

## A measured step forward MAGDOS LC



### Operation & Maintenance Instructions

Read these operation & maintenance instructions  
before start up!

To be held for future reference.



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## 1. Safety

### 1.1 General

This Operation & Maintenance Manual contains basic information to be noted during installation, operation and maintenance. It is therefore essential that the Manual is read by the contractor before installing and commissioning the pump/system as well as by the relevant operating personnel / owner of the pump/system. It must remain accessible at the dosing pump/system for reference at all times.

In addition to the general safety instructions under this main heading Safety, the special safety precautions outlined in other sections must also be observed.

### 1.2 Warnings used in this Operation & Maintenance Manual

This Operation & Maintenance Manual contains vital information, which may endanger people, the environment and the dosing pump/system if disregarded. These statements are identified by the following symbols:

#### **DANGER!**

Refers to an imminent danger.

Non-compliance can lead to death or extremely serious injury.



#### **WARNING!**

Refers to a potentially hazardous situation. Non-compliance can lead to death or serious injury.



#### **CAUTION!**

Refers to a potentially hazardous situation. Non-compliance can lead to minor injury or property damage.



#### **NOTICE!**

Appears in conjunction with safety instructions, which may endanger the pump/system and its operation if disregarded.



#### **IMPORTANT!**

Draws attention to supplementary information to make the work easier and ensure trouble free operation.



Markings which are affixed directly to the pump, such as

- Cable markings
- Markings for process fluid connections

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

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### **1.3 Qualification and training of personnel**

The personnel employed for installation, operation, inspection and maintenance must be qualified for this work. The areas of responsibility, competence and supervision of the personnel must be precisely defined by the owner. Personnel who do not have the required knowledge 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 non-compliance with safety instructions**

Failure to comply with the safety instructions may endanger not only people, but also the environment and the dosing pump/system. Non-compliance with the safety instructions can lead to the loss of all entitlement to damages.

The following hazards in particular may arise:

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

### **1.5 Safe operation**

The safety instructions contained in this Operation & Maintenance Manual must be observed. The owner is responsible for ensuring compliance with local safety regulations.

### **1.6 Safety instructions for the owner/operator**

- Leakages (e.g. due to diaphragm rupture) of hazardous substances (e.g. toxic, abrasive) must be discharged in such a way as to exclude all danger to people and the environment. Statutory regulations must be observed.
- Danger due to electric current must be excluded (for further details, refer to the German VDE standards as well as local rules and regulations).

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

The owner must ensure that all installation, inspection and maintenance work is undertaken by authorized and duly qualified skilled personnel who have also studied this Operation & Maintenance Manual.

The dosing pump must always come to a complete stop before starting any work on the pump. The procedure specified in this Operation & Maintenance Manual for shutting down the dosing pump/system must be observed without fail.

Dosing pumps or systems in contact with potentially harmful media must be decontaminated.

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All safety mechanisms and guards must be refitted and reactivated as soon as the work is completed.

The instructions outlined in chapter 7.2 “Installation location” and 9. “Start up” must be observed before starting the pump/system.

## 1.8 Unauthorized 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 authorized by the manufacturer ensure greater safety. Liability for damage or loss may be voided if non Lutz-Jesco parts are used.

## 1.9 Impermissible modes of operation

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

## 1.10 Dosing of chemicals

### CAUTION!

- When working on dosing systems, the accident prevention regulations applicable on-site must be observed and the specified personal protective equipment worn. The following standard protective clothing is recommended, depending on the hazard associated with the metered medium:



Goggles



Protective gloves



Protective suit

- All people responsible for installation and maintenance of pumps, piping, hoses and accessories should wear this protective equipment.
- Before working on the dosing pump and plant, disconnect it from the power supply and protect it against reconnection:

### CAUTION!

- Any chemical still present in the dosing head may spray out when the power supply is reconnected. This may lead to caustic or other burns to the face and hands. Dosing lines must always be connected before starting the pump again.
- The chemical resistance of the pump’s materials of construction used must be verified before dosing aggressive media!
- The dosing head of the dosing pump as well as connections and lines of the system 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!**

**CAUTION!****CAUTION!**

- Chemical could spray out. This may lead to caustic or other burns. Always relieve the system/pump pressure before starting work on the dosing pump.
- Before working on the dosing head, check valves and connections, flush the pump's wetted end with a harmless medium (mainly water) to avoid unintentional contact with the metered medium.

**WARNING!****WARNING!**

- Never look into the open end of a clogged line or valve.  
Chemical may emerge unexpectedly and cause caustic or other burns to face and hands.
- Before start up, all connections must be inspected for correct tightness and, if necessary, must be further tightened using appropriate tools.

**CAUTION!****CAUTION!**

- If connections at the dosing head are loosened during operation for venting or other reasons, leaking chemical must be removed professionally. This is the only way to avoid the danger of physical injury and corrosion at the dosing pump. Leaking chemical may also damage the diaphragm at its mounting points.

**NOTICE!****NOTICE!**

- When changing the chemical, check whether the pump's and the system's materials of construction are chemically resistant. If there is the danger of a chemical reaction between different media, a thorough cleaning first is mandatory.

**IMPORTANT!****IMPORTANT!**

- After adjusting the stroke length, the locking screw must be retightened. Otherwise the adjusting knob may change its position. Thus causing faulty flow rates.

**DANGER!****DANGER!**

- Fire hazard. Pressure surge: parts may be catapulted off and cause fatal injury. MAGDOS LC must never be used in an explosion-proof area.

**CAUTION!****CAUTION!**

- Hot metal parts may burn your hands. Always disconnect the mains power feeder before opening the magnetic drive and let the dosing pump cool for at least one hour.

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**CAUTION!****Malfunctions may arise in**

- Circuits
- Magnetic strips
- Mobile phones

**if brought in direct vicinity of the stroking solenoid.**

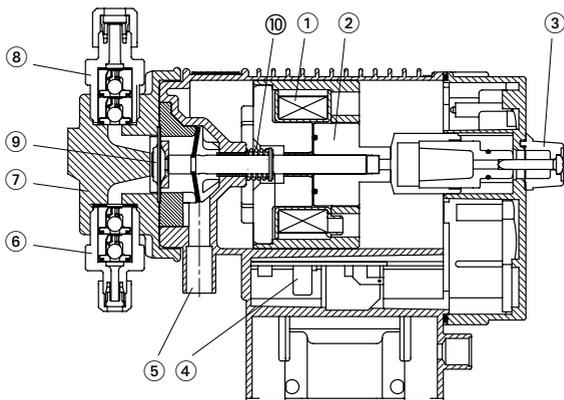
**CAUTION!****1.11 Scope of delivery****IMPORTANT!**

Please unpack the dosing pump and ordered accessories carefully in order not to miss small parts. Immediately compare the scope of delivery to the delivery note. If there are any discrepancies, contact your local distributor.

**IMPORTANT!****2. General**

Dosing pumps are used to add chemicals specifically in various processes. Metering capacities range from 2.0 to 5.9 litres per hour ( 0.53 to 1.56 gph). The exact metered capacities can be derived from the performance curves (chapter 6). All types are available for testing in accordance with the German regulation DVGW-DIN 19635.

