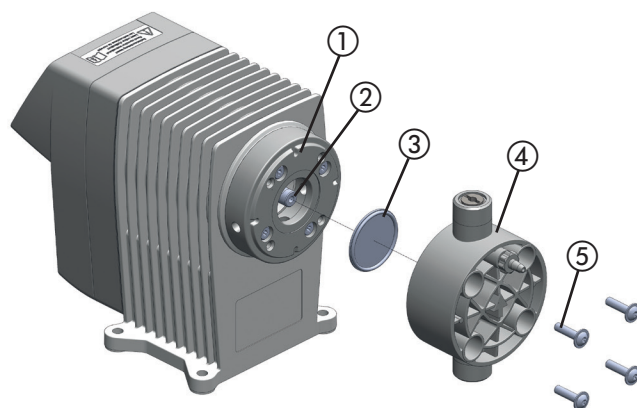


Fig. 32: Exploded view of the diaphragm and dosing head

12.3.1 Remove the old diaphragm

Precondition for action:

- ✓ You have disconnected the dosing pump from the mains supply.
- ✓ You have depressurised the hydraulic sections of the plant.
- ✓ You have rinsed the dosing pump using a safe medium (e.g. water).

Perform the following working steps:

1. Screw out the four screws (5) on the dosing head using a suitable tool (SW 3 Allen key) and take off the dosing head (4).
2. Use pliers to bend the edge of the diaphragm (3) slightly upwards and screw it out counter-clockwise.

12.3.2 Install a new diaphragm

Precondition for action:

- ✓ You have thoroughly cleaned the diaphragm rod (2) and the diaphragm flange (1) so that the new diaphragm is not affected by dosing medium residues.
 - ✓ You have slightly greased the diaphragm thread (3) (e.g. using Molykote Longterm W2).
1. Score the diaphragm manually (3) in the clockwise direction until it safely contacts into the diaphragm rod.
 2. Bring the dosing head into position and insert the screws. First tighten the screws finger-tight. After this, tighten the screws in diagonally opposite sequence, e.g. top left and bottom right and top right and bottom left.



NOTICE

Damage to the dosing head/diaphragm leaks

If you tighten the screws too much, this can lead to the dosing head being damaged. However, not tightening the screws enough leads to the diaphragm being leaky and correct functioning being affected.

⇒ Tighten the screws to a torque of 180 Ncm.

- ✓ Diaphragm change finished.



It may be necessary to recalibrate the dosing pump after replacing the diaphragm or other spare parts on it. For more information, refer to Page 31.

12.4 Clean suction and discharge valves

Contaminated valves affect the dosing precision and this means that you should clean the valves on a regular basis.

With dosing heads made of plastic, when replacing a valve you must replace the complete dosing head (see „Spare parts“ on page 39).

13 Troubleshooting

See below for information about how to rectify faults on the device or the system. If you cannot eliminate the fault, please consult with the manufacturer on further measures or return the dosing pump for repair.

13.1 Type of fault

13.1.1 Alarm LED is lit

Possible cause	Remedy
System back pressure too high (measured at discharge connection of dosing pump)	<ul style="list-style-type: none"> → Clean blocked injection nozzle. → Install pulsation dampeners to reduce pressure peaks if pipes are too long. → Check function of safety valves.
Driving belt torn	→ Contact the manufacturer.

Tab. 23: Type of fault: Alarm LED is lit

Possible cause	Remedy
Viscosity too high	<ul style="list-style-type: none"> → Possibly reduce the concentration of the dosing medium or increase the temperature. → Install spring-loaded valves. → Increase the pipe diameter.
Current supply interrupted	→ Reconnect the current supply
The dosing pump's electrical data does not match that of the mains supply	→ Check the electrical installation.
System back pressure too high (measured at discharge connection of dosing pump)	<ul style="list-style-type: none"> → Clean blocked injection nozzle. → Install pulsation dampeners to reduce pressure peaks if pipes are too long. → Check function of safety valves.

