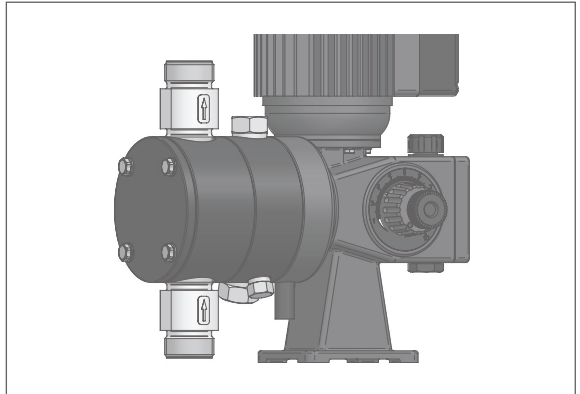


## Double-diaphragm system



### Operating manual

Read this operating manual before using the equipment.  
To be retained for future reference.

---

## Table of Contents

1. Safety instructions.....	3
1.1 General .....	3
1.2 Identification of safety instructions in the operating manual .....	3
1.3 Personnel qualifications and training .....	4
1.4 Hazards due to failure to follow safety instructions .....	4
1.5 Safety awareness at work.....	4
1.6 Safety instructions for the operating company/operator .....	4
1.7 Safety instructions for inspection, maintenance and installation work .....	4
1.8 Unauthorised modification and production of spare parts.....	5
1.9 Inadmissible operating practices .....	5
1.10 Dosing of chemicals.....	5
1.11 Scope of delivery .....	6
2. General .....	7
3. Design and function .....	8
3.1. Diaphragm monitoring.....	8
4. Special instructions for new installation of double-diaphragm systems .....	9
5. Information concerning maintenance work on the double-diaphragm system .....	10
6. Information for the mode of function of the double-diaphragm system and for possible malfunctions.....	11
7. Declaration of Harmlessness.....	12
8. Warranty Application.....	13

---

## 1. Safety instructions

### 1.1 General

This operating manual contains basic instructions to be followed during installation, operation and maintenance. It is therefore essential for the assembler and the relevant technical personnel/operating company to read this operating manual. It must remain accessible at the dosing pump/system for reference at all times. Besides the general safety instructions in this "Safety" section, the special safety instructions in the other sections are also to be followed.

### 1.2 Identification of safety instructions in the operating manual

Failure to follow the safety instructions in this operating manual may result in personal injury or damage to the environment and the dosing pump/system. Safety instructions are identified by the following symbols:

#### **DANGER!**

Indicates an immediate danger.

Failure to follow this instruction may lead to death or extremely serious injuries.



#### **WARNING!**

Indicates a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injury.



#### **CAUTION!**

Indicates a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.



#### **ATTENTION!**

or

#### **NOTE!**

Failure to follow these safety instructions may endanger the machine and its functions.



#### **IMPORTANT!**

This refers to additional information to facilitate operation and ensure the smooth running of the equipment.



Information attached directly to the dosing pump, such as

- Cable markings
- Markings for process fluid connections

must be followed without fail and must remain fully legible at all times.

---

### **1.3 Personnel qualifications and training**

The personnel employed for operation, maintenance, inspection, and installation must be suitably qualified for this work. The responsibilities, areas of competence and personnel supervision must be clearly defined by the operating company. Personnel who do not have the required know-how must be duly trained and instructed. If necessary, this training can also be provided by the manufacturer/supplier on behalf of the dosing pump's owner. In addition, the owner of the system must ensure that the relevant personnel are fully familiar with and have understood the contents of this Operation & Maintenance Manual.

### **1.4 Hazards due to failure to follow safety instructions**

Failure to comply with the safety instructions may endanger not only people, but also the environment and the dosing pump/system. Failure to follow the safety instructions may invalidate any damage claims.

The following hazards in particular may result:

- Failure of major dosing pump/system functions.
- Failure of required maintenance and repair methods.
- Danger to persons due to electrical, mechanical and chemical effects.
- Danger to the environment due to leakage of hazardous substances.

### **1.5 Safety awareness at work**

The safety instructions contained in this operating manual must be observed. The operating company is responsible for ensuring compliance with local safety regulations.