### 3. Description

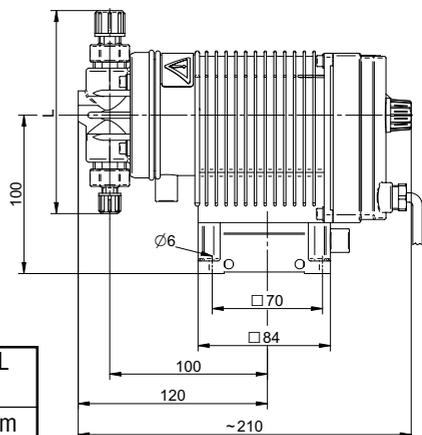
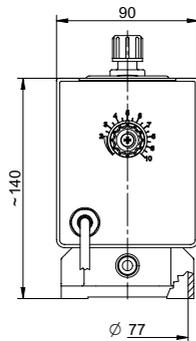


#### Legend:

- 1 Solenoid coil
- 2 Solenoid armature
- 3 Stroke adjustment
- 4 Electronic unit
- 5 Drain pipe
- 6 Suction valve
- 7 Dosing head
- 8 Discharge valve
- 9 Diaphragm
- 10 Diaphragm return spring

The solenoid coil ① of the drive solenoid is activated in a pulsating manner by the electronic unit ④ in the MAGDOS LC dosing pump. The solenoid armature ② forces the diaphragm ⑨ to the left and displaces the liquid in the dosing head ⑦. The liquid escapes through the discharge valve ⑧ into the discharge line. When the solenoid armature is de-energized, the diaphragm return spring ⑩ moves the solenoid armature ② and diaphragm ⑨ back to its original position. A negative pressure is produced in the dosing head ⑦ and liquid is drawn in through the suction valve ⑥. Leakages due to a diaphragm rupture are discharged in a controlled manner through the drain ⑤.

### 4. Dimensions



Nominal width	Tubing connection	Dim. L
DN 4	4/6 - 4/6	126 mm
DN 6	6/9 - 6/9	134 mm
DN 4 / DN 6	4/6 - 6/9	130 mm

All dimensions in mm. For dimensions in inches refer to page 68.

## 5. Technical data

<b>MAGDOS LC</b>	<b>2</b>	<b>4</b>	<b>6</b>
Max. pressure* [bar]	10	8	5
Flow rate at max. pressure* [l/h]	2.0	3.9	5.7
Medium pressure* [bar]	6	4	3
Flow rate at medium pressure* [l/h]	2.2	4.1	5.9
Max. stroke frequency [1/min]	120		
Suction lift [mH <sub>2</sub> O] for non-effervescent media	3		
Max. supply pressure [mbar]	800		
Power supply	115 V AC or 230 V AC +/- 10% 50/60 Hz		
Power supply cable	2m (230 V AC with shock-proof plug, 115 V AC with-/ UL- CSA-plug)		
Power consumption	20 W		
Max. Power consumption during dosing stroke	230 V AC: 2.0 A; 115 V AC: 3.8 A		
Soldered fuse	230 V AC and 115 V AC: 3.15 A slow		
Protection class	IP 65		
Insulation class	F		
Max. ambient temperature	45° C (with PVC parts 40° C)		
Max. process fluid temperature	40° C (with PVC parts 35° C)		

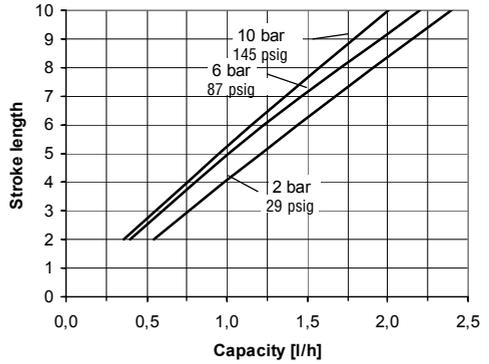
\* The exact metered capacities can be derived from the performance curves.

Technical data for the USA refer to page 69.

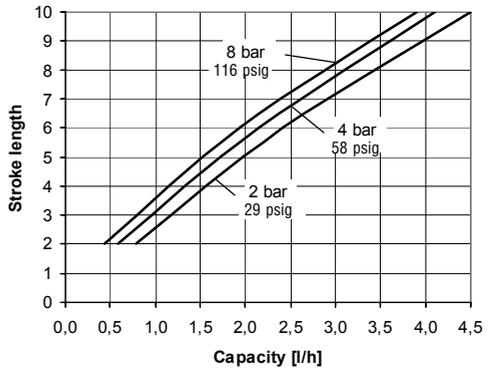
## 6. Performance curves

The performance curves refer to water at 20 °C (68 °F). The performance of the dosing pump depends on the viscosity of the process fluid and hydraulic installation conditions. Dosing pumps must therefore be gauged in litres during application.

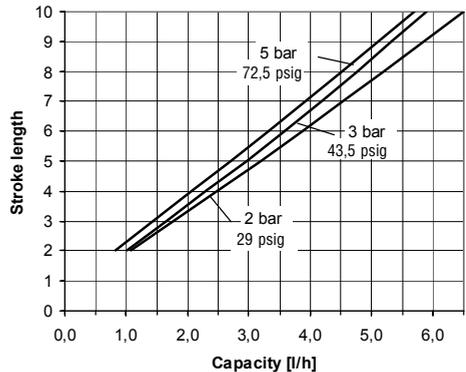
### MAGDOS LC 2



### MAGDOS LC 4



### MAGDOS LC 6



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## 7. Installation

### 7.1 General notes of instruction

For the selection of a dosing pump when designing a system as well as for the installation and operation, local rules and regulations must be obeyed. This applies to the selection of appropriate materials of construction, the handling of the chemicals and the electrical installation. At the same time the technical data of the dosing pump (chapter 5.) must be taken into consideration. The system must be designed accordingly/properly (e.g. pressure loss in lines depending on nominal diameter and length).

The designer and the user are responsible to make sure that the whole system including the dosing pump is constructed so that neither plant equipment nor buildings are damaged in the case of chemical leakage due to the failure of wear parts (e.g. diaphragm rupture) or burst tubing. If the chemical plant represents a potential danger, the installation must be carried out in a way that no unreasonably high consequential damages occur, even if the dosing pump fails. Therefore we recommend the installation of leakage probes and containment tanks.

The drain pipe of the dosing head must be visible in order for a diaphragm failure to be detected. Drainage must be routed with a downward slope to the collecting tank.

To increase the dosing accuracy and to ensure the functional reliability, we recommend the use of additional accessories! These include back pressure valves, relief valves, leakage probes and low level indicators, as shown in the installation examples. Always use appropriate tools for the installation of plastic connecting parts.

To avoid damage, never apply excessive force.

#### **IMPORTANT!**

Plastic parts (especially PVC parts) can be tightened and loosened more easily if the thread is lubricated with slip additive (e.g. silicone grease).

Threaded stainless steel parts (i.e. dosing head and check valves) have to be lubricated before assembled (i.e. PTFE-spray). This will make the disassembly easier when performing maintenance on the pump.

#### **NOTICE!**

The slip additive must be compatible with the chemical to be metered.

### 7.2 Installation location

The installation location of the dosing pump must be easily accessible for the operating and service staff.