Tab. 24: Type of fault: Dosing pump not delivering or output too low

13.1.2 Dosing pump not delivering or output too low

Possible cause	Remedy
Wrong type of dosing pump selected	→ Check the dosing pump's technical data and if necessary select a type with a higher delivery capacity.
Valve leaking or blocked	<ul style="list-style-type: none"> → Clean the valve and vent the dosing pump. → Tighten the screw connections.
Valve installed incorrectly	→ Reassemble the valve. Ensure that the valve balls are located above the valve seats.
Valve damaged (e.g. valve balls)	→ Remove the damaged parts or install a new valve.
Suction line is leaking	→ Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve)	→ Clean the suction line
Shut-off valves closed	→ Open the shut-off valves Inspect the dosing pump for possible damage.
Suction head too high	<ul style="list-style-type: none"> → Set the dosing pump to feed or reduce the suction head. → Install a priming aid.

Tab. 24: Type of fault: Dosing pump not delivering or output too low

13.1.3 Dosing pump does not prime

Possible cause	Remedy
Valve leaking or blocked	<ul style="list-style-type: none"> → Clean the valve and vent the dosing pump. → Tighten the screw connections.
Valve installed incorrectly	→ Reassemble the valve. Ensure that the valve balls are located above the valve seats.
Valve damaged (e.g. valve balls)	→ Remove the damaged parts or install a new valve.
Suction line is leaking	→ Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve)	→ Clean the suction line
Shut-off valves closed	→ Open the shut-off valves Inspect the dosing pump for possible damage.
Suction head too high	<ul style="list-style-type: none"> → Set the dosing pump to feed or reduce the suction head. → Install a priming aid.

Tab. 25: Type of fault: Dosing pump does not prime

Possible cause	Remedy
Viscosity too high	→ Possibly reduce the concentration of the dosing medium or increase the temperature. → Install spring-loaded valves. → Increase the pipe diameter.
Current supply interrupted	→ Reconnect the current supply
Dry the valves	→ Dampen the dosing head and the valves → Vent the dosing head.
Air in the suction line with simultaneous pressure on the discharge valve	→ Vent the dosing head or the lines.

Tab. 25: Type of fault: Dosing pump does not prime

13.1.4 Delivery rate varies

Possible cause	Remedy
Valve leaking or blocked	→ Clean the valve and vent the dosing pump. → Tighten the screw connections.
Valve damaged (e.g. valve balls)	→ Remove the damaged parts or install a new valve.
Suction line is leaking	→ Seal the leak locations or replace the parts.
Suction line is blocked (e.g. screen in foot valve)	→ Clean the suction line
Viscosity too high	→ Possibly reduce the concentration of the dosing medium or increase the temperature. → Install spring-loaded valves. → Increase the pipe diameter.
The dosing pump's electrical data does not match that of the mains supply	→ Check the electrical installation.
Suction side pressure too high (pump siphoning)	→ Install a back-pressure valve in the pressure line.
Pressure peaks due to acceleration with long suction lines	→ Install a suction pressure regulator.

Tab. 26: Type of fault: Delivery rate varies

Possible cause	Remedy
Imprecise dosing due to changeable positive and negative suction heads	→ Install a suction pressure regulator.
System back pressure too high (measured at discharge connection of dosing pump)	→ Clean blocked injection nozzle. → Install pulsation dampeners to reduce pressure peaks if pipes are too long. → Check function of safety valves.

Tab. 26: Type of fault: Delivery rate varies

13.1.5 No stroke movement observed

Possible cause	Remedy
Diaphragm return spring broken	→ Contact the manufacturer.
Current supply interrupted	→ Reconnect the current supply
The dosing pump's electrical data does not match that of the mains supply	→ Check the electrical installation.
Pressure peaks due to acceleration with long suction lines	→ Install a suction pressure regulator.
System back pressure too high (measured at discharge connection of dosing pump)	→ Clean blocked injection nozzle. → Install pulsation dampeners to reduce pressure peaks if pipes are too long. → Check function of safety valves.

Tab. 27: Type of fault: No stroke movement observed

13.1.6 Dosing pump delivery rate too high

Possible cause	Remedy
Suction side pressure too high (pump siphoning)	→ Install a back-pressure valve in the pressure line.
Pressure peaks due to acceleration with long suction lines	→ Install a suction pressure regulator.