### **1.6 Safety instructions for the operating company/operator**

Leakages of dangerous substances (e.g. aggressive, toxic), for example due to a broken diaphragm, must be suitably drained away so that they do not cause danger to persons or the environment. Legal requirements must be observed.

### **1.7 Safety instructions for inspection, maintenance and installation work**

The operating company must ensure that all maintenance, inspection and installation work is carried out by authorised and duly qualified personnel, who have read and understood this operating manual.

Any work on the machine must only be carried out after it has been brought to a complete stop. Always follow the procedure specified in the operating manual for shutting down the dosing pump/system.

Dosing pumps or systems which convey hazardous media must be decontaminated.

All safety and protective equipment must be reattached and activated immediately after the work has been completed.

---

## 1.8 Unauthorised modification and production of spare parts

The dosing pump may only be modified or converted in consultation with the manufacturer. Genuine spare parts and accessories authorised by the manufacturer ensure greater safety. No liability can be accepted for any damage resulting from the use of non-Lutz-Jesco parts.

## 1.9 Inadmissible operating practices

The operational safety of the pump supplied can only be guaranteed when it is used in conformity with its intended use as specified in our contract documents, especially the order confirmation. The limit values specified in the order documentation must never be exceeded.

### Special conditions

#### ATTENTION!

The minimum requirements for the zone classification must be ensured if using the double-diaphragm system in areas with a potentially explosive atmosphere. Both the pump itself, the motor and any accessories must meet with the minimum requirements. When using a diaphragm rupture sensor, see point. 3.1 Diaphragm rupture monitoring.



**ATTENTION!**

## 1.10 Dosing of chemicals

#### CAUTION!

When working on dosing systems, the local accident prevention regulations must be observed and the specified personal protective equipment must be worn. The following standard protective clothing is recommended, depending on the hazardousness of the metered medium:



**CAUTION!**



Goggles



Protective gloves



Protective suit

It is recommended that all persons responsible for the installation and maintenance of piping systems, hoses and accessories wear this protective clothing.

- Before working on the dosing pump and system, disconnect it from the mains power supply and prevent it from being switched on.

#### CAUTION!

- Any chemical still present in the dosing head may spray out when the voltage supply is reconnected. This may lead to chemical or other burns to the face and hands. Dosing lines must always be connected before switching on again.
- The chemical resistance of the construction materials in the pump must be verified before dosing aggressive media!



**CAUTION!**

- 
- The pump dosing head and the system connections and lines may be under pressure. Working on the dosing system requires special safety precautions and may only be carried out by instructed technical personnel:



**CAUTION!**

**CAUTION!**

Chemical may spray out. This may lead to chemical or other burns. Always release the pressure before starting work on the dosing pump.

- Before working on the dosing head, valves and connections, flush the dosing pump with a harmless medium (water in most cases), to avoid unintentional contact with the metered medium.



**WARNING!!**

**WARNING!**

- Never look into the open end of a clogged line or valve. Chemicals may emerge unexpectedly and cause chemical or other burns to face and hands.
- Before start-up, all screw connections must be inspected for correct tightness and leak-tightness, and must be re-tightened using an appropriate tool if necessary.



**CAUTION!**

**CAUTION!**

- If connections at the dosing head are loosened during operation, for venting or other reasons, leaking chemicals must be removed properly. Only in this way is it possible to effectively avoid the risk of injuries caused by chemicals and corrosion at the dosing pump. Leaking chemicals may also damage the diaphragm at its mounting edge.