The operation sound of the dosing pump might be transmitted to the piping and thus result in a disturbing noise level. In this case, it is recommended to mount the dosing pump on a wall bracket which, for the same reason, should be fixed to outer walls instead of interior walls adjacent to occupied rooms. When installing the dosing pump below the storage level of the process fluid, care must be taken to ensure that chemical leakages due to a broken diaphragm cannot cause any damage (collecting pan, leakage sensor).

It is also possible to mount the pump directly on the chemical supply tank.

Please note the ambient temperature of the dosing pump (refer to technical data table). Radiant heat of apparatus and heat exchangers must be shielded so that the dosing pump can still dissipate its own heat sufficiently. Exposure to direct sunlight must be



**IMPORTANT!**



**NOTICE!**

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avoided. If the dosing pump is installed outside, provide a roof to protect it against weather.



**DANGER!**

### **7.3 Electrical connection**

#### **DANGER!**

- Fire hazard. Pressure surge: parts may burst and cause fatal injury. Magdos LC must never be used in an explosion-proof area.

The electrical connection of the dosing pump must be made according to the local rules and regulations and may only be carried out by technical personnel. The 230 VAC version of the MAGDOS LC is connected via a grounded appliance plug connector. The 115 VAC version is equipped with a UL/CSA plug connector.

### **7.4 Pressure sustaining and safety valves**

Pressure sustaining valves are accessories for optimizing the dosing process. They are used

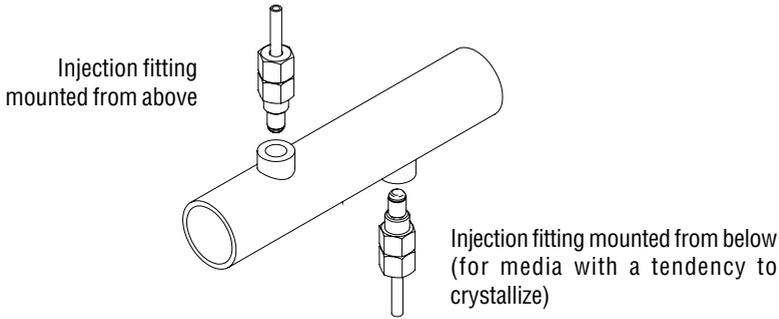
- to increase the dosing accuracy in the presence of fluctuating back pressure.
- with long dosing lines in order to prevent excess delivery, as the accelerated medium continues moving on account of its own inertia even when the delivery stroke has already ended.
- to prevent siphoning through the dosing pump if the suction pressure is higher than the system pressure.

Safety and overflow valves protect the dosing pump and the associated accessories and lines from overloads. Those prevent the system pressure from rising to an impermissible high level on the discharge side of the dosing pump, what may be caused by the accidental closing of valves while pump in operation or a clogged injector.

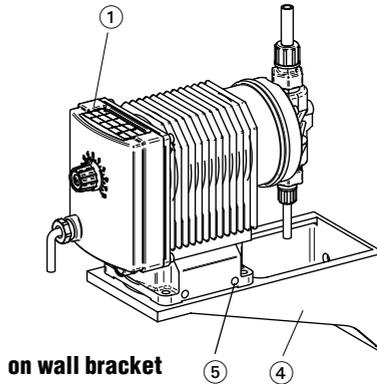
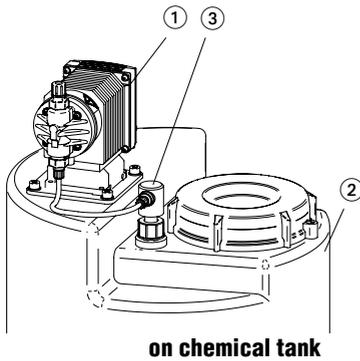
### **7.5 Injection nozzles**

Injection nozzles are used to mix the metered process fluid into a main stream and simultaneously fulfill a non-return function. The injection nozzle is usually installed in the main line from above. Installation from below is only recommended in the case of media with a tendency to crystallize. Thus entrapped air is able to leave.

In the case of media with a tendency to contaminate the injector, it is advisable to use an injector which can be dismantled for maintenance and shut off.



## 7.6 Installation examples



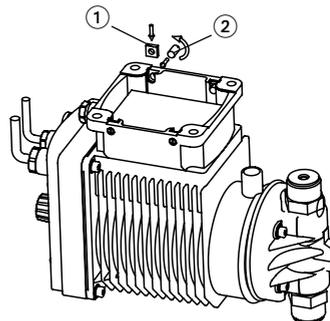
### Legend

- 1 MAGDOS LC
- 2 Chemical tank
- 3 Suction line
- 4 Wall bracket
- 5 Mounting Hardware Magdos Pump Riser Base (p/n 37558)

### Mounting of Magdos LC to Wall Bracket, Tank Mounting Plate, and Pump Riser Base

#### Legend

- 1 Bolt M5
- 2 Rod M5

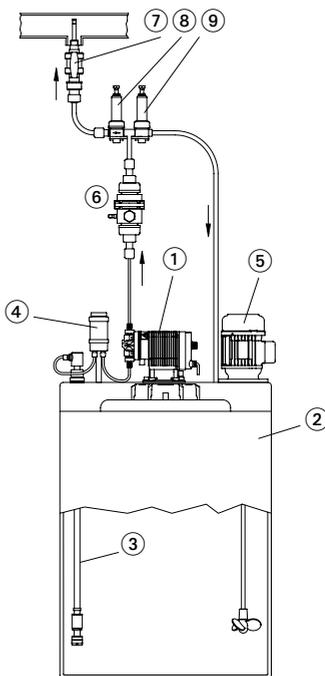


Mounting Hardware consisting of  
 4 x Bolt  
 4 x Rod  
 (p/n 37558)

## Installation example

### Legend

- 1 MAGDOS LC
- 2 Chemical tank
- 3 Suction line
- 4 Priming aid
- 5 Electric agitator
- 6 Pulsation dampener
- 7 Injection nozzle with non-return and shutoff valve
- 8 Back pressure regulating valve
- 9 Pressure relief valve (safety valve)

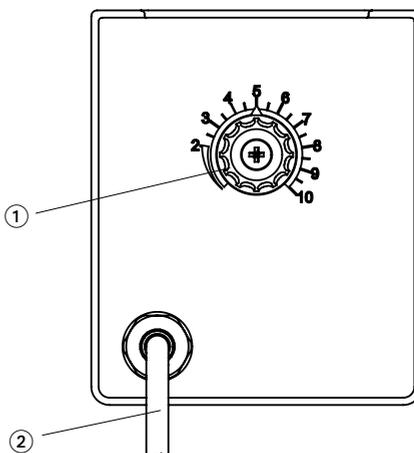


## 8. Operation

Control panel MAGDOS LC

### Legend

- 1 Stroke adjustment with scale and locking screw
- 2 Mains cable



## 8.1 Setting of flow rate

Volumetric displacement per dosing stroke

The stroke length adjustment limits the movement of the diaphragm. Adjusting the stroke length does not have a linear proportional effect on the stroke volume. The volume per dosing stroke is shown in the performance curves or displayed on the dosing pump's calibration table.

For adjustment, loosen the locking screw, adjust to the desired setting and retighten the locking screw.

### **NOTICE!**

Adjust stroke length only, while pump is in operation.



**NOTICE!**

## 9. Start up

### **NOTICE!**

Personal protective equipment as specified by on-site safety regulations must be worn at all times while working on the dosing pump!