Tab. 28: Type of fault: Dosing pump delivery rate too high

13.1.7 Diaphragm is torn or tears too often

Possible cause	Remedy
Shut-off valves closed	→ Open the shut-off valves Inspect the dosing pump for possible damage.
Pressure peaks due to acceleration with long suction lines	→ Install a suction pressure regulator.
The materials are not suitable for the dosing medium being used	→ Check the resistance of the materials.
Diaphragm not screwed up to the end stop on the diaphragm rod	→ Screw a new diaphragm up to the end stop.
System back pressure too high (measured at discharge connection of dosing pump)	→ Clean blocked injection nozzle. → Install pulsation dampeners to reduce pressure peaks if pipes are too long. → Check function of safety valves.
Media sediment in dosing head	→ Clean the dosing head.

Tab. 29: Type of fault: Diaphragm is torn or tears too often

14 Spare parts

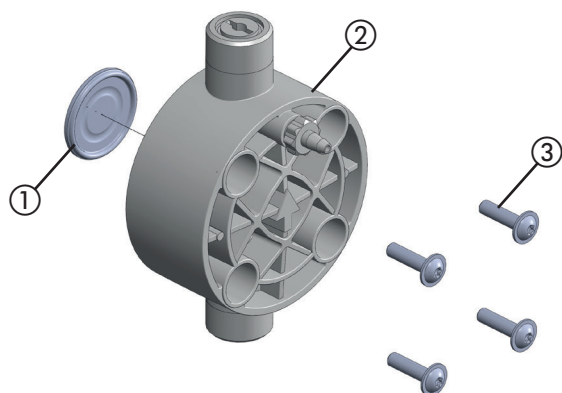


Fig. 33: Spare parts kits for MEMDOS SMART LB 2, 5, 10 (dosing head made of plastic)

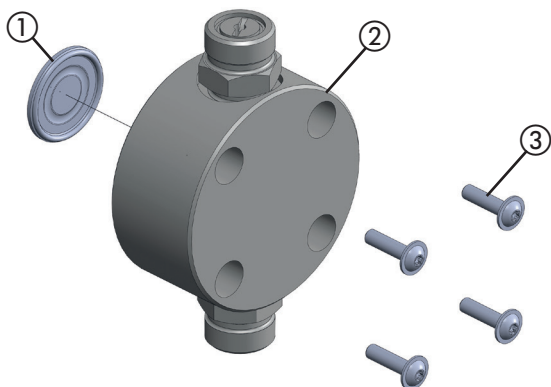


Fig. 34: Spare parts kits for MEMDOS SMART LB 2, 5, 10 (dosing head made of stainless steel (1.4571))

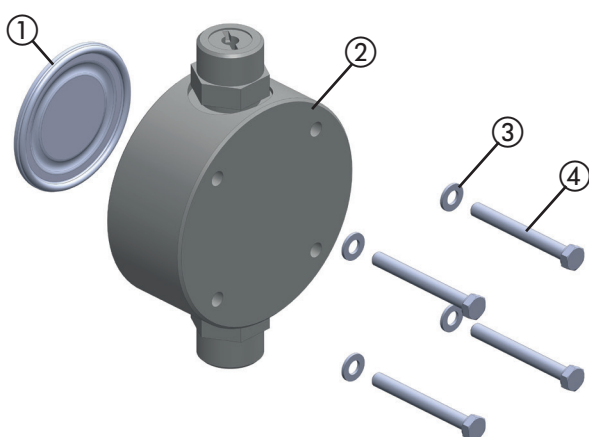


Fig. 35: Spare parts kits for MEMDOS SMART LB 15, 20 (dosing head made of plastic or stainless steel (1.4571))

Required kits for a complete service:

- 1 diaphragm spare parts kit,
- 1 dosing head spare parts kit including valves.

14.1 Diaphragm spare parts kits

Diaphragm spare parts kit containing:

- 1 diaphragm (1),
- 1 set of dosing head screws (3),
- 1 set of washers (4) (only MEMDOS SMART LB 15, 20).

Diaphragm kit	Tips	Part No.
	LD 2	39122
	LB 5, LB 10	39123
	LB 15, LB 20	40607

14.2 Dosing head spare parts kits including valves

Spare parts set: dosing head including screws consisting of:

- Dosing head (2),
- Valves,
- 1 set of dosing head screws (3),
- 1 set of washers (4) (only MEMDOS SMART LB 15, 20).