### 1.11 Scope of delivery



**IMPORTANT!**

**IMPORTANT!**

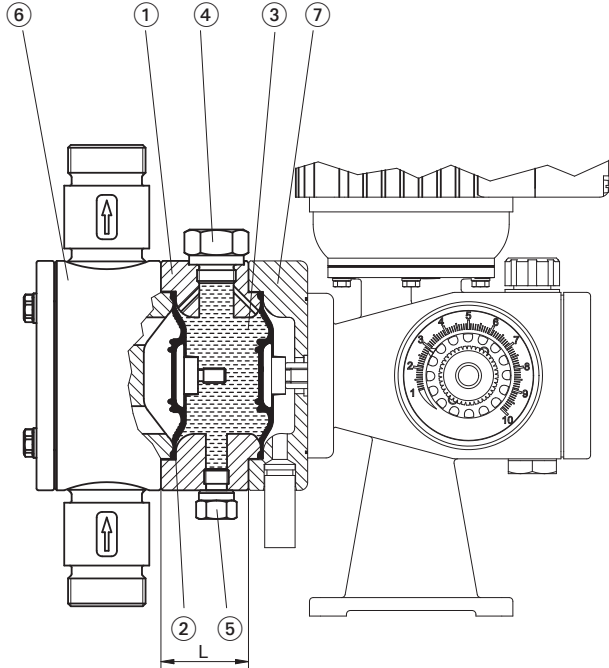
Carefully unpack the dosing pump and any accompanying accessories ordered, so that small parts are not left inside the packaging. Compare the delivery content with the delivery note immediately. If there are any discrepancies, determine the cause.

## 2. General

The diaphragm dosing pumps are designed in such a manner in the standard version that a leakage following a wear-related diaphragm rupture is drained in a targeted manner. To increase the operating safety and to avoid damage to the environment from leakages in event of diaphragm damage, a double-diaphragm system is available for the Lutz-Jesco diaphragm dosing pumps. This can also be obtained as a retrofit kit for the pump sizes listed below.

Double-diaphragm system							
Dosing head material	Diaphragm Ø [mm]	L [mm]	Part No.			torque required [Nm]	Glycerine [ml]
			MEMDOS MR/ZMR	MEMDOS E/DX	MAGDOS DE/DX		
PVC/ PP/ 1.4571	64	39	-	12835189	12833521	2	300
PP	90	47.5	12833522	12835251	12833522	6	
1.4571			-	12837060	-		
PP	120		12833523	12833523	12833523	6	
1.4571		12837058	12837058	12837058			
PP	150	12833524	12835348	-	10	1220	
1.4571		-	12837059	-			
PP	185	12833525	-	-	12		
1.4571		12835670	-	-			

### 3. Design and function



In the standard version, the dosing head ⑥ is screwed onto the diaphragm flange ⑦ of the gear. In doing so, the diaphragm positioned in-between is clamped tight on its outer edge.

For the double-diaphragm system, a ring chamber ① is inserted between the diaphragm flange ⑦ of the drive and the dosing head ⑥ where another diaphragm of the same design ② is inserted between the dosing head ⑥ and ring chamber ①. The interior of the ring chamber is filled with a neutral fluid ③ free of air, usually glycerine. For media to be dosed that are not conductive, a special conductive solution can also be used in the double-diaphragm system. It is necessary to contact our factory for this purpose.

The medium facing the diaphragm is thus hydraulically coupled. This means that when the drive diaphragm is moved that a deflection of the diaphragm ② takes place.

#### 3.1. Diaphragm monitoring

Where required, a diaphragm rupture sensor that reacts against changes to the conductivity of the transfer fluid can be screwed-in as a monitoring instrument. For this purpose, the plug ⑤ at the bottom is removed and the leakage sensor is inserted instead. The plug ④ is used for filling the system. The diaphragm rupture sensor must only be operated using special electrical evaluation devices.

In non-explosive areas, a level relay, order no. 443000714, is required according to the description in MB 44 300.



---

## CAUTION!

For use in Zone 1 and 2 explosive areas, the diaphragm rupture sensor must only be operated using the evaluation unit, order no. 44399003 (see separate documentation).

The diaphragm rupture sensor itself is a passive element without internal electric / electrical component and only represents a conductive connection for the transfer fluid. In conjunction with the evaluation element, it is ensured that a max. voltage of 10 V and a max. current of 2.5 mA can be processed.

If the diaphragm rupture sensor is operated via the prescribed evaluation element than no particular ATEX approval is required!



**CAUTION!**

## 4. Special instructions for new installation of double-diaphragm systems

Before installing the system, where applicable, the filled dosing head must be drained and rinsed professionally so that the chemical cannot cause any damage. Wear personal protective clothing for this purpose. Other safety instructions must be found under point 1.10 "Dosing chemicals".