Goggles



Protective gloves



Protective clothing



**CAUTION!**

1. At the initial startup switch on power and let pump prime. For this purpose, it is advisable to set the stroke to "10". If the dosing pump does not prime drawing from the supply tank, the dosing head must be filled with process liquid (through the top of the head after removing the discharge check valve) while the pump is switched off. If the medium is not hazardous, it can be used directly; otherwise use a neutral medium that will not disturb the process (water can be used in many cases).

### **WARNING!**

Chemical could spray out. This may lead to caustic or other burns. Ensure that the line is not under pressure before disconnecting it.

Mount discharge valve, switch on the dosing pump and allow it to prime again (priming aid is recommended, refer to installation examples).

2. If a venting facility is integrated in the dosing head or is available as separate unit, open it while the dosing pump is operating until liquid escapes. Then close it. In the case of effervescent media allow the process fluid to flow continuously (approx. 1 drop per 1...3 strokes).

The escaping chemical must be returned to the storage vessel with the aid of a hose connector.

3. When desired operation is achieved, set flow rate and lock adjusting knob. For a first approximation refer to the calibration table attached to the dosing pump. Such a calibration table indicates the stroke length setting for a selected flow rate per stroke (ml/pulse) as a function of the system pressure. Intermediate values must be calculated.



**WARNING!**

Example:

LC 2	1,00	1,25	1,50	1,75	2,00	2,25	◀	l/h	
bar	psig	0,26	0,33	0,40	0,46	0,53	0,59	◀	gph
2	29	4,1	5,2	6,3	7,3	8,3	9,4	◀	Hub länge stroke length
6	87	5,0	6,1	7,2	8,2	9,2	-		
10	145	5,2	6,5	7,7	8,8	10,0	-		

Required capacity: 1.50 l/h (0.40 gph) @ 6bar (87psig). Calibration table shows a stroke length of 7.2. The pump's stroke length adjustment has to be set to 7.2, while the pump is operating.



**NOTICE!**

**NOTICE!**

Depending on the installation, the chemicals used and the media temperature, these values may differ and must be verified under operating conditions.

- The manufacturer of the dosing equipment is not responsible for damages due to excessive or low flow rates resulting from faulty dosing pump settings or insufficient and incorrect installation of peripheral accessories and fittings.

**10. Shutdown**

Before starting any maintenance and before prolonged downtime, drain the chemical from the dosing pump and rinse it with a neutral medium.



**CAUTION!**

**CAUTION!**

Excess chemical must be disposed of in accordance with local rules and regulations. Note the applicable accident prevention regulations and wear personal protective equipment.



Goggles



Protective gloves



Protective clothing



**CAUTION!**

**CAUTION!**

The dosing pump must be disconnected from the power supply and secured to prevent unauthorized restarting.



**CAUTION!**

**CAUTION!**

The pressure must be relieved before disconnecting the discharge line from the pump discharge valve so that chemical will not spray out.

It is advisable to loosen the discharge and suction check valves in order to drain the dosing head.

## 11. Maintenance

Dosing pumps are produced according to the highest quality standards and have a long service life. Nevertheless some parts are subject to wear caused by operation (e.g. diaphragm, valve seats, valve balls). To ensure a long operating life, visual inspection is recommended regularly. Periodic maintenance protects dosing pump and system from unexpected downtime.

### NOTICE!

The dosing pump may have to be re-adjusted after changing the diaphragm or replacing other parts (chapter 11.5 correcting the stroke length adjustment).

### 11.1 Replacing the diaphragm

#### CAUTION!

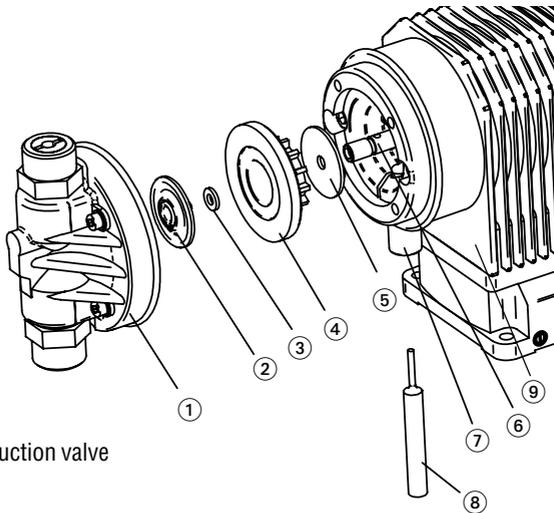
Chemical could spray out. This may lead to caustic or other burns. The dosing pump head must always be depressurized and rinsed with water or a suitable medium before starting any work on the dosing pump.



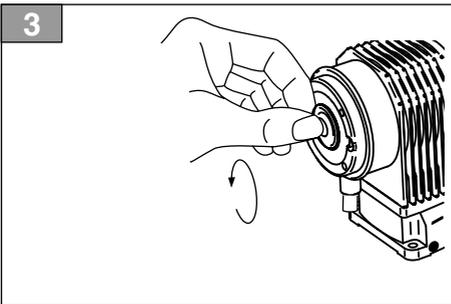
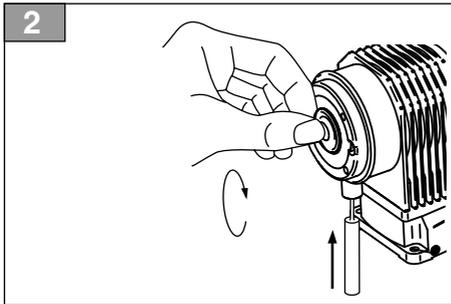
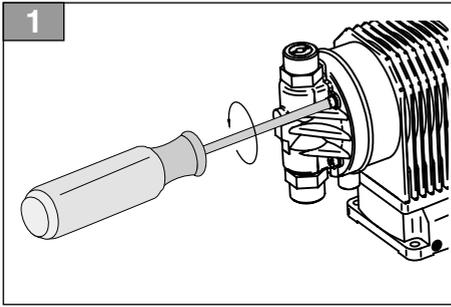
**NOTICE!**



**CAUTION!**



- 1 Dosing head  
with discharge and suction valve
- 2 Diaphragm
- 3 Support plate
- 4 Diaphragm insert
- 5 Deflector plate
- 6 Diaphragm rod
- 7 Drain pipe
- 8 Locking pin (Part No. 29379)
- 9 Drive unit housing



## Replacing the diaphragm

1. Remove the dosing head ① with a suitable tool (size 3 Allen key).  
*Figure 1*

2. With the dosing pump operating, adjust stroke length setting to 0% and then turn pump off. Insert the locking pin ⑧ (Art. No. 29379) through the drainage pipe into the drilled hole in the diaphragm rod ⑥.

If the diaphragm rod has twisted so that the drilled hole cannot be reached, grab the outer edge of the diaphragm ② and turn it clockwise until the drilled hole can be seen through the drain pipe. The diaphragm rod can then be secured with the locking pin.

*Figure 2*

3. Switch off the pump.

4. Grab the edge of the diaphragm ② and turn it counterclockwise. The support plate ③ behind the diaphragm is removed at the same time.

*Figure 3*

### IMPORTANT!

The diaphragm insert ④ and the support plate ③ must be cleaned before installing a new diaphragm. Otherwise the diaphragm may be attacked from the rear that is still contaminated.