PVC	Type	Part No.
Glass/PVDF/FPM (ball/seat/seals)	LB 2	41192
	LB 5, LB 10	38983
	LB 15, LB 20	40571

PP	Type	Part No.
Glass/PVDF/FPM (ball/seat/seals)	LB 2	41193
	LB 5, LB 10	38980
	LB 15, LB 20	40572

PVDF	Type	Part No.
PTFE/PVDF/FPM (ball/seat/seals)	LB 2	41194
	LB 5, LB 10	38986
	LB 15, LB 20	40573

Stainless steel (1.4571)	Type	Part No.
Stainless steel (1.4571) / stainless steel (1.4571) / FPM (ball/seat/seals)	LB 2	41195
	LB 5, LB 10	39944
	LB 15, LB 20	40574

15 Delivery characteristic curves

This Chapter is intended to give you an idea of the delivery capacity that the dosing pump can achieve at specific back pressures. These delivery capacities were determined on the manufacturer's test stands. They apply at 20 °C (68 °F) for water, at 100 % stroke frequency. The delivery capacity depends on the medium (density and viscosity) and temperature. Since these conditions vary at every installation location, you should calibrate the dosing pump.

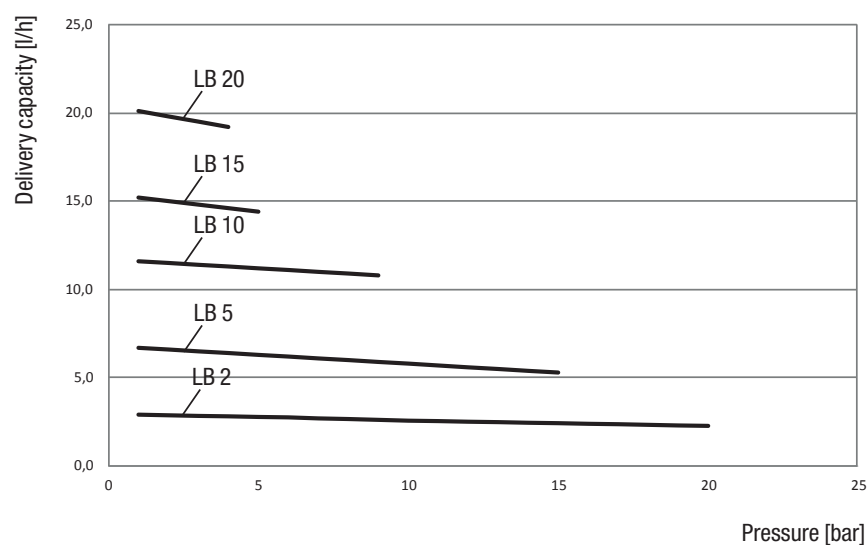


Fig. 36: Delivery characteristic curves MEMDOS SMART LB 2 – 20

16 EC Declaration of Conformity



(DE) EG-Konformitätserklärung

Hiermit erklären wir, dass das nachfolgend bezeichnete Gerät aufgrund seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der aufgeführten EG-Richtlinien entspricht. Bei einer nicht mit uns abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

(EN) EC Declaration of Conformity

We hereby certify that the device described in the following complies with the relevant fundamental safety and sanitary requirements and the listed EC regulations due to the concept and design of the version sold by us.

If the device is modified without our consent, this declaration loses its validity.

(FR) Déclaration de conformité CE

Nous déclarons sous notre propre responsabilité que le produit ci-dessous mentionné répond aux exigences essentielles de sécurité et de santé des directives CE énumérées aussi bien sur le plan de sa conception et de son type de construction que du modèle que nous avons mis en circulation.

Cette déclaration perdra sa validité en cas d'une modification effectuée sur le produit sans notre accord explicite.

(ES) Declaración de conformidad CE

Por la presente declaramos que, dados la concepción y los aspectos constructivos del modelo puesto por nosotros en circulación, el aparato mencionado a continuación cumple con los requisitos sanitarios y de seguridad vigentes de las directivas de la U.E. citadas a continuación.

Esta declaración será invalidada por cambios en el aparato realizados sin nuestro consentimiento.