Before assembling the system, the diaphragm must be moved to its rear position. This can be achieved by adjusting the stroke adjustment to position 10", corresponding with 100% and the diaphragm is pulled to the rear position by the return spring. If the gear is difficult to move or is self-locking, it may be necessary to either carry out several start-stop attempts with the motor or to keep turning on the electrically disconnected motor on the fan wheel until the rearmost position for the diaphragm is reached.

After screwing off the dosing head installed, the condition and the quality of the diaphragm installed must be checked. If the PTFE protective film on the surface of the diaphragm is damaged, the diaphragm must be removed. See SD 1 02 04 "Using replacement diaphragms" for this purpose. The diaphragm installed must be clean and free from chemicals. Now the ring chamber ① as well as the front diaphragm ② are inserted in their centring. Using the new longer fastening screws, the dosing head is mounted at the front and secured in its position using the screws. When finally tightening the screws, observe the tightening torque specified in the table above.

## IMPORTANT!

The diaphragm will not provide a tight seal if the tightening torque is too low. The dosing head may be damaged if the tightening torque is too high.

The plug ⑤ or leakage sensor that may be installed must be screwed in leak-tight. For this purpose, please make sure you use the matching O-rings.

The glycerine supplied is filled through the hole in the plug ④. In doing so, make sure that the operating diaphragm is in its rear position. The glycerine is filled in slowly until it overflows.



**IMPORTANT!**



## IMPORTANT!

### IMPORTANT!

The system must be filled free of air otherwise a considerable reduced performance with the future dosing may occur. The plug ④ is now screwed in with the O-ring placed underneath.

The dosing pump can now be put back into operation. You can find details for this in the operating manual for the pump.

## 5. Information concerning maintenance work on the double-diaphragm system

The system is maintenance-free. We recommend however, that you monitor for leaks on a regular basis.

If the work diaphragm should be defective then glycerine escapes from the system through the leak opening in the diaphragm flange and the dosing is reduced considerably or fails completely.

If the front diaphragm ② is defective, this leads to the medium conveyed being mixed with the glycerine.. When using the respectively set leakage monitor in the ring chamber, there is a change in the conductivity and thus, to a utilisable message. In some cases, the glycerine can also enter the dosing area and mix with the metered medium. Thus, make sure that both media are compatible with one another.

If there is a suspicion of leaking glycerine, you can check the glycerine filling and, where applicable, top it up. For this purpose, first the diaphragm must be moved to its rear position (see point 4).



## ATTENTION!

### ATTENTION!

The system must be pressure-free. The media side must be relieved from pressure, e.g., by draining the media from the dosing head or opening the pressure line against the atmosphere.

The plug ④ is carefully unscrewed Now new glycerine can be filled until is overflows. Raising air bubbles must be eliminated. Using the O-ring, screw the plug back in.

After checking the operational readiness of all attachments, the dosing pump can be put back into operation, See "Start-up" in the corresponding operating manual of the dosing pump for this purpose.

## 6. Information for the mode of function of the double-diaphragm system and for possible malfunctions.

### IMPORTANT!

The double-diaphragm system must be filled free of air to allow it to function according to its design and in a safe manner. As a result of the compressibility of glycerine, a **reduced performance of up to 10%** of the nominal dosing capacity may occur depending on the pressure. This must be taken into account when dimensioning the dosing pump-

Depending on the type and size, the diaphragm dosing pumps are able to lift up to 0.8 bar (8 mWS). If there is an air lock in the double-diaphragm system, this has an effect on the deflection of the dosing diaphragm ② which may lead to a considerable reduction in the delivery rate. If a reduced dosing that is considerably more than 10% can be detected then there are reasons for suspicion that there is air trapped in the double-diaphragm system. In this case, you have to check the system as described above. Glycerine that has escaped can only be replaced by original products. The amount required is listed in the table specified above.



**IMPORTANT!**

## 7. Declaration of Harmlessness

### Declaration of Harmlessness

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

---

## 8. 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 of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.

---

## Notes

---

## Notes