### NOTICE!

Inspect that the deflector plate ⑤ is in perfect condition, „Check and replacing the deflector“ (Chapter 11.2).



**IMPORTANT!**

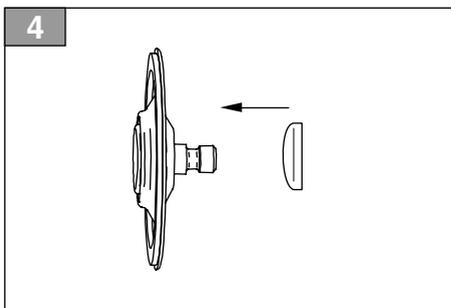


**NOTICE!**

5. Grease the diaphragm rod with Molykote DX at the contact point with the housing bushing and along the diaphragm thread.

6. Push the support plate ③ onto the threaded connector of the new diaphragm with the concave side facing towards the diaphragm.

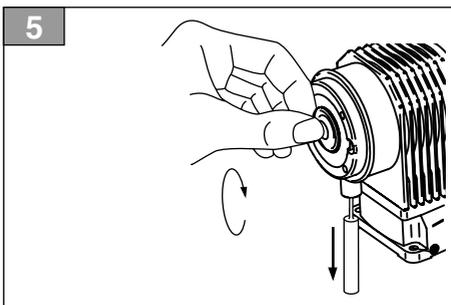
Figure 4



7. Turn the new diaphragm ② clockwise into the diaphragm rod together with the support plate washer ③ until it locks tightly to the stroking rod. The smooth side of the support is pressed against the end of the diaphragm rod. Figure 5

8. Now remove the locking pin ⑧.

Start pump to adjust stroke length adjustment to 0%. Turn pump off to install dosing head.



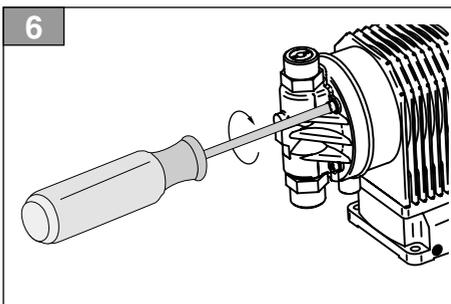
9. Install the dosing head ①. Tighten the screws alternately, e.g. top left – bottom right – top right – bottom left. A tightening torque of **125 Ncm** is required for the dosing head screws. Figure 6

### 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.

10. After reconnecting the suction and discharge line, the dosing pump is started as described in the section start up (Chapter 9).

If the diaphragm is frequently worn down and requires frequent replacement, (Chapter 13) „Troubleshooting“ for a description of possible causes.



**IMPORTANT!**

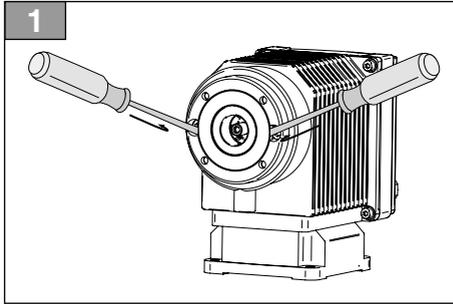
## 11.2 Inspecting and replacing the deflector plate



**CAUTION!**

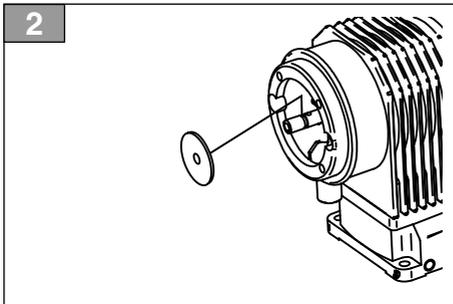
### **CAUTION!**

Chemical could spray out. This may lead to caustic or other burns. The dosing head must always be depressurized and rinsed with water or a suitable medium before starting any work on the dosing pump.



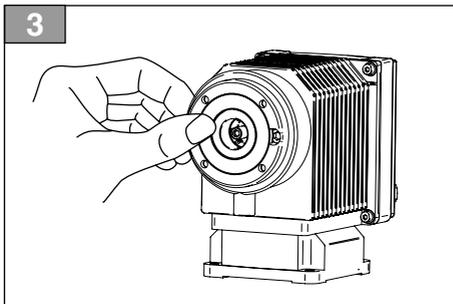
The following steps are required to verify that the deflector plate is in perfect condition and to replace it if necessary. Repeat steps 1-4 of Chapter 11.1 „Replacing the diaphragm“.

The deflector plate ⑤ can be reached after removing the diaphragm insert ④. The diaphragm insert can be removed without difficulty by prying it out with two screwdrivers inserted in the countersinks of the outer flanges. *Figure 1*



Examine the condition of the diaphragm. The deflector plate must be replaced if it is damaged.

Remove the old deflector plate. Slide the new deflector plate ⑤ onto the diaphragm rod until it engages in the groove of the diaphragm rod ⑥. *Figure 2*



Now press the diaphragm insert into the flange and proceed through steps 5-10 in Chapter 11.1 „Replacing the diaphragm“. *Figure 3*

### 11.3 Check valves

The dosing pump check valves must be cleaned regularly.

**CAUTION!**

Chemical could spray out. This may lead to caustic or other burns. The dosing pump must always be depressurized and rinsed with water or a suitable medium before starting any work on the dosing pump.



**CAUTION!**

**NOTICE!**

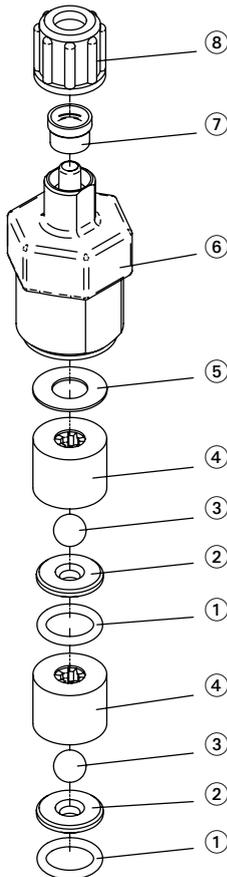
Debris in check valves will reduce the dosing accuracy.



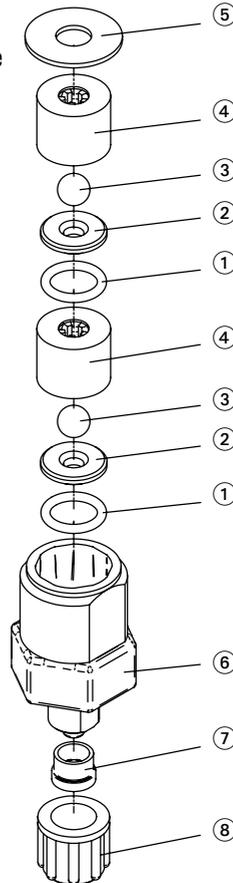
**NOTICE!**

**Double ball check valve**

Discharge  
check valve



Suction  
check valve



**Legend**

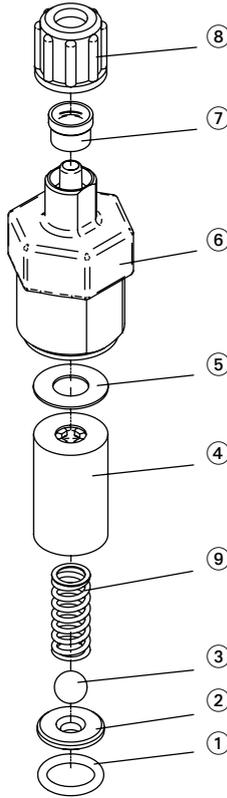
- 1. O-Ring
- 2. Valve seat
- 3. Valve ball
- 5. Gasket
- 6.\* Valve body
- 7.\* Hose clamp