(NL) EU-overeenstemmingsverklaring

Ondergetekende Lutz-Jesco GmbH, bevestigt, dat het volgende genoemde apparaat in de door ons in de handel gebrachte uitvoering voldoet aan de eis van, en in overeenstemming is met de EU-richtlijnen, de EU-veiligheidsstandaard en de voor het product specifieke standaard. Bij een niet met ons afgestemde verandering aan het apparaat verliest deze verklaring haar geldigheid.

(PT) Declaração de conformidade CE

Declaramos pelo presente documento que o equipamento a seguir descrito, devido à sua concepção e ao tipo de construção daí resultante, bem como a versão por nós lançada no mercado, cumpre as exigências básicas aplicáveis de segurança e de saúde das directivas CE indicadas.

A presente declaração perde a sua validade em caso de alteração ao equipamento não autorizada por nós.

Bezeichnung des Gerätes:

Schrittmotor-Membrandosierpumpe

Description of the unit:

Stepper Motor-driven Diaphragm Dosing Pump

Désignation du matériel:

Pompe doseuse à membrane entraînée par moteur pas à pas

Descripción de la mercancía:

Bomba dosificadora de membrana con motor paso a paso

Omschrijving van het apparaat:

Designação do aparelho:

Typ:

MEMDOS SMART LB 2 – 20

Type:

EG-Richtlinien:

2006/42/EG, 2004/108/EG

EC directives:

Die Schutzziele der Niederspannungsrichtlinie 2006/95/EG wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie 2006/42/EG eingehalten.

The protective aims of the Low Voltage Directive 2006/95/EC were adhered to in accordance with Annex I, No. 1.5.1 of the Machinery Directive 2006/42/EC.

Harmonisierte Normen:

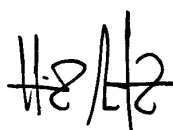
EN ISO 12100, EN 809, EN 61000-6-2, EN 61000-6-3

Harmonized standards:

Dokumentationsbevollmächtigter:

Lutz-Jesco GmbH

Authorized person for documentation:



Heinz Lutz
Geschäftsführer / Chief Executive Officer
Lutz-Jesco GmbH
Wedemark, 01.04.2014

Lutz-Jesco GmbH
Am Bostelberge 19
30900 Wedemark
Germany

17 Declaration of harmlessness

Please copy the declaration, stick it to the outside of the packaging and return it with the device.

Declaration of no objection

Please fill out a separate form for each appliance!

We forward the following device for repairs:

Device and device type: Part-no.:

Order No.: Date of delivery:

Reason for repair:

.....

.....

Dosing medium

Description: Irritating: ☐ Yes ☐ No

Properties: Corrosive: ☐ Yes ☐ No

We hereby certify, that the product has been cleaned thoroughly inside and outside before returning, that it is free from hazardous material (i.e. chemical, biological, toxic, flammable, and radioactive material) and that the lubricant has been drained.

If the manufacturer finds it necessary to carry out further cleaning work, we accept the charge will be made to us.

We assure that the aforementioned information is correct and complete and that the unit is dispatched according to the legal requirements.

Company / address: Phone:

..... Fax:

..... Email:

Customer No.: Contact person:

Date, Signature:

Notes

18 Warranty application

Warranty Application

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty application, filled out.

Sender

Company: Phone: Date:

Address:

Contact person:

Manufacturer order no.: Date of delivery:.....

Device type: Serial number:

Nominal capacity / nominal pressure:

Description of fault:.....

.....

.....

.....

.....

.....

.....

.....

.....

Service conditions of the device

Point of use / system designation:.....

.....

.....

Accessories used (suction line etc.):.....

.....

.....

.....

.....

Commissioning (date):

Duty period (approx. operating hours):

Please describe the specific installation and enclose a simple drawing or picture of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.

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Product Range

Lutz Pumpen GmbH
P.O. Box 1462 • D-97864 Wertheim
www.lutz-pumpen.de



Barrel and Container Pumps



Flow Meters



Double Diaphragm Pumps



Centrifugal Pumps

Product Range

Lutz-Jesco GmbH
P.O. Box 100164 • D-30891 Wedemark
www.lutz-jesco.com



Dosing Pumps



Chlorinators



Chemical Centrifugal Pumps



TECHNOPOL®

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Measuring and Control Equipment



Disinfection



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The Lutz-Jesco App for iPads is available from the iTunes App Store.
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