- 4.\* Ball guide
- 8.\* Nut

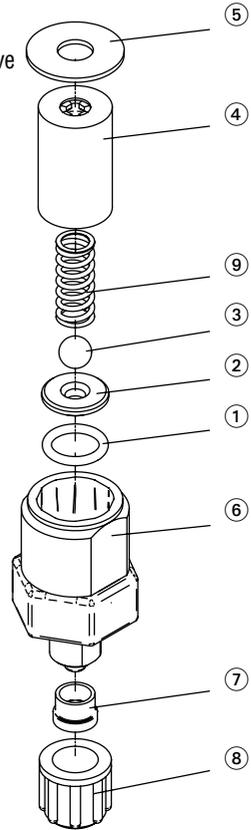
\*not a part of the spare parts kit.

## Spring-loaded check valve

Discharge  
check valve



Suction  
check valve



### Legend

- |           |                |                 |                |
|-----------|----------------|-----------------|----------------|
| 1. O-Ring | 2. Valve seat  | 3. Valve ball   | 4. *Ball guide |
| 5. Gasket | 6. *Valve body | 7. * Hose clamp | 8. *Nut        |
| 9. Spring |                |                 |                |

\*not included in spare parts kits.

## 11.4 Drive solenoid

### DANGER!

Components are energized!

Electric shocks can kill! Unplug the mains connector before opening the pump.



**DANGER!**

### CAUTION!

Hot metal parts may burn your hands. Always disconnect the mains power supply before opening the magnetic drive and let the dosing pump cool down for at least one hour.



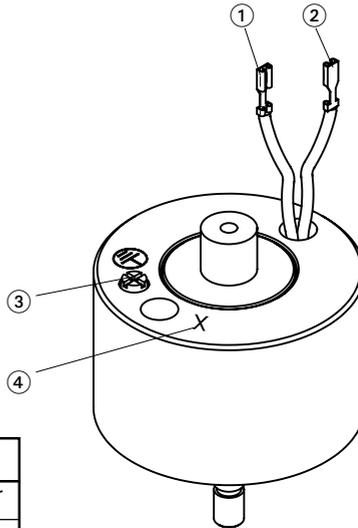
**CAUTION!**

To check, measure the electrical resistance of the solenoid coil when it has cooled down. Disconnect the leads from the electronic unit first.

Drive solenoid

- 1, 2 Power supply
- 3 Ground connection
- 4 Letter

The solenoids differ, depending on the pump version.



Resistance at 20°C (68°F) +/-5%				
Pump type	230V~	Letter	115V~	Letter
LC	104Ω	“D”	26Ω	„E“

### NOTICE!

The resistance value is up to 30% higher when the coil is at operating temperature.

If the resistance is substantially lower, there is a short-circuit in the coil. If the resistance is high, the coil is burned out or the wire is broken.

There must not be an electrically conductive connection between the power supply connections ① + ② and the ground connection ③. (Resistance cannot be measured!).



**NOTICE!**

### DANGER!

Components are energized!

Electric shocks can kill!

The coil must not be used if there is any electrically conductive connection between the ground connection and the power supply.

After measuring the resistance across the coil, reconnect wiring to circuit board (refer to Chapter 11.6 „Diagram of circuit board“). The ground conductor must be reconnected under all circumstances.



**DANGER!**

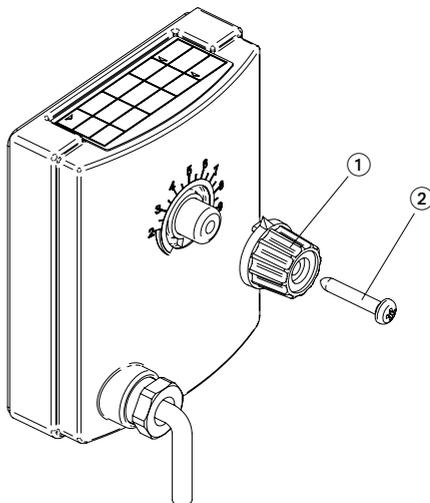
## 11.5 Correction of stroke length adjustment



### IMPORTANT!

After replacing the diaphragm or other spare parts it might become necessary to readjust the dosing pump.

**IMPORTANT!**



### Legend

- 1 Stroke length adjusting knob
- 2 Locking screw

1. Switch power on.
2. Regardless of the indicator position, loosen the locking screw and turn the stroke length adjusting knob counterclockwise until the dosing pump no longer delivers or, in the case of pressureless operation, only delivers minimum.



**NOTICE!**

### NOTICE!

Do not use force, while executing the following. Due to the elasticity of the dampening ring slight movement of the diaphragm still remains even in position “0”.

If “zero delivery” could not be achieved, because the knob has reached the stop position, remove the knob after further loosening the locking screw, turn it clockwise and reattach it. Then adjust zero delivery.



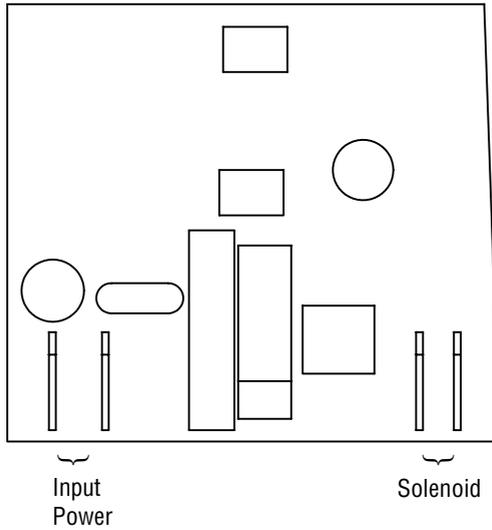
**CAUTION!**

### CAUTION!

The discharge line must be routed back to the storage tank during setup in order to prevent dosing excess chemical.

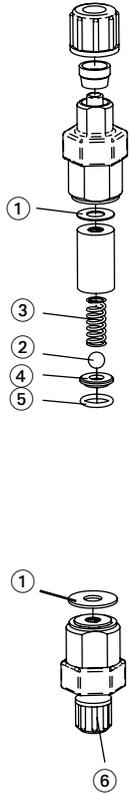
3. Attach knob so that the indicator is pointing to “0”. With the knob tightly held, fasten locking screw.
4. Gauge the capacity of the dosing pump by liters according to a setting listed on the calibration table. If there is a major discrepancy, correct the knob position.

## 11.6 Diagram of the circuit board MAGDOS LC

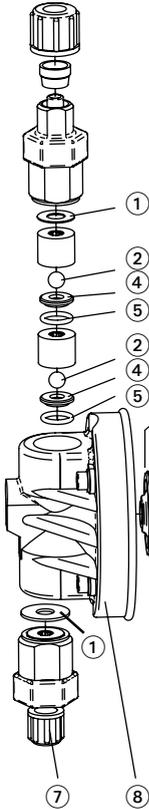


## 12. Spare parts list MAGDOS LC 2 ... 6

Spring-loaded  
check valve



Double ball  
check valve

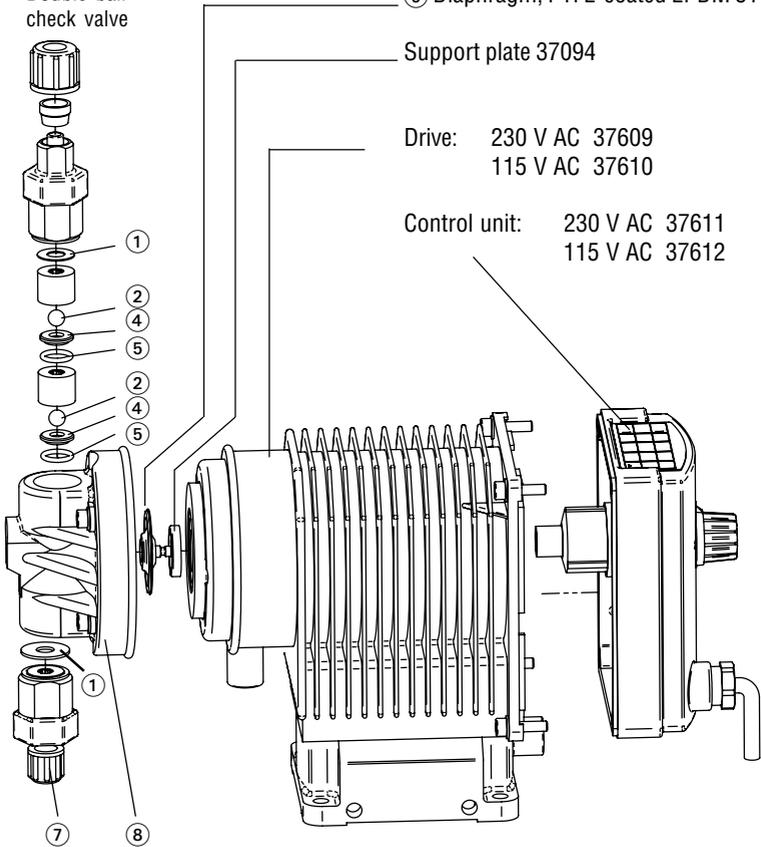


⑨ Diaphragm, PTFE-coated EPDM 81424

Support plate 37094

Drive: 230 V AC 37609  
115 V AC 37610

Control unit: 230 V AC 37611  
115 V AC 37612



Spare parts list for MAGDOS LC <i>with double ball check valves</i>		
Consists of:	Material	Part No.:
① Gaskets		
② Valve balls	PVC / Glass / Viton®	37657
④ Valve seats	PVC / Glass / EPDM	37658
⑤ O-rings	PP/ Glass / Viton®	37357
⑨ Diaphragm	PP/ Glass / EPDM	37658

Further materials upon request.

Spare parts list for MAGDOS LC with <i>spring-loaded check valves</i>		
Consists of:	Material	Part No.:
① Gaskets		
② Valve balls		
③ Springs	PVC / Glass / Viton®	37659
④ Valve seats	PVC / Glass / EPDM	37660
⑤ O-rings	PP/ Glass / Viton®	37659
⑨ Diaphragm	PVC/ Glass / EPDM	37660

⑥ Spring-loaded check valve complete with connection 4/6		
Material	Part-No.:	
	Suction valve	Discharge valve
PVC / Glass / Viton®	37631	37632
PVC / Glass / EPDM	37635	37636
PP/ Glass / Viton®	37649	37650
PP/ Glass / EPDM	37653	37654

⑦ Double ball check valve complete with connection 4/6		
Material	Part-No.:	
	Suction valve	Discharge valve
PVC / Glass / Viton®	37613	37614
PVC / Glass / EPDM	37627	37628
PP/ Glass / Viton®	37641	37642
PP/ Glass / EPDM	37645	37646

⑥ Spring-loaded check valve complete with connection 6/9		
Material	Part-No.:	
	Suction valve	Discharge valve
PVC / Glass / Viton®	37633	37634
PVC / Glass / EPDM	37637	37638
PP/ Glass / Viton®	37651	37652
PP/ Glass / EPDM	37655	37656

⑦ Double ball check valve complete with connection 6/9		
Material	Part-No.:	
	Suction valve	Discharge valve
PVC / Glass / Viton®	37615	37616
PVC / Glass / EPDM	37629	37630
PP/ Glass / Viton®	37643	37644
PP/ Glass / EPDM	37647	37648

⑧ Dosing head including mounting bolts	
Material	Part No.:
PVC	37312
PP	37318
PVC with venting	37315

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### 13. Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Recommended Action</b>
Dosing pump not delivering or output too low.	Check valves leaking or blocked.	Clean check valves and bleed dosing head. See also start-up of pump.
	Check valves incorrectly installed.	Reassemble check valves. Ensure that valve balls are located above valve seats.
	Suction valve or suction line leaking or blocked.	Clean or seal suction line.
	Suction lift too high.	<ul style="list-style-type: none"> <li>- Install dosing pump at lower position.</li> <li>- Install pulsation dampener on suction side.</li> <li>- Install priming aid.</li> </ul>
	Viscosity too high.	<ul style="list-style-type: none"> <li>- Install spring-loaded check valves.</li> <li>- Enlarge suction and discharge line/diameter.</li> <li>- Use special dosing head</li> </ul> >> Contact Lutz-Jesco.
No stroke movement observed.	Stroke length set to zero.	Correctly adjust pump stroke length.
	Diaphragm return spring broken.	Replace spring.
	Fuse blown.	Check power supply voltage, inform Lutz-Jesco service.
	Power supply interrupted.	Switch on power supply voltage.
	Solenoid defective.	Check coil resistance and isolation; replace solenoid, if required. Refer to page 59.

<b>Problem</b>	<b>Possible Cause</b>	<b>Recommended Action</b>
Frequent diaphragm failures.	No support plate. See Maintenance.	Replace diaphragm and support plate. When replacing diaphragm, check if deflector plate or diaphragm rod have been corroded by chemical.
	Diaphragm was not properly tightened to the diaphragm rod.	Screw in new diaphragm. Support plate must be clamped between diaphragm and diaphragm rod.
	System back pressure too high (measured at discharge connection of dosing pump).	Inspect system. Clean blocked injection nozzle. Reduce pressure spikes resulting from extremely long tubes by installing pulsation dampeners. Check function of safety valves.
	Media sediment in dosing head.	Flush dosing head.
	Dosing Pump delivering too much.	Pressure on suction side too high. (Pump siphoning). Stroke stop shifted.

If the problem cannot be solved with the support of the above instructions, contact our After-Sales Service for further assistance or return dosing pump to manufacturer.

## 14. Declaration of conformity

This declaration is no assurance of characteristics in the sense of the product liability law. The safety notes in the operation & maintenance instructions must be obeyed.

### EC – Declaration of Conformity

We, **Lutz-Jesco GmbH**  
**Am Bostelberge 19**  
**D – 30900 Wedemark**

hereby certify  
that the product described in the following complies with the relevant fundamental safety and sanitary requirements and the EC regulations mentioned below due to the concept and design of the version sold by us.  
If the product is modified without our consent, this declaration loses its validity.

Product description:	Solenoid Metering Pump M A G D O S
Model designation:	MD., MK., E., EL., FL., DE., DX., LT., LC..
Relevant EC regulations:	EC Low-Voltage Directive (73/23/EEC) EC Directive Relating to Machinery (98/37/EEC) EC Electromagnetic Compatibility Directive (93/68/EEC)
Applied harmonized standards, especially:	EN 292-1 and EN 292-2, Safety of Machines EN 809, Pumps and Pump Devices of Liquids, Safety Requirements EN 50081 Parts 1 and 2, EN 50082 Parts 1 and 2, Electromagnetic Compatibility, Emission of Noise and Noise Immunity
Applied national standards and technical specifications, especially:	DIN 19 635, Metering Devices for the Treatment of Drinking Water

Date, Signature of Manufacturer: 2005/01/01 . . . . .  . . . . .

Information on the signer: **Mr. Lucjan Gogolin, Head of Technical Office**

This declaration is no assurance of characteristics in the sense of the product liability law.  
The safety notes in the operating instructions must be observed.

## 15. Declaration of harmlessness

Contact your local distributor for return authorization.

### Declaration of harmlessness

(Please fill in separately for each unit – pump or accessory –)

We forward the following metering equipment to you for repair:

Type (metering pump or accessory): \_\_\_\_\_

Part No.: \_\_\_\_\_

Order No.: \_\_\_\_\_

Date of delivery: \_\_\_\_\_

Reason for repair: \_\_\_\_\_

Chemical metered: \_\_\_\_\_ Properties: Irritating: Yes/No  
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 Lutz-Jesco has to (further) clean the unit the costs will be charged 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:

E-mail:

Customer No.:

Contact:

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature / Stamp

\*) Please delete as applicable!

Please, return declaration with product  
by attaching to the package.

Lutz-Jesco GmbH, Am Bostelberge 19  
D-30900 Wedemark, Germany

---

## 16. Warranty

Please copy this page and send it back with the MAGDOS!

If the dosing pump fails during the warranty period, please return the cleaned MAGDOS with the completed warranty claim.

---

Sender

Company: ..... Phone: ..... Date: .....

Address: ..... City ..... ZIP ..... Country

Contact person: .....

Lutz-Jesco order number: ..... Delivery Date: .....

MAGDOS LC model: ..... Serial number: .....

Max. capacity / max. pressure: .....

Description of fault: .....

.....  
.....

---

Type of fault:

1. Mechanical fault

- Premature wear
- Wear parts
- Breakage / other damage
- Corrosion
- Damage in transit

2. Electrical fault

- Connections, plug connectors or cables loose
- Operating elements (e.g. switches / push-buttons)
- Electronic unit

3. Leaks

- Connections
- Dosing head

4. Inadequate or no delivery

- Diaphragm defective
- Others

---

Service conditions of the dosing pump

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

Accessories used (Suction line, PDS, etc.): .....

.....  
.....

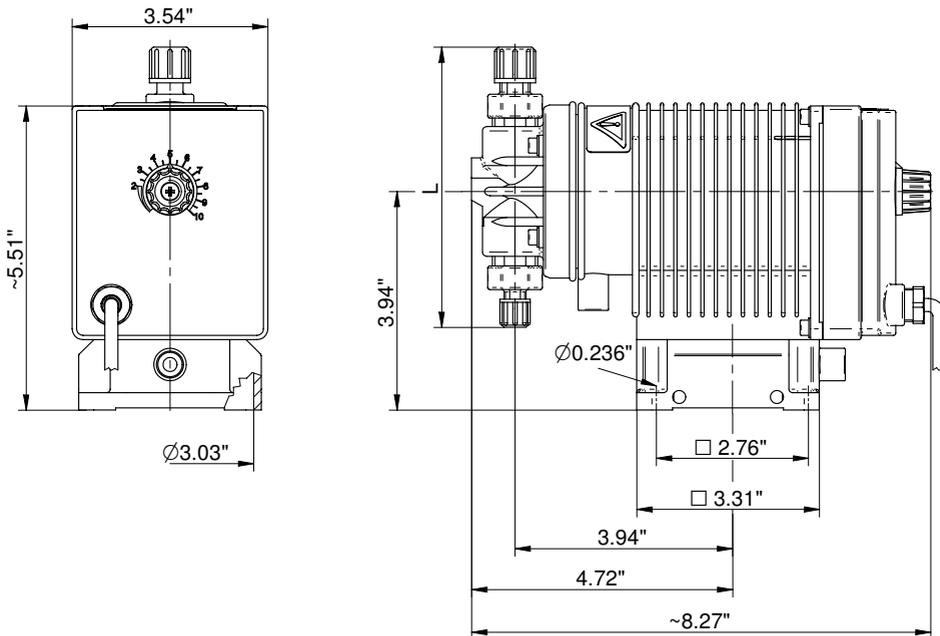
Commissioning (date): .....

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.



## Dimensions for the USA



DN	Connection	„L“ Dimension
4	4/6 - 4/6	4.96"
6	1/4" x 3/8"-1/4" x 3/8"	5.28"
4/6	4/6 - 1/4" x 3/8"	5.12"

All dimensions in inches.

## Technical data for the USA

<b>MAGDOS LC</b>	<b>2</b>	<b>4</b>	<b>6</b>
Max. pressure [psig]	145	116	73
Capacity at max. pressure* [gph]	0.53	1.03	1.51
Medium pressure* [psig]	87	58	44
Capacity medium pressure* [gph]	0.58	1.08	1.56
Max. stroke frequency [SPM]	120		
Suction lift [ft. H2O] for non-effervescent media	10		
Max. positiv static suction head [ft. H2O]	26.2		
Voltage	115V AC optional: 230 V AC +/- 10%, 50/60 Hz		
Length power cord [ft.]	6 (115V AC w. UL-/CSA-plug) (230V AC w. schuko plug)		
Power consumption	20 W		
Max. power consumption during dosing stroke	115 V AC: 3.8 A; 230 V AC: 2.0 A		
Soldered fuse	115 V AC and 230V AC: 3.15 A slow reacting		
Protection class	NEMA 4X / IP 65		
Insulation class	F		
Max. ambient temperature [F°]	PVC- 104 (optional PP 113)		
Max. temperature of process fluid [F°]	PVC- 95 (optional PP 104)		
Weight [lbs.]	4.4		
Max. sound pressure level [dB(A)] without pressure	58		
Max. sound pressure level [dB(A)] at test pressure	60		
Connection type (standard)	1/4"x 3/8" PE-tubing		

## Check valves MAGDOS LC 2 ... LC 6 USA

Double ball check valve complete with connection 1/4"x 3/8"			Spring-loaded check valve complete with connection 1/4"x 3/8"		
Material	Part No.		Material	Part No.	
	Suction valve	Discharge valve		Suction valve	Discharge valve
PVC/ Glass/ Viton®	37669	37670	PVC/ Glass/ Viton®	37677	37678
PVC/ Glass/ EPDM	37671	37672	PVC/ Glass/ EPDM	37679	37680
PP/ Glass/ Viton®	37673	37674	PP/ Glass/ Viton®	37681	37682
PP/ Glass/ EPDM	37675	37676	PP/ Glass/ EPDM	37683	37684

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Internet: [www.jescome.com](http://www.jescome.com)



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